

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0135
Expires: July 31, 2010**UNORTHODOX
LOCATION****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 Hobbs**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

5. Lease Serial No.

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.
LUSK DEEP UNIT A 33H9. API Well No.
30-025-43390-00-X110. Field and Pool, or Exploratory
LUSK11. County or Parish, and State
LEA COUNTY, NM

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator

COG OPERATING LLC

Contact: MAYTE X REYES

E-Mail: mreyes1@concho.com

3a. Address

ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-42873b. Phone No. (include area code)
Ph: 575-748-6945

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

Sec 18 T19S R32E SESE 373FSL 1166FEL

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION

☒ Notice of Intent☐ Subsequent Report☐ Final Abandonment Notice

TYPE OF ACTION

☐ Acidize☐ Alter Casing☐ Casing Repair☐ Change Plans☐ Convert to Injection☐ Deepen☐ Fracture Treat☐ New Construction☐ Plug and Abandon☐ Plug Back☐ Production (Start/Resume)☐ Reclamation☐ Recomplete☐ Temporarily Abandon☐ Water Disposal☐ Water Shut-Off☐ Well Integrity☒ Other
Change to Original A
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 recomple 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 recomple 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.

Operator request a new total depth of 14683? MD.

New production cement volumes are

860 sks 11.0 ppg (3.2 ft³/sk) lead.
NEOCER TM 2 lbm/sk kol-seal

1280 sks 13.2 ppg (1.41 ft³/sk) tail
NEOCER TM

FTP: 100' FNL & 1980' FEL SEC 19

LTP: 100' FSL & 1980' FEL SEC 19

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

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

Electronic Submission #348954 verified by the BLM Well Information System

For COG OPERATING LLC, sent to the Hobbs

Committed to AFMSS for processing by MUSTAFA HAQUE on 09/01/2016 (16MH0023SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 08/24/2016

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ~~(BLM Approver Not Specified)~~ MUSTAFA HAQUE

Title PETROLEUM ENGINEER

Date 09/06/2016

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 ****

**PECOS DISTRICT
CONDITIONS OF APPROVAL**

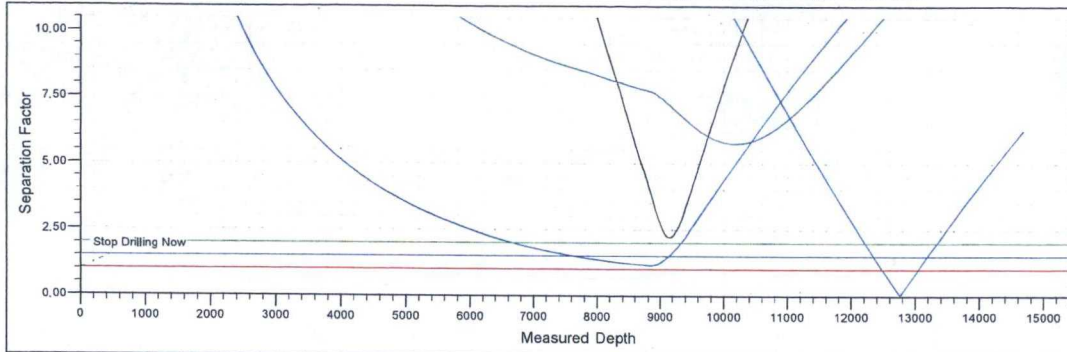
OPERATOR'S NAME:	COG Operating, LLC.
LEASE NO.:	NMNM-025566
WELL NAME & NO.:	Lusk Deep Unit A 33H
SURFACE HOLE FOOTAGE:	0190' FSL & 1980' FEL
BOTTOM HOLE FOOTAGE	0330' FNL & 1980' FEL
LOCATION:	Section 19, T. 19 S., R 32 E., NMPM
COUNTY:	Lea County, New Mexico

All previous COAs still apply.

MHH 09062016

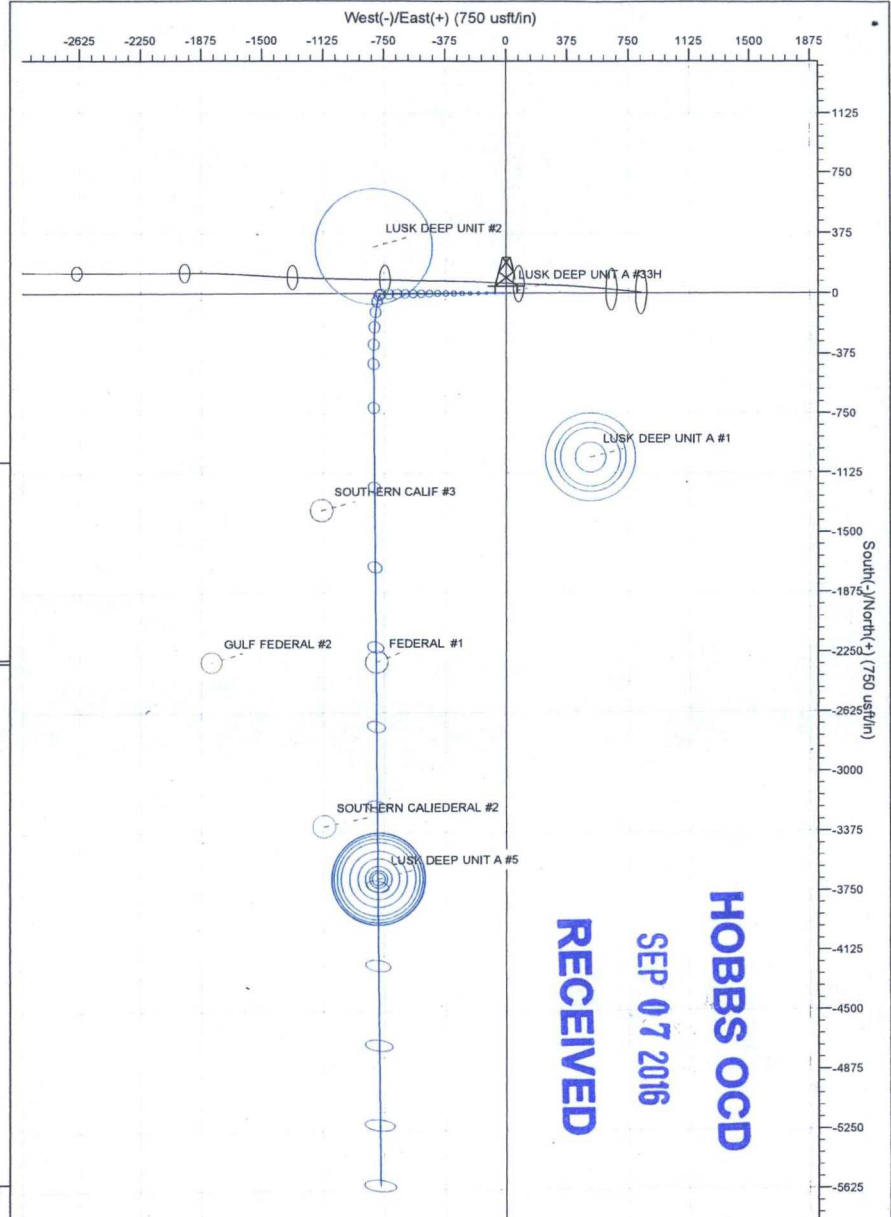
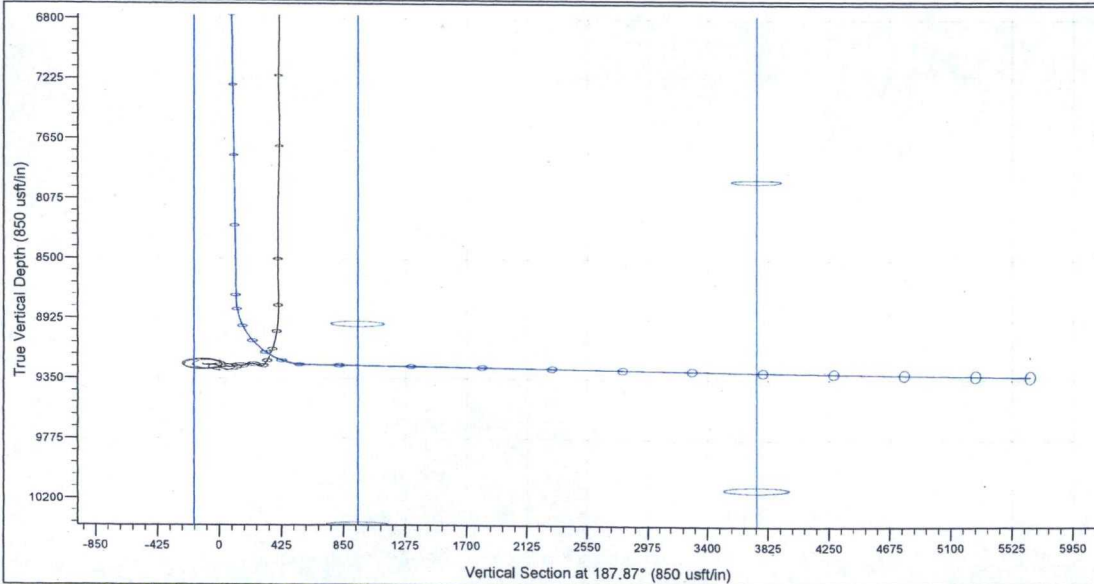


Project: LEA COUNTY, NM
Site: LUSK BSS
Well: LUSK DEEP UNIT A #33H
Wellbore: Wellbore #1
Design: DVD Plan 3 - land at 100' FNL



LEGEND

- LUSK DEEP UNIT A #28H, OWB, ACTUAL WELLPATH V0
- LUSK DEEP UNIT A #5, OWB, ACTUAL WELLPATH V0
- LUSK DEEP UNIT #2, OWB, ACTUAL WELLPATH V0
- LUSK DEEP UNIT A #1, OWB, ACTUAL WELLPATH V0
- SOUTHERN CALIF #3, OWB, ACTUAL WELLPATH V0
- SOUTHERN CALIFEDERAL #2, OWB, ACTUAL WELLPATH V0
- FEDERAL #1, OWB, ACTUAL WELLPATH V0
- GULF FEDERAL #2, OWB, ACTUAL WELLPATH V0
- DVD Plan 3 - land at 100' FNL



HOBBS OCD
SEP 07 2016
RECEIVED

HOBBS OCD

SEP 07 2016

RECEIVED

COP OPERATING, LLC

LEA COUNTY, NM

LUSK BSS

LUSK DEEP UNIT A #33H

Wellbore #1

Plan: DWD Plan 3 - land at 100' FNL

Standard Survey Report

24 August, 2016

COG Operating LLC

Survey Report

Company:	COP OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Well:	LUSK DEEP UNIT A #33H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	DWD Plan 3 - land at 100' FNL	Database:	EDM_Users

Project	LEA COUNTY, NM		
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	LUSK BSS				
Site Position:		Northing:	546,609.70 usft	Latitude:	32° 30' 8.821 N
From:	Map	Easting:	583,312.20 usft	Longitude:	104° 3' 47.146 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.15 °

Well	LUSK DEEP UNIT A #33H					
Well Position	+N/-S	0.0 usft	Northing:	602,092.30 usf	Latitude:	32° 39' 14.836 N
	+E/-W	0.0 usft	Easting:	664,064.90 usf	Longitude:	103° 48' 0.961 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	0.0 usf	Ground Level:	3,585.0 usf	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	WMM2015	6/2/2016	7.22	60.42	48,268

Design	DWD Plan 3 - land at 100' FNL				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	187.87	

Survey Tool Program	Date 8/24/2016				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.0	14,683.3	DWD Plan 3 - land at 100' FNL (Wellbore)	MWD	OWSG MWD - Standard	

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)	
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00	
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00	
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00	
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00	
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00	
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00	
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00	

COG Operating LLC

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	DWD Plan 3 - land at 100' FNL	Database:	EDM_Users

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)
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
950.0	0.00	0.00	950.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	1.00	269.56	1,000.0	0.0	-0.4	0.1	2.00	2.00	0.00
1,100.0	3.00	269.56	1,099.9	0.0	-3.9	0.6	2.00	2.00	0.00
1,200.0	5.00	269.56	1,199.7	-0.1	-10.9	1.6	2.00	2.00	0.00
1,236.8	5.74	269.56	1,236.4	-0.1	-14.3	2.1	2.00	2.00	0.00
1,300.0	5.74	269.56	1,299.2	-0.2	-20.7	3.0	0.00	0.00	0.00
1,400.0	5.74	269.56	1,398.7	-0.2	-30.7	4.4	0.00	0.00	0.00
1,500.0	5.74	269.56	1,498.2	-0.3	-40.7	5.9	0.00	0.00	0.00
1,600.0	5.74	269.56	1,597.7	-0.4	-50.6	7.3	0.00	0.00	0.00
1,700.0	5.74	269.56	1,697.2	-0.5	-60.6	8.8	0.00	0.00	0.00
1,800.0	5.74	269.56	1,796.7	-0.5	-70.6	10.2	0.00	0.00	0.00
1,900.0	5.74	269.56	1,896.2	-0.6	-80.6	11.6	0.00	0.00	0.00
2,000.0	5.74	269.56	1,995.7	-0.7	-90.6	13.1	0.00	0.00	0.00
2,100.0	5.74	269.56	2,095.2	-0.8	-100.6	14.5	0.00	0.00	0.00
2,200.0	5.74	269.56	2,194.7	-0.8	-110.6	16.0	0.00	0.00	0.00
2,300.0	5.74	269.56	2,294.2	-0.9	-120.6	17.4	0.00	0.00	0.00
2,400.0	5.74	269.56	2,393.7	-1.0	-130.6	18.9	0.00	0.00	0.00
2,500.0	5.74	269.56	2,493.2	-1.1	-140.6	20.3	0.00	0.00	0.00
2,600.0	5.74	269.56	2,592.7	-1.1	-150.6	21.8	0.00	0.00	0.00
2,700.0	5.74	269.56	2,692.2	-1.2	-160.6	23.2	0.00	0.00	0.00
2,800.0	5.74	269.56	2,791.7	-1.3	-170.6	24.6	0.00	0.00	0.00
2,900.0	5.74	269.56	2,891.2	-1.4	-180.6	26.1	0.00	0.00	0.00
3,000.0	5.74	269.56	2,990.7	-1.4	-190.6	27.5	0.00	0.00	0.00
3,100.0	5.74	269.56	3,090.2	-1.5	-200.6	29.0	0.00	0.00	0.00
3,200.0	5.74	269.56	3,189.7	-1.6	-210.6	30.4	0.00	0.00	0.00
3,300.0	5.74	269.56	3,289.2	-1.7	-220.6	31.9	0.00	0.00	0.00
3,400.0	5.74	269.56	3,388.7	-1.8	-230.6	33.3	0.00	0.00	0.00
3,500.0	5.74	269.56	3,488.2	-1.8	-240.6	34.8	0.00	0.00	0.00
3,600.0	5.74	269.56	3,587.7	-1.9	-250.6	36.2	0.00	0.00	0.00
3,700.0	5.74	269.56	3,687.2	-2.0	-260.5	37.6	0.00	0.00	0.00
3,800.0	5.74	269.56	3,786.7	-2.1	-270.5	39.1	0.00	0.00	0.00
3,900.0	5.74	269.56	3,886.2	-2.1	-280.5	40.5	0.00	0.00	0.00
4,000.0	5.74	269.56	3,985.7	-2.2	-290.5	42.0	0.00	0.00	0.00
4,100.0	5.74	269.56	4,085.2	-2.3	-300.5	43.4	0.00	0.00	0.00
4,200.0	5.74	269.56	4,184.7	-2.4	-310.5	44.9	0.00	0.00	0.00
4,300.0	5.74	269.56	4,284.2	-2.4	-320.5	46.3	0.00	0.00	0.00
4,400.0	5.74	269.56	4,383.7	-2.5	-330.5	47.7	0.00	0.00	0.00
4,500.0	5.74	269.56	4,483.2	-2.6	-340.5	49.2	0.00	0.00	0.00
4,600.0	5.74	269.56	4,582.7	-2.7	-350.5	50.6	0.00	0.00	0.00
4,700.0	5.74	269.56	4,682.2	-2.7	-360.5	52.1	0.00	0.00	0.00
4,800.0	5.74	269.56	4,781.7	-2.8	-370.5	53.5	0.00	0.00	0.00

COG Operating LLC

Survey Report

Company:	COP OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Well:	LUSK DEEP UNIT A #33H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	DWD Plan 3 - land at 100' FNL	Database:	EDM_Users

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)
4,900.0	5.74	269.56	4,881.2	-2.9	-380.5	55.0	0.00	0.00	0.00
5,000.0	5.74	269.56	4,980.7	-3.0	-390.5	56.4	0.00	0.00	0.00
5,100.0	5.74	269.56	5,080.2	-3.0	-400.5	57.9	0.00	0.00	0.00
5,200.0	5.74	269.56	5,179.7	-3.1	-410.5	59.3	0.00	0.00	0.00
5,300.0	5.74	269.56	5,279.2	-3.2	-420.5	60.7	0.00	0.00	0.00
5,400.0	5.74	269.56	5,378.7	-3.3	-430.5	62.2	0.00	0.00	0.00
5,500.0	5.74	269.56	5,478.2	-3.3	-440.5	63.6	0.00	0.00	0.00
5,600.0	5.74	269.56	5,577.7	-3.4	-450.5	65.1	0.00	0.00	0.00
5,700.0	5.74	269.56	5,677.2	-3.5	-460.5	66.5	0.00	0.00	0.00
5,800.0	5.74	269.56	5,776.7	-3.6	-470.4	68.0	0.00	0.00	0.00
5,900.0	5.74	269.56	5,876.2	-3.7	-480.4	69.4	0.00	0.00	0.00
6,000.0	5.74	269.56	5,975.7	-3.7	-490.4	70.8	0.00	0.00	0.00
6,100.0	5.74	269.56	6,075.2	-3.8	-500.4	72.3	0.00	0.00	0.00
6,200.0	5.74	269.56	6,174.7	-3.9	-510.4	73.7	0.00	0.00	0.00
6,300.0	5.74	269.56	6,274.2	-4.0	-520.4	75.2	0.00	0.00	0.00
6,400.0	5.74	269.56	6,373.7	-4.0	-530.4	76.6	0.00	0.00	0.00
6,500.0	5.74	269.56	6,473.2	-4.1	-540.4	78.1	0.00	0.00	0.00
6,600.0	5.74	269.56	6,572.7	-4.2	-550.4	79.5	0.00	0.00	0.00
6,700.0	5.74	269.56	6,672.2	-4.3	-560.4	81.0	0.00	0.00	0.00
6,800.0	5.74	269.56	6,771.7	-4.3	-570.4	82.4	0.00	0.00	0.00
6,900.0	5.74	269.56	6,871.2	-4.4	-580.4	83.8	0.00	0.00	0.00
7,000.0	5.74	269.56	6,970.7	-4.5	-590.4	85.3	0.00	0.00	0.00
7,100.0	5.74	269.56	7,070.2	-4.6	-600.4	86.7	0.00	0.00	0.00
7,200.0	5.74	269.56	7,169.7	-4.6	-610.4	88.2	0.00	0.00	0.00
7,300.0	5.74	269.56	7,269.2	-4.7	-620.4	89.6	0.00	0.00	0.00
7,400.0	5.74	269.56	7,368.7	-4.8	-630.4	91.1	0.00	0.00	0.00
7,500.0	5.74	269.56	7,468.2	-4.9	-640.4	92.5	0.00	0.00	0.00
7,600.0	5.74	269.56	7,567.7	-4.9	-650.4	94.0	0.00	0.00	0.00
7,700.0	5.74	269.56	7,667.2	-5.0	-660.4	95.4	0.00	0.00	0.00
7,800.0	5.74	269.56	7,766.7	-5.1	-670.4	96.8	0.00	0.00	0.00
7,900.0	5.74	269.56	7,866.2	-5.2	-680.3	98.3	0.00	0.00	0.00
8,000.0	5.74	269.56	7,965.7	-5.3	-690.3	99.7	0.00	0.00	0.00
8,100.0	5.74	269.56	8,065.1	-5.3	-700.3	101.2	0.00	0.00	0.00
8,200.0	5.74	269.56	8,164.6	-5.4	-710.3	102.6	0.00	0.00	0.00
8,300.0	5.74	269.56	8,264.1	-5.5	-720.3	104.1	0.00	0.00	0.00
8,400.0	5.74	269.56	8,363.6	-5.6	-730.3	105.5	0.00	0.00	0.00
8,500.0	5.74	269.56	8,463.1	-5.6	-740.3	106.9	0.00	0.00	0.00
8,600.0	5.74	269.56	8,562.6	-5.7	-750.3	108.4	0.00	0.00	0.00
8,700.0	5.74	269.56	8,662.1	-5.8	-760.3	109.8	0.00	0.00	0.00
8,800.0	5.74	269.56	8,761.6	-5.9	-770.3	111.3	0.00	0.00	0.00
8,818.3	5.74	269.56	8,779.9	-5.9	-772.1	111.5	0.00	0.00	0.00
8,900.0	11.33	209.54	8,860.7	-12.9	-780.2	119.6	12.00	6.85	-73.50

COG Operating LLC

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Planned Survey

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9,000.0	22.50	193.50	8,956.3	-40.2	-789.5	147.9	12.00	11.16	-16.05
9,100.0	34.22	187.95	9,044.2	-86.8	-797.9	195.2	12.00	11.72	-5.54
9,200.0	46.07	185.01	9,120.5	-150.7	-805.0	259.5	12.00	11.85	-2.94
9,300.0	57.97	183.06	9,181.9	-229.2	-810.4	338.0	12.00	11.90	-1.95
9,400.0	69.89	181.57	9,225.8	-318.8	-814.0	427.2	12.00	11.93	-1.50
9,500.0	81.83	180.28	9,250.2	-415.6	-815.5	523.3	12.00	11.94	-1.28
9,561.6	89.18	179.54	9,255.0	-476.9	-815.4	584.1	12.00	11.94	-1.21
9,600.0	89.18	179.54	9,255.6	-515.3	-815.1	622.1	0.00	0.00	0.00
9,700.0	89.18	179.54	9,257.0	-615.3	-814.3	721.0	0.00	0.00	0.00
9,800.0	89.18	179.54	9,258.4	-715.3	-813.5	820.0	0.00	0.00	0.00
9,900.0	89.18	179.54	9,259.8	-815.3	-812.7	918.9	0.00	0.00	0.00
10,000.0	89.18	179.54	9,261.3	-915.3	-811.9	1,017.8	0.00	0.00	0.00
10,100.0	89.18	179.54	9,262.7	-1,015.3	-811.1	1,116.8	0.00	0.00	0.00
10,200.0	89.18	179.54	9,264.1	-1,115.3	-810.3	1,215.7	0.00	0.00	0.00
10,300.0	89.18	179.54	9,265.6	-1,215.2	-809.5	1,314.6	0.00	0.00	0.00
10,400.0	89.18	179.54	9,267.0	-1,315.2	-808.7	1,413.6	0.00	0.00	0.00
10,500.0	89.18	179.54	9,268.4	-1,415.2	-807.9	1,512.5	0.00	0.00	0.00
10,600.0	89.18	179.54	9,269.9	-1,515.2	-807.1	1,611.4	0.00	0.00	0.00
10,700.0	89.18	179.54	9,271.3	-1,615.2	-806.3	1,710.4	0.00	0.00	0.00
10,800.0	89.18	179.54	9,272.7	-1,715.2	-805.5	1,809.3	0.00	0.00	0.00
10,900.0	89.18	179.54	9,274.2	-1,815.2	-804.7	1,908.2	0.00	0.00	0.00
11,000.0	89.18	179.54	9,275.6	-1,915.2	-803.9	2,007.2	0.00	0.00	0.00
11,100.0	89.18	179.54	9,277.0	-2,015.1	-803.1	2,106.1	0.00	0.00	0.00
11,200.0	89.18	179.54	9,278.4	-2,115.1	-802.3	2,205.1	0.00	0.00	0.00
11,300.0	89.18	179.54	9,279.9	-2,215.1	-801.5	2,304.0	0.00	0.00	0.00
11,400.0	89.18	179.54	9,281.3	-2,315.1	-800.7	2,402.9	0.00	0.00	0.00
11,500.0	89.18	179.54	9,282.7	-2,415.1	-799.8	2,501.9	0.00	0.00	0.00
11,600.0	89.18	179.54	9,284.2	-2,515.1	-799.0	2,600.8	0.00	0.00	0.00
11,700.0	89.18	179.54	9,285.6	-2,615.1	-798.2	2,699.7	0.00	0.00	0.00
11,800.0	89.18	179.54	9,287.0	-2,715.0	-797.4	2,798.7	0.00	0.00	0.00
11,900.0	89.18	179.54	9,288.5	-2,815.0	-796.6	2,897.6	0.00	0.00	0.00
12,000.0	89.18	179.54	9,289.9	-2,915.0	-795.8	2,996.5	0.00	0.00	0.00
12,100.0	89.18	179.54	9,291.3	-3,015.0	-795.0	3,095.5	0.00	0.00	0.00
12,200.0	89.18	179.54	9,292.8	-3,115.0	-794.2	3,194.4	0.00	0.00	0.00
12,300.0	89.18	179.54	9,294.2	-3,215.0	-793.4	3,293.3	0.00	0.00	0.00
12,400.0	89.18	179.54	9,295.6	-3,315.0	-792.6	3,392.3	0.00	0.00	0.00
12,500.0	89.18	179.54	9,297.1	-3,414.9	-791.8	3,491.2	0.00	0.00	0.00
12,600.0	89.18	179.54	9,298.5	-3,514.9	-791.0	3,590.1	0.00	0.00	0.00
12,700.0	89.18	179.54	9,299.9	-3,614.9	-790.2	3,689.1	0.00	0.00	0.00
12,800.0	89.18	179.54	9,301.3	-3,714.9	-789.4	3,788.0	0.00	0.00	0.00
12,900.0	89.18	179.54	9,302.8	-3,814.9	-788.6	3,886.9	0.00	0.00	0.00
13,000.0	89.18	179.54	9,304.2	-3,914.9	-787.8	3,985.9	0.00	0.00	0.00

COG Operating LLC

Survey Report

Company:	COP OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Well:	LUSK DEEP UNIT A #33H	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	DWD Plan 3 - land at 100' FNL	Database:	EDM_Users

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)
13,100.0	89.18	179.54	9,305.6	-4,014.9	-787.0	4,084.8	0.00	0.00	0.00
13,200.0	89.18	179.54	9,307.1	-4,114.9	-786.2	4,183.7	0.00	0.00	0.00
13,300.0	89.18	179.54	9,308.5	-4,214.8	-785.4	4,282.7	0.00	0.00	0.00
13,400.0	89.18	179.54	9,309.9	-4,314.8	-784.6	4,381.6	0.00	0.00	0.00
13,500.0	89.18	179.54	9,311.4	-4,414.8	-783.8	4,480.6	0.00	0.00	0.00
13,600.0	89.18	179.54	9,312.8	-4,514.8	-783.0	4,579.5	0.00	0.00	0.00
13,700.0	89.18	179.54	9,314.2	-4,614.8	-782.2	4,678.4	0.00	0.00	0.00
13,800.0	89.18	179.54	9,315.7	-4,714.8	-781.4	4,777.4	0.00	0.00	0.00
13,900.0	89.18	179.54	9,317.1	-4,814.8	-780.6	4,876.3	0.00	0.00	0.00
14,000.0	89.18	179.54	9,318.5	-4,914.7	-779.8	4,975.2	0.00	0.00	0.00
14,100.0	89.18	179.54	9,320.0	-5,014.7	-779.0	5,074.2	0.00	0.00	0.00
14,200.0	89.18	179.54	9,321.4	-5,114.7	-778.2	5,173.1	0.00	0.00	0.00
14,300.0	89.18	179.54	9,322.8	-5,214.7	-777.4	5,272.0	0.00	0.00	0.00
14,400.0	89.18	179.54	9,324.2	-5,314.7	-776.6	5,371.0	0.00	0.00	0.00
14,500.0	89.18	179.54	9,325.7	-5,414.7	-775.8	5,469.9	0.00	0.00	0.00
14,600.0	89.18	179.54	9,327.1	-5,514.7	-775.0	5,568.8	0.00	0.00	0.00
14,683.3	89.18	179.54	9,328.3	-5,598.0	-774.3	5,651.3	0.00	0.00	0.00

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Lusk Deep Unit A	0.00	0.00	0.0	0.0	0.0	602,092.30	664,064.90	32° 39' 14.836 N	103° 48' 0.961 W
- plan hits target center									
- Point									
Lusk Deep Unit A	0.00	0.00	9,255.0	-706.9	-813.6	601,385.41	663,251.34	32° 39' 7.882 N	103° 48' 10.518 W
- plan misses target center by 3.3usft at 9791.5usft MD (9258.3 TVD, -706.8 N, -813.6 E)									
- Point									
Lusk Deep Unit A	0.00	0.00	9,255.0	-476.9	-815.4	601,615.40	663,249.49	32° 39' 10.158 N	103° 48' 10.526 W
- plan hits target center									
- Point									
Lusk Deep Unit A	0.00	0.00	9,325.0	-5,598.0	-774.1	596,494.30	663,290.80	32° 38' 19.481 N	103° 48' 10.342 W
- plan misses target center by 3.3usft at 14683.3usft MD (9328.3 TVD, -5598.0 N, -774.3 E)									
- Point									

Checked By: _____ Approved By: _____ Date: _____

COG OPERATING, LLC

LEA COUNTY, NM

LUSK BSS

LUSK DEEP UNIT A #33H

Wellbore #1

DWD Plan 3 - land at 100' FNL

Anticollision Report

24 August, 2016

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Reference	DWD Plan 3 - land at 100' FNL		
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 10,000.0 usft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date 8/24/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	14,683.3	DWD Plan 3 - land at 100' FNL (Wellbore	MWD	OWSG MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
LUSK BSS						
FEDERAL #1 - OWB - ACTUAL WELLPATH	2,813.5	2,715.0	2,389.5	2,309.3	29.826 CC, ES	
FEDERAL #1 - OWB - ACTUAL WELLPATH	3,100.0	2,715.0	2,406.6	2,325.3	29.629 SF	
GULF FEDERAL #2 - OWB - ACTUAL WELLPATH	2,712.2	2,500.0	2,840.0	2,765.8	38.292 CC, ES	
GULF FEDERAL #2 - OWB - ACTUAL WELLPATH	3,100.0	2,500.0	2,866.3	2,790.6	37.879 SF	
LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH	8,824.5	8,784.0	301.0	40.5	1.155 Shut in Produces, CC	
LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH	8,850.0	8,809.4	301.7	40.4	1.155 Shut in Produces, ES, SF	
LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH	950.0	946.0	1,149.8	1,132.2	65.547 CC	
LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH	10,122.1	9,259.8	1,328.6	1,097.4	5.748 ES	
LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH	10,200.0	9,260.9	1,330.8	1,099.1	5.742 SF	
LUSK DEEP UNIT A #28H - OWB - ACTUAL WELLPATH	9,157.3	11,881.6	277.9	153.5	2.234 CC, ES, SF	
LUSK DEEP UNIT A #5 - OWB - ACTUAL WELLPATH	12,753.8	9,262.5	5.7	-273.3	0.020 Stop Drilling Now, CC, ES,	
SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLP	2,875.5	2,736.0	3,468.1	3,387.2	42.871 CC	
SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLP	2,900.0	2,736.0	3,468.1	3,387.2	42.822 ES	
SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLP	14,683.3	2,736.0	6,945.1	6,774.7	40.769 SF	
SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH	2,816.8	2,695.0	1,664.4	1,584.8	20.907 CC, ES	
SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH	3,000.0	2,695.0	1,674.4	1,594.1	20.847 SF	

Offset Design LUSK BSS - FEDERAL #1 - OWB - ACTUAL WELLPATH												Offset Site Error:	0.0 usft
Survey Program: 2715-INC-ONLY												Offset Well Error:	3.0 usft
Reference	Vertical	Measured	Vertical	Semi Major Axis	Offset	Highside	Offset Wellbore Centre	Between	Between	Minimum	Separation	Warning	
Depth (usft)	Depth (usft)	Depth (usft)	Depth (usft)	(usft)	(usft)	Toolface (")	+N/-S (usft)	+E/-W (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)		
0.0	0.0	0.0	0.0	0.0	3.0	-161.03	-2,307.7	-793.2	2,440.3				
100.0	100.0	74.0	74.0	0.1	3.6	-161.03	-2,307.7	-793.2	2,440.2	2,436.5	3.70	660.017	
200.0	200.0	174.0	174.0	0.5	5.4	-161.03	-2,307.7	-793.2	2,440.2	2,434.3	5.89	414.069	
300.0	300.0	274.0	274.0	0.9	7.7	-161.03	-2,307.7	-793.2	2,440.2	2,431.7	8.53	286.212	
400.0	400.0	374.0	374.0	1.2	10.1	-161.03	-2,307.7	-793.2	2,440.2	2,428.9	11.30	215.873	
500.0	500.0	474.0	474.0	1.6	12.6	-161.03	-2,307.7	-793.2	2,440.2	2,426.1	14.14	172.530	
600.0	600.0	574.0	574.0	1.9	15.1	-161.03	-2,307.7	-793.2	2,440.2	2,423.2	17.01	143.417	
700.0	700.0	674.0	674.0	2.3	17.6	-161.03	-2,307.7	-793.2	2,440.2	2,420.3	19.90	122.601	
800.0	800.0	774.0	774.0	2.7	20.2	-161.03	-2,307.7	-793.2	2,440.2	2,417.4	22.80	107.009	
900.0	900.0	874.0	874.0	3.0	22.7	-161.03	-2,307.7	-793.2	2,440.2	2,414.5	25.71	94.908	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - FEDERAL #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2715-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
950.0	950.0	924.0	924.0	3.2	24.0	-161.03	-2,307.7	-793.2	2,440.2	2,413.0	27.17	89.822		
1,000.0	1,000.0	974.0	974.0	3.4	25.3	-70.61	-2,307.7	-793.2	2,440.1	2,411.4	28.62	85.259		
1,100.0	1,099.9	1,073.9	1,073.9	3.7	27.8	-70.71	-2,307.7	-793.2	2,438.9	2,407.4	31.52	77.378		
1,200.0	1,199.7	1,173.7	1,173.7	4.1	30.4	-70.91	-2,307.7	-793.2	2,436.6	2,402.2	34.42	70.784		
1,236.8	1,236.4	1,210.4	1,210.4	4.2	31.3	-71.00	-2,307.7	-793.2	2,435.5	2,400.0	35.49	68.618		
1,300.0	1,299.2	1,273.2	1,273.2	4.4	32.9	-71.14	-2,307.7	-793.2	2,433.4	2,396.1	37.33	65.185		
1,400.0	1,398.7	1,372.7	1,372.7	4.8	35.5	-71.37	-2,307.7	-793.2	2,430.2	2,389.9	40.25	60.385		
1,500.0	1,498.2	1,472.2	1,472.2	5.1	38.0	-71.59	-2,307.7	-793.2	2,427.0	2,383.8	43.17	56.225		
1,600.0	1,597.7	1,571.7	1,571.7	5.5	40.6	-71.81	-2,307.7	-793.2	2,423.8	2,377.8	46.09	52.589		
1,700.0	1,697.2	1,671.2	1,671.2	5.9	43.1	-72.03	-2,307.7	-793.2	2,420.7	2,371.7	49.02	49.383		
1,800.0	1,796.7	1,770.7	1,770.7	6.3	45.7	-72.26	-2,307.7	-793.2	2,417.7	2,365.7	51.95	46.537		
1,900.0	1,896.2	1,870.2	1,870.2	6.6	48.2	-72.48	-2,307.7	-793.2	2,414.6	2,359.7	54.89	43.994		
2,000.0	1,995.7	1,969.7	1,969.7	7.0	50.8	-72.71	-2,307.7	-793.2	2,411.6	2,353.8	57.82	41.707		
2,100.0	2,095.2	2,069.2	2,069.2	7.4	53.4	-72.94	-2,307.7	-793.2	2,408.6	2,347.9	60.76	39.642		
2,200.0	2,194.7	2,168.7	2,168.7	7.8	55.9	-73.16	-2,307.7	-793.2	2,405.7	2,342.0	63.70	37.766		
2,300.0	2,294.2	2,268.2	2,268.2	8.2	58.5	-73.39	-2,307.7	-793.2	2,402.8	2,336.2	66.64	36.056		
2,400.0	2,393.7	2,367.7	2,367.7	8.6	61.0	-73.62	-2,307.7	-793.2	2,400.0	2,330.4	69.58	34.490		
2,500.0	2,493.2	2,467.2	2,467.2	8.9	63.6	-73.84	-2,307.7	-793.2	2,397.2	2,324.6	72.53	33.051		
2,600.0	2,592.7	2,566.7	2,566.7	9.3	66.1	-74.07	-2,307.7	-793.2	2,394.4	2,318.9	75.47	31.725		
2,700.0	2,692.2	2,666.2	2,666.2	9.7	68.7	-74.30	-2,307.7	-793.2	2,391.7	2,313.2	78.42	30.499		
2,800.0	2,791.7	2,715.0	2,715.0	10.1	70.0	-74.42	-2,307.7	-793.2	2,389.5	2,309.4	80.06	29.846		
2,813.5	2,805.2	2,715.0	2,715.0	10.2	70.0	-74.42	-2,307.7	-793.2	2,389.5	2,309.3	80.11	29.826 CC, ES		
2,900.0	2,891.2	2,715.0	2,715.0	10.5	70.0	-74.42	-2,307.7	-793.2	2,391.0	2,310.6	80.45	29.721		
3,000.0	2,990.7	2,715.0	2,715.0	10.9	70.0	-74.42	-2,307.7	-793.2	2,396.7	2,315.9	80.84	29.649		
3,100.0	3,090.2	2,715.0	2,715.0	11.3	70.0	-74.42	-2,307.7	-793.2	2,406.6	2,325.3	81.22	29.629 SF		
3,200.0	3,189.7	2,715.0	2,715.0	11.7	70.0	-74.42	-2,307.7	-793.2	2,420.5	2,338.9	81.61	29.659		
3,300.0	3,289.2	2,715.0	2,715.0	12.0	70.0	-74.42	-2,307.7	-793.2	2,438.5	2,356.5	82.00	29.737		
3,400.0	3,388.7	2,715.0	2,715.0	12.4	70.0	-74.42	-2,307.7	-793.2	2,460.4	2,378.0	82.39	29.863		
3,500.0	3,488.2	2,715.0	2,715.0	12.8	70.0	-74.42	-2,307.7	-793.2	2,486.1	2,403.3	82.78	30.033		
3,600.0	3,587.7	2,715.0	2,715.0	13.2	70.0	-74.42	-2,307.7	-793.2	2,515.6	2,432.4	83.17	30.246		
3,700.0	3,687.2	2,715.0	2,715.0	13.6	70.0	-74.42	-2,307.7	-793.2	2,548.6	2,465.0	83.56	30.501		
3,800.0	3,786.7	2,715.0	2,715.0	14.0	70.0	-74.42	-2,307.7	-793.2	2,585.1	2,501.1	83.95	30.794		
3,900.0	3,886.2	2,715.0	2,715.0	14.4	70.0	-74.42	-2,307.7	-793.2	2,624.9	2,540.5	84.34	31.123		
4,000.0	3,985.7	2,715.0	2,715.0	14.8	70.0	-74.42	-2,307.7	-793.2	2,667.8	2,583.1	84.73	31.487		
4,100.0	4,085.2	2,715.0	2,715.0	15.2	70.0	-74.42	-2,307.7	-793.2	2,713.8	2,628.6	85.12	31.882		
4,200.0	4,184.7	2,715.0	2,715.0	15.5	70.0	-74.42	-2,307.7	-793.2	2,762.6	2,677.1	85.51	32.307		
4,300.0	4,284.2	2,715.0	2,715.0	15.9	70.0	-74.42	-2,307.7	-793.2	2,814.1	2,728.2	85.90	32.760		
4,400.0	4,383.7	2,715.0	2,715.0	16.3	70.0	-74.42	-2,307.7	-793.2	2,868.2	2,781.9	86.29	33.238		
4,500.0	4,483.2	2,715.0	2,715.0	16.7	70.0	-74.42	-2,307.7	-793.2	2,924.7	2,838.0	86.68	33.740		
4,600.0	4,582.7	2,715.0	2,715.0	17.1	70.0	-74.42	-2,307.7	-793.2	2,983.4	2,896.4	87.07	34.264		
4,700.0	4,682.2	2,715.0	2,715.0	17.5	70.0	-74.42	-2,307.7	-793.2	3,044.4	2,956.9	87.46	34.807		
4,800.0	4,781.7	2,715.0	2,715.0	17.9	70.0	-74.42	-2,307.7	-793.2	3,107.3	3,019.5	87.85	35.369		
4,900.0	4,881.2	2,715.0	2,715.0	18.3	70.0	-74.42	-2,307.7	-793.2	3,172.2	3,083.9	88.25	35.947		
5,000.0	4,980.7	2,715.0	2,715.0	18.7	70.0	-74.42	-2,307.7	-793.2	3,238.8	3,150.2	88.64	36.540		
5,100.0	5,080.2	2,715.0	2,715.0	19.1	70.0	-74.42	-2,307.7	-793.2	3,307.2	3,218.1	89.03	37.147		
5,200.0	5,179.7	2,715.0	2,715.0	19.5	70.0	-74.42	-2,307.7	-793.2	3,377.1	3,287.7	89.42	37.766		
5,300.0	5,279.2	2,715.0	2,715.0	19.9	70.0	-74.42	-2,307.7	-793.2	3,448.5	3,358.7	89.81	38.397		
5,400.0	5,378.7	2,715.0	2,715.0	20.2	70.0	-74.42	-2,307.7	-793.2	3,521.3	3,431.1	90.20	39.037		
5,500.0	5,478.2	2,715.0	2,715.0	20.6	70.0	-74.42	-2,307.7	-793.2	3,595.3	3,504.8	90.60	39.686		
5,600.0	5,577.7	2,715.0	2,715.0	21.0	70.0	-74.42	-2,307.7	-793.2	3,670.7	3,579.7	90.99	40.343		
5,700.0	5,677.2	2,715.0	2,715.0	21.4	70.0	-74.42	-2,307.7	-793.2	3,747.1	3,655.8	91.38	41.007		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - FEDERAL #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2715-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
5,800.0	5,776.7	2,715.0	2,715.0	21.8	70.0	-74.42	-2,307.7	-793.2	3,824.7	3,732.9	91.77	41.677		
5,900.0	5,876.2	2,715.0	2,715.0	22.2	70.0	-74.42	-2,307.7	-793.2	3,903.3	3,811.1	92.16	42.352		
6,000.0	5,975.7	2,715.0	2,715.0	22.6	70.0	-74.42	-2,307.7	-793.2	3,982.8	3,890.3	92.55	43.032		
6,100.0	6,075.2	2,715.0	2,715.0	23.0	70.0	-74.42	-2,307.7	-793.2	4,063.3	3,970.3	92.95	43.716		
6,200.0	6,174.7	2,715.0	2,715.0	23.4	70.0	-74.42	-2,307.7	-793.2	4,144.6	4,051.2	93.34	44.404		
6,300.0	6,274.2	2,715.0	2,715.0	23.8	70.0	-74.42	-2,307.7	-793.2	4,226.7	4,133.0	93.73	45.094		
6,400.0	6,373.7	2,715.0	2,715.0	24.2	70.0	-74.42	-2,307.7	-793.2	4,309.5	4,215.4	94.12	45.786		
6,500.0	6,473.2	2,715.0	2,715.0	24.6	70.0	-74.42	-2,307.7	-793.2	4,393.1	4,298.6	94.51	46.481		
6,600.0	6,572.7	2,715.0	2,715.0	24.9	70.0	-74.42	-2,307.7	-793.2	4,477.4	4,382.5	94.91	47.176		
6,700.0	6,672.2	2,715.0	2,715.0	25.3	70.0	-74.42	-2,307.7	-793.2	4,562.2	4,466.9	95.30	47.873		
6,800.0	6,771.7	2,715.0	2,715.0	25.7	70.0	-74.42	-2,307.7	-793.2	4,647.7	4,552.0	95.69	48.570		
6,900.0	6,871.2	2,715.0	2,715.0	26.1	70.0	-74.42	-2,307.7	-793.2	4,733.8	4,637.7	96.08	49.267		
7,000.0	6,970.7	2,715.0	2,715.0	26.5	70.0	-74.42	-2,307.7	-793.2	4,820.4	4,723.9	96.48	49.964		
7,100.0	7,070.2	2,715.0	2,715.0	26.9	70.0	-74.42	-2,307.7	-793.2	4,907.5	4,810.6	96.87	50.661		
7,200.0	7,169.7	2,715.0	2,715.0	27.3	70.0	-74.42	-2,307.7	-793.2	4,995.0	4,897.8	97.26	51.357		
7,300.0	7,269.2	2,715.0	2,715.0	27.7	70.0	-74.42	-2,307.7	-793.2	5,083.1	4,985.4	97.65	52.053		
7,400.0	7,368.7	2,715.0	2,715.0	28.1	70.0	-74.42	-2,307.7	-793.2	5,171.6	5,073.5	98.05	52.747		
7,500.0	7,468.2	2,715.0	2,715.0	28.5	70.0	-74.42	-2,307.7	-793.2	5,260.5	5,162.0	98.44	53.439		
7,600.0	7,567.7	2,715.0	2,715.0	28.9	70.0	-74.42	-2,307.7	-793.2	5,349.7	5,250.9	98.83	54.131		
7,700.0	7,667.2	2,715.0	2,715.0	29.3	70.0	-74.42	-2,307.7	-793.2	5,439.4	5,340.2	99.22	54.820		
7,800.0	7,766.7	2,715.0	2,715.0	29.7	70.0	-74.42	-2,307.7	-793.2	5,529.4	5,429.8	99.61	55.508		
7,900.0	7,866.2	2,715.0	2,715.0	30.0	70.0	-74.42	-2,307.7	-793.2	5,619.7	5,519.7	100.01	56.193		
8,000.0	7,965.7	2,715.0	2,715.0	30.4	70.0	-74.42	-2,307.7	-793.2	5,710.4	5,610.0	100.40	56.877		
8,100.0	8,065.1	2,715.0	2,715.0	30.8	70.0	-74.42	-2,307.7	-793.2	5,801.4	5,700.6	100.79	57.558		
8,200.0	8,164.6	2,715.0	2,715.0	31.2	70.0	-74.42	-2,307.7	-793.2	5,892.7	5,791.5	101.18	58.237		
8,300.0	8,264.1	2,715.0	2,715.0	31.6	70.0	-74.42	-2,307.7	-793.2	5,984.2	5,882.6	101.58	58.913		
8,400.0	8,363.6	2,715.0	2,715.0	32.0	70.0	-74.42	-2,307.7	-793.2	6,076.0	5,974.0	101.97	59.586		
8,500.0	8,463.1	2,715.0	2,715.0	32.4	70.0	-74.42	-2,307.7	-793.2	6,168.1	6,065.7	102.36	60.257		
8,600.0	8,562.6	2,715.0	2,715.0	32.8	70.0	-74.42	-2,307.7	-793.2	6,260.4	6,157.6	102.76	60.925		
8,700.0	8,662.1	2,715.0	2,715.0	33.2	70.0	-74.42	-2,307.7	-793.2	6,352.9	6,249.8	103.15	61.591		
8,800.0	8,761.6	2,715.0	2,715.0	33.6	70.0	-74.42	-2,307.7	-793.2	6,445.7	6,342.2	103.54	62.253		
8,818.3	8,779.9	2,715.0	2,715.0	33.7	70.0	-74.42	-2,307.7	-793.2	6,462.7	6,359.1	103.61	62.374		
8,825.0	8,786.5	2,715.0	2,715.0	33.7	70.0	-67.03	-2,307.7	-793.2	6,468.9	6,365.3	103.64	62.418		
8,850.0	8,811.4	2,715.0	2,715.0	33.8	70.0	-43.17	-2,307.7	-793.2	6,491.8	6,388.0	103.74	62.580		
8,875.0	8,836.1	2,715.0	2,715.0	33.9	70.0	-28.20	-2,307.7	-793.2	6,514.1	6,410.3	103.83	62.737		
8,900.0	8,860.7	2,715.0	2,715.0	34.0	70.0	-19.48	-2,307.7	-793.2	6,535.9	6,431.9	103.93	62.889		
8,925.0	8,885.1	2,715.0	2,715.0	34.1	70.0	-14.19	-2,307.7	-793.2	6,557.0	6,453.0	104.02	63.035		
8,950.0	8,909.2	2,715.0	2,715.0	34.2	70.0	-10.78	-2,307.7	-793.2	6,577.4	6,473.3	104.11	63.176		
8,975.0	8,933.0	2,715.0	2,715.0	34.2	70.0	-8.45	-2,307.7	-793.2	6,597.1	6,492.9	104.20	63.310		
9,000.0	8,956.3	2,715.0	2,715.0	34.3	70.0	-6.79	-2,307.7	-793.2	6,616.0	6,511.7	104.29	63.438		
9,025.0	8,979.2	2,715.0	2,715.0	34.4	70.0	-5.56	-2,307.7	-793.2	6,634.1	6,529.7	104.38	63.558		
9,050.0	9,001.5	2,715.0	2,715.0	34.5	70.0	-4.63	-2,307.7	-793.2	6,651.3	6,546.9	104.46	63.672		
9,075.0	9,023.2	2,715.0	2,715.0	34.6	70.0	-3.91	-2,307.7	-793.2	6,667.7	6,563.1	104.55	63.778		
9,100.0	9,044.2	2,715.0	2,715.0	34.7	70.0	-3.33	-2,307.7	-793.2	6,683.0	6,578.4	104.63	63.875		
9,125.0	9,064.5	2,715.0	2,715.0	34.7	70.0	-2.86	-2,307.7	-793.2	6,697.4	6,592.7	104.70	63.965		
9,150.0	9,084.0	2,715.0	2,715.0	34.8	70.0	-2.48	-2,307.7	-793.2	6,710.7	6,606.0	104.78	64.046		
9,175.0	9,102.7	2,715.0	2,715.0	34.9	70.0	-2.16	-2,307.7	-793.2	6,723.1	6,618.2	104.85	64.118		
9,200.0	9,120.5	2,715.0	2,715.0	35.0	70.0	-1.88	-2,307.7	-793.2	6,734.3	6,629.4	104.93	64.180		
9,225.0	9,137.4	2,715.0	2,715.0	35.0	70.0	-1.65	-2,307.7	-793.2	6,744.4	6,639.4	105.00	64.233		
9,250.0	9,153.3	2,715.0	2,715.0	35.1	70.0	-1.45	-2,307.7	-793.2	6,753.4	6,648.4	105.07	64.276		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - FEDERAL #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2715-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
9,275.0	9,168.1	2,715.0	2,715.0	35.2	70.0	-1.28	-2,307.7	-793.2	6,761.3	6,656.2	105.14	64.309		
9,300.0	9,181.9	2,715.0	2,715.0	35.2	70.0	-1.12	-2,307.7	-793.2	6,768.0	6,662.8	105.21	64.330		
9,325.0	9,194.6	2,715.0	2,715.0	35.3	70.0	-0.98	-2,307.7	-793.2	6,773.5	6,668.3	105.28	64.341		
9,350.0	9,206.2	2,715.0	2,715.0	35.4	70.0	-0.86	-2,307.7	-793.2	6,777.9	6,672.5	105.34	64.340		
9,375.0	9,216.6	2,715.0	2,715.0	35.5	70.0	-0.74	-2,307.7	-793.2	6,781.0	6,675.6	105.41	64.327		
9,400.0	9,225.8	2,715.0	2,715.0	35.5	70.0	-0.64	-2,307.7	-793.2	6,783.0	6,677.5	105.49	64.303		
9,425.0	9,233.8	2,715.0	2,715.0	35.6	70.0	-0.54	-2,307.7	-793.2	6,783.7	6,678.2	105.56	64.265		
9,450.0	9,240.5	2,715.0	2,715.0	35.7	70.0	-0.44	-2,307.7	-793.2	6,783.2	6,677.6	105.63	64.216		
9,475.0	9,246.0	2,715.0	2,715.0	35.7	70.0	-0.36	-2,307.7	-793.2	6,781.5	6,675.8	105.71	64.153		
9,500.0	9,250.2	2,715.0	2,715.0	35.8	70.0	-0.27	-2,307.7	-793.2	6,778.6	6,672.9	105.79	64.078		
9,525.0	9,253.1	2,715.0	2,715.0	35.9	70.0	-0.19	-2,307.7	-793.2	6,774.6	6,668.7	105.87	63.989		
9,550.0	9,254.7	2,715.0	2,715.0	36.0	70.0	-0.10	-2,307.7	-793.2	6,769.3	6,663.3	105.95	63.888		
9,561.6	9,255.0	2,715.0	2,715.0	36.0	70.0	-0.07	-2,307.7	-793.2	6,766.4	6,660.4	105.99	63.837		
9,600.0	9,255.6	2,715.0	2,715.0	36.2	70.0	-0.07	-2,307.7	-793.2	6,756.7	6,650.5	106.13	63.662		
9,700.0	9,257.0	2,715.0	2,715.0	36.6	70.0	-0.07	-2,307.7	-793.2	6,732.2	6,625.7	106.55	63.186		
9,800.0	9,258.4	2,715.0	2,715.0	37.1	70.0	-0.07	-2,307.7	-793.2	6,709.2	6,602.1	107.03	62.685		
9,900.0	9,259.8	2,715.0	2,715.0	37.6	70.0	-0.07	-2,307.7	-793.2	6,687.5	6,579.9	107.58	62.161		
10,000.0	9,261.3	2,715.0	2,715.0	38.2	70.0	-0.07	-2,307.7	-793.2	6,667.3	6,559.1	108.20	61.618		
10,100.0	9,262.7	2,715.0	2,715.0	38.9	70.0	-0.07	-2,307.7	-793.2	6,648.6	6,539.7	108.89	61.059		
10,200.0	9,264.1	2,715.0	2,715.0	39.7	70.0	-0.07	-2,307.7	-793.2	6,631.3	6,521.6	109.63	60.488		
10,300.0	9,265.6	2,715.0	2,715.0	40.5	70.0	-0.07	-2,307.7	-793.2	6,615.4	6,505.0	110.43	59.906		
10,400.0	9,267.0	2,715.0	2,715.0	41.3	70.0	-0.07	-2,307.7	-793.2	6,601.1	6,489.8	111.28	59.318		
10,500.0	9,268.4	2,715.0	2,715.0	42.2	70.0	-0.07	-2,307.7	-793.2	6,588.2	6,476.0	112.18	58.726		
10,600.0	9,269.9	2,715.0	2,715.0	43.2	70.0	-0.07	-2,307.7	-793.2	6,576.8	6,463.7	113.13	58.133		
10,700.0	9,271.3	2,715.0	2,715.0	44.2	70.0	-0.07	-2,307.7	-793.2	6,566.9	6,452.8	114.13	57.541		
10,800.0	9,272.7	2,715.0	2,715.0	45.2	70.0	-0.07	-2,307.7	-793.2	6,558.6	6,443.4	115.16	56.952		
10,900.0	9,274.2	2,715.0	2,715.0	46.3	70.0	-0.07	-2,307.7	-793.2	6,551.7	6,435.5	116.23	56.368		
11,000.0	9,275.6	2,715.0	2,715.0	47.4	70.0	-0.07	-2,307.7	-793.2	6,546.4	6,429.0	117.34	55.791		
11,100.0	9,277.0	2,715.0	2,715.0	48.5	70.0	-0.07	-2,307.7	-793.2	6,542.6	6,424.1	118.48	55.223		
11,200.0	9,278.4	2,715.0	2,715.0	49.7	70.0	-0.07	-2,307.7	-793.2	6,540.3	6,420.6	119.64	54.664		
11,299.1	9,279.9	2,715.0	2,715.0	50.9	70.0	-0.07	-2,307.7	-793.2	6,539.5	6,418.7	120.83	54.121		
11,300.0	9,279.9	2,715.0	2,715.0	50.9	70.0	-0.07	-2,307.7	-793.2	6,539.5	6,418.7	120.84	54.116		
11,400.0	9,281.3	2,715.0	2,715.0	52.1	70.0	-0.07	-2,307.7	-793.2	6,540.3	6,418.3	122.07	53.580		
11,500.0	9,282.7	2,715.0	2,715.0	53.4	70.0	-0.07	-2,307.7	-793.2	6,542.6	6,419.3	123.32	53.056		
11,600.0	9,284.2	2,715.0	2,715.0	54.6	70.0	-0.07	-2,307.7	-793.2	6,546.5	6,421.9	124.59	52.545		
11,700.0	9,285.6	2,715.0	2,715.0	55.9	70.0	-0.07	-2,307.7	-793.2	6,551.8	6,425.9	125.88	52.048		
11,800.0	9,287.0	2,715.0	2,715.0	57.2	70.0	-0.07	-2,307.7	-793.2	6,558.7	6,431.5	127.19	51.565		
11,900.0	9,288.5	2,715.0	2,715.0	58.6	70.0	-0.07	-2,307.7	-793.2	6,567.1	6,438.6	128.52	51.097		
12,000.0	9,289.9	2,715.0	2,715.0	59.9	70.0	-0.07	-2,307.7	-793.2	6,577.0	6,447.1	129.87	50.642		
12,100.0	9,291.3	2,715.0	2,715.0	61.3	70.0	-0.07	-2,307.7	-793.2	6,588.4	6,457.2	131.24	50.203		
12,200.0	9,292.8	2,715.0	2,715.0	62.7	70.0	-0.07	-2,307.7	-793.2	6,601.3	6,468.7	132.62	49.778		
12,300.0	9,294.2	2,715.0	2,715.0	64.0	70.0	-0.07	-2,307.7	-793.2	6,615.7	6,481.7	134.01	49.368		
12,400.0	9,295.6	2,715.0	2,715.0	65.5	70.0	-0.07	-2,307.7	-793.2	6,631.6	6,496.1	135.42	48.972		
12,500.0	9,297.1	2,715.0	2,715.0	66.9	70.0	-0.07	-2,307.7	-793.2	6,648.9	6,512.1	136.83	48.591		
12,600.0	9,298.5	2,715.0	2,715.0	68.3	70.0	-0.07	-2,307.7	-793.2	6,667.7	6,529.4	138.27	48.224		
12,700.0	9,299.9	2,715.0	2,715.0	69.7	70.0	-0.07	-2,307.7	-793.2	6,687.9	6,548.2	139.71	47.871		
12,800.0	9,301.3	2,715.0	2,715.0	71.2	70.0	-0.07	-2,307.7	-793.2	6,709.6	6,568.4	141.16	47.532		
12,900.0	9,302.8	2,715.0	2,715.0	72.7	70.0	-0.07	-2,307.7	-793.2	6,732.6	6,590.0	142.62	47.207		
13,000.0	9,304.2	2,715.0	2,715.0	74.1	70.0	-0.07	-2,307.7	-793.2	6,757.1	6,613.0	144.09	46.895		
13,100.0	9,305.6	2,715.0	2,715.0	75.6	70.0	-0.07	-2,307.7	-793.2	6,783.0	6,637.4	145.57	46.596		
13,200.0	9,307.1	2,715.0	2,715.0	77.1	70.0	-0.07	-2,307.7	-793.2	6,810.2	6,663.2	147.06	46.311		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - FEDERAL #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2715-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
13,300.0	9,308.5	2,715.0	2,715.0	78.6	70.0	-0.07	-2,307.7	-793.2	6,838.8	6,690.3	148.55	46.037		
13,400.0	9,309.9	2,715.0	2,715.0	80.1	70.0	-0.07	-2,307.7	-793.2	6,868.7	6,718.7	150.05	45.776		
13,500.0	9,311.4	2,715.0	2,715.0	81.6	70.0	-0.07	-2,307.7	-793.2	6,900.0	6,748.4	151.56	45.527		
13,600.0	9,312.8	2,715.0	2,715.0	83.1	70.0	-0.07	-2,307.7	-793.2	6,932.5	6,779.4	153.07	45.289		
13,700.0	9,314.2	2,715.0	2,715.0	84.6	70.0	-0.07	-2,307.7	-793.2	6,966.4	6,811.8	154.59	45.062		
13,800.0	9,315.7	2,715.0	2,715.0	86.2	70.0	-0.07	-2,307.7	-793.2	7,001.4	6,845.3	156.12	44.846		
13,900.0	9,317.1	2,715.0	2,715.0	87.7	70.0	-0.07	-2,307.7	-793.2	7,037.8	6,880.1	157.65	44.641		
14,000.0	9,318.5	2,715.0	2,715.0	89.2	70.0	-0.07	-2,307.7	-793.2	7,075.4	6,916.2	159.19	44.446		
14,100.0	9,320.0	2,715.0	2,715.0	90.8	70.0	-0.07	-2,307.7	-793.2	7,114.1	6,953.4	160.73	44.261		
14,200.0	9,321.4	2,715.0	2,715.0	92.3	70.0	-0.07	-2,307.7	-793.2	7,154.1	6,991.8	162.28	44.086		
14,300.0	9,322.8	2,715.0	2,715.0	93.9	70.0	-0.07	-2,307.7	-793.2	7,195.2	7,031.4	163.83	43.919		
14,400.0	9,324.2	2,715.0	2,715.0	95.4	70.0	-0.07	-2,307.7	-793.2	7,237.5	7,072.1	165.38	43.762		
14,500.0	9,325.7	2,715.0	2,715.0	97.0	70.0	-0.07	-2,307.7	-793.2	7,280.9	7,114.0	166.94	43.614		
14,600.0	9,327.1	2,715.0	2,715.0	98.5	70.0	-0.07	-2,307.7	-793.2	7,325.4	7,156.9	168.50	43.473		
14,683.3	9,328.3	2,715.0	2,715.0	99.8	70.0	-0.07	-2,307.7	-793.2	7,363.3	7,193.5	169.81	43.363		

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - GULF FEDERAL #2 - OWB - ACTUAL WELLPATH												Offset Site Error:	0.0 usft
Survey Program: 2500-INC-ONLY												Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning							
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.0	0.0	0.0	0.0	0.0	3.0	-141.90	-2,308.0	-1,809.9	2,933.3				
100.0	100.0	63.0	63.0	0.1	3.4	-141.90	-2,308.0	-1,809.9	2,933.0	2,929.5	3.55	825.396	
200.0	200.0	163.0	163.0	0.5	5.2	-141.90	-2,308.0	-1,809.9	2,933.0	2,927.4	5.66	518.289	
300.0	300.0	263.0	263.0	0.9	7.4	-141.90	-2,308.0	-1,809.9	2,933.0	2,924.8	8.26	354.927	
400.0	400.0	363.0	363.0	1.2	9.8	-141.90	-2,308.0	-1,809.9	2,933.0	2,922.0	11.03	265.900	
500.0	500.0	463.0	463.0	1.6	12.3	-141.90	-2,308.0	-1,809.9	2,933.0	2,919.2	13.86	211.549	
600.0	600.0	563.0	563.0	1.9	14.8	-141.90	-2,308.0	-1,809.9	2,933.0	2,916.3	16.73	175.295	
700.0	700.0	663.0	663.0	2.3	17.3	-141.90	-2,308.0	-1,809.9	2,933.0	2,913.4	19.62	149.504	
800.0	800.0	763.0	763.0	2.7	19.9	-141.90	-2,308.0	-1,809.9	2,933.0	2,910.5	22.52	130.261	
900.0	900.0	863.0	863.0	3.0	22.4	-141.90	-2,308.0	-1,809.9	2,933.0	2,907.6	25.42	115.372	
950.0	950.0	913.0	913.0	3.2	23.7	-141.90	-2,308.0	-1,809.9	2,933.0	2,906.1	26.88	109.126	
1,000.0	1,000.0	963.0	963.0	3.4	25.0	-51.47	-2,308.0	-1,809.9	2,932.7	2,904.4	28.33	103.525	
1,100.0	1,099.9	1,062.9	1,062.9	3.7	27.5	-51.56	-2,308.0	-1,809.9	2,930.6	2,899.3	31.23	93.846	
1,200.0	1,199.7	1,162.7	1,162.7	4.1	30.1	-51.74	-2,308.0	-1,809.9	2,926.2	2,892.1	34.13	85.738	
1,236.8	1,236.4	1,199.4	1,199.4	4.2	31.0	-51.82	-2,308.0	-1,809.9	2,924.1	2,888.9	35.20	83.071	
1,300.0	1,299.2	1,262.2	1,262.2	4.4	32.6	-51.92	-2,308.0	-1,809.9	2,920.2	2,883.2	37.04	78.846	
1,400.0	1,398.7	1,361.7	1,361.7	4.8	35.2	-52.07	-2,308.0	-1,809.9	2,914.0	2,874.1	39.95	72.942	
1,500.0	1,498.2	1,461.2	1,461.2	5.1	37.7	-52.23	-2,308.0	-1,809.9	2,907.9	2,865.0	42.87	67.831	
1,600.0	1,597.7	1,560.7	1,560.7	5.5	40.3	-52.38	-2,308.0	-1,809.9	2,901.7	2,855.9	45.79	63.367	
1,700.0	1,697.2	1,660.2	1,660.2	5.9	42.8	-52.54	-2,308.0	-1,809.9	2,895.6	2,846.9	48.72	59.433	
1,800.0	1,796.7	1,759.7	1,759.7	6.3	45.4	-52.70	-2,308.0	-1,809.9	2,889.5	2,837.9	51.65	55.943	
1,900.0	1,896.2	1,859.2	1,859.2	6.6	47.9	-52.85	-2,308.0	-1,809.9	2,883.5	2,828.9	54.58	52.826	
2,000.0	1,995.7	1,958.7	1,958.7	7.0	50.5	-53.01	-2,308.0	-1,809.9	2,877.4	2,819.9	57.52	50.025	
2,100.0	2,095.2	2,058.2	2,058.2	7.4	53.1	-53.17	-2,308.0	-1,809.9	2,871.4	2,810.9	60.46	47.494	
2,200.0	2,194.7	2,157.7	2,157.7	7.8	55.6	-53.33	-2,308.0	-1,809.9	2,865.4	2,802.0	63.40	45.198	
2,300.0	2,294.2	2,257.2	2,257.2	8.2	58.2	-53.49	-2,308.0	-1,809.9	2,859.4	2,793.1	66.34	43.104	
2,400.0	2,393.7	2,356.7	2,356.7	8.6	60.7	-53.65	-2,308.0	-1,809.9	2,853.5	2,784.2	69.28	41.188	
2,500.0	2,493.2	2,456.2	2,456.2	8.9	63.3	-53.81	-2,308.0	-1,809.9	2,847.5	2,775.3	72.22	39.428	
2,600.0	2,592.7	2,500.0	2,500.0	9.3	64.4	-53.88	-2,308.0	-1,809.9	2,842.2	2,768.4	73.73	38.547	
2,700.0	2,692.2	2,500.0	2,500.0	9.7	64.4	-53.88	-2,308.0	-1,809.9	2,840.0	2,765.9	74.12	38.316	
2,712.2	2,704.3	2,500.0	2,500.0	9.8	64.4	-53.88	-2,308.0	-1,809.9	2,840.0	2,765.8	74.17	38.292 CC, ES	
2,800.0	2,791.7	2,500.0	2,500.0	10.1	64.4	-53.88	-2,308.0	-1,809.9	2,841.3	2,766.8	74.51	38.135	
2,900.0	2,891.2	2,500.0	2,500.0	10.5	64.4	-53.88	-2,308.0	-1,809.9	2,846.2	2,771.3	74.89	38.003	
3,000.0	2,990.7	2,500.0	2,500.0	10.9	64.4	-53.88	-2,308.0	-1,809.9	2,854.5	2,779.2	75.28	37.918	
3,100.0	3,090.2	2,500.0	2,500.0	11.3	64.4	-53.88	-2,308.0	-1,809.9	2,866.3	2,790.6	75.67	37.879 SF	
3,200.0	3,189.7	2,500.0	2,500.0	11.7	64.4	-53.88	-2,308.0	-1,809.9	2,881.6	2,805.5	76.06	37.886	
3,300.0	3,289.2	2,500.0	2,500.0	12.0	64.4	-53.88	-2,308.0	-1,809.9	2,900.2	2,823.7	76.45	37.937	
3,400.0	3,388.7	2,500.0	2,500.0	12.4	64.4	-53.88	-2,308.0	-1,809.9	2,922.1	2,845.2	76.84	38.030	
3,500.0	3,488.2	2,500.0	2,500.0	12.8	64.4	-53.88	-2,308.0	-1,809.9	2,947.2	2,870.0	77.22	38.164	
3,600.0	3,587.7	2,500.0	2,500.0	13.2	64.4	-53.88	-2,308.0	-1,809.9	2,975.5	2,897.9	77.61	38.337	
3,700.0	3,687.2	2,500.0	2,500.0	13.6	64.4	-53.88	-2,308.0	-1,809.9	3,006.9	2,928.8	78.00	38.547	
3,800.0	3,786.7	2,500.0	2,500.0	14.0	64.4	-53.88	-2,308.0	-1,809.9	3,041.2	2,962.8	78.39	38.793	
3,900.0	3,886.2	2,500.0	2,500.0	14.4	64.4	-53.88	-2,308.0	-1,809.9	3,078.4	2,999.6	78.78	39.073	
4,000.0	3,985.7	2,500.0	2,500.0	14.8	64.4	-53.88	-2,308.0	-1,809.9	3,118.3	3,039.1	79.17	39.385	
4,100.0	4,085.2	2,500.0	2,500.0	15.2	64.4	-53.88	-2,308.0	-1,809.9	3,160.9	3,081.4	79.56	39.728	
4,200.0	4,184.7	2,500.0	2,500.0	15.5	64.4	-53.88	-2,308.0	-1,809.9	3,206.1	3,126.1	79.96	40.098	
4,300.0	4,284.2	2,500.0	2,500.0	15.9	64.4	-53.88	-2,308.0	-1,809.9	3,253.7	3,173.3	80.35	40.496	
4,400.0	4,383.7	2,500.0	2,500.0	16.3	64.4	-53.88	-2,308.0	-1,809.9	3,303.6	3,222.9	80.74	40.919	
4,500.0	4,483.2	2,500.0	2,500.0	16.7	64.4	-53.88	-2,308.0	-1,809.9	3,355.8	3,274.7	81.13	41.365	
4,600.0	4,582.7	2,500.0	2,500.0	17.1	64.4	-53.88	-2,308.0	-1,809.9	3,410.2	3,328.6	81.52	41.833	
4,700.0	4,682.2	2,500.0	2,500.0	17.5	64.4	-53.88	-2,308.0	-1,809.9	3,466.5	3,384.6	81.91	42.321	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - GULF FEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2500-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,800.0	4,781.7	2,500.0	2,500.0	17.9	64.4	-53.88	-2,308.0	-1,809.9	3,524.8	3,442.5	82.30	42.828		
4,900.0	4,881.2	2,500.0	2,500.0	18.3	64.4	-53.88	-2,308.0	-1,809.9	3,585.0	3,502.3	82.69	43.353		
5,000.0	4,980.7	2,500.0	2,500.0	18.7	64.4	-53.88	-2,308.0	-1,809.9	3,646.8	3,563.8	83.08	43.894		
5,100.0	5,080.2	2,500.0	2,500.0	19.1	64.4	-53.88	-2,308.0	-1,809.9	3,710.4	3,626.9	83.48	44.449		
5,200.0	5,179.7	2,500.0	2,500.0	19.5	64.4	-53.88	-2,308.0	-1,809.9	3,775.5	3,691.7	83.87	45.018		
5,300.0	5,279.2	2,500.0	2,500.0	19.9	64.4	-53.88	-2,308.0	-1,809.9	3,842.2	3,757.9	84.26	45.600		
5,400.0	5,378.7	2,500.0	2,500.0	20.2	64.4	-53.88	-2,308.0	-1,809.9	3,910.2	3,825.6	84.65	46.193		
5,500.0	5,478.2	2,500.0	2,500.0	20.6	64.4	-53.88	-2,308.0	-1,809.9	3,979.6	3,894.6	85.04	46.796		
5,600.0	5,577.7	2,500.0	2,500.0	21.0	64.4	-53.88	-2,308.0	-1,809.9	4,050.3	3,964.9	85.43	47.409		
5,700.0	5,677.2	2,500.0	2,500.0	21.4	64.4	-53.88	-2,308.0	-1,809.9	4,122.2	4,036.4	85.82	48.030		
5,800.0	5,776.7	2,500.0	2,500.0	21.8	64.4	-53.88	-2,308.0	-1,809.9	4,195.2	4,109.0	86.22	48.659		
5,900.0	5,876.2	2,500.0	2,500.0	22.2	64.4	-53.88	-2,308.0	-1,809.9	4,269.4	4,182.8	86.61	49.295		
6,000.0	5,975.7	2,500.0	2,500.0	22.6	64.4	-53.88	-2,308.0	-1,809.9	4,344.5	4,257.5	87.00	49.937		
6,100.0	6,075.2	2,500.0	2,500.0	23.0	64.4	-53.88	-2,308.0	-1,809.9	4,420.7	4,333.3	87.39	50.584		
6,200.0	6,174.7	2,500.0	2,500.0	23.4	64.4	-53.88	-2,308.0	-1,809.9	4,497.8	4,410.0	87.78	51.237		
6,300.0	6,274.2	2,500.0	2,500.0	23.8	64.4	-53.88	-2,308.0	-1,809.9	4,575.8	4,487.6	88.18	51.893		
6,400.0	6,373.7	2,500.0	2,500.0	24.2	64.4	-53.88	-2,308.0	-1,809.9	4,654.6	4,566.0	88.57	52.554		
6,500.0	6,473.2	2,500.0	2,500.0	24.6	64.4	-53.88	-2,308.0	-1,809.9	4,734.2	4,645.3	88.96	53.217		
6,600.0	6,572.7	2,500.0	2,500.0	24.9	64.4	-53.88	-2,308.0	-1,809.9	4,814.6	4,725.3	89.35	53.883		
6,700.0	6,672.2	2,500.0	2,500.0	25.3	64.4	-53.88	-2,308.0	-1,809.9	4,895.7	4,806.0	89.75	54.551		
6,800.0	6,771.7	2,500.0	2,500.0	25.7	64.4	-53.88	-2,308.0	-1,809.9	4,977.5	4,887.4	90.14	55.221		
6,900.0	6,871.2	2,500.0	2,500.0	26.1	64.4	-53.88	-2,308.0	-1,809.9	5,060.0	4,969.4	90.53	55.893		
7,000.0	6,970.7	2,500.0	2,500.0	26.5	64.4	-53.88	-2,308.0	-1,809.9	5,143.0	5,052.1	90.92	56.565		
7,100.0	7,070.2	2,500.0	2,500.0	26.9	64.4	-53.88	-2,308.0	-1,809.9	5,226.7	5,135.4	91.31	57.239		
7,200.0	7,169.7	2,500.0	2,500.0	27.3	64.4	-53.88	-2,308.0	-1,809.9	5,310.9	5,219.2	91.71	57.912		
7,300.0	7,269.2	2,500.0	2,500.0	27.7	64.4	-53.88	-2,308.0	-1,809.9	5,395.7	5,303.6	92.10	58.586		
7,400.0	7,368.7	2,500.0	2,500.0	28.1	64.4	-53.88	-2,308.0	-1,809.9	5,481.0	5,388.5	92.49	59.259		
7,500.0	7,468.2	2,500.0	2,500.0	28.5	64.4	-53.88	-2,308.0	-1,809.9	5,566.7	5,473.9	92.88	59.932		
7,600.0	7,567.7	2,500.0	2,500.0	28.9	64.4	-53.88	-2,308.0	-1,809.9	5,653.0	5,559.7	93.28	60.605		
7,700.0	7,667.2	2,500.0	2,500.0	29.3	64.4	-53.88	-2,308.0	-1,809.9	5,739.7	5,646.0	93.67	61.276		
7,800.0	7,766.7	2,500.0	2,500.0	29.7	64.4	-53.88	-2,308.0	-1,809.9	5,826.8	5,732.7	94.06	61.947		
7,900.0	7,866.2	2,500.0	2,500.0	30.0	64.4	-53.88	-2,308.0	-1,809.9	5,914.3	5,819.8	94.45	62.616		
8,000.0	7,965.7	2,500.0	2,500.0	30.4	64.4	-53.88	-2,308.0	-1,809.9	6,002.2	5,907.4	94.85	63.284		
8,100.0	8,065.1	2,500.0	2,500.0	30.8	64.4	-53.88	-2,308.0	-1,809.9	6,090.5	5,995.2	95.24	63.950		
8,200.0	8,164.6	2,500.0	2,500.0	31.2	64.4	-53.88	-2,308.0	-1,809.9	6,179.1	6,083.5	95.63	64.614		
8,300.0	8,264.1	2,500.0	2,500.0	31.6	64.4	-53.88	-2,308.0	-1,809.9	6,268.1	6,172.1	96.02	65.277		
8,400.0	8,363.6	2,500.0	2,500.0	32.0	64.4	-53.88	-2,308.0	-1,809.9	6,357.4	6,261.0	96.42	65.937		
8,500.0	8,463.1	2,500.0	2,500.0	32.4	64.4	-53.88	-2,308.0	-1,809.9	6,447.0	6,350.2	96.81	66.596		
8,600.0	8,562.6	2,500.0	2,500.0	32.8	64.4	-53.88	-2,308.0	-1,809.9	6,537.0	6,439.8	97.20	67.252		
8,700.0	8,662.1	2,500.0	2,500.0	33.2	64.4	-53.88	-2,308.0	-1,809.9	6,627.2	6,529.6	97.59	67.906		
8,800.0	8,761.6	2,500.0	2,500.0	33.6	64.4	-53.88	-2,308.0	-1,809.9	6,717.7	6,619.7	97.99	68.557		
8,818.3	8,779.9	2,500.0	2,500.0	33.7	64.4	-53.88	-2,308.0	-1,809.9	6,734.3	6,636.2	98.06	68.676		
8,825.0	8,786.5	2,500.0	2,500.0	33.7	64.4	-46.96	-2,308.0	-1,809.9	6,740.3	6,642.2	98.08	68.720		
8,850.0	8,811.4	2,500.0	2,500.0	33.8	64.4	-24.72	-2,308.0	-1,809.9	6,762.6	6,664.4	98.18	68.879		
8,875.0	8,836.1	2,500.0	2,500.0	33.9	64.4	-11.15	-2,308.0	-1,809.9	6,784.4	6,686.2	98.28	69.033		
8,900.0	8,860.7	2,500.0	2,500.0	34.0	64.4	-3.65	-2,308.0	-1,809.9	6,805.7	6,707.3	98.37	69.182		
8,925.0	8,885.1	2,500.0	2,500.0	34.1	64.4	0.59	-2,308.0	-1,809.9	6,826.4	6,727.9	98.47	69.326		
8,950.0	8,909.2	2,500.0	2,500.0	34.2	64.4	3.10	-2,308.0	-1,809.9	6,846.4	6,747.8	98.56	69.465		
8,975.0	8,933.0	2,500.0	2,500.0	34.2	64.4	4.64	-2,308.0	-1,809.9	6,865.6	6,767.0	98.65	69.597		
9,000.0	8,956.3	2,500.0	2,500.0	34.3	64.4	5.61	-2,308.0	-1,809.9	6,884.2	6,785.4	98.74	69.722		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - GULF FEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2500-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Separation Factor		Warning				
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,025.0	8,979.2	2,500.0	2,500.0	34.4	64.4	6.23	-2,308.0	-1,809.9	6,901.9	6,803.1	98.82	69.840		
9,050.0	9,001.5	2,500.0	2,500.0	34.5	64.4	6.64	-2,308.0	-1,809.9	6,918.8	6,819.9	98.91	69.951		
9,075.0	9,023.2	2,500.0	2,500.0	34.6	64.4	6.91	-2,308.0	-1,809.9	6,934.8	6,835.8	98.99	70.055		
9,100.0	9,044.2	2,500.0	2,500.0	34.7	64.4	7.08	-2,308.0	-1,809.9	6,949.9	6,850.9	99.07	70.150		
9,125.0	9,064.5	2,500.0	2,500.0	34.7	64.4	7.20	-2,308.0	-1,809.9	6,964.1	6,864.9	99.15	70.238		
9,150.0	9,084.0	2,500.0	2,500.0	34.8	64.4	7.27	-2,308.0	-1,809.9	6,977.2	6,878.0	99.23	70.316		
9,175.0	9,102.7	2,500.0	2,500.0	34.9	64.4	7.32	-2,308.0	-1,809.9	6,989.4	6,890.1	99.30	70.386		
9,200.0	9,120.5	2,500.0	2,500.0	35.0	64.4	7.36	-2,308.0	-1,809.9	7,000.4	6,901.1	99.37	70.446		
9,225.0	9,137.4	2,500.0	2,500.0	35.0	64.4	7.39	-2,308.0	-1,809.9	7,010.5	6,911.0	99.44	70.496		
9,250.0	9,153.3	2,500.0	2,500.0	35.1	64.4	7.41	-2,308.0	-1,809.9	7,019.4	6,919.9	99.52	70.536		
9,275.0	9,168.1	2,500.0	2,500.0	35.2	64.4	7.44	-2,308.0	-1,809.9	7,027.2	6,927.6	99.58	70.565		
9,300.0	9,181.9	2,500.0	2,500.0	35.2	64.4	7.47	-2,308.0	-1,809.9	7,033.9	6,934.2	99.65	70.584		
9,325.0	9,194.6	2,500.0	2,500.0	35.3	64.4	7.51	-2,308.0	-1,809.9	7,039.4	6,939.7	99.72	70.591		
9,350.0	9,206.2	2,500.0	2,500.0	35.4	64.4	7.56	-2,308.0	-1,809.9	7,043.8	6,944.0	99.79	70.586		
9,375.0	9,216.6	2,500.0	2,500.0	35.5	64.4	7.62	-2,308.0	-1,809.9	7,047.0	6,947.1	99.86	70.569		
9,400.0	9,225.8	2,500.0	2,500.0	35.5	64.4	7.69	-2,308.0	-1,809.9	7,049.0	6,949.1	99.93	70.539		
9,425.0	9,233.8	2,500.0	2,500.0	35.6	64.4	7.77	-2,308.0	-1,809.9	7,049.9	6,949.9	100.00	70.496		
9,450.0	9,240.5	2,500.0	2,500.0	35.7	64.4	7.86	-2,308.0	-1,809.9	7,049.6	6,949.5	100.08	70.440		
9,475.0	9,246.0	2,500.0	2,500.0	35.7	64.4	7.98	-2,308.0	-1,809.9	7,048.0	6,947.9	100.15	70.371		
9,500.0	9,250.2	2,500.0	2,500.0	35.8	64.4	8.11	-2,308.0	-1,809.9	7,045.3	6,945.1	100.23	70.289		
9,525.0	9,253.1	2,500.0	2,500.0	35.9	64.4	8.26	-2,308.0	-1,809.9	7,041.5	6,941.2	100.32	70.193		
9,550.0	9,254.7	2,500.0	2,500.0	36.0	64.4	8.42	-2,308.0	-1,809.9	7,036.5	6,936.1	100.40	70.084		
9,561.6	9,255.0	2,500.0	2,500.0	36.0	64.4	8.51	-2,308.0	-1,809.9	7,033.7	6,933.3	100.44	70.029		
9,600.0	9,255.6	2,500.0	2,500.0	36.2	64.4	8.51	-2,308.0	-1,809.9	7,024.4	6,923.8	100.58	69.839		
9,700.0	9,257.0	2,500.0	2,500.0	36.6	64.4	8.51	-2,308.0	-1,809.9	7,001.0	6,900.0	100.99	69.323		
9,800.0	9,258.4	2,500.0	2,500.0	37.1	64.4	8.51	-2,308.0	-1,809.9	6,979.0	6,877.6	101.48	68.775		
9,900.0	9,259.8	2,500.0	2,500.0	37.6	64.4	8.51	-2,308.0	-1,809.9	6,958.4	6,856.4	102.03	68.200		
10,000.0	9,261.3	2,500.0	2,500.0	38.2	64.4	8.51	-2,308.0	-1,809.9	6,939.1	6,836.5	102.65	67.600		
10,100.0	9,262.7	2,500.0	2,500.0	38.9	64.4	8.51	-2,308.0	-1,809.9	6,921.3	6,817.9	103.33	66.980		
10,200.0	9,264.1	2,500.0	2,500.0	39.7	64.4	8.51	-2,308.0	-1,809.9	6,904.8	6,800.7	104.08	66.344		
10,300.0	9,265.6	2,500.0	2,500.0	40.5	64.4	8.51	-2,308.0	-1,809.9	6,889.7	6,784.9	104.88	65.695		
10,400.0	9,267.0	2,500.0	2,500.0	41.3	64.4	8.51	-2,308.0	-1,809.9	6,876.1	6,770.4	105.73	65.036		
10,500.0	9,268.4	2,500.0	2,500.0	42.2	64.4	8.51	-2,308.0	-1,809.9	6,863.9	6,757.3	106.63	64.371		
10,600.0	9,269.9	2,500.0	2,500.0	43.2	64.4	8.51	-2,308.0	-1,809.9	6,853.1	6,745.6	107.58	63.703		
10,700.0	9,271.3	2,500.0	2,500.0	44.2	64.4	8.51	-2,308.0	-1,809.9	6,843.8	6,735.3	108.57	63.035		
10,800.0	9,272.7	2,500.0	2,500.0	45.2	64.4	8.51	-2,308.0	-1,809.9	6,836.0	6,726.3	109.61	62.369		
10,900.0	9,274.2	2,500.0	2,500.0	46.3	64.4	8.51	-2,308.0	-1,809.9	6,829.5	6,718.9	110.68	61.707		
11,000.0	9,275.6	2,500.0	2,500.0	47.4	64.4	8.51	-2,308.0	-1,809.9	6,824.6	6,712.8	111.78	61.052		
11,100.0	9,277.0	2,500.0	2,500.0	48.5	64.4	8.51	-2,308.0	-1,809.9	6,821.1	6,708.2	112.92	60.406		
11,200.0	9,278.4	2,500.0	2,500.0	49.7	64.4	8.51	-2,308.0	-1,809.9	6,819.1	6,705.0	114.09	59.769		
11,288.3	9,279.7	2,500.0	2,500.0	50.7	64.4	8.51	-2,308.0	-1,809.9	6,818.5	6,703.3	115.15	59.215		
11,300.0	9,279.9	2,500.0	2,500.0	50.9	64.4	8.51	-2,308.0	-1,809.9	6,818.5	6,703.2	115.29	59.143		
11,400.0	9,281.3	2,500.0	2,500.0	52.1	64.4	8.51	-2,308.0	-1,809.9	6,819.4	6,702.9	116.51	58.529		
11,500.0	9,282.7	2,500.0	2,500.0	53.4	64.4	8.51	-2,308.0	-1,809.9	6,821.8	6,704.0	117.76	57.929		
11,600.0	9,284.2	2,500.0	2,500.0	54.6	64.4	8.51	-2,308.0	-1,809.9	6,825.6	6,706.6	119.03	57.342		
11,700.0	9,285.6	2,500.0	2,500.0	55.9	64.4	8.51	-2,308.0	-1,809.9	6,830.9	6,710.6	120.33	56.770		
11,800.0	9,287.0	2,500.0	2,500.0	57.2	64.4	8.51	-2,308.0	-1,809.9	6,837.7	6,716.0	121.64	56.213		
11,900.0	9,288.5	2,500.0	2,500.0	58.6	64.4	8.51	-2,308.0	-1,809.9	6,845.9	6,722.9	122.97	55.671		
12,000.0	9,289.9	2,500.0	2,500.0	59.9	64.4	8.51	-2,308.0	-1,809.9	6,855.5	6,731.2	124.32	55.145		
12,100.0	9,291.3	2,500.0	2,500.0	61.3	64.4	8.51	-2,308.0	-1,809.9	6,866.6	6,741.0	125.68	54.635		
12,200.0	9,292.8	2,500.0	2,500.0	62.7	64.4	8.51	-2,308.0	-1,809.9	6,879.2	6,752.1	127.06	54.141		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - GULF FEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2500-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	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	
12,300.0	9,294.2	2,500.0	2,500.0	64.0	64.4	8.51	-2,308.0	-1,809.9	6,893.1	6,764.7	128.45	53.662		
12,400.0	9,295.6	2,500.0	2,500.0	65.5	64.4	8.51	-2,308.0	-1,809.9	6,908.5	6,778.7	129.86	53.199		
12,500.0	9,297.1	2,500.0	2,500.0	66.9	64.4	8.51	-2,308.0	-1,809.9	6,925.3	6,794.0	131.28	52.752		
12,600.0	9,298.5	2,500.0	2,500.0	68.3	64.4	8.51	-2,308.0	-1,809.9	6,943.5	6,810.8	132.71	52.320		
12,700.0	9,299.9	2,500.0	2,500.0	69.7	64.4	8.51	-2,308.0	-1,809.9	6,963.1	6,828.9	134.15	51.904		
12,800.0	9,301.3	2,500.0	2,500.0	71.2	64.4	8.51	-2,308.0	-1,809.9	6,984.1	6,848.4	135.60	51.503		
12,900.0	9,302.8	2,500.0	2,500.0	72.7	64.4	8.51	-2,308.0	-1,809.9	7,006.4	6,869.3	137.07	51.117		
13,000.0	9,304.2	2,500.0	2,500.0	74.1	64.4	8.51	-2,308.0	-1,809.9	7,030.1	6,891.5	138.54	50.745		
13,100.0	9,305.6	2,500.0	2,500.0	75.6	64.4	8.51	-2,308.0	-1,809.9	7,055.1	6,915.1	140.01	50.388		
13,200.0	9,307.1	2,500.0	2,500.0	77.1	64.4	8.51	-2,308.0	-1,809.9	7,081.4	6,939.9	141.50	50.045		
13,300.0	9,308.5	2,500.0	2,500.0	78.6	64.4	8.51	-2,308.0	-1,809.9	7,109.1	6,966.1	143.00	49.715		
13,400.0	9,309.9	2,500.0	2,500.0	80.1	64.4	8.51	-2,308.0	-1,809.9	7,138.0	6,993.5	144.50	49.399		
13,500.0	9,311.4	2,500.0	2,500.0	81.6	64.4	8.51	-2,308.0	-1,809.9	7,168.2	7,022.2	146.01	49.096		
13,600.0	9,312.8	2,500.0	2,500.0	83.1	64.4	8.51	-2,308.0	-1,809.9	7,199.7	7,052.2	147.52	48.805		
13,700.0	9,314.2	2,500.0	2,500.0	84.6	64.4	8.51	-2,308.0	-1,809.9	7,232.4	7,083.4	149.04	48.527		
13,800.0	9,315.7	2,500.0	2,500.0	86.2	64.4	8.51	-2,308.0	-1,809.9	7,266.4	7,115.8	150.57	48.260		
13,900.0	9,317.1	2,500.0	2,500.0	87.7	64.4	8.51	-2,308.0	-1,809.9	7,301.6	7,149.5	152.10	48.005		
14,000.0	9,318.5	2,500.0	2,500.0	89.2	64.4	8.51	-2,308.0	-1,809.9	7,337.9	7,184.3	153.64	47.762		
14,100.0	9,320.0	2,500.0	2,500.0	90.8	64.4	8.51	-2,308.0	-1,809.9	7,375.5	7,220.3	155.18	47.529		
14,200.0	9,321.4	2,500.0	2,500.0	92.3	64.4	8.51	-2,308.0	-1,809.9	7,414.2	7,257.4	156.72	47.307		
14,300.0	9,322.8	2,500.0	2,500.0	93.9	64.4	8.51	-2,308.0	-1,809.9	7,454.0	7,295.7	158.27	47.096		
14,400.0	9,324.2	2,500.0	2,500.0	95.4	64.4	8.51	-2,308.0	-1,809.9	7,495.0	7,335.1	159.83	46.894		
14,500.0	9,325.7	2,500.0	2,500.0	97.0	64.4	8.51	-2,308.0	-1,809.9	7,537.0	7,375.6	161.39	46.701		
14,600.0	9,327.1	2,500.0	2,500.0	98.5	64.4	8.51	-2,308.0	-1,809.9	7,580.2	7,417.2	162.95	46.518		
14,683.3	9,328.3	2,500.0	2,500.0	99.8	64.4	8.51	-2,308.0	-1,809.9	7,616.9	7,452.7	164.25	46.373		

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH														Offset Site Error:	0.0 usft
Survey Program: 13974-INC-ONLY														Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
0.0	0.0	0.0	0.0	0.0	3.0	-70.23	292.4	-813.4	864.4						
100.0	100.0	98.0	98.0	0.1	3.9	-70.23	292.4	-813.4	864.4	860.3	4.07	212.462			
200.0	200.0	198.0	198.0	0.5	5.9	-70.23	292.4	-813.4	864.4	858.0	6.43	134.419			
300.0	300.0	298.0	298.0	0.9	8.3	-70.23	292.4	-813.4	864.4	855.3	9.12	94.773			
400.0	400.0	398.0	398.0	1.2	10.7	-70.23	292.4	-813.4	864.4	852.5	11.93	72.476			
500.0	500.0	498.0	498.0	1.6	13.2	-70.23	292.4	-813.4	864.4	849.6	14.78	58.468			
600.0	600.0	598.0	598.0	1.9	15.7	-70.23	292.4	-813.4	864.4	846.7	17.67	48.922			
700.0	700.0	698.0	698.0	2.3	18.3	-70.23	292.4	-813.4	864.4	843.8	20.57	42.024			
800.0	800.0	798.0	798.0	2.7	20.8	-70.23	292.4	-813.4	864.4	840.9	23.48	36.815			
900.0	900.0	898.0	898.0	3.0	23.4	-70.23	292.4	-813.4	864.4	838.0	26.40	32.746			
950.0	950.0	948.0	948.0	3.2	24.7	-70.23	292.4	-813.4	864.4	836.5	27.86	31.030			
1,000.0	1,000.0	998.0	998.0	3.4	25.9	20.22	292.4	-813.4	864.0	834.7	29.31	29.473			
1,100.0	1,099.9	1,097.9	1,097.9	3.7	28.5	20.32	292.4	-813.4	860.7	828.5	32.22	26.711			
1,200.0	1,199.7	1,197.7	1,197.7	4.1	31.1	20.53	292.4	-813.4	854.2	819.0	35.14	24.311			
1,236.8	1,236.4	1,234.4	1,234.4	4.2	32.0	20.63	292.4	-813.4	850.9	814.7	36.21	23.501			
1,300.0	1,299.2	1,297.2	1,297.2	4.4	33.6	20.78	292.4	-813.4	845.0	807.0	38.05	22.207			
1,400.0	1,398.7	1,396.7	1,396.7	4.8	36.2	21.03	292.4	-813.4	835.7	794.7	40.97	20.395			
1,500.0	1,498.2	1,496.2	1,496.2	5.1	38.8	21.28	292.4	-813.4	826.4	782.5	43.90	18.822			
1,600.0	1,597.7	1,595.7	1,595.7	5.5	41.3	21.53	292.4	-813.4	817.0	770.2	46.84	17.445			
1,700.0	1,697.2	1,695.2	1,695.2	5.9	43.9	21.79	292.4	-813.4	807.7	758.0	49.77	16.228			
1,800.0	1,796.7	1,794.7	1,794.7	6.3	46.4	22.06	292.4	-813.4	798.5	745.8	52.71	15.147			
1,900.0	1,896.2	1,894.2	1,894.2	6.6	49.0	22.33	292.4	-813.4	789.2	733.5	55.66	14.180			
2,000.0	1,995.7	1,993.7	1,993.7	7.0	51.6	22.61	292.4	-813.4	780.0	721.4	58.60	13.310			
2,100.0	2,095.2	2,093.2	2,093.2	7.4	54.1	22.89	292.4	-813.4	770.7	709.2	61.55	12.523			
2,200.0	2,194.7	2,192.7	2,192.7	7.8	56.7	23.19	292.4	-813.4	761.5	697.0	64.50	11.807			
2,300.0	2,294.2	2,292.2	2,292.2	8.2	59.3	23.48	292.4	-813.4	752.3	684.9	67.45	11.155			
2,400.0	2,393.7	2,391.7	2,391.7	8.6	61.8	23.79	292.4	-813.4	743.2	672.8	70.40	10.557			
2,500.0	2,493.2	2,491.2	2,491.2	8.9	64.4	24.11	292.4	-813.4	734.0	660.7	73.35	10.008			
2,600.0	2,592.7	2,590.7	2,590.7	9.3	67.0	24.43	292.4	-813.4	724.9	648.6	76.30	9.501			
2,700.0	2,692.2	2,690.2	2,690.2	9.7	69.5	24.76	292.4	-813.4	715.8	636.6	79.25	9.032			
2,800.0	2,791.7	2,789.7	2,789.7	10.1	72.1	25.10	292.4	-813.4	706.8	624.5	82.21	8.597			
2,900.0	2,891.2	2,889.2	2,889.2	10.5	74.7	25.45	292.4	-813.4	697.7	612.5	85.16	8.193			
3,000.0	2,990.7	2,988.7	2,988.7	10.9	77.2	25.80	292.4	-813.4	688.7	600.6	88.12	7.815			
3,100.0	3,090.2	3,088.2	3,088.2	11.3	79.8	26.17	292.4	-813.4	679.7	588.6	91.07	7.463			
3,200.0	3,189.7	3,187.7	3,187.7	11.7	82.4	26.55	292.4	-813.4	670.7	576.7	94.03	7.133			
3,300.0	3,289.2	3,287.2	3,287.2	12.0	84.9	26.93	292.4	-813.4	661.8	564.8	96.99	6.823			
3,400.0	3,388.7	3,386.7	3,386.7	12.4	87.5	27.33	292.4	-813.4	652.9	552.9	99.95	6.532			
3,500.0	3,488.2	3,486.2	3,486.2	12.8	90.1	27.74	292.4	-813.4	644.0	541.1	102.90	6.258			
3,600.0	3,587.7	3,585.7	3,585.7	13.2	92.7	28.16	292.4	-813.4	635.2	529.3	105.86	6.000			
3,700.0	3,687.2	3,685.2	3,685.2	13.6	95.2	28.59	292.4	-813.4	626.4	517.5	108.82	5.756			
3,800.0	3,786.7	3,784.7	3,784.7	14.0	97.8	29.03	292.4	-813.4	617.6	505.8	111.78	5.525			
3,900.0	3,886.2	3,884.2	3,884.2	14.4	100.4	29.49	292.4	-813.4	608.9	494.1	114.74	5.307			
4,000.0	3,985.7	3,983.7	3,983.7	14.8	102.9	29.95	292.4	-813.4	600.2	482.5	117.69	5.099			
4,100.0	4,085.2	4,083.2	4,083.2	15.2	105.5	30.44	292.4	-813.4	591.5	470.9	120.65	4.903			
4,200.0	4,184.7	4,182.7	4,182.7	15.5	108.1	30.93	292.4	-813.4	582.9	459.3	123.61	4.716			
4,300.0	4,284.2	4,282.2	4,282.2	15.9	110.6	31.45	292.4	-813.4	574.4	447.8	126.57	4.538			
4,400.0	4,383.7	4,381.7	4,381.7	16.3	113.2	31.97	292.4	-813.4	565.8	436.3	129.53	4.368			
4,500.0	4,483.2	4,481.2	4,481.2	16.7	115.8	32.52	292.4	-813.4	557.4	424.9	132.49	4.207			
4,600.0	4,582.7	4,580.7	4,580.7	17.1	118.3	33.08	292.4	-813.4	549.0	413.5	135.45	4.053			
4,700.0	4,682.2	4,680.2	4,680.2	17.5	120.9	33.65	292.4	-813.4	540.6	402.2	138.41	3.906			
4,800.0	4,781.7	4,779.7	4,779.7	17.9	123.5	34.25	292.4	-813.4	532.3	390.9	141.37	3.765			

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 13974-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.0	4,881.2	4,879.2	4,879.2	18.3	126.0	34.86	292.4	-813.4	524.0	379.7	144.33	3.631		
5,000.0	4,980.7	4,978.7	4,978.7	18.7	128.6	35.50	292.4	-813.4	515.9	368.6	147.29	3.502		
5,100.0	5,080.2	5,078.2	5,078.2	19.1	131.2	36.15	292.4	-813.4	507.7	357.5	150.25	3.379		
5,200.0	5,179.7	5,177.7	5,177.7	19.5	133.8	36.83	292.4	-813.4	499.7	346.5	153.21	3.261		
5,300.0	5,279.2	5,277.2	5,277.2	19.9	136.3	37.52	292.4	-813.4	491.7	335.5	156.17	3.149		
5,400.0	5,378.7	5,376.7	5,376.7	20.2	138.9	38.24	292.4	-813.4	483.8	324.7	159.13	3.040		
5,500.0	5,478.2	5,476.2	5,476.2	20.6	141.5	38.99	292.4	-813.4	476.0	313.9	162.10	2.936		
5,600.0	5,577.7	5,575.7	5,575.7	21.0	144.0	39.75	292.4	-813.4	468.2	303.2	165.06	2.837		
5,700.0	5,677.2	5,675.2	5,675.2	21.4	146.6	40.55	292.4	-813.4	460.6	292.6	168.02	2.741		
5,800.0	5,776.7	5,774.7	5,774.7	21.8	149.2	41.37	292.4	-813.4	453.0	282.0	170.98	2.650		
5,900.0	5,876.2	5,874.2	5,874.2	22.2	151.7	42.21	292.4	-813.4	445.6	271.6	173.94	2.562		
6,000.0	5,975.7	5,973.7	5,973.7	22.6	154.3	43.09	292.4	-813.4	438.2	261.3	176.90	2.477		
6,100.0	6,075.2	6,073.2	6,073.2	23.0	156.9	44.00	292.4	-813.4	430.9	251.1	179.86	2.396		
6,200.0	6,174.7	6,172.7	6,172.7	23.4	159.4	44.93	292.4	-813.4	423.8	240.9	182.82	2.318		
6,300.0	6,274.2	6,272.2	6,272.2	23.8	162.0	45.90	292.4	-813.4	416.7	231.0	185.78	2.243		
6,400.0	6,373.7	6,371.7	6,371.7	24.2	164.6	46.90	292.4	-813.4	409.8	221.1	188.75	2.171		
6,500.0	6,473.2	6,471.2	6,471.2	24.6	167.2	47.94	292.4	-813.4	403.0	211.3	191.71	2.102		
6,600.0	6,572.7	6,570.7	6,570.7	24.9	169.7	49.01	292.4	-813.4	396.4	201.7	194.67	2.036		
6,700.0	6,672.2	6,670.2	6,670.2	25.3	172.3	50.11	292.4	-813.4	389.9	192.3	197.63	1.973 Advise and Monitor		
6,800.0	6,771.7	6,769.7	6,769.7	25.7	174.9	51.25	292.4	-813.4	383.5	183.0	200.59	1.912 Advise and Monitor		
6,900.0	6,871.2	6,869.2	6,869.2	26.1	177.4	52.43	292.4	-813.4	377.3	173.8	203.55	1.854 Advise and Monitor		
7,000.0	6,970.7	6,968.7	6,968.7	26.5	180.0	53.65	292.4	-813.4	371.3	164.8	206.51	1.798 Advise and Monitor		
7,100.0	7,070.2	7,068.2	7,068.2	26.9	182.6	54.91	292.4	-813.4	365.5	156.0	209.48	1.745 Advise and Monitor		
7,200.0	7,169.7	7,167.7	7,167.7	27.3	185.1	56.21	292.4	-813.4	359.8	147.4	212.44	1.694 Advise and Monitor		
7,300.0	7,269.2	7,267.2	7,267.2	27.7	187.7	57.55	292.4	-813.4	354.3	138.9	215.40	1.645 Advise and Monitor		
7,400.0	7,368.7	7,366.7	7,366.7	28.1	190.3	58.93	292.4	-813.4	349.0	130.7	218.36	1.598 Advise and Monitor		
7,500.0	7,468.2	7,466.2	7,466.2	28.5	192.8	60.35	292.4	-813.4	344.0	122.6	221.32	1.554 Advise and Monitor		
7,600.0	7,567.7	7,565.7	7,565.7	28.9	195.4	61.81	292.4	-813.4	339.1	114.8	224.28	1.512 Advise and Monitor		
7,700.0	7,667.2	7,665.2	7,665.2	29.3	198.0	63.31	292.4	-813.4	334.5	107.2	227.25	1.472 Shut in Produces		
7,800.0	7,766.7	7,764.7	7,764.7	29.7	200.6	64.86	292.4	-813.4	330.1	99.9	230.21	1.434 Shut in Produces		
7,900.0	7,866.2	7,864.2	7,864.2	30.0	203.1	66.44	292.4	-813.4	326.0	92.8	233.17	1.398 Shut in Produces		
8,000.0	7,965.7	7,963.7	7,963.7	30.4	205.7	68.07	292.4	-813.4	322.1	85.9	236.13	1.364 Shut in Produces		
8,100.0	8,065.1	8,063.1	8,063.1	30.8	208.3	69.73	292.4	-813.4	318.5	79.4	239.09	1.332 Shut in Produces		
8,200.0	8,164.6	8,162.6	8,162.6	31.2	210.8	71.42	292.4	-813.4	315.1	73.1	242.06	1.302 Shut in Produces		
8,300.0	8,264.1	8,262.1	8,262.1	31.6	213.4	73.16	292.4	-813.4	312.1	67.0	245.02	1.274 Shut in Produces		
8,400.0	8,363.6	8,361.6	8,361.6	32.0	216.0	74.92	292.4	-813.4	309.3	61.3	247.98	1.247 Shut in Produces		
8,500.0	8,463.1	8,461.1	8,461.1	32.4	218.5	76.71	292.4	-813.4	306.8	55.9	250.94	1.223 Shut in Produces		
8,600.0	8,562.6	8,560.6	8,560.6	32.8	221.1	78.53	292.4	-813.4	304.7	50.8	253.90	1.200 Shut in Produces		
8,700.0	8,662.1	8,660.1	8,660.1	33.2	223.7	80.38	292.4	-813.4	302.8	46.0	256.87	1.179 Shut in Produces		
8,800.0	8,761.6	8,759.6	8,759.6	33.6	226.2	82.24	292.4	-813.4	301.3	41.5	259.83	1.160 Shut in Produces		
8,818.3	8,779.9	8,777.9	8,777.9	33.7	226.7	82.59	292.4	-813.4	301.1	40.7	260.37	1.156 Shut in Produces		
8,824.5	8,786.0	8,784.0	8,784.0	33.7	226.9	90.00	292.4	-813.4	301.0	40.5	260.55	1.155 Shut in Produces, CC		
8,825.0	8,786.5	8,784.5	8,784.5	33.7	226.9	90.63	292.4	-813.4	301.0	40.5	260.57	1.155 Shut in Produces		
8,850.0	8,811.4	8,809.4	8,809.4	33.8	227.5	116.64	292.4	-813.4	301.7	40.4	261.31	1.155 Shut in Produces, ES, SF		
8,875.0	8,836.1	8,834.1	8,834.1	33.9	228.2	133.43	292.4	-813.4	303.7	41.7	262.04	1.159 Shut in Produces		
8,900.0	8,860.7	8,858.7	8,858.7	34.0	228.8	143.71	292.4	-813.4	307.1	44.3	262.77	1.169 Shut in Produces		
8,925.0	8,885.1	8,883.1	8,883.1	34.1	229.4	150.36	292.4	-813.4	311.7	48.2	263.50	1.183 Shut in Produces		
8,950.0	8,909.2	8,907.2	8,907.2	34.2	230.1	154.99	292.4	-813.4	317.7	53.4	264.21	1.202 Shut in Produces		
8,975.0	8,933.0	8,931.0	8,931.0	34.2	230.7	158.40	292.4	-813.4	324.9	60.0	264.92	1.226 Shut in Produces		
9,000.0	8,956.3	8,954.3	8,954.3	34.3	231.3	161.04	292.4	-813.4	333.4	67.8	265.61	1.255 Shut in Produces		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 13974-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,025.0	8,979.2	8,977.2	8,977.2	34.4	231.9	163.16	292.4	-813.4	343.1	76.8	266.28	1.289	Shut in Produces	
9,050.0	9,001.5	8,999.5	8,999.5	34.5	232.4	164.89	292.4	-813.4	354.1	87.1	266.94	1.326	Shut in Produces	
9,075.0	9,023.2	9,021.2	9,021.2	34.6	233.0	166.36	292.4	-813.4	366.2	98.6	267.59	1.368	Shut in Produces	
9,100.0	9,044.2	9,042.2	9,042.2	34.7	233.5	167.61	292.4	-813.4	379.5	111.2	268.21	1.415	Shut in Produces	
9,125.0	9,064.5	9,062.5	9,062.5	34.7	234.1	168.69	292.4	-813.4	393.8	125.0	268.81	1.465	Shut in Produces	
9,150.0	9,084.0	9,082.0	9,082.0	34.8	234.6	169.64	292.4	-813.4	409.3	139.9	269.39	1.519	Advise and Monitor	
9,175.0	9,102.7	9,100.7	9,100.7	34.9	235.1	170.49	292.4	-813.4	425.7	155.8	269.95	1.577	Advise and Monitor	
9,200.0	9,120.5	9,118.5	9,118.5	35.0	235.5	171.24	292.4	-813.4	443.2	172.7	270.48	1.638	Advise and Monitor	
9,225.0	9,137.4	9,135.4	9,135.4	35.0	236.0	171.91	292.4	-813.4	461.5	190.5	270.99	1.703	Advise and Monitor	
9,250.0	9,153.3	9,151.3	9,151.3	35.1	236.4	172.53	292.4	-813.4	480.7	209.3	271.47	1.771	Advise and Monitor	
9,275.0	9,168.1	9,166.1	9,166.1	35.2	236.7	173.09	292.4	-813.4	500.8	228.9	271.92	1.842	Advise and Monitor	
9,300.0	9,181.9	9,179.9	9,179.9	35.2	237.1	173.62	292.4	-813.4	521.6	249.2	272.35	1.915	Advise and Monitor	
9,325.0	9,194.6	9,192.6	9,192.6	35.3	237.4	174.12	292.4	-813.4	543.1	270.3	272.75	1.991	Advise and Monitor	
9,350.0	9,206.2	9,204.2	9,204.2	35.4	237.7	174.61	292.4	-813.4	565.2	292.1	273.11	2.070		
9,375.0	9,216.6	9,214.6	9,214.6	35.5	238.0	175.09	292.4	-813.4	587.9	314.5	273.45	2.150		
9,400.0	9,225.8	9,223.8	9,223.8	35.5	238.2	175.60	292.4	-813.4	611.2	337.4	273.76	2.232		
9,425.0	9,233.8	9,231.8	9,231.8	35.6	238.4	176.16	292.4	-813.4	634.8	360.8	274.04	2.317		
9,450.0	9,240.5	9,238.5	9,238.5	35.7	238.6	176.84	292.4	-813.4	658.9	384.6	274.29	2.402		
9,475.0	9,246.0	9,244.0	9,244.0	35.7	238.8	177.75	292.4	-813.4	683.3	408.8	274.50	2.489		
9,500.0	9,250.2	9,248.2	9,248.2	35.8	238.9	177.18	292.4	-813.4	707.9	433.3	274.69	2.577		
9,525.0	9,253.1	9,251.1	9,251.1	35.9	238.9	-177.94	292.4	-813.4	732.8	457.9	274.85	2.666		
9,550.0	9,254.7	9,252.7	9,252.7	36.0	239.0	-167.78	292.4	-813.4	757.7	482.7	274.98	2.756		
9,561.6	9,255.0	9,253.0	9,253.0	36.0	239.0	-143.50	292.4	-813.4	769.3	494.2	275.02	2.797		
9,600.0	9,255.6	9,253.6	9,253.6	36.2	239.0	-144.83	292.4	-813.4	807.7	532.5	275.18	2.935		
9,700.0	9,257.0	9,255.0	9,255.0	36.6	239.0	-147.91	292.4	-813.4	907.7	632.1	275.63	3.293		
9,800.0	9,258.4	9,256.4	9,256.4	37.1	239.1	-150.54	292.4	-813.4	1,007.7	731.5	276.15	3.649		
9,900.0	9,259.8	9,257.8	9,257.8	37.6	239.1	-152.80	292.4	-813.4	1,107.7	830.9	276.74	4.003		
10,000.0	9,261.3	9,259.3	9,259.3	38.2	239.2	-154.76	292.4	-813.4	1,207.7	930.3	277.39	4.354		
10,100.0	9,262.7	9,260.7	9,260.7	38.9	239.2	-156.48	292.4	-813.4	1,307.6	1,029.5	278.11	4.702		
10,200.0	9,264.1	9,262.1	9,262.1	39.7	239.2	-157.98	292.4	-813.4	1,407.6	1,128.7	278.89	5.047		
10,300.0	9,265.6	9,263.6	9,263.6	40.5	239.3	-159.32	292.4	-813.4	1,507.6	1,227.9	279.73	5.390		
10,400.0	9,267.0	9,265.0	9,265.0	41.3	239.3	-160.50	292.4	-813.4	1,607.6	1,327.0	280.62	5.729		
10,500.0	9,268.4	9,266.4	9,266.4	42.2	239.3	-161.56	292.4	-813.4	1,707.6	1,426.0	281.56	6.065		
10,600.0	9,269.9	9,267.9	9,267.9	43.2	239.4	-162.52	292.4	-813.4	1,807.6	1,525.0	282.55	6.397		
10,700.0	9,271.3	9,269.3	9,269.3	44.2	239.4	-163.39	292.4	-813.4	1,907.6	1,624.0	283.58	6.727		
10,800.0	9,272.7	9,270.7	9,270.7	45.2	239.4	-164.17	292.4	-813.4	2,007.6	1,722.9	284.65	7.053		
10,900.0	9,274.2	9,272.2	9,272.2	46.3	239.5	-164.89	292.4	-813.4	2,107.6	1,821.8	285.75	7.375		
11,000.0	9,275.6	9,273.6	9,273.6	47.4	239.5	-165.54	292.4	-813.4	2,207.5	1,920.6	286.90	7.695		
11,100.0	9,277.0	9,275.0	9,275.0	48.5	239.6	-166.14	292.4	-813.4	2,307.5	2,019.5	288.07	8.010		
11,200.0	9,278.4	9,276.4	9,276.4	49.7	239.6	-166.70	292.4	-813.4	2,407.5	2,118.2	289.28	8.322		
11,300.0	9,279.9	9,277.9	9,277.9	50.9	239.6	-167.21	292.4	-813.4	2,507.5	2,217.0	290.51	8.631		
11,400.0	9,281.3	9,279.3	9,279.3	52.1	239.7	-167.69	292.4	-813.4	2,607.5	2,315.7	291.77	8.937		
11,500.0	9,282.7	9,280.7	9,280.7	53.4	239.7	-168.13	292.4	-813.4	2,707.5	2,414.4	293.06	9.239		
11,600.0	9,284.2	9,282.2	9,282.2	54.6	239.7	-168.54	292.4	-813.4	2,807.5	2,513.1	294.37	9.537		
11,700.0	9,285.6	9,283.6	9,283.6	55.9	239.8	-168.92	292.4	-813.4	2,907.5	2,611.8	295.70	9.833		
11,800.0	9,287.0	9,285.0	9,285.0	57.2	239.8	-169.28	292.4	-813.4	3,007.5	2,710.4	297.05	10.124		
11,900.0	9,288.5	9,286.5	9,286.5	58.6	239.9	-169.62	292.4	-813.4	3,107.4	2,809.0	298.42	10.413		
12,000.0	9,289.9	9,287.9	9,287.9	59.9	239.9	-169.94	292.4	-813.4	3,207.4	2,907.6	299.80	10.699		
12,100.0	9,291.3	9,289.3	9,289.3	61.3	239.9	-170.24	292.4	-813.4	3,307.4	3,006.2	301.20	10.981		
12,200.0	9,292.8	9,290.8	9,290.8	62.7	240.0	-170.52	292.4	-813.4	3,407.4	3,104.8	302.62	11.260		
12,300.0	9,294.2	9,292.2	9,292.2	64.0	240.0	-170.78	292.4	-813.4	3,507.4	3,203.4	304.05	11.536		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 13974-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
12,400.0	9,295.6	9,293.6	9,293.6	65.5	240.0	-171.03	292.4	-813.4	3,607.4	3,301.9	305.49	11.808		
12,500.0	9,297.1	9,295.1	9,295.1	66.9	240.1	-171.27	292.4	-813.4	3,707.4	3,400.4	306.95	12.078		
12,600.0	9,298.5	9,296.5	9,296.5	68.3	240.1	-171.50	292.4	-813.4	3,807.4	3,499.0	308.42	12.345		
12,700.0	9,299.9	9,297.9	9,297.9	69.7	240.2	-171.71	292.4	-813.4	3,907.4	3,597.5	309.90	12.609		
12,800.0	9,301.3	9,299.3	9,299.3	71.2	240.2	-171.92	292.4	-813.4	4,007.3	3,696.0	311.38	12.869		
12,900.0	9,302.8	9,300.8	9,300.8	72.7	240.2	-172.11	292.4	-813.4	4,107.3	3,794.5	312.88	13.127		
13,000.0	9,304.2	9,302.2	9,302.2	74.1	240.3	-172.30	292.4	-813.4	4,207.3	3,892.9	314.39	13.383		
13,100.0	9,305.6	9,303.6	9,303.6	75.6	240.3	-172.47	292.4	-813.4	4,307.3	3,991.4	315.91	13.635		
13,200.0	9,307.1	9,305.1	9,305.1	77.1	240.3	-172.64	292.4	-813.4	4,407.3	4,089.9	317.43	13.884		
13,300.0	9,308.5	9,306.5	9,306.5	78.6	240.4	-172.80	292.4	-813.4	4,507.3	4,188.3	318.96	14.131		
13,400.0	9,309.9	9,307.9	9,307.9	80.1	240.4	-172.96	292.4	-813.4	4,607.3	4,286.8	320.50	14.375		
13,500.0	9,311.4	9,309.4	9,309.4	81.6	240.4	-173.11	292.4	-813.4	4,707.3	4,385.2	322.04	14.617		
13,600.0	9,312.8	9,310.8	9,310.8	83.1	240.5	-173.25	292.4	-813.4	4,807.3	4,483.7	323.60	14.856		
13,700.0	9,314.2	9,312.2	9,312.2	84.6	240.5	-173.38	292.4	-813.4	4,907.3	4,582.1	325.15	15.092		
13,800.0	9,315.7	9,313.7	9,313.7	86.2	240.6	-173.51	292.4	-813.4	5,007.2	4,680.5	326.72	15.326		
13,900.0	9,317.1	9,315.1	9,315.1	87.7	240.6	-173.64	292.4	-813.4	5,107.2	4,779.0	328.28	15.557		
14,000.0	9,318.5	9,316.5	9,316.5	89.2	240.6	-173.76	292.4	-813.4	5,207.2	4,877.4	329.86	15.786		
14,100.0	9,320.0	9,318.0	9,318.0	90.8	240.7	-173.88	292.4	-813.4	5,307.2	4,975.8	331.44	16.013		
14,200.0	9,321.4	9,319.4	9,319.4	92.3	240.7	-173.99	292.4	-813.4	5,407.2	5,074.2	333.02	16.237		
14,300.0	9,322.8	9,320.8	9,320.8	93.9	240.7	-174.10	292.4	-813.4	5,507.2	5,172.6	334.61	16.459		
14,400.0	9,324.2	9,322.2	9,322.2	95.4	240.8	-174.20	292.4	-813.4	5,607.2	5,271.0	336.20	16.678		
14,500.0	9,325.7	9,323.7	9,323.7	97.0	240.8	-174.30	292.4	-813.4	5,707.2	5,369.4	337.80	16.895		
14,600.0	9,327.1	9,325.1	9,325.1	98.5	240.9	-174.40	292.4	-813.4	5,807.2	5,467.8	339.39	17.110		
14,683.3	9,328.3	9,326.3	9,326.3	99.8	240.9	-174.48	292.4	-813.4	5,890.5	5,549.7	340.73	17.288		

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2132-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (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
0.0	0.0	0.0	0.0	0.0	3.0	153.25		-1,026.7	517.6	1,149.8				
100.0	100.0	96.0	96.0	0.1	3.3	153.25		-1,026.7	517.6	1,149.8	1,146.3	3.46	331.896	
200.0	200.0	196.0	196.0	0.5	4.2	153.25		-1,026.7	517.6	1,149.8	1,145.1	4.68	245.694	
300.0	300.0	296.0	296.0	0.9	5.3	153.25		-1,026.7	517.6	1,149.8	1,143.6	6.18	186.095	
400.0	400.0	396.0	396.0	1.2	6.6	153.25		-1,026.7	517.6	1,149.8	1,142.0	7.82	147.122	
500.0	500.0	496.0	496.0	1.6	7.9	153.25		-1,026.7	517.6	1,149.8	1,140.3	9.52	120.731	
600.0	600.0	596.0	596.0	1.9	9.3	153.25		-1,026.7	517.6	1,149.8	1,138.5	11.27	101.999	
700.0	700.0	696.0	696.0	2.3	10.8	153.25		-1,026.7	517.6	1,149.8	1,136.7	13.05	88.130	
800.0	800.0	796.0	796.0	2.7	12.2	153.25		-1,026.7	517.6	1,149.8	1,134.9	14.84	77.497	
900.0	900.0	896.0	896.0	3.0	13.6	153.25		-1,026.7	517.6	1,149.8	1,133.1	16.64	69.107	
950.0	950.0	946.0	946.0	3.2	14.4	153.25		-1,026.7	517.6	1,149.8	1,132.2	17.54	65.547 CC	
1,000.0	1,000.0	996.0	996.0	3.4	15.1	-116.34		-1,026.7	517.6	1,150.0	1,131.5	18.44	62.355	
1,100.0	1,099.9	1,095.9	1,095.9	3.7	16.5	-116.46		-1,026.7	517.6	1,151.5	1,131.3	20.24	56.889	
1,200.0	1,199.7	1,195.7	1,195.7	4.1	18.0	-116.72		-1,026.7	517.6	1,154.6	1,132.6	22.05	52.370	
1,236.8	1,236.4	1,232.4	1,232.4	4.2	18.5	-116.84		-1,026.7	517.6	1,156.2	1,133.5	22.72	50.900	
1,300.0	1,299.2	1,295.2	1,295.2	4.4	19.4	-117.12		-1,026.7	517.6	1,159.1	1,135.2	23.86	48.574	
1,400.0	1,398.7	1,394.7	1,394.7	4.8	20.9	-117.55		-1,026.7	517.6	1,163.7	1,138.0	25.68	45.307	
1,500.0	1,498.2	1,494.2	1,494.2	5.1	22.4	-117.99		-1,026.7	517.6	1,168.4	1,140.9	27.51	42.465	
1,600.0	1,597.7	1,593.7	1,593.7	5.5	23.8	-118.42		-1,026.7	517.6	1,173.1	1,143.8	29.35	39.972	
1,700.0	1,697.2	1,693.2	1,693.2	5.9	25.3	-118.84		-1,026.7	517.6	1,177.9	1,146.7	31.19	37.770	
1,800.0	1,796.7	1,792.7	1,792.7	6.3	26.8	-119.26		-1,026.7	517.6	1,182.8	1,149.8	33.03	35.810	
1,900.0	1,896.2	1,892.2	1,892.2	6.6	28.2	-119.68		-1,026.7	517.6	1,187.7	1,152.9	34.87	34.057	
2,000.0	1,995.7	1,991.7	1,991.7	7.0	29.7	-120.10		-1,026.7	517.6	1,192.7	1,156.0	36.72	32.480	
2,100.0	2,095.2	2,091.2	2,091.2	7.4	31.2	-120.51		-1,026.7	517.6	1,197.8	1,159.2	38.57	31.053	
2,200.0	2,194.7	2,190.7	2,190.7	7.8	33.1	-120.92		-1,026.7	517.6	1,202.9	1,162.0	40.89	29.416	
2,300.0	2,294.2	2,290.2	2,290.2	8.2	35.4	-121.33		-1,026.7	517.6	1,208.1	1,164.6	43.54	27.745	
2,400.0	2,393.7	2,389.7	2,389.7	8.6	37.6	-121.73		-1,026.7	517.6	1,213.3	1,167.2	46.20	26.266	
2,500.0	2,493.2	2,489.2	2,489.2	8.9	39.9	-122.13		-1,026.7	517.6	1,218.7	1,169.8	48.85	24.947	
2,600.0	2,592.7	2,588.7	2,588.7	9.3	42.2	-122.52		-1,026.7	517.6	1,224.0	1,172.5	51.50	23.766	
2,700.0	2,692.2	2,688.2	2,688.2	9.7	44.4	-122.91		-1,026.7	517.6	1,229.4	1,175.3	54.16	22.700	
2,800.0	2,791.7	2,787.7	2,787.7	10.1	46.7	-123.30		-1,026.7	517.6	1,234.9	1,178.1	56.82	21.735	
2,900.0	2,891.2	2,887.2	2,887.2	10.5	49.0	-123.68		-1,026.7	517.6	1,240.4	1,181.0	59.47	20.857	
3,000.0	2,990.7	2,986.7	2,986.7	10.9	51.3	-124.07		-1,026.7	517.6	1,246.0	1,183.9	62.13	20.054	
3,100.0	3,090.2	3,086.2	3,086.2	11.3	53.5	-124.44		-1,026.7	517.6	1,251.7	1,186.9	64.79	19.318	
3,200.0	3,189.7	3,185.7	3,185.7	11.7	55.8	-124.82		-1,026.7	517.6	1,257.4	1,189.9	67.45	18.641	
3,300.0	3,289.2	3,285.2	3,285.2	12.0	58.1	-125.19		-1,026.7	517.6	1,263.1	1,193.0	70.11	18.015	
3,400.0	3,388.7	3,384.7	3,384.7	12.4	60.3	-125.56		-1,026.7	517.6	1,268.9	1,196.2	72.78	17.436	
3,500.0	3,488.2	3,484.2	3,484.2	12.8	62.6	-125.92		-1,026.7	517.6	1,274.8	1,199.4	75.44	16.899	
3,600.0	3,587.7	3,583.7	3,583.7	13.2	64.9	-126.28		-1,026.7	517.6	1,280.7	1,202.6	78.10	16.398	
3,700.0	3,687.2	3,683.2	3,683.2	13.6	67.2	-126.64		-1,026.7	517.6	1,286.7	1,205.9	80.76	15.932	
3,800.0	3,786.7	3,783.0	3,782.7	14.0	69.2	-126.99		-1,026.7	517.6	1,292.7	1,209.5	83.22	15.533	
3,900.0	3,886.2	3,882.5	3,882.2	14.4	71.3	-127.34		-1,026.7	517.6	1,298.7	1,213.0	85.69	15.156	
4,000.0	3,985.7	3,982.0	3,981.7	14.8	73.4	-127.69		-1,026.7	517.6	1,304.8	1,216.7	88.16	14.801	
4,100.0	4,085.2	4,081.5	4,081.2	15.2	75.5	-128.04		-1,026.7	517.6	1,311.0	1,220.4	90.62	14.467	
4,200.0	4,184.7	4,181.0	4,180.7	15.5	77.5	-128.38		-1,026.7	517.6	1,317.2	1,224.1	93.09	14.150	
4,300.0	4,284.2	4,280.5	4,280.2	15.9	79.6	-128.72		-1,026.7	517.6	1,323.4	1,227.9	95.56	13.850	
4,400.0	4,383.7	4,380.0	4,379.7	16.3	81.7	-129.05		-1,026.7	517.6	1,329.7	1,231.7	98.02	13.565	
4,500.0	4,483.2	4,479.5	4,479.2	16.7	83.8	-129.38		-1,026.7	517.6	1,336.1	1,235.5	100.54	13.289	
4,600.0	4,582.7	4,579.0	4,578.7	17.1	86.3	-129.71		-1,026.7	517.6	1,342.5	1,239.0	103.44	12.978	
4,700.0	4,682.2	4,678.5	4,678.2	17.5	88.8	-130.04		-1,026.7	517.6	1,348.9	1,242.5	106.35	12.684	
4,800.0	4,781.7	4,778.0	4,777.7	17.9	91.7	-130.41		-1,026.7	517.6	1,355.4	1,245.8	109.60	12.367	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2132-HNC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,900.0	4,881.2	4,895.0	4,894.6	18.3	94.1	-130.74	-1,026.7	517.6	1,362.0	1,249.6	112.37	12.120		
5,000.0	4,980.7	4,977.0	4,976.7	18.7	95.7	-131.00	-1,026.7	517.6	1,368.4	1,254.0	114.40	11.962		
5,100.0	5,080.2	5,076.5	5,076.2	19.1	97.7	-131.31	-1,026.7	517.6	1,375.0	1,258.3	116.77	11.775		
5,200.0	5,179.7	5,176.0	5,175.7	19.5	99.7	-131.62	-1,026.7	517.6	1,381.7	1,262.5	119.15	11.596		
5,300.0	5,279.2	5,285.0	5,284.6	19.9	101.9	-131.96	-1,026.7	517.6	1,388.4	1,266.7	121.71	11.407		
5,400.0	5,378.7	5,375.1	5,374.7	20.2	103.9	-132.23	-1,026.7	517.6	1,395.1	1,270.9	124.18	11.234		
5,500.0	5,478.2	5,474.6	5,474.2	20.6	106.2	-132.53	-1,026.7	517.6	1,401.8	1,274.9	126.88	11.049		
5,600.0	5,577.7	5,574.1	5,573.7	21.0	108.5	-132.83	-1,026.7	517.6	1,408.6	1,279.1	129.53	10.874		
5,700.0	5,677.2	5,673.6	5,673.2	21.4	110.7	-133.13	-1,026.7	517.6	1,415.4	1,283.3	132.12	10.713		
5,800.0	5,776.7	5,773.1	5,772.7	21.8	112.9	-133.42	-1,026.7	517.6	1,422.3	1,287.6	134.72	10.558		
5,900.0	5,876.2	5,872.6	5,872.2	22.2	115.1	-133.71	-1,026.7	517.6	1,429.2	1,291.9	137.31	10.409		
6,000.0	5,975.7	5,972.1	5,971.7	22.6	117.3	-134.00	-1,026.7	517.6	1,436.2	1,296.3	139.90	10.266		
6,100.0	6,075.2	6,071.6	6,071.2	23.0	119.5	-134.28	-1,026.7	517.6	1,443.1	1,300.7	142.49	10.128		
6,200.0	6,174.7	6,171.1	6,170.7	23.4	121.7	-134.57	-1,026.7	517.6	1,450.2	1,305.1	145.08	9.996		
6,300.0	6,274.2	6,270.6	6,270.2	23.8	123.9	-134.85	-1,026.7	517.6	1,457.2	1,309.5	147.67	9.868		
6,400.0	6,373.7	6,370.1	6,369.7	24.2	126.1	-135.12	-1,026.7	517.6	1,464.3	1,314.0	150.26	9.745		
6,500.0	6,473.2	6,469.6	6,469.2	24.6	128.3	-135.40	-1,026.7	517.6	1,471.4	1,318.6	152.86	9.626		
6,600.0	6,572.7	6,569.1	6,568.7	24.9	130.5	-135.67	-1,026.7	517.6	1,478.6	1,323.1	155.45	9.512		
6,700.0	6,672.2	6,668.6	6,668.2	25.3	132.7	-135.94	-1,026.7	517.6	1,485.7	1,327.7	158.04	9.401		
6,800.0	6,771.7	6,768.1	6,767.7	25.7	134.9	-136.20	-1,026.7	517.6	1,493.0	1,332.3	160.63	9.294		
6,900.0	6,871.2	6,867.6	6,867.2	26.1	137.1	-136.47	-1,026.7	517.6	1,500.2	1,337.0	163.22	9.191		
7,000.0	6,970.7	6,967.1	6,966.7	26.5	139.3	-136.73	-1,026.7	517.6	1,507.5	1,341.7	165.81	9.091		
7,100.0	7,070.2	7,066.6	7,066.2	26.9	141.5	-136.99	-1,026.7	517.6	1,514.8	1,346.4	168.41	8.995		
7,200.0	7,169.7	7,166.1	7,165.7	27.3	143.7	-137.24	-1,026.7	517.6	1,522.1	1,351.1	171.00	8.901		
7,300.0	7,269.2	7,265.6	7,265.2	27.7	145.9	-137.50	-1,026.7	517.6	1,529.5	1,355.9	173.57	8.812		
7,400.0	7,368.7	7,365.1	7,364.7	28.1	147.8	-137.75	-1,026.7	517.6	1,536.9	1,361.0	175.86	8.739		
7,500.0	7,468.2	7,464.6	7,464.2	28.5	149.7	-138.00	-1,026.7	517.6	1,544.3	1,366.2	178.16	8.668		
7,600.0	7,567.7	7,564.1	7,563.7	28.9	151.6	-138.24	-1,026.7	517.6	1,551.8	1,371.3	180.45	8.600		
7,700.0	7,667.2	7,663.6	7,663.2	29.3	153.5	-138.49	-1,026.7	517.6	1,559.3	1,376.5	182.74	8.533		
7,800.0	7,766.7	7,763.1	7,762.7	29.7	155.4	-138.73	-1,026.7	517.6	1,566.8	1,381.8	185.04	8.468		
7,900.0	7,866.2	7,862.6	7,862.2	30.0	157.5	-138.97	-1,026.7	517.6	1,574.3	1,386.8	187.51	8.396		
8,000.0	7,965.7	7,962.1	7,961.7	30.4	159.9	-139.20	-1,026.7	517.6	1,581.9	1,391.6	190.31	8.312		
8,100.0	8,065.1	8,061.5	8,061.1	30.8	162.3	-139.44	-1,026.7	517.6	1,589.5	1,396.4	193.11	8.231		
8,200.0	8,164.6	8,161.0	8,160.6	31.2	164.7	-139.67	-1,026.7	517.6	1,597.1	1,401.2	195.90	8.153		
8,300.0	8,264.1	8,260.5	8,260.1	31.6	167.1	-139.90	-1,026.7	517.6	1,604.8	1,406.1	198.70	8.076		
8,400.0	8,363.6	8,360.0	8,359.6	32.0	169.5	-140.13	-1,026.7	517.6	1,612.5	1,411.0	201.50	8.002		
8,500.0	8,463.1	8,459.5	8,459.1	32.4	171.9	-140.36	-1,026.7	517.6	1,620.2	1,415.9	204.30	7.930		
8,600.0	8,562.6	8,559.0	8,558.6	32.8	174.3	-140.58	-1,026.7	517.6	1,627.9	1,420.8	207.09	7.861		
8,700.0	8,662.1	8,658.5	8,658.1	33.2	176.7	-140.80	-1,026.7	517.6	1,635.6	1,425.7	209.89	7.793		
8,800.0	8,761.6	8,758.0	8,757.6	33.6	179.1	-141.02	-1,026.7	517.6	1,643.4	1,430.7	212.69	7.727		
8,818.3	8,779.9	8,776.3	8,775.9	33.7	179.5	-141.06	-1,026.7	517.6	1,644.8	1,431.6	213.20	7.715		
8,825.0	8,786.5	8,782.9	8,782.5	33.7	179.7	-133.12	-1,026.7	517.6	1,645.3	1,431.9	213.38	7.711		
8,850.0	8,811.4	8,808.0	8,807.4	33.8	180.3	-107.55	-1,026.7	517.6	1,646.6	1,432.6	214.08	7.692		
8,875.0	8,836.1	8,832.8	8,832.1	33.9	180.9	-91.31	-1,026.7	517.6	1,647.1	1,432.4	214.78	7.669		
8,900.0	8,860.7	8,857.4	8,856.7	34.0	181.5	-81.71	-1,026.7	517.6	1,646.8	1,431.4	215.47	7.643		
8,925.0	8,885.1	8,881.8	8,881.1	34.1	182.1	-75.83	-1,026.7	517.6	1,645.7	1,429.5	216.15	7.614		
8,950.0	8,909.2	8,905.9	8,905.2	34.2	182.7	-72.08	-1,026.7	517.6	1,643.8	1,427.0	216.82	7.581		
8,975.0	8,933.0	8,930.0	8,929.3	34.2	184.0	-69.98	-1,026.7	517.6	1,641.4	1,423.1	218.22	7.522		
9,000.0	8,956.3	8,953.0	8,952.3	34.3	184.0	-68.16	-1,026.7	517.6	1,637.7	1,419.3	218.31	7.501		
9,025.0	8,979.2	8,975.9	8,975.2	34.4	184.4	-67.11	-1,026.7	517.6	1,633.5	1,414.6	218.85	7.464		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2132-INC-ONLY													Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance						Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,050.0	9,001.5	8,998.2	8,997.5	34.5	185.1	-66.61	-1,026.7	517.6	1,628.6	1,409.0	219.56	7.417		
9,075.0	9,023.2	9,019.9	9,019.2	34.6	185.7	-66.48	-1,026.7	517.6	1,623.0	1,402.7	220.25	7.369		
9,100.0	9,044.2	9,040.9	9,040.2	34.7	186.3	-66.63	-1,026.7	517.6	1,616.8	1,395.9	220.93	7.318		
9,125.0	9,064.5	9,061.2	9,060.5	34.7	186.8	-67.02	-1,026.7	517.6	1,610.0	1,388.4	221.58	7.266		
9,150.0	9,084.0	9,080.7	9,080.0	34.8	187.4	-67.63	-1,026.7	517.6	1,602.6	1,380.4	222.21	7.212		
9,175.0	9,102.7	9,099.4	9,098.7	34.9	187.9	-68.41	-1,026.7	517.6	1,594.7	1,371.9	222.81	7.157		
9,200.0	9,120.5	9,135.0	9,134.2	35.0	188.9	-69.82	-1,026.7	517.6	1,586.5	1,362.6	223.88	7.086		
9,225.0	9,137.4	9,135.0	9,134.2	35.0	188.9	-70.46	-1,026.7	517.6	1,577.6	1,353.6	223.96	7.044		
9,250.0	9,153.3	9,150.0	9,149.3	35.1	189.3	-71.63	-1,026.7	517.6	1,568.4	1,344.0	224.40	6.989		
9,275.0	9,168.1	9,164.9	9,164.1	35.2	189.7	-72.92	-1,026.7	517.6	1,558.9	1,334.0	224.85	6.933		
9,300.0	9,181.9	9,178.7	9,177.9	35.2	190.0	-74.30	-1,026.7	517.6	1,549.1	1,323.8	225.26	6.877		
9,325.0	9,194.6	9,191.4	9,190.6	35.3	190.3	-75.74	-1,026.7	517.6	1,539.0	1,313.4	225.65	6.820		
9,350.0	9,206.2	9,203.0	9,202.2	35.4	190.6	-77.24	-1,026.7	517.6	1,528.8	1,302.8	226.01	6.764		
9,375.0	9,216.6	9,213.4	9,212.6	35.5	190.9	-78.76	-1,026.7	517.6	1,518.5	1,292.1	226.35	6.709		
9,400.0	9,225.8	9,222.6	9,221.8	35.5	191.1	-80.30	-1,026.7	517.6	1,508.0	1,281.4	226.65	6.654		
9,425.0	9,233.8	9,230.5	9,229.8	35.6	191.3	-81.84	-1,026.7	517.6	1,497.6	1,270.7	226.92	6.600		
9,450.0	9,240.5	9,237.3	9,236.5	35.7	191.5	-83.37	-1,026.7	517.6	1,487.1	1,260.0	227.17	6.547		
9,475.0	9,246.0	9,242.7	9,242.0	35.7	191.6	-84.87	-1,026.7	517.6	1,476.8	1,249.4	227.38	6.495		
9,500.0	9,250.2	9,246.9	9,246.2	35.8	191.7	-86.32	-1,026.7	517.6	1,466.5	1,238.9	227.56	6.444		
9,525.0	9,253.1	9,249.8	9,249.1	35.9	191.8	-87.72	-1,026.7	517.6	1,456.4	1,228.7	227.72	6.395		
9,550.0	9,254.7	9,251.5	9,250.7	36.0	191.9	-89.06	-1,026.7	517.6	1,446.5	1,218.6	227.85	6.348		
9,561.6	9,255.0	9,251.8	9,251.0	36.0	191.9	-89.65	-1,026.7	517.6	1,441.9	1,214.0	227.89	6.327		
9,600.0	9,255.6	9,252.3	9,251.6	36.2	191.9	-89.68	-1,026.7	517.6	1,427.4	1,199.4	228.05	6.259		
9,700.0	9,257.0	9,253.7	9,253.0	36.6	191.9	-89.74	-1,026.7	517.6	1,394.0	1,165.5	228.49	6.101		
9,800.0	9,258.4	9,255.2	9,254.4	37.1	191.9	-89.80	-1,026.7	517.6	1,367.0	1,138.0	229.01	5.969		
9,900.0	9,259.8	9,256.6	9,255.8	37.6	192.0	-89.86	-1,026.7	517.6	1,347.0	1,117.4	229.60	5.867		
10,000.0	9,261.3	9,258.0	9,257.3	38.2	192.0	-89.92	-1,026.7	517.6	1,334.1	1,103.9	230.26	5.794		
10,100.0	9,262.7	9,259.5	9,258.7	38.9	192.1	-89.99	-1,026.7	517.6	1,328.7	1,097.8	230.98	5.753		
10,122.1	9,263.0	9,259.8	9,259.0	39.1	192.1	-90.00	-1,026.7	517.6	1,328.6	1,097.4	231.15	5.748 ES		
10,200.0	9,264.1	9,260.9	9,260.1	39.7	192.1	-90.05	-1,026.7	517.6	1,330.8	1,099.1	231.76	5.742 SF		
10,300.0	9,265.6	9,262.3	9,261.6	40.5	192.1	-90.11	-1,026.7	517.6	1,340.4	1,107.8	232.59	5.763		
10,400.0	9,267.0	9,263.8	9,263.0	41.3	192.2	-90.17	-1,026.7	517.6	1,357.3	1,123.8	233.48	5.813		
10,500.0	9,268.4	9,265.2	9,264.4	42.2	192.2	-90.23	-1,026.7	517.6	1,381.2	1,146.8	234.42	5.892		
10,600.0	9,269.9	9,266.6	9,265.9	43.2	192.2	-90.29	-1,026.7	517.6	1,411.9	1,176.5	235.41	5.998		
10,700.0	9,271.3	9,268.1	9,267.3	44.2	192.3	-90.36	-1,026.7	517.6	1,448.8	1,212.4	236.43	6.128		
10,800.0	9,272.7	9,269.5	9,268.7	45.2	192.3	-90.42	-1,026.7	517.6	1,491.5	1,254.0	237.50	6.280		
10,900.0	9,274.2	9,270.9	9,270.2	46.3	192.3	-90.48	-1,026.7	517.6	1,539.5	1,300.9	238.61	6.452		
11,000.0	9,275.6	9,272.3	9,271.6	47.4	192.4	-90.54	-1,026.7	517.6	1,592.4	1,352.6	239.75	6.642		
11,100.0	9,277.0	9,273.8	9,273.0	48.5	192.4	-90.60	-1,026.7	517.6	1,649.6	1,408.7	240.93	6.847		
11,200.0	9,278.4	9,275.2	9,274.4	49.7	192.5	-90.67	-1,026.7	517.6	1,710.8	1,468.6	242.13	7.065		
11,300.0	9,279.9	9,276.6	9,275.9	50.9	192.5	-90.73	-1,026.7	517.6	1,775.5	1,532.1	243.37	7.295		
11,400.0	9,281.3	9,278.1	9,277.3	52.1	192.5	-90.79	-1,026.7	517.6	1,843.3	1,598.7	244.63	7.535		
11,500.0	9,282.7	9,279.5	9,278.7	53.4	192.6	-90.85	-1,026.7	517.6	1,914.0	1,668.1	245.91	7.783		
11,600.0	9,284.2	9,280.9	9,280.2	54.6	192.6	-90.91	-1,026.7	517.6	1,987.2	1,740.0	247.22	8.038		
11,700.0	9,285.6	9,282.4	9,281.6	55.9	192.6	-90.97	-1,026.7	517.6	2,062.6	1,814.1	248.55	8.299		
11,800.0	9,287.0	9,283.8	9,283.0	57.2	192.7	-91.04	-1,026.7	517.6	2,140.1	1,890.2	249.90	8.564		
11,900.0	9,288.5	9,285.2	9,284.5	58.6	192.7	-91.10	-1,026.7	517.6	2,219.3	1,968.1	251.26	8.833		
12,000.0	9,289.9	9,286.7	9,285.9	59.9	192.7	-91.16	-1,026.7	517.6	2,300.2	2,047.6	252.65	9.104		
12,100.0	9,291.3	9,288.1	9,287.3	61.3	192.8	-91.22	-1,026.7	517.6	2,382.5	2,128.5	254.05	9.378		
12,200.0	9,292.8	9,289.5	9,288.8	62.7	192.8	-91.28	-1,026.7	517.6	2,466.2	2,210.7	255.46	9.654		
12,300.0	9,294.2	9,290.9	9,290.2	64.0	192.8	-91.34	-1,026.7	517.6	2,551.0	2,294.1	256.89	9.930		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #1 - OWB - ACTUAL WELLPATH														Offset Site Error:	0.0 usft
Survey Program: 2132-INC-ONLY														Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
12,400.0	9,295.6	9,292.4	9,291.6	65.5	192.9	-91.41	-1,026.7	517.6	2,636.8	2,378.5	258.34	10.207			
12,500.0	9,297.1	9,293.8	9,293.1	66.9	192.9	-91.47	-1,026.7	517.6	2,723.7	2,463.9	259.79	10.484			
12,600.0	9,298.5	9,295.2	9,294.5	68.3	193.0	-91.53	-1,026.7	517.6	2,811.4	2,550.1	261.26	10.761			
12,700.0	9,299.9	9,296.7	9,295.9	69.7	193.0	-91.59	-1,026.7	517.6	2,899.9	2,637.2	262.74	11.037			
12,800.0	9,301.3	9,298.1	9,297.3	71.2	193.0	-91.65	-1,026.7	517.6	2,989.1	2,724.9	264.22	11.313			
12,900.0	9,302.8	9,299.5	9,298.8	72.7	193.1	-91.71	-1,026.7	517.6	3,079.0	2,813.3	265.72	11.587			
13,000.0	9,304.2	9,301.0	9,300.2	74.1	193.1	-91.78	-1,026.7	517.6	3,169.5	2,902.3	267.23	11.861			
13,100.0	9,305.6	9,302.4	9,301.6	75.6	193.1	-91.84	-1,026.7	517.6	3,260.6	2,991.8	268.74	12.133			
13,200.0	9,307.1	9,303.8	9,303.1	77.1	193.2	-91.90	-1,026.7	517.6	3,352.1	3,081.9	270.27	12.403			
13,300.0	9,308.5	9,305.3	9,304.5	78.6	193.2	-91.96	-1,026.7	517.6	3,444.2	3,172.4	271.80	12.672			
13,400.0	9,309.9	9,306.7	9,305.9	80.1	193.2	-92.02	-1,026.7	517.6	3,536.6	3,263.3	273.33	12.939			
13,500.0	9,311.4	9,308.1	9,307.4	81.6	193.3	-92.08	-1,026.7	517.6	3,629.5	3,354.6	274.88	13.204			
13,600.0	9,312.8	9,309.6	9,308.8	83.1	193.3	-92.15	-1,026.7	517.6	3,722.7	3,446.3	276.43	13.467			
13,700.0	9,314.2	9,311.0	9,310.2	84.6	193.4	-92.21	-1,026.7	517.6	3,816.3	3,538.3	277.98	13.728			
13,800.0	9,315.7	9,312.4	9,311.7	86.2	193.4	-92.27	-1,026.7	517.6	3,910.2	3,630.6	279.55	13.988			
13,900.0	9,317.1	9,313.8	9,313.1	87.7	193.4	-92.33	-1,026.7	517.6	4,004.4	3,723.2	281.11	14.245			
14,000.0	9,318.5	9,315.3	9,314.5	89.2	193.5	-92.39	-1,026.7	517.6	4,098.8	3,816.1	282.69	14.499			
14,100.0	9,320.0	9,316.7	9,316.0	90.8	193.5	-92.45	-1,026.7	517.6	4,193.5	3,909.3	284.26	14.752			
14,200.0	9,321.4	9,318.1	9,317.4	92.3	193.5	-92.51	-1,026.7	517.6	4,288.5	4,002.6	285.85	15.003			
14,300.0	9,322.8	9,319.6	9,318.8	93.9	193.6	-92.58	-1,026.7	517.6	4,383.7	4,096.2	287.43	15.251			
14,400.0	9,324.2	9,321.0	9,320.2	95.4	193.6	-92.64	-1,026.7	517.6	4,479.1	4,190.0	289.02	15.497			
14,500.0	9,325.7	9,322.4	9,321.7	97.0	193.6	-92.70	-1,026.7	517.6	4,574.6	4,284.0	290.62	15.741			
14,600.0	9,327.1	9,323.9	9,323.1	98.5	193.7	-92.76	-1,026.7	517.6	4,670.4	4,378.2	292.22	15.983			
14,683.3	9,328.3	9,325.1	9,324.3	99.8	193.7	-92.81	-1,026.7	517.6	4,750.3	4,456.8	293.55	16.182			

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #28H - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 100-MWD													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	Highside Toolface (°)	Offset Wellbore Centre	Distance	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
								+N/-S (usft)	+E/-W (usft)					
0.0	0.0	0.0	0.0	0.0	3.0	-89.19		53.9	-3,814.5	3,814.9				
100.0	100.0	90.0	90.0	0.1	3.0	-89.19		54.0	-3,814.5	3,814.9	3,811.8	3.15	1,212.495	
200.0	200.0	189.2	189.2	0.5	3.0	-89.18		54.4	-3,814.6	3,815.0	3,811.4	3.54	1,078.284	
300.0	300.0	279.4	279.4	0.9	3.1	-89.18		54.7	-3,814.7	3,815.2	3,811.2	3.96	962.865	
400.0	400.0	369.0	369.0	1.2	3.2	-89.18		54.9	-3,815.2	3,815.6	3,811.2	4.42	864.006	
500.0	500.0	473.1	473.1	1.6	3.3	-89.17		55.0	-3,815.8	3,816.2	3,811.3	4.92	775.571	
600.0	600.0	584.8	584.8	1.9	3.5	-89.17		55.1	-3,816.2	3,816.6	3,811.1	5.47	697.422	
700.0	700.0	680.9	680.9	2.3	3.7	-89.17		55.2	-3,816.4	3,816.8	3,810.8	6.02	633.576	
800.0	800.0	774.2	774.2	2.7	3.9	-89.17		55.3	-3,816.7	3,817.2	3,810.6	6.59	579.244	
900.0	900.0	830.9	830.9	3.0	4.3	-89.16		55.9	-3,816.4	3,817.0	3,809.7	7.32	521.373	
950.0	950.0	1,002.0	1,002.0	3.2	4.5	-89.16		56.0	-3,815.5	3,816.4	3,808.7	7.68	497.193	
1,000.0	1,000.0	1,060.3	1,060.3	3.4	4.6	1.27		55.8	-3,814.5	3,815.1	3,807.1	8.00	477.001	
1,100.0	1,099.9	1,171.4	1,171.3	3.7	4.9	1.26		54.7	-3,812.4	3,809.7	3,801.0	8.63	441.246	
1,200.0	1,199.7	1,275.1	1,275.0	4.1	5.2	1.24		52.8	-3,810.2	3,800.6	3,791.3	9.27	410.065	
1,236.8	1,236.4	1,312.6	1,312.5	4.2	5.3	1.23		52.2	-3,809.4	3,796.3	3,786.8	9.50	399.424	
1,300.0	1,299.2	1,376.9	1,376.7	4.4	5.5	1.22		51.1	-3,807.9	3,788.6	3,778.7	9.91	382.110	
1,400.0	1,398.7	1,500.7	1,500.5	4.8	5.9	1.20		49.3	-3,804.8	3,776.1	3,765.4	10.64	354.812	
1,500.0	1,498.2	1,618.7	1,618.5	5.1	6.2	1.19		48.3	-3,801.1	3,763.0	3,751.6	11.37	330.988	
1,600.0	1,597.7	1,750.0	1,749.7	5.5	6.6	1.18		47.7	-3,796.1	3,749.1	3,737.0	12.15	308.579	
1,700.0	1,697.2	1,855.0	1,854.6	5.9	7.0	1.19		47.6	-3,791.4	3,734.7	3,721.9	12.86	290.463	
1,800.0	1,796.7	1,943.8	1,943.3	6.3	7.3	1.19		48.0	-3,787.6	3,720.5	3,706.9	13.52	275.172	
1,900.0	1,896.2	2,043.9	2,043.3	6.6	7.6	1.21		48.8	-3,783.5	3,706.5	3,692.2	14.23	260.558	
2,000.0	1,995.7	2,173.9	2,173.1	7.0	8.0	1.24		50.4	-3,777.5	3,691.9	3,676.9	15.03	245.560	
2,100.0	2,095.2	2,305.9	2,304.9	7.4	8.5	1.28		52.3	-3,770.3	3,676.5	3,660.6	15.86	231.845	
2,200.0	2,194.7	2,449.0	2,447.7	7.8	8.9	1.32		54.4	-3,760.9	3,660.0	3,643.3	16.73	218.800	
2,300.0	2,294.2	2,579.7	2,578.0	8.2	9.4	1.35		55.9	-3,750.9	3,642.5	3,624.9	17.56	207.409	
2,400.0	2,393.7	2,684.3	2,682.3	8.6	9.8	1.37		56.5	-3,742.4	3,624.4	3,606.1	18.31	197.935	
2,500.0	2,493.2	2,781.8	2,779.4	8.9	10.1	1.37		56.2	-3,734.4	3,606.3	3,587.3	19.04	189.421	
2,600.0	2,592.7	2,892.6	2,889.8	9.3	10.5	1.36		55.6	-3,725.2	3,588.1	3,568.3	19.82	181.067	
2,700.0	2,692.2	3,000.0	2,996.8	9.7	10.9	1.39		56.6	-3,715.8	3,569.4	3,548.8	20.59	173.388	
2,800.0	2,791.7	3,077.5	3,074.0	10.1	11.2	1.41		57.7	-3,709.1	3,550.9	3,529.6	21.25	167.096	
2,900.0	2,891.2	3,100.0	3,096.4	10.5	11.2	1.42		58.0	-3,707.3	3,533.6	3,511.9	21.72	162.702	
3,000.0	2,990.7	3,163.0	3,159.3	10.9	11.5	1.43		58.4	-3,703.2	3,517.6	3,495.2	22.33	157.539	
3,100.0	3,090.2	3,200.0	3,196.3	11.3	11.6	1.43		58.5	-3,701.7	3,503.5	3,480.6	22.85	153.344	
3,200.0	3,189.7	3,283.3	3,279.5	11.7	11.9	1.43		58.4	-3,699.1	3,490.4	3,466.9	23.52	148.376	
3,300.0	3,289.2	3,365.0	3,361.2	12.0	12.2	1.44		58.5	-3,697.0	3,477.9	3,453.7	24.20	143.735	
3,400.0	3,388.7	3,441.1	3,437.3	12.4	12.4	1.44		58.6	-3,695.5	3,465.9	3,441.1	24.85	139.477	
3,500.0	3,488.2	3,517.3	3,513.5	12.8	12.7	1.45		58.9	-3,694.5	3,454.7	3,429.2	25.50	135.470	
3,600.0	3,587.7	3,615.2	3,611.3	13.2	13.0	1.47		59.7	-3,693.7	3,443.8	3,417.6	26.23	131.304	
3,700.0	3,687.2	3,760.8	3,756.9	13.6	13.5	1.51		61.7	-3,691.5	3,432.5	3,405.3	27.12	126.561	
3,800.0	3,786.7	3,861.2	3,857.3	14.0	13.9	1.55		64.0	-3,688.9	3,419.9	3,392.1	27.86	122.752	
3,900.0	3,886.2	3,944.6	3,940.7	14.4	14.2	1.60		66.5	-3,687.2	3,407.9	3,379.4	28.54	119.407	
4,000.0	3,985.7	4,032.2	4,028.1	14.8	14.5	1.65		69.0	-3,685.7	3,396.3	3,367.0	29.23	116.175	
4,100.0	4,085.2	4,120.4	4,116.3	15.2	14.8	1.69		71.0	-3,684.5	3,385.0	3,355.1	29.93	113.098	
4,200.0	4,184.7	4,230.3	4,226.2	15.5	15.2	1.72		72.9	-3,683.0	3,373.7	3,343.0	30.70	109.881	
4,300.0	4,284.2	4,330.9	4,326.9	15.9	15.5	1.76		74.4	-3,681.5	3,362.2	3,330.8	31.45	106.924	
4,400.0	4,383.7	4,430.4	4,426.2	16.3	15.9	1.80		76.4	-3,679.9	3,350.7	3,318.5	32.18	104.113	
4,500.0	4,483.2	4,520.5	4,516.4	16.7	16.2	1.84		78.6	-3,678.6	3,339.3	3,306.4	32.89	101.534	
4,600.0	4,582.7	4,600.0	4,595.8	17.1	16.4	1.88		80.3	-3,677.7	3,328.3	3,294.8	33.56	99.188	
4,700.0	4,682.2	4,688.6	4,684.4	17.5	16.7	1.91		81.9	-3,677.2	3,317.8	3,283.6	34.25	96.869	
4,800.0	4,781.7	4,773.7	4,769.5	17.9	17.0	1.93		82.9	-3,677.1	3,307.7	3,272.8	34.93	94.687	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #28H - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 100-MWD													Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis			Distance							Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
4,900.0	4,881.2	4,865.4	4,861.2	18.3	17.3	1.94	83.3	-3,677.4	3,298.0	3,262.4	35.63	92.557		
5,000.0	4,980.7	4,961.2	4,957.0	18.7	17.7	1.94	83.1	-3,677.8	3,288.5	3,252.1	36.34	90.495		
5,100.0	5,080.2	5,068.3	5,064.1	19.1	18.0	1.95	82.9	-3,678.2	3,278.9	3,241.8	37.08	88.424		
5,200.0	5,179.7	5,169.3	5,165.1	19.5	18.3	1.94	82.4	-3,678.4	3,269.1	3,231.3	37.81	86.469		
5,300.0	5,279.2	5,314.3	5,310.1	19.9	18.8	1.94	81.5	-3,677.9	3,258.8	3,220.1	38.69	84.235		
5,400.0	5,378.7	5,425.9	5,421.6	20.2	19.2	1.93	80.6	-3,676.3	3,247.4	3,207.9	39.47	82.283		
5,500.0	5,478.2	5,527.6	5,523.4	20.6	19.6	1.93	80.4	-3,674.7	3,235.8	3,195.6	40.21	80.464		
5,600.0	5,577.7	5,628.8	5,624.6	21.0	19.9	1.95	81.1	-3,673.0	3,224.1	3,183.1	40.96	78.711		
5,700.0	5,677.2	5,734.8	5,730.5	21.4	20.3	1.98	82.2	-3,671.1	3,212.4	3,170.7	41.73	76.985		
5,800.0	5,776.7	5,845.5	5,841.2	21.8	20.7	2.00	83.2	-3,668.7	3,200.2	3,157.7	42.51	75.280		
5,900.0	5,876.2	5,938.9	5,934.6	22.2	21.0	2.03	84.0	-3,666.6	3,188.0	3,144.8	43.23	73.739		
6,000.0	5,975.7	6,024.1	6,019.7	22.6	21.3	2.04	84.6	-3,665.0	3,176.2	3,132.3	43.93	72.305		
6,100.0	6,075.2	6,105.7	6,101.3	23.0	21.6	2.06	85.3	-3,663.9	3,164.9	3,120.2	44.61	70.948		
6,200.0	6,174.7	12,252.0	9,251.2	23.4	99.9	168.09	79.6	-426.2	3,086.8	2,963.6	123.28	25.040		
6,300.0	6,274.2	12,252.0	9,251.2	23.8	99.9	168.09	79.6	-426.2	2,987.7	2,864.0	123.67	24.159		
6,400.0	6,373.7	12,252.0	9,251.2	24.2	99.9	168.09	79.6	-426.2	2,888.6	2,764.6	124.06	23.284		
6,500.0	6,473.2	12,252.0	9,251.2	24.6	99.9	168.09	79.6	-426.2	2,789.6	2,665.2	124.45	22.415		
6,600.0	6,572.7	12,252.0	9,251.2	24.9	99.9	168.09	79.6	-426.2	2,690.7	2,565.9	124.84	21.553		
6,700.0	6,672.2	12,221.1	9,252.3	25.3	99.0	167.02	80.0	-457.1	2,591.6	2,467.2	124.37	20.837		
6,800.0	6,771.7	12,212.7	9,252.7	25.7	98.8	166.70	80.1	-465.5	2,492.6	2,368.1	124.53	20.017		
6,900.0	6,871.2	12,204.1	9,253.0	26.1	98.6	166.36	80.2	-474.1	2,393.7	2,269.0	124.68	19.199		
7,000.0	6,970.7	12,195.1	9,253.4	26.5	98.3	165.98	80.3	-483.0	2,294.8	2,170.0	124.82	18.385		
7,100.0	7,070.2	12,185.9	9,253.9	26.9	98.0	165.57	80.5	-492.3	2,196.0	2,071.1	124.95	17.575		
7,200.0	7,169.7	12,176.4	9,254.3	27.3	97.8	165.12	80.6	-501.8	2,097.2	1,972.2	125.08	16.767		
7,300.0	7,269.2	12,166.5	9,254.9	27.7	97.5	164.63	80.8	-511.6	1,998.5	1,873.3	125.19	15.963		
7,400.0	7,368.7	12,156.3	9,255.4	28.1	97.2	164.09	81.0	-521.8	1,899.8	1,774.5	125.30	15.162		
7,500.0	7,468.2	12,145.8	9,256.0	28.5	96.9	163.50	81.2	-532.3	1,801.2	1,675.8	125.40	14.364		
7,600.0	7,567.7	12,125.0	9,257.3	28.9	96.3	162.20	81.6	-553.0	1,702.6	1,577.4	125.21	13.598		
7,700.0	7,667.2	12,120.5	9,257.6	29.3	96.2	161.89	81.7	-557.5	1,604.1	1,478.6	125.48	12.784		
7,800.0	7,766.7	12,088.6	9,259.4	29.7	95.3	159.41	82.4	-589.4	1,505.5	1,380.5	124.98	12.046		
7,900.0	7,866.2	12,060.5	9,260.8	30.0	94.5	156.67	83.1	-617.4	1,406.8	1,282.2	124.59	11.292		
8,000.0	7,965.7	12,035.7	9,261.8	30.4	93.9	153.65	83.7	-642.2	1,308.0	1,183.7	124.29	10.524		
8,100.0	8,065.1	12,013.5	9,262.5	30.8	93.2	150.33	84.3	-664.4	1,209.2	1,085.1	124.06	9.746		
8,200.0	8,164.6	11,993.6	9,262.9	31.2	92.7	146.70	84.9	-684.3	1,110.3	986.4	123.90	8.961		
8,300.0	8,264.1	11,975.6	9,263.3	31.6	92.2	142.74	85.4	-702.3	1,011.4	887.6	123.79	8.170		
8,400.0	8,363.6	11,959.3	9,263.5	32.0	91.7	138.45	85.9	-718.5	912.5	788.8	123.73	7.375		
8,500.0	8,463.1	11,944.5	9,263.6	32.4	91.3	133.86	86.4	-733.4	813.7	690.0	123.71	6.577		
8,600.0	8,562.6	11,931.6	9,263.6	32.8	91.0	129.28	86.8	-746.2	715.0	591.2	123.75	5.778		
8,700.0	8,662.1	11,921.0	9,263.6	33.2	90.7	124.99	87.2	-756.9	616.5	492.7	123.84	4.978		
8,800.0	8,761.6	11,910.5	9,263.6	33.6	90.4	120.32	87.5	-767.4	518.5	394.5	123.95	4.183		
8,818.3	8,779.9	11,908.6	9,263.6	33.7	90.3	119.43	87.6	-769.3	500.6	376.6	123.97	4.038		
8,825.0	8,786.5	11,907.9	9,263.6	33.7	90.3	125.34	87.6	-770.0	494.1	370.1	123.97	3.985		
8,850.0	8,811.4	11,905.3	9,263.6	33.8	90.2	145.06	87.7	-772.5	469.9	345.9	124.00	3.790		
8,875.0	8,836.1	11,902.8	9,263.6	33.9	90.2	157.39	87.8	-775.0	446.2	322.2	124.03	3.597		
8,900.0	8,860.7	11,900.4	9,263.6	34.0	90.1	164.30	87.8	-777.4	423.1	299.0	124.06	3.410		
8,925.0	8,885.1	11,898.1	9,263.6	34.1	90.0	168.33	87.9	-779.7	400.7	276.6	124.09	3.229		
8,950.0	8,909.2	11,895.9	9,263.6	34.2	90.0	170.83	88.0	-781.9	379.3	255.2	124.12	3.056		
8,975.0	8,933.0	11,893.8	9,263.6	34.2	89.9	172.47	88.1	-784.0	359.1	235.0	124.15	2.893		
9,000.0	8,956.3	11,891.8	9,263.6	34.3	89.8	173.60	88.1	-786.0	340.4	216.2	124.18	2.741		
9,025.0	8,979.2	11,889.9	9,263.6	34.4	89.8	174.42	88.2	-788.0	323.5	199.3	124.21	2.604		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #28H - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 100-MWD													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	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
9,050.0	9,001.5	11,888.0	9,263.6	34.5	89.7	175.04		88.2	-789.8	308.7	184.5	124.25	2.485	
9,075.0	9,023.2	11,886.3	9,263.6	34.6	89.7	175.53		88.3	-791.5	296.5	172.2	124.28	2.385	
9,100.0	9,044.2	11,884.8	9,263.6	34.7	89.7	175.92		88.3	-793.0	287.1	162.7	124.32	2.309	
9,125.0	9,064.5	11,883.3	9,263.6	34.7	89.6	176.25		88.4	-794.5	280.8	156.5	124.36	2.258	
9,150.0	9,084.0	11,882.0	9,263.6	34.8	89.6	176.54		88.4	-795.8	278.0	153.7	124.40	2.235	
9,157.3	9,089.6	11,881.6	9,263.6	34.8	89.6	176.62		88.4	-796.2	277.9	153.5	124.41	2.234 CC, ES, SF	
9,175.0	9,102.7	11,880.8	9,263.6	34.9	89.5	176.81		88.5	-797.0	278.8	154.3	124.44	2.240	
9,200.0	9,120.5	11,879.7	9,263.6	35.0	89.5	177.07		88.5	-798.1	283.0	158.5	124.48	2.274	
9,225.0	9,137.4	11,878.7	9,263.6	35.0	89.5	177.32		88.5	-799.1	290.6	166.1	124.53	2.333	
9,250.0	9,153.3	11,877.9	9,263.6	35.1	89.5	177.59		88.5	-799.9	301.2	176.6	124.57	2.418	
9,275.0	9,168.1	11,877.2	9,263.6	35.2	89.4	177.88		88.6	-800.6	314.6	190.0	124.62	2.524	
9,300.0	9,181.9	11,876.7	9,263.6	35.2	89.4	178.20		88.6	-801.1	330.3	205.6	124.68	2.649	
9,325.0	9,194.6	11,876.3	9,263.6	35.3	89.4	178.57		88.6	-801.5	348.1	223.3	124.73	2.790	
9,350.0	9,206.2	11,876.0	9,263.6	35.4	89.4	179.02		88.6	-801.8	367.5	242.7	124.80	2.945	
9,375.0	9,216.6	11,875.9	9,263.6	35.5	89.4	179.58		88.6	-801.9	388.2	263.4	124.86	3.109	
9,400.0	9,225.8	11,875.9	9,263.6	35.5	89.4	-179.71		88.6	-801.9	410.1	285.2	124.93	3.283	
9,425.0	9,233.8	11,876.1	9,263.6	35.6	89.4	-178.76		88.6	-801.7	432.9	307.9	125.01	3.463	
9,450.0	9,240.5	11,876.4	9,263.6	35.7	89.4	-177.43		88.6	-801.5	456.4	331.3	125.09	3.648	
9,475.0	9,246.0	11,876.8	9,263.6	35.7	89.4	-175.47		88.6	-801.0	480.4	355.2	125.18	3.838	
9,500.0	9,250.2	11,877.4	9,263.6	35.8	89.5	-172.29		88.6	-800.4	504.8	379.5	125.28	4.030	
9,525.0	9,253.1	11,878.1	9,263.6	35.9	89.5	-166.40		88.5	-799.7	529.5	404.1	125.38	4.223	
9,550.0	9,254.7	11,878.9	9,263.6	36.0	89.5	-152.65		88.5	-798.9	554.4	428.9	125.49	4.418	
9,561.6	9,255.0	11,879.4	9,263.6	36.0	89.5	-138.91		88.5	-798.4	565.9	440.4	125.54	4.508	
9,600.0	9,255.6	11,880.9	9,263.6	36.2	89.5	-136.97		88.4	-796.9	604.3	478.6	125.72	4.806	
9,700.0	9,257.0	11,884.9	9,263.6	36.6	89.7	-132.42		88.3	-792.9	704.1	577.9	126.24	5.578	
9,800.0	9,258.4	11,888.9	9,263.6	37.1	89.8	-128.50		88.2	-788.9	804.0	677.2	126.84	6.339	
9,900.0	9,259.8	11,893.0	9,263.6	37.6	89.9	-125.12		88.1	-784.8	903.9	776.4	127.50	7.089	
10,000.0	9,261.3	11,897.1	9,263.6	38.2	90.0	-122.20		88.0	-780.7	1,003.8	875.5	128.24	7.827	
10,100.0	9,262.7	11,901.3	9,263.6	38.9	90.1	-119.65		87.8	-776.6	1,103.7	974.6	129.04	8.553	
10,200.0	9,264.1	11,905.5	9,263.6	39.7	90.2	-117.43		87.7	-772.3	1,203.6	1,073.7	129.90	9.266	
10,300.0	9,265.6	11,909.7	9,263.6	40.5	90.3	-115.47		87.6	-768.1	1,303.5	1,172.7	130.82	9.964	
10,400.0	9,267.0	11,914.1	9,263.6	41.3	90.5	-113.73		87.4	-763.8	1,403.4	1,271.6	131.79	10.649	
10,500.0	9,268.4	11,918.4	9,263.6	42.2	90.6	-112.19		87.3	-759.4	1,503.3	1,370.5	132.81	11.319	
10,600.0	9,269.9	11,922.8	9,263.6	43.2	90.7	-110.81		87.1	-755.0	1,603.2	1,469.3	133.88	11.975	
10,700.0	9,271.3	11,927.3	9,263.6	44.2	90.8	-109.57		87.0	-750.5	1,703.1	1,568.1	135.00	12.616	
10,800.0	9,272.7	11,931.8	9,263.6	45.2	91.0	-108.45		86.8	-746.0	1,803.0	1,666.8	136.16	13.242	
10,900.0	9,274.2	11,935.0	9,263.6	46.3	91.0	-107.74		86.7	-742.8	1,902.9	1,765.6	137.32	13.858	
11,000.0	9,275.6	11,935.0	9,263.6	47.4	91.0	-107.74		86.7	-742.8	2,002.8	1,864.4	138.42	14.469	
11,100.0	9,277.0	11,935.0	9,263.6	48.5	91.0	-107.74		86.7	-742.8	2,102.7	1,963.2	139.56	15.067	
11,200.0	9,278.4	11,935.0	9,263.6	49.7	91.0	-107.74		86.7	-742.8	2,202.7	2,061.9	140.73	15.652	
11,300.0	9,279.9	11,950.4	9,263.5	50.9	91.5	-104.89		86.2	-727.4	2,302.5	2,160.2	142.36	16.174	
11,400.0	9,281.3	11,953.9	9,263.5	52.1	91.6	-104.36		86.1	-724.0	2,402.5	2,258.8	143.68	16.721	
11,500.0	9,282.7	11,957.3	9,263.5	53.4	91.7	-103.87		86.0	-720.6	2,502.4	2,357.4	145.02	17.255	
11,600.0	9,284.2	11,960.7	9,263.5	54.6	91.8	-103.41		85.9	-717.2	2,602.3	2,455.9	146.39	17.777	
11,700.0	9,285.6	11,964.0	9,263.4	55.9	91.9	-102.98		85.8	-713.8	2,702.2	2,554.4	147.77	18.286	
11,800.0	9,287.0	11,967.3	9,263.4	57.2	91.9	-102.58		85.7	-710.5	2,802.1	2,653.0	149.18	18.784	
11,900.0	9,288.5	11,970.6	9,263.3	58.6	92.0	-102.21		85.6	-707.3	2,902.1	2,751.5	150.60	19.270	
12,000.0	9,289.9	11,973.8	9,263.3	59.9	92.1	-101.86		85.5	-704.1	3,002.0	2,849.9	152.04	19.745	
12,100.0	9,291.3	11,977.0	9,263.2	61.3	92.2	-101.52		85.4	-700.9	3,101.9	2,948.4	153.49	20.209	
12,200.0	9,292.8	11,980.1	9,263.2	62.7	92.3	-101.21		85.3	-697.7	3,201.8	3,046.9	154.96	20.662	
12,300.0	9,294.2	11,983.3	9,263.1	64.0	92.4	-100.91		85.2	-694.6	3,301.7	3,145.3	156.44	21.106	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #28H - OWB - ACTUAL WELLPATH														Offset Site Error:	0.0 usft
Survey Program: 100-MWD														Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
12,400.0	9,295.6	11,986.4	9,263.1	65.5	92.5	-100.63		85.1	-691.5	3,401.7	3,243.7	157.93	21.539		
12,500.0	9,297.1	11,989.4	9,263.0	66.9	92.6	-100.37		85.0	-688.5	3,501.6	3,342.2	159.44	21.962		
12,600.0	9,298.5	11,992.4	9,263.0	68.3	92.6	-100.11		84.9	-685.5	3,601.5	3,440.6	160.95	22.377		
12,700.0	9,299.9	11,995.4	9,262.9	69.7	92.7	-99.87		84.9	-682.5	3,701.5	3,539.0	162.48	22.782		
12,800.0	9,301.3	11,998.3	9,262.8	71.2	92.8	-99.64		84.8	-679.5	3,801.4	3,637.4	164.01	23.178		
12,900.0	9,302.8	12,001.3	9,262.8	72.7	92.9	-99.42		84.7	-676.6	3,901.3	3,735.8	165.55	23.566		
13,000.0	9,304.2	12,004.1	9,262.7	74.1	93.0	-99.21		84.6	-673.7	4,001.2	3,834.1	167.10	23.945		
13,100.0	9,305.6	12,007.0	9,262.6	75.6	93.1	-99.01		84.5	-670.9	4,101.2	3,932.5	168.66	24.316		
13,200.0	9,307.1	12,009.8	9,262.6	77.1	93.1	-98.82		84.4	-668.1	4,201.1	4,030.9	170.23	24.680		
13,300.0	9,308.5	12,012.6	9,262.5	78.6	93.2	-98.64		84.4	-665.3	4,301.0	4,129.2	171.80	25.035		
13,400.0	9,309.9	12,015.4	9,262.4	80.1	93.3	-98.46		84.3	-662.5	4,401.0	4,227.6	173.38	25.384		
13,500.0	9,311.4	12,018.1	9,262.3	81.6	93.4	-98.29		84.2	-659.8	4,500.9	4,326.0	174.96	25.725		
13,600.0	9,312.8	12,020.8	9,262.2	83.1	93.4	-98.13		84.1	-657.1	4,600.8	4,424.3	176.55	26.060		
13,700.0	9,314.2	12,023.5	9,262.2	84.6	93.5	-97.97		84.1	-654.4	4,700.8	4,522.6	178.15	26.387		
13,800.0	9,315.7	12,026.1	9,262.1	86.2	93.6	-97.82		84.0	-651.8	4,800.7	4,621.0	179.75	26.708		
13,900.0	9,317.1	12,028.8	9,262.0	87.7	93.7	-97.67		83.9	-649.1	4,900.7	4,719.3	181.35	27.023		
14,000.0	9,318.5	12,031.3	9,261.9	89.2	93.7	-97.53		83.8	-646.6	5,000.6	4,817.6	182.96	27.332		
14,100.0	9,320.0	12,033.9	9,261.8	90.8	93.8	-97.39		83.8	-644.0	5,100.5	4,916.0	184.57	27.634		
14,200.0	9,321.4	12,036.4	9,261.7	92.3	93.9	-97.26		83.7	-641.5	5,200.5	5,014.3	186.19	27.931		
14,300.0	9,322.8	12,039.0	9,261.6	93.9	93.9	-97.13		83.6	-638.9	5,300.4	5,112.6	187.81	28.222		
14,400.0	9,324.2	12,041.4	9,261.5	95.4	94.0	-97.01		83.6	-636.5	5,400.4	5,210.9	189.43	28.508		
14,500.0	9,325.7	12,043.9	9,261.5	97.0	94.1	-96.89		83.5	-634.0	5,500.3	5,309.2	191.06	28.788		
14,600.0	9,327.1	12,046.3	9,261.4	98.5	94.1	-96.77		83.4	-631.6	5,600.2	5,407.6	192.69	29.063		
14,683.3	9,328.3	12,048.4	9,261.3	99.8	94.2	-96.68		83.4	-629.6	5,683.5	5,489.5	194.05	29.289		

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #5 - OWB - ACTUAL WELLPATH												Offset Site Error:	0.0 usft
Survey Program: 405-INC-ONLY												Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.0	0.0	0.0	0.0	0.0	3.0	-167.94	-3,668.6	-784.1	3,751.7				
100.0	100.0	61.0	61.0	0.1	3.0	-167.94	-3,668.6	-784.1	3,751.5	3,748.3	3.19	1,175.322	
200.0	200.0	161.0	161.0	0.5	3.3	-167.94	-3,668.6	-784.1	3,751.5	3,747.7	3.83	980.758	
300.0	300.0	261.0	261.0	0.9	3.8	-167.94	-3,668.6	-784.1	3,751.5	3,746.9	4.65	806.545	
400.0	400.0	361.0	361.0	1.2	4.4	-167.94	-3,668.6	-784.1	3,751.5	3,745.9	5.61	668.801	
500.0	500.0	461.0	461.0	1.6	5.5	-167.94	-3,668.6	-784.1	3,751.5	3,744.4	7.10	528.714	
600.0	600.0	561.0	561.0	1.9	7.1	-167.94	-3,668.6	-784.1	3,751.5	3,742.4	9.08	413.321	
700.0	700.0	661.0	661.0	2.3	8.9	-167.94	-3,668.6	-784.1	3,751.5	3,740.4	11.15	336.564	
800.0	800.0	761.0	761.0	2.7	10.6	-167.94	-3,668.6	-784.1	3,751.5	3,738.2	13.26	282.865	
900.0	900.0	861.0	861.0	3.0	12.4	-167.94	-3,668.6	-784.1	3,751.5	3,736.1	15.41	243.524	
950.0	950.0	911.0	911.0	3.2	13.3	-167.94	-3,668.6	-784.1	3,751.5	3,735.0	16.48	227.600	
1,000.0	1,000.0	961.0	961.0	3.4	14.2	-77.51	-3,668.6	-784.1	3,751.4	3,733.9	17.56	213.638	
1,100.0	1,099.9	1,060.9	1,060.9	3.7	16.0	-77.57	-3,668.6	-784.1	3,750.7	3,730.9	19.71	190.258	
1,200.0	1,199.7	1,160.7	1,160.7	4.1	17.8	-77.71	-3,668.6	-784.1	3,749.2	3,727.3	21.88	171.370	
1,236.8	1,236.4	1,197.4	1,197.4	4.2	18.5	-77.77	-3,668.6	-784.1	3,748.4	3,725.8	22.68	165.299	
1,300.0	1,299.2	1,260.2	1,260.2	4.4	19.6	-77.87	-3,668.6	-784.1	3,747.1	3,723.0	24.05	155.802	
1,400.0	1,398.7	1,359.7	1,359.7	4.8	21.5	-78.02	-3,668.6	-784.1	3,745.0	3,718.8	26.23	142.762	
1,500.0	1,498.2	1,459.2	1,459.2	5.1	23.3	-78.17	-3,668.6	-784.1	3,742.9	3,714.5	28.45	131.569	
1,600.0	1,597.7	1,591.0	1,591.0	5.5	25.9	-78.36	-3,668.6	-784.1	3,741.0	3,709.6	31.37	119.249	
1,700.0	1,697.2	1,658.2	1,658.2	5.9	27.4	-78.46	-3,668.6	-784.1	3,738.9	3,705.6	33.29	112.315	
1,800.0	1,796.7	1,800.0	1,800.0	6.3	30.7	-78.68	-3,668.6	-784.1	3,737.1	3,700.2	36.93	101.208	
1,900.0	1,896.2	1,857.2	1,857.2	6.6	32.2	-78.76	-3,668.6	-784.1	3,734.9	3,696.0	38.84	96.157	
2,000.0	1,995.7	1,956.7	1,956.7	7.0	34.9	-78.91	-3,668.6	-784.1	3,732.9	3,691.0	41.90	89.096	
2,100.0	2,095.2	2,164.0	2,163.9	7.4	40.5	-79.22	-3,668.6	-784.1	3,732.6	3,684.7	47.86	77.990	
2,200.0	2,194.7	2,164.0	2,163.9	7.8	40.5	-79.22	-3,668.6	-784.1	3,729.1	3,680.9	48.24	77.301	
2,300.0	2,294.2	2,313.0	2,312.9	8.2	44.6	-79.45	-3,668.6	-784.1	3,727.7	3,674.9	52.78	70.622	
2,400.0	2,393.7	2,354.8	2,354.7	8.6	45.6	-79.51	-3,668.6	-784.1	3,725.4	3,671.2	54.20	68.733	
2,500.0	2,493.2	2,454.3	2,454.2	8.9	48.0	-79.66	-3,668.6	-784.1	3,723.6	3,666.6	56.96	65.370	
2,600.0	2,592.7	2,553.9	2,553.7	9.3	50.4	-79.81	-3,668.6	-784.1	3,721.8	3,662.1	59.73	62.315	
2,700.0	2,692.2	2,653.4	2,653.2	9.7	53.0	-79.96	-3,668.6	-784.1	3,720.1	3,657.4	62.68	59.349	
2,800.0	2,791.7	2,757.0	2,756.8	10.1	56.0	-80.12	-3,668.6	-784.1	3,718.3	3,652.2	66.12	56.237	
2,900.0	2,891.2	2,883.0	2,882.8	10.5	59.4	-80.31	-3,668.6	-784.1	3,716.7	3,646.8	69.88	53.184	
3,000.0	2,990.7	2,951.9	2,951.7	10.9	61.1	-80.42	-3,668.6	-784.1	3,714.9	3,642.9	71.99	51.600	
3,100.0	3,090.2	3,051.4	3,051.2	11.3	63.6	-80.57	-3,668.6	-784.1	3,713.3	3,638.4	74.88	49.588	
3,200.0	3,189.7	3,150.9	3,150.7	11.7	66.2	-80.72	-3,668.6	-784.1	3,711.6	3,633.8	77.86	47.672	
3,300.0	3,289.2	3,250.4	3,250.2	12.0	68.8	-80.87	-3,668.6	-784.1	3,710.0	3,629.2	80.84	45.896	
3,400.0	3,388.7	3,355.0	3,354.7	12.4	71.5	-81.03	-3,668.6	-784.1	3,708.4	3,624.5	83.94	44.177	
3,500.0	3,488.2	3,481.0	3,480.7	12.8	74.7	-81.22	-3,668.6	-784.1	3,707.0	3,619.5	87.50	42.368	
3,600.0	3,587.7	3,549.0	3,548.7	13.2	76.5	-81.33	-3,668.6	-784.1	3,705.4	3,615.6	89.73	41.296	
3,615.3	3,602.9	3,564.2	3,563.9	13.3	76.9	-81.35	-3,668.6	-784.1	3,705.1	3,614.9	90.20	41.077	
3,700.0	3,687.2	3,763.0	3,762.7	13.6	82.3	-81.66	-3,668.6	-784.1	3,705.6	3,609.7	95.92	38.634	
3,800.0	3,786.7	3,763.0	3,762.7	14.0	82.3	-81.66	-3,668.6	-784.1	3,702.4	3,606.1	96.31	38.444	
3,900.0	3,886.2	3,847.5	3,847.2	14.4	84.7	-81.78	-3,668.6	-784.1	3,700.9	3,601.9	99.08	37.353	
3,917.5	3,903.6	3,865.0	3,864.6	14.4	85.2	-81.81	-3,668.6	-784.1	3,700.7	3,601.0	99.64	37.140	
4,000.0	3,985.7	4,047.0	4,046.6	14.8	90.3	-82.09	-3,668.6	-784.1	3,700.9	3,595.8	105.10	35.214	
4,100.0	4,085.2	4,047.0	4,046.6	15.2	90.3	-82.09	-3,668.6	-784.1	3,698.1	3,592.6	105.49	35.058	
4,200.0	4,184.7	4,146.1	4,145.7	15.5	93.2	-82.24	-3,668.6	-784.1	3,696.7	3,588.0	108.78	33.983	
4,300.0	4,284.2	4,329.0	4,328.6	15.9	98.6	-82.52	-3,668.6	-784.1	3,696.3	3,581.8	114.54	32.272	
4,400.0	4,383.7	4,345.1	4,344.7	16.3	99.1	-82.55	-3,668.6	-784.1	3,694.1	3,578.7	115.40	32.011	
4,500.0	4,483.2	4,487.0	4,486.5	16.7	103.2	-82.77	-3,668.6	-784.1	3,693.0	3,573.1	119.96	30.785	
4,600.0	4,582.7	4,544.1	4,543.7	17.1	104.9	-82.85	-3,668.6	-784.1	3,691.5	3,569.6	121.98	30.263	

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

COG Operating LLC

Anticollision Report

Company: COG OPERATING, LLC
 Project: LEA COUNTY, NM
 Reference Site: LUSK BSS
 Site Error: 0.0 usft
 Reference Well: LUSK DEEP UNIT A #33H
 Well Error: 0.0 usft
 Reference Wellbore: Wellbore #1
 Reference Design: DWD Plan 3 - land at 100' FNL

Local Co-ordinate Reference: Well LUSK DEEP UNIT A #33H
 TVD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 MD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM_Users
 Offset TVD Reference: Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #5 - OWB - ACTUAL WELLPATH													Offset Site Error: 0.0 usft
Survey Program: 405-INC-ONLY													Offset Well Error: 3.0 usft
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
4,700.0	4,682.2	4,643.6	4,643.2	17.5	107.7	-83.01	-3,668.6	-784.1	3,690.3	3,565.1	125.20	29.475	
4,800.0	4,781.7	4,743.1	4,742.7	17.9	110.5	-83.16	-3,668.6	-784.1	3,689.1	3,560.7	128.42	28.727	
4,900.0	4,881.2	4,842.6	4,842.2	18.3	113.4	-83.31	-3,668.6	-784.1	3,687.9	3,556.3	131.64	28.015	
5,000.0	4,980.7	4,942.1	4,941.7	18.7	116.2	-83.47	-3,668.6	-784.1	3,686.8	3,551.9	134.86	27.337	
5,100.0	5,080.2	5,095.0	5,094.4	19.1	120.5	-83.70	-3,668.6	-784.1	3,686.0	3,546.4	139.60	26.404	
5,200.0	5,179.7	5,141.2	5,140.7	19.5	121.7	-83.78	-3,668.6	-784.1	3,684.5	3,543.4	141.16	26.102	
5,300.0	5,279.2	5,240.7	5,240.2	19.9	124.2	-83.93	-3,668.6	-784.1	3,683.4	3,539.4	144.06	25.569	
5,400.0	5,378.7	5,400.0	5,399.4	20.2	128.2	-84.18	-3,668.6	-784.1	3,682.9	3,534.4	148.48	24.805	
5,500.0	5,478.2	5,439.8	5,439.2	20.6	128.9	-84.24	-3,668.6	-784.1	3,681.4	3,531.8	149.57	24.612	
5,600.0	5,577.7	5,539.3	5,538.7	21.0	130.7	-84.39	-3,668.6	-784.1	3,680.4	3,528.6	151.74	24.255	
5,700.0	5,677.2	5,638.8	5,638.2	21.4	132.5	-84.55	-3,668.6	-784.1	3,679.4	3,525.5	153.90	23.908	
5,800.0	5,776.7	5,738.3	5,737.7	21.8	134.2	-84.70	-3,668.6	-784.1	3,678.5	3,522.4	156.06	23.571	
5,900.0	5,876.2	5,837.8	5,837.2	22.2	136.0	-84.85	-3,668.6	-784.1	3,677.6	3,519.4	158.19	23.248	
6,000.0	5,975.7	5,937.3	5,936.7	22.6	137.7	-85.01	-3,668.6	-784.1	3,676.7	3,516.4	160.26	22.942	
6,100.0	6,075.2	6,036.8	6,036.2	23.0	139.3	-85.16	-3,668.6	-784.1	3,675.8	3,513.5	162.33	22.644	
6,200.0	6,174.7	6,136.3	6,135.7	23.4	141.0	-85.32	-3,668.6	-784.1	3,675.0	3,510.6	164.40	22.353	
6,300.0	6,274.2	6,255.0	6,254.3	23.8	143.0	-85.50	-3,668.6	-784.1	3,674.2	3,507.4	166.80	22.027	
6,400.0	6,373.7	6,335.3	6,334.7	24.2	144.6	-85.63	-3,668.6	-784.1	3,673.4	3,504.6	168.81	21.761	
6,500.0	6,473.2	6,434.8	6,434.2	24.6	146.6	-85.78	-3,668.6	-784.1	3,672.6	3,501.4	171.20	21.452	
6,600.0	6,572.7	6,534.3	6,533.7	24.9	148.6	-85.94	-3,668.6	-784.1	3,671.9	3,498.3	173.59	21.153	
6,700.0	6,672.2	6,633.8	6,633.2	25.3	150.6	-86.09	-3,668.6	-784.1	3,671.2	3,495.2	175.98	20.861	
6,800.0	6,771.7	6,733.3	6,732.7	25.7	152.6	-86.25	-3,668.6	-784.1	3,670.5	3,492.2	178.38	20.578	
6,900.0	6,871.2	6,832.8	6,832.2	26.1	154.6	-86.40	-3,668.6	-784.1	3,669.9	3,489.1	180.77	20.302	
7,000.0	6,970.7	6,932.3	6,931.7	26.5	156.6	-86.56	-3,668.6	-784.1	3,669.3	3,486.1	183.13	20.037	
7,100.0	7,070.2	7,031.8	7,031.2	26.9	158.5	-86.71	-3,668.6	-784.1	3,668.7	3,483.3	185.43	19.785	
7,200.0	7,169.7	7,131.3	7,130.7	27.3	160.4	-86.87	-3,668.6	-784.1	3,668.1	3,480.4	187.72	19.540	
7,300.0	7,269.2	7,230.8	7,230.2	27.7	162.3	-87.02	-3,668.6	-784.1	3,667.6	3,477.6	190.02	19.301	
7,400.0	7,368.7	7,330.3	7,329.7	28.1	164.3	-87.18	-3,668.6	-784.1	3,667.1	3,474.7	192.42	19.058	
7,500.0	7,468.2	7,429.8	7,429.2	28.5	166.4	-87.33	-3,668.6	-784.1	3,666.6	3,471.7	194.91	18.811	
7,600.0	7,567.7	7,529.3	7,528.7	28.9	168.5	-87.49	-3,668.6	-784.1	3,666.1	3,468.7	197.41	18.571	
7,700.0	7,667.2	7,628.8	7,628.2	29.3	170.7	-87.64	-3,668.6	-784.1	3,665.7	3,465.8	199.91	18.337	
7,800.0	7,766.7	7,728.3	7,727.7	29.7	172.8	-87.80	-3,668.6	-784.1	3,665.3	3,462.9	202.41	18.108	
7,809.4	7,776.0	7,737.6	7,737.0	29.7	173.0	-87.81	-3,668.6	-784.1	3,665.3	3,462.6	202.65	18.087	
7,900.0	7,866.2	7,907.0	7,906.3	30.0	176.5	-88.08	-3,668.6	-784.1	3,665.8	3,459.2	206.59	17.745	
8,000.0	7,965.7	7,927.3	7,926.7	30.4	177.0	-88.11	-3,668.6	-784.1	3,664.6	3,457.1	207.45	17.665	
8,100.0	8,065.1	8,026.8	8,026.1	30.8	179.3	-88.26	-3,668.6	-784.1	3,664.3	3,454.1	210.15	17.437	
8,200.0	8,164.6	8,126.3	8,125.6	31.2	181.6	-88.42	-3,668.6	-784.1	3,664.0	3,451.1	212.84	17.214	
8,300.0	8,264.1	8,225.8	8,225.1	31.6	183.9	-88.57	-3,668.6	-784.1	3,663.7	3,448.2	215.54	16.998	
8,400.0	8,363.6	8,325.3	8,324.6	32.0	186.2	-88.73	-3,668.6	-784.1	3,663.5	3,445.3	218.24	16.787	
8,500.0	8,463.1	8,424.8	8,424.1	32.4	188.5	-88.88	-3,668.6	-784.1	3,663.3	3,442.3	220.93	16.581	
8,600.0	8,562.6	8,530.0	8,529.2	32.8	191.0	-89.05	-3,668.6	-784.1	3,663.1	3,439.3	223.76	16.371	
8,700.0	8,662.1	8,623.9	8,623.1	33.2	193.0	-89.20	-3,668.6	-784.1	3,662.9	3,436.8	226.14	16.197	
8,800.0	8,761.6	8,723.4	8,722.6	33.6	195.1	-89.35	-3,668.6	-784.1	3,662.8	3,434.2	228.64	16.020	
8,818.3	8,779.9	8,741.7	8,740.9	33.7	195.5	-89.38	-3,668.6	-784.1	3,662.8	3,433.7	229.10	15.988	
8,825.0	8,786.5	8,748.3	8,747.5	33.7	195.6	-81.48	-3,668.6	-784.1	3,662.7	3,433.5	229.27	15.976	
8,850.0	8,811.4	8,773.1	8,772.4	33.8	196.1	-55.98	-3,668.6	-784.1	3,661.7	3,431.8	229.89	15.928	
8,875.0	8,836.1	8,797.9	8,797.1	33.9	196.6	-39.71	-3,668.6	-784.1	3,659.4	3,428.9	230.51	15.875	
8,900.0	8,860.7	8,822.5	8,821.7	34.0	197.2	-29.97	-3,668.6	-784.1	3,655.8	3,424.6	231.13	15.817	
8,925.0	8,885.1	8,846.9	8,846.1	34.1	197.7	-23.83	-3,668.6	-784.1	3,650.8	3,419.1	231.74	15.754	
8,950.0	8,909.2	8,871.0	8,870.2	34.2	198.2	-19.72	-3,668.6	-784.1	3,644.6	3,412.3	232.34	15.686	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #5 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 405-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
8,975.0	8,933.0	8,894.8	8,894.0	34.2	198.7	-16.80	-3,668.6	-784.1	3,637.2	3,404.3	232.94	15.615		
9,000.0	8,956.3	8,918.1	8,917.3	34.3	199.2	-14.65	-3,668.6	-784.1	3,628.5	3,395.0	233.52	15.538		
9,025.0	8,979.2	9,000.0	8,999.2	34.4	200.9	-13.11	-3,668.6	-784.1	3,619.1	3,383.7	235.34	15.378		
9,050.0	9,001.5	9,000.0	8,999.2	34.5	200.9	-11.79	-3,668.6	-784.1	3,607.7	3,372.3	235.43	15.324		
9,075.0	9,023.2	9,000.0	8,999.2	34.6	200.9	-10.72	-3,668.6	-784.1	3,595.3	3,359.8	235.51	15.266		
9,100.0	9,044.2	9,006.0	9,005.2	34.7	201.1	-9.85	-3,668.6	-784.1	3,581.9	3,346.2	235.76	15.193		
9,125.0	9,064.5	9,026.3	9,025.5	34.7	201.7	-9.16	-3,668.6	-784.1	3,567.5	3,331.1	236.40	15.090		
9,150.0	9,084.0	9,045.8	9,045.0	34.8	202.2	-8.58	-3,668.6	-784.1	3,552.0	3,314.9	237.03	14.985		
9,175.0	9,102.7	9,064.5	9,063.7	34.9	202.7	-8.10	-3,668.6	-784.1	3,535.5	3,297.8	237.63	14.878		
9,200.0	9,120.5	9,082.3	9,081.5	35.0	203.2	-7.69	-3,668.6	-784.1	3,518.0	3,279.8	238.20	14.769		
9,225.0	9,137.4	9,100.0	9,189.2	35.0	206.3	-7.57	-3,668.6	-784.1	3,500.8	3,259.5	241.30	14.508		
9,250.0	9,153.3	9,190.0	9,189.2	35.1	206.3	-7.24	-3,668.6	-784.1	3,481.2	3,239.8	241.37	14.423		
9,275.0	9,168.1	9,190.0	9,189.2	35.2	206.3	-6.96	-3,668.6	-784.1	3,460.9	3,219.4	241.44	14.334		
9,300.0	9,181.9	9,190.0	9,189.2	35.2	206.3	-6.72	-3,668.6	-784.1	3,439.9	3,198.4	241.51	14.243		
9,325.0	9,194.6	9,190.0	9,189.2	35.3	206.3	-6.51	-3,668.6	-784.1	3,418.2	3,176.6	241.57	14.150		
9,350.0	9,206.2	9,190.0	9,189.2	35.4	206.3	-6.33	-3,668.6	-784.1	3,396.0	3,154.4	241.64	14.054		
9,375.0	9,216.6	9,190.0	9,189.2	35.5	206.3	-6.17	-3,668.6	-784.1	3,373.2	3,131.5	241.71	13.956		
9,400.0	9,225.8	9,190.0	9,189.2	35.5	206.3	-6.03	-3,668.6	-784.1	3,350.0	3,108.2	241.78	13.855		
9,425.0	9,233.8	9,195.6	9,194.8	35.6	206.4	-5.94	-3,668.6	-784.1	3,326.3	3,084.3	242.02	13.744		
9,450.0	9,240.5	9,202.3	9,201.5	35.7	206.6	-5.89	-3,668.6	-784.1	3,302.2	3,059.9	242.30	13.629		
9,475.0	9,246.0	9,207.8	9,207.0	35.7	206.8	-5.86	-3,668.6	-784.1	3,277.9	3,035.3	242.54	13.515		
9,500.0	9,250.2	9,212.0	9,211.2	35.8	206.9	-5.87	-3,668.6	-784.1	3,253.2	3,010.5	242.75	13.402		
9,525.0	9,253.1	9,214.9	9,214.1	35.9	207.0	-5.93	-3,668.6	-784.1	3,228.4	2,985.5	242.92	13.290		
9,550.0	9,254.7	9,216.5	9,215.7	36.0	207.1	-6.23	-3,668.6	-784.1	3,203.5	2,960.4	243.05	13.180		
9,561.6	9,255.0	9,216.8	9,216.0	36.0	207.1	-7.08	-3,668.6	-784.1	3,191.9	2,948.8	243.10	13.130		
9,600.0	9,255.6	9,217.4	9,216.6	36.2	207.1	-7.17	-3,668.6	-784.1	3,153.5	2,910.2	243.26	12.964		
9,700.0	9,257.0	9,218.8	9,218.0	36.6	207.1	-7.40	-3,668.6	-784.1	3,053.5	2,809.8	243.71	12.529		
9,800.0	9,258.4	9,220.2	9,219.4	37.1	207.2	-7.65	-3,668.6	-784.1	2,953.5	2,709.2	244.24	12.093		
9,900.0	9,259.8	9,221.6	9,220.8	37.6	207.2	-7.91	-3,668.6	-784.1	2,853.5	2,608.7	244.84	11.655		
10,000.0	9,261.3	9,223.1	9,222.3	38.2	207.3	-8.19	-3,668.6	-784.1	2,753.5	2,508.0	245.50	11.216		
10,100.0	9,262.7	9,224.5	9,223.7	38.9	207.3	-8.50	-3,668.6	-784.1	2,653.5	2,407.3	246.23	10.777		
10,200.0	9,264.1	9,225.9	9,225.1	39.7	207.3	-8.83	-3,668.6	-784.1	2,553.5	2,306.5	247.01	10.338		
10,300.0	9,265.6	9,227.4	9,226.6	40.5	207.4	-9.18	-3,668.6	-784.1	2,453.5	2,205.7	247.85	9.899		
10,400.0	9,267.0	9,228.8	9,228.0	41.3	207.4	-9.56	-3,668.6	-784.1	2,353.5	2,104.8	248.75	9.461		
10,500.0	9,268.4	9,230.2	9,229.4	42.2	207.5	-9.98	-3,668.6	-784.1	2,253.6	2,003.9	249.70	9.025		
10,600.0	9,269.9	9,231.7	9,230.9	43.2	207.5	-10.43	-3,668.6	-784.1	2,153.6	1,902.9	250.69	8.591		
10,700.0	9,271.3	9,233.1	9,232.3	44.2	207.6	-10.93	-3,668.6	-784.1	2,053.6	1,801.9	251.72	8.158		
10,800.0	9,272.7	9,234.5	9,233.7	45.2	207.6	-11.47	-3,668.6	-784.1	1,953.6	1,700.8	252.80	7.728		
10,900.0	9,274.2	9,236.0	9,235.2	46.3	207.6	-12.07	-3,668.6	-784.1	1,853.6	1,599.7	253.91	7.300		
11,000.0	9,275.6	9,237.4	9,236.6	47.4	207.7	-12.74	-3,668.6	-784.1	1,753.6	1,498.5	255.06	6.875		
11,100.0	9,277.0	9,238.8	9,238.0	48.5	207.7	-13.48	-3,668.6	-784.1	1,653.6	1,397.4	256.25	6.453		
11,200.0	9,278.4	9,240.2	9,239.4	49.7	207.8	-14.32	-3,668.6	-784.1	1,553.6	1,296.2	257.46	6.035		
11,300.0	9,279.9	9,241.7	9,240.9	50.9	207.8	-15.26	-3,668.6	-784.1	1,453.6	1,194.9	258.70	5.619		
11,400.0	9,281.3	9,243.1	9,242.3	52.1	207.9	-16.33	-3,668.6	-784.1	1,353.7	1,093.7	259.97	5.207		
11,500.0	9,282.7	9,244.5	9,243.7	53.4	207.9	-17.55	-3,668.6	-784.1	1,253.7	992.4	261.26	4.799		
11,600.0	9,284.2	9,246.0	9,245.2	54.6	207.9	-18.97	-3,668.6	-784.1	1,153.7	891.1	262.57	4.394		
11,700.0	9,285.6	9,247.4	9,246.6	55.9	208.0	-20.62	-3,668.6	-784.1	1,053.7	789.8	263.91	3.993		
11,800.0	9,287.0	9,248.8	9,248.0	57.2	208.0	-22.57	-3,668.6	-784.1	953.7	688.4	265.26	3.595		
11,900.0	9,288.5	9,250.3	9,249.5	58.6	208.1	-24.91	-3,668.6	-784.1	853.7	587.1	266.64	3.202		
12,000.0	9,289.9	9,251.7	9,250.9	59.9	208.1	-27.75	-3,668.6	-784.1	753.7	485.7	268.03	2.812		
12,100.0	9,291.3	9,253.1	9,252.3	61.3	208.2	-31.24	-3,668.6	-784.1	653.7	384.3	269.44	2.426		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - LUSK DEEP UNIT A #5 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 405-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	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
12,200.0	9,292.8	9,254.6	9,253.8	62.7	208.2	-35.60	-3,668.6	-784.1	553.8	282.9	270.86	2.044		
12,300.0	9,294.2	9,256.0	9,255.2	64.0	208.2	-41.15	-3,668.6	-784.1	453.8	181.5	272.30	1.666	Advise and Monitor	
12,400.0	9,295.6	9,257.4	9,256.6	65.5	208.3	-48.26	-3,668.6	-784.1	353.8	80.0	273.75	1.292	Shut in Produces	
12,500.0	9,297.1	9,258.9	9,258.1	66.9	208.3	-57.38	-3,668.6	-784.1	253.8	-21.4	275.21	0.922	Stop Drilling Now	
12,600.0	9,298.5	9,260.3	9,259.5	68.3	208.4	-68.80	-3,668.6	-784.1	153.9	-122.8	276.68	0.556	Stop Drilling Now	
12,700.0	9,299.9	9,261.7	9,260.9	69.7	208.4	-82.28	-3,668.6	-784.1	54.1	-224.1	278.17	0.194	Stop Drilling Now	
12,753.8	9,300.7	9,262.5	9,261.7	70.5	208.4	-90.00	-3,668.6	-784.1	5.7	-273.3	278.97	0.020	Stop Drilling Now, CC, ES, SF	
12,800.0	9,301.3	9,263.1	9,262.3	71.2	208.5	-96.65	-3,668.6	-784.1	46.6	-233.1	279.66	0.166	Stop Drilling Now	
12,900.0	9,302.8	9,264.6	9,263.8	72.7	208.5	-110.24	-3,668.6	-784.1	146.3	-134.9	281.17	0.520	Stop Drilling Now	
13,000.0	9,304.2	9,266.0	9,265.2	74.1	208.6	-121.84	-3,668.6	-784.1	246.3	-36.4	282.68	0.871	Stop Drilling Now	
13,100.0	9,305.6	9,267.4	9,266.6	75.6	208.6	-131.12	-3,668.6	-784.1	346.2	62.0	284.20	1.218	Shut in Produces	
13,200.0	9,307.1	9,268.9	9,268.1	77.1	208.6	-138.37	-3,668.6	-784.1	446.2	160.5	285.73	1.562	Advise and Monitor	
13,300.0	9,308.5	9,270.3	9,269.5	78.6	208.7	-144.02	-3,668.6	-784.1	546.2	258.9	287.27	1.901	Advise and Monitor	
13,400.0	9,309.9	9,271.7	9,270.9	80.1	208.7	-148.47	-3,668.6	-784.1	646.2	357.4	288.81	2.237		
13,500.0	9,311.4	9,273.2	9,272.4	81.6	208.8	-152.01	-3,668.6	-784.1	746.2	455.8	290.37	2.570		
13,600.0	9,312.8	9,274.6	9,273.8	83.1	208.8	-154.89	-3,668.6	-784.1	846.2	554.2	291.92	2.899		
13,700.0	9,314.2	9,276.0	9,275.2	84.6	208.9	-157.26	-3,668.6	-784.1	946.1	652.7	293.49	3.224		
13,800.0	9,315.7	9,277.5	9,276.7	86.2	208.9	-159.24	-3,668.6	-784.1	1,046.1	751.1	295.06	3.546		
13,900.0	9,317.1	9,278.9	9,278.1	87.7	208.9	-160.92	-3,668.6	-784.1	1,146.1	849.5	296.63	3.864		
14,000.0	9,318.5	9,280.3	9,279.5	89.2	209.0	-162.35	-3,668.6	-784.1	1,246.1	947.9	298.21	4.179		
14,100.0	9,320.0	9,281.8	9,281.0	90.8	209.0	-163.59	-3,668.6	-784.1	1,346.1	1,046.3	299.80	4.490		
14,200.0	9,321.4	9,283.2	9,282.4	92.3	209.1	-164.67	-3,668.6	-784.1	1,446.1	1,144.7	301.39	4.798		
14,300.0	9,322.8	9,284.6	9,283.8	93.9	209.1	-165.62	-3,668.6	-784.1	1,546.1	1,243.1	302.98	5.103		
14,400.0	9,324.2	9,286.0	9,285.2	95.4	209.2	-166.46	-3,668.6	-784.1	1,646.1	1,341.5	304.58	5.404		
14,500.0	9,325.7	9,287.5	9,286.7	97.0	209.2	-167.21	-3,668.6	-784.1	1,746.0	1,439.9	306.18	5.703		
14,600.0	9,327.1	9,288.9	9,288.1	98.5	209.2	-167.88	-3,668.6	-784.1	1,846.0	1,538.3	307.78	5.998		
14,683.3	9,328.3	9,290.1	9,289.3	99.8	209.3	-168.39	-3,668.6	-784.1	1,929.3	1,620.2	309.13	6.241		

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2736-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (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
0.0	0.0	0.0	0.0	0.0	3.0	-161.50	-161.50	-3,338.5	-1,117.0	3,520.6				
100.0	100.0	66.0	66.0	0.1	3.4	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,516.8	3.59	980.292	
200.0	200.0	166.0	166.0	0.5	5.2	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,514.7	5.72	615.084	
300.0	300.0	266.0	266.0	0.9	7.5	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,512.1	8.34	422.266	
400.0	400.0	366.0	366.0	1.2	9.9	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,509.3	11.11	316.933	
500.0	500.0	466.0	466.0	1.6	12.4	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,506.5	13.94	252.465	
600.0	600.0	566.0	566.0	1.9	14.9	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,503.6	16.81	209.381	
700.0	700.0	666.0	666.0	2.3	17.4	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,500.7	19.70	178.689	
800.0	800.0	766.0	766.0	2.7	19.9	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,497.8	22.60	155.765	
900.0	900.0	866.0	866.0	3.0	22.5	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,494.9	25.51	138.013	
950.0	950.0	916.0	916.0	3.2	23.8	-161.50	-161.50	-3,338.5	-1,117.0	3,520.4	3,493.5	26.96	130.562	
1,000.0	1,000.0	966.0	966.0	3.4	25.1	-71.07	-71.07	-3,338.5	-1,117.0	3,520.3	3,491.9	28.42	123.885	
1,100.0	1,099.9	1,065.9	1,065.9	3.7	27.6	-71.15	-71.15	-3,338.5	-1,117.0	3,519.1	3,487.8	31.32	112.377	
1,200.0	1,199.7	1,165.7	1,165.7	4.1	30.2	-71.30	-71.30	-3,338.5	-1,117.0	3,516.9	3,482.7	34.22	102.775	
1,236.8	1,236.4	1,202.4	1,202.4	4.2	31.1	-71.37	-71.37	-3,338.5	-1,117.0	3,515.8	3,480.5	35.29	99.627	
1,300.0	1,299.2	1,265.2	1,265.2	4.4	32.7	-71.47	-71.47	-3,338.5	-1,117.0	3,513.8	3,476.6	37.13	94.642	
1,400.0	1,398.7	1,364.7	1,364.7	4.8	35.3	-71.63	-71.63	-3,338.5	-1,117.0	3,510.6	3,470.5	40.04	87.674	
1,500.0	1,498.2	1,464.2	1,464.2	5.1	37.8	-71.78	-71.78	-3,338.5	-1,117.0	3,507.4	3,464.5	42.96	81.641	
1,600.0	1,597.7	1,563.7	1,563.7	5.5	40.4	-71.93	-71.93	-3,338.5	-1,117.0	3,504.3	3,458.4	45.89	76.369	
1,700.0	1,697.2	1,663.2	1,663.2	5.9	42.9	-72.09	-72.09	-3,338.5	-1,117.0	3,501.2	3,452.4	48.82	71.724	
1,800.0	1,796.7	1,762.7	1,762.7	6.3	45.5	-72.24	-72.24	-3,338.5	-1,117.0	3,498.1	3,446.4	51.75	67.601	
1,900.0	1,896.2	1,862.2	1,862.2	6.6	48.0	-72.40	-72.40	-3,338.5	-1,117.0	3,495.1	3,440.4	54.68	63.917	
2,000.0	1,995.7	1,961.7	1,961.7	7.0	50.6	-72.55	-72.55	-3,338.5	-1,117.0	3,492.1	3,434.4	57.62	60.607	
2,100.0	2,095.2	2,061.2	2,061.2	7.4	53.2	-72.71	-72.71	-3,338.5	-1,117.0	3,489.1	3,428.5	60.56	57.617	
2,200.0	2,194.7	2,160.7	2,160.7	7.8	55.7	-72.87	-72.87	-3,338.5	-1,117.0	3,486.1	3,422.6	63.50	54.902	
2,300.0	2,294.2	2,260.2	2,260.2	8.2	58.3	-73.02	-73.02	-3,338.5	-1,117.0	3,483.1	3,416.7	66.44	52.427	
2,400.0	2,393.7	2,359.7	2,359.7	8.6	60.8	-73.18	-73.18	-3,338.5	-1,117.0	3,480.2	3,410.8	69.38	50.161	
2,500.0	2,493.2	2,459.2	2,459.2	8.9	63.4	-73.34	-73.34	-3,338.5	-1,117.0	3,477.3	3,405.0	72.32	48.080	
2,600.0	2,592.7	2,558.7	2,558.7	9.3	65.9	-73.49	-73.49	-3,338.5	-1,117.0	3,474.5	3,399.2	75.27	46.161	
2,700.0	2,692.2	2,658.2	2,658.2	9.7	68.5	-73.65	-73.65	-3,338.5	-1,117.0	3,471.6	3,393.4	78.21	44.386	
2,800.0	2,791.7	2,736.0	2,736.0	10.1	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,468.9	3,388.3	80.60	43.037	
2,875.5	2,866.9	2,736.0	2,736.0	10.4	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,468.1	3,387.2	80.90	42.871 CC	
2,900.0	2,891.2	2,736.0	2,736.0	10.5	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,468.1	3,387.2	80.99	42.822 ES	
3,000.0	2,990.7	2,736.0	2,736.0	10.9	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,470.3	3,388.9	81.38	42.644	
3,100.0	3,090.2	2,736.0	2,736.0	11.3	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,475.3	3,393.6	81.77	42.503	
3,200.0	3,189.7	2,736.0	2,736.0	11.7	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,483.2	3,401.1	82.15	42.398	
3,300.0	3,289.2	2,736.0	2,736.0	12.0	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,493.9	3,411.4	82.54	42.329	
3,400.0	3,388.7	2,736.0	2,736.0	12.4	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,507.5	3,424.6	82.93	42.294	
3,500.0	3,488.2	2,736.0	2,736.0	12.8	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,523.8	3,440.5	83.32	42.292	
3,600.0	3,587.7	2,736.0	2,736.0	13.2	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,542.9	3,459.2	83.71	42.323	
3,700.0	3,687.2	2,736.0	2,736.0	13.6	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,564.7	3,480.6	84.10	42.386	
3,800.0	3,786.7	2,736.0	2,736.0	14.0	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,589.2	3,504.7	84.49	42.480	
3,900.0	3,886.2	2,736.0	2,736.0	14.4	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,616.2	3,531.3	84.88	42.603	
4,000.0	3,985.7	2,736.0	2,736.0	14.8	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,645.8	3,560.5	85.27	42.755	
4,100.0	4,085.2	2,736.0	2,736.0	15.2	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,677.9	3,592.2	85.66	42.935	
4,200.0	4,184.7	2,736.0	2,736.0	15.5	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,712.4	3,626.3	86.05	43.141	
4,300.0	4,284.2	2,736.0	2,736.0	15.9	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,749.2	3,662.8	86.44	43.372	
4,400.0	4,383.7	2,736.0	2,736.0	16.3	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,788.3	3,701.5	86.83	43.628	
4,500.0	4,483.2	2,736.0	2,736.0	16.7	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,829.7	3,742.4	87.22	43.906	
4,600.0	4,582.7	2,736.0	2,736.0	17.1	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,873.1	3,785.5	87.62	44.206	
4,700.0	4,682.2	2,736.0	2,736.0	17.5	70.5	-73.77	-73.77	-3,338.5	-1,117.0	3,918.7	3,830.7	88.01	44.527	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2736-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning	
4,800.0	4,781.7	2,736.0	2,736.0	17.9	70.5	-73.77	-3,338.5	-1,117.0	3,966.2	3,877.8	88.40	44.868		
4,900.0	4,881.2	2,736.0	2,736.0	18.3	70.5	-73.77	-3,338.5	-1,117.0	4,015.7	3,926.9	88.79	45.228		
5,000.0	4,980.7	2,736.0	2,736.0	18.7	70.5	-73.77	-3,338.5	-1,117.0	4,067.0	3,977.9	89.18	45.605		
5,100.0	5,080.2	2,736.0	2,736.0	19.1	70.5	-73.77	-3,338.5	-1,117.0	4,120.2	4,030.6	89.57	45.998		
5,200.0	5,179.7	2,736.0	2,736.0	19.5	70.5	-73.77	-3,338.5	-1,117.0	4,175.0	4,085.0	89.96	46.408		
5,300.0	5,279.2	2,736.0	2,736.0	19.9	70.5	-73.77	-3,338.5	-1,117.0	4,231.5	4,141.1	90.35	46.832		
5,400.0	5,378.7	2,736.0	2,736.0	20.2	70.5	-73.77	-3,338.5	-1,117.0	4,289.6	4,198.8	90.75	47.270		
5,500.0	5,478.2	2,736.0	2,736.0	20.6	70.5	-73.77	-3,338.5	-1,117.0	4,349.2	4,258.0	91.14	47.721		
5,600.0	5,577.7	2,736.0	2,736.0	21.0	70.5	-73.77	-3,338.5	-1,117.0	4,410.2	4,318.7	91.53	48.184		
5,700.0	5,677.2	2,736.0	2,736.0	21.4	70.5	-73.77	-3,338.5	-1,117.0	4,472.7	4,380.8	91.92	48.658		
5,800.0	5,776.7	2,736.0	2,736.0	21.8	70.5	-73.77	-3,338.5	-1,117.0	4,536.5	4,444.2	92.31	49.143		
5,900.0	5,876.2	2,736.0	2,736.0	22.2	70.5	-73.77	-3,338.5	-1,117.0	4,601.6	4,508.9	92.71	49.637		
6,000.0	5,975.7	2,736.0	2,736.0	22.6	70.5	-73.77	-3,338.5	-1,117.0	4,667.9	4,574.8	93.10	50.141		
6,100.0	6,075.2	2,736.0	2,736.0	23.0	70.5	-73.77	-3,338.5	-1,117.0	4,735.5	4,642.0	93.49	50.653		
6,200.0	6,174.7	2,736.0	2,736.0	23.4	70.5	-73.77	-3,338.5	-1,117.0	4,804.1	4,710.2	93.88	51.172		
6,300.0	6,274.2	2,736.0	2,736.0	23.8	70.5	-73.77	-3,338.5	-1,117.0	4,873.8	4,779.6	94.27	51.699		
6,400.0	6,373.7	2,736.0	2,736.0	24.2	70.5	-73.77	-3,338.5	-1,117.0	4,944.6	4,850.0	94.67	52.233		
6,500.0	6,473.2	2,736.0	2,736.0	24.6	70.5	-73.77	-3,338.5	-1,117.0	5,016.4	4,921.3	95.06	52.772		
6,600.0	6,572.7	2,736.0	2,736.0	24.9	70.5	-73.77	-3,338.5	-1,117.0	5,089.1	4,993.7	95.45	53.317		
6,700.0	6,672.2	2,736.0	2,736.0	25.3	70.5	-73.77	-3,338.5	-1,117.0	5,162.7	5,066.9	95.84	53.867		
6,800.0	6,771.7	2,736.0	2,736.0	25.7	70.5	-73.77	-3,338.5	-1,117.0	5,237.3	5,141.0	96.23	54.422		
6,900.0	6,871.2	2,736.0	2,736.0	26.1	70.5	-73.77	-3,338.5	-1,117.0	5,312.6	5,216.0	96.63	54.981		
7,000.0	6,970.7	2,736.0	2,736.0	26.5	70.5	-73.77	-3,338.5	-1,117.0	5,388.7	5,291.7	97.02	55.544		
7,100.0	7,070.2	2,736.0	2,736.0	26.9	70.5	-73.77	-3,338.5	-1,117.0	5,465.7	5,368.3	97.41	56.109		
7,200.0	7,169.7	2,736.0	2,736.0	27.3	70.5	-73.77	-3,338.5	-1,117.0	5,543.3	5,445.5	97.80	56.678		
7,300.0	7,269.2	2,736.0	2,736.0	27.7	70.5	-73.77	-3,338.5	-1,117.0	5,621.7	5,523.5	98.20	57.250		
7,400.0	7,368.7	2,736.0	2,736.0	28.1	70.5	-73.77	-3,338.5	-1,117.0	5,700.7	5,602.1	98.59	57.824		
7,500.0	7,468.2	2,736.0	2,736.0	28.5	70.5	-73.77	-3,338.5	-1,117.0	5,780.4	5,681.4	98.98	58.400		
7,600.0	7,567.7	2,736.0	2,736.0	28.9	70.5	-73.77	-3,338.5	-1,117.0	5,860.7	5,761.3	99.37	58.977		
7,700.0	7,667.2	2,736.0	2,736.0	29.3	70.5	-73.77	-3,338.5	-1,117.0	5,941.6	5,841.9	99.76	59.556		
7,800.0	7,766.7	2,736.0	2,736.0	29.7	70.5	-73.77	-3,338.5	-1,117.0	6,023.1	5,922.9	100.16	60.136		
7,900.0	7,866.2	2,736.0	2,736.0	30.0	70.5	-73.77	-3,338.5	-1,117.0	6,105.1	6,004.6	100.55	60.717		
8,000.0	7,965.7	2,736.0	2,736.0	30.4	70.5	-73.77	-3,338.5	-1,117.0	6,187.7	6,086.7	100.94	61.299		
8,100.0	8,065.1	2,736.0	2,736.0	30.8	70.5	-73.77	-3,338.5	-1,117.0	6,270.8	6,169.4	101.33	61.882		
8,200.0	8,164.6	2,736.0	2,736.0	31.2	70.5	-73.77	-3,338.5	-1,117.0	6,354.3	6,252.6	101.73	62.464		
8,300.0	8,264.1	2,736.0	2,736.0	31.6	70.5	-73.77	-3,338.5	-1,117.0	6,438.3	6,336.2	102.12	63.047		
8,400.0	8,363.6	2,736.0	2,736.0	32.0	70.5	-73.77	-3,338.5	-1,117.0	6,522.8	6,420.3	102.51	63.629		
8,500.0	8,463.1	2,736.0	2,736.0	32.4	70.5	-73.77	-3,338.5	-1,117.0	6,607.7	6,504.8	102.91	64.212		
8,600.0	8,562.6	2,736.0	2,736.0	32.8	70.5	-73.77	-3,338.5	-1,117.0	6,693.0	6,589.7	103.30	64.794		
8,700.0	8,662.1	2,736.0	2,736.0	33.2	70.5	-73.77	-3,338.5	-1,117.0	6,778.8	6,675.1	103.69	65.375		
8,800.0	8,761.6	2,736.0	2,736.0	33.6	70.5	-73.77	-3,338.5	-1,117.0	6,864.9	6,760.8	104.08	65.956		
8,818.3	8,779.9	2,736.0	2,736.0	33.7	70.5	-73.77	-3,338.5	-1,117.0	6,880.7	6,776.6	104.15	66.062		
8,825.0	8,786.5	2,736.0	2,736.0	33.7	70.5	-66.24	-3,338.5	-1,117.0	6,886.4	6,782.3	104.18	66.101		
8,850.0	8,811.4	2,736.0	2,736.0	33.8	70.5	-41.96	-3,338.5	-1,117.0	6,907.6	6,803.3	104.28	66.242		
8,875.0	8,836.1	2,736.0	2,736.0	33.9	70.5	-26.69	-3,338.5	-1,117.0	6,928.0	6,823.6	104.37	66.376		
8,900.0	8,860.7	2,736.0	2,736.0	34.0	70.5	-17.79	-3,338.5	-1,117.0	6,947.7	6,843.2	104.47	66.504		
8,925.0	8,885.1	2,736.0	2,736.0	34.1	70.5	-12.37	-3,338.5	-1,117.0	6,966.6	6,862.1	104.56	66.626		
8,950.0	8,909.2	2,736.0	2,736.0	34.2	70.5	-8.87	-3,338.5	-1,117.0	6,984.7	6,880.1	104.66	66.740		
8,975.0	8,933.0	2,736.0	2,736.0	34.2	70.5	-6.48	-3,338.5	-1,117.0	7,002.0	6,897.2	104.75	66.847		
9,000.0	8,956.3	2,736.0	2,736.0	34.3	70.5	-4.78	-3,338.5	-1,117.0	7,018.3	6,913.5	104.83	66.947		

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLPATH														Offset Site Error:	0.0 usft
Survey Program: 2736-INC-ONLY														Offset Well Error:	3.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)							
9,025.0	8,979.2	2,736.0	2,736.0	34.4	70.5	-3.52	-3,338.5	-1,117.0	7,033.7	6,928.8	104.92	67.038			
9,050.0	9,001.5	2,736.0	2,736.0	34.5	70.5	-2.57	-3,338.5	-1,117.0	7,048.2	6,943.2	105.01	67.122			
9,075.0	9,023.2	2,736.0	2,736.0	34.6	70.5	-1.82	-3,338.5	-1,117.0	7,061.6	6,956.5	105.09	67.197			
9,100.0	9,044.2	2,736.0	2,736.0	34.7	70.5	-1.23	-3,338.5	-1,117.0	7,074.0	6,968.8	105.17	67.263			
9,125.0	9,064.5	2,736.0	2,736.0	34.7	70.5	-0.75	-3,338.5	-1,117.0	7,085.3	6,980.0	105.25	67.321			
9,150.0	9,084.0	2,736.0	2,736.0	34.8	70.5	-0.35	-3,338.5	-1,117.0	7,095.5	6,990.2	105.32	67.369			
9,175.0	9,102.7	2,736.0	2,736.0	34.9	70.5	-0.02	-3,338.5	-1,117.0	7,104.6	6,999.2	105.40	67.408			
9,200.0	9,120.5	2,736.0	2,736.0	35.0	70.5	0.27	-3,338.5	-1,117.0	7,112.5	7,007.1	105.47	67.437			
9,225.0	9,137.4	2,736.0	2,736.0	35.0	70.5	0.52	-3,338.5	-1,117.0	7,119.3	7,013.8	105.54	67.455			
9,250.0	9,153.3	2,736.0	2,736.0	35.1	70.5	0.75	-3,338.5	-1,117.0	7,125.0	7,019.4	105.61	67.464			
9,275.0	9,168.1	2,736.0	2,736.0	35.2	70.5	0.95	-3,338.5	-1,117.0	7,129.4	7,023.7	105.68	67.462			
9,300.0	9,181.9	2,736.0	2,736.0	35.2	70.5	1.13	-3,338.5	-1,117.0	7,132.7	7,026.9	105.75	67.449			
9,325.0	9,194.6	2,736.0	2,736.0	35.3	70.5	1.30	-3,338.5	-1,117.0	7,134.7	7,028.9	105.82	67.424			
9,350.0	9,206.2	2,736.0	2,736.0	35.4	70.5	1.47	-3,338.5	-1,117.0	7,135.5	7,029.6	105.89	67.388			
9,375.0	9,216.6	2,736.0	2,736.0	35.5	70.5	1.62	-3,338.5	-1,117.0	7,135.2	7,029.2	105.96	67.340			
9,400.0	9,225.8	2,736.0	2,736.0	35.5	70.5	1.78	-3,338.5	-1,117.0	7,133.6	7,027.5	106.03	67.280			
9,425.0	9,233.8	2,736.0	2,736.0	35.6	70.5	1.93	-3,338.5	-1,117.0	7,130.8	7,024.7	106.10	67.208			
9,450.0	9,240.5	2,736.0	2,736.0	35.7	70.5	2.08	-3,338.5	-1,117.0	7,126.8	7,020.6	106.17	67.123			
9,475.0	9,246.0	2,736.0	2,736.0	35.7	70.5	2.24	-3,338.5	-1,117.0	7,121.6	7,015.4	106.25	67.026			
9,500.0	9,250.2	2,736.0	2,736.0	35.8	70.5	2.41	-3,338.5	-1,117.0	7,115.3	7,008.9	106.33	66.917			
9,525.0	9,253.1	2,736.0	2,736.0	35.9	70.5	2.58	-3,338.5	-1,117.0	7,107.8	7,001.4	106.41	66.795			
9,550.0	9,254.7	2,736.0	2,736.0	36.0	70.5	2.76	-3,338.5	-1,117.0	7,099.1	6,992.6	106.50	66.660			
9,561.6	9,255.0	2,736.0	2,736.0	36.0	70.5	2.85	-3,338.5	-1,117.0	7,094.7	6,988.2	106.54	66.594			
9,600.0	9,255.6	2,736.0	2,736.0	36.2	70.5	2.85	-3,338.5	-1,117.0	7,079.8	6,973.1	106.68	66.367			
9,700.0	9,257.0	2,736.0	2,736.0	36.6	70.5	2.85	-3,338.5	-1,117.0	7,041.9	6,934.8	107.09	65.758			
9,800.0	9,258.4	2,736.0	2,736.0	37.1	70.5	2.85	-3,338.5	-1,117.0	7,005.2	6,897.6	107.57	65.121			
9,900.0	9,259.8	2,736.0	2,736.0	37.6	70.5	2.85	-3,338.5	-1,117.0	6,969.7	6,861.6	108.13	64.459			
10,000.0	9,261.3	2,736.0	2,736.0	38.2	70.5	2.85	-3,338.5	-1,117.0	6,935.5	6,826.8	108.75	63.778			
10,100.0	9,262.7	2,736.0	2,736.0	38.9	70.5	2.85	-3,338.5	-1,117.0	6,902.6	6,793.2	109.43	63.079			
10,200.0	9,264.1	2,736.0	2,736.0	39.7	70.5	2.85	-3,338.5	-1,117.0	6,871.0	6,760.8	110.17	62.366			
10,300.0	9,265.6	2,736.0	2,736.0	40.5	70.5	2.85	-3,338.5	-1,117.0	6,840.7	6,729.7	110.97	61.644			
10,400.0	9,267.0	2,736.0	2,736.0	41.3	70.5	2.85	-3,338.5	-1,117.0	6,811.7	6,699.9	111.82	60.914			
10,500.0	9,268.4	2,736.0	2,736.0	42.2	70.5	2.85	-3,338.5	-1,117.0	6,784.1	6,671.4	112.73	60.182			
10,600.0	9,269.9	2,736.0	2,736.0	43.2	70.5	2.85	-3,338.5	-1,117.0	6,757.9	6,644.2	113.68	59.448			
10,700.0	9,271.3	2,736.0	2,736.0	44.2	70.5	2.85	-3,338.5	-1,117.0	6,733.0	6,618.3	114.67	58.717			
10,800.0	9,272.7	2,736.0	2,736.0	45.2	70.5	2.85	-3,338.5	-1,117.0	6,709.5	6,593.8	115.70	57.990			
10,900.0	9,274.2	2,736.0	2,736.0	46.3	70.5	2.85	-3,338.5	-1,117.0	6,687.5	6,570.7	116.77	57.269			
11,000.0	9,275.6	2,736.0	2,736.0	47.4	70.5	2.85	-3,338.5	-1,117.0	6,666.8	6,549.0	117.88	56.557			
11,100.0	9,277.0	2,736.0	2,736.0	48.5	70.5	2.85	-3,338.5	-1,117.0	6,647.6	6,528.6	119.02	55.854			
11,200.0	9,278.4	2,736.0	2,736.0	49.7	70.5	2.85	-3,338.5	-1,117.0	6,629.9	6,509.7	120.19	55.163			
11,300.0	9,279.9	2,736.0	2,736.0	50.9	70.5	2.85	-3,338.5	-1,117.0	6,613.6	6,492.2	121.38	54.485			
11,400.0	9,281.3	2,736.0	2,736.0	52.1	70.5	2.85	-3,338.5	-1,117.0	6,598.8	6,476.2	122.61	53.820			
11,500.0	9,282.7	2,736.0	2,736.0	53.4	70.5	2.85	-3,338.5	-1,117.0	6,585.5	6,461.7	123.86	53.170			
11,600.0	9,284.2	2,736.0	2,736.0	54.6	70.5	2.85	-3,338.5	-1,117.0	6,573.7	6,448.6	125.13	52.535			
11,700.0	9,285.6	2,736.0	2,736.0	55.9	70.5	2.85	-3,338.5	-1,117.0	6,563.4	6,437.0	126.42	51.917			
11,800.0	9,287.0	2,736.0	2,736.0	57.2	70.5	2.85	-3,338.5	-1,117.0	6,554.6	6,426.8	127.73	51.314			
11,900.0	9,288.5	2,736.0	2,736.0	58.6	70.5	2.85	-3,338.5	-1,117.0	6,547.3	6,418.2	129.07	50.728			
12,000.0	9,289.9	2,736.0	2,736.0	59.9	70.5	2.85	-3,338.5	-1,117.0	6,541.5	6,411.1	130.41	50.160			
12,100.0	9,291.3	2,736.0	2,736.0	61.3	70.5	2.85	-3,338.5	-1,117.0	6,537.3	6,405.5	131.78	49.608			
12,200.0	9,292.8	2,736.0	2,736.0	62.7	70.5	2.85	-3,338.5	-1,117.0	6,534.6	6,401.4	133.16	49.074			
12,300.0	9,294.2	2,736.0	2,736.0	64.0	70.5	2.85	-3,338.5	-1,117.0	6,533.4	6,398.8	134.55	48.557			

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIEDERAL #2 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2736-INC-ONLY													Offset Well Error:	3.0 usft
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Semi Major Axis (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
12,327.6	9,294.6	2,736.0	2,736.0	64.4	70.5	2.85	2.85	-3,338.5	-1,117.0	6,533.3	6,398.4	134.94	48.417	
12,400.0	9,295.6	2,736.0	2,736.0	65.5	70.5	2.85	2.85	-3,338.5	-1,117.0	6,533.7	6,397.8	135.96	48.057	
12,500.0	9,297.1	2,736.0	2,736.0	66.9	70.5	2.85	2.85	-3,338.5	-1,117.0	6,535.6	6,398.2	137.38	47.574	
12,600.0	9,298.5	2,736.0	2,736.0	68.3	70.5	2.85	2.85	-3,338.5	-1,117.0	6,539.0	6,400.2	138.81	47.108	
12,700.0	9,299.9	2,736.0	2,736.0	69.7	70.5	2.85	2.85	-3,338.5	-1,117.0	6,543.9	6,403.7	140.25	46.659	
12,800.0	9,301.3	2,736.0	2,736.0	71.2	70.5	2.85	2.85	-3,338.5	-1,117.0	6,550.4	6,408.7	141.70	46.227	
12,900.0	9,302.8	2,736.0	2,736.0	72.7	70.5	2.85	2.85	-3,338.5	-1,117.0	6,558.3	6,415.2	143.16	45.811	
13,000.0	9,304.2	2,736.0	2,736.0	74.1	70.5	2.85	2.85	-3,338.5	-1,117.0	6,567.8	6,423.2	144.63	45.410	
13,100.0	9,305.6	2,736.0	2,736.0	75.6	70.5	2.85	2.85	-3,338.5	-1,117.0	6,578.8	6,432.7	146.11	45.026	
13,200.0	9,307.1	2,736.0	2,736.0	77.1	70.5	2.85	2.85	-3,338.5	-1,117.0	6,591.3	6,443.7	147.60	44.657	
13,300.0	9,308.5	2,736.0	2,736.0	78.6	70.5	2.85	2.85	-3,338.5	-1,117.0	6,605.3	6,456.2	149.09	44.303	
13,400.0	9,309.9	2,736.0	2,736.0	80.1	70.5	2.85	2.85	-3,338.5	-1,117.0	6,620.8	6,470.2	150.59	43.964	
13,500.0	9,311.4	2,736.0	2,736.0	81.6	70.5	2.85	2.85	-3,338.5	-1,117.0	6,637.7	6,485.6	152.10	43.640	
13,600.0	9,312.8	2,736.0	2,736.0	83.1	70.5	2.85	2.85	-3,338.5	-1,117.0	6,656.1	6,502.5	153.62	43.329	
13,700.0	9,314.2	2,736.0	2,736.0	84.6	70.5	2.85	2.85	-3,338.5	-1,117.0	6,675.9	6,520.8	155.14	43.032	
13,800.0	9,315.7	2,736.0	2,736.0	86.2	70.5	2.85	2.85	-3,338.5	-1,117.0	6,697.2	6,540.5	156.66	42.749	
13,900.0	9,317.1	2,736.0	2,736.0	87.7	70.5	2.85	2.85	-3,338.5	-1,117.0	6,719.9	6,561.7	158.19	42.478	
14,000.0	9,318.5	2,736.0	2,736.0	89.2	70.5	2.85	2.85	-3,338.5	-1,117.0	6,744.0	6,584.3	159.73	42.221	
14,100.0	9,320.0	2,736.0	2,736.0	90.8	70.5	2.85	2.85	-3,338.5	-1,117.0	6,769.5	6,608.2	161.27	41.975	
14,200.0	9,321.4	2,736.0	2,736.0	92.3	70.5	2.85	2.85	-3,338.5	-1,117.0	6,796.3	6,633.5	162.82	41.742	
14,300.0	9,322.8	2,736.0	2,736.0	93.9	70.5	2.85	2.85	-3,338.5	-1,117.0	6,824.6	6,660.2	164.37	41.520	
14,400.0	9,324.2	2,736.0	2,736.0	95.4	70.5	2.85	2.85	-3,338.5	-1,117.0	6,854.1	6,688.2	165.92	41.309	
14,500.0	9,325.7	2,736.0	2,736.0	97.0	70.5	2.85	2.85	-3,338.5	-1,117.0	6,885.0	6,717.6	167.48	41.109	
14,600.0	9,327.1	2,736.0	2,736.0	98.5	70.5	2.85	2.85	-3,338.5	-1,117.0	6,917.2	6,748.2	169.05	40.919	
14,683.3	9,328.3	2,736.0	2,736.0	99.8	70.5	2.85	2.85	-3,338.5	-1,117.0	6,945.1	6,774.7	170.35	40.769 SF	

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH														Offset Site Error: 0.0 usft	
Survey Program: 2695-INC-ONLY														Offset Well Error: 3.0 usft	
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.0	0.0	0.0	0.0	0.0	3.0	-140.20	-1,358.0	-1,131.5	1,767.7						
100.0	100.0	84.0	84.0	0.1	3.7	-140.20	-1,358.0	-1,131.5	1,767.6	1,763.8	3.84	460.126			
200.0	200.0	184.0	184.0	0.5	5.6	-140.20	-1,358.0	-1,131.5	1,767.6	1,761.5	6.11	289.350			
300.0	300.0	284.0	284.0	0.9	7.9	-140.20	-1,358.0	-1,131.5	1,767.6	1,758.8	8.76	201.707			
400.0	400.0	384.0	384.0	1.2	10.3	-140.20	-1,358.0	-1,131.5	1,767.6	1,756.0	11.55	153.043			
500.0	500.0	484.0	484.0	1.6	12.8	-140.20	-1,358.0	-1,131.5	1,767.6	1,753.2	14.39	122.806			
600.0	600.0	584.0	584.0	1.9	15.3	-140.20	-1,358.0	-1,131.5	1,767.6	1,750.3	17.27	102.371			
700.0	700.0	684.0	684.0	2.3	17.9	-140.20	-1,358.0	-1,131.5	1,767.6	1,747.4	20.16	87.692			
800.0	800.0	784.0	784.0	2.7	20.4	-140.20	-1,358.0	-1,131.5	1,767.6	1,744.5	23.06	76.660			
900.0	900.0	884.0	884.0	3.0	23.0	-140.20	-1,358.0	-1,131.5	1,767.6	1,741.6	25.97	68.074			
950.0	950.0	934.0	934.0	3.2	24.2	-140.20	-1,358.0	-1,131.5	1,767.6	1,740.2	27.42	64.460			
1,000.0	1,000.0	984.0	984.0	3.4	25.5	-49.78	-1,358.0	-1,131.5	1,767.3	1,738.4	28.87	61.207			
1,100.0	1,099.9	1,083.9	1,083.9	3.7	28.1	-49.90	-1,358.0	-1,131.5	1,765.1	1,733.3	31.77	55.550			
1,200.0	1,199.7	1,183.7	1,183.7	4.1	30.6	-50.14	-1,358.0	-1,131.5	1,760.6	1,725.9	34.68	50.769			
1,236.8	1,236.4	1,220.4	1,220.4	4.2	31.6	-50.26	-1,358.0	-1,131.5	1,758.4	1,722.6	35.75	49.187			
1,300.0	1,299.2	1,283.2	1,283.2	4.4	33.2	-50.42	-1,358.0	-1,131.5	1,754.3	1,716.7	37.59	46.675			
1,400.0	1,398.7	1,382.7	1,382.7	4.8	35.7	-50.67	-1,358.0	-1,131.5	1,747.9	1,707.4	40.50	43.159			
1,500.0	1,498.2	1,482.2	1,482.2	5.1	38.3	-50.93	-1,358.0	-1,131.5	1,741.6	1,698.2	43.42	40.110			
1,600.0	1,597.7	1,581.7	1,581.7	5.5	40.8	-51.18	-1,358.0	-1,131.5	1,735.3	1,689.0	46.35	37.443			
1,700.0	1,697.2	1,681.2	1,681.2	5.9	43.4	-51.44	-1,358.0	-1,131.5	1,729.0	1,679.8	49.27	35.090			
1,800.0	1,796.7	1,780.7	1,780.7	6.3	45.9	-51.70	-1,358.0	-1,131.5	1,722.8	1,670.6	52.21	33.000			
1,900.0	1,896.2	1,880.2	1,880.2	6.6	48.5	-51.96	-1,358.0	-1,131.5	1,716.6	1,661.5	55.14	31.131			
2,000.0	1,995.7	1,979.7	1,979.7	7.0	51.1	-52.22	-1,358.0	-1,131.5	1,710.5	1,652.4	58.08	29.451			
2,100.0	2,095.2	2,079.2	2,079.2	7.4	53.6	-52.49	-1,358.0	-1,131.5	1,704.3	1,643.3	61.02	27.933			
2,200.0	2,194.7	2,178.7	2,178.7	7.8	56.2	-52.75	-1,358.0	-1,131.5	1,698.2	1,634.3	63.96	26.553			
2,300.0	2,294.2	2,278.2	2,278.2	8.2	58.7	-53.02	-1,358.0	-1,131.5	1,692.2	1,625.3	66.90	25.295			
2,400.0	2,393.7	2,377.7	2,377.7	8.6	61.3	-53.29	-1,358.0	-1,131.5	1,686.2	1,616.3	69.84	24.144			
2,500.0	2,493.2	2,477.2	2,477.2	8.9	63.8	-53.56	-1,358.0	-1,131.5	1,680.2	1,607.4	72.78	23.085			
2,600.0	2,592.7	2,576.7	2,576.7	9.3	66.4	-53.84	-1,358.0	-1,131.5	1,674.3	1,598.5	75.73	22.109			
2,700.0	2,692.2	2,676.2	2,676.2	9.7	69.0	-54.11	-1,358.0	-1,131.5	1,668.4	1,589.7	78.67	21.206			
2,800.0	2,791.7	2,695.0	2,695.0	10.1	69.4	-54.17	-1,358.0	-1,131.5	1,664.5	1,584.9	79.54	20.925			
2,816.8	2,808.4	2,695.0	2,695.0	10.2	69.4	-54.17	-1,358.0	-1,131.5	1,664.4	1,584.8	79.61	20.907	CC, ES		
2,900.0	2,891.2	2,695.0	2,695.0	10.5	69.4	-54.17	-1,358.0	-1,131.5	1,666.5	1,586.5	79.93	20.849			
3,000.0	2,990.7	2,695.0	2,695.0	10.9	69.4	-54.17	-1,358.0	-1,131.5	1,674.4	1,594.1	80.32	20.847	SF		
3,100.0	3,090.2	2,695.0	2,695.0	11.3	69.4	-54.17	-1,358.0	-1,131.5	1,688.3	1,607.6	80.71	20.919			
3,200.0	3,189.7	2,695.0	2,695.0	11.7	69.4	-54.17	-1,358.0	-1,131.5	1,707.9	1,626.8	81.10	21.061			
3,300.0	3,289.2	2,695.0	2,695.0	12.0	69.4	-54.17	-1,358.0	-1,131.5	1,733.1	1,651.6	81.48	21.269			
3,400.0	3,388.7	2,695.0	2,695.0	12.4	69.4	-54.17	-1,358.0	-1,131.5	1,763.6	1,681.7	81.87	21.541			
3,500.0	3,488.2	2,695.0	2,695.0	12.8	69.4	-54.17	-1,358.0	-1,131.5	1,799.2	1,716.9	82.26	21.871			
3,600.0	3,587.7	2,695.0	2,695.0	13.2	69.4	-54.17	-1,358.0	-1,131.5	1,839.5	1,756.8	82.65	22.256			
3,700.0	3,687.2	2,695.0	2,695.0	13.6	69.4	-54.17	-1,358.0	-1,131.5	1,884.2	1,801.2	83.04	22.690			
3,800.0	3,786.7	2,695.0	2,695.0	14.0	69.4	-54.17	-1,358.0	-1,131.5	1,933.1	1,849.7	83.43	23.170			
3,900.0	3,886.2	2,695.0	2,695.0	14.4	69.4	-54.17	-1,358.0	-1,131.5	1,985.8	1,902.0	83.82	23.691			
4,000.0	3,985.7	2,695.0	2,695.0	14.8	69.4	-54.17	-1,358.0	-1,131.5	2,042.1	1,957.9	84.21	24.250			
4,100.0	4,085.2	2,695.0	2,695.0	15.2	69.4	-54.17	-1,358.0	-1,131.5	2,101.6	2,017.0	84.60	24.841			
4,200.0	4,184.7	2,695.0	2,695.0	15.5	69.4	-54.17	-1,358.0	-1,131.5	2,164.1	2,079.1	84.99	25.463			
4,300.0	4,284.2	2,695.0	2,695.0	15.9	69.4	-54.17	-1,358.0	-1,131.5	2,229.4	2,144.0	85.38	26.110			
4,400.0	4,383.7	2,695.0	2,695.0	16.3	69.4	-54.17	-1,358.0	-1,131.5	2,297.1	2,211.3	85.77	26.781			
4,500.0	4,483.2	2,695.0	2,695.0	16.7	69.4	-54.17	-1,358.0	-1,131.5	2,367.1	2,281.0	86.16	27.472			
4,600.0	4,582.7	2,695.0	2,695.0	17.1	69.4	-54.17	-1,358.0	-1,131.5	2,439.3	2,352.7	86.56	28.181			
4,700.0	4,682.2	2,695.0	2,695.0	17.5	69.4	-54.17	-1,358.0	-1,131.5	2,513.3	2,426.4	86.95	28.906			

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH														Offset Site Error:	0.0 usft
Survey Program: 2695-INC-ONLY														Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning									
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
4,800.0	4,781.7	2,695.0	2,695.0	17.9	69.4	-54.17	-1,358.0	-1,131.5	2,589.1	2,501.7	87.34	29.644			
4,900.0	4,881.2	2,695.0	2,695.0	18.3	69.4	-54.17	-1,358.0	-1,131.5	2,666.5	2,578.7	87.73	30.394			
5,000.0	4,980.7	2,695.0	2,695.0	18.7	69.4	-54.17	-1,358.0	-1,131.5	2,745.3	2,657.2	88.12	31.154			
5,100.0	5,080.2	2,695.0	2,695.0	19.1	69.4	-54.17	-1,358.0	-1,131.5	2,825.5	2,737.0	88.51	31.922			
5,200.0	5,179.7	2,695.0	2,695.0	19.5	69.4	-54.17	-1,358.0	-1,131.5	2,906.9	2,818.0	88.90	32.697			
5,300.0	5,279.2	2,695.0	2,695.0	19.9	69.4	-54.17	-1,358.0	-1,131.5	2,989.4	2,900.1	89.30	33.478			
5,400.0	5,378.7	2,695.0	2,695.0	20.2	69.4	-54.17	-1,358.0	-1,131.5	3,073.0	2,983.3	89.69	34.263			
5,500.0	5,478.2	2,695.0	2,695.0	20.6	69.4	-54.17	-1,358.0	-1,131.5	3,157.5	3,067.4	90.08	35.053			
5,600.0	5,577.7	2,695.0	2,695.0	21.0	69.4	-54.17	-1,358.0	-1,131.5	3,242.9	3,152.4	90.47	35.845			
5,700.0	5,677.2	2,695.0	2,695.0	21.4	69.4	-54.17	-1,358.0	-1,131.5	3,329.1	3,238.3	90.86	36.639			
5,800.0	5,776.7	2,695.0	2,695.0	21.8	69.4	-54.17	-1,358.0	-1,131.5	3,416.1	3,324.8	91.25	37.435			
5,900.0	5,876.2	2,695.0	2,695.0	22.2	69.4	-54.17	-1,358.0	-1,131.5	3,503.8	3,412.1	91.65	38.232			
6,000.0	5,975.7	2,695.0	2,695.0	22.6	69.4	-54.17	-1,358.0	-1,131.5	3,592.1	3,500.0	92.04	39.028			
6,100.0	6,075.2	2,695.0	2,695.0	23.0	69.4	-54.17	-1,358.0	-1,131.5	3,681.0	3,588.6	92.43	39.825			
6,200.0	6,174.7	2,695.0	2,695.0	23.4	69.4	-54.17	-1,358.0	-1,131.5	3,770.5	3,677.6	92.82	40.620			
6,300.0	6,274.2	2,695.0	2,695.0	23.8	69.4	-54.17	-1,358.0	-1,131.5	3,860.4	3,767.2	93.21	41.415			
6,400.0	6,373.7	2,695.0	2,695.0	24.2	69.4	-54.17	-1,358.0	-1,131.5	3,950.9	3,857.3	93.61	42.208			
6,500.0	6,473.2	2,695.0	2,695.0	24.6	69.4	-54.17	-1,358.0	-1,131.5	4,041.8	3,947.8	94.00	42.999			
6,600.0	6,572.7	2,695.0	2,695.0	24.9	69.4	-54.17	-1,358.0	-1,131.5	4,133.1	4,038.8	94.39	43.788			
6,700.0	6,672.2	2,695.0	2,695.0	25.3	69.4	-54.17	-1,358.0	-1,131.5	4,224.9	4,130.1	94.78	44.574			
6,800.0	6,771.7	2,695.0	2,695.0	25.7	69.4	-54.17	-1,358.0	-1,131.5	4,317.0	4,221.8	95.17	45.358			
6,900.0	6,871.2	2,695.0	2,695.0	26.1	69.4	-54.17	-1,358.0	-1,131.5	4,409.4	4,313.8	95.57	46.139			
7,000.0	6,970.7	2,695.0	2,695.0	26.5	69.4	-54.17	-1,358.0	-1,131.5	4,502.2	4,406.2	95.96	46.917			
7,100.0	7,070.2	2,695.0	2,695.0	26.9	69.4	-54.17	-1,358.0	-1,131.5	4,595.2	4,498.9	96.35	47.692			
7,200.0	7,169.7	2,695.0	2,695.0	27.3	69.4	-54.17	-1,358.0	-1,131.5	4,688.6	4,591.8	96.74	48.464			
7,300.0	7,269.2	2,695.0	2,695.0	27.7	69.4	-54.17	-1,358.0	-1,131.5	4,782.2	4,685.1	97.14	49.232			
7,400.0	7,368.7	2,695.0	2,695.0	28.1	69.4	-54.17	-1,358.0	-1,131.5	4,876.1	4,778.5	97.53	49.996			
7,500.0	7,468.2	2,695.0	2,695.0	28.5	69.4	-54.17	-1,358.0	-1,131.5	4,970.2	4,872.3	97.92	50.757			
7,600.0	7,567.7	2,695.0	2,695.0	28.9	69.4	-54.17	-1,358.0	-1,131.5	5,064.5	4,966.2	98.31	51.514			
7,700.0	7,667.2	2,695.0	2,695.0	29.3	69.4	-54.17	-1,358.0	-1,131.5	5,159.1	5,060.4	98.71	52.267			
7,800.0	7,766.7	2,695.0	2,695.0	29.7	69.4	-54.17	-1,358.0	-1,131.5	5,253.8	5,154.7	99.10	53.016			
7,900.0	7,866.2	2,695.0	2,695.0	30.0	69.4	-54.17	-1,358.0	-1,131.5	5,348.8	5,249.3	99.49	53.761			
8,000.0	7,965.7	2,695.0	2,695.0	30.4	69.4	-54.17	-1,358.0	-1,131.5	5,443.9	5,344.0	99.88	54.503			
8,100.0	8,065.1	2,695.0	2,695.0	30.8	69.4	-54.17	-1,358.0	-1,131.5	5,539.2	5,438.9	100.28	55.240			
8,200.0	8,164.6	2,695.0	2,695.0	31.2	69.4	-54.17	-1,358.0	-1,131.5	5,634.6	5,534.0	100.67	55.972			
8,300.0	8,264.1	2,695.0	2,695.0	31.6	69.4	-54.17	-1,358.0	-1,131.5	5,730.3	5,629.2	101.06	56.701			
8,400.0	8,363.6	2,695.0	2,695.0	32.0	69.4	-54.17	-1,358.0	-1,131.5	5,826.0	5,724.6	101.45	57.426			
8,500.0	8,463.1	2,695.0	2,695.0	32.4	69.4	-54.17	-1,358.0	-1,131.5	5,921.9	5,820.1	101.85	58.146			
8,600.0	8,562.6	2,695.0	2,695.0	32.8	69.4	-54.17	-1,358.0	-1,131.5	6,018.0	5,915.7	102.24	58.862			
8,700.0	8,662.1	2,695.0	2,695.0	33.2	69.4	-54.17	-1,358.0	-1,131.5	6,114.1	6,011.5	102.63	59.574			
8,800.0	8,761.6	2,695.0	2,695.0	33.6	69.4	-54.17	-1,358.0	-1,131.5	6,210.4	6,107.4	103.02	60.281			
8,818.3	8,779.9	2,695.0	2,695.0	33.7	69.4	-54.17	-1,358.0	-1,131.5	6,228.1	6,125.0	103.10	60.411			
8,825.0	8,786.5	2,695.0	2,695.0	33.7	69.4	-47.88	-1,358.0	-1,131.5	6,234.5	6,131.4	103.12	60.458			
8,850.0	8,811.4	2,695.0	2,695.0	33.8	69.4	-27.40	-1,358.0	-1,131.5	6,258.3	6,155.1	103.22	60.632			
8,875.0	8,836.1	2,695.0	2,695.0	33.9	69.4	-14.90	-1,358.0	-1,131.5	6,281.8	6,178.5	103.32	60.802			
8,900.0	8,860.7	2,695.0	2,695.0	34.0	69.4	-8.06	-1,358.0	-1,131.5	6,304.9	6,201.5	103.41	60.970			
8,925.0	8,885.1	2,695.0	2,695.0	34.1	69.4	-4.21	-1,358.0	-1,131.5	6,327.5	6,224.0	103.50	61.133			
8,950.0	8,909.2	2,695.0	2,695.0	34.2	69.4	-1.94	-1,358.0	-1,131.5	6,349.6	6,246.0	103.60	61.292			
8,975.0	8,933.0	2,695.0	2,695.0	34.2	69.4	-0.52	-1,358.0	-1,131.5	6,371.1	6,267.4	103.69	61.446			
9,000.0	8,956.3	2,695.0	2,695.0	34.3	69.4	0.39	-1,358.0	-1,131.5	6,392.0	6,288.2	103.78	61.595			

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

COG Operating LLC

Anticollision Report

Company:	COG OPERATING, LLC	Local Co-ordinate Reference:	Well LUSK DEEP UNIT A #33H
Project:	LEA COUNTY, NM	TVD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Reference Site:	LUSK BSS	MD Reference:	3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
Site Error:	0.0 usft	North Reference:	Grid
Reference Well:	LUSK DEEP UNIT A #33H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.0 usft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM_Users
Reference Design:	DWD Plan 3 - land at 100' FNL	Offset TVD Reference:	Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH													Offset Site Error:	0.0 usft
Survey Program: 2695-INC-ONLY													Offset Well Error:	3.0 usft
Reference	Offset	Semi Major Axis		Distance		Warning								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (")	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,025.0	8,979.2	2,695.0	2,695.0	34.4	69.4	1.00	-1,358.0	-1,131.5	6,412.2	6,308.3	103.86	61.738		
9,050.0	9,001.5	2,695.0	2,695.0	34.5	69.4	1.41	-1,358.0	-1,131.5	6,431.6	6,327.7	103.95	61.874		
9,075.0	9,023.2	2,695.0	2,695.0	34.6	69.4	1.70	-1,358.0	-1,131.5	6,450.3	6,346.3	104.03	62.005		
9,100.0	9,044.2	2,695.0	2,695.0	34.7	69.4	1.91	-1,358.0	-1,131.5	6,468.1	6,364.0	104.11	62.128		
9,125.0	9,064.5	2,695.0	2,695.0	34.7	69.4	2.05	-1,358.0	-1,131.5	6,485.1	6,380.9	104.19	62.244		
9,150.0	9,084.0	2,695.0	2,695.0	34.8	69.4	2.16	-1,358.0	-1,131.5	6,501.1	6,396.9	104.26	62.353		
9,175.0	9,102.7	2,695.0	2,695.0	34.9	69.4	2.24	-1,358.0	-1,131.5	6,516.2	6,411.9	104.34	62.453		
9,200.0	9,120.5	2,695.0	2,695.0	35.0	69.4	2.30	-1,358.0	-1,131.5	6,530.4	6,426.0	104.41	62.545		
9,225.0	9,137.4	2,695.0	2,695.0	35.0	69.4	2.35	-1,358.0	-1,131.5	6,543.5	6,439.0	104.48	62.628		
9,250.0	9,153.3	2,695.0	2,695.0	35.1	69.4	2.39	-1,358.0	-1,131.5	6,555.6	6,451.0	104.55	62.701		
9,275.0	9,168.1	2,695.0	2,695.0	35.2	69.4	2.42	-1,358.0	-1,131.5	6,566.6	6,462.0	104.62	62.765		
9,300.0	9,181.9	2,695.0	2,695.0	35.2	69.4	2.45	-1,358.0	-1,131.5	6,576.5	6,471.8	104.69	62.819		
9,325.0	9,194.6	2,695.0	2,695.0	35.3	69.4	2.47	-1,358.0	-1,131.5	6,585.3	6,480.5	104.76	62.861		
9,350.0	9,206.2	2,695.0	2,695.0	35.4	69.4	2.50	-1,358.0	-1,131.5	6,592.9	6,488.1	104.83	62.893		
9,375.0	9,216.6	2,695.0	2,695.0	35.5	69.4	2.53	-1,358.0	-1,131.5	6,599.5	6,494.6	104.90	62.913		
9,400.0	9,225.8	2,695.0	2,695.0	35.5	69.4	2.55	-1,358.0	-1,131.5	6,604.8	6,499.8	104.97	62.922		
9,425.0	9,233.8	2,695.0	2,695.0	35.6	69.4	2.58	-1,358.0	-1,131.5	6,609.0	6,503.9	105.04	62.918		
9,450.0	9,240.5	2,695.0	2,695.0	35.7	69.4	2.62	-1,358.0	-1,131.5	6,611.9	6,506.8	105.12	62.902		
9,475.0	9,246.0	2,695.0	2,695.0	35.7	69.4	2.66	-1,358.0	-1,131.5	6,613.7	6,508.5	105.19	62.873		
9,500.0	9,250.2	2,695.0	2,695.0	35.8	69.4	2.70	-1,358.0	-1,131.5	6,614.3	6,509.0	105.27	62.831		
9,525.0	9,253.1	2,695.0	2,695.0	35.9	69.4	2.74	-1,358.0	-1,131.5	6,613.7	6,508.3	105.35	62.776		
9,550.0	9,254.7	2,695.0	2,695.0	36.0	69.4	2.80	-1,358.0	-1,131.5	6,611.9	6,506.4	105.44	62.709		
9,561.6	9,255.0	2,695.0	2,695.0	36.0	69.4	2.82	-1,358.0	-1,131.5	6,610.6	6,505.1	105.48	62.673		
9,600.0	9,255.6	2,695.0	2,695.0	36.2	69.4	2.82	-1,358.0	-1,131.5	6,606.2	6,500.5	105.62	62.548		
9,700.0	9,257.0	2,695.0	2,695.0	36.6	69.4	2.82	-1,358.0	-1,131.5	6,595.6	6,489.6	106.03	62.206		
9,800.0	9,258.4	2,695.0	2,695.0	37.1	69.4	2.82	-1,358.0	-1,131.5	6,586.6	6,480.0	106.51	61.838		
9,900.0	9,259.8	2,695.0	2,695.0	37.6	69.4	2.82	-1,358.0	-1,131.5	6,579.0	6,472.0	107.07	61.448		
10,000.0	9,261.3	2,695.0	2,695.0	38.2	69.4	2.82	-1,358.0	-1,131.5	6,573.0	6,465.3	107.69	61.038		
10,100.0	9,262.7	2,695.0	2,695.0	38.9	69.4	2.82	-1,358.0	-1,131.5	6,568.5	6,460.1	108.37	60.612		
10,200.0	9,264.1	2,695.0	2,695.0	39.7	69.4	2.82	-1,358.0	-1,131.5	6,565.5	6,456.4	109.11	60.171		
10,300.0	9,265.6	2,695.0	2,695.0	40.5	69.4	2.82	-1,358.0	-1,131.5	6,564.0	6,454.1	109.91	59.720		
10,346.4	9,266.2	2,695.0	2,695.0	40.9	69.4	2.82	-1,358.0	-1,131.5	6,563.9	6,453.6	110.31	59.506		
10,400.0	9,267.0	2,695.0	2,695.0	41.3	69.4	2.82	-1,358.0	-1,131.5	6,564.1	6,453.3	110.77	59.261		
10,500.0	9,268.4	2,695.0	2,695.0	42.2	69.4	2.82	-1,358.0	-1,131.5	6,565.7	6,454.0	111.67	58.796		
10,600.0	9,269.9	2,695.0	2,695.0	43.2	69.4	2.82	-1,358.0	-1,131.5	6,568.8	6,456.1	112.62	58.328		
10,700.0	9,271.3	2,695.0	2,695.0	44.2	69.4	2.82	-1,358.0	-1,131.5	6,573.4	6,459.8	113.61	57.859		
10,800.0	9,272.7	2,695.0	2,695.0	45.2	69.4	2.82	-1,358.0	-1,131.5	6,579.5	6,464.9	114.64	57.391		
10,900.0	9,274.2	2,695.0	2,695.0	46.3	69.4	2.82	-1,358.0	-1,131.5	6,587.2	6,471.5	115.71	56.926		
11,000.0	9,275.6	2,695.0	2,695.0	47.4	69.4	2.82	-1,358.0	-1,131.5	6,596.3	6,479.5	116.82	56.466		
11,100.0	9,277.0	2,695.0	2,695.0	48.5	69.4	2.82	-1,358.0	-1,131.5	6,607.0	6,489.0	117.96	56.011		
11,200.0	9,278.4	2,695.0	2,695.0	49.7	69.4	2.82	-1,358.0	-1,131.5	6,619.1	6,500.0	119.13	55.563		
11,300.0	9,279.9	2,695.0	2,695.0	50.9	69.4	2.82	-1,358.0	-1,131.5	6,632.8	6,512.4	120.33	55.123		
11,400.0	9,281.3	2,695.0	2,695.0	52.1	69.4	2.82	-1,358.0	-1,131.5	6,647.9	6,526.3	121.55	54.693		
11,500.0	9,282.7	2,695.0	2,695.0	53.4	69.4	2.82	-1,358.0	-1,131.5	6,664.5	6,541.7	122.80	54.272		
11,600.0	9,284.2	2,695.0	2,695.0	54.6	69.4	2.82	-1,358.0	-1,131.5	6,682.5	6,558.4	124.07	53.861		
11,700.0	9,285.6	2,695.0	2,695.0	55.9	69.4	2.82	-1,358.0	-1,131.5	6,702.0	6,576.6	125.36	53.461		
11,800.0	9,287.0	2,695.0	2,695.0	57.2	69.4	2.82	-1,358.0	-1,131.5	6,722.9	6,596.2	126.68	53.072		
11,900.0	9,288.5	2,695.0	2,695.0	58.6	69.4	2.82	-1,358.0	-1,131.5	6,745.2	6,617.2	128.01	52.694		
12,000.0	9,289.9	2,695.0	2,695.0	59.9	69.4	2.82	-1,358.0	-1,131.5	6,769.0	6,639.6	129.35	52.329		
12,100.0	9,291.3	2,695.0	2,695.0	61.3	69.4	2.82	-1,358.0	-1,131.5	6,794.1	6,663.4	130.72	51.975		
12,200.0	9,292.8	2,695.0	2,695.0	62.7	69.4	2.82	-1,358.0	-1,131.5	6,820.6	6,688.5	132.10	51.632		

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

COG Operating LLC

Anticollision Report

Company: COG OPERATING, LLC
 Project: LEA COUNTY, NM
 Reference Site: LUSK BSS
 Site Error: 0.0 usft
 Reference Well: LUSK DEEP UNIT A #33H
 Well Error: 0.0 usft
 Reference Wellbore: Wellbore #1
 Reference Design: DWD Plan 3 - land at 100' FNL

Local Co-ordinate Reference: Well LUSK DEEP UNIT A #33H
 TVD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 MD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM_Users
 Offset TVD Reference: Offset Datum

Offset Design LUSK BSS - SOUTHERN CALIF #3 - OWB - ACTUAL WELLPATH													Offset Site Error: 0.0 usft
Survey Program: 2695-INC-ONLY													Offset Well Error: 3.0 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Between Centres (usft)	Between Ellipses (usft)					
12,300.0	9,294.2	2,695.0	2,695.0	64.0	69.4	2.82	-1,358.0	-1,131.5	6,848.4	6,714.9	133.49	51.302	
12,400.0	9,295.6	2,695.0	2,695.0	65.5	69.4	2.82	-1,358.0	-1,131.5	6,877.6	6,742.7	134.90	50.984	
12,500.0	9,297.1	2,695.0	2,695.0	66.9	69.4	2.82	-1,358.0	-1,131.5	6,908.1	6,771.8	136.32	50.677	
12,600.0	9,298.5	2,695.0	2,695.0	68.3	69.4	2.82	-1,358.0	-1,131.5	6,940.0	6,802.2	137.75	50.381	
12,700.0	9,299.9	2,695.0	2,695.0	69.7	69.4	2.82	-1,358.0	-1,131.5	6,973.1	6,833.9	139.19	50.098	
12,800.0	9,301.3	2,695.0	2,695.0	71.2	69.4	2.82	-1,358.0	-1,131.5	7,007.5	6,866.8	140.64	49.825	
12,900.0	9,302.8	2,695.0	2,695.0	72.7	69.4	2.82	-1,358.0	-1,131.5	7,043.1	6,901.0	142.10	49.563	
13,000.0	9,304.2	2,695.0	2,695.0	74.1	69.4	2.82	-1,358.0	-1,131.5	7,080.0	6,936.4	143.57	49.313	
13,100.0	9,305.6	2,695.0	2,695.0	75.6	69.4	2.82	-1,358.0	-1,131.5	7,118.1	6,973.0	145.05	49.072	
13,200.0	9,307.1	2,695.0	2,695.0	77.1	69.4	2.82	-1,358.0	-1,131.5	7,157.3	7,010.8	146.54	48.843	
13,300.0	9,308.5	2,695.0	2,695.0	78.6	69.4	2.82	-1,358.0	-1,131.5	7,197.8	7,049.8	148.03	48.623	
13,400.0	9,309.9	2,695.0	2,695.0	80.1	69.4	2.82	-1,358.0	-1,131.5	7,239.4	7,089.9	149.53	48.413	
13,500.0	9,311.4	2,695.0	2,695.0	81.6	69.4	2.82	-1,358.0	-1,131.5	7,282.2	7,131.1	151.04	48.213	
13,600.0	9,312.8	2,695.0	2,695.0	83.1	69.4	2.82	-1,358.0	-1,131.5	7,326.0	7,173.5	152.56	48.021	
13,700.0	9,314.2	2,695.0	2,695.0	84.6	69.4	2.82	-1,358.0	-1,131.5	7,371.0	7,216.9	154.08	47.839	
13,800.0	9,315.7	2,695.0	2,695.0	86.2	69.4	2.82	-1,358.0	-1,131.5	7,417.0	7,261.4	155.60	47.666	
13,900.0	9,317.1	2,695.0	2,695.0	87.7	69.4	2.82	-1,358.0	-1,131.5	7,464.1	7,307.0	157.14	47.501	
14,000.0	9,318.5	2,695.0	2,695.0	89.2	69.4	2.82	-1,358.0	-1,131.5	7,512.2	7,353.5	158.67	47.344	
14,100.0	9,320.0	2,695.0	2,695.0	90.8	69.4	2.82	-1,358.0	-1,131.5	7,561.4	7,401.1	160.21	47.195	
14,200.0	9,321.4	2,695.0	2,695.0	92.3	69.4	2.82	-1,358.0	-1,131.5	7,611.5	7,449.7	161.76	47.054	
14,300.0	9,322.8	2,695.0	2,695.0	93.9	69.4	2.82	-1,358.0	-1,131.5	7,662.6	7,499.3	163.31	46.920	
14,400.0	9,324.2	2,695.0	2,695.0	95.4	69.4	2.82	-1,358.0	-1,131.5	7,714.7	7,549.8	164.87	46.794	
14,500.0	9,325.7	2,695.0	2,695.0	97.0	69.4	2.82	-1,358.0	-1,131.5	7,767.7	7,601.3	166.42	46.674	
14,600.0	9,327.1	2,695.0	2,695.0	98.5	69.4	2.82	-1,358.0	-1,131.5	7,821.6	7,653.6	167.99	46.561	
14,683.3	9,328.3	2,695.0	2,695.0	99.8	69.4	2.82	-1,358.0	-1,131.5	7,867.2	7,698.0	169.29	46.472	

COG Operating LLC

Anticollision Report

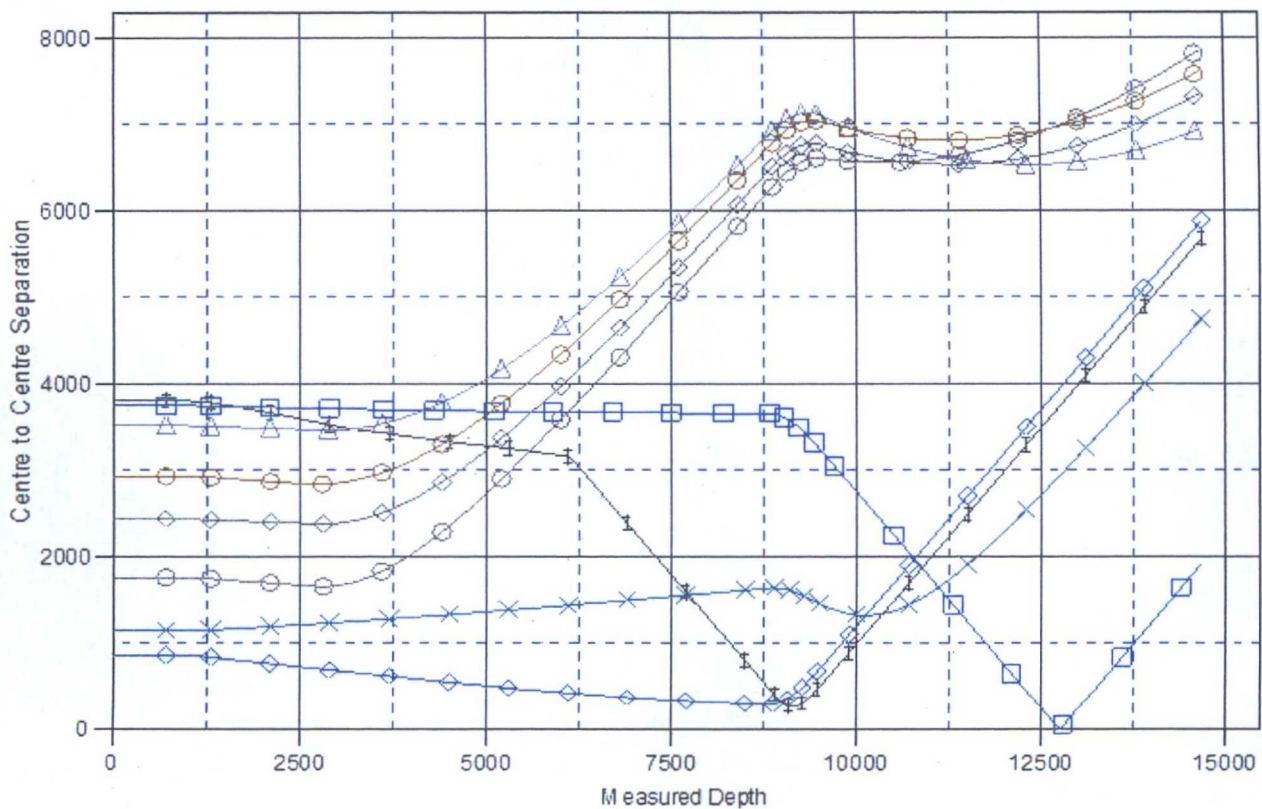
Company: COG OPERATING, LLC
 Project: LEA COUNTY, NM
 Reference Site: LUSK BSS
 Site Error: 0.0 usft
 Reference Well: LUSK DEEP UNIT A #33H
 Well Error: 0.0 usft
 Reference Wellbore: Wellbore #1
 Reference Design: DWD Plan 3 - land at 100' FNL

Local Co-ordinate Reference: Well LUSK DEEP UNIT A #33H
 TVD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 MD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM_Users
 Offset TVD Reference: Offset Datum

Reference Depths are relative to 3585 + 20 = 3605' RKB @ 3605.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: LUSK DEEP UNIT A #33H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.29°

Ladder Plot



LEGEND

IT A #28H, OWB, ACTUAL WELL PATH V0
 IT A #5, OWB, ACTUAL WELL PATH V0
 IT #2, OWB, ACTUAL WELL PATH V0
 LUSK DEEP UNIT A #1, OWB, ACTUAL WELL PATH V0
 SOUTHERN CALIF #3, OWB, ACTUAL WELL PATH V0
 SOUTHERN CALIFEDER #2, OWB, ACTUAL WELL PATH V0
 FEDERAL #1, OWB, ACTUAL WELL PATH V0
 GULF FEDERAL #2, OWB, ACTUAL WELL PATH V0

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

COG Operating LLC

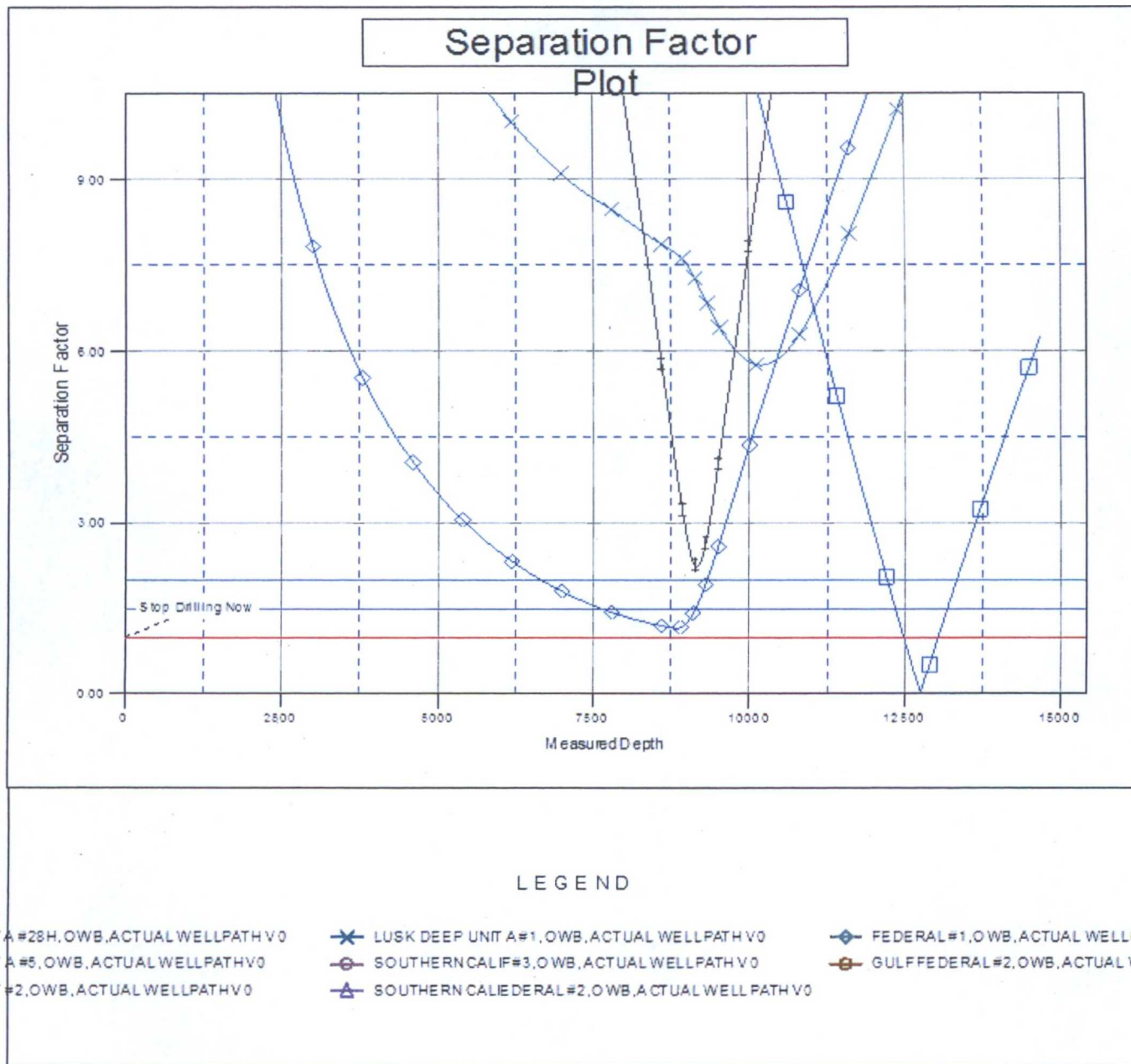
Anticollision Report

Company: COG OPERATING, LLC
 Project: LEA COUNTY, NM
 Reference Site: LUSK BSS
 Site Error: 0.0 usft
 Reference Well: LUSK DEEP UNIT A #33H
 Well Error: 0.0 usft
 Reference Wellbore: Wellbore #1
 Reference Design: DWD Plan 3 - land at 100' FNL

Local Co-ordinate Reference: Well LUSK DEEP UNIT A #33H
 TVD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 MD Reference: 3585 + 20 = 3605' RKB @ 3605.0usft (PATRIOT #2)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: EDM_Users
 Offset TVD Reference: Offset Datum

Reference Depths are relative to 3585 + 20 = 3605' RKB @ 3605.0usft
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: LUSK DEEP UNIT A #33H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.29°



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

HOBBS OCD

SEP 07 2016

DISTRICT I
1628 N. FRENCH DR., HOBBS, NM 88240
Phone: (505) 393-6181 Fax: (505) 393-0720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-0720

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) 478-3460 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

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 30-025-	Pool Code 41440	Pool Name Lusk; Bone Spring
Property Code 308161	Property Name LUSK DEEP UNIT A	Well Number 33H
OCRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3585.2'

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	18	19-S	32-E		373	SOUTH	1166	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
O	19	19-S	32-E		50	SOUTH	1980	EAST	LEA

Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.
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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

LOT 1 40.90 Ac LOT 2 40.84 Ac LOT 3 40.81 Ac LOT 4 40.84 Ac SECTION 18 SECTION 19 LOT 1 40.70 Ac LOT 2 40.74 Ac LOT 3 40.81 Ac LOT 4 40.86 Ac NMLC0064198A NMNM025566	PROJECT AREA PRODUCING AREA GRID AZ. -187°52'23" HORIZ. DIST. -5651.3' B.H. 1980'	NAD 27 SURFACE LOCATION Y=602092.3 N X=664064.9 E LAT.=32.654121° N LONG.=103.800267° W NAD 27 PROPOSED BOTTOM HOLE LOCATION Y=596494.3 N X=663290.8 E LAT.=32.638745° N LONG.=103.802873° W	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. <i>Mayte Reyes</i> 8-3-16 Signature Date Mayte Reyes Printed Name mreyes1@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 18, 2016 Date of Survey Signature & Seal of Professional Surveyor <i>Chad L. Harcrow</i> 5/18/16 Certificate No. CHAD HARCROW 17777 W.O. # 16-373 DRAWN BY: AF
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