

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
NMNM125658

6. If Indian, Allottee or Tribe Name

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

SUBMIT IN TRIPLICATE - Other instructions on page 2**HOBBS OCD**

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

NOV 28 2018

8. Well Name and No.
FEZ FEDERAL COM 703H2. Name of Operator
COG OPERATING LLCContact: MAYTE X REYES
E-Mail: mreyes1@concho.com9. API Well No.
30-025-45279-00-X13a. Address
ONE CONCHO CENTER 600 W ILLINOIS AVENUE
MIDLAND, TX 79701-42873b. Phone No. (include area code)
Ph: 575-748-694510. Field and Pool or Exploratory Area
WC025G09S243532M-WOLFBONE

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

Sec 9 T25S R35E SWSW 280FSL 1085FWL
32.138409 N Lat, 103.377518 W Lon11. County or Parish, State
LEA COUNTY, NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must 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 originally approved APD.

BHL

From: 200' FNL & 990' FWL Section 4. T25S. R35E.
To: 200' FNL & 1310' FWL Section 4. T25S. R35E

This results in the MD TD increasing to 22,654?.

C102 Attached.
AC Report Attached.
Directional Plan Attached.arisdad Field Office
OCD Hobbs

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

Electronic Submission #442381 verified by the BLM Well Information System
For COG OPERATING LLC, sent to the Hobbs
Committed to AFMSS for processing by MUSTAFA HAQUE on 11/02/2018 (19MH0011SE)

Name (Printed/Typed) MAYTE X REYES

Title REGULATORY ANALYST

Signature (Electronic Submission)

Date 11/02/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By MUSTAFA HAQUE

Title PETROLEUM ENGINEER

Date 11/08/2018

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.

(Instructions on page 2)

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

DISTRICT I
1025 N. FRENCH DR., BOBBS, NM 88240
Phone: (505) 323-0181 Fax: (505) 323-0782

DISTRICT II
611 S. FIRST ST., ARTESIA, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

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

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

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

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number 30-025-45279	Pool Code 98098	Pool Name Wildcat; Wolfbone
Property Code 322742	Property Name FEZ FEDERAL COM	Well Number 703H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3250.6'

Surface Location

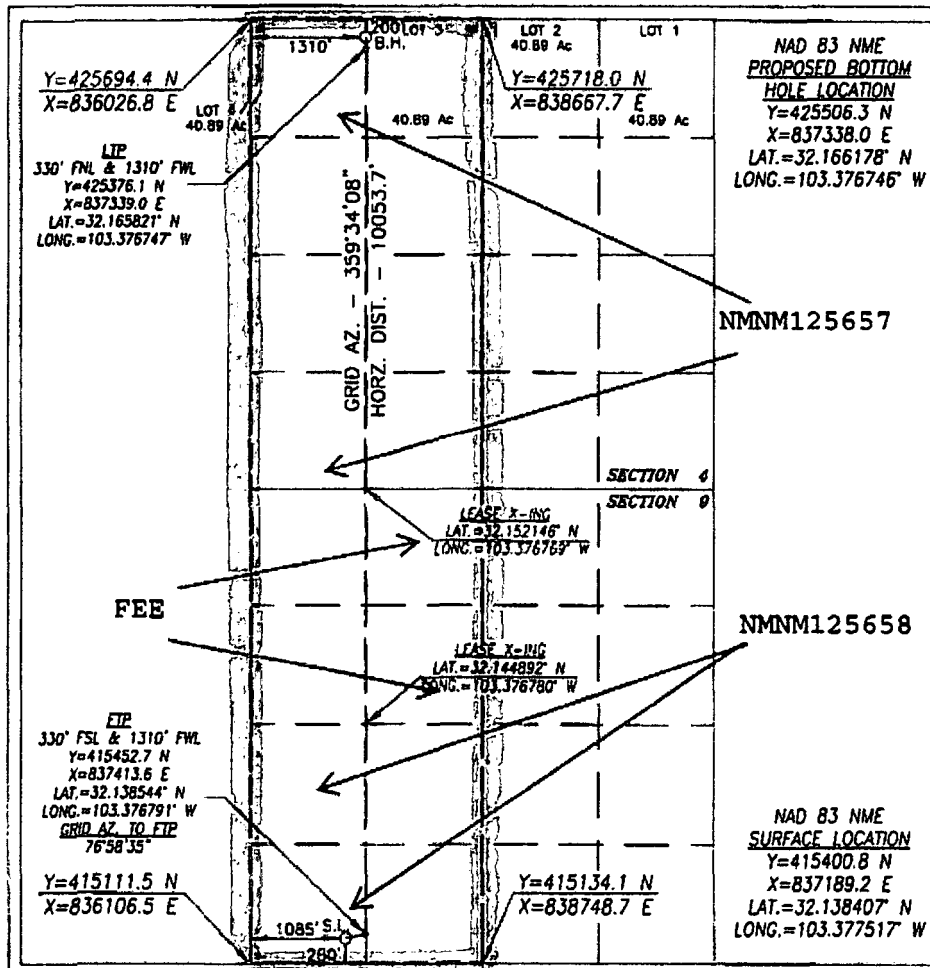
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	9	25-S	35-E		280	SOUTH	1085	WEST	LEA

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
4	4	25-S	35-E		200	NORTH	1310	WEST	LEA

Dedicated Acres 639.8	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



OPERATOR CERTIFICATION

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

Signature: Mayte Reyes Date: 11-18

Printed Name: Mayte Reyes

E-mail Address: mreyes1@concho.com

SURVEYOR CERTIFICATION

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

DECEMBER 2, 2017

Date of Survey

Signature & Seal of Professional Surveyor



Signature: Chad Harcrow 10/2/18
Certificate No. CHAD HARCROW 17777
W.O. # 17-1254 DRAWN BY: JH

As per LR2000 Lot 3: 39.89 Lot 4: 39.91



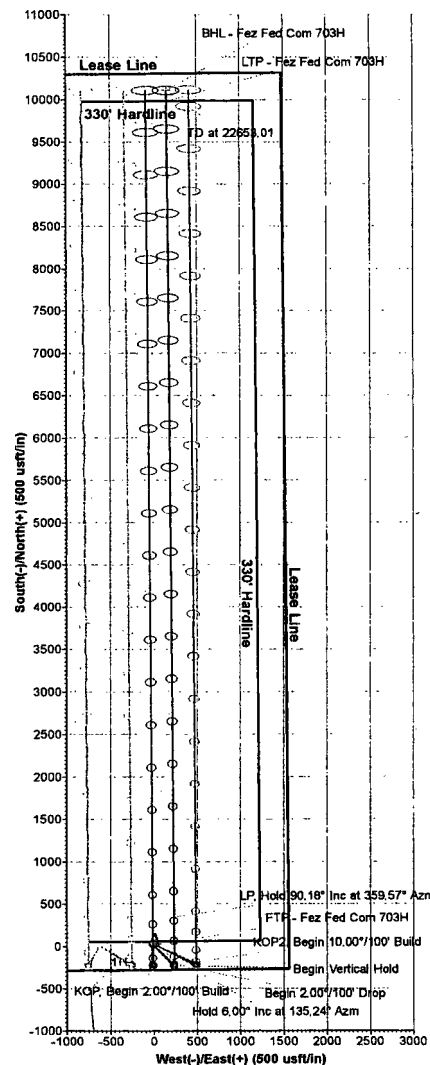
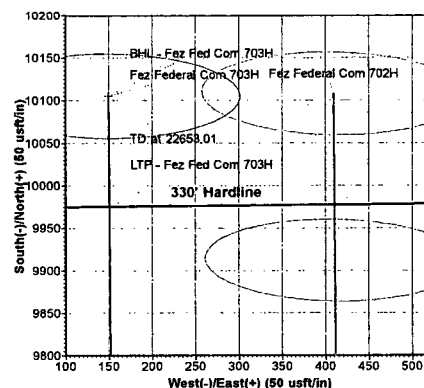
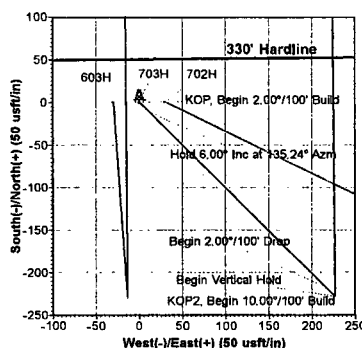
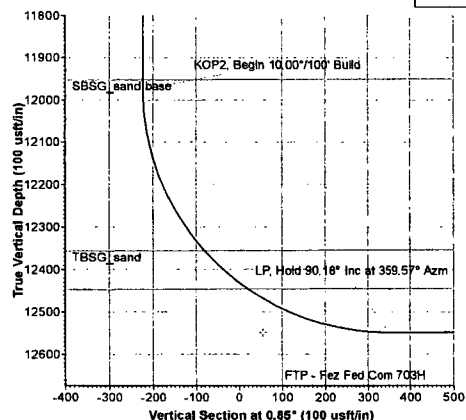
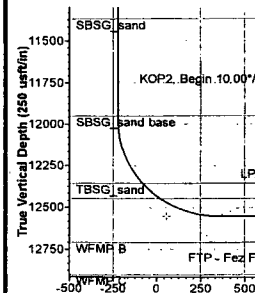
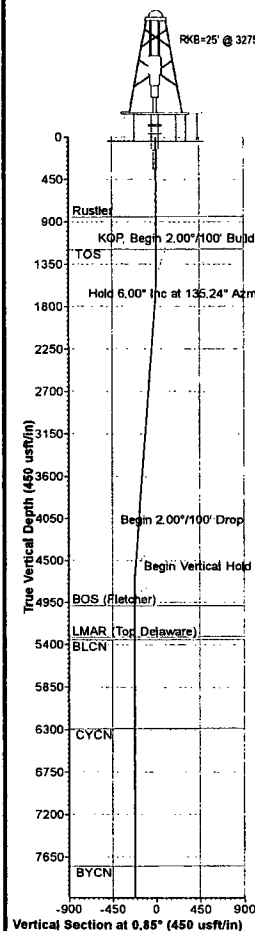
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH
Design: Plan 1 10-12-18
Rig: Precision 595



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: -0.51°
Magnetic North: 6.17°
Magnetic Field
Strength: 47836.3nT
Dip Angle: 59.80°
Date: 10/11/2018
Model: MVHD



WELL DETAILS						
3250.60						
+N-S	+E-W	Northing	Easting	Latitude	Longitude	
0.00	0.00	415342.50	798002.60	32° 8' 17.81034 N	103° 22' 37.38477 W	

DESIGN TARGET DETAILS						
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude
BHL - Fez Fed Com 703H	12519.00	10105.20	149.30	425447.70	798151.80	32° 8' 57.78931 N
LTP - Fez Fed Com 703H	12519.40	9975.00	150.20	425317.50	796152.80	32° 9' 56.50089 N
FTP - Fez Fed Com 703H	12549.00	51.90	224.50	415394.40	798227.10	32° 8' 18.30417 N

SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSec	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP2, Begin 2.00°/100' Build
2	1800.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00	0.00	0.00	Hold 6.00° inc at 135.24° Azm
3	1800.00	0.00	135.24	1799.54	-11.15	-11.96	2.00	135.24	-10.98	0.00	Begin 2.00°/100' Drop
4	4572.26	0.00	135.24	4556.46	-216.85	215.16	0.00	0.00	-213.75	0.00	Begin Vertical Hold
5	4872.26	0.00	0.00	4856.00	-228.10	226.22	2.00	180.00	-224.73	0.00	KOP2, Begin 10.00°/100' Build
6	11992.33	0.00	0.00	11976.04	-228.10	226.22	0.00	0.00	-224.73	0.00	LP, Hold 90.18° inc at 359.57° Azm
7	12894.09	90.18	359.57	12549.00	346.60	221.94	10.00	359.57	349.84	0.00	TD at 22653.01
8	22653.01	90.18	359.57	12519.00	10105.20	149.30	0.00	0.00	0.00	0.00	BHL - Fez Fed Com 703H

LEGEND

- 604H, OH, Plan 1 10-12-18 V0
- 1H, OH, Surveys V0
- 702H, OH, Plan 1 10-12-18 V0
- 603H, OH, Plan 1 10-12-18 V0
- 704H, OH, Plan 1 10-12-18 V0
- Plan 1 10-12-18

Map System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone Name: New Mexico East 3001
Local Origin: Well 703H, Grid North
Latitude: 32° 8' 17.81034 N
Longitude: 103° 22' 37.38477 W
Grid East: 798002.60
Grid North: 415342.50
Scale Factor: 1.000
Geomagnetic Model: MVHD
Sample Date: 11-Oct-18
Magnetic Declination: 6.68°
Dip Angle from Horizontal: 59.80°
Magnetic Field Strength: 47836.33317652nT
To convert a Magnetic Direction to a Grid Direction, Add 6.17°
To convert a Magnetic Direction to a True Direction, Add 6.68° East
To convert a True Direction to a Grid Direction, Subtract 0.51°

FORMATION TOP DETAILS			
TVDPath	MDPath	Formation	DipAngle
847.00	847.00	Rustler	-0.18
1188.00	1188.00	TOS	-0.18
4983.71	5000.00	BOS (Fletcher)	-0.18
5314.71	5331.00	LMAR (Top Delaware)	-0.18
5346.71	5363.00	BLCN	-0.18
6285.71	6302.00	CYCN	-0.18
7745.71	7762.00	BYCN	-0.18
8876.71	8893.00	Bone Sprg	-0.18
9193.71	9210.00	U Avalon	-0.18
9557.71	9574.00	L Avalon	-0.18
10374.71	10391.00	FBSP sand	-0.18
10894.71	10911.00	SBSG sand	-0.18
11368.71	11385.00	SBSG sand	-0.18
11951.71	11968.00	SBSG sand base	-0.18
12355.26	12408.75	TBSG sand	-0.18
12445.84	12543.30	WFMB	-0.18



COG Operating LLC

Lea County, NM (NAD27 NME)

Fez Federal Com

703H

OH

Plan: Plan 1 10-12-18

Standard Planning Report

12 October, 2018



Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 703H
 Wellbore: OH
 Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

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

Site	Fez Federal Com				
Site Position:		Northing:	415,342.20 usft	Latitude:	32° 8' 17.81002 N
From:	Map	Easting:	795,972.50 usft	Longitude:	103° 22' 37.73484 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16"	Grid Convergence:	0.51 °

Well	703H					
Well Position	+N/-S	0.30 usft	Northing:	415,342.50 usft	Latitude:	32° 8' 17.81034 N
	+E/-W	30.10 usft	Easting:	796,002.60 usft	Longitude:	103° 22' 37.38477 W
Position Uncertainty		0.00 usft	Wellhead Elevation:		Ground Level:	3,250.60 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	MVHD	10/11/2018	6.68	59.80	47,836.33317652

Design	Plan 1 10-12-18				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:	0.00	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.00	0.00	0.00	0.85	

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00	
1,800.09	6.00	135.24	1,799.54	-11.15	11.06	2.00	2.00	0.00	135.24	
4,572.20	6.00	135.24	4,556.46	-216.95	215.16	0.00	0.00	0.00	0.00	
4,872.29	0.00	0.00	4,856.00	-228.10	226.22	2.00	-2.00	0.00	180.00	
11,992.33	0.00	0.00	11,976.04	-228.10	226.22	0.00	0.00	0.00	0.00	
12,894.09	90.18	359.57	12,549.00	346.60	221.94	10.00	10.00	-0.05	359.57	
22,653.01	90.18	359.57	12,519.00	10,105.20	149.30	0.00	0.00	0.00	0.00	BHL - Fez Fed Com 7

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 703H
 Wellbore: OH
 Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
847.00	0.00	0.00	847.00	0.00	0.00	0.00	0.00	0.00	0.00
Rustler									
1,188.00	0.00	0.00	1,188.00	0.00	0.00	0.00	0.00	0.00	0.00
TOS									
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 2.00°/100' Build									
1,600.00	2.00	135.24	1,599.98	-1.24	1.23	-1.22	2.00	2.00	0.00
1,700.00	4.00	135.24	1,699.84	-4.95	4.91	-4.88	2.00	2.00	0.00
1,800.00	6.00	135.24	1,799.45	-11.14	11.05	-10.98	2.00	2.00	0.00
1,800.09	6.00	135.24	1,799.54	-11.15	11.06	-10.98	2.00	2.00	0.00
Hold 6.00° Inc at 135.24° Azm									
1,900.00	6.00	135.24	1,898.90	-18.57	18.41	-18.29	0.00	0.00	0.00
2,000.00	6.00	135.24	1,998.36	-25.99	25.78	-25.61	0.00	0.00	0.00
2,100.00	6.00	135.24	2,097.81	-33.41	33.14	-32.92	0.00	0.00	0.00
2,200.00	6.00	135.24	2,197.26	-40.84	40.50	-40.24	0.00	0.00	0.00
2,300.00	6.00	135.24	2,296.71	-48.26	47.87	-47.55	0.00	0.00	0.00
2,400.00	6.00	135.24	2,396.16	-55.69	55.23	-54.86	0.00	0.00	0.00
2,500.00	6.00	135.24	2,495.62	-63.11	62.59	-62.18	0.00	0.00	0.00
2,600.00	6.00	135.24	2,595.07	-70.53	69.95	-69.49	0.00	0.00	0.00
2,700.00	6.00	135.24	2,694.52	-77.96	77.32	-76.81	0.00	0.00	0.00
2,800.00	6.00	135.24	2,793.97	-85.38	84.68	-84.12	0.00	0.00	0.00
2,900.00	6.00	135.24	2,893.42	-92.81	92.04	-91.44	0.00	0.00	0.00
3,000.00	6.00	135.24	2,992.87	-100.23	99.41	-98.75	0.00	0.00	0.00
3,100.00	6.00	135.24	3,092.33	-107.65	106.77	-106.07	0.00	0.00	0.00
3,200.00	6.00	135.24	3,191.78	-115.08	114.13	-113.38	0.00	0.00	0.00
3,300.00	6.00	135.24	3,291.23	-122.50	121.49	-120.69	0.00	0.00	0.00
3,400.00	6.00	135.24	3,390.68	-129.93	128.86	-128.01	0.00	0.00	0.00
3,500.00	6.00	135.24	3,490.13	-137.35	136.22	-135.32	0.00	0.00	0.00
3,600.00	6.00	135.24	3,589.59	-144.77	143.58	-142.64	0.00	0.00	0.00
3,700.00	6.00	135.24	3,689.04	-152.20	150.95	-149.95	0.00	0.00	0.00
3,800.00	6.00	135.24	3,788.49	-159.62	158.31	-157.27	0.00	0.00	0.00
3,900.00	6.00	135.24	3,887.94	-167.05	165.67	-164.58	0.00	0.00	0.00
4,000.00	6.00	135.24	3,987.39	-174.47	173.03	-171.90	0.00	0.00	0.00
4,100.00	6.00	135.24	4,086.84	-181.89	180.40	-179.21	0.00	0.00	0.00
4,200.00	6.00	135.24	4,186.30	-189.32	187.76	-186.52	0.00	0.00	0.00
4,300.00	6.00	135.24	4,285.75	-196.74	195.12	-193.84	0.00	0.00	0.00
4,400.00	6.00	135.24	4,385.20	-204.17	202.49	-201.15	0.00	0.00	0.00
4,500.00	6.00	135.24	4,484.65	-211.59	209.85	-208.47	0.00	0.00	0.00
4,572.20	6.00	135.24	4,556.46	-216.95	215.16	-213.75	0.00	0.00	0.00
Begin 2.00°/100' Drop									
4,600.00	5.45	135.24	4,584.12	-218.92	217.12	-215.69	2.00	-2.00	0.00
4,700.00	3.45	135.24	4,683.81	-224.42	222.58	-221.11	2.00	-2.00	0.00
4,800.00	1.45	135.24	4,783.72	-227.45	225.58	-224.10	2.00	-2.00	0.00
4,872.29	0.00	0.00	4,856.00	-228.10	226.22	-224.73	2.00	-2.00	0.00
Begin Vertical Hold									
5,000.00	0.00	0.00	4,983.71	-228.10	226.22	-224.73	0.00	0.00	0.00
BOS (Fletcher)									
5,331.00	0.00	0.00	5,314.71	-228.10	226.22	-224.73	0.00	0.00	0.00
LMAR (Top Delaware)									
5,363.00	0.00	0.00	5,346.71	-228.10	226.22	-224.73	0.00	0.00	0.00
BLCN									
6,302.00	0.00	0.00	6,285.71	-228.10	226.22	-224.73	0.00	0.00	0.00

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 703H
 Wellbore: OH
 Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
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 Survey Calculation Method: Minimum Curvature

Planned Survey:

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
CYCN									
7,762.00	0.00	0.00	7,745.71	-228.10	226.22	-224.73	0.00	0.00	0.00
BYCN									
8,993.00	0.00	0.00	8,976.71	-228.10	226.22	-224.73	0.00	0.00	0.00
Bone Sprg									
9,210.00	0.00	0.00	9,193.71	-228.10	226.22	-224.73	0.00	0.00	0.00
U Avalon									
9,574.00	0.00	0.00	9,557.71	-228.10	226.22	-224.73	0.00	0.00	0.00
L Avalon									
10,391.00	0.00	0.00	10,374.71	-228.10	226.22	-224.73	0.00	0.00	0.00
FBSP_sand									
10,911.00	0.00	0.00	10,894.71	-228.10	226.22	-224.73	0.00	0.00	0.00
SBSG_sand									
11,385.00	0.00	0.00	11,368.71	-228.10	226.22	-224.73	0.00	0.00	0.00
SBSG_sand									
11,968.00	0.00	0.00	11,951.71	-228.10	226.22	-224.73	0.00	0.00	0.00
SBSG_sand base									
11,992.33	0.00	0.00	11,976.04	-228.10	226.22	-224.73	0.00	0.00	0.00
KOP2, Begin 10.00°/100' Build									
12,000.00	0.77	359.57	11,983.71	-228.05	226.22	-224.68	10.00	10.00	0.00
12,100.00	10.77	359.57	12,083.08	-218.01	226.15	-214.65	10.00	10.00	0.00
12,200.00	20.77	359.57	12,179.19	-190.88	225.95	-187.52	10.00	10.00	0.00
12,300.00	30.77	359.57	12,269.13	-147.46	225.62	-144.11	10.00	10.00	0.00
12,400.00	40.77	359.57	12,350.17	-89.09	225.19	-85.75	10.00	10.00	0.00
12,406.75	41.44	359.57	12,355.26	-84.65	225.15	-81.32	10.00	10.00	0.00
TBSG_sand									
12,500.00	50.77	359.57	12,419.84	-17.53	224.65	-14.21	10.00	10.00	0.00
12,543.30	55.10	359.57	12,445.94	17.01	224.40	20.33	10.00	10.00	0.00
WFMP									
12,600.00	60.77	359.57	12,476.03	65.04	224.04	68.34	10.00	10.00	0.00
12,700.00	70.77	359.57	12,517.02	156.11	223.36	159.39	10.00	10.00	0.00
12,800.00	80.77	359.57	12,541.57	252.91	222.64	256.17	10.00	10.00	0.00
12,894.09	90.18	359.57	12,549.00	346.60	221.94	349.84	10.00	10.00	0.00
LP, Hold 90.18° Inc at 359.57° Azm									
12,900.00	90.18	359.57	12,548.98	352.51	221.90	355.75	0.01	0.01	0.00
13,000.00	90.18	359.57	12,548.67	452.51	221.16	455.72	0.00	0.00	0.00
13,100.00	90.18	359.57	12,548.36	552.50	220.41	555.70	0.00	0.00	0.00
13,200.00	90.18	359.57	12,548.06	652.50	219.67	655.67	0.00	0.00	0.00
13,300.00	90.18	359.57	12,547.75	752.50	218.92	755.65	0.00	0.00	0.00
13,400.00	90.18	359.57	12,547.44	852.49	218.18	855.62	0.00	0.00	0.00
13,500.00	90.18	359.57	12,547.13	952.49	217.43	955.60	0.00	0.00	0.00
13,600.00	90.18	359.57	12,546.83	1,052.49	216.69	1,055.57	0.00	0.00	0.00
13,700.00	90.18	359.57	12,546.52	1,152.48	215.94	1,155.55	0.00	0.00	0.00
13,800.00	90.18	359.57	12,546.21	1,252.48	215.20	1,255.52	0.00	0.00	0.00
13,900.00	90.18	359.57	12,545.90	1,352.48	214.46	1,355.50	0.00	0.00	0.00
14,000.00	90.18	359.57	12,545.60	1,452.47	213.71	1,455.47	0.00	0.00	0.00
14,100.00	90.18	359.57	12,545.29	1,552.47	212.97	1,555.45	0.00	0.00	0.00
14,200.00	90.18	359.57	12,544.98	1,652.47	212.22	1,655.42	0.00	0.00	0.00
14,300.00	90.18	359.57	12,544.67	1,752.46	211.48	1,755.40	0.00	0.00	0.00
14,400.00	90.18	359.57	12,544.37	1,852.46	210.73	1,855.37	0.00	0.00	0.00
14,500.00	90.18	359.57	12,544.06	1,952.46	209.99	1,955.35	0.00	0.00	0.00
14,600.00	90.18	359.57	12,543.75	2,052.45	209.25	2,055.32	0.00	0.00	0.00



Planning Report



Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey:

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,700.00	90.18	359.57	12,543.44	2,152.45	208.50	2,155.30	0.00	0.00	0.00
14,800.00	90.18	359.57	12,543.14	2,252.45	207.76	2,255.27	0.00	0.00	0.00
14,900.00	90.18	359.57	12,542.83	2,352.44	207.01	2,355.25	0.00	0.00	0.00
15,000.00	90.18	359.57	12,542.52	2,452.44	206.27	2,455.22	0.00	0.00	0.00
15,100.00	90.18	359.57	12,542.22	2,552.44	205.52	2,555.20	0.00	0.00	0.00
15,200.00	90.18	359.57	12,541.91	2,652.44	204.78	2,655.17	0.00	0.00	0.00
15,300.00	90.18	359.57	12,541.60	2,752.43	204.03	2,755.15	0.00	0.00	0.00
15,400.00	90.18	359.57	12,541.29	2,852.43	203.29	2,855.12	0.00	0.00	0.00
15,500.00	90.18	359.57	12,540.99	2,952.43	202.55	2,955.10	0.00	0.00	0.00
15,600.00	90.18	359.57	12,540.68	3,052.42	201.80	3,055.07	0.00	0.00	0.00
15,700.00	90.18	359.57	12,540.37	3,152.42	201.06	3,155.05	0.00	0.00	0.00
15,800.00	90.18	359.57	12,540.06	3,252.42	200.31	3,255.02	0.00	0.00	0.00
15,900.00	90.18	359.57	12,539.76	3,352.41	199.57	3,354.99	0.00	0.00	0.00
16,000.00	90.18	359.57	12,539.45	3,452.41	198.82	3,454.97	0.00	0.00	0.00
16,100.00	90.18	359.57	12,539.14	3,552.41	198.08	3,554.94	0.00	0.00	0.00
16,200.00	90.18	359.57	12,538.83	3,652.40	197.34	3,654.92	0.00	0.00	0.00
16,300.00	90.18	359.57	12,538.53	3,752.40	196.59	3,754.89	0.00	0.00	0.00
16,400.00	90.18	359.57	12,538.22	3,852.40	195.85	3,854.87	0.00	0.00	0.00
16,500.00	90.18	359.57	12,537.91	3,952.39	195.10	3,954.84	0.00	0.00	0.00
16,600.00	90.18	359.57	12,537.60	4,052.39	194.36	4,054.82	0.00	0.00	0.00
16,700.00	90.18	359.57	12,537.30	4,152.39	193.61	4,154.79	0.00	0.00	0.00
16,800.00	90.18	359.57	12,536.99	4,252.38	192.87	4,254.77	0.00	0.00	0.00
16,900.00	90.18	359.57	12,536.68	4,352.38	192.12	4,354.74	0.00	0.00	0.00
17,000.00	90.18	359.57	12,536.38	4,452.38	191.38	4,454.72	0.00	0.00	0.00
17,100.00	90.18	359.57	12,536.07	4,552.37	190.64	4,554.69	0.00	0.00	0.00
17,200.00	90.18	359.57	12,535.76	4,652.37	189.89	4,654.67	0.00	0.00	0.00
17,300.00	90.18	359.57	12,535.45	4,752.37	189.15	4,754.64	0.00	0.00	0.00
17,400.00	90.18	359.57	12,535.15	4,852.36	188.40	4,854.62	0.00	0.00	0.00
17,500.00	90.18	359.57	12,534.84	4,952.36	187.66	4,954.59	0.00	0.00	0.00
17,600.00	90.18	359.57	12,534.53	5,052.36	186.91	5,054.57	0.00	0.00	0.00
17,700.00	90.18	359.57	12,534.22	5,152.35	186.17	5,154.54	0.00	0.00	0.00
17,800.00	90.18	359.57	12,533.92	5,252.35	185.43	5,254.52	0.00	0.00	0.00
17,900.00	90.18	359.57	12,533.61	5,352.35	184.68	5,354.49	0.00	0.00	0.00
18,000.00	90.18	359.57	12,533.30	5,452.34	183.94	5,454.47	0.00	0.00	0.00
18,100.00	90.18	359.57	12,532.99	5,552.34	183.19	5,554.44	0.00	0.00	0.00
18,200.00	90.18	359.57	12,532.69	5,652.34	182.45	5,654.42	0.00	0.00	0.00
18,300.00	90.18	359.57	12,532.38	5,752.33	181.70	5,754.39	0.00	0.00	0.00
18,400.00	90.18	359.57	12,532.07	5,852.33	180.96	5,854.37	0.00	0.00	0.00
18,500.00	90.18	359.57	12,531.77	5,952.33	180.21	5,954.34	0.00	0.00	0.00
18,600.00	90.18	359.57	12,531.46	6,052.32	179.47	6,054.32	0.00	0.00	0.00
18,700.00	90.18	359.57	12,531.15	6,152.32	178.73	6,154.29	0.00	0.00	0.00
18,800.00	90.18	359.57	12,530.84	6,252.32	177.98	6,254.27	0.00	0.00	0.00
18,900.00	90.18	359.57	12,530.54	6,352.32	177.24	6,354.24	0.00	0.00	0.00
19,000.00	90.18	359.57	12,530.23	6,452.31	176.49	6,454.22	0.00	0.00	0.00
19,100.00	90.18	359.57	12,529.92	6,552.31	175.75	6,554.19	0.00	0.00	0.00
19,200.00	90.18	359.57	12,529.61	6,652.31	175.00	6,654.16	0.00	0.00	0.00
19,300.00	90.18	359.57	12,529.31	6,752.30	174.26	6,754.14	0.00	0.00	0.00
19,400.00	90.18	359.57	12,529.00	6,852.30	173.51	6,854.11	0.00	0.00	0.00
19,500.00	90.18	359.57	12,528.69	6,952.30	172.77	6,954.09	0.00	0.00	0.00
19,600.00	90.18	359.57	12,528.38	7,052.29	172.03	7,054.06	0.00	0.00	0.00
19,700.00	90.18	359.57	12,528.08	7,152.29	171.28	7,154.04	0.00	0.00	0.00
19,800.00	90.18	359.57	12,527.77	7,252.29	170.54	7,254.01	0.00	0.00	0.00
19,900.00	90.18	359.57	12,527.46	7,352.28	169.79	7,353.99	0.00	0.00	0.00
20,000.00	90.18	359.57	12,527.15	7,452.28	169.05	7,453.96	0.00	0.00	0.00

Database: USA Compass
 Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Site: Fez Federal Com
 Well: 703H
 Wellbore: OH
 Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
20,100.00	90.18	359.57	12,526.85	7,552.28	168.30	7,553.94	0.00	0.00	0.00
20,200.00	90.18	359.57	12,526.54	7,652.27	167.56	7,653.91	0.00	0.00	0.00
20,300.00	90.18	359.57	12,526.23	7,752.27	166.82	7,753.89	0.00	0.00	0.00
20,400.00	90.18	359.57	12,525.93	7,852.27	166.07	7,853.86	0.00	0.00	0.00
20,500.00	90.18	359.57	12,525.62	7,952.26	165.33	7,953.84	0.00	0.00	0.00
20,600.00	90.18	359.57	12,525.31	8,052.26	164.58	8,053.81	0.00	0.00	0.00
20,700.00	90.18	359.57	12,525.00	8,152.26	163.84	8,153.79	0.00	0.00	0.00
20,800.00	90.18	359.57	12,524.70	8,252.25	163.09	8,253.76	0.00	0.00	0.00
20,900.00	90.18	359.57	12,524.39	8,352.25	162.35	8,353.74	0.00	0.00	0.00
21,000.00	90.18	359.57	12,524.08	8,452.25	161.60	8,453.71	0.00	0.00	0.00
21,100.00	90.18	359.57	12,523.77	8,552.24	160.86	8,553.69	0.00	0.00	0.00
21,200.00	90.18	359.57	12,523.47	8,652.24	160.12	8,653.66	0.00	0.00	0.00
21,300.00	90.18	359.57	12,523.16	8,752.24	159.37	8,753.64	0.00	0.00	0.00
21,400.00	90.18	359.57	12,522.85	8,852.23	158.63	8,853.61	0.00	0.00	0.00
21,500.00	90.18	359.57	12,522.54	8,952.23	157.88	8,953.59	0.00	0.00	0.00
21,600.00	90.18	359.57	12,522.24	9,052.23	157.14	9,053.56	0.00	0.00	0.00
21,700.00	90.18	359.57	12,521.93	9,152.22	156.39	9,153.54	0.00	0.00	0.00
21,800.00	90.18	359.57	12,521.62	9,252.22	155.65	9,253.51	0.00	0.00	0.00
21,900.00	90.18	359.57	12,521.31	9,352.22	154.91	9,353.49	0.00	0.00	0.00
22,000.00	90.18	359.57	12,521.01	9,452.21	154.16	9,453.46	0.00	0.00	0.00
22,100.00	90.18	359.57	12,520.70	9,552.21	153.42	9,553.44	0.00	0.00	0.00
22,200.00	90.18	359.57	12,520.39	9,652.21	152.67	9,653.41	0.00	0.00	0.00
22,300.00	90.18	359.57	12,520.09	9,752.21	151.93	9,753.39	0.00	0.00	0.00
22,400.00	90.18	359.57	12,519.78	9,852.20	151.18	9,853.36	0.00	0.00	0.00
22,500.00	90.18	359.57	12,519.47	9,952.20	150.44	9,953.33	0.00	0.00	0.00
22,600.00	90.18	359.57	12,519.16	10,052.20	149.69	10,053.31	0.00	0.00	0.00
22,653.01	90.18	359.57	12,519.00	10,105.20	149.30	10,106.30	0.00	0.00	0.00

TD at 22653.01

Design Targets

Target Name	hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
BHL - Fez Fed Com 703	- plan hits target center	0.00	0.00	12,519.00	10,105.20	149.30	425,447.70	796,151.90	32° 9' 57.78931 N	103° 22' 34.60387 W
LTP - Fez Fed Com 703I	- plan misses target center by 0.07usft at 22522.80usft MD (12519.40 TVD, 9975.00 N, 150.27 E)	0.00	0.00	12,519.40	9,975.00	150.20	425,317.50	796,152.80	32° 9' 56.50089 N	103° 22' 34.60687 W
FTP - Fez Fed Com 703	- plan misses target center by 70.65usft at 12617.99usft MD (12484.56 TVD, 80.87 N, 223.92 E)	0.00	0.00	12,549.00	51.90	224.50	415,394.40	796,227.10	32° 8' 18.30417 N	103° 22' 34.76871 W

Database: USA Compass
Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Site: Fez Federal Com
Well: 703H
Wellbore: OH
Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
847.00	847.00	Rustler		-0.18	0.85	
1,188.00	1,188.00	TOS		-0.18	0.85	
5,000.00	4,983.71	BOS (Fletcher)		-0.18	0.85	
5,331.00	5,314.71	LMAR (Top Delaware)		-0.18	0.85	
5,363.00	5,346.71	BLCN		-0.18	0.85	
6,302.00	6,285.71	CYCN		-0.18	0.85	
7,762.00	7,745.71	BYCN		-0.18	0.85	
8,993.00	8,976.71	Bone Sprg		-0.18	0.85	
9,210.00	9,193.71	U Avalon		-0.18	0.85	
9,574.00	9,557.71	L Avalon		-0.18	0.85	
10,391.00	10,374.71	FBSP_sand		-0.18	0.85	
10,911.00	10,894.71	SBSG_sand		-0.18	0.85	
11,385.00	11,368.71	SBSG_sand		-0.18	0.85	
11,968.00	11,951.71	SBSG_sand base		-0.18	0.85	
12,406.75	12,355.26	TBSG_sand		-0.18	0.85	
12,543.30	12,445.94	WFMP		-0.18	0.85	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
1,500.00	1,500.00	0.00	0.00	KOP, Begin 2.00°/100' Build	
1,800.09	1,799.54	-11.15	11.06	Hold 6.00° Inc at 135.24° Azm	
4,572.20	4,556.46	-216.95	215.16	Begin 2.00°/100' Drop	
4,872.29	4,856.00	-228.10	226.22	Begin Vertical Hold	
11,992.33	11,976.04	-228.10	226.22	KOP2, Begin 10.00°/100' Build	
12,894.09	12,549.00	346.60	221.94	LP, Hold 90.18° Inc at 359.57° Azm	
22,653.01	12,519.00	10,105.20	149.30	TD at 22653.01	



COG Operating LLC

Lea County, NM (NAD27 NME)

Fez Federal Com

703H

OH

Plan 1 10-12-18

Anticollision Report

12 October, 2018



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Plan 1 10-12-18

Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method: MD Interval 100.00usft
Depth Range: Unlimited
Results Limited by: Maximum center-center distance of 50,000.00 usft
Warning Levels Evaluated at: 2.00 Sigma

Error Model: ISCWSA
Scan Method: Closest Approach 3D
Error Surface: Major Axis
Casing Method: Not applied

Survey Tool Program Date 10/12/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	22,653.01	Plan 1 10-12-18 (OH)	MWD+HDGM	OWSG Rev.2 MWD + HDGM

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						
Fez Federal Com						
603H - OH - Plan 1 10-12-18	1,500.11	1,501.21	30.10	19.79	2.919	CC, ES
604H - OH - Plan 1 10-12-18	1,409.69	1,426.99	635.02	625.31	65.388	CC
604H - OH - Plan 1 10-12-18	1,500.00	1,515.89	635.05	624.70	61.353	ES
604H - OH - Plan 1 10-12-18	22,653.01	22,420.22	1,010.03	705.72	3.319	SF
702H - OH - Plan 1 10-12-18	1,416.26	1,417.46	29.90	20.19	3.079	CC
702H - OH - Plan 1 10-12-18	1,600.00	1,600.00	30.27	19.27	2.753	ES
704H - OH - Plan 1 10-12-18	11,933.79	11,949.99	484.65	400.45	5.756	CC
704H - OH - Plan 1 10-12-18	22,653.01	22,584.14	492.36	188.01	1.618	ES, SF
Yates 16 State						
1H - OH - Surveys	1,520.97	1,522.63	904.32	897.56	133.716	CC
1H - OH - Surveys	1,600.00	1,600.36	904.58	897.46	126.944	ES
1H - OH - Surveys	8,700.00	8,565.00	1,013.29	976.46	27.517	SF

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18

Survey Program: 0-MWD+HDGM										Offset Site Error: 0.00 usft		Offset Well Error: 0.00 usft			
Reference		Offset		Semi Major Axis		Highside		Offset Wellbore Centre		Distance		Minimum Separation		Warning	
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
0.00	0.00	1.10	1.10	0.00	0.00	-90.57	-0.30	-30.10	30.10						
100.00	100.00	101.10	101.10	0.13	0.14	-90.57	-0.30	-30.10	30.10	29.83	0.27	110.344			
200.00	200.00	201.10	201.10	0.49	0.50	-90.57	-0.30	-30.10	30.10	29.11	0.99	30.414			
300.00	300.00	301.10	301.10	0.85	0.86	-90.57	-0.30	-30.10	30.10	28.39	1.71	17.637			
400.00	400.00	401.10	401.10	1.21	1.21	-90.57	-0.30	-30.10	30.10	27.68	2.42	12.420			
500.00	500.00	501.10	501.10	1.57	1.57	-90.57	-0.30	-30.10	30.10	26.96	3.14	9.585			
600.00	600.00	601.10	601.10	1.93	1.93	-90.57	-0.30	-30.10	30.10	26.24	3.86	7.803			
700.00	700.00	701.10	701.10	2.29	2.29	-90.57	-0.30	-30.10	30.10	25.53	4.57	6.580			
800.00	800.00	801.10	801.10	2.64	2.65	-90.57	-0.30	-30.10	30.10	24.81	5.29	5.689			
900.00	900.00	901.10	901.10	3.00	3.01	-90.57	-0.30	-30.10	30.10	24.09	6.01	5.010			
1,000.00	1,000.00	1,001.10	1,001.10	3.36	3.36	-90.57	-0.30	-30.10	30.10	23.38	6.73	4.476			
1,100.00	1,100.00	1,101.10	1,101.10	3.72	3.72	-90.57	-0.30	-30.10	30.10	22.66	7.44	4.045			
1,200.00	1,200.00	1,201.10	1,201.10	4.08	4.08	-90.57	-0.30	-30.10	30.10	21.94	8.16	3.689			

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18														Offset Site Error:
Survey Program: 0-MWD+HDGM														0.00 usft
Reference		Offset		Semi-Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)	Between Centres (usft)	Between Ellipses (usft)				
1,300.00	1,300.00	1,301.10	1,301.10	4.44	4.44	-90.57	-0.30	-30.10	30.10	21.23	8.88	3.391		
1,400.00	1,400.00	1,401.10	1,401.10	4.79	4.80	-90.57	-0.30	-30.10	30.10	20.51	9.59	3.138		
1,500.00	1,500.00	1,501.10	1,501.10	5.15	5.16	-90.57	-0.30	-30.10	30.10	19.79	10.31	2.920		
1,500.11	1,500.11	1,501.21	1,501.21	5.15	5.16	-90.57	-0.30	-30.10	30.10	19.79	10.31	2.919 CC, ES		
1,600.00	1,599.98	1,601.15	1,601.13	5.50	5.50	133.20	-2.08	-29.97	31.21	20.22	10.99	2.839		
1,700.00	1,699.84	1,701.11	1,700.84	5.83	5.82	130.74	-7.34	-29.60	34.60	22.94	11.65	2.969		
1,800.09	1,799.54	1,800.98	1,800.42	6.16	6.15	127.60	-16.06	-28.98	40.34	28.02	12.32	3.275		
1,900.00	1,898.90	1,900.62	1,899.53	6.51	6.49	124.99	-26.44	-28.25	47.32	34.33	12.99	3.642		
2,000.00	1,998.36	2,000.36	1,998.72	6.85	6.83	123.05	-36.83	-27.51	54.38	40.70	13.68	3.976		
2,100.00	2,097.81	2,100.10	2,097.91	7.20	7.17	121.56	-47.23	-26.77	61.49	47.12	14.37	4.278		
2,200.00	2,197.26	2,199.83	2,197.10	7.56	7.52	120.37	-57.62	-26.03	68.63	53.55	15.08	4.552		
2,300.00	2,296.71	2,299.57	2,296.29	7.92	7.87	119.42	-68.01	-25.30	75.80	60.01	15.79	4.801		
2,400.00	2,396.16	2,399.30	2,395.48	8.28	8.23	118.62	-78.41	-24.56	82.98	66.47	16.51	5.027		
2,500.00	2,495.62	2,499.04	2,494.67	8.64	8.59	117.96	-88.80	-23.82	90.17	72.95	17.23	5.235		
2,600.00	2,595.07	2,598.77	2,593.86	9.00	8.95	117.39	-99.19	-23.08	97.38	79.43	17.95	5.424		
2,700.00	2,694.52	2,698.51	2,693.05	9.37	9.31	116.90	-109.59	-22.35	104.59	85.91	18.68	5.598		
2,800.00	2,793.97	2,798.25	2,792.24	9.74	9.68	116.47	-119.98	-21.61	111.81	92.40	19.42	5.759		
2,900.00	2,893.42	2,897.98	2,891.43	10.11	10.04	116.10	-130.37	-20.87	119.04	98.89	20.15	5.907		
3,000.00	2,992.87	2,997.72	2,990.62	10.48	10.41	115.76	-140.77	-20.13	126.27	105.38	20.89	6.044		
3,100.00	3,092.33	3,097.45	3,089.81	10.85	10.78	115.47	-151.16	-19.40	133.50	111.87	21.63	6.171		
3,200.00	3,191.78	3,197.19	3,189.00	11.22	11.15	115.20	-161.55	-18.66	140.74	118.36	22.38	6.289		
3,300.00	3,291.23	3,296.92	3,288.19	11.60	11.53	114.96	-171.95	-17.92	147.98	124.86	23.12	6.399		
3,400.00	3,390.68	3,396.66	3,387.38	11.97	11.90	114.75	-182.34	-17.18	155.22	131.35	23.87	6.502		
3,500.00	3,490.13	3,496.40	3,486.57	12.35	12.27	114.55	-192.73	-16.45	162.47	137.85	24.62	6.598		
3,600.00	3,589.59	3,596.13	3,585.76	12.73	12.65	114.37	-203.13	-15.71	169.71	144.34	25.37	6.689		
3,700.00	3,689.04	3,695.87	3,684.95	13.10	13.02	114.20	-213.52	-14.97	176.96	150.84	26.13	6.773		
3,800.00	3,788.49	3,797.24	3,785.90	13.48	13.40	114.48	-222.63	-14.33	183.81	156.93	26.88	6.838		
3,900.00	3,887.94	3,896.74	3,887.24	13.86	13.77	115.79	-228.20	-13.93	189.73	162.11	27.63	6.867		
4,000.00	3,987.39	3,996.93	3,988.41	14.24	14.12	118.03	-230.17	-13.79	194.95	166.60	28.36	6.875		
4,100.00	4,086.84	4,096.47	4,087.94	14.62	14.45	120.66	-230.18	-13.79	200.10	171.03	29.07	6.884		
4,200.00	4,186.30	4,196.92	4,187.40	15.00	14.78	123.16	-230.18	-13.79	205.65	175.87	29.78	6.905		
4,300.00	4,285.75	4,296.37	4,286.85	15.38	15.12	125.52	-230.18	-13.79	211.57	181.08	30.50	6.938		
4,400.00	4,385.20	4,397.82	4,386.30	15.76	15.45	127.75	-230.18	-13.79	217.83	186.62	31.21	6.979		
4,500.00	4,484.65	4,497.28	4,485.75	16.14	15.79	129.86	-230.18	-13.79	224.41	192.48	31.93	7.029		
4,600.00	4,584.12	4,596.74	4,585.22	16.52	16.12	131.84	-230.18	-13.79	231.18	198.54	32.65	7.082		
4,700.00	4,683.61	4,696.43	4,684.91	16.89	16.46	133.32	-230.18	-13.79	236.43	203.08	33.36	7.088		
4,800.00	4,783.12	4,796.34	4,784.82	17.25	16.80	134.10	-230.18	-13.79	239.39	205.33	34.05	7.029		
4,900.00	4,883.71	4,896.33	4,884.81	17.59	17.14	-90.50	-230.18	-13.79	240.02	205.29	34.73	6.910		
5,000.00	4,983.71	4,996.33	4,984.81	17.92	17.49	-90.50	-230.18	-13.79	240.02	204.61	35.41	6.779		
5,100.00	5,083.71	5,096.33	5,084.81	18.26	17.83	-90.50	-230.18	-13.79	240.02	203.94	36.08	6.652		
5,200.00	5,183.71	5,196.33	5,184.81	18.59	18.17	-90.50	-230.18	-13.79	240.02	203.26	36.76	6.529		
5,300.00	5,283.71	5,296.33	5,284.81	18.92	18.51	-90.50	-230.18	-13.79	240.02	202.58	37.44	6.411		
5,400.00	5,383.71	5,396.33	5,384.81	19.26	18.86	-90.50	-230.18	-13.79	240.02	201.90	38.12	6.297		
5,500.00	5,483.71	5,496.33	5,484.81	19.60	19.20	-90.50	-230.18	-13.79	240.02	201.22	38.80	6.186		
5,600.00	5,583.71	5,596.33	5,584.81	19.93	19.55	-90.50	-230.18	-13.79	240.02	200.54	39.48	6.079		
5,700.00	5,683.71	5,696.33	5,684.81	20.27	19.89	-90.50	-230.18	-13.79	240.02	199.86	40.16	5.976		
5,800.00	5,783.71	5,796.33	5,784.81	20.61	20.24	-90.50	-230.18	-13.79	240.02	199.17	40.85	5.876		
5,900.00	5,883.71	5,896.33	5,884.81	20.95	20.59	-90.50	-230.18	-13.79	240.02	198.49	41.53	5.779		
6,000.00	5,983.71	5,996.33	5,984.81	21.29	20.93	-90.50	-230.18	-13.79	240.02	197.80	42.22	5.685		
6,100.00	6,083.71	6,096.33	6,084.81	21.63	21.28	-90.50	-230.18	-13.79	240.02	197.11	42.91	5.594		
6,200.00	6,183.71	6,196.33	6,184.81	21.97	21.63	-90.50	-230.18	-13.79	240.02	196.42	43.60	5.505		
6,300.00	6,283.71	6,296.33	6,284.81	22.31	21.98	-90.50	-230.18	-13.79	240.02	195.73	44.29	5.420		

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error:
Survey Program: 0-MWD+HDGM													Offset Well Error:
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	
6,400.00	6,383.71	6,396.33	6,384.81	22.65	22.33	-90.50	-230.18	-13.79	240.02	195.04	44.98	5.336	
6,500.00	6,483.71	6,496.33	6,484.81	23.00	22.67	-90.50	-230.18	-13.79	240.02	194.35	45.67	5.256	
6,600.00	6,583.71	6,596.33	6,584.81	23.34	23.02	-90.50	-230.18	-13.79	240.02	193.66	46.36	5.177	
6,700.00	6,683.71	6,696.33	6,684.81	23.68	23.37	-90.50	-230.18	-13.79	240.02	192.97	47.05	5.101	
6,800.00	6,783.71	6,796.33	6,784.81	24.03	23.72	-90.50	-230.18	-13.79	240.02	192.27	47.75	5.027	
6,900.00	6,883.71	6,896.33	6,884.81	24.37	24.07	-90.50	-230.18	-13.79	240.02	191.58	48.44	4.955	
7,000.00	6,983.71	6,996.33	6,984.81	24.71	24.42	-90.50	-230.18	-13.79	240.02	190.88	49.14	4.885	
7,100.00	7,083.71	7,096.33	7,084.81	25.06	24.77	-90.50	-230.18	-13.79	240.02	190.19	49.83	4.817	
7,200.00	7,183.71	7,196.33	7,184.81	25.41	25.12	-90.50	-230.18	-13.79	240.02	189.49	50.53	4.750	
7,300.00	7,283.71	7,296.33	7,284.81	25.75	25.47	-90.50	-230.18	-13.79	240.02	188.80	51.22	4.686	
7,400.00	7,383.71	7,396.33	7,384.81	26.10	25.82	-90.50	-230.18	-13.79	240.02	188.10	51.92	4.623	
7,500.00	7,483.71	7,496.33	7,484.81	26.44	26.18	-90.50	-230.18	-13.79	240.02	187.40	52.62	4.561	
7,600.00	7,583.71	7,596.33	7,584.81	26.79	26.53	-90.50	-230.18	-13.79	240.02	186.70	53.32	4.502	
7,700.00	7,683.71	7,696.33	7,684.81	27.14	26.88	-90.50	-230.18	-13.79	240.02	186.00	54.02	4.443	
7,800.00	7,783.71	7,796.33	7,784.81	27.49	27.23	-90.50	-230.18	-13.79	240.02	185.31	54.72	4.387	
7,900.00	7,883.71	7,896.33	7,884.81	27.83	27.58	-90.50	-230.18	-13.79	240.02	184.61	55.42	4.331	
8,000.00	7,983.71	7,996.33	7,984.81	28.18	27.93	-90.50	-230.18	-13.79	240.02	183.91	56.12	4.277	
8,100.00	8,083.71	8,096.33	8,084.81	28.53	28.29	-90.50	-230.18	-13.79	240.02	183.20	56.82	4.225	
8,200.00	8,183.71	8,196.33	8,184.81	28.88	28.64	-90.50	-230.18	-13.79	240.02	182.50	57.52	4.173	
8,300.00	8,283.71	8,296.33	8,284.81	29.23	28.99	-90.50	-230.18	-13.79	240.02	181.80	58.22	4.123	
8,400.00	8,383.71	8,396.33	8,384.81	29.58	29.34	-90.50	-230.18	-13.79	240.02	181.10	58.92	4.074	
8,500.00	8,483.71	8,496.33	8,484.81	29.93	29.70	-90.50	-230.18	-13.79	240.02	180.40	59.62	4.026	
8,600.00	8,583.71	8,596.33	8,584.81	30.27	30.05	-90.50	-230.18	-13.79	240.02	179.70	60.32	3.979	
8,700.00	8,683.71	8,696.33	8,684.81	30.62	30.40	-90.50	-230.18	-13.79	240.02	178.99	61.03	3.933	
8,800.00	8,783.71	8,796.33	8,784.81	30.97	30.76	-90.50	-230.18	-13.79	240.02	178.29	61.73	3.888	
8,900.00	8,883.71	8,896.33	8,884.81	31.32	31.11	-90.50	-230.18	-13.79	240.02	177.59	62.43	3.844	
9,000.00	8,983.71	8,996.33	8,984.81	31.67	31.46	-90.50	-230.18	-13.79	240.02	176.88	63.14	3.802	
9,100.00	9,083.71	9,096.33	9,084.81	32.03	31.82	-90.50	-230.18	-13.79	240.02	176.18	63.84	3.760	
9,200.00	9,183.71	9,196.33	9,184.81	32.38	32.17	-90.50	-230.18	-13.79	240.02	175.48	64.55	3.719	
9,300.00	9,283.71	9,296.33	9,284.81	32.73	32.52	-90.50	-230.18	-13.79	240.02	174.77	65.25	3.678	
9,400.00	9,383.71	9,396.33	9,384.81	33.08	32.88	-90.50	-230.18	-13.79	240.02	174.07	65.96	3.639	
9,500.00	9,483.71	9,496.33	9,484.81	33.43	33.23	-90.50	-230.18	-13.79	240.02	173.36	66.66	3.601	
9,600.00	9,583.71	9,596.33	9,584.81	33.78	33.59	-90.50	-230.18	-13.79	240.02	172.66	67.37	3.563	
9,700.00	9,683.71	9,696.33	9,684.81	34.13	33.94	-90.50	-230.18	-13.79	240.02	171.95	68.07	3.526	
9,800.00	9,783.71	9,796.33	9,784.81	34.48	34.29	-90.50	-230.18	-13.79	240.02	171.24	68.78	3.490	
9,900.00	9,883.71	9,896.33	9,884.81	34.83	34.65	-90.50	-230.18	-13.79	240.02	170.54	69.48	3.454	
10,000.00	9,983.71	9,996.33	9,984.81	35.19	35.00	-90.50	-230.18	-13.79	240.02	169.83	70.19	3.420	
10,100.00	10,083.71	10,096.33	10,084.81	35.54	35.36	-90.50	-230.18	-13.79	240.02	169.13	70.90	3.386	
10,200.00	10,183.71	10,196.33	10,184.81	35.89	35.71	-90.50	-230.18	-13.79	240.02	168.42	71.60	3.352	
10,300.00	10,283.71	10,296.33	10,284.81	36.24	36.07	-90.50	-230.18	-13.79	240.02	167.71	72.31	3.319	
10,400.00	10,383.71	10,396.33	10,384.81	36.60	36.42	-90.50	-230.18	-13.79	240.02	167.00	73.02	3.287	
10,500.00	10,483.71	10,496.33	10,484.81	36.95	36.78	-90.50	-230.18	-13.79	240.02	166.30	73.72	3.256	
10,600.00	10,583.71	10,596.33	10,584.81	37.30	37.13	-90.50	-230.18	-13.79	240.02	165.59	74.43	3.225	
10,700.00	10,683.71	10,696.33	10,684.81	37.65	37.49	-90.50	-230.18	-13.79	240.02	164.88	75.14	3.194	
10,800.00	10,783.71	10,796.33	10,784.81	38.01	37.84	-90.50	-230.18	-13.79	240.02	164.17	75.85	3.165	
10,900.00	10,883.71	10,896.33	10,884.81	38.36	38.20	-90.50	-230.18	-13.79	240.02	163.47	76.55	3.135	
11,000.00	10,983.71	10,996.33	10,984.81	38.71	38.55	-90.50	-230.18	-13.79	240.02	162.76	77.26	3.107	
11,100.00	11,083.71	11,096.33	11,084.81	39.06	38.91	-90.50	-230.18	-13.79	240.02	162.05	77.97	3.078	
11,200.00	11,183.71	11,196.33	11,184.81	39.42	39.26	-90.50	-230.18	-13.79	240.02	161.34	78.68	3.051	
11,300.00	11,283.71	11,296.33	11,284.81	39.77	39.62	-90.50	-230.18	-13.79	240.02	160.63	79.39	3.023	
11,400.00	11,383.71	11,396.33	11,384.81	40.12	39.97	-90.50	-230.18	-13.79	240.02	159.92	80.10	2.997	
11,500.00	11,483.71	11,496.33	11,484.81	40.48	40.33	-90.50	-230.18	-13.79	240.02	159.21	80.81	2.970	

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 703H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 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)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
11,600.00	11,583.71	11,596.33	11,584.81	40.83	40.68	-90.50	-230.18	-13.79	240.02	158.51	81.52	2.944	
11,700.00	11,683.71	11,696.33	11,684.81	41.19	41.04	-90.50	-230.18	-13.79	240.02	157.80	82.22	2.919	
11,755.57	11,739.28	11,751.91	11,740.38	41.38	41.24	-90.43	-229.89	-13.79	240.02	157.40	82.62	2.905	
11,800.00	11,783.71	11,796.11	11,784.47	41.54	41.39	-89.68	-226.77	-13.82	240.04	157.11	82.93	2.895	
11,900.00	11,883.71	11,892.23	11,878.69	41.89	41.71	-85.30	-208.35	-13.95	241.06	157.46	83.60	2.883	
12,000.00	11,983.71	11,980.06	11,961.01	42.25	41.98	-77.73	-177.97	-14.18	246.71	162.48	84.23	2.929	
12,100.00	12,083.08	12,061.26	12,032.16	42.59	42.21	-69.63	-139.00	-14.47	258.54	173.74	84.81	3.049	
12,200.00	12,179.19	12,139.15	12,094.59	42.91	42.42	-62.67	-92.53	-14.81	273.83	188.50	85.33	3.209	
12,300.00	12,269.13	12,214.47	12,148.44	43.19	42.61	-56.94	-39.94	-15.21	290.51	204.71	85.80	3.386	
12,400.00	12,350.17	12,287.83	12,193.81	43.43	42.78	-52.38	17.64	-15.63	306.89	220.67	86.21	3.560	
12,500.00	12,419.84	12,359.68	12,230.78	43.63	42.94	-48.87	79.20	-16.09	321.68	235.11	86.57	3.716	
12,600.00	12,476.03	12,430.43	12,259.36	43.82	43.09	-46.30	143.86	-16.57	333.96	247.05	86.91	3.843	
12,700.00	12,517.02	12,500.00	12,279.50	44.00	43.23	-44.56	210.41	-17.07	343.07	255.83	87.24	3.933	
12,800.00	12,541.57	12,569.85	12,291.46	44.19	43.37	-43.55	279.18	-17.58	348.58	261.01	87.57	3.981	
12,900.00	12,548.98	12,640.74	12,294.98	44.37	43.51	-43.26	349.94	-18.11	350.27	262.38	87.89	3.985	
13,000.00	12,548.67	12,740.74	12,294.67	44.58	43.73	-43.26	449.94	-18.85	350.26	261.95	88.31	3.966	
13,100.00	12,548.36	12,840.74	12,294.36	44.83	43.99	-43.26	549.93	-19.60	350.26	261.44	88.82	3.943	
13,200.00	12,548.06	12,940.74	12,294.06	45.13	44.29	-43.26	649.93	-20.34	350.26	260.84	89.42	3.917	
13,300.00	12,547.75	13,040.74	12,293.75	45.46	44.64	-43.26	749.93	-21.08	350.26	260.15	90.11	3.887	
13,400.00	12,547.44	13,140.74	12,293.44	45.85	45.03	-43.26	849.92	-21.83	350.26	259.38	90.88	3.854	
13,500.00	12,547.13	13,240.74	12,293.13	46.27	45.47	-43.26	949.92	-22.57	350.26	258.52	91.74	3.818	
13,600.00	12,546.83	13,340.74	12,292.83	46.73	45.94	-43.26	1,049.92	-23.32	350.26	257.59	92.68	3.779	
13,700.00	12,546.52	13,440.74	12,292.52	47.24	46.46	-43.26	1,149.91	-24.06	350.26	256.57	93.70	3.738	
13,800.00	12,546.21	13,540.74	12,292.21	47.78	47.01	-43.26	1,249.91	-24.81	350.26	255.47	94.79	3.695	
13,900.00	12,545.90	13,640.74	12,291.91	48.35	47.60	-43.26	1,349.91	-25.55	350.26	254.31	95.96	3.650	
14,000.00	12,545.60	13,740.74	12,291.60	48.96	48.23	-43.26	1,449.90	-26.29	350.26	253.07	97.19	3.604	
14,100.00	12,545.29	13,840.74	12,291.29	49.61	48.89	-43.26	1,549.90	-27.04	350.26	251.76	98.50	3.556	
14,200.00	12,544.98	13,940.74	12,290.98	50.29	49.58	-43.26	1,649.90	-27.78	350.26	250.39	99.87	3.507	
14,300.00	12,544.67	14,040.74	12,290.68	51.00	50.31	-43.26	1,749.89	-28.53	350.26	248.96	101.31	3.458	
14,400.00	12,544.37	14,140.74	12,290.37	51.74	51.06	-43.26	1,849.89	-29.27	350.26	247.46	102.80	3.407	
14,500.00	12,544.06	14,240.74	12,290.06	52.51	51.84	-43.26	1,949.89	-30.02	350.26	245.91	104.35	3.357	
14,600.00	12,543.75	14,340.74	12,289.75	53.30	52.65	-43.26	2,049.88	-30.76	350.26	244.31	105.96	3.306	
14,700.00	12,543.44	14,440.74	12,289.45	54.13	53.49	-43.26	2,149.88	-31.50	350.26	242.65	107.62	3.255	
14,800.00	12,543.14	14,540.74	12,289.14	54.97	54.35	-43.26	2,249.88	-32.25	350.26	240.94	109.33	3.204	
14,900.00	12,542.83	14,640.74	12,288.83	55.85	55.24	-43.26	2,349.87	-32.99	350.26	239.18	111.08	3.153	
15,000.00	12,542.52	14,740.74	12,288.52	56.74	56.15	-43.26	2,449.87	-33.74	350.26	237.38	112.89	3.103	
15,100.00	12,542.22	14,840.74	12,288.22	57.66	57.08	-43.26	2,549.87	-34.48	350.26	235.53	114.74	3.053	
15,200.00	12,541.91	14,940.74	12,287.91	58.59	58.03	-43.26	2,649.86	-35.23	350.26	233.64	116.62	3.003	
15,300.00	12,541.60	15,040.74	12,287.60	59.55	59.00	-43.26	2,749.86	-35.97	350.26	231.71	118.55	2.955	
15,400.00	12,541.29	15,140.74	12,287.29	60.53	59.99	-43.26	2,849.86	-36.71	350.26	229.75	120.52	2.906	
15,500.00	12,540.99	15,240.74	12,286.99	61.52	61.00	-43.26	2,949.85	-37.46	350.26	227.75	122.52	2.859	
15,600.00	12,540.68	15,340.74	12,286.68	62.53	62.02	-43.26	3,049.85	-38.20	350.26	225.71	124.55	2.812	
15,700.00	12,540.37	15,440.74	12,286.37	63.56	63.06	-43.26	3,149.85	-38.95	350.26	223.64	126.62	2.766	
15,800.00	12,540.06	15,540.74	12,286.07	64.60	64.12	-43.26	3,249.85	-39.69	350.26	221.54	128.72	2.721	
15,900.00	12,539.76	15,640.74	12,285.76	65.66	65.19	-43.26	3,349.84	-40.44	350.26	219.42	130.85	2.677	
16,000.00	12,539.45	15,740.74	12,285.45	66.73	66.27	-43.26	3,449.84	-41.18	350.26	217.26	133.00	2.633	
16,100.00	12,539.14	15,840.74	12,285.14	67.82	67.37	-43.26	3,549.84	-41.92	350.26	215.08	135.19	2.591	
16,200.00	12,538.83	15,940.74	12,284.84	68.92	68.48	-43.26	3,649.83	-42.67	350.26	212.87	137.39	2.549	
16,300.00	12,538.53	16,040.74	12,284.53	70.03	69.60	-43.26	3,749.83	-43.41	350.26	210.64	139.63	2.509	
16,400.00	12,538.22	16,140.74	12,284.22	71.15	70.73	-43.26	3,849.83	-44.16	350.26	208.38	141.88	2.469	
16,500.00	12,537.91	16,240.74	12,283.91	72.28	71.87	-43.26	3,949.82	-44.90	350.26	206.10	144.16	2.430	
16,600.00	12,537.60	16,340.74	12,283.61	73.43	73.03	-43.26	4,049.82	-45.65	350.26	203.81	146.46	2.392	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18													Offset Site Error:
Survey Program: 0-MWD+HDGM													Offset Well Error:
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	
16,700.00	12,537.30	16,440.74	12,283.30	74.58	74.19	-43.26	4,149.82	-46.39	350.26	201.49	148.77	2.354	
16,800.00	12,536.99	16,540.74	12,282.99	75.75	75.36	-43.26	4,249.81	-47.13	350.26	199.15	151.11	2.318	
16,900.00	12,536.68	16,640.74	12,282.68	76.92	76.55	-43.26	4,349.81	-47.88	350.26	196.80	153.47	2.282	
17,000.00	12,536.38	16,740.74	12,282.38	78.10	77.74	-43.26	4,449.81	-48.62	350.26	194.42	155.84	2.248	
17,100.00	12,536.07	16,840.74	12,282.07	79.29	78.94	-43.25	4,549.80	-49.37	350.26	192.03	158.23	2.214	
17,200.00	12,535.76	16,940.74	12,281.76	80.49	80.14	-43.25	4,649.80	-50.11	350.26	189.63	160.63	2.181	
17,300.00	12,535.45	17,040.74	12,281.45	81.70	81.36	-43.25	4,749.80	-50.86	350.26	187.21	163.05	2.148	
17,400.00	12,535.15	17,140.74	12,281.15	82.91	82.58	-43.25	4,849.79	-51.60	350.26	184.77	165.49	2.117	
17,500.00	12,534.84	17,240.74	12,280.84	84.13	83.81	-43.25	4,949.79	-52.34	350.26	182.33	167.94	2.086	
17,600.00	12,534.53	17,340.74	12,280.53	85.36	85.04	-43.25	5,049.79	-53.09	350.26	179.87	170.40	2.056	
17,700.00	12,534.22	17,440.74	12,280.23	86.59	86.28	-43.25	5,149.78	-53.83	350.26	177.39	172.87	2.026	
17,800.00	12,533.92	17,540.74	12,279.92	87.83	87.53	-43.25	5,249.78	-54.58	350.26	174.90	175.36	1.997	
17,900.00	12,533.61	17,640.74	12,279.61	89.07	88.78	-43.25	5,349.78	-55.32	350.26	172.41	177.86	1.969	
18,000.00	12,533.30	17,740.74	12,279.30	90.32	90.04	-43.25	5,449.77	-56.07	350.26	169.90	180.36	1.942	
18,100.00	12,532.99	17,840.74	12,279.00	91.58	91.30	-43.25	5,549.77	-56.81	350.26	167.38	182.88	1.915	
18,200.00	12,532.69	17,940.74	12,278.69	92.84	92.57	-43.25	5,649.77	-57.55	350.26	164.85	185.41	1.889	
18,300.00	12,532.38	18,040.74	12,278.38	94.11	93.84	-43.25	5,749.76	-58.30	350.26	162.31	187.95	1.864	
18,400.00	12,532.07	18,140.74	12,278.07	95.38	95.12	-43.25	5,849.76	-59.04	350.26	159.76	190.50	1.839	
18,500.00	12,531.77	18,240.74	12,277.77	96.66	96.40	-43.25	5,949.76	-59.79	350.26	157.20	193.06	1.814	
18,600.00	12,531.46	18,340.74	12,277.46	97.94	97.69	-43.25	6,049.75	-60.53	350.26	154.63	195.63	1.790	
18,700.00	12,531.15	18,440.74	12,277.15	99.22	98.98	-43.25	6,149.75	-61.28	350.26	152.06	198.20	1.767	
18,800.00	12,530.84	18,540.74	12,276.84	100.51	100.28	-43.25	6,249.75	-62.02	350.26	149.47	200.79	1.744	
18,900.00	12,530.54	18,640.74	12,276.54	101.80	101.57	-43.25	6,349.74	-62.76	350.26	146.88	203.38	1.722	
19,000.00	12,530.23	18,740.74	12,276.23	103.10	102.88	-43.25	6,449.74	-63.51	350.26	144.28	205.98	1.700	
19,100.00	12,529.92	18,840.74	12,275.92	104.40	104.18	-43.25	6,549.74	-64.25	350.26	141.68	208.58	1.679	
19,200.00	12,529.61	18,940.74	12,275.61	105.70	105.49	-43.25	6,649.74	-65.00	350.26	139.07	211.20	1.658	
19,300.00	12,529.31	19,040.74	12,275.31	107.01	106.80	-43.25	6,749.73	-65.74	350.26	136.45	213.81	1.638	
19,400.00	12,529.00	19,140.74	12,275.00	108.32	108.12	-43.25	6,849.73	-66.49	350.26	133.82	216.44	1.618	
19,500.00	12,528.69	19,240.74	12,274.69	109.64	109.44	-43.25	6,949.73	-67.23	350.26	131.19	219.07	1.599	
19,600.00	12,528.38	19,340.74	12,274.39	110.95	110.76	-43.25	7,049.72	-67.97	350.26	128.55	221.71	1.580	
19,700.00	12,528.08	19,440.74	12,274.08	112.27	112.08	-43.25	7,149.72	-68.72	350.26	125.91	224.35	1.561	
19,800.00	12,527.77	19,540.74	12,273.77	113.59	113.41	-43.25	7,249.72	-69.46	350.26	123.26	227.00	1.543	
19,900.00	12,527.46	19,640.74	12,273.46	114.92	114.74	-43.25	7,349.71	-70.21	350.26	120.60	229.66	1.525	
20,000.00	12,527.15	19,740.74	12,273.16	116.25	116.07	-43.25	7,449.71	-70.95	350.26	117.94	232.32	1.508	
20,100.00	12,526.85	19,840.74	12,272.85	117.58	117.41	-43.25	7,549.71	-71.70	350.26	115.28	234.98	1.491 Level 3	
20,200.00	12,526.54	19,940.74	12,272.54	118.91	118.74	-43.25	7,649.70	-72.44	350.26	112.61	237.65	1.474 Level 3	
20,300.00	12,526.23	20,040.74	12,272.23	120.24	120.08	-43.25	7,749.70	-73.18	350.26	109.93	240.33	1.457 Level 3	
20,400.00	12,525.93	20,140.74	12,271.93	121.58	121.42	-43.25	7,849.70	-73.93	350.26	107.26	243.01	1.441 Level 3	
20,500.00	12,525.62	20,240.74	12,271.62	122.92	122.77	-43.25	7,949.69	-74.67	350.26	104.57	245.69	1.426 Level 3	
20,600.00	12,525.31	20,340.74	12,271.31	124.26	124.11	-43.25	8,049.69	-75.42	350.26	101.88	248.38	1.410 Level 3	
20,700.00	12,525.00	20,440.74	12,271.00	125.61	125.46	-43.25	8,149.69	-76.16	350.26	99.19	251.07	1.395 Level 3	
20,800.00	12,524.70	20,540.74	12,270.70	126.95	126.81	-43.25	8,249.68	-76.91	350.26	96.50	253.76	1.380 Level 3	
20,900.00	12,524.39	20,640.74	12,270.39	128.30	128.16	-43.25	8,349.68	-77.65	350.26	93.80	256.46	1.366 Level 3	
21,000.00	12,524.08	20,740.74	12,270.08	129.65	129.51	-43.25	8,449.68	-78.39	350.26	91.10	259.16	1.351 Level 3	
21,100.00	12,523.77	20,840.74	12,269.77	131.00	130.87	-43.25	8,549.67	-79.14	350.26	88.39	261.87	1.338 Level 3	
21,200.00	12,523.47	20,940.74	12,269.47	132.36	132.23	-43.25	8,649.67	-79.88	350.26	85.68	264.58	1.324 Level 3	
21,300.00	12,523.16	21,040.74	12,269.16	133.71	133.58	-43.25	8,749.67	-80.63	350.26	82.96	267.29	1.310 Level 3	
21,400.00	12,522.85	21,140.74	12,268.85	135.07	134.94	-43.25	8,849.66	-81.37	350.26	80.25	270.01	1.297 Level 3	
21,500.00	12,522.54	21,240.74	12,268.55	136.43	136.31	-43.25	8,949.66	-82.12	350.26	77.53	272.73	1.284 Level 3	
21,600.00	12,522.24	21,340.74	12,268.24	137.79	137.67	-43.25	9,049.66	-82.86	350.26	74.81	275.45	1.272 Level 3	
21,700.00	12,521.93	21,440.74	12,267.93	139.15	139.03	-43.25	9,149.65	-83.60	350.26	72.08	278.18	1.259 Level 3	
21,800.00	12,521.62	21,540.74	12,267.62	140.51	140.40	-43.25	9,249.65	-84.35	350.26	69.35	280.91	1.247 Level 2	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 603H - OH - Plan 1 10-12-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 usft
Reference	Offset	Semi Major Axis		Reference		Highside	Offset Wellbore Centre		Distance		Minimum	Separation	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Toolface (")	+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor			
21,900.00	12,521.31	21,640.74	12,267.32	141.87	141.77	-43.25	9,349.65	-85.09	350.26	66.62	283.64	1.235 Level 2			
22,000.00	12,521.01	21,740.74	12,267.01	143.24	143.14	-43.25	9,449.64	-85.84	350.26	63.88	286.38	1.223 Level 2			
22,100.00	12,520.70	21,840.74	12,266.70	144.61	144.51	-43.25	9,549.64	-86.58	350.26	61.15	289.11	1.211 Level 2			
22,200.00	12,520.39	21,940.74	12,266.39	145.98	145.88	-43.25	9,649.64	-87.33	350.26	58.41	291.85	1.200 Level 2			
22,300.00	12,520.09	22,040.74	12,266.09	147.35	147.25	-43.25	9,749.63	-88.07	350.26	55.66	294.59	1.189 Level 2			
22,400.00	12,519.78	22,140.74	12,265.78	148.72	148.62	-43.25	9,849.63	-88.81	350.26	52.92	297.34	1.178 Level 2			
22,500.00	12,519.47	22,240.74	12,265.47	150.09	150.00	-43.25	9,949.63	-89.56	350.26	50.17	300.09	1.167 Level 2			
22,600.00	12,519.16	22,340.74	12,265.16	151.46	151.37	-43.25	10,049.62	-90.30	350.26	47.42	302.84	1.157 Level 2			
22,653.01	12,519.00	22,393.75	12,265.00	152.19	152.10	-43.25	10,102.63	-90.70	350.26	45.96	304.29	1.151 Level 2, SF			



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi-Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)	Between Centres (usft)	Between Ellipses (usft)			
0.00	0.00	17.30	17.30	0.00	0.02	-90.50	-5.50	-635.00	635.02				
100.00	100.00	117.30	117.30	0.13	0.19	-90.50	-5.50	-635.00	635.02	634.70	0.32	1,972.689	
200.00	200.00	217.30	217.30	0.49	0.55	-90.50	-5.50	-635.00	635.02	633.98	1.04	611.275	
300.00	300.00	317.30	317.30	0.85	0.90	-90.50	-5.50	-635.00	635.02	633.27	1.76	361.673	
400.00	400.00	417.30	417.30	1.21	1.26	-90.50	-5.50	-635.00	635.02	632.55	2.47	266.810	
500.00	500.00	517.30	517.30	1.57	1.62	-90.50	-5.50	-635.00	635.02	631.83	3.19	199.067	
600.00	600.00	617.30	617.30	1.93	1.98	-90.50	-5.50	-635.00	635.02	631.12	3.91	162.551	
700.00	700.00	717.30	717.30	2.29	2.34	-90.50	-5.50	-635.00	635.02	630.40	4.62	137.345	
800.00	800.00	817.30	817.30	2.64	2.70	-90.50	-5.50	-635.00	635.02	629.68	5.34	118.907	
900.00	900.00	917.30	917.30	3.00	3.06	-90.50	-5.50	-635.00	635.02	628.97	6.06	104.833	
1,000.00	1,000.00	1,017.30	1,017.30	3.36	3.41	-90.50	-5.50	-635.00	635.02	628.25	6.77	93.739	
1,100.00	1,100.00	1,117.30	1,117.30	3.72	3.77	-90.50	-5.50	-635.00	635.02	627.53	7.49	84.768	
1,200.00	1,200.00	1,217.30	1,217.30	4.08	4.13	-90.50	-5.50	-635.00	635.02	626.82	8.21	77.364	
1,300.00	1,300.00	1,317.30	1,317.30	4.44	4.49	-90.50	-5.50	-635.00	635.02	626.10	8.93	71.149	
1,400.00	1,400.00	1,417.30	1,417.30	4.79	4.85	-90.50	-5.50	-635.00	635.02	625.38	9.64	65.859	
1,409.69	1,409.69	1,426.99	1,426.99	4.83	4.88	-90.50	-5.50	-635.00	635.02	625.31	9.71	65.388 CC	
1,500.00	1,500.00	1,515.69	1,515.69	5.15	5.20	-90.50	-5.54	-635.02	635.05	624.70	10.35	61.353 ES	
1,600.00	1,599.98	1,606.33	1,606.30	5.50	5.51	134.18	-7.26	-635.90	637.25	626.25	11.00	57.916	
1,700.00	1,699.84	1,700.00	1,699.84	5.83	5.81	134.01	-11.71	-638.18	643.36	631.72	11.64	55.259	
1,800.09	1,799.54	1,790.72	1,790.25	6.16	6.12	133.80	-18.36	-641.59	653.22	640.94	12.28	53.191	
1,900.00	1,898.90	1,889.99	1,889.14	6.51	6.45	133.78	-26.07	-645.53	664.54	651.58	12.95	51.297	
2,000.00	1,998.36	1,989.35	1,988.12	6.85	6.79	133.77	-33.78	-649.48	675.86	662.22	13.64	49.551	
2,100.00	2,097.81	2,088.71	2,087.10	7.20	7.13	133.75	-41.49	-653.42	687.18	672.85	14.33	47.944	
2,200.00	2,197.26	2,188.06	2,186.08	7.56	7.48	133.74	-49.20	-657.37	698.50	683.47	15.03	46.463	
2,300.00	2,296.71	2,287.42	2,285.06	7.92	7.82	133.73	-56.91	-661.32	709.83	694.09	15.74	45.096	
2,400.00	2,396.16	2,386.78	2,384.03	8.28	8.18	133.72	-64.63	-665.26	721.15	704.70	16.45	43.833	
2,500.00	2,495.62	2,486.13	2,483.01	8.64	8.53	133.71	-72.34	-669.21	732.47	715.30	17.17	42.663	
2,600.00	2,595.07	2,585.49	2,581.99	9.00	8.89	133.69	-80.05	-673.16	743.79	725.91	17.89	41.578	
2,700.00	2,694.52	2,684.85	2,680.97	9.37	9.24	133.68	-87.76	-677.11	755.12	736.50	18.61	40.569	
2,800.00	2,793.97	2,784.20	2,779.95	9.74	9.60	133.67	-95.47	-681.05	766.44	747.10	19.34	39.629	
2,900.00	2,893.42	2,883.56	2,878.93	10.11	9.96	133.66	-103.18	-685.00	777.76	757.69	20.07	38.751	
3,000.00	2,992.87	2,982.92	2,977.90	10.48	10.32	133.65	-110.89	-688.95	789.09	768.28	20.80	37.931	
3,100.00	3,092.33	3,082.27	3,076.88	10.85	10.69	133.64	-118.61	-692.90	800.41	778.87	21.54	37.162	
3,200.00	3,191.78	3,181.63	3,175.86	11.22	11.05	133.63	-126.32	-696.84	811.73	789.46	22.28	36.441	
3,300.00	3,291.23	3,280.99	3,274.84	11.60	11.42	133.62	-134.03	-700.79	823.05	800.04	23.01	35.763	
3,400.00	3,390.68	3,380.34	3,373.82	11.97	11.78	133.62	-141.74	-704.74	834.38	810.62	23.75	35.125	
3,500.00	3,490.13	3,479.70	3,472.80	12.35	12.15	133.61	-149.45	-708.68	845.70	821.20	24.50	34.523	
3,600.00	3,589.59	3,579.06	3,571.78	12.73	12.51	133.60	-157.16	-712.63	857.02	831.78	25.24	33.954	
3,700.00	3,689.04	3,678.41	3,670.75	13.10	12.88	133.59	-164.87	-716.58	868.35	842.36	25.99	33.417	
3,800.00	3,788.49	3,777.77	3,769.73	13.48	13.25	133.58	-172.58	-720.53	879.67	852.94	26.73	32.908	
3,900.00	3,887.94	3,877.13	3,868.71	13.86	13.62	133.57	-180.30	-724.47	890.99	863.51	27.48	32.426	
4,000.00	3,987.39	3,976.49	3,967.69	14.24	13.99	133.57	-188.01	-728.42	902.31	874.09	28.23	31.968	
4,100.00	4,086.84	4,075.84	4,066.67	14.62	14.36	133.56	-195.72	-732.37	913.64	884.66	28.97	31.532	
4,200.00	4,186.30	4,175.20	4,165.65	15.00	14.73	133.55	-203.43	-736.31	924.96	895.24	29.72	31.118	
4,300.00	4,285.75	4,274.56	4,264.62	15.38	15.10	133.55	-211.14	-740.26	936.28	905.81	30.48	30.723	
4,400.00	4,385.20	4,373.91	4,363.60	15.76	15.47	133.54	-218.85	-744.21	947.61	916.38	31.23	30.346	
4,500.00	4,484.65	4,473.27	4,462.58	16.14	15.84	133.53	-226.56	-748.16	958.93	926.95	31.98	29.987	
4,600.00	4,584.12	4,570.93	4,559.97	16.52	16.27	133.68	-233.65	-751.78	969.25	936.46	32.79	29.558	
4,700.00	4,683.81	4,669.50	4,658.49	16.89	16.69	134.00	-236.44	-753.21	975.86	942.28	33.58	29.058	
4,800.00	4,783.72	4,769.03	4,757.02	17.25	17.03	134.23	-236.48	-753.23	978.85	944.57	34.29	28.550	
4,900.00	4,883.71	4,868.02	4,855.01	17.59	17.37	-90.49	-236.48	-753.23	979.49	944.53	34.96	28.020	
5,000.00	4,983.71	5,012.02	5,001.01	17.92	17.70	-90.49	-236.48	-753.23	979.49	943.87	35.62	27.496	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design: Fez Federal Com - 604H - OH - Plan 1 10-12-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error:	0.00 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	Warning		
5,100.00	5,083.71	5,112.02	5,101.01	18.26	18.04	-90.49	-236.48	-753.23	979.49	943.20	36.29	26.990			
5,200.00	5,183.71	5,212.02	5,201.01	18.59	18.37	-90.49	-236.48	-753.23	979.49	942.53	36.96	26.501			
5,300.00	5,283.71	5,312.02	5,301.01	18.92	18.71	-90.49	-236.48	-753.23	979.49	941.86	37.63	26.028			
5,400.00	5,383.71	5,412.02	5,401.01	19.26	19.05	-90.49	-236.48	-753.23	979.49	941.18	38.31	25.570			
5,500.00	5,483.71	5,512.02	5,501.01	19.60	19.39	-90.49	-236.48	-753.23	979.49	940.51	38.98	25.128			
5,600.00	5,583.71	5,612.02	5,601.01	19.93	19.72	-90.49	-236.48	-753.23	979.49	939.83	39.66	24.699			
5,700.00	5,683.71	5,712.02	5,701.01	20.27	20.06	-90.49	-236.48	-753.23	979.49	939.16	40.33	24.284			
5,800.00	5,783.71	5,812.02	5,801.01	20.61	20.41	-90.49	-236.48	-753.23	979.49	938.48	41.01	23.882			
5,900.00	5,883.71	5,912.02	5,901.01	20.95	20.75	-90.49	-236.48	-753.23	979.49	937.80	41.69	23.492			
6,000.00	5,983.71	6,012.02	6,001.01	21.29	21.09	-90.49	-236.48	-753.23	979.49	937.11	42.38	23.114			
6,100.00	6,083.71	6,112.02	6,101.01	21.63	21.43	-90.49	-236.48	-753.23	979.49	936.43	43.06	22.748			
6,200.00	6,183.71	6,212.02	6,201.01	21.97	21.77	-90.49	-236.48	-753.23	979.49	935.75	43.74	22.392			
6,300.00	6,283.71	6,312.02	6,301.01	22.31	22.12	-90.49	-236.48	-753.23	979.49	935.06	44.43	22.047			
6,400.00	6,383.71	6,412.02	6,401.01	22.65	22.46	-90.49	-236.48	-753.23	979.49	934.38	45.11	21.712			
6,500.00	6,483.71	6,512.02	6,501.01	23.00	22.80	-90.49	-236.48	-753.23	979.49	933.69	45.80	21.386			
6,600.00	6,583.71	6,612.02	6,601.01	23.34	23.15	-90.49	-236.48	-753.23	979.49	933.00	46.49	21.070			
6,700.00	6,683.71	6,712.02	6,701.01	23.68	23.49	-90.49	-236.48	-753.23	979.49	932.31	47.18	20.763			
6,800.00	6,783.71	6,812.02	6,801.01	24.03	23.84	-90.49	-236.48	-753.23	979.49	931.63	47.87	20.463			
6,900.00	6,883.71	6,912.02	6,901.01	24.37	24.19	-90.49	-236.48	-753.23	979.49	930.93	48.56	20.173			
7,000.00	6,983.71	7,012.02	7,001.01	24.71	24.53	-90.49	-236.48	-753.23	979.49	930.24	49.25	19.890			
7,100.00	7,083.71	7,112.02	7,101.01	25.06	24.88	-90.49	-236.48	-753.23	979.49	929.55	49.94	19.614			
7,200.00	7,183.71	7,212.02	7,201.01	25.41	25.23	-90.49	-236.48	-753.23	979.49	928.86	50.63	19.346			
7,300.00	7,283.71	7,312.02	7,301.01	25.75	25.57	-90.49	-236.48	-753.23	979.49	928.17	51.32	19.085			
7,400.00	7,383.71	7,412.02	7,401.01	26.10	25.92	-90.49	-236.48	-753.23	979.49	927.47	52.02	18.830			
7,500.00	7,483.71	7,512.02	7,501.01	26.44	26.27	-90.49	-236.48	-753.23	979.49	926.78	52.71	18.582			
7,600.00	7,583.71	7,612.02	7,601.01	26.79	26.62	-90.49	-236.48	-753.23	979.49	926.08	53.41	18.340			
7,700.00	7,683.71	7,712.02	7,701.01	27.14	26.96	-90.49	-236.48	-753.23	979.49	925.39	54.10	18.104			
7,800.00	7,783.71	7,812.02	7,801.01	27.49	27.31	-90.49	-236.48	-753.23	979.49	924.69	54.80	17.874			
7,900.00	7,883.71	7,912.02	7,901.01	27.83	27.66	-90.49	-236.48	-753.23	979.49	924.00	55.50	17.650			
8,000.00	7,983.71	8,012.02	8,001.01	28.18	28.01	-90.49	-236.48	-753.23	979.49	923.30	56.19	17.431			
8,100.00	8,083.71	8,112.02	8,101.01	28.53	28.36	-90.49	-236.48	-753.23	979.49	922.60	56.89	17.217			
8,200.00	8,183.71	8,212.02	8,201.01	28.88	28.71	-90.49	-236.48	-753.23	979.49	921.90	57.59	17.009			
8,300.00	8,283.71	8,312.02	8,301.01	29.23	29.06	-90.49	-236.48	-753.23	979.49	921.20	58.29	16.805			
8,400.00	8,383.71	8,412.02	8,401.01	29.58	29.41	-90.49	-236.48	-753.23	979.49	920.50	58.99	16.605			
8,500.00	8,483.71	8,512.02	8,501.01	29.93	29.76	-90.49	-236.48	-753.23	979.49	919.81	59.69	16.411			
8,600.00	8,583.71	8,612.02	8,601.01	30.27	30.11	-90.49	-236.48	-753.23	979.49	919.11	60.39	16.221			
8,700.00	8,683.71	8,712.02	8,701.01	30.62	30.46	-90.49	-236.48	-753.23	979.49	918.40	61.09	16.035			
8,800.00	8,783.71	8,812.02	8,801.01	30.97	30.81	-90.49	-236.48	-753.23	979.49	917.70	61.79	15.853			
8,900.00	8,883.71	8,912.02	8,901.01	31.32	31.16	-90.49	-236.48	-753.23	979.49	917.00	62.49	15.675			
9,000.00	8,983.71	9,012.02	9,001.01	31.67	31.51	-90.49	-236.48	-753.23	979.49	916.30	63.19	15.501			
9,100.00	9,083.71	9,112.02	9,101.01	32.03	31.87	-90.49	-236.48	-753.23	979.49	915.60	63.89	15.331			
9,200.00	9,183.71	9,212.02	9,201.01	32.38	32.22	-90.49	-236.48	-753.23	979.49	914.90	64.59	15.164			
9,300.00	9,283.71	9,312.02	9,301.01	32.73	32.57	-90.49	-236.48	-753.23	979.49	914.20	65.29	15.001			
9,400.00	9,383.71	9,412.02	9,401.01	33.08	32.92	-90.49	-236.48	-753.23	979.49	913.49	66.00	14.841			
9,500.00	9,483.71	9,512.02	9,501.01	33.43	33.27	-90.49	-236.48	-753.23	979.49	912.79	66.70	14.685			
9,600.00	9,583.71	9,612.02	9,601.01	33.78	33.62	-90.49	-236.48	-753.23	979.49	912.09	67.40	14.532			
9,700.00	9,683.71	9,712.02	9,701.01	34.13	33.98	-90.49	-236.48	-753.23	979.49	911.38	68.11	14.381			
9,800.00	9,783.71	9,812.02	9,801.01	34.48	34.33	-90.49	-236.48	-753.23	979.49	910.68	68.81	14.234			
9,900.00	9,883.71	9,912.02	9,901.01	34.83	34.68	-90.49	-236.48	-753.23	979.49	909.97	69.52	14.090			
10,000.00	9,983.71	10,012.02	10,001.01	35.19	35.03	-90.49	-236.48	-753.23	979.49	909.27	70.22	13.949			
10,100.00	10,083.71	10,112.02	10,101.01	35.54	35.39	-90.49	-236.48	-753.23	979.49	908.57	70.92	13.810			
10,200.00	10,183.71	10,212.02	10,201.01	35.89	35.74	-90.49	-236.48	-753.23	979.49	907.86	71.63	13.674			

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 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)		Offset Wellbore Centre +N-S (usft)	+E-W (usft)					
10,300.00	10,283.71	10,312.02	10,301.01	36.24	36.09	-90.49	-236.48	-753.23	979.49	907.16	72.33	13.541	
10,400.00	10,383.71	10,412.02	10,401.01	36.60	36.45	-90.49	-236.48	-753.23	979.49	906.45	73.04	13.410	
10,500.00	10,483.71	10,512.02	10,501.01	36.95	36.80	-90.49	-236.48	-753.23	979.49	905.74	73.75	13.282	
10,600.00	10,583.71	10,612.02	10,601.01	37.30	37.15	-90.49	-236.48	-753.23	979.49	905.04	74.45	13.156	
10,700.00	10,683.71	10,712.02	10,701.01	37.65	37.50	-90.49	-236.48	-753.23	979.49	904.33	75.16	13.032	
10,800.00	10,783.71	10,812.02	10,801.01	38.01	37.86	-90.49	-236.48	-753.23	979.49	903.63	75.86	12.911	
10,900.00	10,883.71	10,912.02	10,901.01	38.36	38.21	-90.49	-236.48	-753.23	979.49	902.92	76.57	12.792	
11,000.00	10,983.71	11,012.02	11,001.01	38.71	38.57	-90.49	-236.48	-753.23	979.49	902.21	77.28	12.675	
11,100.00	11,083.71	11,112.02	11,101.01	39.06	38.92	-90.49	-236.48	-753.23	979.49	901.51	77.98	12.560	
11,200.00	11,183.71	11,212.02	11,201.01	39.42	39.27	-90.49	-236.48	-753.23	979.49	900.80	78.69	12.447	
11,300.00	11,283.71	11,312.02	11,301.01	39.77	39.63	-90.49	-236.48	-753.23	979.49	900.09	79.40	12.336	
11,400.00	11,383.71	11,412.02	11,401.01	40.12	39.98	-90.49	-236.48	-753.23	979.49	899.38	80.11	12.227	
11,500.00	11,483.71	11,512.02	11,501.01	40.48	40.33	-90.49	-236.48	-753.23	979.49	898.68	80.81	12.120	
11,600.00	11,583.71	11,612.02	11,601.01	40.83	40.69	-90.49	-236.48	-753.23	979.49	897.97	81.52	12.015	
11,700.00	11,683.71	11,712.02	11,701.01	41.19	41.04	-90.49	-236.48	-753.23	979.49	897.26	82.23	11.912	
11,782.50	11,766.21	11,794.54	11,783.51	41.48	41.33	-90.43	-235.44	-753.24	979.49	896.68	82.81	11.828	
11,800.00	11,783.71	11,811.98	11,800.89	41.54	41.39	-90.35	-234.13	-753.25	979.49	896.56	82.93	11.810	
11,900.00	11,883.71	11,908.86	11,896.18	41.89	41.72	-89.37	-217.27	-753.38	979.67	896.06	83.61	11.717	
12,000.00	11,983.71	11,997.84	11,980.06	42.25	41.99	-87.21	-187.84	-753.60	980.87	896.63	84.24	11.644	
12,100.00	12,083.08	12,080.25	12,052.83	42.59	42.22	-85.13	-149.32	-753.89	983.59	898.77	84.82	11.597	
12,200.00	12,179.19	12,159.29	12,116.75	42.91	42.42	-83.17	-102.93	-754.23	987.34	902.01	85.34	11.570	
12,300.00	12,269.13	12,235.72	12,171.92	43.19	42.60	-81.38	-50.12	-754.63	991.71	905.91	85.80	11.559	
12,400.00	12,350.17	12,310.13	12,218.42	43.43	42.77	-79.80	7.90	-755.06	996.25	910.05	86.20	11.557	
12,500.00	12,419.84	12,383.00	12,256.31	43.63	42.93	-78.45	70.08	-755.53	1,000.57	914.01	86.56	11.559	
12,600.00	12,476.03	12,450.00	12,283.92	43.82	43.07	-77.42	131.08	-755.99	1,004.32	917.44	86.89	11.559	
12,700.00	12,517.02	12,525.63	12,306.30	44.00	43.22	-76.61	203.26	-756.53	1,007.18	919.95	87.23	11.546	
12,800.00	12,541.57	12,600.00	12,318.85	44.19	43.37	-76.13	276.52	-757.08	1,008.97	921.40	87.57	11.522	
12,900.00	12,548.98	12,668.01	12,321.98	44.37	43.50	-76.00	344.42	-757.59	1,009.53	921.64	87.88	11.487	
13,000.00	12,548.67	12,768.01	12,321.67	44.58	43.72	-76.00	444.41	-758.34	1,009.53	921.22	88.31	11.432	
13,100.00	12,548.36	12,868.01	12,321.36	44.83	43.98	-76.00	544.41	-759.09	1,009.54	920.72	88.82	11.366	
13,200.00	12,548.06	12,968.01	12,321.05	45.13	44.29	-76.00	644.41	-759.84	1,009.54	920.12	89.42	11.290	
13,300.00	12,547.75	13,068.01	12,320.75	45.46	44.64	-76.00	744.40	-760.59	1,009.55	919.44	90.11	11.203	
13,400.00	12,547.44	13,168.01	12,320.44	45.85	45.03	-76.00	844.40	-761.34	1,009.55	918.67	90.89	11.108	
13,500.00	12,547.13	13,268.01	12,320.13	46.27	45.47	-76.00	944.40	-762.09	1,009.56	917.81	91.74	11.004	
13,600.00	12,546.83	13,368.01	12,319.82	46.73	45.95	-76.00	1,044.39	-762.84	1,009.56	916.88	92.68	10.893	
13,700.00	12,546.52	13,468.01	12,319.52	47.24	46.46	-76.00	1,144.39	-763.59	1,009.57	915.87	93.70	10.774	
13,800.00	12,546.21	13,568.01	12,319.21	47.78	47.02	-76.00	1,244.39	-764.33	1,009.57	914.78	94.79	10.650	
13,900.00	12,545.90	13,668.01	12,318.90	48.35	47.61	-76.00	1,344.38	-765.08	1,009.58	913.62	95.96	10.521	
14,000.00	12,545.60	13,768.01	12,318.60	48.96	48.24	-76.00	1,444.38	-765.83	1,009.58	912.38	97.20	10.387	
14,100.00	12,545.29	13,868.01	12,318.29	49.61	48.90	-76.00	1,544.38	-766.58	1,009.59	911.08	98.51	10.249	
14,200.00	12,544.98	13,968.01	12,317.98	50.29	49.59	-76.00	1,644.37	-767.33	1,009.59	909.71	99.88	10.108	
14,300.00	12,544.67	14,068.01	12,317.67	51.00	50.32	-76.00	1,744.37	-768.08	1,009.60	908.28	101.31	9.965	
14,400.00	12,544.37	14,168.01	12,317.37	51.74	51.07	-76.00	1,844.37	-768.83	1,009.60	906.79	102.81	9.820	
14,500.00	12,544.06	14,268.01	12,317.06	52.51	51.85	-76.00	1,944.36	-769.58	1,009.61	905.25	104.36	9.674	
14,600.00	12,543.75	14,368.01	12,316.75	53.30	52.67	-76.00	2,044.36	-770.33	1,009.61	903.65	105.97	9.527	
14,700.00	12,543.44	14,468.01	12,316.44	54.13	53.50	-76.00	2,144.36	-771.08	1,009.62	901.99	107.63	9.380	
14,800.00	12,543.14	14,568.01	12,316.14	54.97	54.37	-76.00	2,244.35	-771.83	1,009.62	900.28	109.34	9.234	
14,900.00	12,542.83	14,668.01	12,315.83	55.85	55.25	-76.00	2,344.35	-772.58	1,009.63	898.53	111.10	9.088	
15,000.00	12,542.52	14,768.01	12,315.52	56.74	56.16	-76.00	2,444.35	-773.33	1,009.64	896.73	112.90	8.943	
15,100.00	12,542.22	14,868.01	12,315.21	57.66	57.09	-76.00	2,544.34	-774.08	1,009.64	894.89	114.75	8.799	
15,200.00	12,541.91	14,968.01	12,314.91	58.59	58.04	-76.00	2,644.34	-774.83	1,009.65	893.01	116.64	8.656	
15,300.00	12,541.60	15,068.01	12,314.60	59.55	59.02	-76.00	2,744.34	-775.58	1,009.65	891.08	118.57	8.515	

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 703H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.00 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)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
15,400.00	12,541.29	15,168.01	12,314.29	60.53	60.01	-76.00	2,844.33	-776.33	1,009.66	889.12	120.53	8.377		
15,500.00	12,540.99	15,268.01	12,313.98	61.52	61.01	-76.00	2,944.33	-777.08	1,009.66	887.13	122.53	8.240		
15,600.00	12,540.68	15,368.01	12,313.68	62.53	62.04	-76.00	3,044.33	-777.83	1,009.67	885.10	124.57	8.105		
15,700.00	12,540.37	15,468.01	12,313.37	63.56	63.08	-76.00	3,144.32	-778.58	1,009.67	883.03	126.64	7.973		
15,800.00	12,540.06	15,568.01	12,313.06	64.60	64.13	-76.00	3,244.32	-779.33	1,009.68	880.94	128.74	7.843		
15,900.00	12,539.76	15,668.01	12,312.76	65.66	65.20	-76.00	3,344.32	-780.08	1,009.68	878.82	130.87	7.715		
16,000.00	12,539.45	15,768.01	12,312.45	66.73	66.29	-76.00	3,444.31	-780.83	1,009.69	876.66	133.02	7.590		
16,100.00	12,539.14	15,868.01	12,312.14	67.82	67.39	-76.00	3,544.31	-781.58	1,009.69	874.49	135.20	7.468		
16,200.00	12,538.83	15,968.01	12,311.83	68.92	68.49	-76.00	3,644.31	-782.33	1,009.70	872.28	137.41	7.348		
16,300.00	12,538.53	16,068.01	12,311.53	70.03	69.62	-76.00	3,744.30	-783.08	1,009.70	870.06	139.65	7.230		
16,400.00	12,538.22	16,168.01	12,311.22	71.15	70.75	-76.00	3,844.30	-783.83	1,009.71	867.81	141.90	7.116		
16,500.00	12,537.91	16,268.01	12,310.91	72.28	71.89	-76.00	3,944.30	-784.58	1,009.71	865.53	144.18	7.003		
16,600.00	12,537.60	16,368.01	12,310.60	73.43	73.05	-76.00	4,044.29	-785.33	1,009.72	863.24	146.48	6.893		
16,700.00	12,537.30	16,468.01	12,310.30	74.58	74.21	-76.00	4,144.29	-786.08	1,009.72	860.93	148.79	6.786		
16,800.00	12,536.99	16,568.01	12,309.99	75.75	75.39	-76.00	4,244.29	-786.83	1,009.73	858.60	151.13	6.681		
16,900.00	12,536.68	16,668.01	12,309.68	76.92	76.57	-76.00	4,344.28	-787.58	1,009.73	856.25	153.49	6.579		
17,000.00	12,536.38	16,768.01	12,309.37	78.10	77.76	-76.00	4,444.28	-788.33	1,009.74	853.88	155.86	6.479		
17,100.00	12,536.07	16,868.01	12,309.07	79.29	78.96	-76.00	4,544.28	-789.08	1,009.74	851.49	158.25	6.381		
17,200.00	12,535.76	16,968.01	12,308.76	80.49	80.16	-76.00	4,644.27	-789.82	1,009.75	849.09	160.65	6.285		
17,300.00	12,535.45	17,068.01	12,308.45	81.70	81.38	-76.00	4,744.27	-790.57	1,009.75	846.68	163.07	6.192		
17,400.00	12,535.15	17,168.01	12,308.14	82.91	82.60	-76.00	4,844.27	-791.32	1,009.76	844.25	165.51	6.101		
17,500.00	12,534.84	17,268.01	12,307.84	84.13	83.83	-76.00	4,944.26	-792.07	1,009.76	841.81	167.96	6.012		
17,600.00	12,534.53	17,368.01	12,307.53	85.36	85.06	-76.00	5,044.26	-792.82	1,009.77	839.35	170.42	5.925		
17,700.00	12,534.22	17,468.01	12,307.22	86.59	86.30	-76.00	5,144.26	-793.57	1,009.77	836.88	172.89	5.840		
17,800.00	12,533.92	17,568.01	12,306.91	87.83	87.55	-76.00	5,244.25	-794.32	1,009.78	834.40	175.38	5.758		
17,900.00	12,533.61	17,668.01	12,306.61	89.07	88.80	-76.00	5,344.25	-795.07	1,009.78	831.91	177.88	5.677		
18,000.00	12,533.30	17,768.01	12,306.30	90.32	90.06	-76.00	5,444.25	-795.82	1,009.79	829.40	180.39	5.598		
18,100.00	12,532.99	17,868.01	12,305.99	91.58	91.33	-76.00	5,544.24	-796.57	1,009.80	826.89	182.91	5.521		
18,200.00	12,532.69	17,968.01	12,305.69	92.84	92.59	-76.00	5,644.24	-797.32	1,009.80	824.36	185.44	5.446		
18,300.00	12,532.38	18,068.01	12,305.38	94.11	93.87	-76.00	5,744.24	-798.07	1,009.81	821.83	187.98	5.372		
18,400.00	12,532.07	18,168.01	12,305.07	95.38	95.15	-76.00	5,844.23	-798.82	1,009.81	819.28	190.53	5.300		
18,500.00	12,531.77	18,268.01	12,304.76	96.66	96.43	-76.00	5,944.23	-799.57	1,009.82	816.73	193.08	5.230		
18,600.00	12,531.46	18,368.01	12,304.46	97.94	97.71	-76.00	6,044.23	-800.32	1,009.82	814.17	195.65	5.161		
18,700.00	12,531.15	18,468.01	12,304.15	99.22	99.01	-76.00	6,144.22	-801.07	1,009.83	811.60	198.23	5.094		
18,800.00	12,530.84	18,568.01	12,303.84	100.51	100.30	-76.00	6,244.22	-801.82	1,009.83	809.02	200.81	5.029		
18,900.00	12,530.54	18,668.01	12,303.53	101.80	101.60	-76.00	6,344.22	-802.57	1,009.84	806.43	203.40	4.965		
19,000.00	12,530.23	18,768.01	12,303.23	103.10	102.90	-76.00	6,444.22	-803.32	1,009.84	803.84	206.00	4.902		
19,100.00	12,529.92	18,868.01	12,302.92	104.40	104.21	-76.00	6,544.21	-804.07	1,009.85	801.24	208.61	4.841		
19,200.00	12,529.61	18,968.01	12,302.61	105.70	105.52	-76.00	6,644.21	-804.82	1,009.85	798.63	211.22	4.781		
19,300.00	12,529.31	19,068.01	12,302.30	107.01	106.83	-76.00	6,744.21	-805.57	1,009.86	796.02	213.84	4.723		
19,400.00	12,529.00	19,168.01	12,302.00	108.32	108.14	-76.00	6,844.20	-806.32	1,009.86	793.40	216.46	4.665		
19,500.00	12,528.69	19,268.01	12,301.69	109.64	109.46	-76.00	6,944.20	-807.07	1,009.87	790.77	219.10	4.609		
19,600.00	12,528.38	19,368.01	12,301.38	110.95	110.78	-76.00	7,044.20	-807.82	1,009.87	788.14	221.73	4.554		
19,700.00	12,528.08	19,468.01	12,301.07	112.27	112.11	-76.00	7,144.19	-808.57	1,009.88	785.50	224.38	4.501		
19,800.00	12,527.77	19,568.01	12,300.77	113.59	113.43	-76.00	7,244.19	-809.32	1,009.88	782.85	227.03	4.448		
19,900.00	12,527.46	19,668.01	12,300.46	114.92	114.76	-76.00	7,344.19	-810.07	1,009.89	780.21	229.68	4.397		
20,000.00	12,527.15	19,768.01	12,300.15	116.25	116.10	-76.00	7,444.18	-810.82	1,009.89	777.55	232.34	4.347		
20,100.00	12,526.85	19,868.01	12,299.85	117.58	117.43	-76.00	7,544.18	-811.57	1,009.90	774.89	235.01	4.297		
20,200.00	12,526.54	19,968.01	12,299.54	118.91	118.77	-76.00	7,644.18	-812.32	1,009.90	772.23	237.68	4.249		
20,300.00	12,526.23	20,068.01	12,299.23	120.24	120.11	-76.00	7,744.17	-813.07	1,009.91	769.56	240.35	4.202		
20,400.00	12,525.93	20,168.01	12,298.92	121.58	121.45	-76.00	7,844.17	-813.82	1,009.91	766.88	243.03	4.156		
20,500.00	12,525.62	20,268.01	12,298.62	122.92	122.79	-76.00	7,944.17	-814.56	1,009.92	764.21	245.71	4.110		

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 604H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance							
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
20,600.00	12,525.31	20,368.01	12,298.31	124.26	124.14	-76.00	8,044.16	-815.31	1,009.92	761.52	248.40	4.066	
20,700.00	12,525.00	20,468.01	12,298.00	125.61	125.49	-76.00	8,144.16	-816.06	1,009.93	758.84	251.09	4.022	
20,800.00	12,524.70	20,568.01	12,297.69	126.95	126.83	-76.00	8,244.16	-816.81	1,009.93	756.15	253.79	3.979	
20,900.00	12,524.39	20,668.01	12,297.39	128.30	128.19	-76.00	8,344.15	-817.56	1,009.94	753.45	256.49	3.938	
21,000.00	12,524.08	20,768.01	12,297.08	129.65	129.54	-76.00	8,444.15	-818.31	1,009.94	750.75	259.19	3.897	
21,100.00	12,523.77	20,868.01	12,296.77	131.00	130.89	-76.00	8,544.15	-819.06	1,009.95	748.05	261.90	3.856	
21,200.00	12,523.47	20,968.01	12,296.46	132.36	132.25	-76.00	8,644.14	-819.81	1,009.96	745.35	264.61	3.817	
21,300.00	12,523.16	21,068.01	12,296.16	133.71	133.61	-76.00	8,744.14	-820.56	1,009.96	742.64	267.32	3.778	
21,400.00	12,522.85	21,168.01	12,295.85	135.07	134.97	-76.00	8,844.14	-821.31	1,009.97	739.93	270.04	3.740	
21,500.00	12,522.54	21,268.01	12,295.54	136.43	136.33	-76.00	8,944.13	-822.06	1,009.97	737.21	272.76	3.703	
21,600.00	12,522.24	21,368.01	12,295.23	137.79	137.69	-76.00	9,044.13	-822.81	1,009.98	734.50	275.48	3.666	
21,700.00	12,521.93	21,468.01	12,294.93	139.15	139.06	-76.00	9,144.13	-823.56	1,009.98	731.77	278.21	3.630	
21,800.00	12,521.62	21,568.01	12,294.62	140.51	140.43	-76.00	9,244.12	-824.31	1,009.99	729.05	280.94	3.595	
21,900.00	12,521.31	21,668.01	12,294.31	141.87	141.79	-76.00	9,344.12	-825.06	1,009.99	726.32	283.67	3.560	
22,000.00	12,521.01	21,768.01	12,294.01	143.24	143.16	-76.00	9,444.12	-825.81	1,010.00	723.59	286.40	3.527	
22,100.00	12,520.70	21,868.01	12,293.70	144.61	144.53	-76.00	9,544.11	-826.56	1,010.00	720.86	289.14	3.493	
22,200.00	12,520.39	21,968.01	12,293.39	145.98	145.90	-76.00	9,644.11	-827.31	1,010.01	718.13	291.88	3.460	
22,300.00	12,520.09	22,068.01	12,293.08	147.35	147.28	-76.00	9,744.11	-828.06	1,010.01	715.39	294.62	3.428	
22,400.00	12,519.78	22,168.01	12,292.78	148.72	148.65	-76.00	9,844.10	-828.81	1,010.02	712.65	297.37	3.397	
22,500.00	12,519.47	22,268.01	12,292.47	150.09	150.02	-76.00	9,944.10	-829.56	1,010.02	709.91	300.11	3.365	
22,600.00	12,519.16	22,368.01	12,292.16	151.46	151.40	-76.00	10,044.10	-830.31	1,010.03	707.17	302.86	3.335	
22,603.76	12,519.15	22,371.77	12,292.15	151.51	151.45	-76.00	10,047.85	-830.34	1,010.03	707.06	302.97	3.334	
22,653.01	12,519.00	22,420.22	12,292.00	152.19	152.12	-76.00	10,096.30	-830.70	1,010.03	705.72	304.31	3.319 SF	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 702H - OH - Plan 1 10-12-18														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
0.00	0.00	1.20	1.20	0.00	0.00	89.62	0.20	29.90	29.90	29.63	0.27	109.464		
100.00	100.00	101.20	101.20	0.13	0.14	89.62	0.20	29.90	29.90	28.91	0.99	30.200		
200.00	200.00	201.20	201.20	0.49	0.50	89.62	0.20	29.90	29.90	28.19	1.71	17.516		
300.00	300.00	301.20	301.20	0.85	0.86	89.62	0.20	29.90	29.90	27.48	2.42	12.335		
400.00	400.00	401.20	401.20	1.21	1.21	89.62	0.20	29.90	29.90	26.76	3.14	9.520		
500.00	500.00	501.20	501.20	1.57	1.57	89.62	0.20	29.90	29.90	26.04	3.86	7.751		
600.00	600.00	601.20	601.20	1.93	1.93	89.62	0.20	29.90	29.90	25.33	4.57	6.536		
700.00	700.00	701.20	701.20	2.29	2.29	89.62	0.20	29.90	29.90	24.61	5.29	5.650		
800.00	800.00	801.20	801.20	2.64	2.65	89.62	0.20	29.90	29.90	23.89	6.01	4.976		
900.00	900.00	901.20	901.20	3.00	3.01	89.62	0.20	29.90	29.90	23.18	6.73	4.446		
1,000.00	1,000.00	1,001.20	1,001.20	3.36	3.36	89.62	0.20	29.90	29.90	22.46	7.44	4.018		
1,100.00	1,100.00	1,101.20	1,101.20	3.72	3.72	89.62	0.20	29.90	29.90	21.74	8.16	3.665		
1,200.00	1,200.00	1,201.20	1,201.20	4.08	4.08	89.62	0.20	29.90	29.90	21.02	8.88	3.369		
1,300.00	1,300.00	1,301.20	1,301.20	4.44	4.44	89.62	0.20	29.90	29.90	20.31	9.59	3.117		
1,400.00	1,400.00	1,401.20	1,401.20	4.79	4.80	89.62	0.20	29.90	29.90	20.19	9.71	3.079 CC		
1,416.26	1,416.26	1,417.46	1,417.46	4.85	4.86	89.62	0.20	29.90	29.90	19.59	10.31	2.900		
1,500.00	1,500.00	1,501.19	1,501.19	5.15	5.16	89.62	0.20	29.90	29.90	19.58	10.33	2.896		
1,502.19	1,502.19	1,503.36	1,503.36	5.16	5.16	-45.62	0.20	29.90	29.90	19.27	11.00	2.753 ES		
1,600.00	1,599.98	1,600.00	1,599.98	5.50	5.50	-46.46	-0.57	31.46	30.27	19.66	11.66	2.686		
1,700.00	1,699.84	1,699.31	1,699.15	5.83	5.83	-48.93	-2.88	36.11	31.32	20.85	12.34	2.690		
1,800.09	1,798.54	1,798.42	1,797.88	6.16	6.17	-52.72	-6.70	43.81	33.18	22.59	13.02	2.734		
1,900.00	1,898.90	1,898.26	1,897.17	6.51	6.52	-56.74	-11.33	53.16	35.61	24.48	13.72	2.784		
2,000.00	1,998.36	1,998.20	1,996.57	6.85	6.87	-60.23	-15.96	62.51	38.20	26.48	14.43	2.836		
2,100.00	2,097.81	2,098.14	2,095.96	7.20	7.22	-63.28	-20.60	71.87	40.91	28.58	15.14	2.888		
2,200.00	2,197.26	2,198.08	2,195.36	7.56	7.58	-65.94	-25.23	81.22	43.72	30.75	15.86	2.940		
2,300.00	2,296.71	2,298.02	2,294.75	7.92	7.94	-68.27	-29.87	90.57	46.61	32.99	16.58	2.990		
2,400.00	2,396.16	2,397.96	2,394.14	8.28	8.30	-70.33	-34.50	99.93	49.57	35.28	17.31	3.039		
2,500.00	2,495.62	2,497.91	2,493.54	8.64	8.67	-72.15	-39.14	109.28	52.59	37.61	18.04	3.085		
2,600.00	2,595.07	2,597.85	2,592.93	9.00	9.03	-73.77	-43.77	118.63	55.65	39.98	18.77	3.130		
2,700.00	2,694.52	2,697.79	2,692.33	9.37	9.40	-75.23	-48.41	127.99	58.76	42.38	19.51	3.173		
2,800.00	2,793.97	2,797.73	2,791.72	9.74	9.77	-76.53	-53.04	137.34	61.89	44.81	20.25	3.213		
2,900.00	2,893.42	2,897.67	2,891.12	10.11	10.14	-77.72	-57.68	146.69	65.06	47.26	20.99	3.251		
3,000.00	2,992.87	2,997.61	2,990.51	10.48	10.51	-78.79	-62.32	156.05	68.25	49.73	21.74	3.288		
3,100.00	3,092.33	3,097.55	3,089.91	10.85	10.89	-79.76	-66.95	165.40	71.47	52.22	22.49	3.322		
3,200.00	3,191.78	3,197.49	3,189.30	11.22	11.26	-80.65	-71.59	174.76	74.70	54.72	23.23	3.355		
3,300.00	3,291.23	3,297.44	3,288.70	11.60	11.64	-81.47	-76.22	184.11	77.95	57.23	23.99	3.386		
3,400.00	3,390.68	3,397.38	3,388.09	11.97	12.01	-82.22	-80.86	193.46	81.22	59.76	24.74	3.416		
3,500.00	3,490.13	3,497.32	3,487.48	12.35	12.39	-82.91	-85.49	202.82	84.49	62.29	25.49	3.444		
3,600.00	3,589.59	3,597.26	3,586.88	12.73	12.76	-83.55	-90.13	212.17	87.78	64.84	26.25	3.470		
3,700.00	3,689.04	3,697.20	3,686.27	13.10	13.14	-84.15	-94.76	221.52	91.08	67.39	27.00	3.496		
3,800.00	3,788.49	3,797.14	3,785.67	13.48	13.52	-84.70	-99.40	230.88	94.39	69.95	27.76	3.520		
3,900.00	3,887.94	3,897.08	3,885.06	13.86	13.90	-85.21	-104.03	240.23	97.71	72.51	28.52	3.543		
4,000.00	3,987.39	3,997.02	3,984.46	14.24	14.28	-85.70	-108.67	249.59	101.03	75.08	29.28	3.565		
4,100.00	4,086.84	4,096.97	4,083.85	14.62	14.66	-86.15	-113.30	258.94	104.36	77.66	30.04	3.586		
4,200.00	4,186.30	4,196.81	4,183.25	15.00	15.04	-86.57	-117.94	268.29	107.70	80.24	30.80	3.606		
4,300.00	4,285.75	4,296.85	4,282.64	15.38	15.42	-86.97	-122.58	277.65	111.04	82.83	31.56	3.625		
4,400.00	4,385.20	4,396.79	4,382.04	15.76	15.80	-87.34	-127.21	287.00	114.39	85.42	32.32	3.643		
4,500.00	4,484.65	4,496.73	4,481.43	16.14	16.18	-87.69	-131.85	296.35	117.74	88.02	33.08	3.661		
4,600.00	4,584.12	4,596.67	4,580.83	16.52	16.56	-87.98	-136.48	305.71	121.10	90.73	33.83	3.682		
4,700.00	4,683.81	4,696.59	4,680.19	16.89	16.94	-87.12	-141.12	315.06	124.57	93.77	34.57	3.712		
4,800.00	4,783.72	4,796.37	4,779.43	17.25	17.32	-84.76	-145.74	324.40	128.34	97.52	35.29	3.763		
4,900.00	4,883.71	4,895.90	4,878.42	17.59	17.70	54.12	-150.36	333.71	132.82					

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 702H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		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)	Between Centres (usft)	Between Ellipses (usft)			
5,000.00	4,983.71	4,995.35	4,977.33	17.92	18.08	57.95	-154.97	343.02	138.01	102.01	36.00	3.833	
5,100.00	5,083.71	5,094.81	5,076.24	18.26	18.46	61.48	-159.59	352.33	143.78	107.06	36.72	3.916	
5,200.00	5,183.71	5,194.26	5,175.14	18.59	18.84	64.74	-164.20	361.64	150.05	112.62	37.43	4.009	
5,300.00	5,283.71	5,293.71	5,274.05	18.92	19.22	67.72	-168.81	370.95	156.77	118.63	38.15	4.110	
5,400.00	5,383.71	5,393.17	5,372.96	19.26	19.60	70.46	-173.42	380.25	163.88	125.02	38.86	4.217	
5,500.00	5,483.71	5,492.62	5,471.87	19.60	19.99	72.96	-178.04	389.56	171.34	131.76	39.58	4.329	
5,600.00	5,583.71	5,592.07	5,570.78	19.93	20.37	75.25	-182.65	398.87	179.09	138.79	40.30	4.444	
5,700.00	5,683.71	5,691.53	5,669.69	20.27	20.75	77.35	-187.26	408.18	187.10	146.08	41.02	4.562	
5,800.00	5,783.71	5,790.98	5,768.60	20.61	21.13	79.28	-191.87	417.49	195.35	153.61	41.74	4.680	
5,900.00	5,883.71	5,890.43	5,867.51	20.95	21.51	81.04	-196.49	426.79	203.79	161.33	42.46	4.800	
6,000.00	5,983.71	5,989.88	5,966.42	21.29	21.89	82.67	-201.10	436.10	212.42	169.24	43.18	4.919	
6,100.00	6,083.71	6,089.34	6,065.33	21.63	22.27	84.17	-205.71	445.41	221.20	177.29	43.90	5.038	
6,200.00	6,183.71	6,188.79	6,164.23	21.97	22.66	85.55	-210.33	454.72	230.12	185.49	44.62	5.157	
6,300.00	6,283.71	6,288.24	6,263.14	22.31	23.04	86.83	-214.94	464.03	239.16	193.81	45.35	5.274	
6,400.00	6,383.71	6,388.80	6,363.15	22.65	23.42	88.03	-219.59	473.40	248.28	202.21	46.08	5.389	
6,500.00	6,483.71	6,486.89	6,470.88	23.00	23.83	88.96	-223.46	481.21	255.42	208.60	46.82	5.455	
6,600.00	6,583.71	6,605.48	6,579.37	23.34	24.22	89.43	-225.52	485.39	259.24	211.68	47.56	5.451	
6,700.00	6,683.71	6,711.03	6,684.91	23.68	24.57	89.51	-225.89	486.12	259.91	211.66	48.25	5.386	
6,800.00	6,783.71	6,811.03	6,784.91	24.03	24.90	89.51	-225.89	486.12	259.91	210.99	48.93	5.312	
6,900.00	6,883.71	6,911.03	6,884.91	24.37	25.23	89.51	-225.89	486.12	259.91	210.31	49.60	5.240	
7,000.00	6,983.71	7,011.03	6,984.91	24.71	25.56	89.51	-225.89	486.12	259.91	209.64	50.27	5.170	
7,100.00	7,083.71	7,111.03	7,084.91	25.06	25.89	89.51	-225.89	486.12	259.91	208.96	50.95	5.101	
7,200.00	7,183.71	7,211.03	7,184.91	25.41	26.22	89.51	-225.89	486.12	259.91	208.28	51.63	5.034	
7,300.00	7,283.71	7,311.03	7,284.91	25.75	26.55	89.51	-225.89	486.12	259.91	207.61	52.31	4.969	
7,400.00	7,383.71	7,411.03	7,384.91	26.10	26.89	89.51	-225.89	486.12	259.91	206.93	52.99	4.905	
7,500.00	7,483.71	7,511.03	7,484.91	26.44	27.22	89.51	-225.89	486.12	259.91	206.25	53.67	4.843	
7,600.00	7,583.71	7,611.03	7,584.91	26.79	27.56	89.51	-225.89	486.12	259.91	205.57	54.35	4.783	
7,700.00	7,683.71	7,711.03	7,684.91	27.14	27.89	89.51	-225.89	486.12	259.91	204.88	55.03	4.723	
7,800.00	7,783.71	7,811.03	7,784.91	27.49	28.23	89.51	-225.89	486.12	259.91	204.20	55.71	4.665	
7,900.00	7,883.71	7,911.03	7,884.91	27.83	28.56	89.51	-225.89	486.12	259.91	203.52	56.40	4.609	
8,000.00	7,983.71	8,011.03	7,984.91	28.18	28.90	89.51	-225.89	486.12	259.91	202.83	57.08	4.554	
8,100.00	8,083.71	8,111.03	8,084.91	28.53	29.24	89.51	-225.89	486.12	259.91	202.15	57.76	4.499	
8,200.00	8,183.71	8,211.03	8,184.91	28.88	29.57	89.51	-225.89	486.12	259.91	201.46	58.45	4.447	
8,300.00	8,283.71	8,311.03	8,284.91	29.23	29.91	89.51	-225.89	486.12	259.91	200.77	59.14	4.395	
8,400.00	8,383.71	8,411.03	8,384.91	29.58	30.25	89.51	-225.89	486.12	259.91	200.09	59.83	4.345	
8,500.00	8,483.71	8,511.03	8,484.91	29.93	30.59	89.51	-225.89	486.12	259.91	199.40	60.51	4.295	
8,600.00	8,583.71	8,611.03	8,584.91	30.27	30.93	89.51	-225.89	486.12	259.91	198.71	61.20	4.247	
8,700.00	8,683.71	8,711.03	8,684.91	30.62	31.27	89.51	-225.89	486.12	259.91	198.02	61.89	4.199	
8,800.00	8,783.71	8,811.03	8,784.91	30.97	31.61	89.51	-225.89	486.12	259.91	197.33	62.58	4.153	
8,900.00	8,883.71	8,911.03	8,884.91	31.32	31.95	89.51	-225.89	486.12	259.91	196.64	63.27	4.108	
9,000.00	8,983.71	9,011.03	8,984.91	31.67	32.29	89.51	-225.89	486.12	259.91	195.95	63.96	4.063	
9,100.00	9,083.71	9,111.03	9,084.91	32.03	32.63	89.51	-225.89	486.12	259.91	195.26	64.66	4.020	
9,200.00	9,183.71	9,211.03	9,184.91	32.38	32.97	89.51	-225.89	486.12	259.91	194.56	65.35	3.977	
9,300.00	9,283.71	9,311.03	9,284.91	32.73	33.31	89.51	-225.89	486.12	259.91	193.87	66.04	3.936	
9,400.00	9,383.71	9,411.03	9,384.91	33.08	33.66	89.51	-225.89	486.12	259.91	193.18	66.73	3.895	
9,500.00	9,483.71	9,511.03	9,484.91	33.43	34.00	89.51	-225.89	486.12	259.91	192.48	67.43	3.855	
9,600.00	9,583.71	9,611.03	9,584.91	33.78	34.34	89.51	-225.89	486.12	259.91	191.79	68.12	3.815	
9,700.00	9,683.71	9,711.03	9,684.91	34.13	34.69	89.51	-225.89	486.12	259.91	191.09	68.82	3.777	
9,800.00	9,783.71	9,811.03	9,784.91	34.48	35.03	89.51	-225.89	486.12	259.91	190.40	69.51	3.739	
9,900.00	9,883.71	9,911.03	9,884.91	34.83	35.37	89.51	-225.89	486.12	259.91	189.70	70.21	3.702	
10,000.00	9,983.71	10,011.03	9,984.91	35.19	35.72	89.51	-225.89	486.12	259.91	189.01	70.90	3.666	
10,100.00	10,083.71	10,111.03	10,084.91	35.54	36.06	89.51	-225.89	486.12	259.91	188.31	71.60	3.630	

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 702H - OH - Plan 1 10-12-18														Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM														Offset Well Error: 0.00 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)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)						
10,200.00	10,183.71	10,211.03	10,184.91	35.89	36.41	89.51	-225.89	486.12	259.91	187.61	72.30	3.595		
10,300.00	10,283.71	10,311.03	10,284.91	36.24	36.75	89.51	-225.89	486.12	259.91	186.92	73.00	3.561		
10,400.00	10,383.71	10,411.03	10,384.91	36.60	37.10	89.51	-225.89	486.12	259.91	186.22	73.69	3.527		
10,500.00	10,483.71	10,511.03	10,484.91	36.95	37.44	89.51	-225.89	486.12	259.91	185.52	74.39	3.494		
10,600.00	10,583.71	10,611.03	10,584.91	37.30	37.79	89.51	-225.89	486.12	259.91	184.82	75.09	3.461		
10,700.00	10,683.71	10,711.03	10,684.91	37.65	38.14	89.51	-225.89	486.12	259.91	184.12	75.79	3.429		
10,800.00	10,783.71	10,811.03	10,784.91	38.01	38.48	89.51	-225.89	486.12	259.91	183.42	76.49	3.398		
10,900.00	10,883.71	10,911.03	10,884.91	38.36	38.83	89.51	-225.89	486.12	259.91	182.72	77.19	3.367		
11,000.00	10,983.71	11,011.03	10,984.91	38.71	39.18	89.51	-225.89	486.12	259.91	182.02	77.89	3.337		
11,100.00	11,083.71	11,111.03	11,084.91	39.06	39.52	89.51	-225.89	486.12	259.91	181.32	78.59	3.307		
11,200.00	11,183.71	11,211.03	11,184.91	39.42	39.87	89.51	-225.89	486.12	259.91	180.62	79.29	3.278		
11,300.00	11,283.71	11,311.03	11,284.91	39.77	40.22	89.51	-225.89	486.12	259.91	179.92	79.99	3.249		
11,400.00	11,383.71	11,411.03	11,384.91	40.12	40.56	89.51	-225.89	486.12	259.91	179.22	80.69	3.221		
11,500.00	11,483.71	11,511.03	11,484.91	40.48	40.91	89.51	-225.89	486.12	259.91	178.52	81.39	3.193		
11,600.00	11,583.71	11,611.03	11,584.91	40.83	41.26	89.51	-225.89	486.12	259.91	177.82	82.09	3.166		
11,700.00	11,683.71	11,711.03	11,684.91	41.19	41.61	89.51	-225.89	486.12	259.91	177.12	82.79	3.139		
11,704.36	11,688.07	11,715.39	11,689.27	41.20	41.62	89.51	-225.89	486.12	259.91	177.09	82.82	3.138		
11,800.00	11,783.71	11,810.55	11,784.22	41.54	41.95	88.42	-220.94	486.09	259.97	176.48	83.49	3.114		
11,900.00	11,883.71	11,905.72	11,877.09	41.89	42.26	83.98	-200.69	485.94	261.27	177.12	84.15	3.105		
12,000.00	11,983.71	11,992.17	11,957.52	42.25	42.51	77.57	-169.21	485.70	267.47	182.72	84.75	3.156		
12,100.00	12,083.08	12,071.92	12,026.75	42.59	42.71	69.81	-129.74	485.41	279.85	194.56	85.30	3.281		
12,200.00	12,179.19	12,150.00	12,088.58	42.91	42.87	63.01	-82.16	485.05	295.61	209.83	85.78	3.446		
12,300.00	12,269.13	12,222.46	12,139.68	43.19	42.99	57.53	-30.87	484.67	312.69	226.50	86.18	3.628		
12,400.00	12,350.17	12,300.00	12,186.73	43.43	43.09	52.87	30.69	484.21	329.47	242.94	86.52	3.808		
12,500.00	12,419.84	12,365.24	12,219.59	43.63	43.15	49.63	87.01	483.80	344.48	257.70	86.78	3.970		
12,600.00	12,476.03	12,434.83	12,247.33	43.82	43.19	47.10	150.79	483.32	356.97	269.97	87.01	4.103		
12,700.00	12,517.02	12,500.00	12,266.13	44.00	43.25	45.42	213.15	482.86	366.25	278.98	87.27	4.197		
12,800.00	12,541.57	12,572.05	12,278.53	44.19	43.37	44.39	284.07	482.33	371.80	284.19	87.61	4.244		
12,900.00	12,548.98	12,641.73	12,281.98	44.37	43.51	44.10	353.62	481.81	373.48	285.56	87.92	4.248		
13,000.00	12,548.67	12,741.73	12,281.67	44.58	43.74	44.10	453.62	481.07	373.48	285.14	88.34	4.228		
13,100.00	12,548.36	12,841.73	12,281.37	44.83	44.01	44.10	553.61	480.32	373.48	284.63	88.85	4.204		
13,200.00	12,548.06	12,941.73	12,281.06	45.13	44.32	44.10	653.61	479.58	373.48	284.03	89.45	4.175		
13,300.00	12,547.75	13,041.73	12,280.75	45.46	44.67	44.10	753.61	478.83	373.48	283.33	90.14	4.143		
13,400.00	12,547.44	13,141.73	12,280.44	45.85	45.07	44.10	853.60	478.09	373.48	282.56	90.92	4.108		
13,500.00	12,547.13	13,241.73	12,280.14	46.27	45.50	44.10	953.60	477.34	373.48	281.70	91.78	4.069		
13,600.00	12,546.83	13,341.73	12,279.83	46.73	45.98	44.10	1,053.60	476.60	373.48	280.76	92.71	4.028		
13,700.00	12,546.52	13,441.73	12,279.52	47.24	46.49	44.10	1,153.59	475.86	373.48	279.75	93.73	3.985		
13,800.00	12,546.21	13,541.73	12,279.21	47.78	47.05	44.10	1,253.59	475.11	373.48	278.65	94.82	3.939		
13,900.00	12,545.90	13,641.73	12,278.91	48.35	47.63	44.10	1,353.59	474.37	373.48	277.49	95.99	3.891		
14,000.00	12,545.60	13,741.73	12,278.60	48.96	48.26	44.10	1,453.58	473.62	373.48	276.26	97.22	3.842		
14,100.00	12,545.29	13,841.73	12,278.29	49.61	48.91	44.10	1,553.58	472.88	373.48	274.95	98.52	3.791		
14,200.00	12,544.98	13,941.73	12,277.98	50.29	49.60	44.10	1,653.58	472.13	373.48	273.59	99.89	3.739		
14,300.00	12,544.67	14,041.73	12,277.68	51.00	50.32	44.10	1,753.57	471.39	373.48	272.16	101.32	3.686		
14,400.00	12,544.37	14,141.73	12,277.37	51.74	51.07	44.10	1,853.57	470.64	373.48	270.67	102.81	3.633		
14,500.00	12,544.06	14,241.73	12,277.06	52.51	51.85	44.10	1,953.57	469.90	373.48	269.12	104.36	3.579		
14,600.00	12,543.75	14,341.73	12,276.76	53.30	52.66	44.10	2,053.57	469.16	373.48	267.52	105.96	3.525		
14,700.00	12,543.44	14,441.73	12,276.45	54.13	53.49	44.10	2,153.56	468.41	373.48	265.86	107.62	3.470		
14,800.00	12,543.14	14,541.73	12,276.14	54.97	54.35	44.10	2,253.56	467.67	373.48	264.15	109.32	3.416		
14,900.00	12,542.83	14,641.73	12,275.83	55.85	55.23	44.10	2,353.56	466.92	373.48	262.40	111.07	3.362		
15,000.00	12,542.52	14,741.73	12,275.53	56.74	56.13	44.10	2,453.55	466.18	373.48	260.60	112.87	3.309		
15,100.00	12,542.22	14,841.73	12,275.22	57.66	57.06	44.10	2,553.55	465.43	373.48	258.76	114.72	3.256		
15,200.00	12,541.91	14,941.73	12,274.91	58.59	58.01	44.10	2,653.55	464.69	373.48	256.88	116.60	3.203		

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 702H - OH - Plan 1 10-12-18														Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDM														Offset Well Error:	0.00 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)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor			
15,300.00	12,541.60	15,041.73	12,274.60	59.55	58.97	44.10	2,753.54	463.95	373.48	254.95	118.52	3.151			
15,400.00	12,541.29	15,141.73	12,274.30	60.53	59.96	44.10	2,853.54	463.20	373.48	252.99	120.49	3.100			
15,500.00	12,540.99	15,241.73	12,273.99	61.52	60.96	44.10	2,953.54	462.46	373.48	250.99	122.48	3.049			
15,600.00	12,540.68	15,341.73	12,273.68	62.53	61.98	44.10	3,053.53	461.71	373.48	248.96	124.51	2.999			
15,700.00	12,540.37	15,441.73	12,273.37	63.56	63.02	44.10	3,153.53	460.97	373.48	246.90	126.58	2.951			
15,800.00	12,540.06	15,541.73	12,273.07	64.60	64.07	44.10	3,253.53	460.22	373.48	244.80	128.67	2.903			
15,900.00	12,539.76	15,641.73	12,272.76	65.66	65.13	44.10	3,353.52	459.48	373.48	242.68	130.80	2.855			
16,000.00	12,539.45	15,741.73	12,272.45	66.73	66.21	44.10	3,453.52	458.73	373.48	240.53	132.95	2.809			
16,100.00	12,539.14	15,841.73	12,272.15	67.82	67.31	44.10	3,553.52	457.99	373.48	238.35	135.13	2.764			
16,200.00	12,538.83	15,941.73	12,271.84	68.92	68.41	44.10	3,653.51	457.25	373.48	236.14	137.33	2.719			
16,300.00	12,538.53	16,041.73	12,271.53	70.03	69.53	44.10	3,753.51	456.50	373.48	233.91	139.56	2.676			
16,400.00	12,538.22	16,141.73	12,271.22	71.15	70.66	44.10	3,853.51	455.76	373.48	231.66	141.81	2.634			
16,500.00	12,537.91	16,241.73	12,270.92	72.28	71.80	44.10	3,953.50	455.01	373.48	229.39	144.09	2.592			
16,600.00	12,537.60	16,341.73	12,270.61	73.43	72.95	44.10	4,053.50	454.27	373.48	227.09	146.38	2.551			
16,700.00	12,537.30	16,441.73	12,270.30	74.58	74.11	44.10	4,153.50	453.52	373.48	224.78	148.70	2.512			
16,800.00	12,536.99	16,541.73	12,269.99	75.75	75.28	44.10	4,253.49	452.78	373.48	222.44	151.03	2.473			
16,900.00	12,536.68	16,641.73	12,269.69	76.92	76.46	44.10	4,353.49	452.03	373.48	220.09	153.38	2.435			
17,000.00	12,536.38	16,741.73	12,269.38	78.10	77.65	44.10	4,453.49	451.29	373.48	217.72	155.75	2.398			
17,100.00	12,536.07	16,841.73	12,269.07	79.29	78.85	44.10	4,553.48	450.55	373.48	215.34	158.14	2.362			
17,200.00	12,535.76	16,941.73	12,268.76	80.49	80.05	44.10	4,653.48	449.80	373.48	212.93	160.54	2.326			
17,300.00	12,535.45	17,041.73	12,268.46	81.70	81.26	44.10	4,753.48	449.06	373.48	210.52	162.96	2.292			
17,400.00	12,535.15	17,141.73	12,268.15	82.91	82.48	44.10	4,853.47	448.31	373.48	208.08	165.39	2.258			
17,500.00	12,534.84	17,241.73	12,267.84	84.13	83.71	44.10	4,953.47	447.57	373.48	205.64	167.84	2.225			
17,600.00	12,534.53	17,341.73	12,267.53	85.36	84.94	44.10	5,053.47	446.82	373.48	203.18	170.30	2.193			
17,700.00	12,534.22	17,441.73	12,267.23	86.59	86.18	44.10	5,153.46	446.08	373.48	200.71	172.77	2.162			
17,800.00	12,533.92	17,541.73	12,266.92	87.83	87.42	44.10	5,253.46	445.34	373.48	198.22	175.25	2.131			
17,900.00	12,533.61	17,641.73	12,266.61	89.07	88.68	44.10	5,353.46	444.59	373.48	195.73	177.75	2.101			
18,000.00	12,533.30	17,741.73	12,266.31	90.32	89.93	44.10	5,453.45	443.85	373.48	193.22	180.26	2.072			
18,100.00	12,532.99	17,841.73	12,266.00	91.58	91.19	44.10	5,553.45	443.10	373.48	190.70	182.77	2.043			
18,200.00	12,532.69	17,941.73	12,265.69	92.84	92.46	44.10	5,653.45	442.36	373.48	188.17	185.30	2.016			
18,300.00	12,532.38	18,041.73	12,265.38	94.11	93.73	44.10	5,753.45	441.61	373.48	185.64	187.84	1.988			
18,400.00	12,532.07	18,141.73	12,265.08	95.38	95.01	44.10	5,853.44	440.87	373.48	183.09	190.39	1.962			
18,500.00	12,531.77	18,241.73	12,264.77	96.66	96.29	44.10	5,953.44	440.12	373.48	180.53	192.94	1.936			
18,600.00	12,531.46	18,341.73	12,264.46	97.94	97.57	44.10	6,053.44	439.38	373.48	177.97	195.51	1.910			
18,700.00	12,531.15	18,441.73	12,264.15	99.22	98.86	44.10	6,153.43	438.64	373.48	175.39	198.08	1.885			
18,800.00	12,530.84	18,541.73	12,263.85	100.51	100.15	44.10	6,253.43	437.89	373.48	172.81	200.66	1.861			
18,900.00	12,530.54	18,641.73	12,263.54	101.80	101.45	44.10	6,353.43	437.15	373.48	170.22	203.25	1.837			
19,000.00	12,530.23	18,741.73	12,263.23	103.10	102.75	44.10	6,453.42	436.40	373.48	167.62	205.85	1.814			
19,100.00	12,529.92	18,841.73	12,262.92	104.40	104.05	44.10	6,553.42	435.66	373.48	165.02	208.46	1.792			
19,200.00	12,529.61	18,941.73	12,262.62	105.70	105.36	44.10	6,653.42	434.91	373.48	162.41	211.07	1.769			
19,300.00	12,529.31	19,041.73	12,262.31	107.01	106.67	44.10	6,753.41	434.17	373.48	159.79	213.68	1.748			
19,400.00	12,529.00	19,141.73	12,262.00	108.32	107.99	44.10	6,853.41	433.42	373.48	157.17	216.31	1.727			
19,500.00	12,528.69	19,241.73	12,261.70	109.64	109.30	44.10	6,953.41	432.68	373.48	154.54	218.94	1.706			
19,600.00	12,528.38	19,341.73	12,261.39	110.95	110.62	44.10	7,053.40	431.94	373.48	151.90	221.58	1.686			
19,700.00	12,528.08	19,441.73	12,261.08	112.27	111.95	44.10	7,153.40	431.19	373.48	149.26	224.22	1.666			
19,800.00	12,527.77	19,541.73	12,260.77	113.59	113.27	44.10	7,253.40	430.45	373.48	146.61	226.87	1.646			
19,900.00	12,527.46	19,641.73	12,260.47	114.92	114.60	44.10	7,353.39	429.70	373.48	143.96	229.52	1.627			
20,000.00	12,527.15	19,741.73	12,260.16	116.25	115.93	44.10	7,453.39	428.96	373.48	141.30	232.18	1.609			
20,100.00	12,526.85	19,841.73	12,259.85	117.58	117.27	44.10	7,553.39	428.21	373.48	138.63	234.84	1.590			
20,200.00	12,526.54	19,941.73	12,259.54	118.91	118.60	44.10	7,653.38	427.47	373.48	135.96	237.51	1.572			
20,300.00	12,526.23	20,041.73	12,259.24	120.24	119.94	44.10	7,753.38	426.73	373.48	133.29	240.18	1.555			
20,400.00	12,525.93	20,141.73	12,258.93	121.58	121.28	44.10	7,853.38	425.98	373.47	130.61	242.86	1.538			

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 702H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi-Major Axis			Distance						
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
20,500.00	12,525.62	20,241.73	12,258.62	122.92	122.62	44.10	7,953.37	425.24	373.47	127.93	245.54	1.521	
20,600.00	12,525.31	20,341.73	12,258.31	124.26	123.97	44.10	8,053.37	424.49	373.47	125.25	248.23	1.505	
20,700.00	12,525.00	20,441.73	12,258.01	125.61	125.31	44.10	8,153.37	423.75	373.47	122.56	250.92	1.488	Level 3
20,800.00	12,524.70	20,541.73	12,257.70	126.95	126.66	44.10	8,253.36	423.00	373.47	119.86	253.61	1.473	Level 3
20,900.00	12,524.39	20,641.73	12,257.39	128.30	128.01	44.10	8,353.36	422.26	373.47	117.16	256.31	1.457	Level 3
21,000.00	12,524.08	20,741.73	12,257.08	129.65	129.36	44.10	8,453.36	421.51	373.47	114.46	259.01	1.442	Level 3
21,100.00	12,523.77	20,841.73	12,256.78	131.00	130.72	44.10	8,553.35	420.77	373.47	111.75	261.72	1.427	Level 3
21,200.00	12,523.47	20,941.73	12,256.47	132.36	132.07	44.10	8,653.35	420.03	373.47	109.05	264.43	1.412	Level 3
21,300.00	12,523.16	21,041.73	12,256.16	133.71	133.43	44.10	8,753.35	419.28	373.47	106.33	267.14	1.398	Level 3
21,400.00	12,522.85	21,141.73	12,255.86	135.07	134.79	44.10	8,853.34	418.54	373.47	103.62	269.86	1.384	Level 3
21,500.00	12,522.54	21,241.73	12,255.55	136.43	136.15	44.10	8,953.34	417.79	373.47	100.90	272.58	1.370	Level 3
21,600.00	12,522.24	21,341.73	12,255.24	137.79	137.51	44.10	9,053.34	417.05	373.47	98.18	275.30	1.357	Level 3
21,700.00	12,521.93	21,441.73	12,254.93	139.15	138.88	44.10	9,153.33	416.30	373.47	95.45	278.02	1.343	Level 3
21,800.00	12,521.62	21,541.73	12,254.63	140.51	140.24	44.10	9,253.33	415.56	373.47	92.72	280.75	1.330	Level 3
21,900.00	12,521.31	21,641.73	12,254.32	141.87	141.61	44.10	9,353.33	414.81	373.47	89.99	283.48	1.317	Level 3
22,000.00	12,521.01	21,741.73	12,254.01	143.24	142.98	44.10	9,453.33	414.07	373.47	87.26	286.22	1.305	Level 3
22,100.00	12,520.70	21,841.73	12,253.70	144.61	144.35	44.10	9,553.32	413.33	373.47	84.52	288.95	1.293	Level 3
22,200.00	12,520.39	21,941.73	12,253.40	145.98	145.72	44.10	9,653.32	412.58	373.47	81.78	291.69	1.280	Level 3
22,300.00	12,520.09	22,041.73	12,253.09	147.35	147.09	44.10	9,753.32	411.84	373.47	79.04	294.43	1.268	Level 3
22,400.00	12,519.78	22,141.73	12,252.78	148.72	148.46	44.10	9,853.31	411.09	373.47	76.30	297.18	1.257	Level 3
22,500.00	12,519.47	22,241.73	12,252.47	150.09	149.84	44.10	9,953.31	410.35	373.47	73.55	299.92	1.245	Level 2
22,600.00	12,519.16	22,341.73	12,252.17	151.46	151.21	44.10	10,053.31	409.60	373.47	70.80	302.67	1.234	Level 2
22,653.01	12,519.00	22,394.73	12,252.00	152.19	151.94	44.10	10,106.31	409.21	373.47	69.34	304.13	1.228	Level 2, SF

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

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18												Offset Site Error:	0.00 usft
Survey Program: 0:MWD+HDGM												Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum Separation		Warning			
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
0.00	0.00	14.70	14.70	0.00	0.02	-90.49	-5.20	-605.00	605.02				
100.00	100.00	114.70	114.70	0.13	0.18	-90.49	-5.20	-605.00	605.02	604.71	0.31	1,935.529	
200.00	200.00	214.70	214.70	0.49	0.54	-90.49	-5.20	-605.00	605.02	603.99	1.03	587.668	
300.00	300.00	314.70	314.70	0.85	0.90	-90.49	-5.20	-605.00	605.02	603.28	1.75	346.425	
400.00	400.00	414.70	414.70	1.21	1.25	-90.49	-5.20	-605.00	605.02	602.56	2.46	245.603	
500.00	500.00	514.70	514.70	1.57	1.61	-90.49	-5.20	-605.00	605.02	601.84	3.18	190.237	
600.00	600.00	614.70	614.70	1.93	1.97	-90.49	-5.20	-605.00	605.02	601.13	3.90	155.241	
700.00	700.00	714.70	714.70	2.29	2.33	-90.49	-5.20	-605.00	605.02	600.41	4.61	131.121	
800.00	800.00	814.70	814.70	2.64	2.69	-90.49	-5.20	-605.00	605.02	599.69	5.33	113.487	
900.00	900.00	914.70	914.70	3.00	3.05	-90.49	-5.20	-605.00	605.02	598.97	6.05	100.035	
1,000.00	1,000.00	1,014.70	1,014.70	3.36	3.40	-90.49	-5.20	-605.00	605.02	598.26	6.77	89.433	
1,100.00	1,100.00	1,114.70	1,114.70	3.72	3.76	-90.49	-5.20	-605.00	605.02	597.54	7.48	80.864	
1,200.00	1,200.00	1,214.70	1,214.70	4.08	4.12	-90.49	-5.20	-605.00	605.02	596.82	8.20	73.793	
1,300.00	1,300.00	1,314.70	1,314.70	4.44	4.48	-90.49	-5.20	-605.00	605.02	596.11	8.92	67.859	
1,400.00	1,400.00	1,414.70	1,414.70	4.79	4.84	-90.49	-5.20	-605.00	605.02	595.39	9.63	62.808	
1,500.00	1,500.00	1,517.83	1,517.83	5.15	5.21	-90.50	-5.23	-604.95	604.98	594.63	10.36	58.404	
1,600.00	1,599.98	1,639.11	1,639.05	5.50	5.62	134.25	-7.05	-602.18	603.92	592.81	11.12	54.327	
1,700.00	1,699.84	1,758.50	1,758.15	5.83	6.02	134.27	-11.58	-595.26	601.79	589.94	11.85	50.784	
1,797.66	1,797.13	1,856.15	1,855.42	6.16	6.36	134.41	-16.24	-588.14	600.63	588.12	12.51	48.003	
1,800.09	1,799.54	1,858.57	1,857.84	6.16	6.36	134.42	-16.36	-587.96	600.63	588.10	12.53	47.940	
1,900.00	1,898.90	1,958.45	1,957.34	6.51	6.71	134.67	-21.13	-580.68	600.69	587.48	13.22	45.455	
2,000.00	1,998.36	2,058.41	2,056.92	6.85	7.06	134.93	-25.91	-573.39	600.77	586.86	13.91	43.187	
2,100.00	2,097.81	2,158.38	2,156.50	7.20	7.41	135.18	-30.68	-566.10	600.86	586.25	14.61	41.117	
2,200.00	2,197.26	2,258.34	2,256.09	7.56	7.76	135.43	-35.46	-558.81	600.96	585.64	15.32	39.221	
2,300.00	2,296.71	2,358.31	2,355.67	7.92	8.12	135.68	-40.23	-551.52	601.07	585.04	16.04	37.481	
2,400.00	2,396.16	2,458.27	2,455.26	8.28	8.48	135.94	-45.01	-544.23	601.20	584.44	16.76	35.880	
2,500.00	2,495.62	2,558.24	2,554.84	8.64	8.84	136.19	-49.78	-536.94	601.33	583.85	17.48	34.404	
2,600.00	2,595.07	2,658.20	2,654.43	9.00	9.20	136.44	-54.56	-529.65	601.48	583.27	18.21	33.039	
2,700.00	2,694.52	2,758.16	2,754.01	9.37	9.56	136.69	-59.33	-522.36	601.64	582.70	18.93	31.774	
2,800.00	2,793.97	2,858.13	2,853.59	9.74	9.93	136.94	-64.11	-515.07	601.81	582.14	19.67	30.599	
2,900.00	2,893.42	2,958.09	2,953.18	10.11	10.29	137.20	-68.89	-507.78	601.99	581.59	20.40	29.506	
3,000.00	2,992.87	3,058.06	3,052.76	10.48	10.66	137.45	-73.66	-500.49	602.18	581.04	21.14	28.486	
3,100.00	3,092.33	3,158.02	3,152.35	10.85	11.03	137.70	-78.44	-493.20	602.39	580.51	21.88	27.533	
3,200.00	3,191.78	3,257.99	3,251.93	11.22	11.40	137.95	-83.21	-485.91	602.61	579.99	22.62	26.640	
3,300.00	3,291.23	3,357.95	3,351.51	11.60	11.76	138.20	-87.99	-478.62	602.84	579.47	23.36	25.803	
3,400.00	3,390.68	3,457.92	3,451.10	11.97	12.13	138.45	-92.76	-471.33	603.08	578.97	24.11	25.016	
3,500.00	3,490.13	3,557.88	3,550.68	12.35	12.50	138.70	-97.54	-464.04	603.33	578.47	24.85	24.276	
3,600.00	3,589.59	3,657.85	3,650.27	12.73	12.87	138.95	-102.31	-456.75	603.59	577.99	25.60	23.578	
3,700.00	3,689.04	3,757.81	3,749.85	13.10	13.24	139.20	-107.09	-449.47	603.87	577.52	26.35	22.919	
3,800.00	3,788.49	3,857.78	3,849.44	13.48	13.62	139.45	-111.86	-442.18	604.15	577.06	27.10	22.296	
3,900.00	3,887.94	3,957.74	3,949.02	13.86	13.99	139.70	-116.64	-434.89	604.45	576.60	27.85	21.706	
4,000.00	3,987.39	4,057.71	4,048.60	14.24	14.36	139.95	-121.41	-427.60	604.76	576.16	28.60	21.147	
4,100.00	4,086.84	4,157.67	4,148.19	14.62	14.73	140.20	-126.19	-420.31	605.08	575.73	29.35	20.616	
4,200.00	4,186.30	4,257.64	4,247.77	15.00	15.10	140.45	-130.97	-413.02	605.41	575.31	30.10	20.112	
4,300.00	4,285.75	4,357.60	4,347.36	15.38	15.48	140.70	-135.74	-405.73	605.76	574.90	30.86	19.632	
4,400.00	4,385.20	4,457.57	4,446.94	15.76	15.85	140.95	-140.52	-398.44	606.11	574.50	31.61	19.175	
4,500.00	4,484.65	4,557.53	4,546.53	16.14	16.22	141.20	-145.29	-391.15	606.48	574.11	32.36	18.739	
4,600.00	4,584.12	4,657.50	4,646.11	16.52	16.60	141.44	-150.07	-383.86	606.75	573.63	33.12	18.320	
4,700.00	4,683.61	4,757.47	4,745.71	16.89	16.97	141.50	-154.84	-376.57	607.01	573.15	33.86	17.866	
4,800.00	4,783.72	4,857.36	4,845.21	17.25	17.35	141.33	-159.61	-369.28	607.54	572.95	34.60	17.358	
4,900.00	4,883.71	4,957.05	4,944.52	17.59	17.72	-83.82	-164.38	-362.01	593.47	558.16	35.31	16.808	
5,000.00	4,983.71	5,056.67	5,043.76	17.92	18.09	-84.20	-169.14	-354.75	585.71	549.70	36.01	16.263	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
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Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface [']	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)		Offset Wellbore Centre +N/S (usft)	+E/W (usft)					
5,100.00	5,083.71	5,156.29	5,143.00	18.26	18.47	-84.60	-173.89	-347.48	577.98	541.26	36.72	15.740	
5,200.00	5,183.71	5,255.91	5,242.24	18.59	18.84	-85.01	-178.65	-340.22	570.28	532.86	37.43	15.237	
5,300.00	5,283.71	5,355.53	5,341.48	18.92	19.21	-85.43	-183.41	-332.96	562.61	524.48	38.14	14.753	
5,400.00	5,383.71	5,455.15	5,440.72	19.26	19.59	-85.86	-188.17	-325.69	554.97	516.12	38.85	14.287	
5,500.00	5,483.71	5,554.77	5,539.96	19.60	19.96	-86.31	-192.93	-318.43	547.36	507.81	39.56	13.838	
5,600.00	5,583.71	5,654.39	5,639.20	19.93	20.34	-86.76	-197.69	-311.16	539.79	499.52	40.27	13.405	
5,700.00	5,683.71	5,754.00	5,738.44	20.27	20.71	-87.23	-202.45	-303.90	532.25	491.27	40.98	12.988	
5,800.00	5,783.71	5,853.62	5,837.68	20.61	21.08	-87.71	-207.21	-296.63	524.74	483.05	41.69	12.586	
5,900.00	5,883.71	5,953.24	5,936.92	20.95	21.46	-88.21	-211.97	-289.37	517.28	474.87	42.41	12.198	
6,000.00	5,983.71	6,052.86	6,036.16	21.29	21.83	-88.72	-216.72	-282.10	509.85	466.73	43.12	11.824	
6,100.00	6,083.71	6,152.48	6,135.40	21.63	22.21	-89.24	-221.48	-274.84	502.47	458.63	43.84	11.463	
6,200.00	6,183.71	6,252.10	6,234.64	21.97	22.58	-89.78	-226.24	-267.57	495.13	450.58	44.55	11.114	
6,300.00	6,283.71	6,339.38	6,321.69	22.31	22.90	-90.19	-229.70	-262.30	489.08	443.87	45.22	10.817	
6,400.00	6,383.71	6,426.88	6,409.12	22.65	23.22	-90.42	-231.70	-259.25	485.60	439.73	45.87	10.586	
6,500.00	6,483.71	6,516.19	6,498.41	23.00	23.52	-90.49	-232.25	-258.41	484.65	438.13	46.52	10.418	
6,600.00	6,583.71	6,616.19	6,598.41	23.34	23.86	-90.49	-232.25	-258.41	484.65	437.45	47.19	10.269	
6,700.00	6,683.71	6,716.19	6,698.41	23.68	24.19	-90.49	-232.25	-258.41	484.65	436.78	47.87	10.124	
6,800.00	6,783.71	6,816.19	6,798.41	24.03	24.52	-90.49	-232.25	-258.41	484.65	436.10	48.55	9.983	
6,900.00	6,883.71	6,916.19	6,898.41	24.37	24.85	-90.49	-232.25	-258.41	484.65	435.42	49.22	9.846	
7,000.00	6,983.71	7,016.19	6,998.41	24.71	25.19	-90.49	-232.25	-258.41	484.65	434.74	49.90	9.712	
7,100.00	7,083.71	7,116.19	7,098.41	25.06	25.52	-90.49	-232.25	-258.41	484.65	434.06	50.58	9.581	
7,200.00	7,183.71	7,216.19	7,198.41	25.41	25.86	-90.49	-232.25	-258.41	484.65	433.38	51.26	9.454	
7,300.00	7,283.71	7,316.19	7,298.41	25.75	26.20	-90.49	-232.25	-258.41	484.65	432.70	51.95	9.330	
7,400.00	7,383.71	7,416.19	7,398.41	26.10	26.53	-90.49	-232.25	-258.41	484.65	432.02	52.63	9.209	
7,500.00	7,483.71	7,516.19	7,498.41	26.44	26.87	-90.49	-232.25	-258.41	484.65	431.33	53.31	9.091	
7,600.00	7,583.71	7,616.19	7,598.41	26.79	27.21	-90.49	-232.25	-258.41	484.65	430.65	54.00	8.975	
7,700.00	7,683.71	7,716.19	7,698.41	27.14	27.55	-90.49	-232.25	-258.41	484.65	429.96	54.68	8.863	
7,800.00	7,783.71	7,816.19	7,798.41	27.49	27.88	-90.49	-232.25	-258.41	484.65	429.28	55.37	8.753	
7,900.00	7,883.71	7,916.19	7,898.41	27.83	28.22	-90.49	-232.25	-258.41	484.65	428.59	56.06	8.646	
8,000.00	7,983.71	8,016.19	7,998.41	28.18	28.56	-90.49	-232.25	-258.41	484.65	427.90	56.75	8.541	
8,100.00	8,083.71	8,116.19	8,098.41	28.53	28.90	-90.49	-232.25	-258.41	484.65	427.21	57.43	8.438	
8,200.00	8,183.71	8,216.19	8,198.41	28.88	29.24	-90.49	-232.25	-258.41	484.65	426.52	58.12	8.338	
8,300.00	8,283.71	8,316.19	8,298.41	29.23	29.59	-90.49	-232.25	-258.41	484.65	425.83	58.81	8.240	
8,400.00	8,383.71	8,416.19	8,398.41	29.58	29.93	-90.49	-232.25	-258.41	484.65	425.14	59.50	8.145	
8,500.00	8,483.71	8,516.19	8,498.41	29.93	30.27	-90.49	-232.25	-258.41	484.65	424.45	60.19	8.051	
8,600.00	8,583.71	8,616.19	8,598.41	30.27	30.61	-90.49	-232.25	-258.41	484.65	423.76	60.89	7.960	
8,700.00	8,683.71	8,716.19	8,698.41	30.62	30.95	-90.49	-232.25	-258.41	484.65	423.07	61.58	7.870	
8,800.00	8,783.71	8,816.19	8,798.41	30.97	31.30	-90.49	-232.25	-258.41	484.65	422.37	62.27	7.783	
8,900.00	8,883.71	8,916.19	8,898.41	31.32	31.64	-90.49	-232.25	-258.41	484.65	421.68	62.97	7.697	
9,000.00	8,983.71	9,016.19	8,998.41	31.67	31.98	-90.49	-232.25	-258.41	484.65	420.99	63.66	7.613	
9,100.00	9,083.71	9,116.19	9,098.41	32.03	32.33	-90.49	-232.25	-258.41	484.65	420.29	64.35	7.531	
9,200.00	9,183.71	9,216.19	9,198.41	32.38	32.67	-90.49	-232.25	-258.41	484.65	419.60	65.05	7.451	
9,300.00	9,283.71	9,316.19	9,298.41	32.73	33.02	-90.49	-232.25	-258.41	484.65	418.90	65.74	7.372	
9,400.00	9,383.71	9,416.19	9,398.41	33.08	33.36	-90.49	-232.25	-258.41	484.65	418.21	66.44	7.294	
9,500.00	9,483.71	9,516.19	9,498.41	33.43	33.71	-90.49	-232.25	-258.41	484.65	417.51	67.14	7.219	
9,600.00	9,583.71	9,616.19	9,598.41	33.78	34.05	-90.49	-232.25	-258.41	484.65	416.81	67.83	7.145	
9,700.00	9,683.71	9,716.19	9,698.41	34.13	34.40	-90.49	-232.25	-258.41	484.65	416.12	68.53	7.072	
9,800.00	9,783.71	9,816.19	9,798.41	34.48	34.75	-90.49	-232.25	-258.41	484.65	415.42	69.23	7.001	
9,900.00	9,883.71	9,916.19	9,898.41	34.83	35.09	-90.49	-232.25	-258.41	484.65	414.72	69.93	6.931	
10,000.00	9,983.71	10,016.19	9,998.41	35.19	35.44	-90.49	-232.25	-258.41	484.65	414.02	70.62	6.862	
10,100.00	10,083.71	10,116.19	10,098.41	35.54	35.78	-90.49	-232.25	-258.41	484.65	413.32	71.32	6.795	
10,200.00	10,183.71	10,216.19	10,198.41	35.89	36.13	-90.49	-232.25	-258.41	484.65	412.62	72.02	6.729	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error:	0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error:	0.00 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)				
10,300.00	10,283.71	10,316.19	10,298.41	36.24	36.48	-90.49	-232.25	-258.41	484.65	411.92	72.72	6.664		
10,400.00	10,383.71	10,416.19	10,398.41	36.60	36.83	-90.49	-232.25	-258.41	484.65	411.22	73.42	6.601		
10,500.00	10,483.71	10,516.19	10,498.41	36.95	37.17	-90.49	-232.25	-258.41	484.65	410.52	74.12	6.539		
10,600.00	10,583.71	10,616.19	10,598.41	37.30	37.52	-90.49	-232.25	-258.41	484.65	409.82	74.82	6.477		
10,700.00	10,683.71	10,716.19	10,698.41	37.65	37.87	-90.49	-232.25	-258.41	484.65	409.12	75.52	6.417		
10,800.00	10,783.71	10,816.19	10,798.41	38.01	38.22	-90.49	-232.25	-258.41	484.65	408.42	76.22	6.358		
10,900.00	10,883.71	10,916.19	10,898.41	38.36	38.57	-90.49	-232.25	-258.41	484.65	407.72	76.93	6.300		
11,000.00	10,983.71	11,016.19	10,998.41	38.71	38.92	-90.49	-232.25	-258.41	484.65	407.02	77.63	6.243		
11,100.00	11,083.71	11,116.19	11,098.41	39.06	39.26	-90.49	-232.25	-258.41	484.65	406.32	78.33	6.187		
11,200.00	11,183.71	11,216.19	11,198.41	39.42	39.61	-90.49	-232.25	-258.41	484.65	405.61	79.03	6.132		
11,300.00	11,283.71	11,316.19	11,298.41	39.77	39.96	-90.49	-232.25	-258.41	484.65	404.91	79.73	6.078		
11,400.00	11,383.71	11,416.19	11,398.41	40.12	40.31	-90.49	-232.25	-258.41	484.65	404.21	80.44	6.025		
11,500.00	11,483.71	11,516.19	11,498.41	40.48	40.66	-90.49	-232.25	-258.41	484.65	403.51	81.14	5.973		
11,600.00	11,583.71	11,616.19	11,598.41	40.83	41.01	-90.49	-232.25	-258.41	484.65	402.80	81.84	5.922		
11,700.00	11,683.71	11,716.19	11,698.41	41.19	41.36	-90.49	-232.25	-258.41	484.65	402.10	82.55	5.871		
11,800.00	11,783.71	11,816.19	11,798.41	41.54	41.71	-90.49	-232.25	-258.41	484.65	401.40	83.25	5.822		
11,900.00	11,883.71	11,916.19	11,898.41	41.89	42.06	-90.49	-232.25	-258.41	484.65	400.69	83.95	5.773		
11,933.79	11,917.50	11,949.99	11,932.20	42.01	42.18	-90.00	-231.65	-258.41	484.65	400.45	84.19	5.756	CC	
12,000.00	11,983.71	12,015.49	11,997.32	42.25	42.40	-89.20	-224.93	-258.46	484.69	400.05	84.65	5.726		
12,100.00	12,083.08	12,112.09	12,090.94	42.59	42.71	-87.52	-201.59	-258.64	485.11	399.81	85.30	5.687		
12,200.00	12,179.19	12,206.54	12,177.43	42.91	42.98	-85.94	-163.90	-258.92	485.89	400.00	85.89	5.657		
12,300.00	12,269.13	12,300.00	12,255.77	43.19	43.20	-84.47	-113.13	-259.30	486.94	400.55	86.40	5.636		
12,400.00	12,350.17	12,390.13	12,322.55	43.43	43.38	-83.19	-52.74	-259.75	488.13	401.32	86.81	5.623		
12,500.00	12,419.84	12,479.83	12,378.80	43.63	43.52	-82.09	17.01	-260.27	489.34	402.19	87.15	5.615		
12,600.00	12,476.03	12,568.49	12,423.04	43.82	43.64	-81.22	93.74	-260.84	490.43	402.97	87.45	5.608		
12,700.00	12,517.02	12,656.39	12,454.71	44.00	43.78	-80.59	175.65	-261.46	491.29	403.49	87.79	5.596		
12,800.00	12,541.57	12,743.80	12,473.42	44.19	43.94	-80.21	260.93	-262.10	491.83	403.68	88.16	5.579		
12,900.00	12,548.98	12,831.75	12,478.98	44.37	44.10	-80.09	348.62	-262.75	492.01	403.51	88.50	5.559		
13,000.00	12,548.67	12,931.75	12,478.67	44.58	44.32	-80.09	448.62	-263.50	492.02	403.09	88.92	5.533		
13,100.00	12,548.36	13,031.75	12,478.36	44.83	44.58	-80.09	548.62	-264.25	492.02	402.59	89.43	5.502		
13,200.00	12,548.06	13,131.75	12,478.05	45.13	44.88	-80.09	648.61	-265.00	492.02	402.00	90.02	5.466		
13,300.00	12,547.75	13,231.75	12,477.75	45.46	45.23	-80.09	748.61	-265.74	492.03	401.33	90.70	5.425		
13,400.00	12,547.44	13,331.75	12,477.44	45.85	45.62	-80.09	848.61	-266.49	492.03	400.56	91.47	5.379		
13,500.00	12,547.13	13,431.75	12,477.13	46.27	46.05	-80.09	948.60	-267.24	492.03	399.71	92.32	5.330		
13,600.00	12,546.83	13,531.75	12,476.82	46.73	46.52	-80.09	1,048.60	-267.99	492.04	398.79	93.25	5.276		
13,700.00	12,546.52	13,631.75	12,476.52	47.24	47.03	-80.09	1,148.60	-268.74	492.04	397.78	94.26	5.220		
13,800.00	12,546.21	13,731.75	12,476.21	47.78	47.57	-80.09	1,248.59	-269.48	492.04	396.70	95.35	5.161		
13,900.00	12,545.90	13,831.75	12,475.90	48.35	48.15	-80.09	1,348.59	-270.23	492.05	395.54	96.51	5.099		
14,000.00	12,545.60	13,931.75	12,475.60	48.96	48.77	-80.09	1,448.59	-270.98	492.05	394.32	97.73	5.035		
14,100.00	12,545.29	14,031.75	12,475.29	49.61	49.42	-80.09	1,548.58	-271.73	492.06	393.02	99.03	4.969		
14,200.00	12,544.98	14,131.75	12,474.98	50.29	50.10	-80.09	1,648.58	-272.48	492.06	391.67	100.39	4.901		
14,300.00	12,544.67	14,231.75	12,474.67	51.00	50.82	-80.09	1,748.58	-273.22	492.06	390.25	101.82	4.833		
14,400.00	12,544.37	14,331.75	12,474.37	51.74	51.56	-80.09	1,848.57	-273.97	492.07	388.77	103.30	4.763		
14,500.00	12,544.06	14,431.75	12,474.06	52.51	52.33	-80.09	1,948.57	-274.72	492.07	387.23	104.84	4.693		
14,600.00	12,543.75	14,531.75	12,473.75	53.30	53.13	-80.09	2,048.57	-275.47	492.07	385.63	106.44	4.623		
14,700.00	12,543.44	14,631.75	12,473.44	54.13	53.96	-80.09	2,148.57	-276.22	492.08	383.99	108.09	4.553		
14,800.00	12,543.14	14,731.75	12,473.14	54.97	54.81	-80.09	2,248.56	-276.96	492.08	382.29	109.79	4.482		
14,900.00	12,542.83	14,831.75	12,472.83	55.85	55.69	-80.09	2,348.56	-277.71	492.08	380.55	111.53	4.412		
15,000.00	12,542.52	14,931.75	12,472.52	56.74	56.59	-80.09	2,448.56	-278.46	492.09	378.76	113.33	4.342		
15,100.00	12,542.22	15,031.75	12,472.21	57.66	57.51	-80.09	2,548.55	-279.21	492.09	376.93	115.16	4.273		
15,200.00	12,541.91	15,131.75	12,471.91	58.59	58.45	-80.09	2,648.55	-279.96	492.09	375.05	117.04	4.204		
15,300.00	12,541.60	15,231.75	12,471.60	59.55	59.41	-80.09	2,748.55	-280.70	492.10	373.14	118.96	4.137		

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance						Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N-S (usft)	+E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
15,400.00	12,541.29	15,331.75	12,471.29	60.53	60.39	-80.09	2,848.54	-281.45	492.10	371.18	120.92	4.070	
15,500.00	12,540.99	15,431.75	12,470.98	61.52	61.39	-80.09	2,948.54	-282.20	492.11	369.20	122.91	4.004	
15,600.00	12,540.68	15,531.75	12,470.68	62.53	62.40	-80.09	3,048.54	-282.95	492.11	367.17	124.93	3.939	
15,700.00	12,540.37	15,631.75	12,470.37	63.56	63.43	-80.09	3,148.53	-283.70	492.11	365.12	126.99	3.875	
15,800.00	12,540.06	15,731.75	12,470.06	64.60	64.48	-80.09	3,248.53	-284.44	492.12	363.03	129.08	3.812	
15,900.00	12,539.76	15,831.75	12,469.76	65.66	65.54	-80.09	3,348.53	-285.19	492.12	360.92	131.20	3.751	
16,000.00	12,539.45	15,931.75	12,469.45	66.73	66.62	-80.09	3,448.52	-285.94	492.12	358.77	133.35	3.690	
16,100.00	12,539.14	16,031.75	12,469.14	67.82	67.70	-80.09	3,548.52	-286.69	492.13	356.60	135.52	3.631	
16,200.00	12,538.83	16,131.75	12,468.83	68.92	68.80	-80.09	3,648.52	-287.44	492.13	354.41	137.72	3.573	
16,300.00	12,538.53	16,231.75	12,468.53	70.03	69.92	-80.09	3,748.51	-288.18	492.13	352.19	139.95	3.517	
16,400.00	12,538.22	16,331.75	12,468.22	71.15	71.04	-80.09	3,848.51	-288.93	492.14	349.94	142.19	3.461	
16,500.00	12,537.91	16,431.75	12,467.91	72.28	72.18	-80.09	3,948.51	-289.68	492.14	347.68	144.46	3.407	
16,600.00	12,537.60	16,531.75	12,467.60	73.43	73.33	-80.09	4,048.50	-290.43	492.14	345.39	146.75	3.354	
16,700.00	12,537.30	16,631.75	12,467.30	74.58	74.48	-80.09	4,148.50	-291.18	492.15	343.08	149.06	3.302	
16,800.00	12,536.99	16,731.75	12,466.99	75.75	75.65	-80.09	4,248.50	-291.92	492.15	340.76	151.39	3.251	
16,900.00	12,536.68	16,831.75	12,466.68	76.92	76.82	-80.09	4,348.49	-292.67	492.16	338.41	153.74	3.201	
17,000.00	12,536.38	16,931.75	12,466.37	78.10	78.01	-80.09	4,448.49	-293.42	492.16	336.05	156.11	3.153	
17,100.00	12,536.07	17,031.75	12,466.07	79.29	79.20	-80.09	4,548.49	-294.17	492.16	333.67	158.49	3.105	
17,200.00	12,535.76	17,131.75	12,465.76	80.49	80.40	-80.09	4,648.48	-294.92	492.17	331.28	160.89	3.059	
17,300.00	12,535.45	17,231.75	12,465.45	81.70	81.61	-80.09	4,748.48	-295.66	492.17	328.87	163.30	3.014	
17,400.00	12,535.15	17,331.75	12,465.14	82.91	82.82	-80.09	4,848.48	-296.41	492.17	326.44	165.73	2.970	
17,500.00	12,534.84	17,431.75	12,464.84	84.13	84.05	-80.09	4,948.47	-297.16	492.18	324.00	168.17	2.927	
17,600.00	12,534.53	17,531.75	12,464.53	85.36	85.27	-80.09	5,048.47	-297.91	492.18	321.55	170.63	2.884	
17,700.00	12,534.22	17,631.75	12,464.22	86.59	86.51	-80.09	5,148.47	-298.66	492.18	319.09	173.10	2.843	
17,800.00	12,533.92	17,731.75	12,463.92	87.83	87.75	-80.09	5,248.46	-299.40	492.19	316.61	175.58	2.803	
17,900.00	12,533.61	17,831.75	12,463.61	89.07	89.00	-80.09	5,348.46	-300.15	492.19	314.12	178.07	2.764	
18,000.00	12,533.30	17,931.75	12,463.30	90.32	90.25	-80.09	5,448.46	-300.90	492.19	311.62	180.58	2.726	
18,100.00	12,532.99	18,031.75	12,462.99	91.58	91.51	-80.09	5,548.45	-301.65	492.20	309.11	183.09	2.688	
18,200.00	12,532.69	18,131.75	12,462.69	92.84	92.77	-80.09	5,648.45	-302.40	492.20	306.59	185.61	2.652	
18,300.00	12,532.38	18,231.75	12,462.38	94.11	94.04	-80.09	5,748.45	-303.14	492.21	304.06	188.15	2.616	
18,400.00	12,532.07	18,331.75	12,462.07	95.38	95.31	-80.09	5,848.44	-303.89	492.21	301.51	190.69	2.581	
18,500.00	12,531.77	18,431.75	12,461.76	96.66	96.59	-80.09	5,948.44	-304.64	492.21	298.96	193.25	2.547	
18,600.00	12,531.46	18,531.75	12,461.46	97.94	97.87	-80.09	6,048.44	-305.39	492.22	296.41	195.81	2.514	
18,700.00	12,531.15	18,631.75	12,461.15	99.22	99.16	-80.09	6,148.43	-306.14	492.22	293.84	198.38	2.481	
18,800.00	12,530.84	18,731.75	12,460.84	100.51	100.45	-80.09	6,248.43	-306.88	492.22	291.26	200.96	2.449	
18,900.00	12,530.54	18,831.75	12,460.53	101.80	101.74	-80.09	6,348.43	-307.63	492.23	288.68	203.55	2.418	
19,000.00	12,530.23	18,931.75	12,460.23	103.10	103.04	-80.09	6,448.42	-308.38	492.23	286.09	206.14	2.388	
19,100.00	12,529.92	19,031.75	12,459.92	104.40	104.34	-80.09	6,548.42	-309.13	492.23	283.49	208.74	2.358	
19,200.00	12,529.61	19,131.75	12,459.61	105.70	105.65	-80.09	6,648.42	-309.88	492.24	280.88	211.35	2.329	
19,300.00	12,529.31	19,231.75	12,459.30	107.01	106.96	-80.09	6,748.41	-310.62	492.24	278.27	213.97	2.301	
19,400.00	12,529.00	19,331.75	12,459.00	108.32	108.27	-80.09	6,848.41	-311.37	492.24	275.65	216.59	2.273	
19,500.00	12,528.69	19,431.75	12,458.69	109.64	109.58	-80.09	6,948.41	-312.12	492.25	273.03	219.22	2.245	
19,600.00	12,528.38	19,531.75	12,458.38	110.95	110.90	-80.09	7,048.40	-312.87	492.25	270.40	221.85	2.219	
19,700.00	12,528.08	19,631.75	12,458.08	112.27	112.22	-80.09	7,148.40	-313.62	492.26	267.76	224.49	2.193	
19,800.00	12,527.77	19,731.75	12,457.77	113.59	113.54	-80.09	7,248.40	-314.36	492.26	265.12	227.14	2.167	
19,900.00	12,527.46	19,831.75	12,457.46	114.92	114.87	-80.09	7,348.40	-315.11	492.26	262.47	229.79	2.142	
20,000.00	12,527.15	19,931.75	12,457.15	116.25	116.20	-80.09	7,448.39	-315.86	492.27	259.82	232.45	2.118	
20,100.00	12,526.85	20,031.75	12,456.85	117.58	117.53	-80.09	7,548.39	-316.61	492.27	257.16	235.11	2.094	
20,200.00	12,526.54	20,131.75	12,456.54	118.91	118.86	-80.09	7,648.39	-317.36	492.27	254.50	237.77	2.070	
20,300.00	12,526.23	20,231.75	12,456.23	120.24	120.20	-80.09	7,748.38	-318.10	492.28	251.83	240.45	2.047	
20,400.00	12,525.93	20,331.75	12,455.92	121.58	121.54	-80.09	7,848.38	-318.85	492.28	249.16	243.12	2.025	
20,500.00	12,525.62	20,431.75	12,455.62	122.92	122.88	-80.09	7,948.38	-319.60	492.28	246.48	245.80	2.003	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Fez Federal Com - 704H - OH - Plan 1 10-12-18													Offset Site Error: 0.00 usft
Survey Program: 0-MWD+HDGM													Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	
20,600.00	12,525.31	20,531.75	12,455.31	124.26	124.22	-80.09	8,048.37	-320.35	492.29	243.80	248.49	1.981	
20,700.00	12,525.00	20,631.75	12,455.00	125.61	125.57	-80.09	8,148.37	-321.10	492.29	241.12	251.17	1.960	
20,800.00	12,524.70	20,731.75	12,454.69	126.95	126.91	-80.09	8,248.37	-321.84	492.29	238.43	253.87	1.939	
20,900.00	12,524.39	20,831.75	12,454.39	128.30	128.26	-80.09	8,348.36	-322.59	492.30	235.73	256.56	1.919	
21,000.00	12,524.08	20,931.75	12,454.08	129.65	129.61	-80.09	8,448.36	-323.34	492.30	233.04	259.26	1.899	
21,100.00	12,523.77	21,031.75	12,453.77	131.00	130.97	-80.09	8,548.36	-324.09	492.31	230.34	261.97	1.879	
21,200.00	12,523.47	21,131.75	12,453.46	132.36	132.32	-80.09	8,648.35	-324.84	492.31	227.63	264.68	1.860	
21,300.00	12,523.16	21,231.75	12,453.16	133.71	133.68	-80.09	8,748.35	-325.58	492.31	224.93	267.39	1.841	
21,400.00	12,522.85	21,331.75	12,452.85	135.07	135.03	-80.09	8,848.35	-326.33	492.32	222.22	270.10	1.823	
21,500.00	12,522.54	21,431.75	12,452.54	136.43	136.39	-80.09	8,948.34	-327.08	492.32	219.50	272.82	1.805	
21,600.00	12,522.24	21,531.75	12,452.24	137.79	137.75	-80.09	9,048.34	-327.83	492.32	216.78	275.54	1.787	
21,700.00	12,521.93	21,631.75	12,451.93	139.15	139.12	-80.09	9,148.34	-328.58	492.33	214.06	278.26	1.769	
21,800.00	12,521.62	21,731.75	12,451.62	140.51	140.48	-80.09	9,248.33	-329.32	492.33	211.34	280.99	1.752	
21,900.00	12,521.31	21,831.75	12,451.31	141.87	141.84	-80.09	9,348.33	-330.07	492.33	208.62	283.72	1.735	
22,000.00	12,521.01	21,931.75	12,451.01	143.24	143.21	-80.09	9,448.33	-330.82	492.34	205.89	286.45	1.719	
22,100.00	12,520.70	22,031.75	12,450.70	144.61	144.58	-80.09	9,548.32	-331.57	492.34	203.15	289.19	1.703	
22,200.00	12,520.39	22,131.75	12,450.39	145.98	145.95	-80.09	9,648.32	-332.32	492.34	200.42	291.92	1.687	
22,300.00	12,520.09	22,231.75	12,450.08	147.35	147.32	-80.09	9,748.32	-333.06	492.35	197.68	294.66	1.671	
22,400.00	12,519.78	22,331.75	12,449.78	148.72	148.69	-80.09	9,848.31	-333.81	492.35	194.95	297.41	1.655	
22,500.00	12,519.47	22,431.75	12,449.47	150.09	150.06	-80.09	9,948.31	-334.56	492.36	192.20	300.15	1.640	
22,600.00	12,519.16	22,531.75	12,449.16	151.46	151.44	-80.09	10,048.31	-335.31	492.36	189.46	302.90	1.625	
22,604.89	12,519.15	22,536.64	12,449.15	151.53	151.50	-80.09	10,053.20	-335.34	492.36	189.33	303.03	1.625	
22,653.01	12,519.00	22,584.14	12,449.00	152.19	152.16	-80.09	10,100.70	-335.70	492.36	188.01	304.35	1.618 ES, SF	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Yates 16 State - 1H - OH - Surveys														Offset Site Error: 0.00 usft	
Survey Program: 100- 8341-														Offset Well Error: -0.00 usft	
Reference		Offset		Semi Major Axis			Distance								
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning		
0.00	0.00	0.34	0.34	0.00	0.00	-124.52	-516.10	-750.46	910.79						
100.00	100.00	111.64	111.63	0.13	0.08	-124.54	-515.98	-749.62	910.10	909.89	0.22	4,222.392			
200.00	200.00	212.30	212.28	0.49	0.22	-124.58	-515.71	-748.22	908.81	908.10	0.71	1,280.906			
300.00	300.00	311.39	311.37	0.85	0.35	-124.62	-515.52	-746.81	907.53	906.33	1.20	758.477			
400.00	400.00	408.39	408.36	1.21	0.47	-124.64	-515.25	-745.75	906.47	904.79	1.68	539.702			
500.00	500.00	504.91	504.88	1.57	0.59	-124.64	-514.87	-745.20	905.78	903.62	2.15	420.570			
600.00	600.00	602.43	602.40	1.93	0.68	-124.62	-514.44	-745.06	905.41	902.81	2.60	347.775			
700.00	700.00	700.00	699.96	2.29	0.76	-124.60	-514.05	-745.10	905.21	902.17	3.04	297.702			
732.40	732.40	732.74	732.70	2.40	0.77	-124.59	-513.91	-745.16	905.19	902.01	3.17	285.110			
800.00	800.00	797.34	797.30	2.64	0.81	-124.56	-513.53	-745.55	905.30	901.84	3.46	261.817			
900.00	900.00	895.32	895.27	3.00	0.86	-124.47	-512.66	-746.68	905.75	901.88	3.86	234.547			
1,000.00	1,000.00	999.93	999.87	3.36	0.93	-124.35	-511.25	-748.04	906.06	901.77	4.30	210.955			
1,100.00	1,100.00	1,105.97	1,105.89	3.72	1.04	-124.23	-509.56	-748.81	905.76	900.99	4.76	190.124			
1,200.00	1,200.00	1,205.36	1,205.27	4.08	1.16	-124.15	-508.06	-749.12	905.17	899.93	5.24	172.734			
1,300.00	1,300.00	1,302.04	1,301.94	4.44	1.28	-124.07	-506.85	-749.51	904.81	899.09	5.71	158.422			
1,400.00	1,400.00	1,402.98	1,402.87	4.79	1.39	-124.00	-505.81	-749.93	904.57	898.38	6.19	146.171			
1,500.00	1,500.00	1,502.00	1,501.88	5.15	1.51	-123.95	-504.99	-750.21	904.34	897.67	6.67	135.642			
1,520.97	1,520.97	1,522.63	1,522.51	5.22	1.54	100.83	-504.86	-750.26	904.32	897.56	6.76	133.716 CC			
1,600.00	1,599.98	1,600.36	1,600.25	5.50	1.63	100.95	-504.58	-750.39	904.58	897.46	7.13	126.944 ES			
1,700.00	1,699.84	1,700.00	1,699.88	5.83	1.72	101.26	-504.49	-750.46	905.61	898.06	7.55	119.912			
1,800.09	1,799.54	1,799.76	1,799.65	6.16	1.75	101.76	-504.52	-750.48	907.39	899.47	7.91	114.656			
1,900.00	1,898.90	1,898.04	1,897.92	6.51	1.73	102.38	-504.72	-750.44	909.66	901.43	8.23	110.492			
2,000.00	1,998.36	1,997.83	1,997.72	6.85	1.71	103.00	-505.05	-750.38	912.10	903.53	8.57	106.484			
2,100.00	2,097.81	2,098.03	2,097.91	7.20	1.71	103.63	-505.34	-750.28	914.58	905.67	8.92	102.586			
2,200.00	2,197.26	2,198.60	2,198.48	7.56	1.74	104.25	-505.48	-750.15	917.07	907.77	9.30	98.613			
2,300.00	2,296.71	2,301.68	2,301.56	7.92	1.82	104.90	-505.37	-749.86	919.42	909.68	9.74	94.441			
2,400.00	2,396.16	2,402.81	2,402.70	8.28	1.92	105.54	-505.02	-749.38	921.59	911.39	10.20	90.360			
2,500.00	2,495.62	2,503.40	2,503.28	8.64	2.03	106.18	-504.50	-748.82	923.72	913.05	10.67	86.555			
2,600.00	2,595.07	2,603.41	2,603.28	9.00	2.15	106.83	-503.75	-748.28	925.88	914.72	11.15	83.018			
2,700.00	2,694.52	2,702.81	2,702.67	9.37	2.27	107.48	-502.84	-747.80	928.12	916.48	11.64	79.750			
2,800.00	2,793.97	2,802.11	2,801.97	9.74	2.39	108.12	-501.96	-747.31	930.49	918.37	12.13	76.738			
2,900.00	2,893.42	2,901.93	2,901.79	10.11	2.51	108.76	-501.12	-746.79	932.96	920.35	12.62	73.950			
3,000.00	2,992.87	3,000.46	3,000.31	10.48	2.63	109.39	-500.34	-746.27	935.58	922.47	13.11	71.379			
3,100.00	3,092.33	3,099.57	3,099.42	10.85	2.75	110.02	-499.53	-745.84	938.38	924.77	13.60	68.991			
3,200.00	3,191.78	3,199.60	3,199.44	11.22	2.87	110.66	-498.52	-745.47	941.27	927.17	14.10	66.763			
3,300.00	3,291.23	3,298.64	3,298.47	11.60	3.00	111.31	-497.25	-745.20	944.27	929.68	14.59	64.699			
3,400.00	3,390.68	3,397.73	3,397.55	11.97	3.12	111.98	-495.79	-745.05	947.43	932.34	15.09	62.782			
3,500.00	3,490.13	3,496.34	3,496.15	12.35	3.24	112.62	-494.45	-744.92	950.76	935.18	15.59	60.995			
3,600.00	3,589.59	3,593.37	3,593.18	12.73	3.36	113.23	-493.67	-744.73	954.38	938.30	16.08	59.337			
3,700.00	3,689.04	3,693.01	3,692.82	13.10	3.48	113.81	-493.28	-744.52	958.23	941.64	16.59	57.772			
3,800.00	3,788.49	3,791.19	3,791.00	13.48	3.61	114.40	-492.77	-744.39	962.21	945.13	17.09	56.313			
3,900.00	3,887.94	3,889.14	3,888.95	13.86	3.72	114.98	-492.27	-744.41	966.45	948.87	17.58	54.966			
4,000.00	3,987.39	3,984.17	3,983.98	14.24	3.78	115.53	-492.12	-744.60	971.07	953.05	18.02	53.901			
4,100.00	4,086.84	4,081.29	4,081.10	14.62	3.80	116.07	-492.22	-745.11	976.16	957.74	18.42	52.992			
4,200.00	4,186.30	4,178.40	4,178.20	15.00	3.86	116.64	-491.75	-746.01	981.56	962.70	18.86	52.049			
4,300.00	4,285.75	4,276.96	4,276.75	15.38	3.94	117.25	-490.92	-747.22	987.24	967.92	19.31	51.115			
4,400.00	4,385.20	4,382.46	4,382.24	15.76	4.03	117.88	-490.00	-748.28	992.81	973.02	19.79	50.164			
4,500.00	4,484.65	4,499.61	4,499.38	16.14	4.15	118.55	-489.04	-747.96	997.29	977.00	20.29	49.143			
4,600.00	4,584.12	4,607.66	4,607.41	16.52	4.26	119.15	-488.10	-746.13	1,000.41	979.63	20.78	48.141			
4,700.00	4,683.81	4,714.20	4,713.91	16.89	4.36	119.60	-487.07	-743.42	1,001.51	980.26	21.25	47.129			
4,800.00	4,783.72	4,809.41	4,809.08	17.25	4.42	119.74	-487.22	-740.62	1,000.83	979.15	21.67	46.175			
4,900.00	4,883.71	4,900.00	4,899.64	17.59	4.45	-105.11	-488.56	-738.61	999.49	977.44	22.04	45.340			

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Yates 16 State - 1H - OH - Surveys														Offset Site Error:	0.00 usft
Survey Program: 100-8341-														Offset Well Error:	0.00 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			
4,980.11	4,963.82	4,964.50	4,964.12	17.86	4.45	-105.18	-489.75	-737.94	999.03	976.72	22.31	44.779			
5,000.00	4,983.71	4,981.66	4,981.28	17.92	4.45	-105.20	-490.04	-737.89	999.06	976.69	22.38	44.648			
5,100.00	5,083.71	5,079.72	5,079.33	18.26	4.45	-105.28	-491.44	-738.01	999.56	976.86	22.70	44.032			
5,200.00	5,183.71	5,179.64	5,179.25	18.59	4.44	-105.34	-492.63	-738.16	1,000.02	976.99	23.03	43.430			
5,300.00	5,283.71	5,278.80	5,278.40	18.92	4.43	-105.40	-493.83	-738.36	1,000.53	977.17	23.36	42.839			
5,400.00	5,383.71	5,379.64	5,379.23	19.26	4.43	-105.46	-494.96	-738.61	1,001.07	977.38	23.69	42.258			
5,500.00	5,483.71	5,482.32	5,481.91	19.60	4.43	-105.50	-495.79	-738.76	1,001.43	977.40	24.03	41.675			
5,600.00	5,583.71	5,581.39	5,580.97	19.93	4.44	-105.55	-496.55	-738.78	1,001.65	977.27	24.37	41.093			
5,700.00	5,683.71	5,680.85	5,680.43	20.27	4.45	-105.58	-497.27	-738.93	1,001.99	977.27	24.72	40.529			
5,800.00	5,783.71	5,781.77	5,781.35	20.61	4.47	-105.61	-497.82	-739.11	1,002.31	977.24	25.07	39.973			
5,900.00	5,883.71	5,883.51	5,883.09	20.95	4.49	-105.64	-498.40	-739.15	1,002.50	977.06	25.43	39.415			
6,000.00	5,983.71	5,982.62	5,982.20	21.29	4.51	-105.68	-499.14	-739.06	1,002.61	976.81	25.80	38.860			
6,100.00	6,083.71	6,081.60	6,081.17	21.63	4.54	-105.73	-500.03	-739.05	1,002.85	976.68	26.17	38.322			
6,200.00	6,183.71	6,181.54	6,181.11	21.97	4.57	-105.77	-500.81	-739.13	1,003.14	976.60	26.54	37.799			
6,300.00	6,283.71	6,282.76	6,282.32	22.31	4.60	-105.80	-501.32	-739.24	1,003.38	976.46	26.91	37.282			
6,400.00	6,383.71	6,383.61	6,383.17	22.65	4.64	-105.82	-501.66	-739.27	1,003.50	976.21	27.29	36.768			
6,500.00	6,483.71	6,485.02	6,484.58	23.00	4.69	-105.84	-501.96	-739.20	1,003.52	975.83	27.68	36.251			
6,600.00	6,583.71	6,585.02	6,584.58	23.34	4.74	-105.86	-502.26	-739.05	1,003.45	975.37	28.08	35.734			
6,700.00	6,683.71	6,685.51	6,685.07	23.68	4.80	-105.88	-502.59	-738.87	1,003.37	974.89	28.48	35.226			
6,800.00	6,783.71	6,785.51	6,785.07	24.03	4.87	-105.90	-502.95	-738.66	1,003.26	974.37	28.89	34.726			
6,900.00	6,883.71	6,884.77	6,884.33	24.37	4.93	-105.92	-503.34	-738.47	1,003.19	973.89	29.30	34.240			
6,961.55	6,945.26	6,946.00	6,945.56	24.58	4.97	-105.94	-503.65	-738.37	1,003.18	973.63	29.55	33.950			
7,000.00	6,983.71	6,984.29	6,983.84	24.71	4.99	-105.95	-503.84	-738.32	1,003.18	973.48	29.71	33.771			
7,100.00	7,083.71	7,084.46	7,084.02	25.06	5.05	-105.98	-504.34	-738.19	1,003.20	973.08	30.11	33.312			
7,200.00	7,183.71	7,185.62	7,185.18	25.41	5.13	-106.02	-504.87	-737.98	1,003.14	972.61	30.53	32.857			
7,300.00	7,283.71	7,286.29	7,285.84	25.75	5.20	-106.05	-505.37	-737.68	1,002.99	972.04	30.95	32.403			
7,400.00	7,383.71	7,385.12	7,384.68	26.10	5.28	-106.07	-505.76	-737.43	1,002.85	971.48	31.38	31.962			
7,448.04	7,431.75	7,432.49	7,432.05	26.26	5.31	-106.08	-505.94	-737.36	1,002.84	971.26	31.58	31.758			
7,500.00	7,483.71	7,483.75	7,483.30	26.44	5.35	-106.10	-506.19	-737.31	1,002.85	971.06	31.80	31.540			
7,600.00	7,583.71	7,586.53	7,586.08	26.79	5.43	-106.14	-506.79	-737.09	1,002.82	970.60	32.22	31.122			
7,700.00	7,683.71	7,686.84	7,686.39	27.14	5.52	-106.17	-507.30	-736.69	1,002.58	969.92	32.66	30.701			
7,800.00	7,783.71	7,789.04	7,788.59	27.49	5.61	-106.19	-507.63	-736.24	1,002.25	969.15	33.10	30.282			
7,900.00	7,883.71	7,893.09	7,892.63	27.83	5.71	-106.23	-507.95	-735.44	1,001.59	968.05	33.54	29.858			
8,000.00	7,983.71	7,996.04	7,995.57	28.18	5.81	-106.26	-508.31	-734.25	1,000.58	966.59	33.99	29.434			
8,100.00	8,083.71	8,100.23	8,099.75	28.53	5.92	-106.32	-508.84	-732.62	999.22	964.77	34.45	29.009			
8,200.00	8,183.71	8,204.81	8,204.30	28.88	6.02	-106.38	-509.34	-730.50	997.41	962.51	34.90	28.580			
8,300.00	8,283.71	8,298.57	8,298.04	29.23	6.10	-106.45	-510.00	-728.31	995.38	960.06	35.33	28.177			
8,356.40	8,340.10	8,341.00	8,340.40	29.42	6.11	-106.59	-512.12	-727.39	995.01	959.47	35.53	28.002			
8,400.00	8,383.71	8,374.28	8,373.53	29.58	6.11	-106.76	-515.15	-726.68	995.25	959.56	35.69	27.886			
8,500.00	8,483.71	8,448.62	8,446.95	29.93	6.13	-107.42	-526.52	-724.89	997.52	961.47	36.05	27.669			
8,600.00	8,583.71	8,509.91	8,506.49	30.27	6.15	-108.23	-540.95	-723.73	1,003.14	966.71	36.43	27.537			
8,700.00	8,683.71	8,565.00	8,558.60	30.62	6.20	-109.20	-558.76	-723.35	1,013.29	976.46	36.82	27.517 SF			
8,800.00	8,783.71	8,610.00	8,599.87	30.97	6.26	-110.15	-576.68	-723.73	1,028.51	991.27	37.24	27.621			
8,900.00	8,883.71	8,681.13	8,662.91	31.32	6.42	-111.86	-609.55	-724.52	1,048.00	1,010.25	37.75	27.763			
9,000.00	8,983.71	8,728.92	8,703.28	31.67	6.58	-113.18	-635.11	-724.28	1,071.41	1,033.16	38.26	28.006			
9,100.00	9,083.71	8,771.20	8,736.85	32.03	6.77	-114.48	-660.78	-724.07	1,100.36	1,061.56	38.79	28.364			
9,200.00	9,183.71	8,813.73	8,768.53	32.38	7.01	-115.90	-689.14	-723.43	1,134.47	1,095.08	39.38	28.807			
9,300.00	9,283.71	8,849.36	8,793.39	32.73	7.24	-117.15	-714.64	-722.47	1,173.64	1,133.67	39.97	29.362			
9,400.00	9,383.71	8,878.00	8,811.97	33.08	7.46	-118.21	-736.40	-721.44	1,218.05	1,177.52	40.54	30.049			
9,500.00	9,483.71	8,898.45	8,824.24	33.43	7.64	-118.99	-752.73	-720.49	1,267.59	1,226.52	41.07	30.864			
9,600.00	9,583.71	8,923.00	8,837.55	33.78	7.86	-119.98	-773.30	-719.01	1,322.09	1,280.44	41.64	31.748			
9,700.00	9,683.71	8,923.00	8,837.55	34.13	7.86	-119.98	-773.30	-719.01	1,381.02	1,339.02	41.99	32.886			

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
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Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Yates 16 State - 1H - OH - Surveys														Offset Site Error: 0.00 usft
Survey Program: 100- 8341-														Offset Well Error: 0.00 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)	Offset Wellbore Centre E/W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor		
9,800.00	9,783.71	8,944.09	8,847.74	34.48	8.09	-120.85	-791.70	-717.49	1,443.90	1,401.33	42.57	33.918		
9,900.00	9,883.71	8,968.00	8,857.93	34.83	8.34	-121.85	-813.24	-715.56	1,510.69	1,467.51	43.18	34.988		
10,000.00	9,983.71	8,968.00	8,857.93	35.19	8.34	-121.85	-813.24	-715.56	1,580.32	1,536.79	43.53	36.305		
10,100.00	10,083.71	8,968.00	8,857.93	35.54	8.34	-121.85	-813.24	-715.56	1,653.06	1,609.18	43.88	37.672		
10,200.00	10,183.71	8,991.72	8,866.91	35.89	8.63	-122.86	-835.09	-713.46	1,728.06	1,683.54	44.52	38.818		
10,300.00	10,283.71	9,013.00	8,874.30	36.24	8.88	-123.76	-854.94	-711.46	1,805.40	1,760.27	45.13	40.009		
10,400.00	10,383.71	9,013.00	8,874.30	36.60	8.88	-123.76	-854.94	-711.46	1,884.51	1,839.04	45.48	41.438		
10,500.00	10,483.71	9,013.00	8,874.30	36.95	8.88	-123.76	-854.94	-711.46	1,965.54	1,919.71	45.83	42.888		
10,600.00	10,583.71	9,013.00	8,874.30	37.30	8.88	-123.76	-854.94	-711.46	2,048.24	2,002.05	46.18	44.351		
10,700.00	10,683.71	9,034.47	8,881.00	37.65	9.16	-124.67	-875.23	-709.39	2,131.90	2,085.08	46.82	45.539		
10,800.00	10,783.71	9,058.00	8,887.33	38.01	9.47	-125.66	-897.78	-707.13	2,217.43	2,169.96	47.47	46.707		
10,900.00	10,883.71	9,058.00	8,887.33	38.36	9.47	-125.66	-897.78	-707.13	2,303.55	2,255.72	47.83	48.163		
11,000.00	10,983.71	9,058.00	8,887.33	38.71	9.47	-125.66	-897.78	-707.13	2,390.75	2,342.57	48.18	49.620		
11,100.00	11,083.71	9,058.00	8,887.33	39.06	9.47	-125.66	-897.78	-707.13	2,478.91	2,430.38	48.53	51.076		
11,200.00	11,183.71	9,058.00	8,887.33	39.42	9.47	-125.66	-897.78	-707.13	2,567.95	2,519.06	48.89	52.528		
11,300.00	11,283.71	9,058.00	8,887.33	39.77	9.47	-125.66	-897.78	-707.13	2,657.76	2,608.52	49.24	53.975		
11,400.00	11,383.71	9,058.00	8,887.33	40.12	9.47	-125.66	-897.78	-707.13	2,748.27	2,698.68	49.59	55.415		
11,500.00	11,483.71	9,058.00	8,887.33	40.48	9.47	-125.66	-897.78	-707.13	2,839.43	2,789.48	49.95	56.848		
11,600.00	11,583.71	9,058.00	8,887.33	40.83	9.47	-125.66	-897.78	-707.13	2,931.16	2,880.86	50.30	58.272		
11,700.00	11,683.71	9,058.00	8,887.33	41.19	9.47	-125.66	-897.78	-707.13	3,023.41	2,972.76	50.65	59.687		
11,800.00	11,783.71	9,078.79	8,892.02	41.54	9.76	-126.52	-917.95	-705.24	3,115.62	3,064.32	51.30	60.737		
11,900.00	11,883.71	9,081.43	8,892.55	41.89	9.79	-126.63	-920.52	-705.01	3,208.65	3,156.96	51.69	62.078		
12,000.00	11,983.71	9,103.00	8,896.37	42.25	10.09	-125.44	-941.67	-703.23	3,302.52	3,250.18	52.34	63.096		
12,100.00	12,083.08	9,103.00	8,896.37	42.59	10.09	-96.64	-941.67	-703.23	3,397.71	3,345.02	52.69	64.490		
12,200.00	12,179.19	9,103.00	8,896.37	42.91	10.09	-63.38	-941.67	-703.23	3,493.70	3,440.70	53.00	65.914		
12,300.00	12,269.13	9,081.19	8,892.50	43.19	9.79	-41.21	-920.28	-705.03	3,587.06	3,534.08	52.98	67.702		
12,400.00	12,350.17	9,058.00	8,887.33	43.43	9.47	-29.56	-897.78	-707.13	3,676.48	3,623.58	52.90	69.499		
12,500.00	12,419.84	9,058.00	8,887.33	43.63	9.47	-23.25	-897.78	-707.13	3,758.16	3,705.06	53.10	70.775		
12,600.00	12,476.03	9,058.00	8,887.33	43.82	9.47	-19.40	-897.78	-707.13	3,830.79	3,777.51	53.28	71.894		
12,700.00	12,517.02	9,058.00	8,887.33	44.00	9.47	-16.93	-897.78	-707.13	3,892.72	3,839.25	53.47	72.798		
12,800.00	12,541.57	9,058.00	8,887.33	44.19	9.47	-15.33	-897.78	-707.13	3,942.62	3,888.95	53.67	73.464		
12,900.00	12,548.98	9,033.45	8,880.70	44.37	9.15	-14.36	-874.26	-709.48	3,978.81	3,925.27	53.53	74.328		
13,000.00	12,548.67	9,013.00	8,874.30	44.58	8.88	-14.37	-854.94	-711.46	4,010.28	3,956.82	53.47	75.001		
13,100.00	12,548.36	9,013.00	8,874.30	44.83	8.88	-14.37	-854.94	-711.46	4,043.54	3,989.82	53.72	75.270		
13,200.00	12,548.06	9,013.00	8,874.30	45.13	8.88	-14.37	-854.94	-711.46	4,078.98	4,024.96	54.02	75.516		
13,300.00	12,547.75	8,968.00	8,857.93	45.46	8.34	-14.36	-813.24	-715.56	4,116.04	4,062.22	53.81	76.486		
13,400.00	12,547.44	8,968.00	8,857.93	45.85	8.34	-14.36	-813.24	-715.56	4,154.67	4,100.47	54.19	76.662		
13,500.00	12,547.13	8,968.00	8,857.93	46.27	8.34	-14.36	-813.24	-715.56	4,195.32	4,140.70	54.62	76.814		
13,600.00	12,546.83	8,968.00	8,857.93	46.73	8.34	-14.36	-813.24	-715.56	4,237.95	4,182.87	55.08	76.943		
13,700.00	12,546.52	8,947.10	8,849.10	47.24	8.12	-14.35	-794.37	-717.26	4,281.85	4,226.49	55.36	77.347		
13,800.00	12,546.21	8,923.00	8,837.55	47.78	7.86	-14.33	-773.30	-719.01	4,328.16	4,272.52	55.64	77.785		
13,900.00	12,545.90	8,923.00	8,837.55	48.35	7.86	-14.33	-773.30	-719.01	4,375.43	4,319.21	56.22	77.828		
14,000.00	12,545.60	8,923.00	8,837.55	48.96	7.86	-14.33	-773.30	-719.01	4,424.47	4,367.63	56.83	77.853		
14,100.00	12,545.29	8,923.00	8,837.55	49.61	7.86	-14.33	-773.30	-719.01	4,475.19	4,417.72	57.48	77.861		
14,200.00	12,544.98	8,923.00	8,837.55	50.29	7.86	-14.33	-773.30	-719.01	4,527.56	4,469.41	58.16	77.853		
14,300.00	12,544.67	8,923.00	8,837.55	51.00	7.86	-14.33	-773.30	-719.01	4,581.52	4,522.65	58.87	77.831		
14,400.00	12,544.37	8,923.00	8,837.55	51.74	7.86	-14.33	-773.30	-719.01	4,637.00	4,577.40	59.61	77.795		
14,500.00	12,544.06	8,878.00	8,811.97	52.51	7.46	-14.27	-736.40	-721.44	4,693.42	4,633.45	59.97	78.257		
14,600.00	12,543.75	8,878.00	8,811.97	53.30	7.46	-14.27	-736.40	-721.44	4,751.03	4,690.26	60.77	78.180		
14,700.00	12,543.44	8,878.00	8,811.97	54.13	7.46	-14.27	-736.40	-721.44	4,810.03	4,748.44	61.59	78.094		
14,800.00	12,543.14	8,878.00	8,811.97	54.97	7.46	-14.27	-736.40	-721.44	4,870.36	4,807.92	62.44	78.000		
14,900.00	12,542.83	8,878.00	8,811.97	55.85	7.46	-14.27	-736.40	-721.44	4,931.99	4,868.68	63.31	77.899		

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

Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Com
 Site Error: 0.00 usft
 Reference Well: 703H
 Well Error: 0.00 usft
 Reference Wellbore: OH
 Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
 TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
 MD Reference: RKB=25' @ 3275.60usft (Precision 595)
 North Reference: Grid
 Survey Calculation Method: Minimum Curvature
 Output errors are at: 2.00 sigma
 Database: USA Compass
 Offset TVD Reference: Offset Datum

Offset Design Yates 16 State - 1H - OH - Surveys											Offset Site Error: 0.00 usft		
Survey Program: 100- 8341-											Offset Well Error: 0.00 usft		
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance				Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)			
15,000.00	12,542.52	8,878.00	8,811.97	56.74	7.46	-14.27	-736.40	-721.44	4,994.86	4,930.65	64.21	77.793	
15,100.00	12,542.22	8,878.00	8,811.97	57.66	7.46	-14.27	-736.40	-721.44	5,058.92	4,993.80	65.12	77.682	
15,200.00	12,541.91	8,854.33	8,796.71	58.59	7.28	-14.23	-718.33	-722.31	5,123.51	5,057.60	65.90	77.745	
15,300.00	12,541.60	8,833.00	8,782.19	59.55	7.12	-14.18	-702.73	-722.95	5,189.69	5,122.92	66.77	77.724	
15,400.00	12,541.29	8,833.00	8,782.19	60.53	7.12	-14.18	-702.73	-722.95	5,256.44	5,188.69	67.75	77.589	
15,500.00	12,540.99	8,833.00	8,782.19	61.52	7.12	-14.18	-702.73	-722.95	5,324.24	5,255.49	68.74	77.453	
15,600.00	12,540.68	8,833.00	8,782.19	62.53	7.12	-14.18	-702.73	-722.95	5,393.03	5,323.28	69.75	77.316	
15,700.00	12,540.37	8,833.00	8,782.19	63.56	7.12	-14.18	-702.73	-722.95	5,462.79	5,392.01	70.78	77.179	
15,800.00	12,540.06	8,833.00	8,782.19	64.60	7.12	-14.18	-702.73	-722.95	5,533.48	5,461.66	71.82	77.043	
15,900.00	12,539.76	8,788.00	8,749.62	65.66	6.85	-14.07	-671.71	-723.88	5,604.79	5,531.97	72.82	76.968	
16,000.00	12,539.45	8,788.00	8,749.62	66.73	6.85	-14.07	-671.71	-723.88	5,676.69	5,602.80	73.89	76.825	
16,100.00	12,539.14	8,788.00	8,749.62	67.82	6.85	-14.07	-671.71	-723.88	5,749.43	5,674.45	74.98	76.682	
16,200.00	12,538.83	8,788.00	8,749.62	68.92	6.85	-14.07	-671.71	-723.88	5,822.97	5,746.90	76.08	76.542	
16,300.00	12,538.53	8,788.00	8,749.62	70.03	6.85	-14.07	-671.71	-723.88	5,897.29	5,820.11	77.19	76.403	
16,400.00	12,538.22	8,788.00	8,749.62	71.15	6.85	-14.07	-671.71	-723.88	5,972.37	5,894.06	78.31	76.267	
16,500.00	12,537.91	8,788.00	8,749.62	72.28	6.85	-14.07	-671.71	-723.88	6,048.16	5,968.72	79.44	76.133	
16,600.00	12,537.60	8,765.03	8,732.08	73.43	6.74	-14.01	-656.87	-724.13	6,124.14	6,043.57	80.56	76.016	
16,700.00	12,537.30	8,743.00	8,714.69	74.58	6.63	-13.95	-643.36	-724.24	6,201.31	6,119.61	81.70	75.907	
16,800.00	12,536.99	8,743.00	8,714.69	75.75	6.63	-13.95	-643.36	-724.24	6,278.67	6,195.81	82.86	75.774	
16,900.00	12,536.68	8,743.00	8,714.69	76.92	6.63	-13.95	-643.36	-724.24	6,356.65	6,272.62	84.03	75.645	
17,000.00	12,536.38	8,743.00	8,714.69	78.10	6.63	-13.95	-643.36	-724.24	6,435.25	6,350.04	85.21	75.518	
17,100.00	12,536.07	8,743.00	8,714.69	79.29	6.63	-13.95	-643.36	-724.24	6,514.43	6,428.03	86.40	75.394	
17,200.00	12,535.76	8,743.00	8,714.69	80.49	6.63	-13.95	-643.36	-724.24	6,594.18	6,506.58	87.60	75.273	
17,300.00	12,535.45	8,743.00	8,714.69	81.70	6.63	-13.95	-643.36	-724.24	6,674.48	6,585.67	88.81	75.155	
17,400.00	12,535.15	8,743.00	8,714.69	82.91	6.63	-13.95	-643.36	-724.24	6,755.30	6,665.28	90.02	75.040	
17,500.00	12,534.84	8,743.00	8,714.69	84.13	6.63	-13.95	-643.36	-724.24	6,836.63	6,745.38	91.24	74.928	
17,600.00	12,534.53	8,720.75	8,696.55	85.36	6.55	-13.89	-630.48	-724.32	6,917.90	6,825.46	92.45	74.832	
17,700.00	12,534.22	8,698.00	8,677.41	86.59	6.47	-13.83	-618.18	-724.46	7,000.40	6,906.74	93.65	74.747	
17,800.00	12,533.92	8,698.00	8,677.41	87.83	6.47	-13.83	-618.18	-724.46	7,082.79	6,987.89	94.89	74.639	
17,900.00	12,533.61	8,698.00	8,677.41	89.07	6.47	-13.83	-618.18	-724.46	7,165.63	7,069.49	96.14	74.534	
18,000.00	12,533.30	8,698.00	8,677.41	90.32	6.47	-13.83	-618.18	-724.46	7,248.90	7,151.51	97.39	74.432	
18,100.00	12,532.99	8,698.00	8,677.41	91.58	6.47	-13.83	-618.18	-724.46	7,332.59	7,233.95	98.65	74.332	
18,200.00	12,532.69	8,698.00	8,677.41	92.84	6.47	-13.83	-618.18	-724.46	7,416.69	7,316.78	99.91	74.235	
18,300.00	12,532.38	8,698.00	8,677.41	94.11	6.47	-13.83	-618.18	-724.46	7,501.17	7,400.00	101.17	74.141	
18,400.00	12,532.07	8,698.00	8,677.41	95.38	6.47	-13.83	-618.18	-724.46	7,586.04	7,483.59	102.45	74.049	
18,500.00	12,531.77	8,698.00	8,677.41	96.66	6.47	-13.83	-618.18	-724.46	7,671.26	7,567.54	103.72	73.960	
18,600.00	12,531.46	8,698.00	8,677.41	97.94	6.47	-13.83	-618.18	-724.46	7,756.84	7,651.84	105.00	73.873	
18,700.00	12,531.15	8,677.44	8,659.71	99.22	6.41	-13.76	-607.71	-724.52	7,842.46	7,736.20	106.26	73.803	
18,800.00	12,530.84	8,656.00	8,640.96	100.51	6.35	-13.70	-597.33	-724.37	7,928.78	7,821.25	107.52	73.739	
18,900.00	12,530.54	8,656.00	8,640.96	101.80	6.35	-13.70	-597.33	-724.37	8,015.09	7,906.27	108.82	73.656	
19,000.00	12,530.23	8,656.00	8,640.96	103.10	6.35	-13.70	-597.33	-724.37	8,101.72	7,991.60	110.11	73.576	
19,100.00	12,529.92	8,656.00	8,640.96	104.40	6.35	-13.70	-597.33	-724.37	8,188.65	8,077.24	111.41	73.497	
19,200.00	12,529.61	8,656.00	8,640.96	105.70	6.35	-13.70	-597.33	-724.37	8,275.88	8,163.16	112.72	73.421	
19,300.00	12,529.31	8,656.00	8,640.96	107.01	6.35	-13.70	-597.33	-724.37	8,363.39	8,249.37	114.02	73.347	
19,400.00	12,529.00	8,656.00	8,640.96	108.32	6.35	-13.70	-597.33	-724.37	8,451.18	8,335.84	115.34	73.275	
19,500.00	12,528.69	8,656.00	8,640.96	109.64	6.35	-13.70	-597.33	-724.37	8,539.24	8,422.59	116.65	73.205	
19,600.00	12,528.38	8,656.00	8,640.96	110.95	6.35	-13.70	-597.33	-724.37	8,627.56	8,509.59	117.97	73.136	
19,700.00	12,528.08	8,633.30	8,620.81	112.27	6.31	-13.63	-586.89	-724.08	8,715.83	8,596.57	119.26	73.085	
19,800.00	12,527.77	8,610.00	8,599.87	113.59	6.26	-13.55	-576.68	-723.73	8,804.72	8,684.18	120.55	73.039	
19,900.00	12,527.46	8,610.00	8,599.87	114.92	6.26	-13.55	-576.68	-723.73	8,893.55	8,771.67	121.87	72.973	
20,000.00	12,527.15	8,610.00	8,599.87	116.25	6.26	-13.55	-576.68	-723.73	8,982.60	8,859.40	123.20	72.910	
20,100.00	12,526.85	8,610.00	8,599.87	117.58	6.26	-13.55	-576.68	-723.73	9,071.89	8,947.36	124.53	72.848	

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



Anticollision Report



Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Offset Design Yates 16 State - 1H - OH - Surveys													Offset Site Error: 0.00 usft
Survey Program: 100- 8341-													Offset Well Error: 0.00 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	
20,200.00	12,526.54	8,610.00	8,599.87	118.91	6.26	-13.55	-576.68	-723.73	9,161.40	9,035.53	125.86	72.788	
20,300.00	12,526.23	8,610.00	8,599.87	120.24	6.26	-13.55	-576.68	-723.73	9,251.12	9,123.92	127.20	72.729	
20,400.00	12,525.93	8,610.00	8,599.87	121.58	6.26	-13.55	-576.68	-723.73	9,341.05	9,212.51	128.54	72.672	
20,500.00	12,525.62	8,610.00	8,599.87	122.92	6.26	-13.55	-576.68	-723.73	9,431.18	9,301.30	129.88	72.617	
20,600.00	12,525.31	8,610.00	8,599.87	124.26	6.26	-13.55	-576.68	-723.73	9,521.51	9,390.29	131.22	72.562	
20,700.00	12,525.00	8,610.00	8,599.87	125.61	6.26	-13.55	-576.68	-723.73	9,612.03	9,479.47	132.56	72.510	
20,800.00	12,524.70	8,610.00	8,599.87	126.95	6.26	-13.55	-576.68	-723.73	9,702.74	9,568.83	133.91	72.458	
20,900.00	12,524.39	8,610.00	8,599.87	128.30	6.26	-13.55	-576.68	-723.73	9,793.63	9,658.37	135.26	72.408	
21,000.00	12,524.08	8,588.68	8,580.46	129.65	6.23	-13.48	-567.87	-723.46	9,884.35	9,747.77	136.58	72.371	
21,100.00	12,523.77	8,586.03	8,578.02	131.00	6.23	-13.47	-566.81	-723.44	9,975.49	9,837.56	137.93	72.324	
21,200.00	12,523.47	8,565.00	8,558.60	132.36	6.20	-13.41	-558.76	-723.35	10,067.05	9,927.80	139.26	72.292	
21,300.00	12,523.16	8,565.00	8,558.60	133.71	6.20	-13.41	-558.76	-723.35	10,158.44	10,017.83	140.61	72.245	
21,400.00	12,522.85	8,565.00	8,558.60	135.07	6.20	-13.41	-558.76	-723.35	10,249.99	10,108.02	141.97	72.200	
21,500.00	12,522.54	8,565.00	8,558.60	136.43	6.20	-13.41	-558.76	-723.35	10,341.70	10,198.37	143.33	72.155	
21,600.00	12,522.24	8,565.00	8,558.60	137.79	6.20	-13.41	-558.76	-723.35	10,433.55	10,288.87	144.69	72.112	
21,700.00	12,521.93	8,565.00	8,558.60	139.15	6.20	-13.41	-558.76	-723.35	10,525.56	10,379.51	146.05	72.070	
21,800.00	12,521.62	8,565.00	8,558.60	140.51	6.20	-13.41	-558.76	-723.35	10,617.71	10,470.30	147.41	72.029	
21,900.00	12,521.31	8,565.00	8,558.60	141.87	6.20	-13.41	-558.76	-723.35	10,710.01	10,561.23	148.77	71.988	
22,000.00	12,521.01	8,565.00	8,558.60	143.24	6.20	-13.41	-558.76	-723.35	10,802.43	10,652.29	150.14	71.949	
22,100.00	12,520.70	8,565.00	8,558.60	144.61	6.20	-13.41	-558.76	-723.35	10,895.00	10,743.49	151.51	71.911	
22,200.00	12,520.39	8,565.00	8,558.60	145.98	6.20	-13.41	-558.76	-723.35	10,987.69	10,834.82	152.88	71.873	
22,300.00	12,520.09	8,565.00	8,558.60	147.35	6.20	-13.41	-558.76	-723.35	11,080.51	10,926.27	154.25	71.837	
22,400.00	12,519.78	8,565.00	8,558.60	148.72	6.20	-13.41	-558.76	-723.35	11,173.46	11,017.84	155.62	71.801	
22,500.00	12,519.47	8,565.00	8,558.60	150.09	6.20	-13.41	-558.76	-723.35	11,266.52	11,109.53	156.99	71.767	
22,600.00	12,519.16	8,565.00	8,558.60	151.46	6.20	-13.41	-558.76	-723.35	11,359.71	11,201.34	158.36	71.733	
22,653.01	12,519.00	8,565.00	8,558.60	152.19	6.20	-13.41	-558.76	-723.35	11,409.15	11,250.06	159.09	71.715	

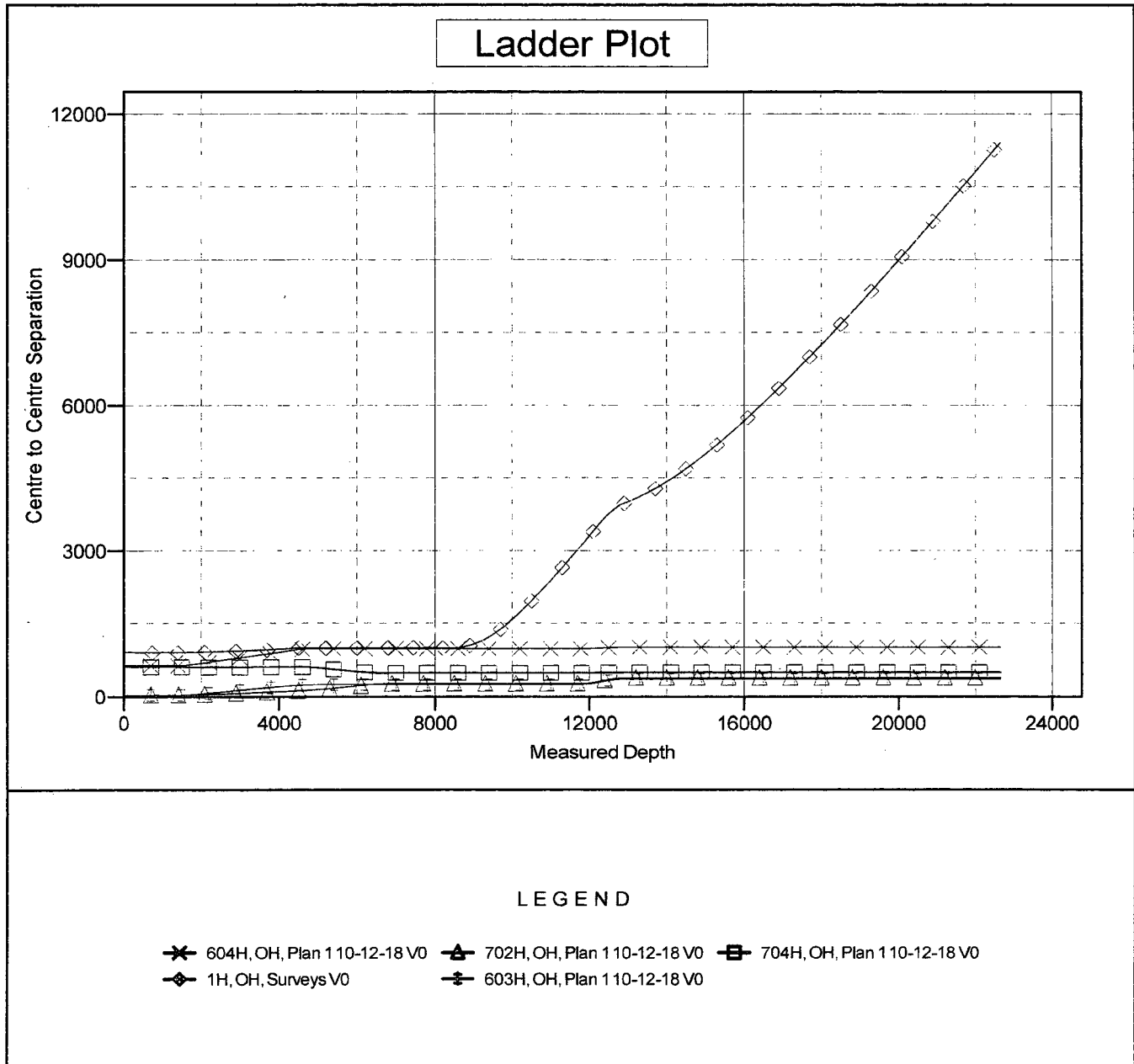
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation

Company: COG Operating LLC
Project: Lea County, NM (NAD27 NME)
Reference Site: Fez Federal Com
Site Error: 0.00 usft
Reference Well: 703H
Well Error: 0.00 usft
Reference Wellbore: OH
Reference Design: Plan 1 10-12-18

Local Co-ordinate Reference: Well 703H
TVD Reference: RKB=25' @ 3275.60usft (Precision 595)
MD Reference: RKB=25' @ 3275.60usft (Precision 595)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: USA Compass
Offset TVD Reference: Offset Datum

Reference Depths are relative to RKB=25' @ 3275.60usft (Precision 59
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 703H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.51°



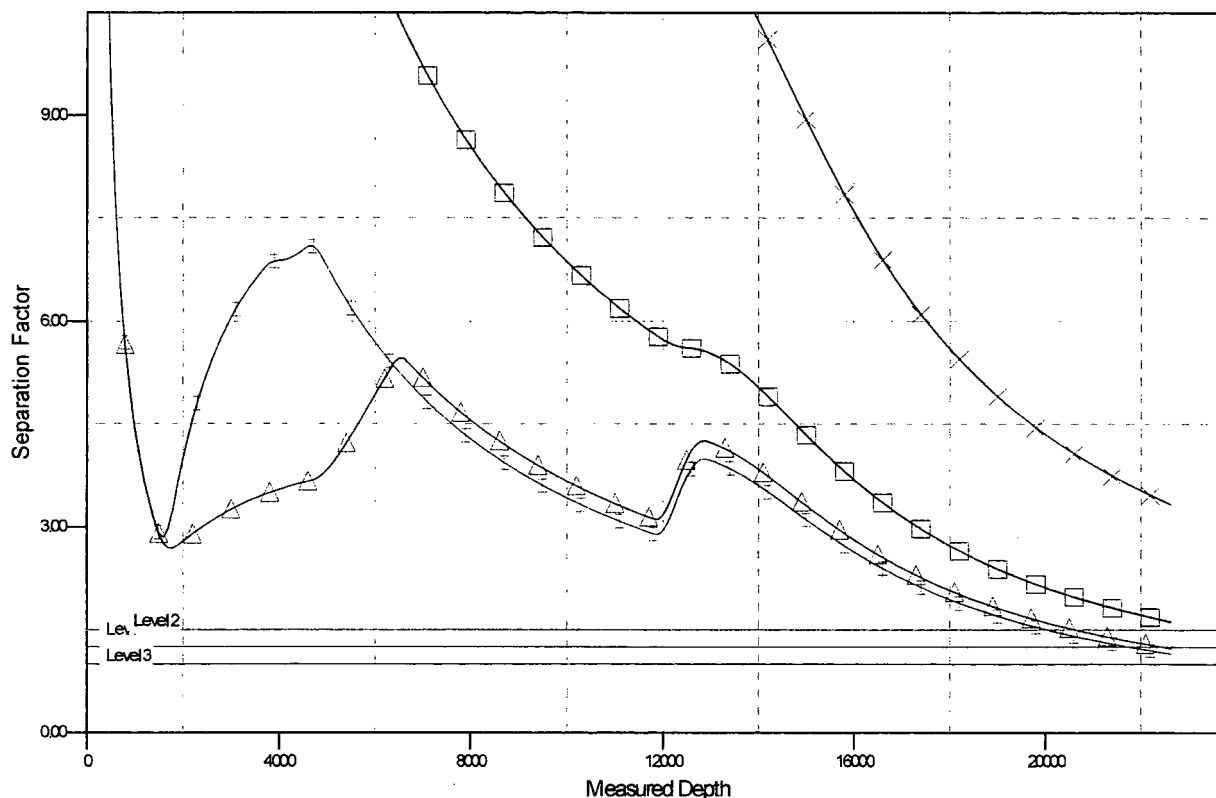
Company: COG Operating LLC
 Project: Lea County, NM (NAD27 NME)
 Reference Site: Fez Federal Corn
 Site Error: 0.00 usft
 Reference Well: 703H
 Well Error: 0.00 usft
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 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: 703H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.51°

Separation Factor Plot



LEGEND

✕ 604H, OH, Plan 1 10-12-18 V0 ▲ 702H, OH, Plan 1 10-12-18 V0 ▣ 704H, OH, Plan 1 10-12-18 V0
 ◆ 1H, OH, Surveys V0 ⬢ 603H, OH, Plan 1 10-12-18 V0