

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (505) 393-6161 Fax: (505) 393-6720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (505) 748-1283 Fax: (505) 748-9720

DISTRICT III
1000 Rio Brazos Road, 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 30-015- 41723	Pool Code 3250	Pool Name Atoka; Glorieta Yeso
Property Code 38945	Property Name PATTON 5 FEE	Well Number 3H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3380'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
E	5	19-S	26-E		1410	NORTH	230	WEST	EDDY

Bottom Hole Location If Different From Surface

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
H	5	19-S	26-E		1700	NORTH	330	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
160			

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

Estimated Completed Interval: 1530 FNL + 605 FWL GRID AZ = 93°09'30" HORIZ. DIST. = 4728.2' Project Area Producing Area GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=615791.8 N X=475932.2 E LAT. = 32.692886° N LONG. = 104.411567° W BOTTOM HOLE LOCATION Y=615531.4 N X=480651.9 E CORNER COORDINATES TABLE <table border="1"> <tr><td>A</td><td>Y=615908.3 N, X=475701.6 E</td></tr> <tr><td>B</td><td>Y=615933.3 N, X=480979.9 E</td></tr> <tr><td>C</td><td>Y=614613.7 N, X=480986.3 E</td></tr> <tr><td>D</td><td>Y=614596.3 N, X=475708.9 E</td></tr> </table>	A	Y=615908.3 N, X=475701.6 E	B	Y=615933.3 N, X=480979.9 E	C	Y=614613.7 N, X=480986.3 E	D	Y=614596.3 N, X=475708.9 E	OPERATOR CERTIFICATION I hereby certify that the information herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. 10-3-13 Signature Date Kelly J. Holly Printed Name kholly@concho.com E-mail Address
	A	Y=615908.3 N, X=475701.6 E							
	B	Y=615933.3 N, X=480979.9 E							
	C	Y=614613.7 N, X=480986.3 E							
D	Y=614596.3 N, X=475708.9 E								
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. JULY 8, 2013 Date of Survey Signature & Seal of Professional Surveyor: 07/15/2013 Certificate Number Gary G. Eidson 12641 Ronald J. Eidson 3239 ACK JWSC W.O. 13.11.0756									

API# 30015-41723



COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Patton 5 Fee

#3H

WB1

Plan: Plan #1 10-03-13

Surface: 1410' FNL, 230' FWL, Sec 5, T19S, R26E, Unit E

PP: 1530' FNL, 605' FWL, Sec 5, T19S, R26E, Unit E

BHL: 1700' FNL, 330' FEL, Sec 5, T19S, R26E, Unit H

Standard Planning Report

03 October, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #3H
Company:	COG Operating LLC	TVD Reference:	GL @ 3380.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3380.00usft
Site:	Patton 5 Fee	North Reference:	Grid
Well:	#3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-03-13		

Project:	Eddy County, New Mexico (NAD 27 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:	Patton 5 Fee		
Site Position:		Northing:	613,610.70 usft
From:	Map	Easting:	475,920.20 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 41' 12.80582 N
		Longitude:	104° 24' 41.76182 W
		Grid Convergence:	-0.04 °

Well:	#3H		
Well Position	+N/-S	2,181.10 usft	Northing:
	+E/-W	12.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	
		Latitude:	32° 41' 34.38927 N
		Longitude:	104° 24' 41.64023 W
		Ground Level:	3,380.00 usft

Wellbore:	WB1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	10/03/13	7.73
			Dip Angle
			(°)
			60.42
			Field Strength
			(nT)
			48,575

Design:	Plan #1 10-03-13		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			93.16

Plan Sections										
Measured Depth	Inclination	Azimuth	Vertical Depth	+N/-S	+E/-W	Dogleg Rate	Build Rate	Turn Rate	TFO	Target
(usft)	(°)	(°)	(usft)	(usft)	(usft)	(°/100usft)	(°/100usft)	(°/100usft)	(°)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,374.70	0.00	0.00	2,374.70	0.00	0.00	0.00	0.00	0.00	0.00	
3,197.43	90.50	119.30	2,895.55	-257.13	458.20	11.00	11.00	0.00	119.30	
4,315.16	90.50	85.77	2,885.49	-496.23	1,533.75	3.00	0.00	-3.00	-89.85	
7,509.95	90.50	85.77	2,857.50	-260.40	4,719.70	0.00	0.00	0.00	0.00	PBHL-Patton 5 #3H



Phoenix Technology Services
Planning Report



Database: GCR DB
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Patton 5 Fee
Well: #3H
Wellbore: WB1
Design: Plan #1 10-03-13

Local Co-ordinate Reference: Well #3H
TVD Reference: GL @ 3380.00usft
MD Reference: GL @ 3380.00usft
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
2,374.70	0.00	0.00	2,374.70	0.00	0.00	0.00	0.00	0.00	0.00
KOP Start Build 11.00									
2,400.00	2.78	119.30	2,399.99	-0.30	0.54	0.55	11.00	11.00	0.00
2,500.00	13.78	119.30	2,498.80	-7.34	13.08	13.46	11.00	11.00	0.00
2,600.00	24.78	119.30	2,593.04	-23.48	41.83	43.06	11.00	11.00	0.00
2,700.00	35.78	119.30	2,679.26	-48.12	85.74	88.26	11.00	11.00	0.00
2,800.00	46.78	119.30	2,754.29	-80.36	143.19	147.40	11.00	11.00	0.00
2,900.00	57.78	119.30	2,815.37	-119.01	212.07	218.30	11.00	11.00	0.00
3,000.00	68.78	119.30	2,860.26	-162.65	289.85	298.37	11.00	11.00	0.00
3,100.00	79.78	119.30	2,887.31	-209.69	373.66	384.65	11.00	11.00	0.00
3,101.97	80.00	119.30	2,887.66	-210.64	375.35	386.39	11.00	11.00	0.00
PP-Patton 5 #3H									
3,197.43	90.50	119.30	2,895.55	-257.13	458.20	471.67	11.00	11.00	0.00
LP Start DLS 3.00 TFO -89.85									
3,200.00	90.50	119.22	2,895.53	-258.39	460.44	473.98	3.00	0.01	-3.00
3,300.00	90.51	116.22	2,894.65	-304.90	548.95	564.91	3.00	0.01	-3.00
3,400.00	90.51	113.22	2,893.76	-346.72	639.77	657.90	3.00	0.01	-3.00
3,500.00	90.52	110.22	2,892.86	-383.72	732.66	752.68	3.00	0.00	-3.00
3,600.00	90.52	107.22	2,891.95	-415.81	827.35	849.00	3.00	0.00	-3.00
3,700.00	90.52	104.22	2,891.04	-442.91	923.59	946.59	3.00	0.00	-3.00
3,800.00	90.52	101.22	2,890.13	-464.93	1,021.12	1,045.18	3.00	0.00	-3.00
3,900.00	90.52	98.22	2,889.21	-481.81	1,119.67	1,144.51	3.00	0.00	-3.00
4,000.00	90.52	95.22	2,888.30	-493.51	1,218.97	1,244.30	3.00	0.00	-3.00
4,100.00	90.52	92.22	2,887.40	-500.00	1,318.74	1,344.28	3.00	0.00	-3.00
4,200.00	90.51	89.22	2,886.51	-501.26	1,418.72	1,444.18	3.00	-0.01	-3.00
4,300.00	90.50	86.22	2,885.62	-497.29	1,518.62	1,543.71	3.00	-0.01	-3.00
4,315.16	90.50	85.77	2,885.49	-496.23	1,533.75	1,558.76	3.00	-0.01	-3.00
Start 3194.79 hold at 4315.16 MD									
4,400.00	90.50	85.77	2,884.75	-489.97	1,618.35	1,642.89	0.00	0.00	0.00
4,500.00	90.50	85.77	2,883.87	-482.59	1,718.08	1,742.05	0.00	0.00	0.00
4,600.00	90.50	85.77	2,882.99	-475.20	1,817.80	1,841.22	0.00	0.00	0.00
4,700.00	90.50	85.77	2,882.12	-467.82	1,917.52	1,940.38	0.00	0.00	0.00
4,800.00	90.50	85.77	2,881.24	-460.44	2,017.25	2,039.55	0.00	0.00	0.00
4,900.00	90.50	85.77	2,880.37	-453.06	2,116.97	2,138.71	0.00	0.00	0.00
5,000.00	90.50	85.77	2,879.49	-445.68	2,216.69	2,237.88	0.00	0.00	0.00
5,100.00	90.50	85.77	2,878.61	-438.30	2,316.42	2,337.04	0.00	0.00	0.00
5,200.00	90.50	85.77	2,877.74	-430.91	2,416.14	2,436.21	0.00	0.00	0.00
5,300.00	90.50	85.77	2,876.86	-423.53	2,515.86	2,535.37	0.00	0.00	0.00
5,400.00	90.50	85.77	2,875.98	-416.15	2,615.59	2,634.54	0.00	0.00	0.00
5,500.00	90.50	85.77	2,875.11	-408.77	2,715.31	2,733.70	0.00	0.00	0.00
5,600.00	90.50	85.77	2,874.23	-401.39	2,815.03	2,832.87	0.00	0.00	0.00
5,700.00	90.50	85.77	2,873.36	-394.00	2,914.76	2,932.03	0.00	0.00	0.00
5,800.00	90.50	85.77	2,872.48	-386.62	3,014.48	3,031.20	0.00	0.00	0.00
5,900.00	90.50	85.77	2,871.60	-379.24	3,114.20	3,130.36	0.00	0.00	0.00
6,000.00	90.50	85.77	2,870.73	-371.86	3,213.93	3,229.53	0.00	0.00	0.00
6,100.00	90.50	85.77	2,869.85	-364.48	3,313.65	3,328.70	0.00	0.00	0.00
6,200.00	90.50	85.77	2,868.98	-357.10	3,413.37	3,427.86	0.00	0.00	0.00
6,300.00	90.50	85.77	2,868.10	-349.71	3,513.10	3,527.03	0.00	0.00	0.00
6,400.00	90.50	85.77	2,867.22	-342.33	3,612.82	3,626.19	0.00	0.00	0.00
6,500.00	90.50	85.77	2,866.35	-334.95	3,712.54	3,725.36	0.00	0.00	0.00
6,600.00	90.50	85.77	2,865.47	-327.57	3,812.27	3,824.52	0.00	0.00	0.00
6,700.00	90.50	85.77	2,864.60	-320.19	3,911.99	3,923.69	0.00	0.00	0.00
6,800.00	90.50	85.77	2,863.72	-312.81	4,011.71	4,022.85	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #3H
Company:	COG Operating LLC	TVD Reference:	GL @ 3380.00usft
Project:	Eddy County, New Mexico (NAD 27 NME)	MD Reference:	GL @ 3380.00usft
Site:	Patton 5 Fee	North Reference:	Grid
Well:	#3H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 10-03-13		

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)
6,900.00	90.50	85.77	2,862.84	-305.42	4,111.44	4,122.02	0.00	0.00	0.00
7,000.00	90.50	85.77	2,861.97	-298.04	4,211.16	4,221.18	0.00	0.00	0.00
7,100.00	90.50	85.77	2,861.09	-290.66	4,310.88	4,320.35	0.00	0.00	0.00
7,200.00	90.50	85.77	2,860.22	-283.28	4,410.61	4,419.51	0.00	0.00	0.00
7,300.00	90.50	85.77	2,859.34	-275.90	4,510.33	4,518.68	0.00	0.00	0.00
7,400.00	90.50	85.77	2,858.46	-268.52	4,610.05	4,617.84	0.00	0.00	0.00
7,500.00	90.50	85.77	2,857.59	-261.13	4,709.78	4,717.01	0.00	0.00	0.00
7,509.95	90.50	85.77	2,857.50	-260.40	4,719.70	4,726.88	0.00	0.00	0.00

TD at 7509.95 - PBHL-Patton 5 #3H

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
PBHL-Patton 5 #3H	- plan hits target center	0.00	360.00	2,857.50	-260.40	4,719.70	615,531.40	480,651.90	32° 41' 31.84352 N	104° 23' 46.40875 W
	- Point									
PP-Patton 5 #3H	- plan hits target center	0.00	0.00	2,887.66	-210.64	375.36	615,581.16	476,307.56	32° 41' 32.30756 N	104° 24' 37.24602 W
	- Point									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,374.70	2,374.70	0.00	0.00	KOP Start Build 11.00
3,197.43	2,895.55	-257.13	458.20	LP Start DLS 3.00 TFO -89.85
4,315.16	2,885.49	-496.23	1,533.75	Start 3194.79 hold at 4315.16 MD
7,509.95	2,857.50	-260.40	4,719.70	TD at 7509.95



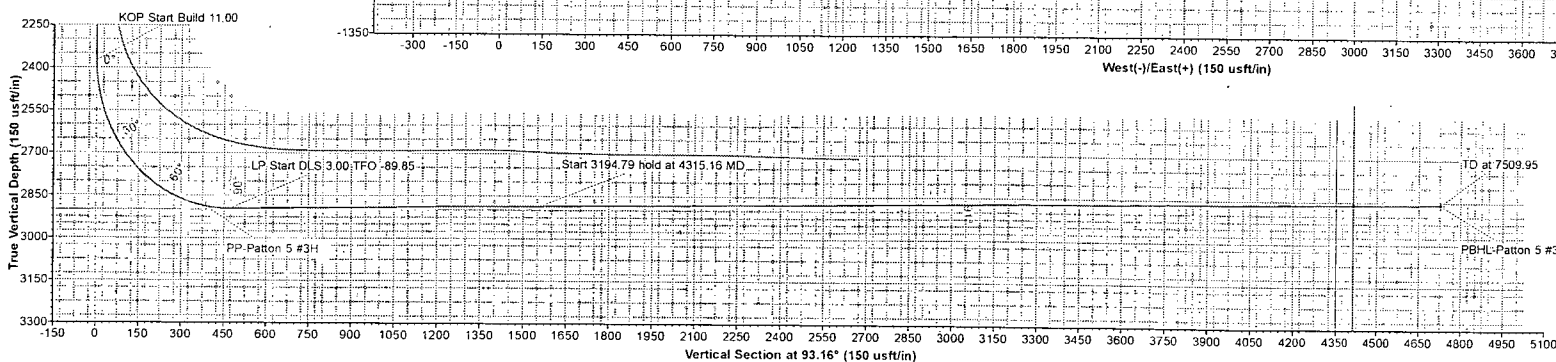
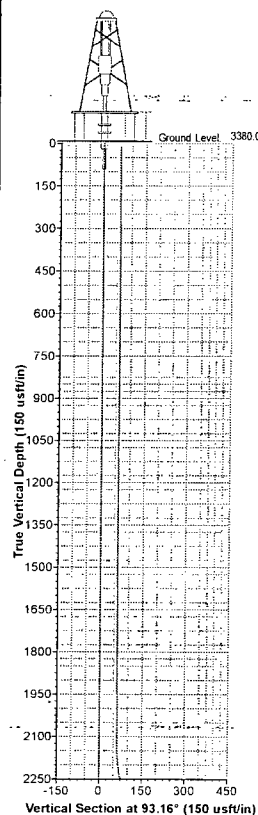
Project: Eddy County, New Mexico (NAD 27 NME)
Site: Patton 5 Fee
Well: #3H
Wellbore: WB1
Design: Plan #1 10-03-13



PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.04°
Magnetic North: 7.77°
Magnetic Field
Strength: 48575.4nT
Dip Angle: 60.42°
Date: 10/03/2013
Model: IGRF2010_14



WELL DETAILS											
	+N/-S	+E/-W	North	Ground Level	3380.00	Latitude	Longitude				
	0.00	0.00	615791.80	Easting	475932.20	32° 41' 34.38927 N	104° 24' 41.64023 W				

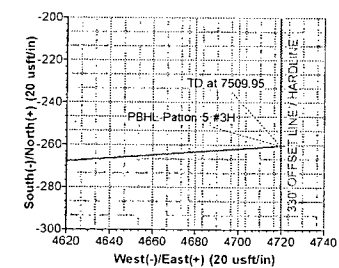
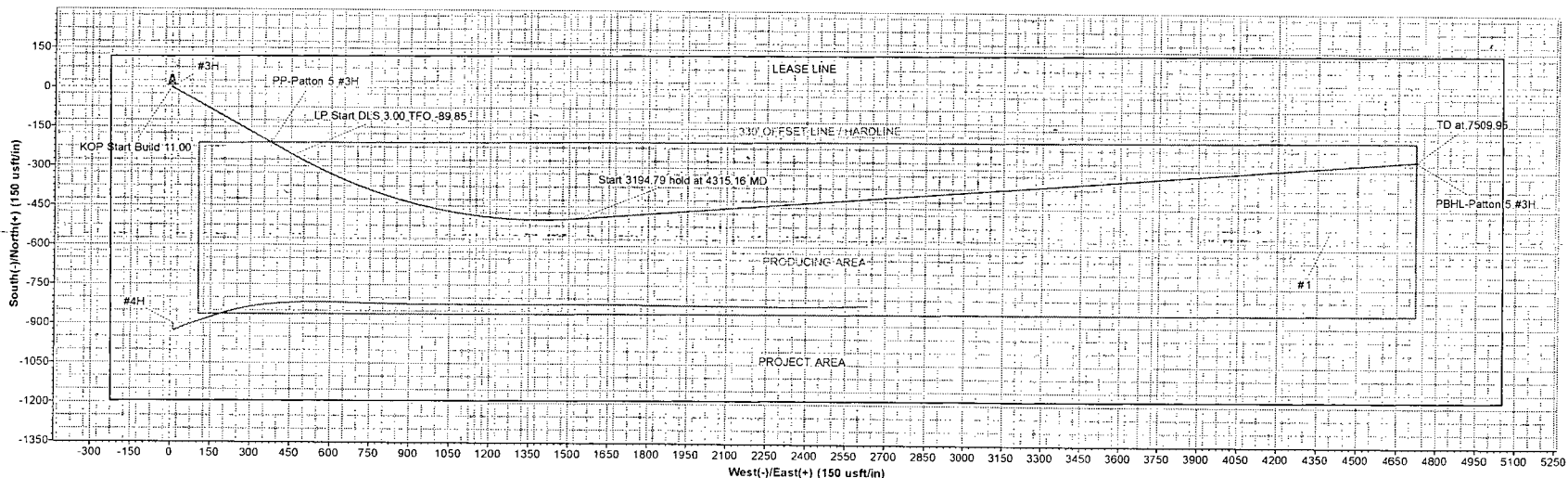
SECTION DETAILS											
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
2	2374.70	0.00	0.00	2374.70	0.00	0.00	0.00	0.00	0.00		KOP Start Build 11.00
3	3197.43	90.50	119.30	2895.55	257.13	459.20	11.00	119.30	471.67		LP Start DLS 3.00 TFO -89.85
4	4315.16	90.50	85.77	2885.49	496.23	1533.75	3.00	-89.85	1539.76		Start 3194.79 hold at 4315.16 MD
5	7509.85	90.50	85.77	2857.50	-260.40	4719.70	0.00	0.00	4726.88	PBHL-Patton 5 #3H	TD at 7509.85

DESIGN TARGET DETAILS											
Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude	Shape			
PBHL-Patton 5 #3H	2857.50	-260.40	4719.70	615531.40	480651.90	32° 41' 31.84351 N	104° 23' 46.40875 W	Point			
									- plan hits target center		
PP-Patton 5 #3H	2887.66	-210.64	375.36	615581.16	476307.56	32° 41' 32.30756 N	104° 24' 37.24602 W	Point			
									- plan hits target center		

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 #3H, Grid North
Latitude: 32° 41' 34.38927 N
Longitude: 104° 24' 41.64023 W
Grid East: 475932.20
Grid North: 615791.80
Scale Factor: 1.000
Geomagnetic Model: IGRF2010_14
Sample Date: 03-Oct-13
Magnetic Declination: 7.73°
Dip Angle from Horizontal: 60.42°
Magnetic Field Strength: 48575
To convert a Magnetic Direction to a Grid Direction, Add 7.77°
To convert a Magnetic Direction to a True Direction, Add 7.73° East
To convert a True Direction to a Grid Direction, Add 0.04°

FORMATION TOP DETAILS
No formation data is available

LEGEND
— #1, OH, Inc Surveys V0
— #4H, WB1, OH V0
— Plan #1 10-03-13





COG Operating LLC

Eddy County, New Mexico (NAD 27 NME)

Patton 5 Fee

#3H

WB1

Plan #1 10-03-13

Anticollision Report

03 October, 2013



PHOENIX
TECHNOLOGY SERVICES



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, New Mexico (NAD 27, NME)	TVD Reference:	GL @ 3380.00usft
Reference Site:	Patton 5 Fee	MD Reference:	GL @ 3380.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1 10-03-13	Offset TVD Reference:	Offset Datum

Reference	Plan #1 10-03-13		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	Stations	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.98 usft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey/Tool Program	Date 10/03/13	
From (usft)	To (usft)	Survey (Wellbore)
0.00	7,509.93	Plan #1 10-03-13 (WB1)
		Tool Name
		MWD
		Description
		MWD - Standard

Summary						
Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Nearburg Ivey Com						
#1 - OH - Inc Surveys	7,163.01	2,825.38	254.48	25.63	1.112	Level 2, CC, ES, SF
Patton 5 Fee						
#4H - WB1 - OH	4,249.93	3,911.12	377.10	297.41	4.732	CC
#4H - WB1 - OH	4,500.00	4,151.70	386.89	294.34	4.180	ES
#4H - WB1 - OH	5,400.00	5,059.07	438.31	297.48	3.112	SF

Nearburg Ivey Com - #1 - OH - Inc Surveys												Offset Site Error: 0.00 usft	
Survey Program: 116-INC												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)	Ellipses (usft)	Minimum Separation (usft)		Separation Factor
0.00	0.00	0.00	0.00	0.00	0.00	97.01	-540.30	4,392.50	4,425.74				
100.00	100.00	64.73	64.73	0.11	1.24	97.01	-540.18	4,392.50	4,425.59	4,424.24	1.35	3,279.804	
200.00	200.00	165.89	165.89	0.34	4.33	97.01	-540.20	4,392.50	4,425.59	4,420.92	4.67	947.306	
300.00	300.00	265.30	265.30	0.56	8.56	97.01	-540.10	4,392.50	4,425.58	4,416.46	9.12	485.412	
350.49	350.49	315.50	315.50	0.68	10.69	97.01	-540.08	4,392.50	4,425.58	4,414.22	11.36	389.517	
400.00	400.00	364.72	364.71	0.79	12.78	97.01	-540.10	4,392.50	4,425.58	4,412.02	13.56	326.313	
500.00	500.00	464.12	464.12	1.01	17.00	97.01	-540.20	4,392.50	4,425.59	4,407.59	18.01	245.765	
600.00	600.00	565.83	565.80	1.24	21.76	97.01	-540.21	4,392.50	4,425.59	4,402.60	22.99	192.486	
700.00	700.00	665.10	665.07	1.46	26.83	97.01	-540.13	4,392.50	4,425.58	4,397.29	28.29	156.418	
708.46	708.46	673.50	673.46	1.48	27.26	97.01	-540.13	4,392.50	4,425.58	4,396.84	28.74	153.977	
800.00	800.00	764.35	764.32	1.69	31.91	97.01	-540.18	4,392.50	4,425.59	4,392.00	33.59	131.736	
900.00	900.00	862.62	862.55	1.91	36.55	97.01	-540.47	4,392.50	4,425.63	4,387.17	38.46	115.068	
1,000.00	1,000.00	966.33	966.26	2.14	40.56	97.02	-540.58	4,392.50	4,425.64	4,382.95	42.69	103.667	
1,100.00	1,100.00	1,066.79	1,066.72	2.36	44.23	97.01	-540.16	4,392.50	4,425.59	4,379.00	46.59	94.987	
1,200.00	1,200.00	1,165.08	1,165.00	2.58	47.48	97.01	-540.01	4,392.50	4,425.57	4,375.50	50.07	88.392	
1,200.02	1,200.02	1,165.10	1,165.02	2.58	47.48	97.01	-540.01	4,392.50	4,425.57	4,375.50	50.07	88.391	
1,300.00	1,300.00	1,263.35	1,263.28	2.81	50.73	97.01	-540.16	4,392.50	4,425.59	4,372.05	53.54	82.655	
1,400.00	1,400.00	1,365.86	1,365.77	3.03	55.37	97.01	-540.18	4,392.50	4,425.59	4,367.18	58.41	75.772	
1,500.00	1,500.00	1,465.25	1,465.16	3.26	60.54	97.01	-540.10	4,392.50	4,425.58	4,361.78	63.80	69.364	
1,524.89	1,524.89	1,489.99	1,489.89	3.32	61.83	97.01	-540.09	4,392.50	4,425.58	4,360.44	65.14	67.935	
1,600.00	1,600.00	1,564.63	1,564.54	3.48	65.71	97.01	-540.12	4,392.50	4,425.58	4,356.39	69.20	63.956	

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	GL @ 3380.00usft
Reference Site:	Patton 5 Fee	MD Reference:	GL @ 3380.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	WB1	Database:	GCR DB
Reference Design:	Plan #1 10-03-13	Offset TVD Reference:	Offset Datum

Offset Design: Nearburg Ivey Com - #1 - OH- Inc Surveys													Offset Site Error: 0.00 usft	
Survey Program: 116-INC													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		
1,700.00	1,700.00	1,664.01	1,663.91	3.71	70.88	97.01	-540.27	4,392.50	4,425.60	4,351.01	74.59	59.331		
1,800.00	1,800.00	1,764.12	1,763.98	3.93	75.53	97.02	-540.56	4,392.50	4,425.64	4,346.18	79.46	55.697		
1,900.00	1,900.00	1,865.75	1,865.61	4.16	80.13	97.02	-540.60	4,392.50	4,425.64	4,341.35	84.29	52.507		
2,000.00	2,000.00	1,967.40	1,967.25	4.38	84.73	97.01	-540.33	4,392.50	4,425.61	4,336.49	89.12	49.661		
2,018.15	2,018.15	1,982.16	1,982.00	4.42	85.28	97.01	-540.32	4,392.50	4,425.61	4,335.90	89.70	49.336		
2,100.00	2,100.00	2,064.38	2,064.22	4.61	87.60	97.01	-540.46	4,392.50	4,425.62	4,333.41	92.21	47.994		
2,200.00	2,200.00	2,164.84	2,164.68	4.83	90.44	97.02	-540.56	4,392.50	4,425.64	4,330.36	95.28	46.451		
2,300.00	2,300.00	2,265.29	2,265.13	5.06	93.28	97.02	-540.58	4,392.50	4,425.64	4,327.30	98.34	45.004		
2,374.70	2,374.70	2,340.33	2,340.17	5.23	95.40	97.02	-540.54	4,392.50	4,425.63	4,325.01	100.63	43.980		
2,400.00	2,399.99	2,365.74	2,365.58	5.28	96.12	-22.31	-540.51	4,392.50	4,425.06	4,323.66	101.40	43.640		
2,450.00	2,449.74	2,415.71	2,415.55	5.37	97.53	-22.52	-540.45	4,392.50	4,420.60	4,317.69	102.91	42.957		
2,500.00	2,498.80	2,464.98	2,464.82	5.48	98.93	-22.96	-540.37	4,392.50	4,411.74	4,307.33	104.41	42.255		
2,550.00	2,546.71	2,514.02	2,513.85	5.59	100.40	-23.63	-540.23	4,392.50	4,398.57	4,292.58	106.00	41.497		
2,600.00	2,593.04	2,559.91	2,559.74	5.73	101.94	-24.56	-540.06	4,392.50	4,381.23	4,273.56	107.66	40.693		
2,650.00	2,637.36	2,603.81	2,603.64	5.90	103.41	-25.79	-539.93	4,392.50	4,359.88	4,250.57	109.31	39.884		
2,700.00	2,679.26	2,645.32	2,645.15	6.15	104.80	-27.38	-539.84	4,392.50	4,334.74	4,223.79	110.95	39.070		
2,750.00	2,718.36	2,684.07	2,683.90	6.47	106.10	-29.40	-539.79	4,392.50	4,306.04	4,193.47	112.57	38.252		
2,800.00	2,754.29	2,719.70	2,719.53	6.89	107.29	-31.96	-539.76	4,392.50	4,274.07	4,159.88	114.19	37.430		
2,850.00	2,786.73	2,751.89	2,751.71	7.43	108.37	-35.19	-539.75	4,392.50	4,239.13	4,123.32	115.81	36.606		
2,900.00	2,815.37	2,780.32	2,780.15	8.09	109.33	-39.27	-539.76	4,392.50	4,201.55	4,084.14	117.42	35.784		
2,950.00	2,839.96	2,804.75	2,804.58	8.86	110.14	-44.43	-539.78	4,392.50	4,161.70	4,042.69	119.01	34.970		
3,000.00	2,860.26	2,824.94	2,824.77	9.75	110.82	-50.95	-539.80	4,392.50	4,119.95	3,999.38	120.57	34.171		
3,050.00	2,876.10	2,840.71	2,840.53	10.72	111.35	-59.05	-539.82	4,392.50	4,076.71	3,954.63	122.07	33.396		
3,100.00	2,887.31	2,851.89	2,851.72	11.78	111.72	-68.81	-539.84	4,392.50	4,032.37	3,908.87	123.50	32.650		
3,150.00	2,893.81	2,858.40	2,858.23	12.89	111.94	-79.93	-539.85	4,392.50	3,987.37	3,862.54	124.83	31.942		
3,197.43	2,895.55	2,860.18	2,860.00	13.98	112.00	-91.04	-539.86	4,392.50	3,944.45	3,818.46	125.98	31.309		
3,200.00	2,895.53	2,860.16	2,859.98	14.04	112.00	-91.05	-539.86	4,392.50	3,942.12	3,816.08	126.04	31.276		
3,300.00	2,894.65	2,859.37	2,859.20	16.43	111.98	-91.19	-539.86	4,392.50	3,850.72	3,722.32	128.41	29.988		
3,400.00	2,893.76	2,858.56	2,858.39	18.92	111.95	-91.37	-539.85	4,392.50	3,757.70	3,626.83	130.87	28.714		
3,500.00	2,892.86	2,857.73	2,857.56	21.46	111.92	-91.60	-539.85	4,392.50	3,663.17	3,529.79	133.38	27.464		
3,600.00	2,891.95	2,856.89	2,856.72	24.05	111.89	-91.90	-539.85	4,392.50	3,567.31	3,431.37	135.94	26.242		
3,700.00	2,891.04	2,856.03	2,855.86	26.65	111.86	-92.32	-539.85	4,392.50	3,470.26	3,331.75	138.51	25.054		
3,800.00	2,890.13	2,855.16	2,854.99	29.27	111.83	-92.97	-539.85	4,392.50	3,372.21	3,231.11	141.10	23.900		
3,900.00	2,889.21	2,854.28	2,854.11	31.88	111.80	-94.11	-539.85	4,392.50	3,273.34	3,129.66	143.68	22.782		
4,000.00	2,888.30	2,853.39	2,853.22	34.48	111.77	-96.72	-539.84	4,392.50	3,173.87	3,027.61	146.26	21.701		
4,100.00	2,887.40	2,852.50	2,852.33	37.06	111.74	-109.16	-539.84	4,392.50	3,074.02	2,925.21	148.81	20.657		
4,200.00	2,886.51	2,851.61	2,851.44	39.62	111.72	108.48	-539.84	4,392.50	2,974.03	2,822.69	151.34	19.652		
4,300.00	2,885.62	2,850.72	2,850.55	42.15	111.69	96.17	-539.84	4,392.50	2,874.19	2,720.36	153.83	18.684		
4,315.16	2,885.49	2,850.56	2,850.41	42.53	111.68	95.58	-539.84	4,392.50	2,859.08	2,704.87	154.21	18.540		
4,400.00	2,884.75	2,849.83	2,849.66	44.66	111.66	95.41	-539.84	4,392.50	2,774.60	2,618.28	156.31	17.750		
4,500.00	2,883.87	2,848.94	2,848.77	47.19	111.63	95.21	-539.84	4,392.50	2,675.04	2,516.22	158.82	16.844		
4,600.00	2,882.99	2,848.05	2,847.88	49.75	111.60	95.02	-539.84	4,392.50	2,575.51	2,414.17	161.34	15.963		
4,700.00	2,882.12	2,847.17	2,846.99	52.32	111.57	94.82	-539.83	4,392.50	2,476.03	2,312.14	163.89	15.108		
4,800.00	2,881.24	2,846.28	2,846.11	54.91	111.54	94.62	-539.83	4,392.50	2,376.58	2,210.14	166.44	14.279		
4,900.00	2,880.37	2,845.39	2,845.22	57.51	111.51	94.42	-539.83	4,392.50	2,277.19	2,108.17	169.02	13.473		
5,000.00	2,879.49	2,844.50	2,844.33	60.12	111.48	94.22	-539.83	4,392.50	2,177.84	2,006.24	171.60	12.691		
5,100.00	2,878.61	2,843.62	2,843.45	62.75	111.45	94.02	-539.83	4,392.50	2,078.57	1,904.37	174.20	11.932		
5,200.00	2,877.74	2,842.73	2,842.56	65.38	111.42	93.83	-539.83	4,392.50	1,979.36	1,802.56	176.80	11.195		
5,300.00	2,876.86	2,841.85	2,841.67	68.02	111.39	93.63	-539.82	4,392.50	1,880.24	1,700.83	179.41	10.480		
5,400.00	2,875.98	2,840.96	2,840.79	70.67	111.36	93.43	-539.82	4,392.50	1,781.21	1,599.18	182.03	9.785		
5,500.00	2,875.11	2,840.07	2,839.90	73.33	111.33	93.23	-539.82	4,392.50	1,682.30	1,497.65	184.66	9.110		
5,600.00	2,874.23	2,839.19	2,839.02	75.99	111.30	93.03	-539.82	4,392.50	1,583.53	1,396.24	187.29	8.455		

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	GL @ 3380.00usft
Reference Site:	Patton 5 Fee	MD Reference:	GL @ 3380.00usft
Site Error:	0.00'usft	North Reference:	Grid
Reference Well:	#3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00'usft	Output errors are at	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1 10-03-13	Offset TVD Reference:	Offset Datum

Offset Design Nearburg Ivey Com - #1 - OH - Inc Surveys													Offset Site Error:	0.00 usft
Survey Program: 116-INC													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)				
5,700.00	2,873.36	2,838.30	2,838.13	78.66	111.27	92.83	-539.82	4,392.50	1,484.92	1,295.00	189.92	7.818		
5,800.00	2,872.48	2,837.42	2,837.25	81.33	111.24	92.63	-539.82	4,392.50	1,386.51	1,193.95	192.57	7.200		
5,900.00	2,871.60	2,836.53	2,836.36	84.00	111.21	92.43	-539.82	4,392.50	1,288.34	1,093.13	195.21	6.600		
6,000.00	2,870.73	2,835.65	2,835.48	86.68	111.18	92.24	-539.82	4,392.50	1,190.48	992.62	197.86	6.017		
6,100.00	2,869.85	2,834.76	2,834.59	89.36	111.15	92.04	-539.81	4,392.50	1,093.01	892.50	200.51	5.451		
6,200.00	2,868.98	2,833.88	2,833.71	92.05	111.12	91.84	-539.81	4,392.50	996.03	792.86	203.17	4.903		
6,300.00	2,868.10	2,833.00	2,832.82	94.73	111.09	91.64	-539.81	4,392.50	899.72	693.89	205.83	4.371		
6,400.00	2,867.22	2,832.11	2,831.94	97.42	111.06	91.44	-539.81	4,392.50	804.30	595.82	208.49	3.858		
6,500.00	2,866.35	2,831.23	2,831.06	100.12	111.03	91.24	-539.81	4,392.50	710.15	499.00	211.15	3.363		
6,600.00	2,865.47	2,830.34	2,830.17	102.81	111.00	91.04	-539.81	4,392.50	617.83	404.02	213.82	2.890		
6,700.00	2,864.60	2,829.46	2,829.29	105.51	110.97	90.84	-539.81	4,392.50	528.32	311.84	216.48	2.440		
6,800.00	2,863.72	2,828.58	2,828.41	108.21	110.94	90.65	-539.81	4,392.50	443.31	224.16	219.15	2.023		
6,900.00	2,862.84	2,827.70	2,827.52	110.91	110.91	90.45	-539.80	4,392.50	365.97	144.14	221.82	1.650		
7,000.00	2,861.97	2,826.81	2,826.64	113.61	110.88	90.25	-539.80	4,392.50	302.21	77.72	224.50	1.346	Level 3	
7,100.00	2,861.09	2,825.93	2,825.76	116.32	110.85	90.05	-539.80	4,392.50	262.17	35.00	227.17	1.154	Level 2	
7,163.01	2,860.54	2,825.36	2,825.20	118.02	110.84	89.92	-539.80	4,392.50	254.48	25.63	228.86	1.112	Level 2, CC, ES, SF	
7,200.00	2,860.22	2,825.05	2,824.88	119.02	110.83	89.85	-539.80	4,392.50	257.16	27.31	229.85	1.119	Level 2	
7,300.00	2,859.34	2,824.17	2,824.00	121.73	110.80	89.65	-539.80	4,392.50	289.01	56.49	232.52	1.243	Level 2	
7,400.00	2,858.46	2,823.29	2,823.12	124.44	110.77	89.45	-539.80	4,392.50	347.74	112.54	235.20	1.478	Level 3	
7,509.95	2,857.50	2,822.32	2,822.15	127.42	110.73	89.24	-539.80	4,392.50	430.26	192.11	238.15	1.807		

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



Phoenix Technology Services
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	GL @ 3380.00usft
Reference Site:	Patton 5 Fee	MD Reference:	GL @ 3380.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan #1 10-03-13	Offset TVD Reference:	Offset Datum

Offset Design Patton 5 Fee - #4H - WB1 - OH														Offset Site Error:	0.00 usft
Survey Program: 100-MWD														Offset Well Error:	0.00 usft
Reference	Vertical	Offset	Semi Major Axis	Reference	Offset	Highside	Offset Wellbore Centre	Distance	Between	Between	Minimum	Separation	Warning		
Measured Depth (usft)	Depth (usft)	Depth (usft)	Reference (usft)	Offset (usft)	Toolface (°)	N/S (usft)	N/S (usft)	Centres (usft)	Centres (usft)	Ellipses (usft)	Separation (usft)	Factor			
0.00	0.00	0.00	0.00	0.00	0.00	179.36	-899.60	10.00	899.74						
100.00	100.00	80.59	80.59	0.11	0.09	179.37	-899.93	9.84	900.02	899.81	0.20	4,419.157			
200.00	200.00	179.95	179.94	0.34	0.28	179.37	-900.88	9.86	900.97	900.35	0.62	1,457.083			
300.00	300.00	274.16	274.14	0.56	0.48	179.34	-901.94	10.42	902.10	901.06	1.04	866.845			
400.00	400.00	368.07	368.04	0.79	0.68	179.35	-903.72	10.26	904.00	902.53	1.47	616.161			
500.00	500.00	466.30	466.24	1.01	0.89	179.34	-906.05	10.50	906.37	904.47	1.90	476.622			
600.00	600.00	569.21	569.12	1.24	1.10	179.32	-908.41	10.72	908.67	906.33	2.34	388.606			
700.00	700.00	672.05	671.94	1.46	1.32	179.33	-910.36	10.64	910.56	907.79	2.78	327.874			
800.00	800.00	775.15	775.03	1.69	1.54	179.35	-912.02	10.31	912.17	908.95	3.22	283.167			
900.00	900.00	875.25	875.12	1.91	1.75	179.38	-913.40	9.92	913.54	909.88	3.66	249.779			
1,000.00	1,000.00	975.01	974.87	2.14	1.96	179.40	-914.83	9.61	914.97	910.88	4.09	223.669			
1,100.00	1,100.00	1,077.14	1,076.99	2.36	2.17	179.41	-916.21	9.49	916.32	911.79	4.53	202.207			
1,200.00	1,200.00	1,175.69	1,175.54	2.58	2.38	179.40	-917.41	9.54	917.55	912.58	4.96	184.829			
1,300.00	1,300.00	1,274.88	1,274.71	2.81	2.59	179.40	-918.83	9.62	918.98	913.58	5.40	170.233			
1,400.00	1,400.00	1,374.53	1,374.35	3.03	2.80	179.38	-920.28	9.89	920.44	914.61	5.83	157.795			
1,500.00	1,500.00	1,477.30	1,477.11	3.26	3.01	179.37	-921.70	10.08	921.82	915.54	6.27	146.938			
1,600.00	1,600.00	1,577.83	1,577.63	3.48	3.23	179.36	-922.81	10.28	922.93	916.22	6.71	137.562			
1,700.00	1,700.00	1,677.82	1,677.62	3.71	3.44	179.35	-923.94	10.51	924.06	916.91	7.14	129.349			
1,800.00	1,800.00	1,780.03	1,779.82	3.93	3.65	179.32	-924.98	10.92	925.09	917.50	7.58	121.983			
1,900.00	1,900.00	1,882.10	1,881.88	4.16	3.87	179.32	-925.76	11.06	925.85	917.83	8.02	115.392			
2,000.00	2,000.00	1,982.28	1,982.07	4.38	4.08	179.31	-926.40	11.23	926.48	918.02	8.46	109.519			
2,100.00	2,100.00	2,082.00	2,081.78	4.61	4.29	179.29	-927.05	11.42	927.15	918.25	8.89	104.257			
2,200.00	2,200.00	2,321.31	2,316.39	4.83	4.85	177.14	-912.58	45.65	922.70	913.02	9.68	95.278			
2,300.00	2,300.00	2,438.78	2,419.73	5.06	5.28	173.77	-893.52	97.54	908.43	898.10	10.34	87.892			
2,374.70	2,374.70	2,532.56	2,491.52	5.23	5.96	169.97	-874.38	154.57	897.24	886.05	11.18	80.218			
2,400.00	2,399.99	2,557.31	2,508.69	5.28	6.21	49.89	-868.76	171.49	893.32	881.84	11.48	77.796			
2,450.00	2,449.74	2,586.81	2,528.04	5.37	6.53	49.31	-861.91	192.67	884.19	872.28	11.91	74.246			
2,500.00	2,498.80	2,611.50	2,543.35	5.48	6.84	49.07	-856.39	211.24	873.70	861.38	12.32	70.893			
2,550.00	2,546.71	2,636.35	2,557.94	5.59	7.18	48.97	-851.06	230.63	861.85	849.08	12.78	67.458			
2,600.00	2,593.04	2,661.00	2,571.51	5.73	7.54	49.00	-845.96	250.56	848.60	835.34	13.27	63.949			
2,650.00	2,637.36	2,682.36	2,582.52	5.90	7.89	49.32	-841.76	268.38	834.05	820.25	13.80	60.460			
2,700.00	2,679.26	2,701.76	2,591.93	6.15	8.22	49.87	-838.22	284.96	818.31	803.94	14.37	56.962			
2,750.00	2,718.36	2,724.00	2,602.04	6.47	8.61	50.45	-834.62	304.44	801.52	786.43	15.08	53.140			
2,800.00	2,754.29	2,739.72	2,608.73	6.89	8.91	51.46	-832.37	318.48	783.64	767.84	15.81	49.580			
2,850.00	2,786.73	2,755.00	2,614.85	7.43	9.20	52.64	-830.39	332.35	764.77	748.14	16.63	45.977			
2,900.00	2,815.37	2,787.00	2,626.68	8.09	9.84	53.41	-826.84	361.86	744.78	726.84	17.93	41.530			
2,950.00	2,839.96	2,805.79	2,633.03	8.86	10.24	54.88	-825.12	379.46	723.69	704.59	19.10	37.884			
3,000.00	2,860.26	2,830.41	2,640.56	9.75	10.77	56.38	-823.18	402.82	701.57	681.06	20.51	34.198			
3,050.00	2,876.10	2,857.79	2,647.96	10.72	11.38	58.08	-821.36	429.12	678.35	656.25	22.10	30.696			
3,100.00	2,887.31	2,887.86	2,654.82	11.78	12.06	60.01	-819.46	458.33	653.62	630.08	23.84	27.429			
3,150.00	2,893.81	2,911.00	2,659.38	12.89	12.60	62.42	-818.17	480.98	628.42	602.92	25.49	24.651			
3,197.43	2,895.55	2,942.00	2,664.61	13.98	13.34	64.94	-817.00	511.51	603.52	576.20	27.32	22.088			
3,200.00	2,895.53	2,942.00	2,664.61	14.04	13.34	64.96	-817.00	511.51	602.15	574.77	27.38	21.990			
3,300.00	2,894.65	2,997.68	2,671.60	16.43	14.71	65.15	-816.52	566.74	553.72	522.58	31.14	17.782			
3,400.00	2,893.76	3,067.56	2,678.51	18.92	16.45	64.89	-818.05	636.42	514.09	478.73	35.36	14.537			
3,500.00	2,892.86	3,154.77	2,678.52	21.46	18.67	64.04	-820.35	723.57	481.32	441.19	40.13	11.995			
3,600.00	2,891.95	3,251.69	2,679.01	24.05	21.18	62.89	-822.47	820.47	453.64	408.42	45.22	10.032			
3,700.00	2,891.04	3,351.07	2,678.98	26.65	23.78	61.70	-823.74	919.83	430.20	379.77	50.43	8.530			
3,800.00	2,890.13	3,450.71	2,678.90	29.27	26.42	60.64	-824.44	1,019.48	411.03	355.34	55.69	7.381			
3,900.00	2,889.21	3,549.82	2,678.39	31.88	29.07	59.68	-824.41	1,118.58	396.11	335.16	60.95	6.499			
4,000.00	2,888.30	3,647.30	2,677.17	34.48	31.69	58.89	-824.24	1,216.05	386.06	319.89	66.17	5.834			
4,100.00	2,887.40	3,750.37	2,675.62	37.06	34.47	58.34	-824.09	1,319.11	380.71	309.18	71.54	5.322			

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



Phoenix Technology Services
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Reference Site: Patton 5 Fee
Site Error: 0.00 usft
Reference Well: #3H
Well Error: 0.00 usft
Reference Wellbore: WB1
Reference Design: Plan #1 10-03-13

Local Co-ordinate Reference: Well #3H
TVD Reference: GL @ 3380.00usft
MD Reference: GL @ 3380.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: GCR DB
Offset TVD Reference: Offset Datum

Offset Design Patton 5-Fee - #4H - WB1 - OH														Offset Site Error: 0.00 usft
Survey Program: 100-MWD														Offset Well Error: 0.00 usft
Reference		Offset		Semi Major Axis		Distance		Minimum		Separation		Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N-S (usft)	+E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Factor		
4,200.00	2,886.51	3,860.97	2,678.06	39.62	37.46	58.67	-823.77	1,429.68	377.78	300.70	77.08	4.901		
4,249.93	2,886.06	3,911.12	2,680.38	40.88	38.82	59.09	-823.31	1,479.77	377.10	297.41	79.70	4.732 CC		
4,300.00	2,885.62	3,958.46	2,682.36	42.15	40.10	59.56	-823.05	1,527.06	377.86	295.61	82.25	4.594		
4,315.16	2,885.49	3,974.00	2,682.94	42.53	40.52	59.72	-823.01	1,542.59	378.38	295.33	83.05	4.556		
4,400.00	2,884.75	4,055.81	2,685.63	44.66	42.75	60.61	-822.87	1,624.36	381.94	294.53	87.41	4.370		
4,500.00	2,883.87	4,151.70	2,687.98	47.19	45.36	61.54	-822.97	1,720.22	386.89	294.34	92.55	4.180 ES		
4,600.00	2,882.99	4,247.49	2,689.40	49.75	47.98	62.37	-823.68	1,815.99	392.96	295.23	97.72	4.021		
4,700.00	2,882.12	4,344.73	2,689.72	52.32	50.63	63.07	-824.70	1,913.23	399.90	296.95	102.95	3.884		
4,800.00	2,881.24	4,444.72	2,688.93	54.91	53.36	63.60	-825.48	2,013.21	407.16	298.90	108.27	3.761		
4,900.00	2,880.37	4,547.05	2,689.40	57.51	56.16	64.29	-826.42	2,115.53	414.04	300.37	113.67	3.643		
5,000.00	2,879.49	4,648.21	2,690.97	60.12	58.92	65.10	-827.52	2,216.68	420.67	301.62	119.05	3.534		
5,100.00	2,878.61	4,754.51	2,693.64	62.75	61.83	65.99	-827.66	2,322.95	426.11	301.53	124.58	3.420		
5,200.00	2,877.74	4,857.51	2,696.38	65.38	64.65	66.80	-826.79	2,425.90	430.70	300.67	130.03	3.312		
5,300.00	2,876.86	4,959.45	2,698.65	68.02	67.43	67.47	-824.82	2,527.80	434.51	299.05	135.46	3.208		
5,400.00	2,875.98	5,059.07	2,700.29	70.67	70.16	68.03	-822.57	2,627.38	438.31	297.48	140.83	3.112 SF		
5,500.00	2,875.11	5,064.00	2,700.36	73.33	70.29	68.06	-822.46	2,632.30	452.24	308.61	143.62	3.149		
5,600.00	2,874.23	5,064.00	2,700.36	75.99	70.29	68.06	-822.46	2,632.30	486.72	340.44	146.28	3.327		
5,700.00	2,873.36	5,064.00	2,700.36	78.66	70.29	68.06	-822.46	2,632.30	537.84	388.89	148.95	3.611		
5,800.00	2,872.48	5,064.00	2,700.36	81.33	70.29	68.06	-822.46	2,632.30	601.37	449.75	151.62	3.966		
5,900.00	2,871.60	5,064.00	2,700.36	84.00	70.29	68.06	-822.46	2,632.30	673.82	519.52	154.29	4.367		
6,000.00	2,870.73	5,064.00	2,700.36	86.68	70.29	68.06	-822.46	2,632.30	752.60	595.63	156.97	4.794		
6,100.00	2,869.85	5,064.00	2,700.36	89.36	70.29	68.06	-822.46	2,632.30	835.93	676.28	159.65	5.236		
6,200.00	2,868.98	5,064.00	2,700.36	92.05	70.29	68.06	-822.46	2,632.30	922.58	760.24	162.34	5.683		
6,300.00	2,868.10	5,064.00	2,700.36	94.73	70.29	68.06	-822.46	2,632.30	1,011.70	846.67	165.03	6.130		
6,400.00	2,867.22	5,064.00	2,700.36	97.42	70.29	68.06	-822.46	2,632.30	1,102.68	934.97	167.72	6.575		
6,500.00	2,866.35	5,064.00	2,700.36	100.12	70.29	68.06	-822.46	2,632.30	1,195.11	1,024.70	170.41	7.013		
6,600.00	2,865.47	5,064.00	2,700.36	102.81	70.29	68.06	-822.46	2,632.30	1,288.67	1,115.56	173.11	7.444		
6,700.00	2,864.60	5,064.00	2,700.36	105.51	70.29	68.06	-822.46	2,632.30	1,383.13	1,207.33	175.80	7.867		
6,800.00	2,863.72	5,064.00	2,700.36	108.21	70.29	68.06	-822.46	2,632.30	1,478.32	1,299.81	178.50	8.282		
6,900.00	2,862.84	5,064.00	2,700.36	110.91	70.29	68.06	-822.46	2,632.30	1,574.10	1,392.90	181.20	8.687		
7,000.00	2,861.97	5,064.00	2,700.36	113.61	70.29	68.06	-822.46	2,632.30	1,670.38	1,486.48	183.91	9.083		
7,100.00	2,861.09	5,064.00	2,700.36	116.32	70.29	68.06	-822.46	2,632.30	1,767.08	1,580.47	186.61	9.469		
7,200.00	2,860.22	5,064.00	2,700.36	119.02	70.29	68.06	-822.46	2,632.30	1,864.12	1,674.80	189.32	9.847		
7,300.00	2,859.34	5,064.00	2,700.36	121.73	70.29	68.06	-822.46	2,632.30	1,961.46	1,769.43	192.02	10.215		
7,400.00	2,858.46	5,064.00	2,700.36	124.44	70.29	68.06	-822.46	2,632.30	2,059.05	1,864.32	194.73	10.574		
7,509.95	2,857.50	5,064.00	2,700.36	127.42	70.29	68.06	-822.46	2,632.30	2,166.61	1,968.90	197.71	10.959		

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



Phoenix Technology Services
Anticollision Report



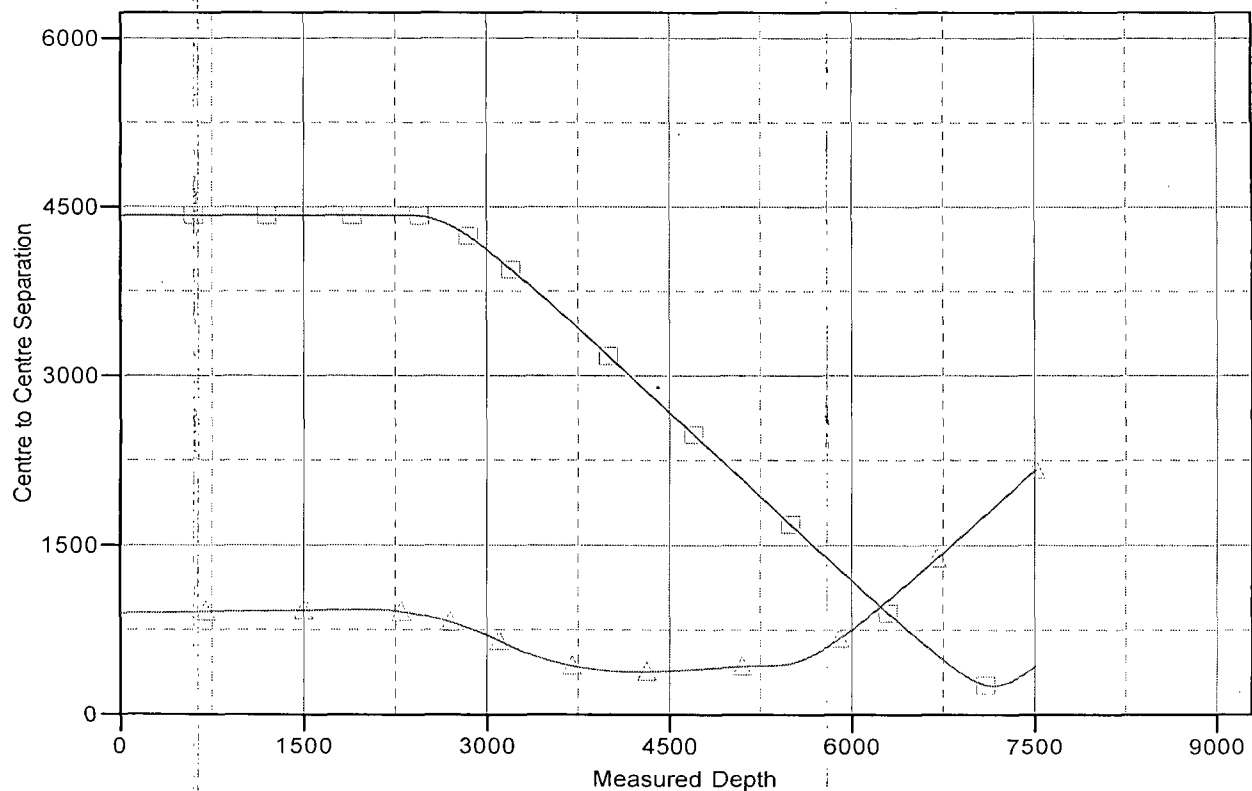
Company: COG Operating LLC
Project: Eddy County, New Mexico (NAD 27 NME)
Reference Site: Patton 5 Fee
Site Error: 0.00 usft
Reference Well: #3H
Well Error: 0.00 usft
Reference Wellbore: WB1
Reference Design: Plan #1 10-03-13

Local Co-ordinate Reference:
TVD Reference: Well #3H
MD Reference: GL @ 3380.00usft
North Reference: GL @ 3380.00usft
Survey Calculation Method: Grid
Output errors are at: Minimum Curvature
Database: 2.00 sigma
Offset TVD Reference: GCR DB
Offset Datum

Reference Depths are relative to GL @ 3380.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #3H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Ladder Plot



LEGEND

■ #1, OH, Inc Surveys V0 ▲ #4H, WB1, OH V0



Phoenix Technology Services
Anticollision Report

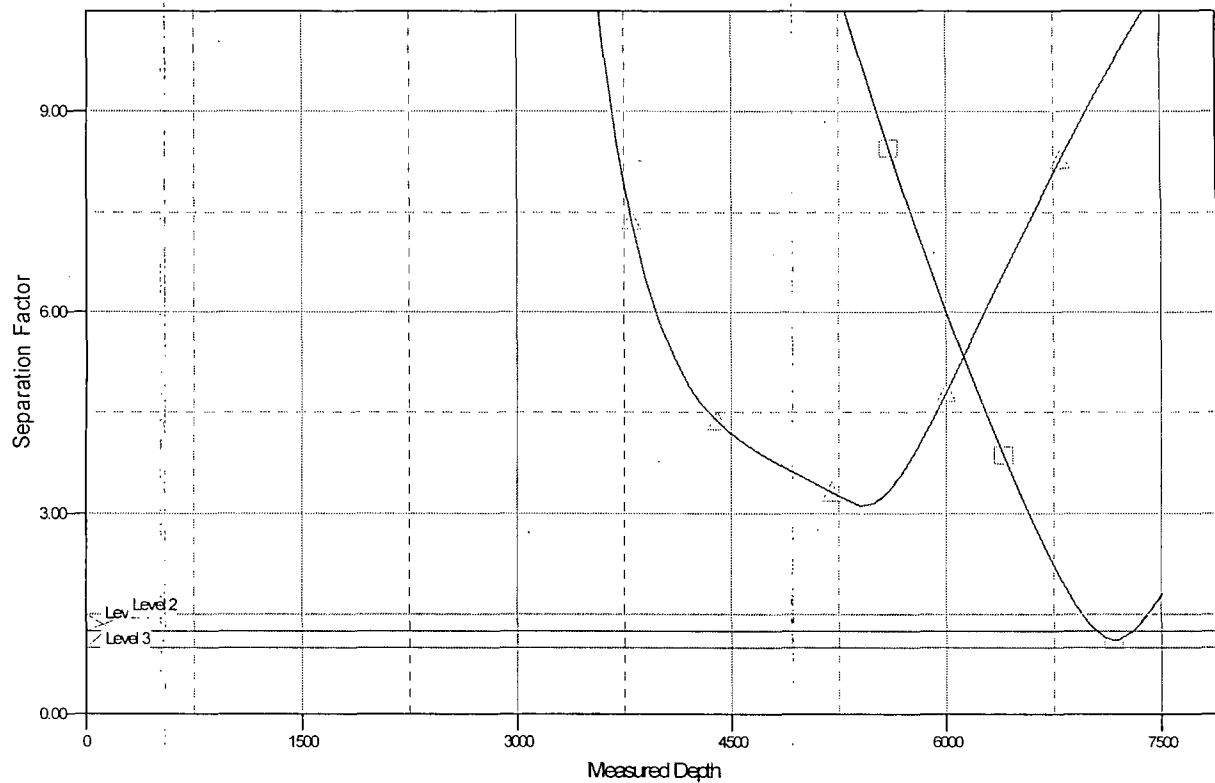


Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #3H
Project:	Eddy County, New Mexico (NAD 27 NME)	TVD Reference:	GL @ 3380.00usft
Reference Site:	Patton 5 Fee	MD Reference:	GL @ 3380.00usft
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#3H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	WB1	Database:	GCR DB
Reference Design:	Plan.#1 10-03-13	Offset TVD Reference:	Offset Datum

Reference Depths are relative to GL @ 3380.00usft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #3H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.04°

Separation Factor Plot



LEGEND

□ #1, OH, Inc Surveys V0 ▲ #4H, WB1, OH V0