

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 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
NM OIL CONSERVATION
ARTESIA DISTRICT
JUL 03 2014
AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

RECEIVED

API Number 30-015-42477	Pool Code 3250	Pool Name Atoka; Glorieta Yeso
Property Code	Property Name PILUM 15 FEE	Well Number 1H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3352'

Surface Location

UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
D	22	18-S	26-E		400	NORTH	330	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
D	15	18-S	26-E		330	NORTH	330	WEST	EDDY
Dedicated Acres 160	Joint or Infill	Consolidation Code	Order No.						

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

SECTION 15 SECTION 22 Estimated Completed Interval: 330 FSL 330 FWL	GEODETIC COORDINATES NAD 27 NME SURFACE LOCATION Y=632743.7 N X=486623.0 E LAT.=32.739500° N LONG.=104.376838° W BOTTOM HOLE LOCATION Y=638100.8 N X=486654.4 E CORNER COORDINATES TABLE <table> <tr><td>A - Y=638431.0 N, X=486326.5 E</td></tr> <tr><td>B - Y=638429.7 N, X=487648.7 E</td></tr> <tr><td>C - Y=633136.9 N, X=487629.2 E</td></tr> <tr><td>D - Y=633146.2 N, X=486293.9 E</td></tr> <tr><td>E - Y=631817.6 N, X=486291.2 E</td></tr> <tr><td>F - Y=631809.6 N, X=487623.5 E</td></tr> </table> SCALE: 1"=2000'	A - Y=638431.0 N, X=486326.5 E	B - Y=638429.7 N, X=487648.7 E	C - Y=633136.9 N, X=487629.2 E	D - Y=633146.2 N, X=486293.9 E	E - Y=631817.6 N, X=486291.2 E	F - Y=631809.6 N, X=487623.5 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. 6-16-14 Signature Date Kelly J. Holly Printed Name kholly@concho.com E-mail Address SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. NOVEMBER 4, 2013 Date of Survey Signature & Seal of Professional Surveyor: Certificate Number: 3239 Ronald J. Eidson 12641 Ronald J. Eidson 3239 05/14/2014 BKL/JACK REL. W.O.: 13111235 JWSC W.O.: 14.13.0532
A - Y=638431.0 N, X=486326.5 E								
B - Y=638429.7 N, X=487648.7 E								
C - Y=633136.9 N, X=487629.2 E								
D - Y=633146.2 N, X=486293.9 E								
E - Y=631817.6 N, X=486291.2 E								
F - Y=631809.6 N, X=487623.5 E								



COG Operating LLC

Eddy County, NM (NAD27 NME)

Pilum 15 Fee

#1H

Wellbore #1

Plan: Plan #1 05-23-14

Surface: 400' FNL, 300' FWL, Sec 22, T18S, R26E, Unit D

PP: 330' FSL, 330' FWL, Sec 15, T18S, R26E, Unit M

BHL: 330' FNL, 330' FWL, Sec 15, T18S, R26E, Unit D

Standard Planning Report

11 June, 2014





Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3370.00usft
Project:	Eddy County NM (NAD27 NME)	MD Reference:	KB @ 3370.00usft
Site:	Pilum 15 Fee	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1.05-23-14		

Project:	Eddy 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:	Pilum 15 Fee		
Site Position:		Northing:	632,879.50 usft
From:	Map	Easting:	487,958.90 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 44' 23.54811 N
		Longitude:	104° 22' 20.97828 W
		Grid Convergence:	-0.02 °

Well:	#1H		
Well Position	+N-S	-135.80 usft	Northing:
	+E-W	-1,335.90 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	Ground Level:

Wellbore:	Wellbore #1		
Magnetics	Model Name	Sample Date	Declination
			(°)
	IGRF2010_14	05/23/14	7.64
			Dip Angle
			(°)
			Field Strength
			(nT)

Design:	Plan #1.05-23-14		
Audit Notes:			
Version:	Phase:	PROTOTYPE	Tie On Depth:
			0.00
Vertical Section:	Depth From (TVD)	+N/S	+E/W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			0.34

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	
2,209.75	0.00	0.00	2,209.75	0.00	0.00	0.00	0.00	0.00	0.00	
3,024.30	89.60	0.34	2,730.61	517.23	3.04	11.00	11.00	0.04	0.34	
7,864.25	89.60	0.34	2,764.40	5,356.98	31.47	0.00	0.00	0.00	0.00	BHL-Pilum 15 Fee #1



Phoenix Technology Services
Planning Report



Database:	GCR DB	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3370.00usft
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3370.00usft
Site:	Pilum 15 Fee	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 05-23-14		

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
2,209.75	0.00	0.00	2,209.75	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Start 11°/100' Build									
2,300.00	9.93	0.34	2,299.55	7.80	0.05	7.80	11.00	11.00	0.00
2,400.00	20.93	0.34	2,395.80	34.36	0.20	34.36	11.00	11.00	0.00
2,500.00	31.93	0.34	2,485.21	78.80	0.46	78.80	11.00	11.00	0.00
2,600.00	42.93	0.34	2,564.50	139.48	0.82	139.48	11.00	11.00	0.00
2,700.00	53.93	0.34	2,630.76	214.17	1.26	214.18	11.00	11.00	0.00
2,800.00	64.93	0.34	2,681.54	300.14	1.76	300.14	11.00	11.00	0.00
2,900.00	75.93	0.34	2,714.99	394.21	2.32	394.22	11.00	11.00	0.00
2,906.19	76.61	0.34	2,716.46	400.22	2.35	400.23	11.00	11.00	0.00
Sec. Crossing, 2906' MD									
3,000.00	86.93	0.34	2,729.87	492.94	2.90	492.95	11.00	11.00	0.00
3,024.30	89.60	0.34	2,730.61	517.23	3.04	517.23	11.00	11.00	0.00
LP, 89.6° Inc, 0.34° Azim - Start hold									
3,100.00	89.60	0.34	2,731.14	592.92	3.48	592.93	0.00	0.00	0.00
3,200.00	89.60	0.34	2,731.84	692.92	4.07	692.93	0.00	0.00	0.00
3,237.08	89.60	0.34	2,732.10	730.00	4.29	730.01	0.00	0.00	0.00
PP-Pilum 15 Fee #1H									
3,237.27	89.60	0.34	2,732.10	730.19	4.29	730.20	0.00	0.00	0.00
330' HL Crossing, 3237' MD									
3,300.00	89.60	0.34	2,732.54	792.92	4.66	792.93	0.00	0.00	0.00
3,400.00	89.60	0.34	2,733.23	892.91	5.25	892.93	0.00	0.00	0.00
3,500.00	89.60	0.34	2,733.93	992.91	5.83	992.92	0.00	0.00	0.00
3,600.00	89.60	0.34	2,734.63	1,092.90	6.42	1,092.92	0.00	0.00	0.00
3,700.00	89.60	0.34	2,735.33	1,192.90	7.01	1,192.92	0.00	0.00	0.00
3,800.00	89.60	0.34	2,736.03	1,292.89	7.59	1,292.92	0.00	0.00	0.00
3,900.00	89.60	0.34	2,736.72	1,392.89	8.18	1,392.91	0.00	0.00	0.00
4,000.00	89.60	0.34	2,737.42	1,492.89	8.77	1,492.91	0.00	0.00	0.00
4,100.00	89.60	0.34	2,738.12	1,592.88	9.36	1,592.91	0.00	0.00	0.00
4,200.00	89.60	0.34	2,738.82	1,692.88	9.94	1,692.91	0.00	0.00	0.00
4,300.00	89.60	0.34	2,739.52	1,792.87	10.53	1,792.90	0.00	0.00	0.00
4,400.00	89.60	0.34	2,740.22	1,892.87	11.12	1,892.90	0.00	0.00	0.00
4,500.00	89.60	0.34	2,740.91	1,992.87	11.71	1,992.90	0.00	0.00	0.00
4,600.00	89.60	0.34	2,741.61	2,092.86	12.29	2,092.90	0.00	0.00	0.00
4,700.00	89.60	0.34	2,742.31	2,192.86	12.88	2,192.90	0.00	0.00	0.00
4,800.00	89.60	0.34	2,743.01	2,292.85	13.47	2,292.89	0.00	0.00	0.00
4,900.00	89.60	0.34	2,743.71	2,392.85	14.06	2,392.89	0.00	0.00	0.00
5,000.00	89.60	0.34	2,744.40	2,492.84	14.64	2,492.89	0.00	0.00	0.00
5,100.00	89.60	0.34	2,745.10	2,592.84	15.23	2,592.89	0.00	0.00	0.00
5,200.00	89.60	0.34	2,745.80	2,692.84	15.82	2,692.88	0.00	0.00	0.00
5,300.00	89.60	0.34	2,746.50	2,792.83	16.41	2,792.88	0.00	0.00	0.00
5,400.00	89.60	0.34	2,747.20	2,892.83	16.99	2,892.88	0.00	0.00	0.00
5,500.00	89.60	0.34	2,747.89	2,992.82	17.58	2,992.88	0.00	0.00	0.00
5,600.00	89.60	0.34	2,748.59	3,092.82	18.17	3,092.87	0.00	0.00	0.00
5,700.00	89.60	0.34	2,749.29	3,192.82	18.76	3,192.87	0.00	0.00	0.00
5,800.00	89.60	0.34	2,749.99	3,292.81	19.34	3,292.87	0.00	0.00	0.00
5,900.00	89.60	0.34	2,750.69	3,392.81	19.93	3,392.87	0.00	0.00	0.00
6,000.00	89.60	0.34	2,751.38	3,492.80	20.52	3,492.86	0.00	0.00	0.00
6,100.00	89.60	0.34	2,752.08	3,592.80	21.11	3,592.86	0.00	0.00	0.00
6,200.00	89.60	0.34	2,752.78	3,692.79	21.69	3,692.86	0.00	0.00	0.00
6,300.00	89.60	0.34	2,753.48	3,792.79	22.28	3,792.86	0.00	0.00	0.00
6,400.00	89.60	0.34	2,754.18	3,892.79	22.87	3,892.85	0.00	0.00	0.00



Phoenix Technology Services
Planning Report



Database:	GCR:DB	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3370.00usft
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3370.00usft
Site:	Pilum-15 Fee	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Plan #1 05-23-14		

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)	
6,500.00	89.60	0.34	2,754.88	3,992.78	23.45	3,992.85	0.00	0.00	0.00	
6,600.00	89.60	0.34	2,755.57	4,092.78	24.04	4,092.85	0.00	0.00	0.00	
6,700.00	89.60	0.34	2,756.27	4,192.77	24.63	4,192.85	0.00	0.00	0.00	
6,800.00	89.60	0.34	2,756.97	4,292.77	25.22	4,292.84	0.00	0.00	0.00	
6,900.00	89.60	0.34	2,757.67	4,392.77	25.80	4,392.84	0.00	0.00	0.00	
7,000.00	89.60	0.34	2,758.37	4,492.76	26.39	4,492.84	0.00	0.00	0.00	
7,100.00	89.60	0.34	2,759.06	4,592.76	26.98	4,592.84	0.00	0.00	0.00	
7,200.00	89.60	0.34	2,759.76	4,692.75	27.57	4,692.83	0.00	0.00	0.00	
7,300.00	89.60	0.34	2,760.46	4,792.75	28.15	4,792.83	0.00	0.00	0.00	
7,400.00	89.60	0.34	2,761.16	4,892.74	28.74	4,892.83	0.00	0.00	0.00	
7,500.00	89.60	0.34	2,761.86	4,992.74	29.33	4,992.83	0.00	0.00	0.00	
7,600.00	89.60	0.34	2,762.55	5,092.74	29.92	5,092.82	0.00	0.00	0.00	
7,700.00	89.60	0.34	2,763.25	5,192.73	30.50	5,192.82	0.00	0.00	0.00	
7,800.00	89.60	0.34	2,763.95	5,292.73	31.09	5,292.82	0.00	0.00	0.00	
7,864.25	89.60	0.34	2,764.40	5,356.98	31.47	5,357.07	0.00	0.00	0.00	
TD at 7864.25' MD - BHL-Pilum 15 Fee #1H										

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
PP-Pilum 15 Fee #1H	- plan hits target center	0.00	360.00	2,732.10	730.00	4.29	633,473.70	486,627.29	32° 44' 29.42291 N	104° 22' 36.57176 W
	- Point									
BHL-Pilum 15 Fee #1H	- plan hits target center	0.00	0.00	2,764.40	5,356.98	31.47	638,100.68	486,654.47	32° 45' 15.20949 N	104° 22' 36.27573 W
	- Point									

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
2,209.75	2,209.75	0.00	0.00	KOP, Start 11"/100' Build	
2,906.19	2,716.46	400.22	2.35	Sec. Crossing, 2906' MD	
3,024.30	2,730.61	517.23	3.04	LP, 89.6° Inc, 0.34° Azm - Start hold	
3,237.27	2,732.10	730.19	4.29	330' HL Crossing, 3237' MD	
7,864.25	2,764.40	5,356.98	31.47	TD at 7864.25' MD	



Project: Eddy County, NM (NAD27 NME)
Site: Pilum 15 Fee
Well: #1H
Wellbore: Wellbore #1
Design: Plan #1 05-23-14

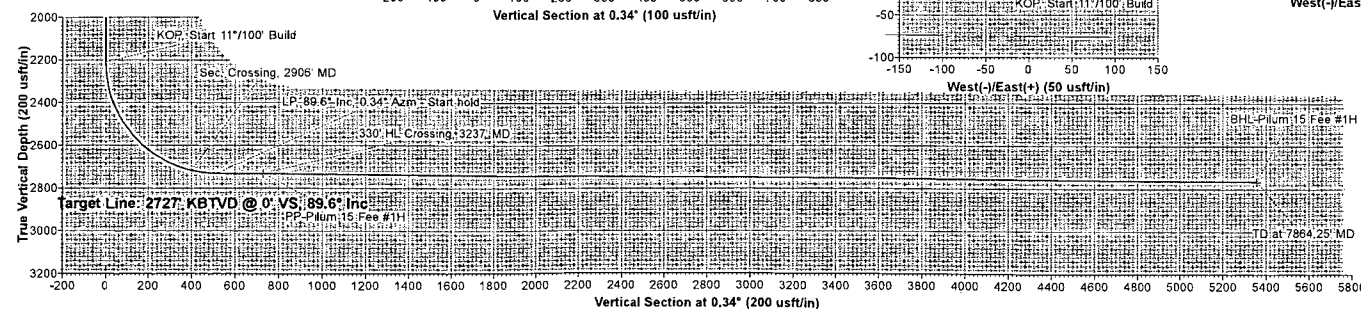
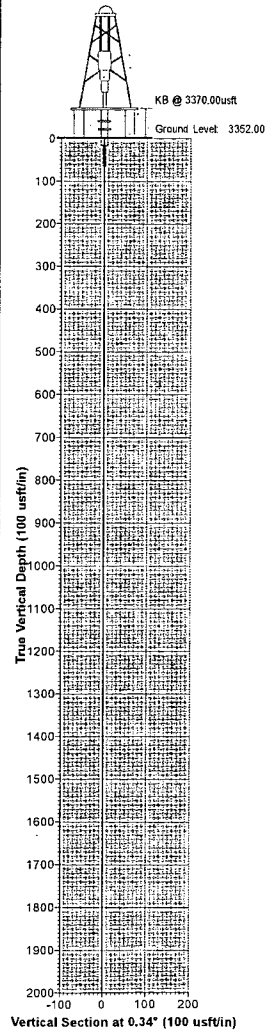


PHOENIX
TECHNOLOGY SERVICES



Azimuths to Grid North
True North: 0.02°
Magnetic North: 7.66°

Magnetic Field
Strength: 48544.2snT
Dip Angle: 60.45°
Date: 05/23/2014
Model: IGRF2010_14



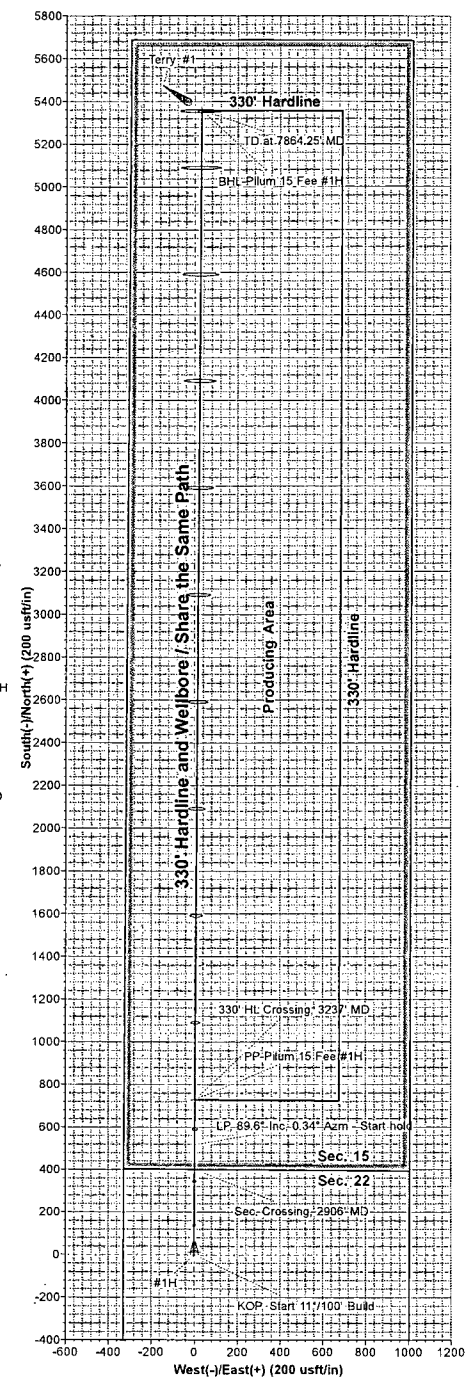
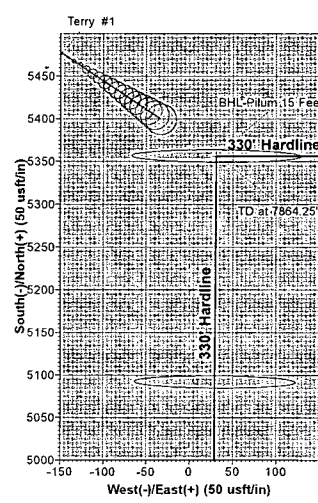
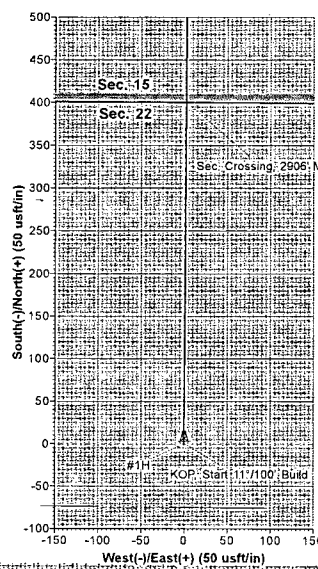
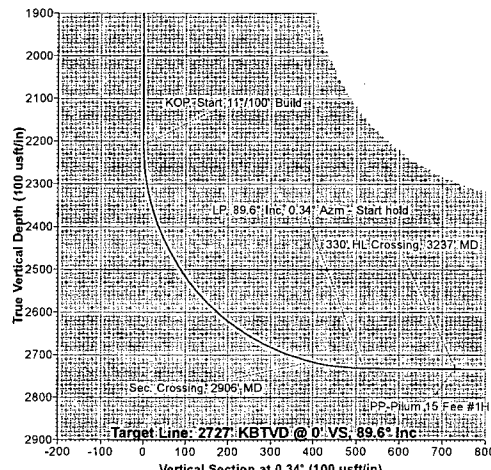
WELL DETAILS																
			Ground Level		3352.00		Latitude		Longitude							
-N/S	+E/W	Northing	Easting	32° 44' 22.19914 N	104° 22' 36.61846 W											
0.00	0.00	632743.70	486623.00													

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		
2	2209.75	0.00	0.00	2209.75	0.00	0.00	0.00	0.00	0.00	0.00	KOP, Start 11°/100' Build
3	3024.30	89.60	0.34	2730.61	517.23	3.04	11.00	0.34	517.23		LP, 89.6° Inc, 0.34° Azm - Start hold
4	7864.25	89.60	0.34	2764.40	5356.98	31.47	0.00	0.00	5357.07	BHL-Pilum 15 Fee #1H	TD at 7864.25' MD

DESIGN TARGET DETAILS											
Name	TVD	-N/S	Northing	Easting	Latitude	Longitude	Shape				
PP-Pilum 15 Fee #1H	2732.10	730.00	4.29	633473.70	486627.29	32° 44' 29.42291° N	104° 22' 36.57176 W	Point			
- plan hits target center											
BHL-Pilum 15 Fee #1H	2764.40	5356.98	31.47	638100.68	486654.47	32° 45' 15.20949 N	104° 22' 36.27573 W	Point			
- plan hits target center											

LEGEND

- #1, Existing Wellbore, Existing Surveys VO
- Plan #1 05-23-14





PHOENIX
TECHNOLOGY SERVICES

COG Operating LLC

Eddy County, NM (NAD27 NME)

Pilum 15 Fee

#1H

Wellbore #1

Plan #1 05-23-14

Anticollision Report

23 May, 2014



Company:	COG Operating LLC	Local Co-ordinate/Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB -18 @ 3370.00usft (Planning)
Reference Site:	Pilum 15 Fee	MD Reference:	KB -18 @ 3370.00usft (Planning)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2:00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass 5000.GCR DB
Reference Design:	Plan #1 05-23-14	Offset TVD Reference:	Offset Datum

Reference:	Plan #1 05-23-14		
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	2014/05/23		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	7,864.25	Plan #1 05-23-14 (Wellbore #1)	MWD	MWD - Standard	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Terry						
#1 - Existing Wellbore - Existing Surveys	7,864.25	2,767.75	168.41	64.19	1.616	CC, ES, SF

Terry - #1 - Existing Wellbore - Existing Surveys										Offset Site Error: 0.00 usft			
Survey Program: 100-MWD										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
0.00	0.00	0.00	0.00	0.00	0.00	-1.55	5,477.15	-147.79	5,479.15				
100.00	100.00	155.36	155.35	0.09	0.22	-1.53	5,476.13	-146.27	5,478.36	5,478.05	0.31	N/A	
200.00	200.00	255.35	255.32	0.32	0.45	-1.52	5,475.16	-144.82	5,477.35	5,476.59	0.76	7,173.960	
300.00	300.00	355.33	355.29	0.54	0.67	-1.50	5,474.19	-143.37	5,476.34	5,475.13	1.22	4,504.718	
400.00	400.00	455.32	455.26	0.77	0.90	-1.49	5,473.21	-141.92	5,475.33	5,473.67	1.67	3,282.877	
500.00	500.00	555.30	555.23	0.99	1.13	-1.47	5,472.24	-140.47	5,474.32	5,472.20	2.12	2,582.223	
600.00	600.00	655.29	655.20	1.22	1.36	-1.46	5,471.27	-139.02	5,473.32	5,470.74	2.57	2,127.902	
700.00	700.00	755.27	755.17	1.44	1.58	-1.44	5,470.30	-137.57	5,472.31	5,469.28	3.02	1,809.430	
800.00	800.00	855.26	855.14	1.67	1.81	-1.43	5,469.33	-136.12	5,471.30	5,467.82	3.48	1,573.800	
900.00	900.00	955.24	955.11	1.89	2.04	-1.41	5,468.36	-134.67	5,470.29	5,466.36	3.93	1,392.409	
1,000.00	1,000.00	1,055.23	1,055.08	2.12	2.27	-1.40	5,467.38	-133.22	5,469.28	5,464.90	4.38	1,248.459	
1,100.00	1,100.00	1,155.21	1,155.05	2.34	2.49	-1.38	5,466.41	-131.77	5,468.28	5,463.44	4.83	1,131.448	
1,200.00	1,200.00	1,255.20	1,255.02	2.56	2.72	-1.37	5,465.44	-130.32	5,467.27	5,461.99	5.29	1,034.457	
1,300.00	1,300.00	1,355.18	1,354.98	2.79	2.95	-1.35	5,464.47	-128.87	5,466.27	5,460.53	5.74	952.755	
1,400.00	1,400.00	1,455.17	1,454.95	3.01	3.18	-1.34	5,463.50	-127.42	5,465.26	5,459.07	6.19	882.990	
1,500.00	1,500.00	1,555.15	1,554.92	3.24	3.40	-1.32	5,462.53	-125.97	5,464.25	5,457.61	6.64	822.725	
1,600.00	1,600.00	1,655.14	1,654.89	3.46	3.63	-1.31	5,461.55	-124.53	5,463.25	5,456.16	7.09	770.142	
1,700.00	1,700.00	1,755.12	1,754.86	3.69	3.86	-1.29	5,460.58	-123.08	5,462.24	5,454.70	7.55	723.861	
1,800.00	1,800.00	1,855.10	1,854.83	3.91	4.08	-1.28	5,459.61	-121.63	5,461.24	5,453.24	8.00	682.813	
1,900.00	1,900.00	1,955.09	1,954.80	4.14	4.31	-1.26	5,458.64	-120.18	5,460.24	5,451.79	8.45	646.157	
2,000.00	2,000.00	2,055.07	2,054.77	4.36	4.54	-1.25	5,457.67	-118.73	5,459.23	5,450.33	8.90	613.226	
2,100.00	2,100.00	2,155.06	2,154.74	4.59	4.77	-1.23	5,456.70	-117.28	5,458.23	5,448.88	9.35	583.478	
2,209.75	2,209.75	2,264.80	2,264.46	4.83	5.02	-1.21	5,455.63	-115.69	5,457.13	5,447.28	9.85	553.972	
2,250.00	2,249.96	2,304.98	2,304.64	4.93	5.11	-1.55	5,455.24	-115.11	5,455.17	5,445.14	10.03	543.663	
2,300.00	2,299.55	2,354.50	2,354.15	5.05	5.22	-1.57	5,454.76	-114.39	5,448.43	5,438.17	10.27	530.588	
2,350.00	2,348.31	2,403.15	2,402.80	5.18	5.33	-1.60	5,454.28	-113.68	5,436.98	5,426.47	10.51	517.392	

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

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB 18 @ 3370.00usft (Planning)
Reference Site:	Pilum 15 Fee	MD Reference:	KB 18 @ 3370.00usft (Planning)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at:	2.00 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1.05-23-14	Offset TVD Reference:	Offset Datum

Offset Design														Terry - #1 - Existing Wellbore - Existing Surveys		Offset Site Error: 0.00 usft	
Survey Program: 100-MWD																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				
2,400.00	2,395.80	2,450.48	2,450.12	5.31	5.44	-1.65	5,453.82	-113.00	5,420.92	5,410.17	10.75	504.301					
2,450.00	2,441.57	2,496.05	2,495.68	5.45	5.54	-1.72	5,453.38	-112.34	5,400.40	5,389.41	10.99	491.440					
2,500.00	2,485.21	2,539.45	2,539.08	5.60	5.64	-1.82	5,452.96	-111.71	5,375.60	5,364.37	11.24	478.300					
2,550.00	2,526.31	2,580.27	2,579.89	5.82	5.73	-1.95	5,452.56	-111.11	5,346.77	5,335.21	11.56	462.603					
2,600.00	2,564.50	2,618.15	2,617.76	6.11	5.82	-2.12	5,452.19	-110.57	5,314.15	5,302.22	11.93	445.528					
2,650.00	2,599.42	2,652.72	2,652.32	6.46	5.90	-2.35	5,451.86	-110.06	5,278.06	5,265.70	12.36	427.190					
2,700.00	2,630.76	2,683.67	2,683.27	6.87	5.97	-2.67	5,451.56	-109.62	5,238.82	5,225.98	12.84	407.875					
2,750.00	2,658.21	2,710.72	2,710.32	7.36	6.03	-3.11	5,451.29	-109.22	5,196.80	5,183.41	13.39	387.988					
2,800.00	2,681.54	2,733.62	2,733.21	7.92	6.08	-3.77	5,451.07	-108.89	5,152.38	5,138.38	14.00	367.984					
2,850.00	2,700.53	2,752.16	2,751.75	8.53	6.13	-4.84	5,450.89	-108.62	5,105.98	5,091.32	14.66	348.295					
2,900.00	2,714.99	2,766.16	2,765.75	9.20	6.16	-6.79	5,450.76	-108.42	5,058.01	5,042.65	15.36	329.286					
2,950.00	2,724.80	2,775.50	2,775.09	9.92	6.18	-11.39	5,450.67	-108.28	5,008.93	4,992.83	16.09	311.234					
3,000.00	2,729.87	2,780.09	2,779.68	10.66	6.19	-32.99	5,450.62	-108.22	4,959.17	4,942.33	16.85	294.329					
3,024.30	2,730.61	2,780.59	2,780.18	11.03	6.19	-96.16	5,450.62	-108.21	4,934.89	4,917.67	17.22	286.560					
3,100.00	2,731.14	2,780.39	2,779.98	12.22	6.19	-96.08	5,450.62	-108.21	4,859.22	4,840.82	18.41	263.989					
3,200.00	2,731.84	2,780.13	2,779.71	13.84	6.19	-95.97	5,450.62	-108.22	4,759.27	4,739.24	20.03	237.603					
3,300.00	2,732.54	2,779.86	2,779.45	15.51	6.19	-95.86	5,450.62	-108.22	4,659.31	4,637.61	21.70	214.715					
3,400.00	2,733.23	2,779.59	2,779.18	17.21	6.19	-95.75	5,450.63	-108.23	4,559.36	4,535.96	23.40	194.825					
3,500.00	2,733.93	2,779.33	2,778.92	18.94	6.19	-95.65	5,450.63	-108.23	4,459.41	4,434.28	25.13	177.463					
3,600.00	2,734.63	2,779.06	2,778.65	20.69	6.19	-95.54	5,450.63	-108.23	4,359.46	4,332.58	26.87	162.225					
3,700.00	2,735.33	2,778.80	2,778.39	22.45	6.19	-95.43	5,450.63	-108.24	4,259.51	4,230.88	28.63	148.773					
3,800.00	2,736.03	2,778.53	2,778.12	24.21	6.19	-95.32	5,450.64	-108.24	4,159.57	4,129.17	30.40	136.830					
3,900.00	2,736.72	2,778.27	2,777.85	25.99	6.18	-95.22	5,450.64	-108.24	4,059.63	4,027.45	32.18	126.166					
4,000.00	2,737.42	2,778.00	2,777.59	27.78	6.18	-95.11	5,450.64	-108.25	3,959.69	3,925.73	33.96	116.595					
4,100.00	2,738.12	2,777.74	2,777.32	29.57	6.18	-95.00	5,450.64	-108.25	3,859.75	3,824.00	35.75	107.962					
4,200.00	2,738.82	2,777.47	2,777.06	31.36	6.18	-94.89	5,450.65	-108.26	3,759.82	3,722.28	37.55	100.140					
4,300.00	2,739.52	2,777.21	2,776.79	33.16	6.18	-94.79	5,450.65	-108.26	3,659.89	3,620.55	39.34	93.023					
4,400.00	2,740.22	2,776.94	2,776.53	34.96	6.18	-94.68	5,450.65	-108.26	3,559.97	3,518.82	41.15	86.521					
4,500.00	2,740.91	2,776.68	2,776.26	36.77	6.18	-94.57	5,450.65	-108.27	3,460.05	3,417.10	42.95	80.559					
4,600.00	2,741.61	2,776.41	2,776.00	38.58	6.18	-94.46	5,450.66	-108.27	3,360.13	3,315.38	44.76	75.074					
4,700.00	2,742.31	2,776.15	2,775.73	40.39	6.18	-94.36	5,450.66	-108.28	3,260.23	3,213.66	46.57	70.012					
4,800.00	2,743.01	2,775.88	2,775.47	42.20	6.18	-94.25	5,450.66	-108.28	3,160.32	3,111.94	48.38	65.326					
4,900.00	2,743.71	2,775.61	2,775.20	44.01	6.18	-94.14	5,450.66	-108.28	3,060.42	3,010.23	50.19	60.976					
5,000.00	2,744.40	2,775.35	2,774.94	45.83	6.18	-94.03	5,450.67	-108.29	2,960.53	2,908.53	52.00	56.928					
5,100.00	2,745.10	2,775.08	2,774.67	47.64	6.18	-93.92	5,450.67	-108.29	2,860.65	2,806.83	53.82	53.152					
5,200.00	2,745.80	2,774.82	2,774.41	49.46	6.18	-93.82	5,450.67	-108.29	2,760.77	2,705.14	55.64	49.622					
5,300.00	2,746.50	2,774.55	2,774.14	51.28	6.18	-93.71	5,450.67	-108.30	2,660.91	2,603.46	57.45	46.314					
5,400.00	2,747.20	2,774.29	2,773.88	53.10	6.18	-93.60	5,450.68	-108.30	2,561.05	2,501.78	59.27	43.208					
5,500.00	2,747.89	2,774.02	2,773.61	54.92	6.17	-93.49	5,450.68	-108.31	2,461.21	2,400.12	61.09	40.287					
5,600.00	2,748.59	2,773.76	2,773.35	56.74	6.17	-93.38	5,450.68	-108.31	2,361.38	2,298.47	62.91	37.535					
5,700.00	2,749.29	2,773.49	2,773.08	58.56	6.17	-93.28	5,450.68	-108.31	2,261.57	2,196.83	64.73	34.937					
5,800.00	2,749.99	2,773.23	2,772.81	60.38	6.17	-93.17	5,450.69	-108.32	2,161.77	2,095.22	66.55	32.482					
5,900.00	2,750.69	2,772.96	2,772.55	62.20	6.17	-93.06	5,450.69	-108.32	2,061.99	1,993.62	68.37	30.157					
6,000.00	2,751.38	2,772.70	2,772.28	64.03	6.17	-92.95	5,450.69	-108.33	1,962.24	1,892.04	70.20	27.953					
6,100.00	2,752.08	2,772.43	2,772.02	65.85	6.17	-92.84	5,450.69	-108.33	1,862.51	1,790.49	72.02	25.861					
6,200.00	2,752.78	2,772.17	2,771.75	67.67	6.17	-92.74	5,450.70	-108.33	1,762.81	1,688.96	73.84	23.872					
6,300.00	2,753.48	2,771.90	2,771.49	69.50	6.17	-92.63	5,450.70	-108.34	1,663.14	1,587.48	75.67	21.980					
6,400.00	2,754.18	2,771.63	2,771.22	71.32	6.17	-92.52	5,450.70	-108.34	1,563.52	1,486.03	77.49	20.177					
6,500.00	2,754.88	2,771.37	2,770.96	73.15	6.17	-92.41	5,450.71	-108.34	1,463.96	1,384.64	79.31	18.458					
6,600.00	2,755.57	2,771.10	2,770.69	74.97	6.17	-92.30	5,450.71	-108.35	1,364.45	1,283.31	81.14	16.816					
6,700.00	2,756.27	2,770.84	2,770.43	76.80	6.17	-92.19	5,450.71	-108.35	1,265.03	1,182.06	82.96	15.248					
6,800.00	2,756.97	2,770.57	2,770.16	78.62	6.17	-92.09	5,450.71	-108.36	1,165.70	1,080.91	84.79	13.748					

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



Phoenix Technology Services
Anticollision Report



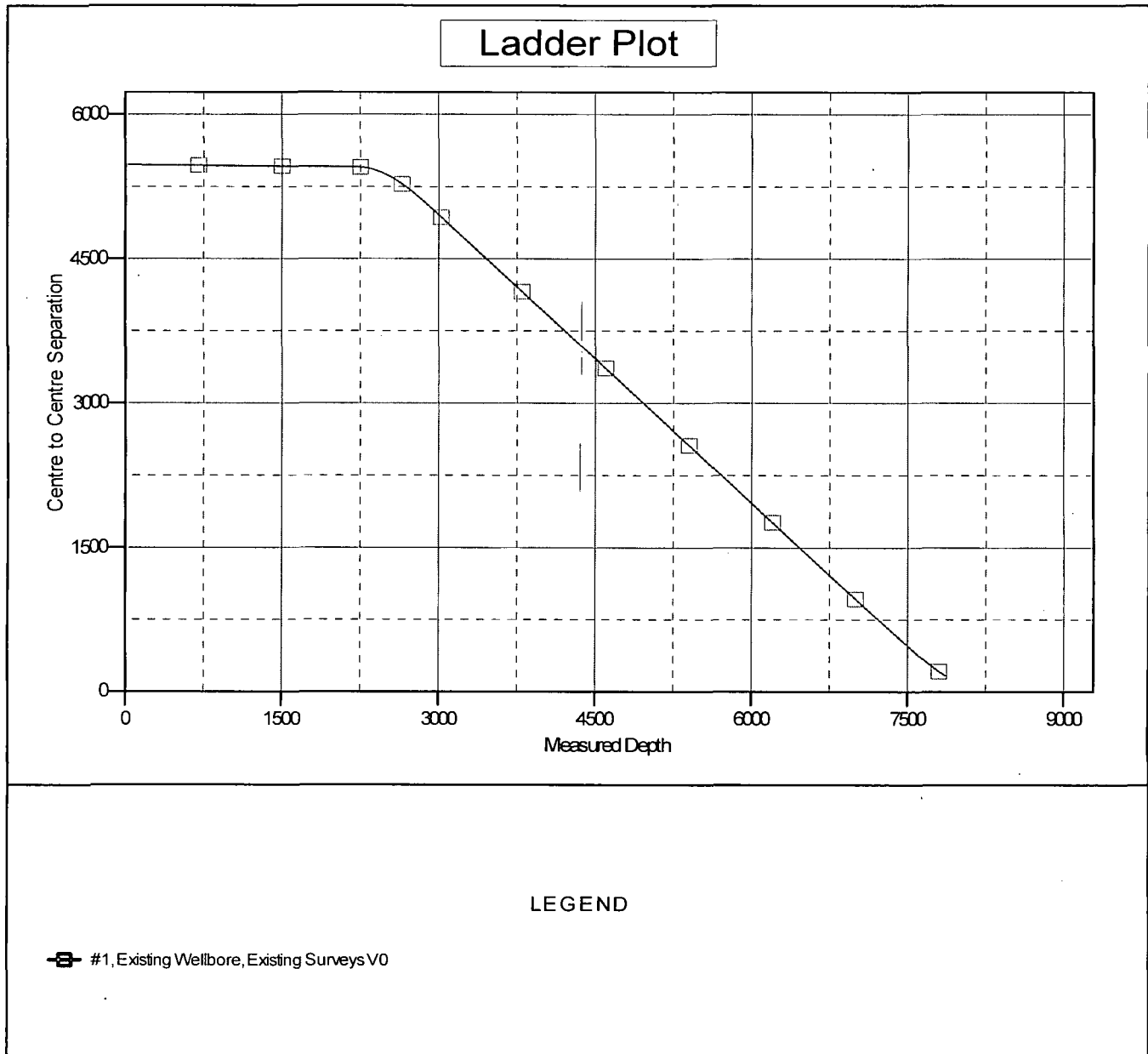
Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27-NME)	TVD Reference:	KB 18 @ 3370'00usft (Planning)
Reference Site:	Pilum 15 Fee	MD Reference:	KB 18 @ 3370'00usft (Planning)
Site Error:	0'00'usft	North Reference:	Grid
Reference Well:	#1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0'00'usft	Output errors are at:	2'00' sigma
Reference Wellbore:	Wellbore #1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #1'05-23-14	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0'00'usft
Survey Program: 100-MWD												Offset Well Error:	0'00'usft
Terry #1 - Existing Wellbore - Existing Surveys													
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
6,900.00	2,757.67	2,770.31	2,769.90	80.45	6.17	-91.98	5,450.72	-108.36	1,066.49	979.88	86.61	12.313	
7,000.00	2,758.37	2,770.04	2,769.63	82.27	6.17	-91.87	5,450.72	-108.36	967.45	879.01	88.44	10.939	
7,100.00	2,759.06	2,769.78	2,769.37	84.10	6.17	-91.76	5,450.72	-108.37	868.63	778.37	90.27	9.623	
7,200.00	2,759.76	2,769.51	2,769.10	85.93	6.16	-91.65	5,450.72	-108.37	770.12	678.03	92.09	8.363	
7,300.00	2,760.46	2,769.25	2,768.84	87.75	6.16	-91.55	5,450.73	-108.38	672.04	578.13	93.92	7.156	
7,400.00	2,761.16	2,768.98	2,768.57	89.58	6.16	-91.44	5,450.73	-108.38	574.63	478.89	95.74	6.002	
7,500.00	2,761.86	2,768.72	2,768.30	91.41	6.16	-91.33	5,450.73	-108.38	478.29	380.72	97.57	4.902	
7,600.00	2,762.55	2,768.45	2,768.04	93.23	6.16	-91.22	5,450.73	-108.39	383.82	284.43	99.40	3.862	
7,700.00	2,763.25	2,768.19	2,767.77	95.06	6.16	-91.11	5,450.74	-108.39	293.05	191.83	101.22	2.895	
7,800.00	2,763.95	2,767.92	2,767.51	96.89	6.16	-91.00	5,450.74	-108.39	210.80	107.75	103.05	2.046	
7,864.25	2,764.40	2,767.75	2,767.34	98.06	6.16	-90.93	5,450.74	-108.40	168.41	64.19	104.22	1.616 CC, ES, SF	

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H:
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB: 18' @ 3370.00usft (Planning)
Reference Site:	Pilum 15.Fee	MD Reference:	KB: 18' @ 3370.00usft (Planning)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	Wellbore #1	Database	Compass 5000 GCR DB
Reference Design:	Plan #1 05-23-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB: 18' @ 3370.00usft (Planning)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #1H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.02°



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County NM (NAD27 NME)	TVD Reference:	KB: 18' @ 3370.00usft (Planning)
Reference Site:	Pilum 15 Fee	MD Reference:	KB: 18' @ 3370.00usft (Planning)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	#1H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2100 sigma
Reference Wellbore:	Wellbore #1	Database:	Compass 5000 GCR DB
Reference Design:	Plan #105-23-14	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB: 18' @ 3370.00usft (Planning)

Offset Depths are relative to Offset Datum

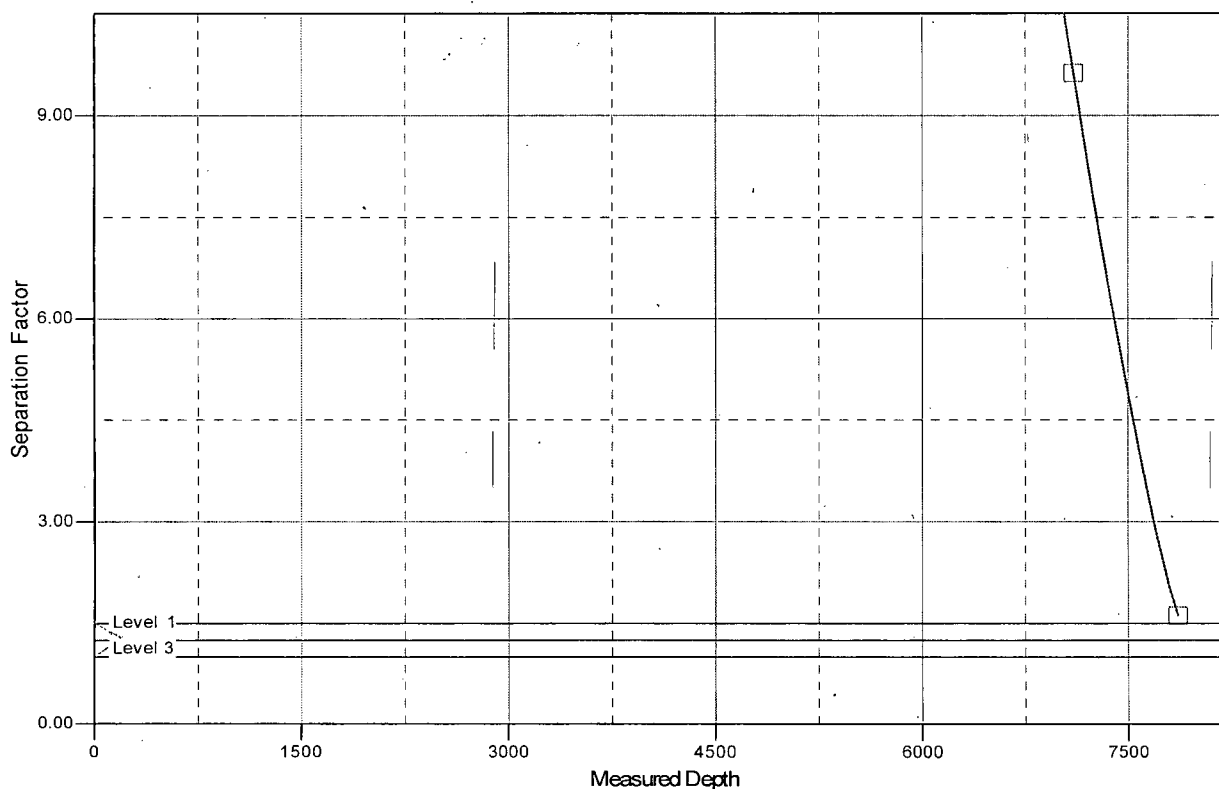
Central Meridian is 104° 19' 60.00000 W

Coordinates are relative to: #1H

Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30

Grid Convergence at Surface is: -0.02°

Separation Factor Plot



LEGEND

#1, Existing Wellbore, Existing Surveys V0