

DISTRICT I

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

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) 476-3462NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 04 2016State 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 30-015-43659	Pool Code 50270	Pool Name Penasco Draw; SA-Yeso (ASSOC)
Property Code 38872	Property Name CLYDESDALE 1 FEE	Well Number 5H
OGRID No. 229137	Operator Name COG OPERATING, LLC	Elevation 3401'

Surface Location

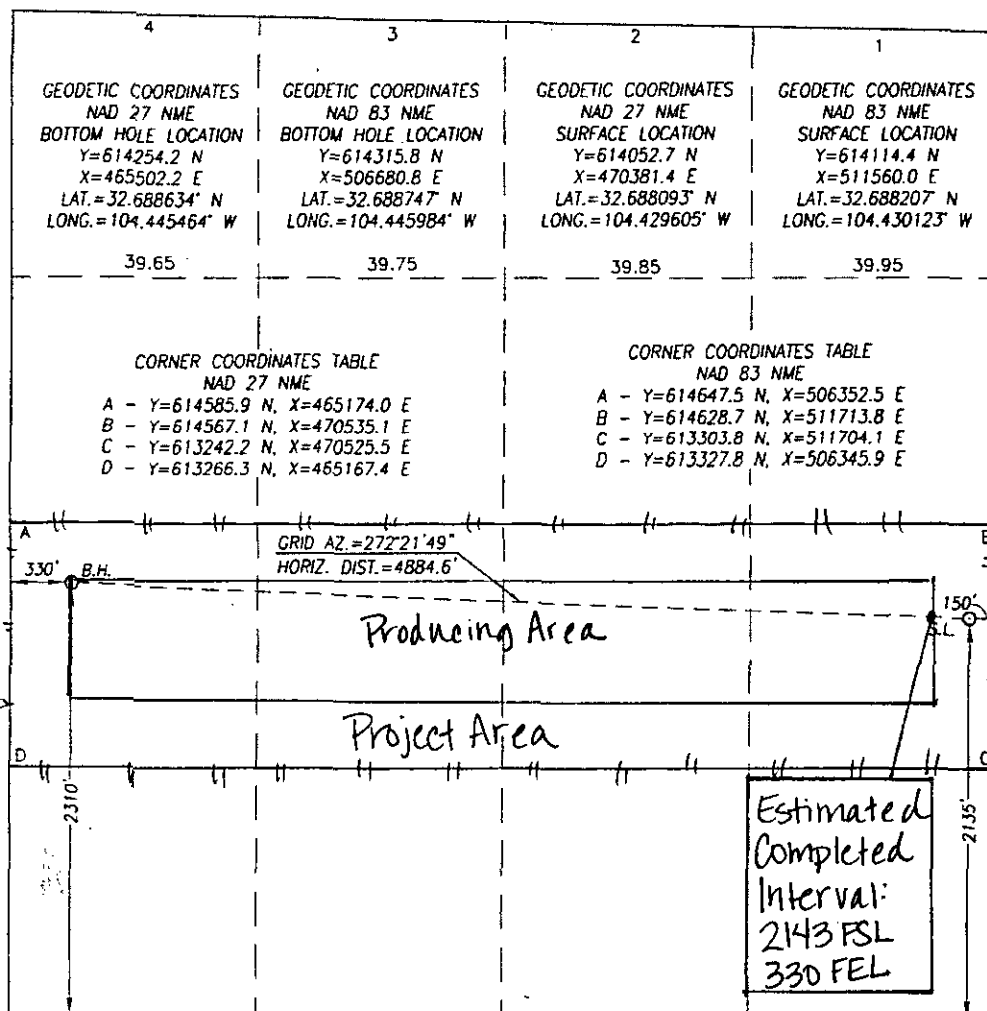
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	1	19-S	25-E		2135	SOUTH	150	EAST	EDDY

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
L	1	19-S	25-E		2310	SOUTH	330	WEST	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



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.

3-2-16
Date
Kelly J Holly
Printed Name
kholly@concho.com
E-mail Address

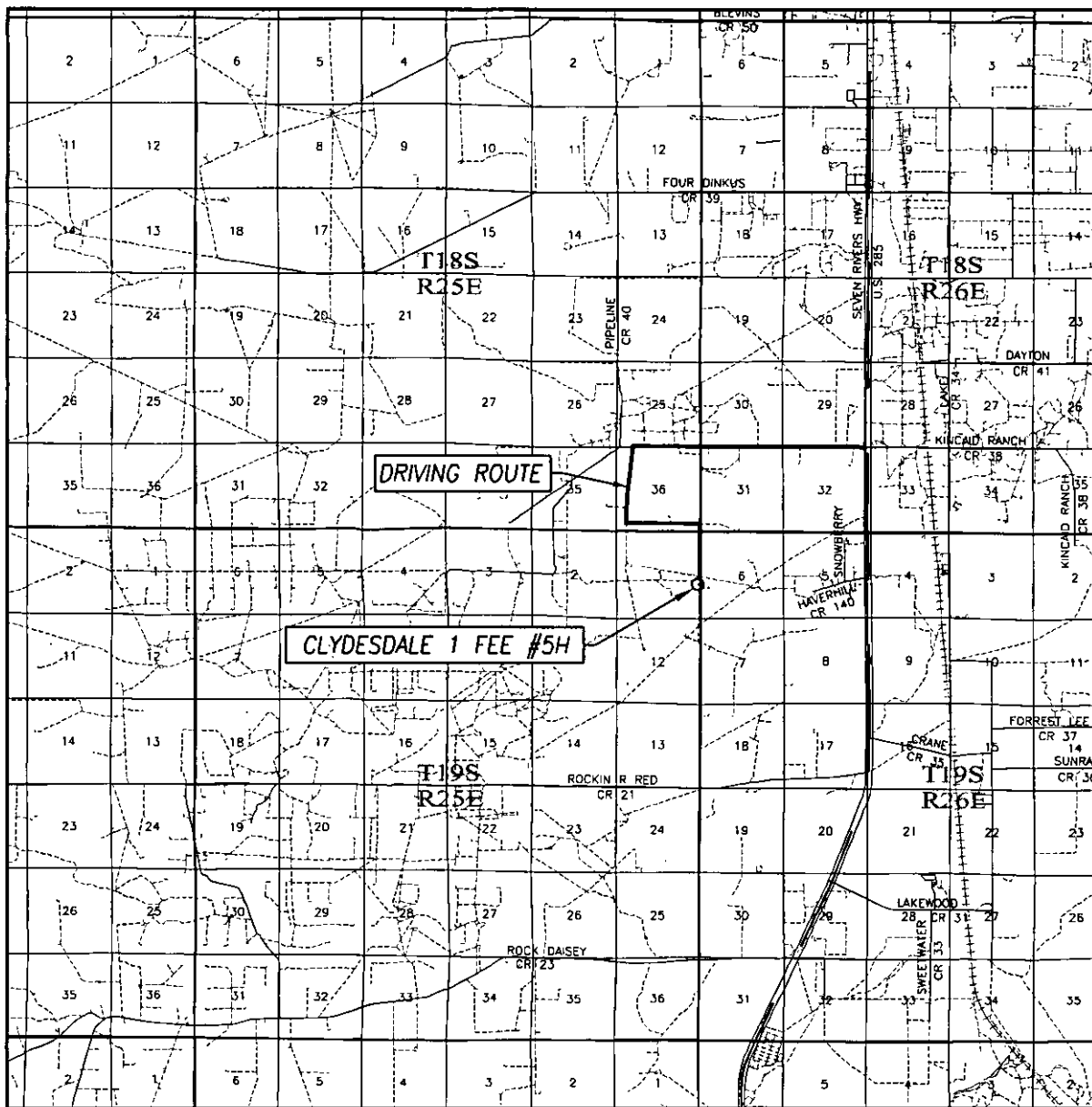
SURVEYOR CERTIFICATION

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.

JANUARY 14, 2016

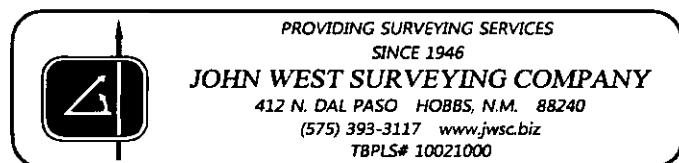
Date of Survey
Signature of Professional Surveyor:

RONALD J. EIDSON
NEW MEXICO
REGISTERED
3239
01/26/2016
Certificate Number
ACK JWSC W.O. 16 11.0019



DRIVING ROUTE: SEE TOPOGRAPHICAL AND ACCESS ROAD MAP

LEASE CLYDESDALE 1 FEE



2.8 MILES TO U.S. HWY. 285

CO. RD. 38

KINCAID RANCH RD.

36

3500

31

3443

3400

6

3380

3360

3400

3409

3380

Windmill 3411

1

END DRIVING ROUTE

CLYDESDALE 1 FEE #5H

CONTOUR INTERVAL:
DAYTON, N.M. - 10'

U.S.G.S. TOPOGRAPHIC MAP
DAYTON, N.M.

FROM THE INTERSECTION OF U.S. HWY. 285 AND CO. RD. 38 (KINCAID RANCH RD.), GO WEST ON CO. RD. 38 APPROX. 2.8 MILES. TURN LEFT AND GO SOUTH ON CALICHE LEASE ROAD APPROX. 0.9 MILES. TURN LEFT AND GO EAST APPROX. 0.9 MILES. TURN RIGHT AND GO SOUTH APPROX. 0.7 MILES TO THE NORTHEAST CORNER OF THIS LOCATION.



TBPLS# 10021000



COG Operating LLC

Eddy County, NM (NAD-27 2015)

Clydesdale 1 Fee #5H

SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I

PP: 2143' FSL, 330' FEL, Sec 1, T19S, R25E, Unit I

BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L

Plan: Design #1

Target Centerline is 2,915' KBTVD @ 2° Up (92° Inclination)

Standard Planning Report

11 February, 2016





Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Company:	COG Operating LLC	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site:	Clydesdale 1 Fee #5H	North Reference:	Grid
Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L		
Design:	Design #1		

Project	Eddy County, NM (NAD-27 2015)		
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	Clydesdale 1 Fee #5H		
Site Position:	Map	Northing:	614,052.70 usft
From:		Easting:	470,381.40 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13.20 in
		Grid Convergence:	-0.05 °

Well	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	0.00 usft
		Ground Level:	3,401.00 usft

Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L		
Magnetics	Model Name	Sample Date	Declination
	IGRF2015	2/10/2016	7.53
			Dip Angle
			60.36
			Field Strength
			48,259

Design	Design #1		
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
			(°)
			272.36

Plan Sections										
Measured	Inclination	Azimuth	Vertical	+N/-S	+E/-W	Dogleg	Build	Turn	TFO	Target
Depth	(°)	(°)	Depth	(usft)	(usft)	Rate	Rate	Rate	(°)	
(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	
2,375.63	0.00	0.00	2,375.63	0.00	0.00	0.00	0.00	0.00	0.00	
3,211.99	92.00	272.36	2,896.18	22.24	-538.59	11.00	11.00	-10.48	272.36	
7,558.95	92.00	272.36	2,744.47	201.50	-4,879.20	0.00	0.00	0.00	0.00	PBHL (C1F #5H/L1 D



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Company:	COG Operating LLC	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD-27 2015)	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site:	Clydesdale 1 Fee #5H	North Reference:	Grid
Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L		
Design:	Design #1		

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
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	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
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,375.63	0.00	0.00	2,375.63	0.00	0.00	0.00	0.00	0.00	0.00
KOP - Start DLS 11.00 TFO 272.36									
2,400.00	2.68	272.36	2,399.99	0.02	-0.57	0.57	11.00	11.00	0.00
2,450.00	8.18	272.36	2,449.75	0.22	-5.30	5.30	11.00	11.00	0.00
2,500.00	13.68	272.36	2,498.82	0.61	-14.77	14.78	11.00	11.00	0.00
2,550.00	19.18	272.36	2,546.76	1.19	-28.89	28.92	11.00	11.00	0.00
2,600.00	24.68	272.36	2,593.13	1.96	-47.54	47.58	11.00	11.00	0.00
2,650.00	30.18	272.36	2,637.49	2.91	-70.55	70.61	11.00	11.00	0.00
2,700.00	35.68	272.36	2,679.44	4.03	-97.69	97.78	11.00	11.00	0.00
2,750.00	41.18	272.36	2,718.59	5.32	-128.73	128.84	11.00	11.00	0.00
2,800.00	46.68	272.36	2,754.59	6.75	-163.38	163.52	11.00	11.00	0.00
2,850.00	52.18	272.36	2,787.09	8.31	-201.32	201.49	11.00	11.00	0.00
2,900.00	57.68	272.36	2,815.81	10.00	-242.19	242.39	11.00	11.00	0.00
2,950.00	63.18	272.36	2,840.47	11.80	-285.62	285.87	11.00	11.00	0.00
3,000.00	68.68	272.36	2,860.86	13.68	-331.22	331.50	11.00	11.00	0.00
3,050.00	74.18	272.36	2,876.77	15.63	-378.56	378.88	11.00	11.00	0.00
3,100.00	79.68	272.36	2,888.08	17.64	-427.20	427.57	11.00	11.00	0.00
3,150.00	85.18	272.36	2,894.66	19.69	-476.70	477.11	11.00	11.00	0.00
3,200.00	90.68	272.36	2,896.46	21.75	-526.61	527.06	11.00	11.00	0.00
3,211.99	92.00	272.36	2,896.18	22.24	-538.59	539.05	11.00	11.00	0.00
EOC - Start 4346.96 hold at 3211.99 MD									
3,300.00	92.00	272.36	2,893.11	25.87	-626.47	627.00	0.00	0.00	0.00
3,400.00	92.00	272.36	2,889.62	30.00	-726.32	726.94	0.00	0.00	0.00
3,500.00	92.00	272.36	2,886.13	34.12	-826.18	826.88	0.00	0.00	0.00
3,600.00	92.00	272.36	2,882.64	38.24	-926.03	926.82	0.00	0.00	0.00
3,700.00	92.00	272.36	2,879.15	42.37	-1,025.88	1,026.76	0.00	0.00	0.00
3,800.00	92.00	272.36	2,875.66	46.49	-1,125.74	1,126.70	0.00	0.00	0.00



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Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L		
Design:	Design #1		

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)	
3,900.00	92.00	272.36	2,872.17	50.61	-1,225.59	1,226.64	0.00	0.00	0.00	
4,000.00	92.00	272.36	2,868.68	54.74	-1,325.45	1,326.58	0.00	0.00	0.00	
4,100.00	92.00	272.36	2,865.19	58.86	-1,425.30	1,426.51	0.00	0.00	0.00	
4,200.00	92.00	272.36	2,861.70	62.99	-1,525.15	1,526.45	0.00	0.00	0.00	
4,300.00	92.00	272.36	2,858.21	67.11	-1,625.01	1,626.39	0.00	0.00	0.00	
4,400.00	92.00	272.36	2,854.72	71.23	-1,724.86	1,726.33	0.00	0.00	0.00	
4,500.00	92.00	272.36	2,851.23	75.36	-1,824.72	1,826.27	0.00	0.00	0.00	
4,600.00	92.00	272.36	2,847.74	79.48	-1,924.57	1,926.21	0.00	0.00	0.00	
4,700.00	92.00	272.36	2,844.25	83.60	-2,024.42	2,026.15	0.00	0.00	0.00	
4,800.00	92.00	272.36	2,840.76	87.73	-2,124.28	2,126.09	0.00	0.00	0.00	
4,900.00	92.00	272.36	2,837.27	91.85	-2,224.13	2,226.03	0.00	0.00	0.00	
5,000.00	92.00	272.36	2,833.78	95.98	-2,323.99	2,325.97	0.00	0.00	0.00	
5,100.00	92.00	272.36	2,830.29	100.10	-2,423.84	2,425.91	0.00	0.00	0.00	
5,200.00	92.00	272.36	2,826.80	104.22	-2,523.69	2,525.84	0.00	0.00	0.00	
5,300.00	92.00	272.36	2,823.31	108.35	-2,623.55	2,625.78	0.00	0.00	0.00	
5,400.00	92.00	272.36	2,819.82	112.47	-2,723.40	2,725.72	0.00	0.00	0.00	
5,500.00	92.00	272.36	2,816.33	116.59	-2,823.25	2,825.66	0.00	0.00	0.00	
5,600.00	92.00	272.36	2,812.84	120.72	-2,923.11	2,925.60	0.00	0.00	0.00	
5,700.00	92.00	272.36	2,809.35	124.84	-3,022.96	3,025.54	0.00	0.00	0.00	
5,800.00	92.00	272.36	2,805.86	128.97	-3,122.82	3,125.48	0.00	0.00	0.00	
5,900.00	92.00	272.36	2,802.37	133.09	-3,222.67	3,225.42	0.00	0.00	0.00	
6,000.00	92.00	272.36	2,798.88	137.21	-3,322.52	3,325.36	0.00	0.00	0.00	
6,100.00	92.00	272.36	2,795.39	141.34	-3,422.38	3,425.30	0.00	0.00	0.00	
6,200.00	92.00	272.36	2,791.90	145.46	-3,522.23	3,525.23	0.00	0.00	0.00	
6,300.00	92.00	272.36	2,788.41	149.58	-3,622.09	3,625.17	0.00	0.00	0.00	
6,400.00	92.00	272.36	2,784.92	153.71	-3,721.94	3,725.11	0.00	0.00	0.00	
6,500.00	92.00	272.36	2,781.43	157.83	-3,821.79	3,825.05	0.00	0.00	0.00	
6,600.00	92.00	272.36	2,777.94	161.96	-3,921.65	3,924.99	0.00	0.00	0.00	
6,700.00	92.00	272.36	2,774.45	166.08	-4,021.50	4,024.93	0.00	0.00	0.00	
6,800.00	92.00	272.36	2,770.96	170.20	-4,121.36	4,124.87	0.00	0.00	0.00	
6,900.00	92.00	272.36	2,767.47	174.33	-4,221.21	4,224.81	0.00	0.00	0.00	
7,000.00	92.00	272.36	2,763.98	178.45	-4,321.06	4,324.75	0.00	0.00	0.00	
7,100.00	92.00	272.36	2,760.49	182.57	-4,420.92	4,424.69	0.00	0.00	0.00	
7,200.00	92.00	272.36	2,757.00	186.70	-4,520.77	4,524.63	0.00	0.00	0.00	
7,300.00	92.00	272.36	2,753.51	190.82	-4,620.63	4,624.56	0.00	0.00	0.00	
7,400.00	92.00	272.36	2,750.02	194.95	-4,720.48	4,724.50	0.00	0.00	0.00	
7,500.00	92.00	272.36	2,746.53	199.07	-4,820.33	4,824.44	0.00	0.00	0.00	
7,558.95	92.00	272.36	2,744.47	201.50	-4,879.20	4,883.36	0.00	0.00	0.00	
TD at 7558.95										



TDS
Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
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Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L		
Design:	Design #1		

Design Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(usft)	(usft)	(usft)	(usft)	(usft)		
- Shape									
KOP (C1F #5H/L1 Design - plan hits target center - Point	0.00	0.00	2,375.63	0.00	0.00	614,052.70	470,381.40	32° 41' 17.135 N	104° 25' 46.577 W
PBHL (C1F #5H/L1 Design - plan hits target center - Point	0.00	0.00	2,744.47	201.50	-4,879.20	614,254.20	465,502.20	32° 41' 19.081 N	104° 26' 43.672 W
PP (C1F #5H/L1 Design - plan hits target center - Point	0.00	360.00	2,769.61	7.43	-180.00	614,060.14	470,201.40	32° 41' 17.207 N	104° 25' 48.683 W
EOC (C1F #5H/L1 Design - plan hits target center - Point	0.00	0.00	2,896.18	22.24	-538.59	614,074.95	469,842.81	32° 41' 17.350 N	104° 25' 52.879 W

Plan Annotations					
Measured Depth	Vertical Depth	Local Coordinates			
(usft)	(usft)	+N/-S	+E/-W	Comment	
(usft)	(usft)	(usft)	(usft)		
2,375.63	2,375.63	0.00	0.00	KOP - Start DLS 11.00 TFO 272.36	
3,211.99	2,896.18	22.24	-538.59	EOC - Start 4346.96 hold at 3211.99 MD	
7,558.95	2,744.47	201.50	-4,879.20	TD at 7558.95	



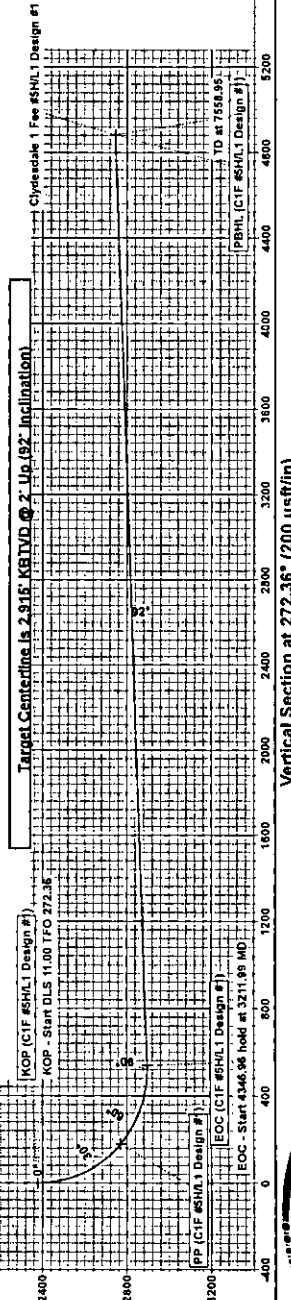
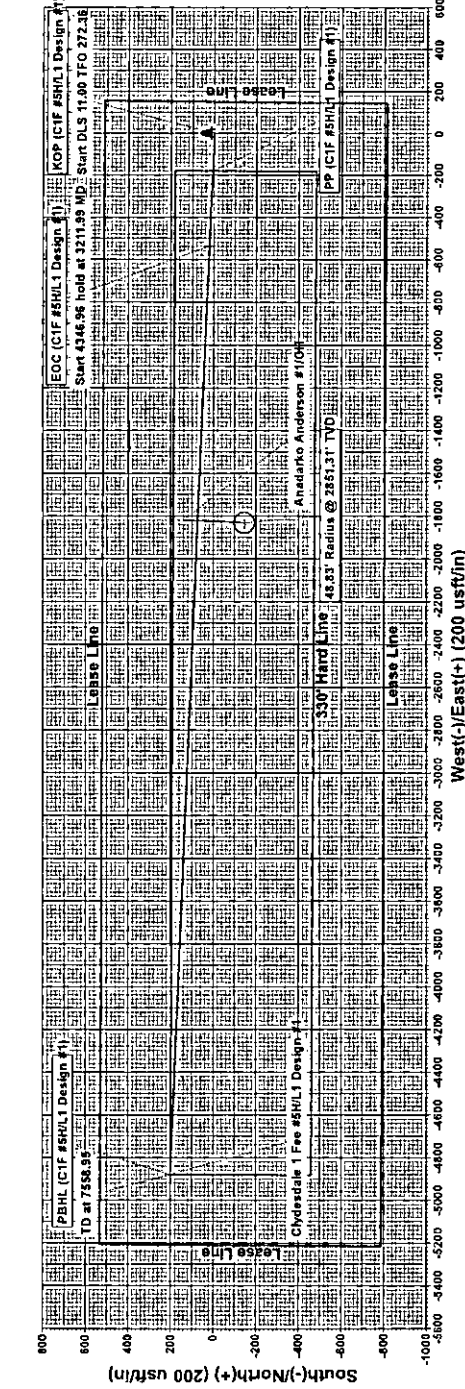
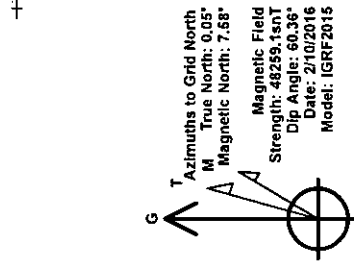
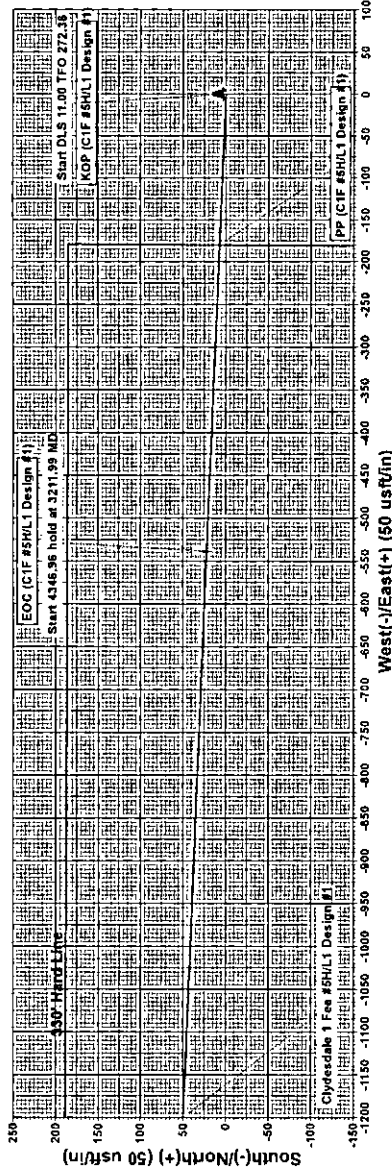
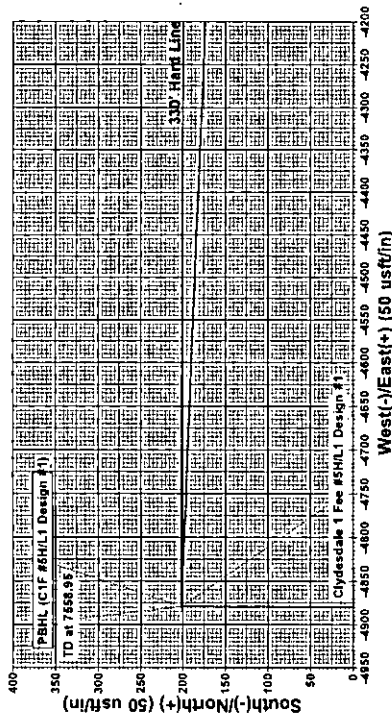
COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Clydesdale 1 Fee #5H

Well: SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit 1
Wellbore: BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L

Plan: Design #1 (SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit L)

Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2375.83	0.00	0.00	2375.83	0.00	0.00	0.00	0.00	0.00	0.00
3	3211.99	92.00	272.36	2896.18	22.24	-538.59	11.00	272.36	539.05	539.05
4	7559.95	92.00	272.36	2744.47	201.50	-4879.20	0.00	0.00	4883.36	PBHL (C1F #5H/L1 Design #1)



Ground Elevation: 3401.00
RKB Elevation: KB @ 3419.00usft (Silver Oak 3)
Northing: 614052.70
Easting: 470381.40
Latitude: 32° 41' 17.135 N
Longitude: 104° 25' 46.577 W



Terra Directional Services LLC
3705 South County Road 1210, Midland, TX 79706
Phone: 432-618-1210

PROJECT DETAILS: Eddy County, NM (NAD-27 2015)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



COG Operating LLC

Eddy County, NM (NAD-27 2015)

Clydesdale 1 Fee #5H

SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I

PP: 2143' FSL, 330' FEL, Sec 1, T19S, R25E, Unit I

BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L

Design #1

Anticollision Report

11 February, 2016





TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference	Design #1		
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:	Elliptical Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program	Date: 2/11/2016			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	7,558.95	Design #1 (BHL: 2310' FSL, 330' FWL, Se	MWD	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						
Anadarko Anderson #1						
Anadarko Anderson #1 - OH - OH	4,497.84	2,848.91	170.90	66.47	1.636	CC
Anadarko Anderson #1 - OH - OH	4,600.00	2,845.35	199.07	58.33	1.414	Level 3, ES, SF
Montana 1 Fee #3						
Montana 1 Fee #3 - OH - OH	7,490.04	2,748.34	1,318.26	1,101.49	6.081	CC
Montana 1 Fee #3 - OH - OH	7,500.00	2,747.87	1,318.30	1,101.26	6.074	ES
Montana 1 Fee #3 - OH - OH	7,558.95	2,745.10	1,320.06	1,101.70	6.045	SF
Pan American Matlock #1						
Pan American Matlock #1 - OH - OH	5,850.12	2,829.88	1,492.89	1,332.65	9.317	CC
Pan American Matlock #1 - OH - OH	5,900.00	2,828.18	1,493.72	1,332.52	9.266	ES
Pan American Matlock #1 - OH - OH	6,900.00	2,794.11	1,824.74	1,548.36	6.602	SF

Offset Design		Anadarko Anderson #1 - Anadarko Anderson #1 - OH - OH										Offset Site Error: 0.00 usft	
Survey Program: 263-INC												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	0.00	0.00	0.00	0.00	-94.50	-144.30	-1,831.70	1,837.38				
100.00	100.00	95.50	95.50	0.09	1.83	-94.50	-144.15	-1,831.69	1,837.36	1,835.44	1.91	960.798	
200.00	200.00	196.33	196.33	0.32	3.75	-94.48	-143.66	-1,831.67	1,837.30	1,833.24	4.05	453.108	
300.00	300.00	296.81	296.80	0.54	6.12	-94.46	-142.86	-1,831.64	1,837.20	1,830.56	6.64	276.713	
400.00	400.00	397.51	397.50	0.77	10.51	-94.43	-141.85	-1,831.60	1,837.09	1,825.86	11.23	163.601	
500.00	500.00	498.37	498.35	0.99	15.17	-94.38	-140.44	-1,831.54	1,836.92	1,820.83	16.09	114.167	
600.00	600.00	599.80	599.57	1.22	21.78	-94.33	-138.56	-1,831.46	1,836.70	1,813.82	22.88	80.277	
700.00	700.00	701.03	700.96	1.44	29.49	-94.25	-136.00	-1,831.36	1,836.41	1,805.64	30.77	58.681	
800.00	800.00	800.38	800.27	1.67	37.80	-94.16	-133.18	-1,831.24	1,836.09	1,796.83	39.25	46.775	
900.00	900.00	899.40	899.27	1.89	44.85	-94.09	-130.85	-1,831.15	1,835.82	1,789.33	46.49	39.487	
1,000.00	1,000.00	998.62	998.47	2.12	51.66	-94.03	-128.97	-1,831.07	1,835.61	1,782.11	53.50	34.311	
1,100.00	1,100.00	1,098.61	1,098.44	2.34	57.46	-93.97	-127.23	-1,831.00	1,835.42	1,775.92	59.49	30.851	
1,200.00	1,200.00	1,198.59	1,198.40	2.56	63.31	-93.92	-125.49	-1,830.92	1,835.22	1,769.68	65.55	27.999	

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



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design: Anadarko Anderson #1 - Anadarko Anderson #1 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 263-INC														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)	Offset Wellbore Centre E-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Separation (usft)	Separation Factor			
1,300.00	1,300.00	1,298.58	1,298.37	2.79	69.17	-93.87	-123.74	-1,830.85	1,835.03	1,763.43	71.61	25.827			
1,400.00	1,400.00	1,398.98	1,398.76	3.01	75.32	-93.81	-121.97	-1,830.78	1,834.84	1,756.89	77.96	23.537			
1,500.00	1,500.00	1,500.04	1,499.80	3.24	82.70	-93.74	-119.58	-1,830.68	1,834.59	1,749.06	85.53	21.450			
1,600.00	1,600.00	1,599.34	1,599.07	3.46	90.29	-93.67	-117.26	-1,830.59	1,834.34	1,741.03	93.31	19.658			
1,700.00	1,700.00	1,698.79	1,698.50	3.69	96.12	-93.60	-115.24	-1,830.50	1,834.13	1,734.78	99.35	18.461			
1,800.00	1,800.00	1,798.25	1,797.94	3.91	101.96	-93.55	-113.51	-1,830.43	1,833.95	1,728.56	105.39	17.402			
1,900.00	1,900.00	1,897.71	1,897.39	4.14	107.79	-93.50	-112.05	-1,830.37	1,833.80	1,722.37	111.43	16.457			
2,000.00	2,000.00	1,999.49	1,999.15	4.36	114.32	-93.45	-110.25	-1,830.30	1,833.62	1,715.45	118.16	15.517			
2,100.00	2,100.00	2,099.62	2,099.25	4.59	121.24	-93.37	-107.77	-1,830.19	1,833.37	1,708.08	125.29	14.633			
2,200.00	2,200.00	2,198.95	2,198.56	4.81	128.30	-93.30	-105.58	-1,830.10	1,833.15	1,700.59	132.56	13.829			
2,300.00	2,300.00	2,298.43	2,298.02	5.04	135.12	-93.24	-103.74	-1,830.03	1,832.97	1,693.39	139.58	13.132			
2,375.63	2,375.63	2,374.05	2,373.63	5.21	139.52	-93.20	-102.42	-1,829.97	1,832.84	1,688.70	144.14	12.715			
2,400.00	2,399.99	2,398.41	2,397.99	5.26	140.94	-5.56	-101.99	-1,829.96	1,832.23	1,686.62	145.61	12.583			
2,450.00	2,449.75	2,448.11	2,447.68	5.36	143.75	-5.60	-101.13	-1,829.92	1,827.44	1,678.92	148.52	12.305			
2,500.00	2,498.82	2,497.01	2,496.57	5.46	146.28	-5.71	-100.31	-1,829.89	1,817.93	1,666.78	151.15	12.027			
2,550.00	2,546.76	2,544.77	2,544.33	5.60	148.76	-5.89	-99.56	-1,829.86	1,803.78	1,650.05	153.73	11.733			
2,600.00	2,593.13	2,590.97	2,590.52	5.74	151.15	-6.17	-98.88	-1,829.83	1,785.14	1,628.91	156.23	11.426			
2,650.00	2,637.49	2,635.18	2,634.72	5.93	153.44	-6.54	-98.26	-1,829.80	1,762.16	1,603.54	158.62	11.109			
2,700.00	2,679.44	2,677.06	2,676.50	6.18	155.46	-7.04	-97.71	-1,829.78	1,735.07	1,574.33	160.75	10.794			
2,750.00	2,718.59	2,716.21	2,715.75	6.52	157.24	-7.71	-97.20	-1,829.76	1,704.11	1,541.49	162.62	10.479			
2,800.00	2,754.59	2,752.20	2,751.74	6.96	158.87	-8.60	-96.73	-1,829.74	1,669.57	1,505.22	164.35	10.159			
2,850.00	2,787.09	2,784.70	2,784.24	7.52	160.35	-9.81	-96.31	-1,829.72	1,631.77	1,465.86	165.91	9.836			
2,900.00	2,815.81	2,813.42	2,812.95	8.20	161.65	-11.48	-95.93	-1,829.71	1,591.05	1,423.77	167.28	9.511			
2,950.00	2,840.47	2,838.08	2,837.61	9.00	162.77	-13.88	-95.61	-1,829.69	1,547.80	1,379.35	168.46	9.188			
3,000.00	2,860.86	2,858.46	2,857.99	9.92	163.70	-17.53	-95.34	-1,829.68	1,502.43	1,333.00	169.42	8.868			
3,050.00	2,876.77	2,874.38	2,873.90	10.94	164.42	-23.52	-95.13	-1,829.67	1,455.34	1,285.17	170.17	8.552			
3,100.00	2,888.08	2,885.68	2,885.20	12.04	164.94	-34.49	-94.98	-1,829.67	1,406.98	1,236.29	170.70	8.243			
3,150.00	2,894.66	2,892.26	2,891.79	13.20	165.24	-56.92	-94.90	-1,829.66	1,357.81	1,186.82	170.99	7.941			
3,200.00	2,896.46	2,894.07	2,893.59	14.40	165.32	-95.91	-94.88	-1,829.66	1,308.26	1,137.22	171.04	7.649			
3,211.99	2,896.18	2,893.79	2,893.31	14.69	165.31	-105.45	-94.88	-1,829.66	1,296.38	1,125.35	171.02	7.580			
3,300.00	2,893.11	2,890.71	2,890.24	16.87	165.17	-104.49	-94.92	-1,829.66	1,209.25	1,038.43	170.82	7.079			
3,400.00	2,889.62	2,887.23	2,886.75	19.43	165.01	-103.38	-94.96	-1,829.67	1,110.40	939.81	170.59	6.509			
3,500.00	2,886.13	2,883.74	2,883.26	22.03	164.85	-102.26	-95.01	-1,829.67	1,011.77	841.38	170.39	5.938			
3,600.00	2,882.64	2,880.25	2,879.77	24.66	164.69	-101.13	-95.06	-1,829.67	913.42	743.22	170.20	5.367			
3,700.00	2,879.15	2,876.76	2,876.28	27.33	164.53	-100.00	-95.10	-1,829.67	815.46	645.42	170.04	4.796			
3,800.00	2,875.66	2,873.27	2,872.79	30.00	164.37	-98.86	-95.15	-1,829.67	718.05	548.15	169.90	4.226			
3,900.00	2,872.17	2,869.78	2,869.30	32.70	164.21	-97.71	-95.19	-1,829.68	621.44	451.72	169.72	3.662			
4,000.00	2,868.68	2,866.29	2,865.81	35.40	164.05	-96.55	-95.24	-1,829.68	526.07	356.70	169.37	3.106			
4,100.00	2,865.19	2,862.80	2,862.33	38.11	163.89	-95.39	-95.28	-1,829.68	432.77	264.31	168.46	2.569			
4,200.00	2,861.70	2,859.31	2,858.84	40.83	163.74	-94.23	-95.33	-1,829.68	343.23	177.38	165.85	2.070			
4,300.00	2,858.21	2,855.82	2,855.35	43.55	163.58	-93.06	-95.38	-1,829.68	261.34	103.39	157.95	1.655			
4,400.00	2,854.72	2,852.33	2,851.86	46.28	163.42	-91.89	-95.42	-1,829.69	196.89	62.14	134.75	1.461 Level 3			
4,497.84	2,851.31	2,848.91	2,848.44	48.95	163.26	-90.75	-95.47	-1,829.69	170.90	66.47	104.43	1.636 CC			
4,500.00	2,851.23	2,848.84	2,848.37	49.01	163.26	-90.73	-95.47	-1,829.69	170.91	66.39	104.52	1.635			
4,600.00	2,847.74	2,845.35	2,844.88	51.75	163.10	-89.56	-95.51	-1,829.69	199.07	58.33	140.74	1.414 Level 3, ES, SF			
4,700.00	2,844.25	2,841.86	2,841.39	54.49	162.94	-88.39	-95.56	-1,829.69	264.62	99.64	164.98	1.604			
4,800.00	2,840.76	2,838.37	2,837.90	57.23	162.79	-87.22	-95.60	-1,829.69	346.98	173.93	173.05	2.005			
4,900.00	2,837.27	2,834.88	2,834.41	59.97	162.63	-86.06	-95.65	-1,829.69	436.74	261.25	175.49	2.489			
5,000.00	2,833.78	2,831.39	2,830.92	62.71	162.47	-84.90	-95.69	-1,829.70	530.15	354.12	176.04	3.012			

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



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Survey Program: 263-INC														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	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)					
5,100.00	2,830.29	2,827.90	2,827.43	65.46	162.31	-83.74	-95.74	-1,829.70	625.59	449.68	175.91	3.556			
5,200.00	2,826.80	2,824.41	2,823.94	69.20	162.15	-82.60	-95.79	-1,829.70	722.24	546.71	175.54	4.114			
5,300.00	2,823.31	2,820.92	2,820.45	70.95	161.99	-81.45	-95.83	-1,829.70	819.68	644.60	175.09	4.682			
5,400.00	2,819.82	2,817.43	2,816.96	73.70	161.84	-80.32	-95.88	-1,829.70	917.66	743.04	174.62	5.255			
5,500.00	2,816.33	2,813.94	2,813.47	76.45	161.68	-79.19	-95.92	-1,829.71	1,016.03	841.85	174.18	5.833			
5,600.00	2,812.84	2,810.45	2,809.98	79.20	161.52	-78.07	-95.97	-1,829.71	1,114.67	940.92	173.75	6.415			
5,700.00	2,809.35	2,806.96	2,806.49	81.95	161.36	-76.97	-96.01	-1,829.71	1,213.52	1,040.17	173.35	7.001			
5,800.00	2,805.86	2,803.47	2,803.01	84.70	161.20	-75.87	-96.06	-1,829.71	1,312.54	1,139.57	172.97	7.588			
5,900.00	2,802.37	2,799.98	2,799.52	87.45	161.04	-74.78	-96.11	-1,829.71	1,411.69	1,239.07	172.62	8.178			
6,000.00	2,798.88	2,796.49	2,796.03	90.20	160.88	-73.71	-96.15	-1,829.72	1,510.84	1,338.66	172.28	8.770			
6,100.00	2,795.39	2,793.00	2,792.54	92.96	160.73	-72.64	-96.20	-1,829.72	1,610.28	1,438.31	171.97	9.364			
6,200.00	2,791.90	2,789.51	2,789.05	95.71	160.57	-71.59	-96.24	-1,829.72	1,709.69	1,538.02	171.67	9.959			
6,300.00	2,788.41	2,786.02	2,785.56	98.47	160.41	-70.56	-96.29	-1,829.72	1,809.15	1,637.77	171.38	10.556			
6,400.00	2,784.92	2,782.53	2,782.07	101.22	160.25	-69.54	-96.33	-1,829.72	1,908.67	1,737.56	171.11	11.154			
6,500.00	2,781.43	2,779.04	2,778.58	103.97	160.09	-68.53	-96.38	-1,829.73	2,008.23	1,837.37	170.85	11.754			
6,600.00	2,777.94	2,775.55	2,775.09	106.73	159.93	-67.53	-96.43	-1,829.73	2,107.82	1,937.22	170.60	12.355			
6,700.00	2,774.45	2,772.06	2,771.60	109.49	159.78	-66.55	-96.47	-1,829.73	2,207.44	2,037.08	170.36	12.958			
6,800.00	2,770.96	2,768.57	2,768.11	112.24	159.62	-65.59	-96.52	-1,829.73	2,307.10	2,136.97	170.13	13.561			
6,900.00	2,767.47	2,765.09	2,764.62	115.00	159.46	-64.64	-96.56	-1,829.73	2,406.77	2,236.87	169.90	14.166			
7,000.00	2,763.98	2,761.60	2,761.13	117.75	159.30	-63.70	-96.61	-1,829.73	2,506.47	2,336.79	169.68	14.772			
7,100.00	2,760.49	2,758.11	2,757.64	120.51	159.14	-62.78	-96.65	-1,829.74	2,606.18	2,436.72	169.46	15.379			
7,200.00	2,757.00	2,754.62	2,754.15	123.27	158.98	-61.88	-96.70	-1,829.74	2,705.92	2,536.66	169.25	15.987			
7,300.00	2,753.51	2,751.13	2,750.66	126.02	158.83	-60.99	-96.74	-1,829.74	2,805.66	2,636.61	169.05	16.597			
7,400.00	2,750.02	2,747.64	2,747.17	128.78	158.67	-60.11	-96.79	-1,829.74	2,905.42	2,736.57	168.85	17.207			
7,500.00	2,746.53	2,744.15	2,743.69	131.54	158.51	-59.26	-96.84	-1,829.74	3,005.19	2,836.54	168.65	17.819			
7,558.95	2,744.47	2,742.09	2,741.63	133.16	158.42	-58.76	-96.86	-1,829.75	3,064.02	2,895.48	168.54	18.180			



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit I	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design												Offset Site Error:	0.00 usft
Montana 1 Fee #3 - Montana 1 Fee #3 - OH - OH												Offset Well Error:	0.00 usft
Survey Program: 176-INC													
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	1.51	1.51	0.00	0.03	-102.89	-1,118.10	-4,885.80	5,012.10				
100.00	100.00	152.49	152.49	0.09	3.56	-102.89	-1,118.11	-4,884.99	5,011.59	5,009.34	2.25	2,231.824	
200.00	200.00	257.39	257.38	0.32	7.20	-102.90	-1,118.14	-4,883.76	5,010.44	5,005.96	4.48	1,118.596	
300.00	300.00	353.80	353.78	0.54	10.87	-102.90	-1,118.16	-4,882.67	5,009.35	5,002.65	6.69	748.247	
400.00	400.00	450.20	450.18	0.77	14.53	-102.90	-1,118.18	-4,881.66	5,008.33	4,999.42	8.91	562.023	
500.00	500.00	548.61	548.59	0.99	18.20	-102.90	-1,118.19	-4,880.72	5,007.38	4,996.26	11.13	449.974	
600.00	600.00	632.00	631.97	1.22	21.44	-102.91	-1,118.21	-4,879.95	5,006.52	4,993.40	13.12	381.663	
700.00	700.00	731.83	731.80	1.44	24.07	-102.91	-1,118.22	-4,879.20	5,005.79	4,990.20	15.59	321.068	
800.00	800.00	821.43	821.39	1.67	26.43	-102.91	-1,118.23	-4,878.73	5,005.28	4,987.44	17.84	280.554	
900.00	900.00	924.00	923.97	1.89	29.13	-102.91	-1,118.23	-4,878.42	5,005.00	4,984.61	20.39	245.481	
1,000.00	1,000.00	1,015.01	1,014.98	2.12	31.22	-102.91	-1,118.24	-4,878.21	5,004.76	4,982.36	22.40	223.460	
1,100.00	1,100.00	1,121.44	1,121.40	2.34	33.66	-102.91	-1,118.24	-4,877.84	5,004.41	4,979.71	24.71	202.536	
1,200.00	1,200.00	1,227.86	1,227.83	2.56	36.11	-102.91	-1,118.25	-4,877.32	5,003.94	4,976.92	27.02	185.177	
1,300.00	1,300.00	1,334.29	1,334.25	2.79	38.56	-102.92	-1,118.27	-4,876.66	5,003.34	4,974.00	29.34	170.546	
1,400.00	1,400.00	1,433.35	1,433.31	3.01	41.23	-102.92	-1,118.28	-4,875.98	5,002.68	4,971.11	31.57	158.475	
1,500.00	1,500.00	1,531.59	1,531.55	3.24	43.94	-102.92	-1,118.29	-4,875.35	5,002.05	4,968.28	33.79	148.039	
1,600.00	1,600.00	1,629.83	1,629.78	3.46	46.64	-102.92	-1,118.30	-4,874.75	5,001.46	4,965.45	36.01	138.891	
1,700.00	1,700.00	1,728.07	1,728.02	3.69	49.34	-102.92	-1,118.31	-4,874.18	5,000.90	4,962.67	38.23	130.807	
1,800.00	1,800.00	1,826.94	1,826.89	3.91	52.10	-102.92	-1,118.32	-4,873.65	5,000.38	4,959.91	40.47	123.560	
1,900.00	1,900.00	1,932.64	1,932.59	4.14	55.45	-102.93	-1,118.33	-4,873.02	4,999.80	4,956.91	42.89	116.570	
2,000.00	2,000.00	2,038.34	2,038.28	4.38	58.79	-102.93	-1,118.35	-4,872.27	4,999.11	4,953.80	45.31	110.324	
2,100.00	2,100.00	2,144.03	2,143.98	4.59	62.14	-102.93	-1,118.36	-4,871.40	4,998.31	4,950.58	47.73	104.710	
2,200.00	2,200.00	2,249.73	2,249.67	4.81	65.48	-102.93	-1,118.38	-4,870.40	4,997.39	4,947.24	50.16	99.635	
2,300.00	2,300.00	2,352.99	2,352.92	5.04	69.35	-102.94	-1,118.40	-4,869.32	4,996.38	4,943.72	52.66	94.881	
2,375.63	2,375.63	2,430.00	2,429.93	5.21	72.50	-102.94	-1,118.41	-4,868.48	4,995.58	4,940.99	54.59	91.514	
2,400.00	2,399.99	2,454.80	2,454.73	5.26	73.51	-15.33	-1,118.42	-4,868.21	4,994.77	4,939.56	55.21	90.473	
2,450.00	2,449.75	2,505.41	2,505.34	5.36	75.59	-15.50	-1,118.43	-4,867.65	4,989.67	4,933.20	56.47	88.356	
2,500.00	2,499.82	2,555.27	2,555.19	5.48	77.63	-15.62	-1,118.44	-4,867.08	4,979.99	4,922.25	57.73	86.258	
2,550.00	2,549.76	2,603.92	2,603.83	5.60	79.62	-16.32	-1,118.45	-4,866.52	4,965.82	4,906.84	58.98	84.198	
2,600.00	2,593.13	2,650.90	2,650.81	5.74	81.54	-17.01	-1,118.46	-4,865.97	4,947.30	4,887.11	60.19	82.189	
2,650.00	2,637.49	2,695.78	2,695.69	5.93	83.38	-17.94	-1,118.47	-4,865.43	4,924.60	4,863.23	61.37	80.240	
2,700.00	2,679.44	2,738.15	2,738.06	6.18	85.11	-19.14	-1,118.48	-4,864.92	4,897.94	4,835.43	62.51	78.360	
2,750.00	2,718.59	2,776.00	2,775.90	6.52	86.57	-20.70	-1,118.49	-4,864.46	4,867.57	4,804.05	63.52	76.636	
2,800.00	2,754.59	2,809.08	2,808.98	6.96	87.76	-22.70	-1,118.49	-4,864.08	4,833.79	4,769.39	64.40	75.060	
2,850.00	2,787.09	2,838.92	2,838.82	7.52	88.83	-25.31	-1,118.50	-4,863.74	4,796.93	4,731.70	65.23	73.543	
2,900.00	2,815.81	2,865.24	2,865.14	8.20	89.78	-28.75	-1,118.51	-4,863.46	4,757.31	4,691.32	65.99	72.091	
2,950.00	2,840.47	2,887.79	2,887.69	9.00	90.59	-33.37	-1,118.51	-4,863.23	4,715.32	4,648.63	66.69	70.706	
3,000.00	2,860.86	2,906.36	2,906.26	9.92	91.26	-39.70	-1,118.51	-4,863.04	4,671.32	4,604.01	67.32	69.394	
3,050.00	2,876.77	2,920.77	2,920.67	10.94	91.77	-48.47	-1,118.52	-4,862.90	4,625.74	4,557.87	67.87	68.159	
3,100.00	2,888.08	2,930.89	2,930.78	12.04	92.14	-60.54	-1,118.52	-4,862.81	4,578.99	4,510.65	68.34	67.003	
3,150.00	2,894.66	2,936.60	2,936.50	13.20	92.34	-76.21	-1,118.52	-4,862.75	4,531.51	4,462.78	68.73	65.929	
3,200.00	2,896.46	2,937.85	2,937.75	14.40	92.39	-93.96	-1,118.52	-4,862.74	4,483.73	4,414.69	69.04	64.942	
3,211.99	2,896.18	2,937.48	2,937.38	14.69	92.37	-98.17	-1,118.52	-4,862.74	4,472.28	4,403.17	69.10	64.718	
3,300.00	2,893.11	2,933.84	2,933.73	16.87	92.24	-98.02	-1,118.52	-4,862.78	4,388.34	4,318.76	69.58	63.072	
3,400.00	2,889.62	2,929.68	2,929.58	19.43	92.09	-97.84	-1,118.52	-4,862.82	4,293.16	4,222.94	70.21	61.144	
3,500.00	2,886.13	2,925.52	2,925.42	22.03	91.94	-97.66	-1,118.52	-4,862.86	4,198.19	4,127.24	70.95	59.170	
3,600.00	2,882.64	2,921.34	2,921.24	24.66	91.79	-97.48	-1,118.52	-4,862.90	4,103.46	4,031.68	71.79	57.160	
3,700.00	2,879.15	2,917.15	2,917.04	27.33	91.64	-97.31	-1,118.52	-4,862.94	4,008.99	3,936.26	72.72	55.126	
3,800.00	2,875.66	2,912.94	2,912.84	30.00	91.49	-97.13	-1,118.51	-4,862.98	3,914.78	3,841.03	73.75	53.079	

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



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Montana 1 Fee #3 - Montana 1 Fee #3 - OH - OH														Offset Well Error:	0.00 usft
Survey Program: 176-INC															
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)					
3,900.00	2,872.17	2,908.73	2,908.62	32.70	91.34	-96.95	-1,118.51	-4,863.02	3,820.86	3,745.98	74.88	51.026			
4,000.00	2,868.68	2,904.50	2,904.39	35.40	91.19	-96.76	-1,118.51	-4,863.06	3,727.26	3,651.15	76.10	48.976			
4,100.00	2,865.19	2,900.25	2,900.15	38.11	91.04	-96.58	-1,118.51	-4,863.10	3,633.99	3,556.56	77.42	46.936			
4,200.00	2,861.70	2,896.00	2,895.90	40.83	90.88	-96.40	-1,118.51	-4,863.14	3,541.08	3,462.23	78.85	44.910			
4,300.00	2,858.21	2,891.73	2,891.63	43.55	90.73	-96.22	-1,118.51	-4,863.19	3,448.56	3,368.18	80.38	42.905			
4,400.00	2,854.72	2,887.45	2,887.35	46.28	90.58	-96.03	-1,118.51	-4,863.23	3,356.46	3,274.45	82.02	40.925			
4,500.00	2,851.23	2,883.15	2,883.05	49.01	90.42	-95.85	-1,118.51	-4,863.27	3,264.83	3,181.06	83.77	38.973			
4,600.00	2,847.74	2,878.84	2,878.74	51.75	90.27	-95.66	-1,118.51	-4,863.32	3,173.69	3,088.04	85.65	37.054			
4,700.00	2,844.25	2,874.52	2,874.42	54.49	90.11	-95.48	-1,118.51	-4,863.36	3,083.10	2,995.44	87.66	35.171			
4,800.00	2,840.76	2,870.19	2,870.09	57.23	89.96	-95.29	-1,118.51	-4,863.41	2,993.10	2,903.29	89.81	33.326			
4,900.00	2,837.27	2,865.84	2,865.74	59.97	89.80	-95.10	-1,118.51	-4,863.45	2,903.75	2,811.63	92.11	31.524			
5,000.00	2,833.78	2,861.46	2,861.36	62.71	89.64	-94.92	-1,118.50	-4,863.50	2,815.10	2,720.53	94.57	29.766			
5,100.00	2,830.29	2,857.10	2,857.00	65.46	89.49	-94.73	-1,118.50	-4,863.55	2,727.24	2,630.03	97.21	28.056			
5,200.00	2,826.80	2,852.71	2,852.61	68.20	89.33	-94.54	-1,118.50	-4,863.59	2,640.23	2,540.20	100.03	26.395			
5,300.00	2,823.31	2,848.31	2,848.21	70.95	89.17	-94.35	-1,118.50	-4,863.64	2,554.16	2,451.12	103.05	24.787			
5,400.00	2,819.82	2,843.89	2,843.80	73.70	89.01	-94.16	-1,118.50	-4,863.69	2,469.14	2,362.86	106.28	23.233			
5,500.00	2,816.33	2,839.46	2,839.37	76.45	88.85	-93.97	-1,118.50	-4,863.74	2,385.27	2,275.53	109.74	21.736			
5,600.00	2,812.84	2,835.02	2,834.92	79.20	88.69	-93.77	-1,118.50	-4,863.79	2,302.68	2,189.23	113.45	20.297			
5,700.00	2,809.35	2,830.56	2,830.46	81.95	88.53	-93.58	-1,118.50	-4,863.83	2,221.51	2,104.09	117.42	18.920			
5,800.00	2,805.86	2,826.09	2,825.99	84.70	88.37	-93.39	-1,118.50	-4,863.88	2,141.93	2,020.26	121.66	17.605			
5,900.00	2,802.37	2,821.61	2,821.51	87.45	88.21	-93.19	-1,118.50	-4,863.93	2,064.11	1,937.91	126.20	16.356			
6,000.00	2,798.88	2,817.11	2,817.01	90.20	88.05	-93.00	-1,118.50	-4,863.98	1,988.26	1,857.22	131.04	15.173			
6,100.00	2,795.39	2,812.59	2,812.50	92.96	87.89	-92.80	-1,118.50	-4,864.04	1,914.63	1,778.43	136.20	14.058			
6,200.00	2,791.90	2,808.06	2,807.97	95.71	87.73	-92.61	-1,118.49	-4,864.09	1,843.47	1,701.80	141.67	13.012			
6,300.00	2,788.41	2,803.52	2,803.43	98.47	87.56	-92.41	-1,118.49	-4,864.14	1,775.08	1,627.63	147.45	12.038			
6,400.00	2,784.92	2,798.96	2,798.87	101.22	87.40	-92.21	-1,118.49	-4,864.19	1,709.79	1,556.26	153.53	11.136			
6,500.00	2,781.43	2,794.39	2,794.30	103.97	87.24	-92.01	-1,118.49	-4,864.24	1,647.98	1,488.10	159.88	10.307			
6,600.00	2,777.94	2,789.81	2,789.71	106.73	87.07	-91.82	-1,118.49	-4,864.30	1,590.05	1,423.59	166.46	9.552			
6,700.00	2,774.45	2,785.21	2,785.11	109.49	86.91	-91.62	-1,118.49	-4,864.35	1,536.43	1,363.25	173.18	8.872			
6,800.00	2,770.96	2,780.59	2,780.50	112.24	86.74	-91.42	-1,118.49	-4,864.41	1,487.59	1,307.62	179.96	8.266			
6,900.00	2,767.47	2,775.96	2,775.87	115.00	86.57	-91.22	-1,118.49	-4,864.46	1,444.02	1,257.33	186.69	7.735			
7,000.00	2,763.98	2,771.32	2,771.23	117.75	86.41	-91.01	-1,118.49	-4,864.52	1,406.21	1,212.99	193.22	7.278			
7,100.00	2,760.49	2,766.66	2,766.57	120.51	86.24	-90.81	-1,118.49	-4,864.57	1,374.63	1,175.24	199.39	6.894			
7,200.00	2,757.00	2,761.99	2,761.89	123.27	86.07	-90.61	-1,118.48	-4,864.63	1,349.72	1,144.71	205.02	6.583			
7,300.00	2,753.51	2,757.29	2,757.20	126.02	85.89	-90.40	-1,118.48	-4,864.69	1,331.86	1,121.93	209.93	6.344			
7,400.00	2,750.02	2,752.58	2,752.49	128.78	85.70	-90.20	-1,118.48	-4,864.75	1,321.33	1,107.36	213.97	6.175			
7,490.04	2,746.87	2,748.34	2,748.25	131.26	85.53	-90.02	-1,118.48	-4,864.80	1,318.26	1,101.49	216.78	6.081 CC			
7,500.00	2,746.53	2,747.87	2,747.78	131.54	85.51	-90.00	-1,118.48	-4,864.80	1,318.30	1,101.26	217.04	6.074 ES			
7,558.95	2,744.47	2,745.10	2,745.00	133.16	85.40	-89.88	-1,118.48	-4,864.84	1,320.06	1,101.70	218.36	6.045 SF			



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Pan American Matlock #1 - Pan American Matlock #1 - OH - OH														Offset Well Error:	0.00 usft
Survey Program: 100-INC															
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	0.00	0.00	0.00	0.00	-114.22	-1,456.60	-3,238.00	3,550.65						
100.00	100.00	124.85	124.82	0.09	8.45	-114.18	-1,453.99	-3,237.95	3,549.82	3,542.03	7.79	455.839			
200.00	200.00	224.79	224.70	0.32	19.72	-114.13	-1,450.50	-3,237.89	3,548.33	3,530.06	18.27	194.174			
300.00	300.00	324.73	324.57	0.54	30.99	-114.08	-1,447.01	-3,237.83	3,546.85	3,518.07	28.77	123.267			
400.00	400.00	424.67	424.45	0.77	42.27	-114.03	-1,443.53	-3,237.76	3,545.37	3,506.08	39.28	90.254			
500.00	500.00	524.61	524.33	0.99	53.54	-113.98	-1,440.04	-3,237.70	3,543.89	3,494.09	49.80	71.164			
600.00	600.00	624.55	624.21	1.22	64.82	-113.93	-1,436.55	-3,237.64	3,542.41	3,482.09	60.32	58.724			
700.00	700.00	724.49	724.09	1.44	76.09	-113.88	-1,433.06	-3,237.57	3,540.94	3,470.09	70.86	49.974			
800.00	800.00	824.43	823.97	1.67	87.37	-113.82	-1,429.58	-3,237.51	3,539.47	3,458.07	81.40	43.484			
900.00	900.00	924.37	923.84	1.89	98.64	-113.77	-1,426.09	-3,237.45	3,538.00	3,446.06	91.95	38.479			
1,000.00	1,000.00	1,024.31	1,023.72	2.12	109.92	-113.72	-1,422.60	-3,237.38	3,536.54	3,434.04	102.50	34.502			
1,100.00	1,100.00	1,124.24	1,123.60	2.34	121.19	-113.67	-1,419.12	-3,237.32	3,535.08	3,422.01	113.07	31.266			
1,200.00	1,200.00	1,224.18	1,223.48	2.56	132.47	-113.62	-1,415.63	-3,237.26	3,533.62	3,409.98	123.64	28.580			
1,300.00	1,300.00	1,324.12	1,323.36	2.79	143.74	-113.57	-1,412.14	-3,237.19	3,532.17	3,397.95	134.22	26.316			
1,400.00	1,400.00	1,424.06	1,423.23	3.01	155.01	-113.52	-1,408.65	-3,237.13	3,530.71	3,385.91	144.81	24.382			
1,500.00	1,500.00	1,524.00	1,523.11	3.24	166.29	-113.47	-1,405.17	-3,237.07	3,529.26	3,373.86	155.40	22.710			
1,600.00	1,600.00	1,623.94	1,622.99	3.46	177.56	-113.41	-1,401.68	-3,237.00	3,527.82	3,361.81	166.01	21.251			
1,700.00	1,700.00	1,723.88	1,722.87	3.69	188.84	-113.36	-1,398.19	-3,236.94	3,526.37	3,349.75	176.62	19.966			
1,800.00	1,800.00	1,823.82	1,822.75	3.91	200.11	-113.31	-1,394.70	-3,236.88	3,524.93	3,337.69	187.24	18.826			
1,900.00	1,900.00	1,923.76	1,922.63	4.14	211.39	-113.26	-1,391.22	-3,236.81	3,523.49	3,325.63	197.87	17.808			
2,000.00	2,000.00	2,023.70	2,022.50	4.36	222.66	-113.21	-1,387.73	-3,236.75	3,522.06	3,313.56	208.50	16.892			
2,100.00	2,100.00	2,123.64	2,122.38	4.59	233.94	-113.16	-1,384.24	-3,236.69	3,520.63	3,301.48	219.14	16.065			
2,200.00	2,200.00	2,223.57	2,222.26	4.81	245.21	-113.10	-1,380.76	-3,236.62	3,519.20	3,289.40	229.79	15.315			
2,300.00	2,300.00	2,323.51	2,322.14	5.04	256.49	-113.05	-1,377.27	-3,236.56	3,517.77	3,277.32	240.45	14.630			
2,375.63	2,375.63	2,399.10	2,397.68	5.21	265.01	-113.01	-1,374.63	-3,236.51	3,516.69	3,268.17	248.52	14.151			
2,400.00	2,399.99	2,423.44	2,422.01	5.26	267.76	-25.41	-1,373.78	-3,236.50	3,515.83	3,264.72	251.11	14.001			
2,450.00	2,449.75	2,473.17	2,471.71	5.36	273.37	-25.65	-1,372.05	-3,236.47	3,510.85	3,254.50	256.35	13.696			
2,500.00	2,499.82	2,522.23	2,520.73	5.48	278.90	-26.15	-1,370.33	-3,236.43	3,501.59	3,240.12	261.47	13.392			
2,550.00	2,546.76	2,570.15	2,568.62	5.60	284.31	-26.91	-1,368.66	-3,236.40	3,488.14	3,221.73	266.41	13.093			
2,600.00	2,593.13	2,616.50	2,614.95	5.74	289.54	-27.98	-1,367.05	-3,236.37	3,470.64	3,199.52	271.12	12.801			
2,650.00	2,637.49	2,660.85	2,659.27	5.93	294.54	-29.38	-1,365.50	-3,236.35	3,449.25	3,173.69	275.56	12.517			
2,700.00	2,679.44	2,702.80	2,701.19	6.18	299.27	-31.18	-1,364.03	-3,236.32	3,424.19	3,144.50	279.69	12.243			
2,750.00	2,718.59	2,741.95	2,740.32	6.52	303.69	-33.47	-1,362.67	-3,236.29	3,395.70	3,112.24	283.46	11.979			
2,800.00	2,764.59	2,777.95	2,776.30	6.96	307.75	-36.33	-1,361.41	-3,236.27	3,364.07	3,077.23	286.85	11.728			
2,850.00	2,787.09	2,810.47	2,808.80	7.52	311.42	-39.90	-1,360.28	-3,236.25	3,329.62	3,039.80	289.81	11.489			
2,900.00	2,815.81	2,839.20	2,837.51	8.20	314.66	-44.33	-1,359.27	-3,236.23	3,292.67	3,000.34	292.33	11.263			
2,950.00	2,840.47	2,863.89	2,862.18	9.00	317.45	-49.79	-1,358.41	-3,236.22	3,253.61	2,959.22	294.39	11.052			
3,000.00	2,860.86	2,884.30	2,882.58	9.92	319.75	-56.44	-1,357.70	-3,236.20	3,212.80	2,916.84	295.97	10.855			
3,050.00	2,876.77	2,900.24	2,898.52	10.94	321.55	-64.36	-1,357.14	-3,236.19	3,170.66	2,873.61	297.05	10.674			
3,100.00	2,888.08	2,911.58	2,909.84	12.04	322.83	-73.41	-1,356.75	-3,236.19	3,127.59	2,829.97	297.62	10.509			
3,150.00	2,894.66	2,918.20	2,916.45	13.20	323.57	-83.21	-1,356.52	-3,236.18	3,084.01	2,786.32	297.69	10.360			
3,200.00	2,896.46	2,920.04	2,918.30	14.40	323.78	-93.13	-1,356.45	-3,236.18	3,040.35	2,743.09	297.25	10.228			
3,211.99	2,896.18	2,919.77	2,918.03	14.69	323.75	-95.44	-1,356.46	-3,236.18	3,029.90	2,732.83	297.07	10.199			
3,300.00	2,893.11	2,916.77	2,915.03	16.87	323.41	-98.33	-1,356.57	-3,236.18	2,953.68	2,658.04	295.65	9.991			
3,400.00	2,889.62	2,913.36	2,911.63	19.43	323.03	-95.20	-1,356.69	-3,236.19	2,867.89	2,573.90	293.99	9.755			
3,500.00	2,886.13	2,909.96	2,908.22	22.03	322.64	-95.07	-1,356.81	-3,236.19	2,783.05	2,490.78	292.26	9.522			
3,600.00	2,882.64	2,906.55	2,904.82	24.66	322.26	-94.94	-1,356.92	-3,236.19	2,699.23	2,408.80	290.43	9.294			
3,700.00	2,879.15	2,903.14	2,901.41	27.33	321.88	-94.81	-1,357.04	-3,236.19	2,615.55	2,328.10	288.45	9.071			
3,800.00	2,875.66	2,899.73	2,898.01	30.00	321.49	-94.68	-1,357.16	-3,236.19	2,535.11	2,248.83	286.29	8.855			

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



TDS
Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore:	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

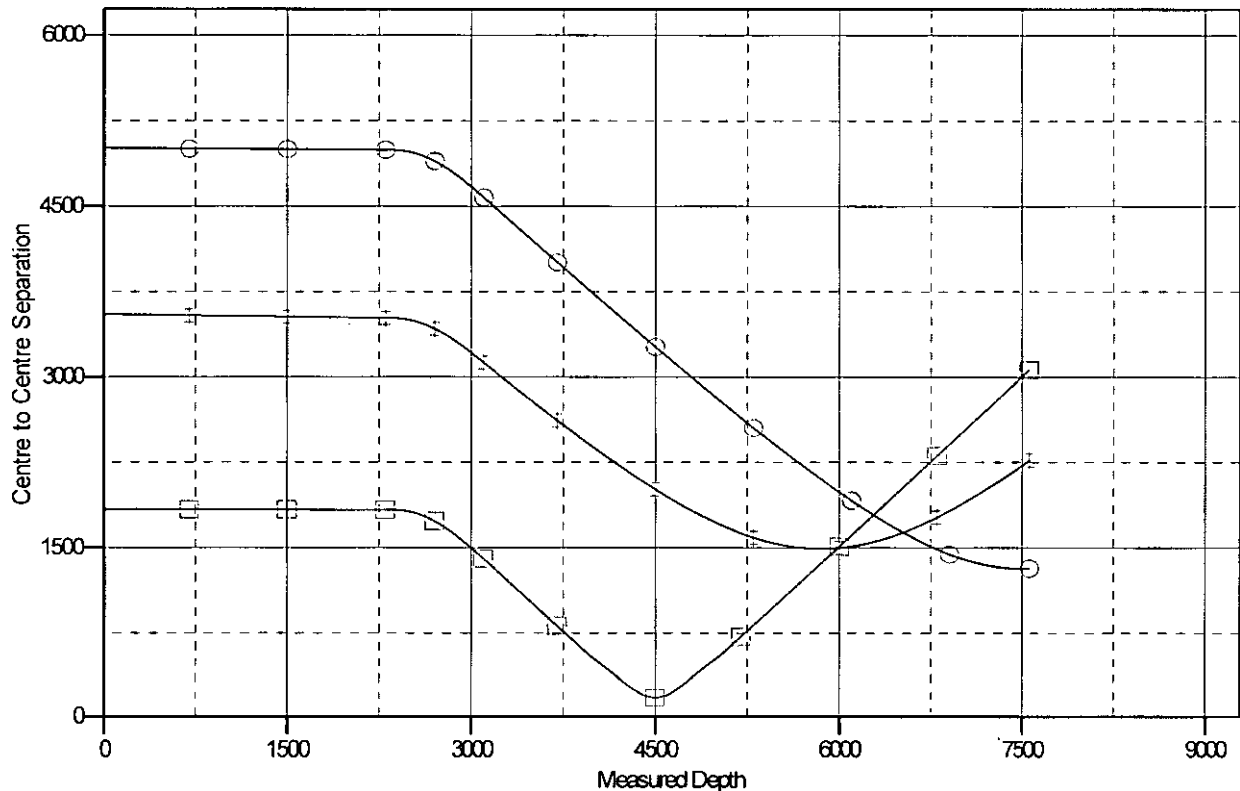
Offset Design														Offset Site Error: 0.00 usft	
Pan American Matlock #1 - Pan American Matlock #1 - OH - OH														Offset Well Error: 0.00 usft	
Survey Program: 100-INC															
Reference		Offset		Semi Major Axis		Distance								Warning	
Measured Depth (usft)	Vertical Depth (usft)	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			
3,900.00	2,872.17	2,896.33	2,894.60	32.70	321.11	-94.55	-1,357.28	-3,236.20	2,455.05	2,171.13	283.91	8.647			
4,000.00	2,868.68	2,892.92	2,891.20	35.40	320.72	-94.42	-1,357.40	-3,236.20	2,376.48	2,095.20	281.28	8.449			
4,100.00	2,865.19	2,889.51	2,887.79	38.11	320.34	-94.29	-1,357.52	-3,236.20	2,299.58	2,021.22	278.36	8.261			
4,200.00	2,861.70	2,886.10	2,884.39	40.83	319.95	-94.16	-1,357.64	-3,236.20	2,224.51	1,949.42	275.08	8.087			
4,300.00	2,858.21	2,882.70	2,880.98	43.55	319.57	-94.03	-1,357.76	-3,236.21	2,151.46	1,880.04	271.42	7.927			
4,400.00	2,854.72	2,879.29	2,877.58	46.28	319.18	-93.90	-1,357.88	-3,236.21	2,080.65	1,813.35	267.30	7.784			
4,500.00	2,851.23	2,875.88	2,874.17	49.01	318.80	-93.76	-1,357.99	-3,236.21	2,012.31	1,749.63	262.68	7.661			
4,600.00	2,847.74	2,872.47	2,870.77	51.75	318.42	-93.63	-1,358.11	-3,236.21	1,946.71	1,689.22	257.50	7.560			
4,700.00	2,844.25	2,869.07	2,867.36	54.49	318.03	-93.50	-1,358.23	-3,236.21	1,884.13	1,632.45	251.68	7.486			
4,800.00	2,840.76	2,865.56	2,863.95	57.23	317.65	-93.37	-1,358.35	-3,236.22	1,824.88	1,579.69	245.19	7.443			
4,900.00	2,837.27	2,862.25	2,860.55	59.97	317.26	-93.24	-1,358.47	-3,236.22	1,769.29	1,531.33	237.96	7.435			
5,000.00	2,833.78	2,858.85	2,857.14	62.71	316.88	-93.11	-1,358.59	-3,236.22	1,717.72	1,487.74	229.98	7.469			
5,100.00	2,830.29	2,855.44	2,853.74	65.46	316.49	-92.98	-1,358.71	-3,236.22	1,670.55	1,449.30	221.25	7.551			
5,200.00	2,826.80	2,852.03	2,850.33	68.20	316.11	-92.85	-1,358.83	-3,236.23	1,628.15	1,416.34	211.81	7.687			
5,300.00	2,823.31	2,848.62	2,846.93	70.95	315.73	-92.72	-1,358.95	-3,236.23	1,590.91	1,389.09	201.82	7.883			
5,400.00	2,819.82	2,845.22	2,843.52	73.70	315.34	-92.59	-1,359.06	-3,236.23	1,559.19	1,367.68	191.52	8.141			
5,500.00	2,816.33	2,841.81	2,840.12	76.45	314.96	-92.46	-1,359.18	-3,236.23	1,533.35	1,352.01	181.34	8.456			
5,600.00	2,812.84	2,838.40	2,836.71	79.20	314.57	-92.33	-1,359.30	-3,236.23	1,513.67	1,341.66	172.01	8.800			
5,700.00	2,809.35	2,834.99	2,833.31	81.95	314.19	-92.20	-1,359.42	-3,236.24	1,500.41	1,335.80	164.61	9.115			
5,800.00	2,805.86	2,831.59	2,829.90	84.70	313.80	-92.07	-1,359.54	-3,236.24	1,493.73	1,333.17	160.56	9.303			
5,850.12	2,804.11	2,829.88	2,828.20	86.08	313.61	-92.00	-1,359.60	-3,236.24	1,492.89	1,332.65	160.24	9.317 CC			
5,900.00	2,802.37	2,828.18	2,826.50	87.45	313.42	-91.94	-1,359.66	-3,236.24	1,493.72	1,332.52	161.20	9.266 ES			
6,000.00	2,798.88	2,824.77	2,823.09	90.20	313.03	-91.80	-1,359.78	-3,236.24	1,500.38	1,333.46	166.92	8.988			
6,100.00	2,795.39	2,821.36	2,819.69	92.96	312.65	-91.67	-1,359.90	-3,236.24	1,513.63	1,336.81	176.82	8.560			
6,200.00	2,791.90	2,817.96	2,816.28	95.71	312.27	-91.54	-1,360.02	-3,236.25	1,533.29	1,343.94	189.35	8.097			
6,300.00	2,788.41	2,814.55	2,812.88	98.47	311.88	-91.41	-1,360.13	-3,236.25	1,559.13	1,356.01	203.12	7.676			
6,400.00	2,784.92	2,811.14	2,809.47	101.22	311.50	-91.28	-1,360.25	-3,236.25	1,590.83	1,373.70	217.13	7.327			
6,500.00	2,781.43	2,807.73	2,806.07	103.97	311.11	-91.15	-1,360.37	-3,236.25	1,628.06	1,397.30	230.76	7.055			
6,600.00	2,777.94	2,804.33	2,802.66	106.73	310.73	-91.02	-1,360.49	-3,236.26	1,670.44	1,426.80	243.65	6.856			
6,700.00	2,774.45	2,800.92	2,799.25	109.49	310.34	-90.89	-1,360.61	-3,236.26	1,717.61	1,462.02	255.59	6.720			
6,800.00	2,770.96	2,797.51	2,795.85	112.24	309.96	-90.76	-1,360.73	-3,236.26	1,769.17	1,502.65	266.51	6.638			
6,900.00	2,767.47	2,794.11	2,792.44	115.00	309.57	-90.63	-1,360.85	-3,236.26	1,824.74	1,548.36	276.39	6.602 SF			
7,000.00	2,763.98	2,790.70	2,789.04	117.75	309.19	-90.50	-1,360.97	-3,236.26	1,883.99	1,598.73	285.25	6.505			
7,100.00	2,760.49	2,787.29	2,785.63	120.51	308.81	-90.37	-1,361.09	-3,236.27	1,946.56	1,653.40	293.16	6.540			
7,200.00	2,757.00	2,783.88	2,782.23	123.27	308.42	-90.24	-1,361.20	-3,236.27	2,012.16	1,711.97	300.19	6.703			
7,300.00	2,753.51	2,780.48	2,778.82	126.02	308.04	-90.11	-1,361.32	-3,236.27	2,080.49	1,774.08	306.41	6.790			
7,400.00	2,750.02	2,777.07	2,775.42	128.78	307.65	-89.98	-1,361.44	-3,236.27	2,151.29	1,839.40	311.89	6.898			
7,500.00	2,746.53	2,773.66	2,772.01	131.54	307.27	-89.85	-1,361.56	-3,236.27	2,224.34	1,907.61	316.72	7.023			
7,558.95	2,744.47	2,771.65	2,770.00	133.16	307.04	-89.77	-1,361.63	-3,236.28	2,268.36	1,949.06	319.29	7.104			

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3419.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.05°

Ladder Plot



LEGEND

◆ Pan American Matlock #1, OH, OHV0 ■ Anadarko Anderson #1, OH, OHV0 ● Montana 1 Fee #3, OH, OHV0

Company:	COG Operating LLC	Local Co-ordinate Reference:	Well SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Project:	Eddy County, NM (NAD-27 2015)	TVD Reference:	KB @ 3419.00usft (Silver Oak 3)
Reference Site:	Clydesdale 1 Fee #5H	MD Reference:	KB @ 3419.00usft (Silver Oak 3)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	BHL: 2310' FSL, 330' FWL, Sec 1, T19S, R25E, Unit L	Database:	EDM 5000.1 Single User Db
Reference Design:	Design #1	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3419.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: SHL: 2135' FSL, 150' FEL, Sec 1, T19S, R25E, Unit I
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: -0.05°

