

District I - (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II - (575) 748-1283
811 S. First St., Artesia, NM 88210
District III - (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV - (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised August 1, 2011

SUNDRY NOTICES AND REPORTS ON WELLS (DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)		WELL API NO. 30-015-42967
1. Type of Well: Oil Well ☒ Gas Well ☐ Other ☐		5. Indicate Type of Lease STATE ☒ FEE ☐
2. Name of Operator COG Operating LLC		6. State Oil & Gas Lease No.
3. Address of Operator One Concho Center - 600 W Illinois Ave Midland, TX 79701		7. Lease Name or Unit Agreement Name Halberd 27 State Com
4. Well Location Unit Letter M : 1003 feet from the SOUTH line and 65 feet from the WEST line Section 26 Township 17S Range 28E NMPM County EDDY		8. Well Number 1H
11. Elevation (Show whether DR, RKB, RT, GR, etc.) 3680'		9. OGRID Number 229137
		10. Pool name or Wildcat Artesia; Glorieta Yeso 96830

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO: PERFORM REMEDIAL WORK ☐ PLUG AND ABANDON ☐ TEMPORARILY ABANDON ☐ CHANGE PLANS ☐ PULL OR ALTER CASING ☐ MULTIPLE COMPL ☐ DOWNHOLE COMMINGLE ☐	SUBSEQUENT REPORT OF: REMEDIAL WORK ☐ ALTERING CASING ☐ COMMENCE DRILLING OPNS. ☐ P AND A ☐ CASING/CEMENT JOB ☐
OTHER: Change BHL ☒	OTHER: ☐

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

COG Operating LLC respectfully requests permission to change the BHL to:

975 FSL & 330 FWL

Revised C-102, Directional Plan and Anticollision Report are attached.

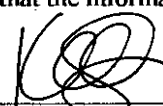
NM OIL CONSERVATION
ARTESIA DISTRICT
APR 28 2016

RECEIVED

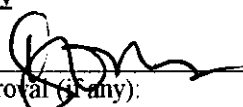
Spud Date:

Rig Release Date:

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE  TITLE Permitting Tech DATE 04/27/2016

Type or print name Kelly J. Holly E-mail address: kholly@concho.com PHONE: 432-685-4384
For State Use Only

APPROVED BY:  TITLE "Geologist" DATE 5/17/16

Conditions of Approval (if any):

NM OIL CONSERVATION

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
ARTESIA DISTRICT
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

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

RECEIVED

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number 30-015-42967		2 Pool Code 96830		3 Pool Name Artesia; Glorieta Yeso	
4 Property Code		5 Property Name HALBERD 27 STATE COM			
6 Well Number 1H		7 GRID NO. 229137			
8 Operator Name COG OPERATING, LLC		9 Elevation 3680'			
10 Surface Location					
UL or lot no. M	Section 26	Township 17S	Range 28E	Lot Idn 1003	Feet from the 1003
North/South line SOUTH		Feet from the 65		East/West line WEST	
County EDDY					
11 Bottom Hole Location If Different From Surface					
UL or lot no. M	Section 27	Township 17S	Range 28E	Lot Idn 975	Feet from the 975
North/South line SOUTH		Feet from the 330		East/West line WEST	
County EDDY					
12 Dedicated Acres 160		13 Joint or Infill		14 Consolidation Code	
15 Order No.					

No allowable will be assigned to this completion until all interest have been consolidated or a non-standard unit has been approved by the division.

		17 OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or undivided 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 a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: Date: 4-28-16 Printed Name: Kelly J. Holly E-mail Address: kholly@concho.com
18 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. 10-14-2014 Date of Survey Signature and Seal of Professional Surveyor: 19680 Certificate Number		CORNER DATA NAD 27 GRID - NM EAST A: FOUND BRASS CAP "1941" N 654171.7 - E 549562.6 B: FOUND BRASS CAP "1941" N 656782.8 - E 549589.7 C: FOUND BRASS CAP "1941" N 659394.4 - E 549615.6 D: FOUND BRASS CAP "1941" N 659403.5 - E 552227.1 E: FOUND BRASS CAP "1941" N 659411.7 - E 554838.6 F: FOUND BRASS CAP "1941" N 659612.6 - E 557438.4 G: FOUND BRASS CAP "1941" N 659806.8 - E 560025.7 H: FOUND BRASS CAP "1941" N 657151.1 - E 560029.7 I: FOUND BRASS CAP "1941" N 654489.2 - E 560017.8 J: FOUND BRASS CAP "1941" N 654360.8 - E 557407.3 K: FOUND BRASS CAP "1941" N 654234.8 - E 554798.0 L: FOUND BRASS CAP "1941" N 654203.5 - E 552180.8 M: FOUND BRASS CAP "1941" N 656823.2 - E 554818.4 1: CALCULATED CORNER N 654297.8 - E 556102.7 2: CALCULATED CORNER N 655601.5 - E 556111.6 3: CALCULATED CORNER N 655529.0 - E 554808.2 4: CALCULATED CORNER N 655477.2 - E 549576.2

RRC - Firm No.: TX 10193838 NM 4655451 - Job No.: LS140388



COG Operating LLC

Eddy County, NM (NAD27 NME)

Halberd 27 State

#1H

WB1

NM OIL CONSERVATION
ARTESIA DISTRICT

APR 28 2016

RECEIVED

Plan: Plan #1 03-02-15

Surface: 1003' FSL, 65' FWL, Sec 26, T17S, R28E, Unit M

PP: 965' FSL, 330' FEL, Sec 27, T17S, R28E, Unit P

BHL: 975' FSL, 330' FWL, Sec 27, T17S, R28E, Unit M

Standard Planning Report

02 March, 2015





Planning Report



Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
Site:	Halberd 27 State	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-02-15		

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	Halberd 27 State				
Site Position:		Northing:	657,322.00 usft	Latitude:	32° 48' 24.98418 N
From:	Map	Easting:	554,777.30 usft	Longitude:	104° 9' 18.18172 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.10 °

Well	#1H					
Well Position	+N/-S	-2,079.70 usft	Northing:	655,242.30 usft	Latitude:	32° 48' 4.40313 N
	+E/-W	93.70 usft	Easting:	554,871.00 usft	Longitude:	104° 9' 17.12500 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,680.00 usft

Wellbore	WB1				
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength
	IGRF2015	3/2/2015	(°) 7.51	(°) 60.53	(nT) 48,453

Design	Plan #1 03-02-15			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.00	0.00	0.00	268.94

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	
3,399.93	0.00	0.00	3,399.93	0.00	0.00	0.00	0.00	0.00	0.00	
4,222.66	90.50	263.28	3,920.78	-61.48	-521.81	11.00	11.00	0.00	263.28	
4,438.92	90.50	269.77	3,918.89	-74.59	-737.55	3.00	0.00	3.00	89.98	
8,669.77	90.50	269.77	3,882.00	-91.70	-4,968.20	0.00	0.00	0.00	0.00	BHL-Halberd 27 St #1

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
Site:	Halberd 27 State	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-02-15		

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
3,399.93	0.00	0.00	3,399.93	0.00	0.00	0.00	0.00	0.00	0.00
KOP, Begin 11°/100' Build									
3,500.00	11.01	263.28	3,499.39	-1.12	-9.52	9.54	11.00	11.00	0.00
3,600.00	22.01	263.28	3,595.12	-4.44	-37.69	37.77	11.00	11.00	0.00
3,700.00	33.01	263.28	3,683.68	-9.84	-83.49	83.66	11.00	11.00	0.00
3,800.00	44.01	263.28	3,761.81	-17.11	-145.23	145.52	11.00	11.00	0.00
3,900.00	55.01	263.28	3,826.64	-26.00	-220.64	221.08	11.00	11.00	0.00
4,000.00	66.01	263.28	3,875.80	-36.17	-306.95	307.57	11.00	11.00	0.00
4,093.81	76.33	263.28	3,906.04	-46.54	-395.02	395.81	11.00	11.00	0.00
PP-Halberd 27 St #1H									
4,100.00	77.01	263.28	3,907.47	-47.25	-400.99	401.80	11.00	11.00	0.00
4,200.00	88.01	263.28	3,920.49	-58.83	-499.31	500.31	11.00	11.00	0.00
4,203.70	88.42	263.28	3,920.60	-59.27	-502.99	503.99	11.00	11.00	0.00
TL, 3925' TVD @ 0 VZ, 90.5° Inc									
4,222.66	90.50	263.28	3,920.78	-61.48	-521.81	522.85	11.00	11.00	0.00
LP, Begin 3°/100' Turn									
4,300.00	90.50	265.60	3,920.11	-68.98	-598.78	599.95	3.00	0.00	3.00
4,400.00	90.50	268.60	3,919.23	-74.03	-698.63	699.88	3.00	0.00	3.00
4,438.92	90.50	269.77	3,918.89	-74.59	-737.55	738.80	3.00	0.00	3.00
Hold 90.5° Inc									
4,500.00	90.50	269.77	3,918.36	-74.83	-798.62	799.87	0.00	0.00	0.00
4,600.00	90.50	269.77	3,917.49	-75.24	-898.62	899.86	0.00	0.00	0.00
4,700.00	90.50	269.77	3,916.62	-75.64	-998.62	999.84	0.00	0.00	0.00
4,800.00	90.50	269.77	3,915.74	-76.05	-1,098.61	1,099.83	0.00	0.00	0.00
4,900.00	90.50	269.77	3,914.87	-76.45	-1,198.61	1,199.81	0.00	0.00	0.00
5,000.00	90.50	269.77	3,914.00	-76.86	-1,298.60	1,299.80	0.00	0.00	0.00
5,100.00	90.50	269.77	3,913.13	-77.26	-1,398.60	1,399.78	0.00	0.00	0.00
5,200.00	90.50	269.77	3,912.26	-77.67	-1,498.59	1,499.77	0.00	0.00	0.00
5,300.00	90.50	269.77	3,911.38	-78.07	-1,598.59	1,599.76	0.00	0.00	0.00
5,400.00	90.50	269.77	3,910.51	-78.47	-1,698.58	1,699.74	0.00	0.00	0.00
5,500.00	90.50	269.77	3,909.64	-78.88	-1,798.58	1,799.73	0.00	0.00	0.00
5,600.00	90.50	269.77	3,908.77	-79.28	-1,898.57	1,899.71	0.00	0.00	0.00
5,700.00	90.50	269.77	3,907.90	-79.69	-1,998.57	1,999.70	0.00	0.00	0.00
5,800.00	90.50	269.77	3,907.02	-80.09	-2,098.56	2,099.69	0.00	0.00	0.00
5,900.00	90.50	269.77	3,906.15	-80.50	-2,198.56	2,199.67	0.00	0.00	0.00
6,000.00	90.50	269.77	3,905.28	-80.90	-2,298.56	2,299.66	0.00	0.00	0.00
6,100.00	90.50	269.77	3,904.41	-81.31	-2,398.55	2,399.64	0.00	0.00	0.00
6,200.00	90.50	269.77	3,903.54	-81.71	-2,498.55	2,499.63	0.00	0.00	0.00
6,300.00	90.50	269.77	3,902.66	-82.11	-2,598.54	2,599.61	0.00	0.00	0.00
6,400.00	90.50	269.77	3,901.79	-82.52	-2,698.54	2,699.60	0.00	0.00	0.00
6,500.00	90.50	269.77	3,900.92	-82.92	-2,798.53	2,799.59	0.00	0.00	0.00
6,600.00	90.50	269.77	3,900.05	-83.33	-2,898.53	2,899.57	0.00	0.00	0.00
6,700.00	90.50	269.77	3,899.18	-83.73	-2,998.52	2,999.56	0.00	0.00	0.00
6,800.00	90.50	269.77	3,898.30	-84.14	-3,098.52	3,099.54	0.00	0.00	0.00
6,900.00	90.50	269.77	3,897.43	-84.54	-3,198.51	3,199.53	0.00	0.00	0.00
7,000.00	90.50	269.77	3,896.56	-84.95	-3,298.51	3,299.52	0.00	0.00	0.00
7,100.00	90.50	269.77	3,895.69	-85.35	-3,398.50	3,399.50	0.00	0.00	0.00
7,200.00	90.50	269.77	3,894.82	-85.76	-3,498.50	3,499.49	0.00	0.00	0.00
7,300.00	90.50	269.77	3,893.94	-86.16	-3,598.50	3,599.47	0.00	0.00	0.00
7,400.00	90.50	269.77	3,893.07	-86.56	-3,698.49	3,699.46	0.00	0.00	0.00
7,500.00	90.50	269.77	3,892.20	-86.97	-3,798.49	3,799.44	0.00	0.00	0.00
7,600.00	90.50	269.77	3,891.33	-87.37	-3,898.48	3,899.43	0.00	0.00	0.00
7,700.00	90.50	269.77	3,890.46	-87.78	-3,998.48	3,999.42	0.00	0.00	0.00

Database:	Compass 5000 GCR	Local Co-ordinate Reference:	Well #1H
Company:	COG Operating LLC	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Project:	Eddy County, NM (NAD27 NME)	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
Site:	Halberd 27 State	North Reference:	Grid
Well:	#1H	Survey Calculation Method:	Minimum Curvature
Wellbore:	WB1		
Design:	Plan #1 03-02-15		

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)
7,800.00	90.50	269.77	3,889.58	-88.18	-4,098.47	4,099.40	0.00	0.00	0.00
7,900.00	90.50	269.77	3,888.71	-88.59	-4,198.47	4,199.39	0.00	0.00	0.00
8,000.00	90.50	269.77	3,887.84	-88.99	-4,298.46	4,299.37	0.00	0.00	0.00
8,100.00	90.50	269.77	3,886.97	-89.40	-4,398.46	4,399.36	0.00	0.00	0.00
8,200.00	90.50	269.77	3,886.10	-89.80	-4,498.45	4,499.35	0.00	0.00	0.00
8,300.00	90.50	269.77	3,885.22	-90.20	-4,598.45	4,599.33	0.00	0.00	0.00
8,400.00	90.50	269.77	3,884.35	-90.61	-4,698.44	4,699.32	0.00	0.00	0.00
8,500.00	90.50	269.77	3,883.48	-91.01	-4,798.44	4,799.30	0.00	0.00	0.00
8,600.00	90.50	269.77	3,882.61	-91.42	-4,898.44	4,899.29	0.00	0.00	0.00
8,669.77	90.50	269.77	3,882.00	-91.70	-4,968.20	4,969.05	0.00	0.00	0.00
TD at 8669.78' MD - BHL-Halberd 27 St #1H									

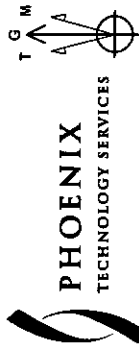
Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
BHL-Halberd 27 St #1H	0.00	0.01	3,882.00	-91.70	-4,968.20	655,150.60	549,902.80	32° 48' 3.57497 N	104° 10' 15.33444 W
- plan hits target center									
- Point									
PP-Halberd 27 St #1H	0.00	0.00	3,906.04	-46.54	-395.00	655,195.76	554,476.00	32° 48' 3.94915 N	104° 9' 21.75376 W
- plan hits target center									
- Point									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,203.70	3,920.60	TL, 3925' TVD @ 0 VZ, 90.5° Inc		-0.50	268.91	

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment
3,399.93	3,399.93	0.00	0.00	KOP, Begin 11°/100' Build
4,222.66	3,920.78	-61.48	-521.81	LP, Begin 3°/100' Turn
4,438.92	3,918.89	-74.59	-737.55	Hold 90.5° Inc
8,669.77	3,882.00	-91.70	-4,968.20	TD at 8669.78' MD



Project: Eddy County, NM (NAD27 NME)
Site: Halberd 27 State
Well: #1H
Wellbore: WB1
Design: Plan #1 03-02-15
Rig: Silver Oak 3



Asimuth to Grid North
True North: 0.0°
Magnetic North: 7.42°
Magnetic Field
Strength: 49452.8nT
Dip Angle: 60.53°
Date: 3/22/2015
Model: IGRF2015

WELL DETAILS

Ground Level 3680.00
Easting 554871.00
Northing 655421.30
Latitude 32° 48' 4.0313" N
Longitude 104° 9' 17.12500" W

SECTION DETAILS

Sec	MD	Inc	Alt	TVD	+N-S	-E-W	Dlog	IFace	Ysect	Target	Annotation
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	KOP Begin 11'100' Build
2	3398.93	0.00	0.00	3398.93	0.00	0.00	0.00	0.00	0.00	0.00	LP Begin 3'100' Turn
3	4358.92	90.50	288.77	3918.85	-74.59	-270.55	3.00	40.58	738.60	0.00	Hold 90.5° Inc
4	4358.92	90.50	288.77	3918.85	-74.59	-270.55	3.00	40.58	738.60	0.00	Hold 90.5° Inc
5	8668.77	90.50	288.77	3042.00	-31.70	-4983.78	0.00	0.00	4983.05	BHL-Halberd 27 St #1H	TD at 8668.78 MD

DESIGN TARGET DETAILS

Name	TVL	+N-S	-E-W	Northing	Easting	Latitude	Longitude	Shape
BHL-Halberd 27 St #1H	3882.00	-91.70	-4983.78	655150.60	549902.00	32° 48' 33.7487" N	104° 16' 15.3044" W	Point
PP-Halberd 27 St #1H	3908.84	-46.54	-395.00	655195.78	564478.00	32° 48' 3.8415" N	104° 9' 21.7578" W	Point
+ Plan View Target Center								

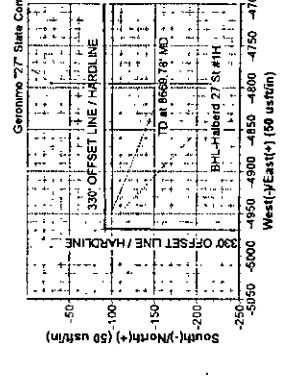
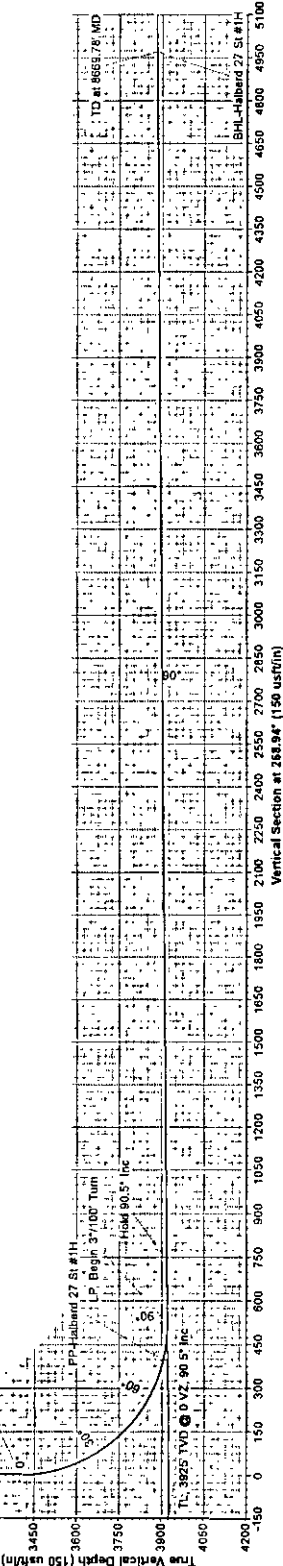
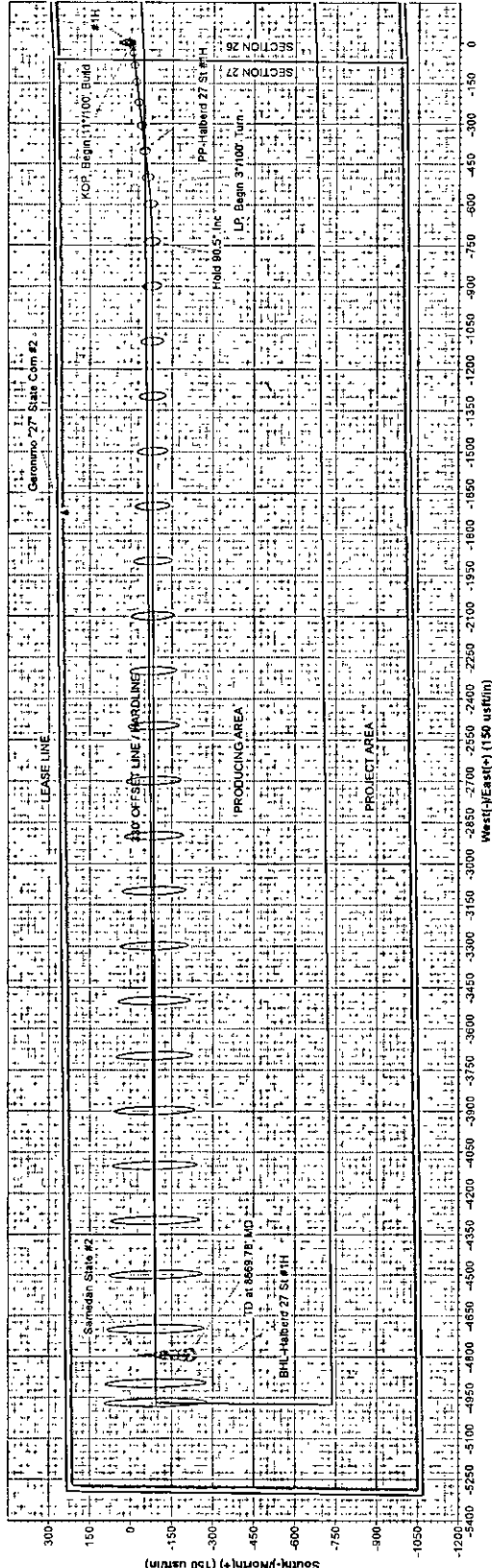
FORMATION TOP DETAILS

TVD Path 3912.60
MD Path 4203.70
Formation TL 3925
TVD @ 9.12 90.5° Inc
Dip Angle -0.50
Dip Angle 288.91

LEGEND

--- #2, WB1, As-Drilled V0
--- #2, WB1, As-Drilled V0
--- Plan #1 03-02-15

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 #1H, Grid North
Latitude 32° 48' 4.0313" N
Longitude 104° 9' 17.12500" W
Grid East 554871.00
Grid North 655421.30
Scale Factor 1.000
Geomagnetic Model IGRF2015
Sample Date 02-Mar-15
Magnetic Declination 7.51°
Dip Angle from Horizontal 60.53°
Magnetic Field Strength 49453
To convert a Magnetic Direction to a Grid Direction, Add 7.42°
To convert a Magnetic Direction to a True Direction, Add 7.51° East
To convert a True Direction to a Grid Direction, Subtract 0.10°





COG Operating LLC

Eddy County, NM (NAD27 NME)

Halberd 27 State

#1H

WB1

Plan #1 03-02-15

Anticollision Report

02 March, 2015





Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset.TVD Reference:	Offset Datum

Reference	Plan #1 03-02-15		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 50.00usft	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	3/2/2015		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
0.00	8,669.75	Plan #1 03-02-15 (WB1)	PHX+MWD+IGRF	PHX+MWD+IGRF v3:standard declination	

Site Name	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Geronimo "27" State Com						
#2 - WB1 - As-Drilled	8,496.18	3,867.02	7.77	-182.04	0.041	Level 1, CC, ES, SF
Samedan State						
#2 - WB1 - As-Drilled	5,423.06	3,884.55	315.45	243.10	4.360	CC, ES
#2 - WB1 - As-Drilled	5,500.00	3,883.88	324.70	249.45	4.315	SF

Offset Design		Geronimo "27" State Com - #2 - WB1 - As-Drilled										Offset Site Error:		0.00 usft	
Survey Program:		202-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		
0.00	0.00	0.00	0.00	0.00	0.00	-90.34	-28.27	-4,794.65	4,794.77						
50.00	50.00	32.96	32.96	0.06	0.04	-90.34	-28.29	-4,794.65	4,794.74	4,794.64	0.09	N/A			
100.00	100.00	82.90	82.90	0.15	0.09	-90.34	-28.42	-4,794.65	4,794.74	4,794.50	0.24	N/A			
150.00	150.00	132.84	132.84	0.33	0.14	-90.34	-28.65	-4,794.65	4,794.74	4,794.27	0.47	N/A			
200.00	200.00	182.77	182.77	0.51	0.20	-90.35	-28.99	-4,794.65	4,794.74	4,794.04	0.70	6,841.792			
250.00	250.00	232.71	232.71	0.68	0.29	-90.35	-29.44	-4,794.65	4,794.74	4,793.77	0.97	4,943.563			
300.00	300.00	282.65	282.64	0.86	0.40	-90.36	-29.99	-4,794.65	4,794.75	4,793.48	1.26	3,799.832			
350.00	350.00	332.58	332.57	1.04	0.51	-90.37	-30.64	-4,794.65	4,794.75	4,793.20	1.55	3,085.899			
400.00	400.00	382.51	382.49	1.22	0.62	-90.38	-31.40	-4,794.65	4,794.75	4,792.91	1.85	2,597.819			
450.00	450.00	432.46	432.44	1.40	0.74	-90.39	-32.25	-4,794.65	4,794.76	4,792.62	2.14	2,240.831			
500.00	500.00	482.45	482.42	1.58	0.85	-90.40	-33.12	-4,794.65	4,794.77	4,792.33	2.43	1,970.884			
550.00	550.00	532.45	532.41	1.76	0.97	-90.41	-33.99	-4,794.65	4,794.77	4,792.05	2.73	1,758.985			
600.00	600.00	582.44	582.39	1.94	1.08	-90.42	-34.87	-4,794.65	4,794.78	4,791.76	3.02	1,588.227			
650.00	650.00	632.43	632.38	2.12	1.19	-90.43	-35.74	-4,794.65	4,794.79	4,791.47	3.31	1,447.689			
700.00	700.00	682.42	682.36	2.30	1.31	-90.44	-36.61	-4,794.65	4,794.79	4,791.19	3.61	1,329.989			
750.00	750.00	732.42	732.35	2.48	1.42	-90.45	-37.48	-4,794.65	4,794.80	4,790.90	3.90	1,229.985			
800.00	800.00	782.41	782.33	2.66	1.54	-90.46	-38.36	-4,794.65	4,794.81	4,790.61	4.19	1,143.968			
850.00	850.00	832.40	832.32	2.84	1.65	-90.47	-39.23	-4,794.65	4,794.81	4,790.33	4.48	1,069.196			
900.00	900.00	882.39	882.30	3.01	1.76	-90.48	-40.10	-4,794.65	4,794.82	4,790.04	4.78	1,003.599			
950.00	950.00	932.39	932.28	3.19	1.88	-90.49	-40.97	-4,794.65	4,794.83	4,789.76	5.07	945.587			
1,000.00	1,000.00	982.38	982.27	3.37	1.99	-90.50	-41.85	-4,794.65	4,794.83	4,789.47	5.36	893.914			
1,050.00	1,050.00	1,032.37	1,032.25	3.55	2.10	-90.51	-42.72	-4,794.65	4,794.84	4,789.19	5.66	847.597			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design: Geronimo "27" State Com - #2 - WB1 - As-Drilled														Offset Site Error: 0.00 usft	
Survey Program: 202-MWD														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			
1,100.00	1,100.00	1,082.36	1,082.24	3.73	2.22	-90.52	-43.59	-4,794.65	4,794.85	4,788.90	5.95	805.843			
1,150.00	1,150.00	1,132.37	1,132.24	3.91	2.32	-90.53	-44.46	-4,794.65	4,794.86	4,788.63	6.23	769.349			
1,200.00	1,200.00	1,182.38	1,182.25	4.09	2.42	-90.54	-45.30	-4,794.65	4,794.87	4,788.35	6.51	736.311			
1,250.00	1,250.00	1,232.40	1,232.25	4.27	2.52	-90.55	-46.12	-4,794.65	4,794.87	4,788.08	6.79	705.994			
1,300.00	1,300.00	1,282.41	1,282.26	4.45	2.62	-90.56	-46.92	-4,794.65	4,794.88	4,787.81	7.07	678.074			
1,350.00	1,350.00	1,332.43	1,332.27	4.63	2.72	-90.57	-47.70	-4,794.65	4,794.89	4,787.54	7.35	652.279			
1,400.00	1,400.00	1,382.44	1,382.28	4.81	2.82	-90.58	-48.45	-4,794.65	4,794.90	4,787.27	7.63	628.374			
1,450.00	1,450.00	1,432.46	1,432.29	4.99	2.92	-90.59	-49.19	-4,794.65	4,794.90	4,786.99	7.91	606.159			
1,500.00	1,500.00	1,482.48	1,482.30	5.17	3.02	-90.60	-49.90	-4,794.65	4,794.91	4,786.72	8.19	585.462			
1,550.00	1,550.00	1,532.49	1,532.31	5.34	3.12	-90.60	-50.59	-4,794.65	4,794.92	4,786.45	8.47	566.131			
1,600.00	1,600.00	1,582.51	1,582.33	5.52	3.23	-90.61	-51.25	-4,794.65	4,794.93	4,786.18	8.75	548.036			
1,650.00	1,650.00	1,632.51	1,632.32	5.70	3.33	-90.62	-51.91	-4,794.65	4,794.93	4,785.90	9.03	530.940			
1,700.00	1,700.00	1,682.50	1,682.31	5.88	3.43	-90.63	-52.56	-4,794.65	4,794.94	4,785.63	9.31	514.876			
1,750.00	1,750.00	1,732.50	1,732.30	6.06	3.53	-90.64	-53.22	-4,794.65	4,794.95	4,785.35	9.59	499.755			
1,800.00	1,800.00	1,782.49	1,782.29	6.24	3.64	-90.64	-53.87	-4,794.65	4,794.95	4,785.08	9.88	485.497			
1,850.00	1,850.00	1,832.49	1,832.29	6.42	3.74	-90.65	-54.52	-4,794.65	4,794.96	4,784.80	10.16	472.030			
1,900.00	1,900.00	1,882.49	1,882.28	6.60	3.84	-90.66	-55.18	-4,794.65	4,794.97	4,784.53	10.44	459.290			
1,950.00	1,950.00	1,932.48	1,932.27	6.78	3.94	-90.67	-55.83	-4,794.65	4,794.98	4,784.26	10.72	447.220			
2,000.00	2,000.00	1,982.48	1,982.26	6.96	4.05	-90.67	-56.49	-4,794.65	4,794.98	4,783.98	11.00	435.768			
2,050.00	2,050.00	2,032.47	2,032.25	7.14	4.15	-90.68	-57.14	-4,794.65	4,794.99	4,783.71	11.29	424.888			
2,100.00	2,100.00	2,082.47	2,082.24	7.32	4.26	-90.69	-57.80	-4,794.65	4,795.00	4,783.43	11.57	414.381			
2,150.00	2,150.00	2,132.46	2,132.23	7.50	4.37	-90.70	-58.45	-4,794.65	4,795.01	4,783.15	11.86	404.213			
2,200.00	2,200.00	2,182.46	2,182.23	7.67	4.48	-90.71	-59.11	-4,794.65	4,795.02	4,782.86	12.15	394.532			
2,250.00	2,250.00	2,232.46	2,232.22	7.85	4.59	-90.71	-59.76	-4,794.65	4,795.02	4,782.58	12.44	385.304			
2,300.00	2,300.00	2,282.45	2,282.21	8.03	4.70	-90.72	-60.41	-4,794.65	4,795.03	4,782.30	12.74	376.497			
2,350.00	2,350.00	2,332.45	2,332.20	8.21	4.81	-90.73	-61.07	-4,794.65	4,795.04	4,782.01	13.03	368.085			
2,400.00	2,400.00	2,382.44	2,382.19	8.39	4.93	-90.74	-61.72	-4,794.65	4,795.05	4,781.73	13.32	360.040			
2,450.00	2,450.00	2,432.44	2,432.18	8.57	5.04	-90.75	-62.38	-4,794.65	4,795.06	4,781.45	13.61	352.339			
2,500.00	2,500.00	2,482.43	2,482.17	8.75	5.15	-90.75	-63.03	-4,794.65	4,795.07	4,781.17	13.90	344.961			
2,550.00	2,550.00	2,532.43	2,532.17	8.93	5.26	-90.76	-63.69	-4,794.65	4,795.08	4,780.88	14.19	337.885			
2,600.00	2,600.00	2,582.43	2,582.16	9.11	5.37	-90.77	-64.34	-4,794.65	4,795.08	4,780.60	14.48	331.086			
2,650.00	2,650.00	2,632.42	2,632.15	9.29	5.49	-90.78	-64.99	-4,794.65	4,795.09	4,780.32	14.77	324.554			
2,700.00	2,700.00	2,682.42	2,682.14	9.47	5.60	-90.78	-65.65	-4,794.65	4,795.10	4,780.04	15.07	318.276			
2,750.00	2,750.00	2,732.40	2,732.12	9.65	5.71	-90.79	-66.31	-4,794.65	4,795.11	4,779.75	15.36	312.231			
2,800.00	2,800.00	2,782.36	2,782.08	9.83	5.82	-90.80	-66.98	-4,794.65	4,795.12	4,779.47	15.65	306.407			
2,850.00	2,850.00	2,832.33	2,832.04	10.00	5.94	-90.81	-67.68	-4,794.65	4,795.13	4,779.19	15.94	300.797			
2,900.00	2,900.00	2,882.30	2,882.00	10.18	6.05	-90.82	-68.40	-4,794.65	4,795.14	4,778.91	16.23	295.388			
2,950.00	2,950.00	2,932.26	2,931.96	10.36	6.16	-90.83	-69.14	-4,794.65	4,795.15	4,778.63	16.53	290.171			
3,000.00	3,000.00	2,982.23	2,981.92	10.54	6.27	-90.84	-69.90	-4,794.65	4,795.16	4,778.34	16.82	285.134			
3,050.00	3,050.00	3,032.19	3,031.88	10.72	6.39	-90.84	-70.69	-4,794.65	4,795.17	4,778.06	17.11	280.270			
3,100.00	3,100.00	3,082.15	3,081.83	10.90	6.50	-90.85	-71.49	-4,794.65	4,795.19	4,777.78	17.40	275.569			
3,150.00	3,150.00	3,132.11	3,131.79	11.08	6.61	-90.86	-72.32	-4,794.65	4,795.20	4,777.50	17.69	271.023			
3,200.00	3,200.00	3,182.08	3,181.74	11.26	6.73	-90.87	-73.16	-4,794.65	4,795.21	4,777.23	17.98	266.625			
3,250.00	3,250.00	3,232.06	3,231.72	11.44	6.83	-90.88	-74.03	-4,794.65	4,795.22	4,776.95	18.27	262.424			
3,300.00	3,300.00	3,282.09	3,281.74	11.62	6.94	-90.89	-74.88	-4,794.65	4,795.24	4,776.68	18.55	258.443			
3,350.00	3,350.00	3,332.12	3,331.77	11.80	7.04	-90.90	-75.71	-4,794.65	4,795.25	4,776.41	18.84	254.580			
3,399.93	3,399.93	3,382.08	3,381.72	11.98	7.14	-90.91	-76.51	-4,794.65	4,795.26	4,776.15	19.12	250.837			
3,450.00	3,449.92	3,432.11	3,431.74	12.15	7.24	5.83	-77.29	-4,794.65	4,792.88	4,773.49	19.39	247.136			
3,500.00	3,499.39	3,481.62	3,481.25	12.32	7.34	5.91	-78.03	-4,794.65	4,785.75	4,766.09	19.67	243.339			
3,550.00	3,547.93	3,530.22	3,529.84	12.50	7.44	6.05	-78.74	-4,794.65	4,773.94	4,754.00	19.94	239.406			
3,600.00	3,595.12	3,577.46	3,577.08	12.68	7.54	6.27	-79.41	-4,794.65	4,757.55	4,737.33	20.22	235.270			
3,650.00	3,640.50	3,622.91	3,622.52	12.88	7.63	6.57	-80.03	-4,794.65	4,736.74	4,716.22	20.52	230.858			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Geronimo "27" State Com - #2 - WB1 - As-Drilled														Offset Well Error:	0.00 usft
Survey Program: 202-MWD															
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)					
3,700.00	3,683.68	3,666.14	3,665.75	13.12	7.72	6.98	-80.60	-4,794.65	4,711.69	4,690.85	20.84	226.053			
3,750.00	3,724.23	3,706.74	3,706.35	13.41	7.81	7.51	-81.13	-4,794.65	4,682.65	4,661.43	21.22	220.713			
3,800.00	3,761.81	3,744.36	3,743.96	13.78	7.88	8.21	-81.62	-4,794.65	4,649.87	4,628.21	21.66	214.697			
3,850.00	3,796.05	3,778.65	3,778.25	14.24	7.95	9.14	-82.07	-4,794.65	4,613.66	4,591.47	22.19	207.894			
3,900.00	3,826.64	3,809.31	3,808.90	14.83	8.02	10.40	-82.47	-4,794.65	4,574.36	4,551.52	22.84	200.262			
3,950.00	3,853.31	3,836.03	3,835.63	15.55	8.07	12.17	-82.82	-4,794.65	4,532.32	4,508.70	23.62	191.854			
4,000.00	3,875.80	3,858.59	3,858.19	16.43	8.12	14.77	-83.12	-4,794.65	4,487.94	4,463.40	24.55	182.828			
4,050.00	3,893.91	3,876.77	3,876.36	17.46	8.15	18.85	-83.36	-4,794.65	4,441.63	4,416.02	25.61	173.418			
4,100.00	3,907.47	3,890.40	3,889.99	18.63	8.18	25.95	-83.54	-4,794.65	4,393.81	4,367.00	26.81	163.895			
4,150.00	3,916.35	3,899.36	3,898.95	19.91	8.20	40.31	-83.65	-4,794.65	4,344.92	4,316.80	28.12	154.539			
4,200.00	3,920.49	3,903.57	3,903.16	21.30	8.21	72.71	-83.71	-4,794.65	4,295.42	4,265.91	29.51	145.565			
4,250.00	3,920.54	3,903.70	3,903.29	22.77	8.21	95.02	-83.71	-4,794.65	4,245.71	4,214.73	30.98	137.033			
4,300.00	3,920.11	3,903.32	3,902.91	24.28	8.21	96.75	-83.71	-4,794.65	4,195.90	4,163.41	32.49	129.158			
4,350.00	3,919.67	3,902.93	3,902.52	25.88	8.21	100.30	-83.70	-4,794.65	4,146.00	4,111.91	34.08	121.637			
4,400.00	3,919.23	3,902.52	3,902.11	27.48	8.21	111.51	-83.69	-4,794.65	4,096.03	4,060.35	35.68	114.787			
4,450.00	3,918.80	3,902.09	3,901.68	29.14	8.21	168.26	-83.69	-4,794.65	4,046.03	4,008.69	37.35	108.339			
4,500.00	3,918.36	3,901.66	3,901.24	30.83	8.21	168.11	-83.68	-4,794.65	3,996.04	3,957.00	39.03	102.377			
4,550.00	3,917.92	3,901.22	3,900.81	32.55	8.20	167.95	-83.68	-4,794.65	3,946.04	3,905.28	40.76	96.815			
4,600.00	3,917.49	3,900.79	3,900.38	34.28	8.20	167.79	-83.67	-4,794.65	3,896.04	3,853.56	42.49	91.702			
4,650.00	3,917.05	3,900.36	3,899.94	36.05	8.20	167.63	-83.67	-4,794.65	3,846.04	3,801.79	44.25	86.916			
4,700.00	3,916.62	3,899.92	3,899.51	37.81	8.20	167.46	-83.66	-4,794.65	3,796.04	3,750.03	46.01	82.496			
4,750.00	3,916.18	3,899.49	3,899.08	39.61	8.20	167.29	-83.65	-4,794.65	3,746.05	3,698.24	47.81	78.357			
4,800.00	3,915.74	3,899.06	3,898.64	41.40	8.20	167.12	-83.65	-4,794.65	3,696.05	3,646.45	49.60	74.516			
4,850.00	3,915.31	3,898.62	3,898.21	43.22	8.20	166.94	-83.64	-4,794.65	3,646.05	3,594.64	51.42	70.914			
4,900.00	3,914.87	3,898.19	3,897.78	45.03	8.20	166.75	-83.64	-4,794.65	3,596.05	3,542.82	53.23	67.557			
4,950.00	3,914.44	3,897.76	3,897.34	46.86	8.20	166.56	-83.63	-4,794.65	3,546.05	3,490.99	55.06	64.402			
5,000.00	3,914.00	3,897.32	3,896.91	48.70	8.20	166.37	-83.63	-4,794.65	3,496.06	3,439.16	56.89	61.450			
5,050.00	3,913.56	3,896.89	3,896.48	50.54	8.20	166.17	-83.62	-4,794.65	3,446.06	3,387.32	58.74	58.665			
5,100.00	3,913.13	3,896.46	3,896.04	52.39	8.19	165.96	-83.62	-4,794.65	3,396.06	3,335.48	60.58	56.057			
5,150.00	3,912.69	3,896.02	3,895.61	54.24	8.19	165.75	-83.61	-4,794.65	3,346.06	3,283.63	62.44	53.591			
5,200.00	3,912.26	3,895.59	3,895.18	56.10	8.19	165.54	-83.60	-4,794.65	3,296.06	3,231.77	64.29	51.267			
5,250.00	3,911.82	3,895.16	3,894.74	57.96	8.19	165.31	-83.60	-4,794.65	3,246.07	3,179.91	66.16	49.067			
5,300.00	3,911.38	3,894.72	3,894.31	59.83	8.19	165.08	-83.59	-4,794.65	3,196.07	3,128.05	68.02	46.987			
5,350.00	3,910.95	3,894.29	3,893.88	61.70	8.19	164.85	-83.59	-4,794.65	3,146.07	3,076.18	69.89	45.014			
5,400.00	3,910.51	3,893.86	3,893.45	63.57	8.19	164.60	-83.58	-4,794.65	3,096.07	3,024.31	71.76	43.144			
5,450.00	3,910.08	3,893.42	3,893.01	65.45	8.19	164.35	-83.58	-4,794.65	3,046.07	2,972.44	73.64	41.365			
5,500.00	3,909.64	3,892.99	3,892.58	67.33	8.19	164.09	-83.57	-4,794.65	2,996.08	2,920.56	75.52	39.675			
5,550.00	3,909.20	3,892.56	3,892.15	69.21	8.19	163.83	-83.56	-4,794.65	2,946.08	2,868.68	77.40	38.064			
5,600.00	3,908.77	3,892.12	3,891.71	71.09	8.19	163.55	-83.56	-4,794.65	2,896.08	2,816.80	79.28	36.530			
5,650.00	3,908.33	3,891.69	3,891.28	72.98	8.19	163.27	-83.55	-4,794.65	2,846.08	2,764.92	81.17	35.065			
5,700.00	3,907.90	3,891.26	3,890.85	74.87	8.18	162.97	-83.55	-4,794.65	2,796.09	2,713.03	83.05	33.667			
5,750.00	3,907.46	3,890.82	3,890.41	76.76	8.18	162.67	-83.54	-4,794.65	2,746.09	2,661.15	84.94	32.329			
5,800.00	3,907.02	3,890.39	3,889.98	78.65	8.18	162.36	-83.54	-4,794.65	2,696.09	2,609.26	86.83	31.050			
5,850.00	3,906.59	3,889.96	3,889.55	80.54	8.18	162.03	-83.53	-4,794.65	2,646.09	2,557.37	88.72	29.824			
5,900.00	3,906.15	3,889.52	3,889.11	82.44	8.18	161.70	-83.52	-4,794.65	2,596.09	2,505.48	90.62	28.649			
5,950.00	3,905.72	3,889.09	3,888.68	84.33	8.18	161.35	-83.52	-4,794.65	2,546.10	2,453.58	92.51	27.521			
6,000.00	3,905.28	3,888.66	3,888.25	86.23	8.18	160.99	-83.51	-4,794.65	2,496.10	2,401.69	94.41	26.439			
6,050.00	3,904.84	3,888.22	3,887.81	88.13	8.18	160.62	-83.51	-4,794.65	2,446.10	2,349.79	96.31	25.399			
6,100.00	3,904.41	3,887.79	3,887.38	90.03	8.18	160.24	-83.50	-4,794.65	2,396.10	2,297.90	98.20	24.395			
6,150.00	3,903.97	3,887.36	3,886.95	91.93	8.18	159.84	-83.50	-4,794.65	2,346.10	2,246.00	100.10	23.436			
6,200.00	3,903.54	3,886.92	3,886.51	93.83	8.18	159.42	-83.49	-4,794.65	2,296.11	2,194.10	102.01	22.510			
6,250.00	3,903.10	3,886.49	3,886.08	95.73	8.17	158.99	-83.48	-4,794.65	2,246.11	2,142.20	103.91	21.617			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design: Geronimo "27" State Com - #2 - WB1 - As-Drilled														Offset Site Error:	0.00 usft
Survey Program: 202-MWD														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)					
6,300.00	3,902.66	3,886.06	3,885.65	97.64	8.17	158.54	-83.48	-4,794.65	2,196.11	2,090.30	105.81	20.755			
6,350.00	3,902.23	3,885.62	3,885.21	89.54	8.17	158.08	-83.47	-4,794.65	2,146.11	2,038.40	107.71	19.924			
6,400.00	3,901.79	3,885.19	3,884.78	101.44	8.17	157.60	-83.47	-4,794.65	2,096.11	1,986.50	109.62	19.122			
6,450.00	3,901.36	3,884.76	3,884.35	103.35	8.17	157.09	-83.46	-4,794.65	2,046.12	1,934.60	111.52	18.347			
6,500.00	3,900.92	3,884.32	3,883.91	105.26	8.17	156.57	-83.46	-4,794.65	1,996.12	1,882.69	113.43	17.588			
6,550.00	3,900.48	3,883.89	3,883.48	107.16	8.17	156.02	-83.45	-4,794.65	1,946.12	1,830.79	115.33	16.874			
6,600.00	3,900.05	3,883.46	3,883.05	109.07	8.17	155.45	-83.45	-4,794.65	1,896.12	1,778.89	117.24	16.173			
6,650.00	3,899.61	3,883.02	3,882.61	110.98	8.17	154.85	-83.44	-4,794.65	1,846.13	1,726.98	119.15	15.495			
6,700.00	3,899.18	3,882.59	3,882.18	112.89	8.17	154.23	-83.43	-4,794.65	1,796.13	1,675.07	121.05	14.837			
6,750.00	3,898.74	3,882.16	3,881.75	114.80	8.17	153.57	-83.43	-4,794.65	1,746.13	1,623.17	122.96	14.201			
6,800.00	3,898.30	3,881.72	3,881.31	116.71	8.16	152.89	-83.42	-4,794.65	1,696.13	1,571.26	124.87	13.583			
6,850.00	3,897.87	3,881.29	3,880.88	118.62	8.16	152.18	-83.42	-4,794.65	1,646.14	1,519.36	126.78	12.984			
6,900.00	3,897.43	3,880.86	3,880.45	120.53	8.16	151.43	-83.41	-4,794.65	1,596.14	1,467.45	128.69	12.403			
6,950.00	3,897.00	3,880.42	3,880.01	122.44	8.16	150.64	-83.41	-4,794.65	1,546.14	1,415.54	130.60	11.839			
7,000.00	3,896.56	3,879.99	3,879.58	124.35	8.16	149.82	-83.40	-4,794.65	1,496.14	1,363.63	132.51	11.291			
7,050.00	3,896.12	3,879.56	3,879.15	126.26	8.16	148.96	-83.39	-4,794.65	1,446.15	1,311.72	134.42	10.758			
7,100.00	3,895.69	3,879.12	3,878.71	128.17	8.16	148.05	-83.39	-4,794.65	1,396.15	1,259.81	136.33	10.241			
7,150.00	3,895.25	3,878.69	3,878.28	130.09	8.16	147.09	-83.38	-4,794.65	1,346.15	1,207.91	138.25	9.737			
7,200.00	3,894.82	3,878.26	3,877.85	132.00	8.16	146.08	-83.38	-4,794.65	1,296.15	1,156.00	140.16	9.248			
7,250.00	3,894.38	3,877.82	3,877.41	133.91	8.16	145.02	-83.37	-4,794.65	1,246.15	1,104.09	142.07	8.771			
7,300.00	3,893.94	3,877.39	3,876.98	135.83	8.16	143.90	-83.37	-4,794.65	1,196.15	1,052.18	143.98	8.308			
7,350.00	3,893.51	3,876.96	3,876.55	137.74	8.15	142.72	-83.36	-4,794.65	1,146.16	1,000.27	145.90	7.856			
7,400.00	3,893.07	3,876.52	3,876.11	139.65	8.15	141.47	-83.35	-4,794.65	1,096.17	948.36	147.81	7.416			
7,450.00	3,892.64	3,876.09	3,875.68	141.57	8.15	140.16	-83.35	-4,794.65	1,046.17	896.45	149.72	6.987			
7,500.00	3,892.20	3,875.66	3,875.25	143.48	8.15	138.77	-83.34	-4,794.65	996.17	844.54	151.64	6.569			
7,550.00	3,891.76	3,875.22	3,874.81	145.40	8.15	137.30	-83.34	-4,794.65	946.18	792.62	153.55	6.162			
7,600.00	3,891.33	3,874.79	3,874.38	147.31	8.15	135.74	-83.33	-4,794.65	896.18	740.71	155.46	5.765			
7,650.00	3,890.89	3,874.36	3,873.95	149.23	8.15	134.10	-83.33	-4,794.65	846.18	688.80	157.38	5.377			
7,700.00	3,890.46	3,873.92	3,873.51	151.15	8.15	132.36	-83.32	-4,794.65	796.19	636.89	159.29	4.998			
7,750.00	3,890.02	3,873.49	3,873.08	153.06	8.15	130.52	-83.31	-4,794.65	746.19	584.98	161.21	4.629			
7,800.00	3,889.58	3,873.06	3,872.65	154.98	8.15	128.58	-83.31	-4,794.65	696.20	533.07	163.12	4.268			
7,850.00	3,889.15	3,872.62	3,872.21	156.89	8.15	126.53	-83.30	-4,794.65	646.20	481.16	165.04	3.915			
7,900.00	3,888.71	3,872.19	3,871.78	158.81	8.15	124.38	-83.30	-4,794.65	596.21	429.25	166.95	3.571			
7,950.00	3,888.28	3,871.76	3,871.35	160.73	8.14	122.10	-83.29	-4,794.65	546.21	377.34	168.87	3.234			
8,000.00	3,887.84	3,871.32	3,870.92	162.64	8.14	119.71	-83.29	-4,794.65	496.22	325.43	170.79	2.905			
8,050.00	3,887.40	3,870.89	3,870.48	164.56	8.14	117.21	-83.28	-4,794.65	446.23	273.53	172.70	2.584			
8,100.00	3,886.97	3,870.46	3,870.05	166.48	8.14	114.59	-83.27	-4,794.65	396.24	221.62	174.62	2.269			
8,150.00	3,886.53	3,870.02	3,869.62	168.40	8.14	111.86	-83.27	-4,794.65	346.25	169.72	176.54	1.961			
8,200.00	3,886.10	3,869.59	3,869.18	170.31	8.14	109.03	-83.26	-4,794.65	296.27	117.82	178.45	1.660			
8,250.00	3,885.66	3,869.16	3,868.75	172.23	8.14	106.11	-83.26	-4,794.65	246.29	65.92	180.37	1.365 Level 3			
8,300.00	3,885.22	3,868.72	3,868.32	174.15	8.14	103.09	-83.25	-4,794.65	196.33	14.04	182.29	1.077 Level 2			
8,350.00	3,884.79	3,868.29	3,867.88	176.07	8.14	100.01	-83.25	-4,794.65	146.38	-37.82	184.21	0.795 Level 1			
8,400.00	3,884.35	3,867.86	3,867.45	177.99	8.14	96.87	-83.24	-4,794.65	96.49	-89.63	186.12	0.518 Level 1			
8,450.00	3,883.92	3,867.42	3,867.02	179.90	8.14	93.70	-83.24	-4,794.65	46.83	-141.21	188.04	0.249 Level 1			
8,496.18	3,883.51	3,867.02	3,866.62	181.68	8.13	90.75	-83.23	-4,794.65	7.77	-182.04	189.81	0.041 Level 1, CC, ES, SF			
8,500.00	3,883.48	3,866.99	3,866.58	181.82	8.13	90.51	-83.23	-4,794.65	8.66	-181.30	189.96	0.045 Level 1			
8,550.00	3,883.04	3,866.56	3,866.15	183.74	8.13	87.31	-83.22	-4,794.65	54.38	-137.50	191.88	0.283 Level 1			
8,600.00	3,882.61	3,866.12	3,865.72	185.66	8.13	84.14	-83.22	-4,794.65	104.11	-89.69	193.79	0.537 Level 1			
8,650.00	3,882.17	3,865.69	3,865.28	187.58	8.13	81.01	-83.21	-4,794.65	154.01	-41.70	195.71	0.787 Level 1			
8,669.77	3,882.00	3,865.52	3,865.11	188.34	8.13	79.79	-83.21	-4,794.65	173.76	-22.71	196.47	0.884 Level 1			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design Samedan State - #2 - WB1 - As-Drilled														Offset Site Error:	0.00 usft
Survey Program: 535-MWD														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (usft)	Separation Factor	Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		+N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)					
0.00	0.00	0.00	0.00	0.00	0.00	-81.43	259.60	-1,722.94	1,742.61						
50.00	50.00	22.05	22.05	0.06	0.02	-81.43	259.59	-1,722.94	1,742.39	1,742.30	0.08	N/A			
100.00	100.00	72.15	72.15	0.15	0.08	-81.43	259.57	-1,722.94	1,742.38	1,742.15	0.23	7,631.642			
150.00	150.00	122.26	122.26	0.33	0.14	-81.43	259.53	-1,722.94	1,742.38	1,741.91	0.46	3,756.004			
200.00	200.00	172.36	172.36	0.51	0.19	-81.44	259.47	-1,722.94	1,742.37	1,741.67	0.70	2,490.977			
250.00	250.00	222.47	222.47	0.68	0.25	-81.44	259.39	-1,722.94	1,742.36	1,741.42	0.94	1,863.378			
300.00	300.00	272.58	272.58	0.86	0.31	-81.44	259.29	-1,722.94	1,742.34	1,741.17	1.17	1,488.375			
350.00	350.00	322.68	322.68	1.04	0.36	-81.45	259.17	-1,722.94	1,742.32	1,740.92	1.41	1,239.017			
400.00	400.00	372.79	372.79	1.22	0.42	-81.45	259.03	-1,722.94	1,742.30	1,740.66	1.64	1,061.218			
450.00	450.00	422.89	422.89	1.40	0.48	-81.46	258.87	-1,722.94	1,742.28	1,740.40	1.88	928.040			
500.00	500.00	473.00	473.00	1.58	0.53	-81.46	258.68	-1,722.94	1,742.25	1,740.14	2.11	824.557			
550.00	550.00	523.10	523.10	1.76	0.59	-81.47	258.48	-1,722.94	1,742.22	1,739.87	2.35	741.833			
600.00	600.00	573.13	573.13	1.94	0.69	-81.48	258.26	-1,722.94	1,742.19	1,739.56	2.63	663.204			
650.00	650.00	623.13	623.13	2.12	0.80	-81.48	258.04	-1,722.94	1,742.16	1,739.24	2.92	596.905			
700.00	700.00	673.13	673.12	2.30	0.91	-81.49	257.83	-1,722.94	1,742.12	1,738.91	3.21	542.655			
750.00	750.00	723.13	723.12	2.48	1.03	-81.50	257.61	-1,722.94	1,742.09	1,738.59	3.50	497.443			
800.00	800.00	773.13	773.12	2.66	1.14	-81.50	257.39	-1,722.94	1,742.06	1,738.27	3.79	459.184			
850.00	850.00	823.13	823.12	2.84	1.25	-81.51	257.17	-1,722.94	1,742.03	1,737.94	4.09	426.299			
900.00	900.00	873.13	873.12	3.01	1.36	-81.52	256.95	-1,722.94	1,742.00	1,737.62	4.38	397.880			
950.00	950.00	923.13	923.12	3.19	1.48	-81.52	256.73	-1,722.94	1,741.96	1,737.29	4.67	373.012			
1,000.00	1,000.00	973.13	973.12	3.37	1.59	-81.53	256.52	-1,722.94	1,741.93	1,736.97	4.96	351.069			
1,050.00	1,050.00	1,023.12	1,023.12	3.55	1.70	-81.54	256.30	-1,722.94	1,741.90	1,736.65	5.25	331.563			
1,100.00	1,100.00	1,073.12	1,073.12	3.73	1.81	-81.55	256.08	-1,722.94	1,741.87	1,736.32	5.55	314.111			
1,150.00	1,150.00	1,123.12	1,123.12	3.91	1.93	-81.55	255.86	-1,722.94	1,741.83	1,736.00	5.84	298.403			
1,200.00	1,200.00	1,173.12	1,173.12	4.09	2.04	-81.56	255.64	-1,722.94	1,741.80	1,735.67	6.13	284.191			
1,250.00	1,250.00	1,223.12	1,223.11	4.27	2.15	-81.57	255.43	-1,722.94	1,741.77	1,735.35	6.42	271.270			
1,300.00	1,300.00	1,273.12	1,273.11	4.45	2.26	-81.57	255.21	-1,722.94	1,741.74	1,735.03	6.71	259.473			
1,350.00	1,350.00	1,323.12	1,323.11	4.63	2.38	-81.58	254.99	-1,722.94	1,741.71	1,734.70	7.00	248.659			
1,400.00	1,400.00	1,373.12	1,373.11	4.81	2.49	-81.59	254.77	-1,722.94	1,741.67	1,734.38	7.30	238.710			
1,450.00	1,450.00	1,423.12	1,423.11	4.99	2.60	-81.60	254.55	-1,722.94	1,741.64	1,734.05	7.59	229.526			
1,500.00	1,500.00	1,473.12	1,473.11	5.17	2.71	-81.60	254.33	-1,722.94	1,741.61	1,733.73	7.88	221.022			
1,550.00	1,550.00	1,523.12	1,523.11	5.34	2.83	-81.61	254.12	-1,722.94	1,741.58	1,733.41	8.17	213.126			
1,600.00	1,600.00	1,573.22	1,573.21	5.52	2.94	-81.62	253.89	-1,722.94	1,741.55	1,733.08	8.46	205.766			
1,650.00	1,650.00	1,623.33	1,623.32	5.70	3.05	-81.63	253.64	-1,722.94	1,741.51	1,732.75	8.76	198.895			
1,700.00	1,700.00	1,673.45	1,673.43	5.88	3.17	-81.63	253.37	-1,722.94	1,741.47	1,732.42	9.05	192.468			
1,750.00	1,750.00	1,723.56	1,723.54	6.06	3.28	-81.64	253.07	-1,722.94	1,741.43	1,732.09	9.34	186.443			
1,800.00	1,800.00	1,773.67	1,773.65	6.24	3.39	-81.65	252.76	-1,722.94	1,741.38	1,731.75	9.63	180.783			
1,850.00	1,850.00	1,823.78	1,823.77	6.42	3.50	-81.67	252.42	-1,722.94	1,741.33	1,731.41	9.92	175.455			
1,900.00	1,900.00	1,873.89	1,873.88	6.60	3.62	-81.68	252.06	-1,722.94	1,741.28	1,731.06	10.22	170.433			
1,950.00	1,950.00	1,924.00	1,923.99	6.78	3.73	-81.69	251.67	-1,722.94	1,741.22	1,730.72	10.51	165.689			
2,000.00	2,000.00	1,974.11	1,974.09	6.96	3.84	-81.70	251.26	-1,722.94	1,741.17	1,730.36	10.80	161.201			
2,050.00	2,050.00	2,024.21	2,024.19	7.14	3.96	-81.72	250.84	-1,722.94	1,741.10	1,730.01	11.09	156.950			
2,100.00	2,100.00	2,074.21	2,074.19	7.32	4.07	-81.73	250.40	-1,722.94	1,741.04	1,729.66	11.39	152.918			
2,150.00	2,150.00	2,124.21	2,124.18	7.50	4.18	-81.75	249.96	-1,722.94	1,740.98	1,729.30	11.68	149.088			
2,200.00	2,200.00	2,174.21	2,174.18	7.67	4.29	-81.76	249.53	-1,722.94	1,740.92	1,728.95	11.97	145.445			
2,250.00	2,250.00	2,224.20	2,224.17	7.85	4.41	-81.77	249.09	-1,722.94	1,740.85	1,728.59	12.26	141.975			
2,300.00	2,300.00	2,274.20	2,274.17	8.03	4.52	-81.79	248.65	-1,722.94	1,740.79	1,728.24	12.55	138.667			
2,350.00	2,350.00	2,324.20	2,324.17	8.21	4.63	-81.80	248.22	-1,722.94	1,740.73	1,727.88	12.85	135.509			
2,400.00	2,400.00	2,374.20	2,374.16	8.39	4.75	-81.82	247.78	-1,722.94	1,740.67	1,727.53	13.14	132.492			
2,450.00	2,450.00	2,424.20	2,424.16	8.57	4.85	-81.83	247.35	-1,722.94	1,740.60	1,727.17	13.43	129.606			
2,500.00	2,500.00	2,474.19	2,474.15	8.75	4.97	-81.84	246.91	-1,722.94	1,740.54	1,726.82	13.72	126.842			
2,550.00	2,550.00	2,524.19	2,524.15	8.93	5.08	-81.86	246.47	-1,722.94	1,740.48	1,726.47	14.01	124.194			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design														Offset Site Error:	0.00 usft
Samedan State - #2 - WB1 - As-Drilled														Offset Well Error:	0.00 usft
Survey Program: 535-MWD															
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)										
2,600.00	2,600.00	2,574.19	2,574.15	9.11	5.20	-81.87	246.04	-1,722.94	1,740.42	1,726.11	14.31	121.654			
2,650.00	2,650.00	2,624.19	2,624.14	9.29	5.31	-81.89	245.60	-1,722.94	1,740.36	1,725.76	14.60	119.216			
2,700.00	2,700.00	2,674.19	2,674.14	9.47	5.42	-81.90	245.16	-1,722.94	1,740.30	1,725.41	14.89	116.873			
2,750.00	2,750.00	2,724.18	2,724.14	9.65	5.54	-81.92	244.73	-1,722.94	1,740.23	1,725.05	15.18	114.621			
2,800.00	2,800.00	2,774.18	2,774.13	9.83	5.65	-81.93	244.29	-1,722.94	1,740.17	1,724.70	15.47	112.454			
2,850.00	2,850.00	2,824.18	2,824.13	10.00	5.76	-81.94	243.86	-1,722.94	1,740.11	1,724.35	15.77	110.366			
2,900.00	2,900.00	2,874.18	2,874.12	10.18	5.87	-81.96	243.42	-1,722.94	1,740.05	1,723.99	16.06	108.355			
2,950.00	2,950.00	2,924.18	2,924.12	10.36	5.99	-81.97	242.98	-1,722.94	1,739.99	1,723.64	16.35	106.416			
3,000.00	3,000.00	2,974.18	2,974.12	10.54	6.10	-81.99	242.55	-1,722.94	1,739.93	1,723.29	16.64	104.545			
3,050.00	3,050.00	3,024.14	3,024.08	10.72	6.21	-82.00	242.11	-1,722.94	1,739.87	1,722.94	16.93	102.768			
3,100.00	3,100.00	3,074.03	3,073.97	10.90	6.31	-82.01	241.69	-1,722.94	1,739.81	1,722.60	17.21	101.106			
3,150.00	3,150.00	3,123.92	3,123.86	11.08	6.41	-82.03	241.30	-1,722.94	1,739.76	1,722.27	17.49	99.498			
3,200.00	3,200.00	3,173.81	3,173.75	11.26	6.50	-82.04	240.93	-1,722.94	1,739.70	1,721.94	17.76	97.939			
3,250.00	3,250.00	3,223.71	3,223.64	11.44	6.60	-82.05	240.58	-1,722.94	1,739.66	1,721.61	18.04	96.429			
3,300.00	3,300.00	3,273.60	3,273.53	11.62	6.70	-82.06	240.25	-1,722.94	1,739.61	1,721.29	18.32	94.965			
3,350.00	3,350.00	3,323.49	3,323.43	11.80	6.80	-82.07	239.94	-1,722.94	1,739.57	1,720.97	18.60	93.544			
3,399.93	3,399.93	3,373.32	3,373.25	11.98	6.90	-82.08	239.65	-1,722.94	1,739.53	1,720.65	18.87	92.168			
3,450.00	3,449.92	3,423.21	3,423.14	12.15	7.00	14.72	239.39	-1,722.94	1,737.16	1,718.02	19.15	90.729			
3,500.00	3,499.39	3,472.57	3,472.50	12.32	7.09	14.97	239.15	-1,722.94	1,730.19	1,710.77	19.42	89.113			
3,550.00	3,547.93	3,521.09	3,521.01	12.50	7.19	15.41	238.93	-1,722.94	1,718.66	1,698.98	19.69	87.302			
3,600.00	3,595.12	3,568.35	3,568.28	12.68	7.28	16.05	238.71	-1,722.94	1,702.70	1,682.73	19.97	85.281			
3,650.00	3,640.50	3,613.82	3,613.75	12.88	7.38	16.93	238.49	-1,722.94	1,682.45	1,662.19	20.26	83.042			
3,700.00	3,683.68	3,657.08	3,657.01	13.12	7.46	18.11	238.26	-1,722.94	1,658.11	1,637.53	20.58	80.553			
3,750.00	3,724.23	3,697.72	3,697.65	13.41	7.54	19.64	238.04	-1,722.94	1,629.93	1,608.98	20.95	77.783			
3,800.00	3,761.81	3,735.38	3,735.30	13.78	7.62	21.62	237.82	-1,722.94	1,598.17	1,576.78	21.40	74.698			
3,850.00	3,796.05	3,769.70	3,769.63	14.24	7.69	24.21	237.62	-1,722.94	1,563.15	1,541.23	21.93	71.286			
3,900.00	3,826.64	3,800.38	3,800.30	14.83	7.75	27.60	237.43	-1,722.94	1,525.22	1,502.64	22.58	67.559			
3,950.00	3,853.31	3,827.12	3,827.04	15.55	7.80	32.10	237.26	-1,722.94	1,484.74	1,461.38	23.36	63.568			
4,000.00	3,875.80	3,849.68	3,849.61	16.43	7.85	38.11	237.11	-1,722.94	1,442.12	1,417.84	24.28	59.397			
4,050.00	3,893.91	3,867.86	3,867.78	17.46	7.89	46.18	236.99	-1,722.94	1,397.77	1,372.43	25.34	55.153			
4,100.00	3,907.47	3,881.48	3,881.40	18.63	7.91	56.81	236.90	-1,722.94	1,352.14	1,325.60	26.54	50.950			
4,150.00	3,916.35	3,890.42	3,890.35	19.91	7.93	70.06	236.84	-1,722.94	1,305.68	1,277.83	27.85	46.890			
4,200.00	3,920.49	3,894.60	3,894.53	21.30	7.94	84.90	236.81	-1,722.94	1,258.84	1,229.60	29.24	43.054			
4,250.00	3,920.54	3,894.70	3,894.62	22.77	7.94	91.64	236.81	-1,722.94	1,212.01	1,181.29	30.71	39.463			
4,300.00	3,920.11	3,894.29	3,894.22	24.28	7.94	91.71	236.81	-1,722.94	1,165.01	1,132.79	32.22	36.162			
4,350.00	3,919.67	3,893.88	3,893.80	25.88	7.94	91.79	236.81	-1,722.94	1,117.82	1,084.00	33.81	33.057			
4,400.00	3,919.23	3,893.45	3,893.38	27.48	7.94	91.88	236.82	-1,722.94	1,070.44	1,035.02	35.41	30.227			
4,450.00	3,918.80	3,893.02	3,892.94	29.14	7.94	91.93	236.82	-1,722.94	1,022.88	985.81	37.08	27.589			
4,500.00	3,918.36	3,892.59	3,892.51	30.83	7.94	91.85	236.82	-1,722.94	975.44	936.68	38.76	25.165			
4,550.00	3,917.92	3,892.15	3,892.07	32.55	7.93	91.77	236.82	-1,722.94	928.27	887.79	40.49	22.927			
4,600.00	3,917.49	3,891.71	3,891.64	34.28	7.93	91.69	236.83	-1,722.94	881.41	839.20	42.22	20.879			
4,650.00	3,917.05	3,891.28	3,891.20	36.05	7.93	91.61	236.83	-1,722.94	834.92	790.64	43.98	18.984			
4,700.00	3,916.62	3,890.84	3,890.77	37.81	7.93	91.54	236.83	-1,722.94	788.85	743.11	45.74	17.245			
4,750.00	3,916.18	3,890.41	3,890.33	39.61	7.93	91.46	236.84	-1,722.94	743.30	695.76	47.54	15.636			
4,800.00	3,915.74	3,889.97	3,889.90	41.40	7.93	91.38	236.84	-1,722.94	698.35	649.02	49.33	14.156			
4,850.00	3,915.31	3,889.54	3,889.46	43.22	7.93	91.30	236.84	-1,722.94	654.13	602.99	51.15	12.790			
4,900.00	3,914.87	3,889.10	3,889.02	45.03	7.93	91.22	236.85	-1,722.94	610.81	557.85	52.96	11.533			
4,950.00	3,914.44	3,888.67	3,888.59	46.86	7.93	91.14	236.85	-1,722.94	568.58	513.79	54.79	10.377			
5,000.00	3,914.00	3,888.23	3,888.15	48.70	7.93	91.06	236.85	-1,722.94	527.71	471.09	56.62	9.320			
5,050.00	3,913.56	3,887.79	3,887.72	50.54	7.93	90.98	236.85	-1,722.94	488.55	430.08	58.47	8.356			
5,100.00	3,913.13	3,887.36	3,887.28	52.39	7.92	90.90	236.86	-1,722.94	451.52	391.21	60.31	7.486			
5,150.00	3,912.69	3,886.92	3,886.85	54.24	7.92	90.82	236.86	-1,722.94	417.22	355.05	62.17	6.711			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design: Samedan State - #2 - WB1 - As-Drilled														Offset Site Error:	0.00 usft
Survey Program: 535-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		
5,200.00	3,912.26	3,886.49	3,886.41	56.10	7.92	90.74	236.86	-1,722.94	386.35	322.33	64.02	5.035			
5,250.00	3,911.82	3,886.05	3,885.98	57.96	7.92	90.67	236.87	-1,722.94	359.81	293.92	65.89	5.461			
5,300.00	3,911.38	3,885.62	3,885.54	59.83	7.92	90.59	236.87	-1,722.94	338.61	270.86	67.75	4.998			
5,350.00	3,910.95	3,885.18	3,885.11	61.70	7.92	90.51	236.87	-1,722.94	323.80	254.18	69.62	4.651			
5,400.00	3,910.51	3,884.75	3,884.67	63.57	7.92	90.43	236.87	-1,722.94	316.30	244.80	71.49	4.424			
5,423.06	3,910.31	3,884.55	3,884.47	64.44	7.92	90.39	236.88	-1,722.94	315.45	243.10	72.36	4.360 CC, ES			
5,450.00	3,910.08	3,884.31	3,884.23	65.45	7.92	90.35	236.88	-1,722.94	316.60	243.23	73.37	4.315			
5,500.00	3,909.64	3,883.88	3,883.80	67.33	7.92	90.27	236.88	-1,722.94	324.70	249.45	75.25	4.315 SF			
5,550.00	3,909.20	3,883.44	3,883.36	69.21	7.92	90.19	236.88	-1,722.94	340.03	262.91	77.13	4.409			
5,600.00	3,908.77	3,883.00	3,882.93	71.09	7.92	90.11	236.89	-1,722.94	361.68	282.68	79.01	4.578			
5,650.00	3,908.33	3,882.57	3,882.49	72.98	7.92	90.03	236.89	-1,722.94	388.60	307.70	80.90	4.804			
5,700.00	3,907.90	3,882.13	3,882.06	74.87	7.91	89.95	236.89	-1,722.94	419.76	336.98	82.78	5.071			
5,750.00	3,907.46	3,881.70	3,881.62	76.76	7.91	89.87	236.90	-1,722.94	454.30	369.63	84.67	5.365			
5,800.00	3,907.02	3,881.26	3,881.19	78.65	7.91	89.80	236.90	-1,722.94	491.51	404.95	86.56	5.678			
5,850.00	3,906.59	3,880.83	3,880.75	80.54	7.91	89.72	236.90	-1,722.94	530.82	442.37	88.45	6.001			
5,900.00	3,906.15	3,880.39	3,880.31	82.44	7.91	89.64	236.90	-1,722.94	571.81	481.46	90.35	6.329			
5,950.00	3,905.72	3,879.96	3,879.88	84.33	7.91	89.56	236.91	-1,722.94	614.13	521.88	92.24	6.658			
6,000.00	3,905.28	3,879.52	3,879.44	86.23	7.91	89.48	236.91	-1,722.94	657.53	563.39	94.14	6.985			
6,050.00	3,904.84	3,879.08	3,879.01	88.13	7.91	89.40	236.91	-1,722.94	701.81	605.77	96.04	7.308			
6,100.00	3,904.41	3,878.65	3,878.57	90.03	7.91	89.32	236.92	-1,722.94	746.81	648.87	97.94	7.626			
6,150.00	3,903.97	3,878.21	3,878.14	91.93	7.91	89.24	236.92	-1,722.94	792.41	692.57	99.84	7.937			
6,200.00	3,903.54	3,877.78	3,877.70	93.83	7.91	89.16	236.92	-1,722.94	838.51	736.77	101.74	8.242			
6,250.00	3,903.10	3,877.34	3,877.27	95.73	7.90	89.08	236.93	-1,722.94	885.03	781.40	103.64	8.540			
6,300.00	3,902.66	3,876.91	3,876.83	97.64	7.90	89.00	236.93	-1,722.94	931.92	826.38	105.54	8.830			
6,350.00	3,902.23	3,876.47	3,876.40	99.54	7.90	88.93	236.93	-1,722.94	979.11	871.67	107.44	9.113			
6,400.00	3,901.79	3,876.04	3,875.96	101.44	7.90	88.85	236.93	-1,722.94	1,026.57	917.22	109.35	9.388			
6,450.00	3,901.36	3,875.60	3,875.52	103.35	7.90	88.77	236.94	-1,722.94	1,074.26	963.01	111.25	9.656			
6,500.00	3,900.92	3,875.17	3,875.09	105.26	7.90	88.69	236.94	-1,722.94	1,122.15	1,008.99	113.16	9.917			
6,550.00	3,900.48	3,874.73	3,874.65	107.16	7.90	88.61	236.94	-1,722.94	1,170.22	1,055.15	115.06	10.170			
6,600.00	3,900.05	3,874.29	3,874.22	109.07	7.90	88.53	236.95	-1,722.94	1,218.44	1,101.47	116.97	10.417			
6,650.00	3,899.61	3,873.86	3,873.78	110.98	7.90	88.45	236.95	-1,722.94	1,266.80	1,147.92	118.88	10.656			
6,700.00	3,899.18	3,873.42	3,873.35	112.89	7.90	88.37	236.95	-1,722.94	1,315.28	1,194.49	120.78	10.889			
6,750.00	3,898.74	3,872.99	3,872.91	114.80	7.90	88.29	236.96	-1,722.94	1,363.87	1,241.18	122.69	11.116			
6,800.00	3,898.30	3,872.55	3,872.48	116.71	7.90	88.21	236.96	-1,722.94	1,412.56	1,287.96	124.60	11.337			
6,850.00	3,897.87	3,872.12	3,872.04	118.62	7.89	88.14	236.96	-1,722.94	1,461.34	1,334.83	126.51	11.551			
6,900.00	3,897.43	3,871.68	3,871.60	120.53	7.89	88.06	236.96	-1,722.94	1,510.20	1,381.77	128.42	11.760			
6,950.00	3,897.00	3,871.25	3,871.17	122.44	7.89	87.98	236.97	-1,722.94	1,559.13	1,428.79	130.33	11.963			
7,000.00	3,896.56	3,870.81	3,870.73	124.35	7.89	87.90	236.97	-1,722.94	1,608.12	1,475.88	132.24	12.160			
7,050.00	3,896.12	3,870.37	3,870.30	126.26	7.89	87.82	236.97	-1,722.94	1,657.18	1,523.02	134.15	12.353			
7,100.00	3,895.69	3,869.94	3,869.86	128.17	7.89	87.74	236.98	-1,722.94	1,706.29	1,570.22	136.06	12.540			
7,150.00	3,895.25	3,869.50	3,869.43	130.09	7.89	87.66	236.98	-1,722.94	1,755.45	1,617.47	137.98	12.723			
7,200.00	3,894.82	3,869.07	3,868.99	132.00	7.89	87.58	236.98	-1,722.94	1,804.65	1,664.77	139.89	12.901			
7,250.00	3,894.38	3,868.63	3,868.56	133.91	7.89	87.50	236.98	-1,722.94	1,853.90	1,712.10	141.80	13.074			
7,300.00	3,893.94	3,868.20	3,868.12	135.83	7.89	87.43	236.99	-1,722.94	1,903.19	1,759.48	143.71	13.243			
7,350.00	3,893.51	3,867.76	3,867.69	137.74	7.89	87.35	236.99	-1,722.94	1,952.52	1,806.89	145.63	13.408			
7,400.00	3,893.07	3,867.33	3,867.25	139.65	7.88	87.27	236.99	-1,722.94	2,001.87	1,854.33	147.54	13.568			
7,450.00	3,892.64	3,866.89	3,866.81	141.57	7.88	87.19	237.00	-1,722.94	2,051.26	1,901.81	149.45	13.725			
7,500.00	3,892.20	3,866.45	3,866.38	143.48	7.88	87.11	237.00	-1,722.94	2,100.68	1,949.31	151.37	13.878			
7,550.00	3,891.76	3,866.02	3,865.94	145.40	7.88	87.03	237.00	-1,722.94	2,150.12	1,996.84	153.28	14.027			
7,600.00	3,891.33	3,865.58	3,865.51	147.31	7.88	86.95	237.00	-1,722.94	2,199.59	2,044.40	155.20	14.173			
7,650.00	3,890.89	3,865.15	3,865.07	149.23	7.88	86.87	237.01	-1,722.94	2,249.09	2,091.98	157.11	14.315			
7,700.00	3,890.46	3,864.71	3,864.64	151.15	7.88	86.79	237.01	-1,722.94	2,298.60	2,139.58	159.03	14.454			

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



Anticollision Report



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Offset Design: Samedan State - #2 - WB1 - As-Drilled												Offset Site Error:	0.00 usft
Survey Program: 535-MWD												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)			
7,750.00	3,890.02	3,864.28	3,864.20	153.06	7.88	86.72	237.01	-1,722.94	2,348.14	2,187.20	160.94	14.580	
7,800.00	3,889.58	3,863.84	3,863.77	154.98	7.88	86.64	237.02	-1,722.94	2,397.69	2,234.83	162.86	14.723	
7,850.00	3,889.15	3,863.41	3,863.33	156.89	7.88	86.56	237.02	-1,722.94	2,447.26	2,282.49	164.77	14.852	
7,900.00	3,888.71	3,862.97	3,862.89	158.81	7.88	86.48	237.02	-1,722.94	2,496.85	2,330.16	166.69	14.979	
7,950.00	3,888.28	3,862.53	3,862.46	160.73	7.87	86.40	237.03	-1,722.94	2,546.46	2,377.85	168.60	15.103	
8,000.00	3,887.84	3,862.10	3,862.02	162.64	7.87	86.32	237.03	-1,722.94	2,596.08	2,425.56	170.52	15.225	
8,050.00	3,887.40	3,861.66	3,861.59	164.56	7.87	86.24	237.03	-1,722.94	2,645.71	2,473.28	172.44	15.343	
8,100.00	3,886.97	3,861.23	3,861.15	166.48	7.87	86.16	237.03	-1,722.94	2,695.36	2,521.01	174.35	15.459	
8,150.00	3,886.53	3,860.79	3,860.72	168.40	7.87	86.09	237.04	-1,722.94	2,745.02	2,568.75	176.27	15.573	
8,200.00	3,886.10	3,860.36	3,860.28	170.31	7.87	86.01	237.04	-1,722.94	2,794.69	2,616.51	178.18	15.684	
8,250.00	3,885.66	3,859.92	3,859.85	172.23	7.87	85.93	237.04	-1,722.94	2,844.38	2,664.28	180.10	15.793	
8,300.00	3,885.22	3,859.49	3,859.41	174.15	7.87	85.85	237.05	-1,722.94	2,894.07	2,712.05	182.02	15.900	
8,350.00	3,884.79	3,859.05	3,858.97	176.07	7.87	85.77	237.05	-1,722.94	2,943.78	2,759.84	183.94	16.004	
8,400.00	3,884.35	3,858.61	3,858.54	177.99	7.87	85.69	237.05	-1,722.94	2,993.49	2,807.64	185.85	16.107	
8,450.00	3,883.92	3,858.18	3,858.10	179.90	7.87	85.61	237.05	-1,722.94	3,043.22	2,855.45	187.77	16.207	
8,500.00	3,883.48	3,857.74	3,857.67	181.82	7.87	85.54	237.06	-1,722.94	3,092.95	2,903.26	189.69	16.305	
8,550.00	3,883.04	3,857.31	3,857.23	183.74	7.86	85.46	237.06	-1,722.94	3,142.69	2,951.09	191.61	16.402	
8,600.00	3,882.61	3,856.87	3,856.80	185.66	7.86	85.38	237.06	-1,722.94	3,192.44	2,998.92	193.52	16.496	
8,650.00	3,882.17	3,856.44	3,856.36	187.58	7.86	85.30	237.07	-1,722.94	3,242.20	3,046.76	195.44	16.589	
8,669.77	3,882.00	3,856.26	3,856.19	188.34	7.86	85.27	237.07	-1,722.94	3,261.87	3,065.67	196.20	16.625	

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 @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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:	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3698.00usft (Silver Oak 3)

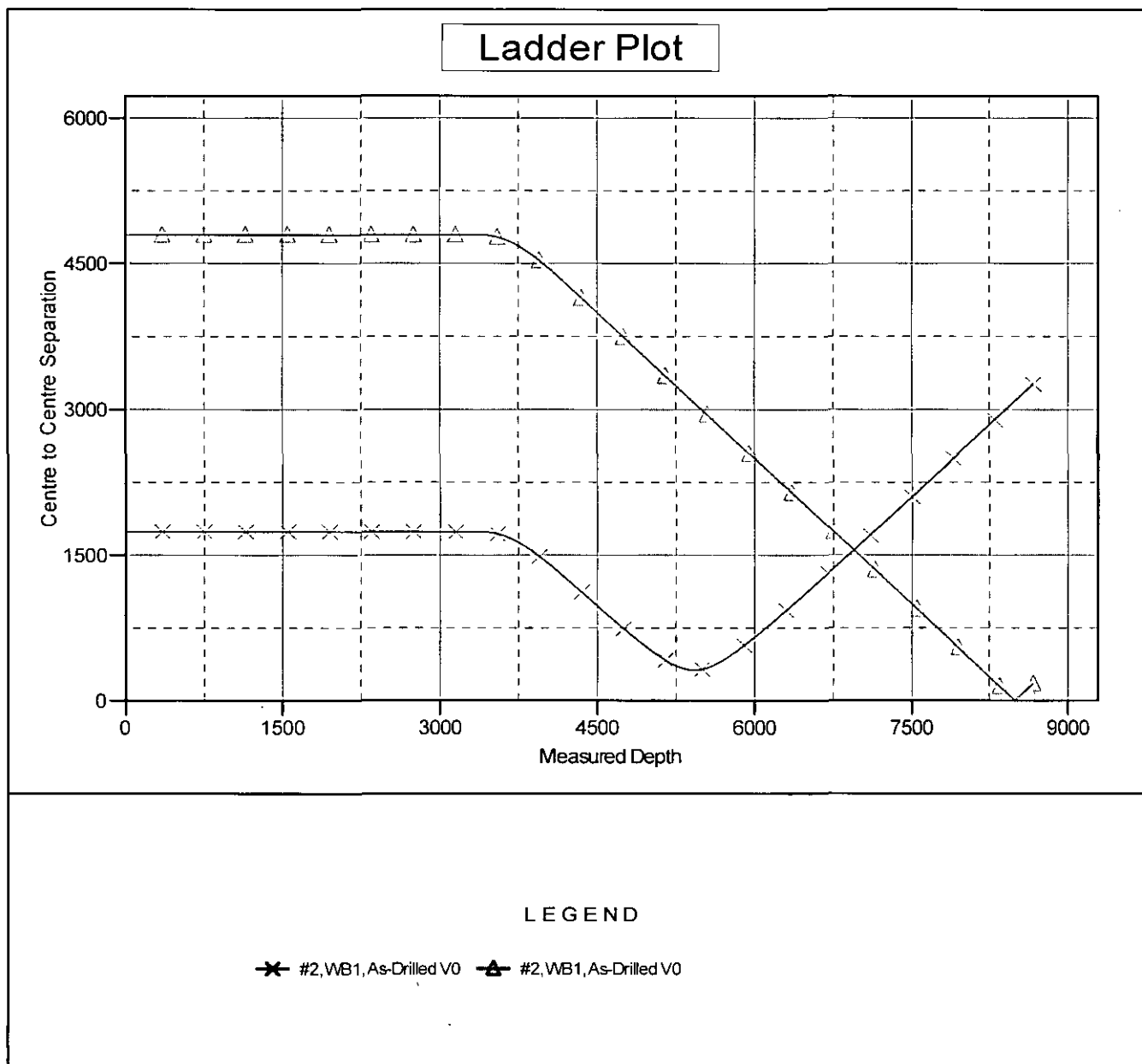
Offset Depths are relative to Offset Datum

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: 0.10°



Company:	COG Operating LLC	Local Co-ordinate Reference:	Well #1H
Project:	Eddy County, NM (NAD27 NME)	TVD Reference:	KB @ 3698.00usft (Silver Oak 3)
Reference Site:	Halberd 27 State	MD Reference:	KB @ 3698.00usft (Silver Oak 3)
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	WB1	Database:	Compass 5000 GCR
Reference Design:	Plan #1 03-02-15	Offset TVD Reference:	Offset Datum

Reference Depths are relative to KB @ 3698.00usft (Silver Oak 3)
 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: 0.10°

