



NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 23 2017

RECEIVED

COG Operating LLC

Eddy County, NM (NAD-27 2015)

Collier 22 State Com #43H

SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E

PP: 1650' FNL, 330' FWL, Sec 22, T17S, R28E, Unit E

BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H

Plan: Design #2

Standard Planning Report

17 December, 2016





TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Collier 22 State Com #43H
Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Design: Design #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Site Collier 22 State Com #43H
KB @ 3592.00usft (Silver Oak 3)
KB @ 3592.00usft (Silver Oak 3)
Grid
Minimum Curvature

Project: Eddy County, NM (NAD-27 2015)
Map System: US State Plane 1927 (Exact solution)
Geo Datum: NAD 1927 (NADCON CONUS)
Map Zone: New Mexico East 3001
System Datum: Mean Sea Level

Site: Collier 22 State Com #43H
Site Position: Northing: 662,964.70 usft Latitude: 32° 49' 20.900 N
From: Map Easting: 549,798.10 usft Longitude: 104° 10' 16.421 W
Position Uncertainty: 0.00 usft Slot Radius: 13.20 in Grid Convergence: 0.09 °

Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Position: +N/-S: 0.00 usft Northing: 662,964.70 usft Latitude: 32° 49' 20.900 N
+E/-W: 0.00 usft Easting: 549,798.10 usft Longitude: 104° 10' 16.421 W
Position Uncertainty: 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 3,574.00 usft

Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Magnetics: Model Name: IGRF2015 Sample Date: 12/10/2016 Declination (°): 7.33 Dip Angle (°): 60.52 Field Strength (nT): 48,281

Design: Design #2
Audit Notes:
Version: Phase: PLAN Tie On Depth: 0.00
Vertical Section: Depth From (TVD) (usft): 0.00 +N/-S (usft): 0.00 +E/-W (usft): 0.00 Direction (°): 89.59

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,625.13	0.00	0.00	2,625.13	0.00	0.00	0.00	0.00	0.00	89.59	
3,443.61	90.03	89.59	3,146.00	3.73	521.15	11.00	11.00	0.00	0.00	
5,196.36	90.03	89.59	3,145.00	16.27	2,273.86	0.00	0.00	0.00	0.00	
5,211.94	89.80	89.59	3,145.03	16.38	2,289.44	1.50	-1.50	0.00	180.00	
6,345.44	89.80	89.59	3,149.00	24.49	3,422.91	0.00	0.00	0.00	0.00	
6,382.61	90.36	89.60	3,148.95	24.76	3,460.07	1.50	1.50	0.02	0.64	
7,821.70	90.36	89.60	3,140.00	34.90	4,899.10	0.00	0.00	0.00	0.00	PBHL-D2 (C22SC#43)



TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Collier 22 State Com #43H
Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S,
R28E, Unit E
Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S,
R28E, Unit H
Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,625.13	0.00	0.00	2,625.13	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 11.00									
2,650.00	2.74	89.59	2,649.99	0.00	0.59	0.59	11.00	11.00	0.00
2,700.00	8.24	89.59	2,699.74	0.04	5.37	5.37	11.00	11.00	0.00
2,750.00	13.74	89.59	2,748.81	0.11	14.90	14.90	11.00	11.00	0.00
2,800.00	19.24	89.59	2,796.73	0.21	29.08	29.08	11.00	11.00	0.00
2,850.00	24.74	89.59	2,843.08	0.34	47.79	47.79	11.00	11.00	0.00
2,900.00	30.24	89.59	2,887.42	0.51	70.86	70.86	11.00	11.00	0.00
2,950.00	35.74	89.59	2,929.34	0.70	98.07	98.07	11.00	11.00	0.00
3,000.00	41.24	89.59	2,968.47	0.92	129.17	129.17	11.00	11.00	0.00
3,050.00	46.74	89.59	3,004.43	1.17	163.88	163.88	11.00	11.00	0.00
3,100.00	52.24	89.59	3,036.90	1.44	201.88	201.88	11.00	11.00	0.00
3,150.00	57.74	89.59	3,065.58	1.74	242.81	242.82	11.00	11.00	0.00
3,200.00	63.24	89.59	3,090.20	2.05	286.30	286.31	11.00	11.00	0.00
3,250.00	68.74	89.59	3,110.54	2.38	331.96	331.97	11.00	11.00	0.00
3,300.00	74.24	89.59	3,126.41	2.71	379.35	379.36	11.00	11.00	0.00
3,350.00	79.74	89.59	3,137.66	3.06	428.05	428.06	11.00	11.00	0.00
3,400.00	85.24	89.59	3,144.20	3.42	477.60	477.61	11.00	11.00	0.00
3,443.61	90.03	89.59	3,146.00	3.73	521.16	521.17	11.00	11.00	0.00
Start 1752.76 hold at 3443.61 MD									
3,500.00	90.03	89.59	3,145.97	4.13	577.54	577.56	0.00	0.00	0.00
3,600.00	90.03	89.59	3,145.91	4.85	677.54	677.56	0.00	0.00	0.00
3,700.00	90.03	89.59	3,145.85	5.56	777.54	777.56	0.00	0.00	0.00
3,800.00	90.03	89.59	3,145.80	6.28	877.54	877.56	0.00	0.00	0.00
3,900.00	90.03	89.59	3,145.74	7.00	977.53	977.56	0.00	0.00	0.00



TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Collier 22 State Com #43H
Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S,
R28E, Unit E
Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S,
R28E, Unit H
Design: Design #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Site Collier 22 State Com #43H
KB @ 3592.00usft (Silver Oak 3)
KB @ 3592.00usft (Silver Oak 3)
Grid
Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,000.00	90.03	89.59	3,145.68	7.71	1,077.53	1,077.56	0.00	0.00	0.00
4,100.00	90.03	89.59	3,145.63	8.43	1,177.53	1,177.56	0.00	0.00	0.00
4,200.00	90.03	89.59	3,145.57	9.14	1,277.53	1,277.56	0.00	0.00	0.00
4,300.00	90.03	89.59	3,145.51	9.86	1,377.52	1,377.56	0.00	0.00	0.00
4,400.00	90.03	89.59	3,145.46	10.57	1,477.52	1,477.56	0.00	0.00	0.00
4,500.00	90.03	89.59	3,145.40	11.29	1,577.52	1,577.56	0.00	0.00	0.00
4,600.00	90.03	89.59	3,145.34	12.00	1,677.52	1,677.56	0.00	0.00	0.00
4,700.00	90.03	89.59	3,145.29	12.72	1,777.51	1,777.56	0.00	0.00	0.00
4,800.00	90.03	89.59	3,145.23	13.44	1,877.51	1,877.56	0.00	0.00	0.00
4,900.00	90.03	89.59	3,145.17	14.15	1,977.51	1,977.56	0.00	0.00	0.00
5,000.00	90.03	89.59	3,145.12	14.87	2,077.51	2,077.56	0.00	0.00	0.00
5,100.00	90.03	89.59	3,145.06	15.58	2,177.50	2,177.56	0.00	0.00	0.00
5,196.36	90.03	89.59	3,145.00	16.27	2,273.86	2,273.92	0.00	0.00	0.00
Start Drop -1.50									
5,200.00	89.98	89.59	3,145.00	16.30	2,277.50	2,277.56	1.50	-1.50	0.00
5,211.94	89.80	89.59	3,145.03	16.38	2,289.44	2,289.50	1.50	-1.50	0.00
Start 1133.51 hold at 5211.94 MD									
5,300.00	89.80	89.59	3,145.34	17.01	2,377.50	2,377.56	0.00	0.00	0.00
5,400.00	89.80	89.59	3,145.69	17.73	2,477.49	2,477.56	0.00	0.00	0.00
5,500.00	89.80	89.59	3,146.04	18.44	2,577.49	2,577.56	0.00	0.00	0.00
5,600.00	89.80	89.59	3,146.39	19.16	2,677.49	2,677.56	0.00	0.00	0.00
5,700.00	89.80	89.59	3,146.74	19.88	2,777.48	2,777.56	0.00	0.00	0.00
5,800.00	89.80	89.59	3,147.09	20.59	2,877.48	2,877.56	0.00	0.00	0.00
5,900.00	89.80	89.59	3,147.44	21.31	2,977.48	2,977.55	0.00	0.00	0.00
6,000.00	89.80	89.59	3,147.79	22.02	3,077.48	3,077.55	0.00	0.00	0.00
6,100.00	89.80	89.59	3,148.14	22.74	3,177.47	3,177.55	0.00	0.00	0.00
6,200.00	89.80	89.59	3,148.49	23.45	3,277.47	3,277.55	0.00	0.00	0.00
6,300.00	89.80	89.59	3,148.84	24.17	3,377.47	3,377.55	0.00	0.00	0.00
6,345.44	89.80	89.59	3,149.00	24.49	3,422.90	3,422.99	0.00	0.00	0.00
Start DLS 1.50 TFO 0.71									
6,382.61	90.36	89.60	3,148.95	24.76	3,460.07	3,460.16	1.50	1.50	0.02
Start 1439.03 hold at 62.61 MD									
6,400.00	90.36	89.60	3,148.84	24.88	3,477.46	3,477.55	0.00	0.00	0.00
6,500.00	90.36	89.60	3,148.22	25.59	3,577.46	3,577.55	0.00	0.00	0.00
6,600.00	90.36	89.60	3,147.60	26.29	3,677.45	3,677.55	0.00	0.00	0.00
6,700.00	90.36	89.60	3,146.98	26.99	3,777.45	3,777.55	0.00	0.00	0.00
6,800.00	90.36	89.60	3,146.36	27.70	3,877.44	3,877.54	0.00	0.00	0.00
6,900.00	90.36	89.60	3,145.73	28.40	3,977.44	3,977.54	0.00	0.00	0.00
7,000.00	90.36	89.60	3,145.11	29.11	4,077.44	4,077.54	0.00	0.00	0.00
7,100.00	90.36	89.60	3,144.49	29.81	4,177.43	4,177.54	0.00	0.00	0.00
7,200.00	90.36	89.60	3,143.87	30.52	4,277.43	4,277.54	0.00	0.00	0.00
7,300.00	90.36	89.60	3,143.25	31.22	4,377.42	4,377.53	0.00	0.00	0.00
7,400.00	90.36	89.60	3,142.62	31.93	4,477.42	4,477.53	0.00	0.00	0.00
7,500.00	90.36	89.60	3,142.00	32.63	4,577.41	4,577.53	0.00	0.00	0.00
7,600.00	90.36	89.60	3,141.38	33.34	4,677.41	4,677.53	0.00	0.00	0.00
7,700.00	90.36	89.60	3,140.76	34.04	4,777.40	4,777.53	0.00	0.00	0.00
7,800.00	90.36	89.60	3,140.14	34.75	4,877.40	4,877.52	0.00	0.00	0.00
7,821.70	90.36	89.60	3,140.00	34.90	4,899.10	4,899.22	0.00	0.00	0.00
TD at 7821.70									



TDS
Planning Report



Database: EDM 5000.1 Single User Db
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Site: Collier 22 State Com #43H
Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S,
R28E, Unit E
Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S,
R28E, Unit H
Design: Design #2

Local Co-ordinate Reference:
TVD Reference:
MD Reference:
North Reference:
Survey Calculation Method:

Site Collier 22 State Com #43H
KB @ 3592.00usft (Silver Oak 3)
KB @ 3592.00usft (Silver Oak 3)
Grid
Minimum Curvature

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Max Dev 1.76' @ 807' T - plan misses target center by 190.09usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Circle (radius 1.76)	0.00	0.00	0.00	0.97	190.09	662,965.67	549,988.19	32° 49' 20.907 N	104° 10' 14.193 W
KOP-D2 (C22SC#43H/I) - plan hits target center - Point	0.00	0.00	2,625.13	0.00	0.00	662,964.70	549,798.10	32° 49' 20.900 N	104° 10' 16.421 W
PP-D2 (C22SC#43H/L1) - plan hits target center - Point	0.00	0.00	3,027.46	1.36	190.05	662,966.06	549,988.15	32° 49' 20.911 N	104° 10' 14.194 W
PBHL-D2 (C22SC#43H/ - plan hits target center - Point	0.00	0.00	3,140.00	34.90	4,899.10	662,999.60	554,697.20	32° 49' 21.168 N	104° 9' 19.008 W
EOC-D2 (C22SC#34H/L - plan hits target center - Point	0.00	0.00	3,146.00	3.73	521.16	662,968.43	550,319.26	32° 49' 20.929 N	104° 10' 10.313 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,625.13	2,625.13	0.00	0.00	Start Build 11.00
3,443.61	3,146.00	3.73	521.16	Start 1752.76 hold at 3443.61 MD
5,196.36	3,145.00	16.27	2,273.86	Start Drop -1.50
5,211.94	3,145.03	16.38	2,289.44	Start 1133.51 hold at 5211.94 MD
6,345.44	3,149.00	24.49	3,422.90	Start DLS 1.50 TFO 0.71
6,382.61	3,148.95	24.76	3,460.07	Start 1439.03 hold at 62.61 MD
7,821.70	3,140.00	34.90	4,899.10	TD at 7821.70



COG Operating LLC

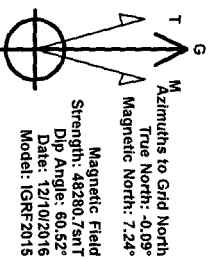
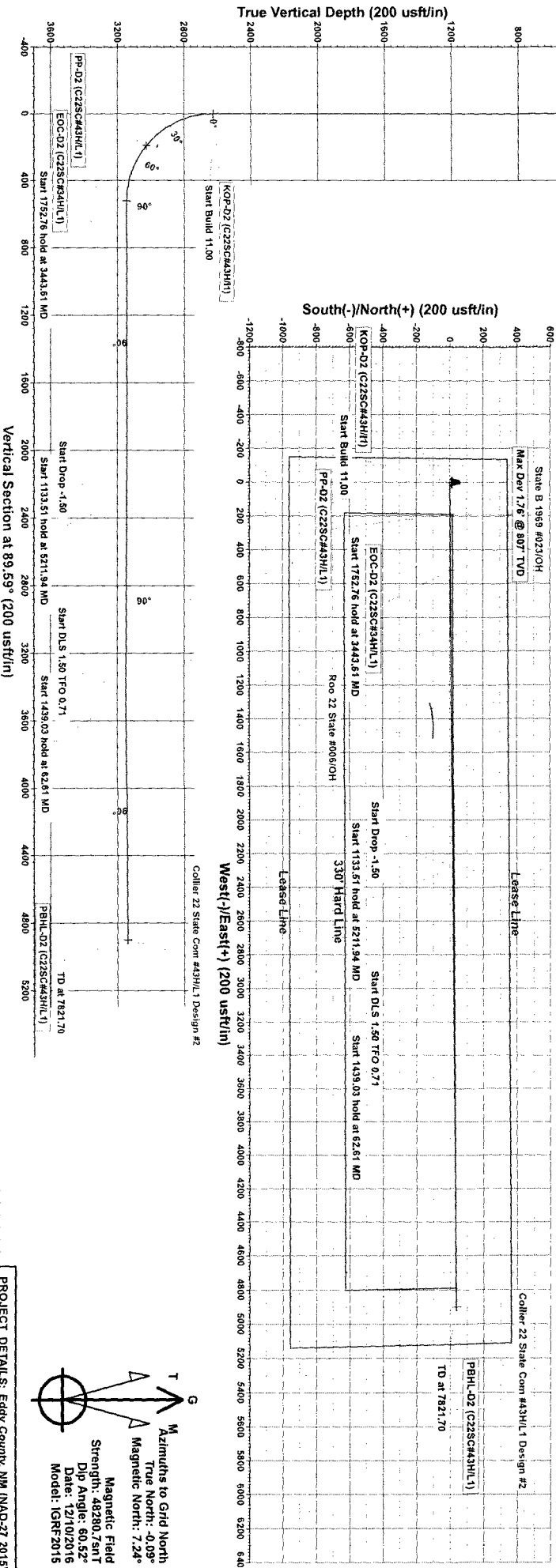
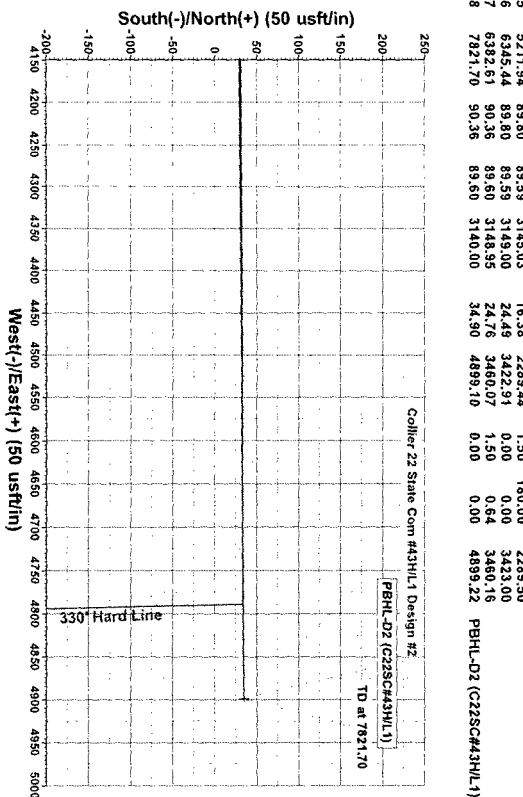
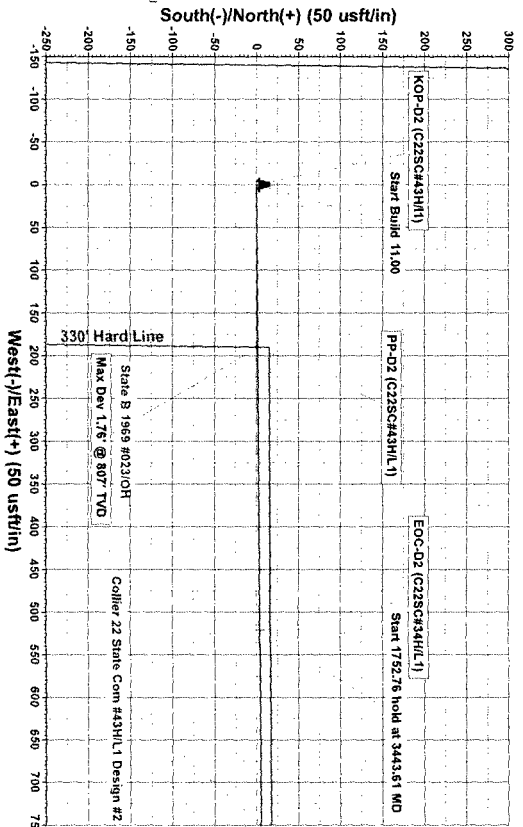
Project: Eddy County, NM (NAD-27 2015)

Site: Collier 22 State Com #43H

Well: SHL: 1650 FNL, 140' FWL, Sec 22, T17S, R28E, Unit E

Wellbore: BHL: 1652 FNL, 220' FEL, Sec 22, T17S, R28E, Unit H

Plan: Design #2 (SHL: 1650 FNL, 140' FWL, Sec 22, T17S, R28E, Unit E/BHL: 1652 FNL, 220' FEL, Sec 22, T17S, R28E, Unit H)



Terra Directional Services LLC
3705 South County Road 1210, Midland, TX 79706
Phone: 432-616-1210

Ground Elevation: 3574.00
RKB Elevation: KB @ 3592.00 usft (Silver Oak 3)
Northing 662964.70
Easting 549798.10
Latitude 32° 49' 20.900 N
Longitude 104° 10' 16.421 W

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



NM OIL CONSERVATION
ARTESIA DISTRICT

JAN 23 2017

RECEIVED

COG Operating LLC

Eddy County, NM (NAD-27 2015)

Collier 22 State Com #43H

SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E

PP: 1650' FNL, 330' FWL, Sec 22, T17S, R28E, Unit E

BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Design #2

Anticollision Report

17 December, 2016





TDS
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S,
R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S,
R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Design #2
Filter type: NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method: Stations
Depth Range: Unlimited
Results Limited by: Maximum center-center distance of 9,999.98 usft
Warning Levels Evaluated at: 2.00 Sigma
Error Model: ISCWSA
Scan Method: Closest Approach 3D
Error Surface: Elliptical Conic
Casing Method: Not applied

Survey Tool Program Date 12/17/2016
From (usft) To (usft) Survey (Wellbore) Tool Name Description
0.00 7,821.70 Design #2 (BHL: 1652' FNL, 220' FEL, Sec 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						
Eddy County Offset Wells	4,259.72	3,150.80	120.58	79.10	2.907	CC, ES, SF
Roo 22 State #006 - OH - OH	100.00	74.00	190.09	188.89	158.355	CC
State B 1969 #023 - OH - OH	800.00	773.99	190.11	176.85	14.342	ES, SF
State B 1969 #023 - OH - OH						

Offset Design

Eddy County Offset Wells - Roo 22 State #006 - OH - OH

Offset Site Error: 0.00 usft
Offset Well Error: 0.00 usft

Reference	Measured Depth (usft)	Vertical Depth (usft)	Offset	Measured Depth (usft)	Vertical Depth (usft)	Reference	Offset	Semi Major Axis	Highside Toolface	Offset Wellbore Centre	Distance	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
										+N-S (usft)	+E-W (usft)					
0.00	0.00	2.77	2.77	0.00	0.00	94.92	-114.00	1,324.60	1,329.50							
100.00	100.00	118.36	118.36	0.09	0.09	94.93	-114.30	1,323.87	1,328.89	1,328.70	0.19	7,068.260				
200.00	200.00	236.84	236.81	0.32	0.25	94.97	-115.00	1,321.34	1,326.78	1,326.22	0.56	2,373.167				
300.00	300.00	335.22	335.15	0.54	0.37	95.02	-115.77	1,318.79	1,324.27	1,323.37	0.90	1,471.031				
400.00	400.00	435.16	435.05	0.77	0.48	95.07	-116.67	1,316.24	1,321.80	1,320.58	1.22	1,084.426				
500.00	500.00	537.67	537.53	0.99	0.55	95.10	-117.20	1,313.57	1,319.25	1,317.74	1.51	871.443				
600.00	600.00	637.16	636.98	1.22	0.66	95.13	-117.67	1,310.87	1,316.59	1,314.73	1.86	709.068				
700.00	700.00	731.00	730.78	1.44	0.81	95.17	-118.30	1,308.21	1,313.85	1,311.62	2.23	589.623				
800.00	800.00	806.93	806.70	1.67	0.94	95.19	-118.61	1,306.95	1,312.33	1,309.74	2.59	507.156				
818.37	818.37	821.00	820.77	1.71	0.96	95.19	-118.61	1,306.93	1,312.31	1,309.65	2.65	494.497				
900.00	900.00	894.36	894.13	1.89	1.09	95.17	-118.39	1,307.24	1,312.62	1,309.64	2.97	441.473				
1,000.00	1,000.00	993.24	993.00	2.12	1.28	95.14	-117.74	1,308.02	1,313.34	1,309.96	3.39	387.719				
1,100.00	1,100.00	1,093.36	1,093.12	2.34	1.48	95.12	-117.22	1,308.77	1,314.05	1,310.24	3.81	345.048				
1,200.00	1,200.00	1,193.29	1,193.04	2.56	1.68	95.10	-116.94	1,309.52	1,314.76	1,310.53	4.23	310.638				
1,300.00	1,300.00	1,294.31	1,294.06	2.79	1.88	95.09	-116.65	1,310.23	1,315.44	1,310.77	4.66	282.207				
1,400.00	1,400.00	1,393.65	1,393.39	3.01	2.08	95.07	-116.31	1,310.91	1,316.09	1,311.00	5.09	258.659				
1,500.00	1,500.00	1,496.38	1,496.13	3.24	2.29	95.06	-116.07	1,311.58	1,316.72	1,311.20	5.52	238.354				
1,600.00	1,600.00	1,598.70	1,598.44	3.46	2.50	95.05	-115.89	1,311.93	1,317.05	1,311.09	5.96	220.947				
1,700.00	1,700.00	1,696.80	1,696.54	3.69	2.71	95.04	-115.83	1,312.31	1,317.43	1,311.04	6.39	206.195				
1,800.00	1,800.00	1,798.48	1,798.22	3.91	2.92	95.04	-115.78	1,312.71	1,317.81	1,310.99	6.82	193.110				
1,900.00	1,900.00	1,898.69	1,898.43	4.14	3.12	95.04	-115.70	1,313.01	1,318.11	1,310.85	7.26	181.621				
2,000.00	2,000.00	1,998.59	1,998.33	4.36	3.33	95.03	-115.67	1,313.32	1,318.41	1,310.72	7.69	171.451				

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation
Page 2

COMPASS 5000.1 Build 78



TDS
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Eddy County Offset Wells - Roo 22 State #006 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 117-Scientific Gyro, 458-MWD														Offset Well Error:	0.00 usft
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)										
2,100.00	2,100.00	2,098.69	2,098.44	4.59	3.54	95.03	-115.64	1,313.63	1,318.72	1,310.60	8.12	162.369			
2,200.00	2,200.00	2,199.09	2,198.83	4.81	3.75	95.03	-115.72	1,313.92	1,319.01	1,310.45	8.56	154.177			
2,300.00	2,300.00	2,300.39	2,300.13	5.04	3.96	95.04	-115.88	1,314.13	1,319.23	1,310.24	8.99	146.703			
2,400.00	2,400.00	2,399.13	2,398.87	5.26	4.16	95.04	-115.99	1,314.30	1,319.41	1,309.99	9.42	140.023			
2,500.00	2,500.00	2,497.33	2,497.07	5.49	4.37	95.05	-116.15	1,314.65	1,319.78	1,309.93	9.85	133.979			
2,600.00	2,600.00	2,598.54	2,598.28	5.71	4.58	95.05	-116.26	1,315.00	1,320.14	1,309.85	10.28	128.359			
2,625.13	2,625.13	2,622.65	2,622.38	5.77	4.63	95.05	-116.27	1,315.09	1,320.23	1,309.83	10.39	127.055			
2,650.00	2,649.99	2,646.48	2,646.21	5.82	4.68	5.47	-116.28	1,315.19	1,319.74	1,309.25	10.49	125.776			
2,700.00	2,699.74	2,694.19	2,693.92	5.92	4.77	5.53	-116.25	1,315.45	1,315.26	1,304.56	10.69	122.990			
2,750.00	2,748.81	2,739.47	2,739.21	6.04	4.87	5.67	-116.18	1,315.78	1,306.13	1,295.23	10.90	119.853			
2,800.00	2,796.73	2,779.32	2,779.05	6.15	4.95	5.87	-116.04	1,316.29	1,292.61	1,281.51	11.09	116.519			
2,850.00	2,843.08	2,818.08	2,817.81	6.29	5.03	6.14	-115.81	1,317.04	1,274.85	1,263.56	11.29	112.920			
2,900.00	2,887.42	2,858.00	2,857.71	6.47	5.11	6.52	-115.46	1,318.07	1,253.00	1,241.51	11.49	109.037			
2,950.00	2,929.34	2,886.54	2,886.23	6.71	5.17	6.98	-115.16	1,319.03	1,227.29	1,215.62	11.67	105.184			
3,000.00	2,968.47	2,915.73	2,915.39	7.03	5.23	7.60	-114.79	1,320.29	1,198.01	1,186.16	11.85	101.124			
3,050.00	3,004.43	2,943.17	2,942.79	7.44	5.29	8.39	-114.39	1,321.72	1,165.36	1,153.33	12.02	96.938			
3,100.00	3,036.90	2,968.63	2,968.20	7.97	5.34	9.44	-113.98	1,323.27	1,129.56	1,117.37	12.19	92.655			
3,150.00	3,065.58	2,988.00	2,987.52	8.62	5.38	10.81	-113.64	1,324.59	1,090.89	1,078.54	12.34	88.380			
3,200.00	3,090.20	3,016.34	3,015.78	9.40	5.44	12.87	-113.13	1,326.67	1,049.54	1,037.02	12.52	83.848			
3,250.00	3,110.54	3,036.92	3,036.29	10.28	5.49	15.79	-112.78	1,328.26	1,005.86	993.19	12.67	79.406			
3,300.00	3,126.41	3,053.97	3,053.29	11.27	5.52	20.25	-112.49	1,329.62	960.20	947.40	12.80	74.990			
3,350.00	3,137.66	3,067.29	3,066.56	12.35	5.55	27.59	-112.28	1,330.72	912.97	900.04	12.93	70.617			
3,400.00	3,144.20	3,076.69	3,075.92	13.48	5.57	40.73	-112.13	1,331.50	864.58	851.54	13.04	66.296			
3,443.61	3,146.00	3,081.56	3,080.78	14.50	5.58	61.08	-112.05	1,331.92	821.78	808.64	13.13	62.573			
3,500.00	3,145.97	3,085.84	3,085.05	15.86	5.59	62.63	-111.98	1,332.29	766.24	752.99	13.26	57.800			
3,600.00	3,145.91	3,093.60	3,092.77	18.35	5.61	65.56	-111.86	1,332.96	668.04	654.47	13.57	49.234			
3,700.00	3,145.85	3,101.57	3,100.72	20.90	5.62	68.73	-111.74	1,333.66	570.34	556.25	14.09	40.490			
3,800.00	3,145.80	3,109.77	3,108.88	23.50	5.64	72.13	-111.62	1,334.39	473.45	458.48	14.98	31.616			
3,900.00	3,145.74	3,118.27	3,117.34	26.13	5.66	75.81	-111.49	1,335.15	377.99	361.42	16.57	22.810			
4,000.00	3,145.68	3,127.29	3,126.33	28.79	5.68	79.87	-111.36	1,335.97	285.38	265.79	19.59	14.568			
4,100.00	3,145.63	3,136.33	3,135.33	31.46	5.70	84.04	-111.22	1,336.79	199.60	173.99	25.61	7.793			
4,200.00	3,145.57	3,145.39	3,144.35	34.15	5.72	88.30	-111.08	1,337.61	134.45	97.93	36.52	3.682			
4,259.72	3,145.54	3,150.80	3,149.74	35.76	5.73	90.86	-111.00	1,338.11	120.58	79.10	41.48	2.907 CC, ES, SF			
4,300.00	3,145.51	3,154.46	3,153.38	36.85	5.74	92.59	-110.94	1,338.44	127.08	86.31	40.77	3.117			
4,400.00	3,145.46	3,163.54	3,162.42	39.55	5.75	96.86	-110.80	1,339.27	184.55	152.34	32.21	5.729			
4,500.00	3,145.40	3,172.64	3,171.49	42.27	5.77	101.08	-110.65	1,340.09	267.96	242.00	25.95	10.325			
4,600.00	3,145.34	3,181.76	3,180.56	44.98	5.79	105.20	-110.51	1,340.93	359.69	337.21	22.49	15.996			
4,700.00	3,145.29	3,190.89	3,189.66	47.71	5.81	109.18	-110.36	1,341.76	454.74	434.29	20.45	22.234			
4,800.00	3,145.23	3,200.04	3,198.76	50.43	5.83	112.99	-110.21	1,342.59	551.40	532.23	19.17	28.766			
4,900.00	3,145.17	3,209.20	3,207.89	53.16	5.85	116.61	-110.05	1,343.43	648.94	630.63	18.31	35.444			
5,000.00	3,145.12	3,218.38	3,217.03	55.89	5.87	120.03	-109.90	1,344.27	747.01	729.31	17.71	42.186			
5,100.00	3,145.06	3,227.57	3,226.18	58.63	5.89	123.25	-109.74	1,345.11	845.44	828.17	17.27	48.945			
5,196.36	3,145.00	3,236.45	3,235.01	61.26	5.91	126.15	-109.58	1,345.92	940.52	923.56	16.96	55.447			
5,200.00	3,145.00	3,236.79	3,235.35	61.36	5.92	126.53	-109.58	1,345.96	944.12	927.16	16.95	55.692			
5,211.94	3,145.03	3,237.92	3,236.48	61.69	5.92	127.77	-109.56	1,346.06	955.90	938.98	16.92	56.495			
5,300.00	3,145.34	3,246.40	3,244.92	64.10	5.94	130.26	-109.41	1,346.84	1,042.92	1,026.21	16.71	62.404			
5,400.00	3,145.69	3,255.96	3,254.44	66.84	5.96	132.86	-109.24	1,347.71	1,141.86	1,125.32	16.53	69.073			
5,500.00	3,146.04	3,265.52	3,263.96	69.58	5.98	135.27	-109.08	1,348.59	1,240.89	1,224.49	16.39	75.893			
5,600.00	3,146.39	3,275.10	3,273.49	72.33	6.00	137.49	-108.91	1,349.47	1,339.99	1,323.70	16.29	82.260			
5,700.00	3,146.74	3,284.68	3,283.04	75.07	6.02	139.55	-108.75	1,350.35	1,439.16	1,422.95	16.21	88.771			
5,800.00	3,147.09	3,294.27	3,292.59	77.81	6.04	141.46	-108.60	1,351.23	1,538.37	1,522.22	16.16	95.225			

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Eddy County Offset Wells - Roo 22 State #006 - OH - OH											Offset Site Error:	0.00 usft
Survey Program: 117-Scientific Gyro, 458-MWD											Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance				Separation Factor	Warning
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)		Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)		
5,900.00	3,147.44	3,303.88	3,302.15	80.56	6.07	143.22	-108.44	1,352.12	1,637.63	1,621.51	16.12	101.618
6,000.00	3,147.79	3,313.49	3,311.72	83.31	6.09	144.86	-108.29	1,353.00	1,736.92	1,720.83	16.09	107.952
6,100.00	3,148.14	3,323.11	3,321.30	86.05	6.11	146.37	-108.14	1,353.89	1,836.23	1,820.15	16.08	114.223
6,200.00	3,148.49	3,332.75	3,330.89	88.80	6.13	147.78	-108.00	1,354.78	1,935.57	1,919.50	16.07	120.432
6,300.00	3,148.84	3,342.39	3,340.49	91.55	6.15	149.09	-107.86	1,355.67	2,034.92	2,018.85	16.08	126.578
6,345.44	3,149.00	3,346.77	3,344.86	92.80	6.16	149.66	-107.79	1,356.07	2,080.08	2,064.00	16.08	129.351
6,382.61	3,148.95	3,350.18	3,348.25	93.82	6.17	147.37	-107.74	1,356.38	2,117.03	2,100.95	16.09	131.615
6,400.00	3,148.84	3,351.69	3,349.75	94.30	6.17	147.59	-107.72	1,356.52	2,134.33	2,118.24	16.09	132.675
6,500.00	3,148.22	3,360.38	3,358.40	97.05	6.19	148.79	-107.60	1,357.33	2,233.81	2,217.71	16.10	138.744
6,600.00	3,147.60	3,369.07	3,367.06	99.80	6.21	149.91	-107.48	1,358.13	2,333.30	2,317.18	16.12	144.755
6,700.00	3,146.98	3,377.88	3,375.83	102.55	6.23	150.97	-107.36	1,358.94	2,432.80	2,416.65	16.14	150.701
6,800.00	3,146.36	3,387.11	3,385.02	105.30	6.25	152.02	-107.23	1,359.80	2,532.31	2,516.13	16.17	156.562
6,900.00	3,145.73	3,396.39	3,394.26	108.05	6.27	153.01	-107.10	1,360.66	2,631.82	2,615.61	16.21	162.359
7,000.00	3,145.11	3,405.72	3,403.55	110.80	6.30	153.94	-106.98	1,361.53	2,731.34	2,715.09	16.25	168.092
7,100.00	3,144.49	3,415.11	3,412.89	113.55	6.32	154.82	-106.85	1,362.40	2,830.87	2,814.58	16.29	173.762
7,200.00	3,143.87	3,424.54	3,422.28	116.30	6.34	155.65	-106.72	1,363.29	2,930.40	2,914.06	16.34	179.367
7,300.00	3,143.25	3,434.03	3,431.73	119.05	6.36	156.44	-106.59	1,364.17	3,029.93	3,013.55	16.39	184.909
7,400.00	3,142.62	3,443.57	3,441.22	121.81	6.38	157.18	-106.46	1,365.07	3,129.47	3,113.03	16.44	190.387
7,500.00	3,142.00	3,453.16	3,450.77	124.56	6.41	157.89	-106.33	1,365.98	3,229.01	3,212.52	16.49	195.800
7,600.00	3,141.38	3,462.81	3,460.37	127.31	6.43	158.56	-106.20	1,366.89	3,328.55	3,312.00	16.55	201.150
7,700.00	3,140.76	3,472.51	3,470.03	130.07	6.45	159.20	-106.07	1,367.81	3,428.10	3,411.49	16.61	206.435
7,800.00	3,140.14	3,482.26	3,479.74	132.82	6.47	159.81	-105.94	1,368.73	3,527.64	3,510.97	16.67	211.656
7,821.70	3,140.00	3,484.38	3,481.85	133.42	6.48	159.94	-105.91	1,368.94	3,549.24	3,532.56	16.68	212.781



TDS
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Eddy County Offset Wells - State B 1969 #023 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 807-INC														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (")	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)										
0.00	0.00	0.00	0.00	0.00	0.00	89.71	0.97	190.09	191.86						
100.00	100.00	74.00	74.00	0.09	1.11	89.70	0.98	190.09	190.09	188.89	1.20	158.355	CC		
200.00	200.00	174.00	174.00	0.32	2.61	89.68	1.05	190.09	190.09	187.17	2.92	65.043			
300.00	300.00	274.00	274.00	0.54	4.10	89.65	1.17	190.09	190.09	185.45	4.64	40.927			
400.00	400.00	374.00	374.00	0.77	5.60	89.59	1.35	190.09	190.09	183.73	6.37	29.857			
500.00	500.00	474.00	474.00	0.99	7.10	89.52	1.58	190.09	190.10	182.01	8.09	23.501			
600.00	600.00	574.00	573.99	1.22	8.60	89.44	1.86	190.09	190.10	180.29	9.81	19.376			
700.00	700.00	673.99	673.99	1.44	10.09	89.34	2.20	190.09	190.10	178.57	11.53	16.483			
800.00	800.00	773.99	773.99	1.67	11.59	89.22	2.59	190.09	190.11	176.85	13.26	14.342	ES, SF		
900.00	900.00	807.00	807.00	1.89	12.08	89.18	2.73	190.09	201.57	188.15	13.42	15.020			
1,000.00	1,000.00	807.00	807.00	2.12	12.08	89.18	2.73	190.09	253.04	241.44	11.60	21.809			
1,100.00	1,100.00	807.00	807.00	2.34	12.08	89.18	2.73	190.09	327.77	317.90	9.86	33.230			
1,200.00	1,200.00	807.00	807.00	2.56	12.08	89.18	2.73	190.09	413.32	404.69	8.63	47.889			
1,300.00	1,300.00	807.00	807.00	2.79	12.08	89.18	2.73	190.09	504.22	496.42	7.79	64.717			
1,400.00	1,400.00	807.00	807.00	3.01	12.08	89.18	2.73	190.09	598.02	590.82	7.21	82.971			
1,500.00	1,500.00	807.00	807.00	3.24	12.08	89.18	2.73	190.09	693.57	686.78	6.79	102.154			
1,600.00	1,600.00	807.00	807.00	3.46	12.08	89.18	2.73	190.09	790.21	783.73	6.48	121.941			
1,700.00	1,700.00	807.00	807.00	3.69	12.08	89.18	2.73	190.09	887.60	881.36	6.25	142.126			
1,800.00	1,800.00	807.00	807.00	3.91	12.08	89.18	2.73	190.09	985.51	979.45	6.06	162.576			
1,900.00	1,900.00	807.00	807.00	4.14	12.08	89.18	2.73	190.09	1,083.81	1,077.89	5.92	183.208			
2,000.00	2,000.00	807.00	807.00	4.36	12.08	89.18	2.73	190.09	1,182.39	1,176.59	5.80	203.970			
2,100.00	2,100.00	807.00	807.00	4.59	12.08	89.18	2.73	190.09	1,281.19	1,275.49	5.70	224.829			
2,200.00	2,200.00	807.00	807.00	4.81	12.08	89.18	2.73	190.09	1,380.16	1,374.54	5.62	245.764			
2,300.00	2,300.00	807.00	807.00	5.04	12.08	89.18	2.73	190.09	1,479.27	1,473.72	5.55	266.759			
2,400.00	2,400.00	807.00	807.00	5.26	12.08	89.18	2.73	190.09	1,578.49	1,573.01	5.48	287.803			
2,500.00	2,500.00	807.00	807.00	5.49	12.08	89.18	2.73	190.09	1,677.81	1,672.38	5.43	308.887			
2,600.00	2,600.00	807.00	807.00	5.71	12.08	89.18	2.73	190.09	1,777.20	1,771.81	5.39	330.001			
2,625.13	2,625.13	807.00	807.00	5.77	12.08	89.18	2.73	190.09	1,802.19	1,796.81	5.37	335.310			
2,650.00	2,649.99	807.00	807.00	5.82	12.08	-0.28	2.73	190.09	1,826.85	1,821.49	5.36	341.081			
2,700.00	2,699.74	807.00	807.00	5.92	12.08	-0.17	2.73	190.09	1,875.86	1,870.57	5.30	354.114			
2,750.00	2,748.81	807.00	807.00	6.04	12.08	-0.13	2.73	190.09	1,923.81	1,918.60	5.21	369.295			
2,800.00	2,796.73	807.00	807.00	6.15	12.08	-0.10	2.73	190.09	1,970.33	1,965.23	5.10	386.248			
2,850.00	2,843.08	807.00	807.00	6.29	12.08	-0.08	2.73	190.09	2,015.11	2,010.14	4.98	404.757			
2,900.00	2,887.42	807.00	807.00	6.47	12.08	-0.07	2.73	190.09	2,057.88	2,053.03	4.85	424.421			
2,950.00	2,929.34	807.00	807.00	6.71	12.08	-0.06	2.73	190.09	2,098.37	2,093.64	4.72	444.525			
3,000.00	2,968.47	807.00	807.00	7.03	12.08	-0.05	2.73	190.09	2,136.34	2,131.73	4.61	463.898			
3,050.00	3,004.43	807.00	807.00	7.44	12.08	-0.05	2.73	190.09	2,171.59	2,167.07	4.52	480.805			
3,100.00	3,036.90	807.00	807.00	7.97	12.08	-0.05	2.73	190.09	2,203.93	2,199.46	4.47	493.009			
3,150.00	3,065.58	807.00	807.00	8.62	12.08	-0.04	2.73	190.09	2,233.20	2,228.72	4.48	498.203			
3,200.00	3,090.20	807.00	807.00	9.40	12.08	-0.04	2.73	190.09	2,259.25	2,254.68	4.57	494.806			
3,250.00	3,110.54	807.00	807.00	10.28	12.08	-0.04	2.73	190.09	2,281.96	2,277.23	4.73	482.726			
3,300.00	3,126.41	807.00	807.00	11.27	12.08	-0.04	2.73	190.09	2,301.21	2,296.24	4.97	463.457			
3,350.00	3,137.66	807.00	807.00	12.35	12.08	-0.04	2.73	190.09	2,316.92	2,311.65	5.27	439.402			
3,400.00	3,144.20	807.00	807.00	13.48	12.08	-0.03	2.73	190.09	2,329.02	2,323.38	5.84	413.007			
3,443.61	3,146.00	807.00	807.00	14.50	12.08	-0.03	2.73	190.09	2,336.58	2,330.58	6.00	389.729			
3,500.00	3,145.97	807.00	807.00	15.86	12.08	-0.03	2.73	190.09	2,345.20	2,338.69	6.50	360.570			
3,600.00	3,145.91	807.00	807.00	18.35	12.08	-0.03	2.73	190.09	2,363.72	2,356.27	7.46	317.017			
3,700.00	3,145.85	807.00	807.00	20.90	12.08	-0.03	2.73	190.09	2,386.30	2,377.87	8.43	283.193			
3,800.00	3,145.80	807.00	807.00	23.50	12.08	-0.03	2.73	190.09	2,412.81	2,403.41	9.40	256.766			
3,900.00	3,145.74	807.00	807.00	26.13	12.08	-0.03	2.73	190.09	2,443.13	2,432.77	10.35	235.942			
4,000.00	3,145.68	807.00	807.00	28.79	12.08	-0.03	2.73	190.09	2,477.11	2,465.82	11.29	219.395			

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



TDS
Anticollision Report



Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Offset Design Eddy County Offset Wells - State B 1969 #023 - OH - OH														Offset Site Error:	0.00 usft
Survey Program: 807-INC														Offset Well Error:	0.00 usft
Reference		Offset		Semi Major Axis		Highside Tooface (')	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)										
4,100.00	3,145.63	807.00	807.00	31.46	12.08	-0.03	2.73	190.09	2,514.62	2,502.42	12.20	206.153			
4,200.00	3,145.57	807.00	807.00	34.15	12.08	-0.03	2.73	190.09	2,555.49	2,542.42	13.07	195.497			
4,300.00	3,145.51	807.00	807.00	36.85	12.08	-0.03	2.73	190.09	2,599.57	2,585.66	13.91	186.894			
4,400.00	3,145.46	807.00	807.00	39.55	12.08	-0.03	2.73	190.09	2,646.70	2,631.99	14.71	179.942			
4,500.00	3,145.40	807.00	807.00	42.27	12.08	-0.03	2.73	190.09	2,696.71	2,681.24	15.47	174.333			
4,600.00	3,145.34	807.00	807.00	44.98	12.08	-0.03	2.73	190.09	2,749.45	2,733.26	16.19	169.829			
4,700.00	3,145.29	807.00	807.00	47.71	12.08	-0.03	2.73	190.09	2,804.76	2,787.89	16.87	166.245			
4,800.00	3,145.23	807.00	807.00	50.43	12.08	-0.03	2.73	190.09	2,862.50	2,844.99	17.51	163.432			
4,900.00	3,145.17	807.00	807.00	53.16	12.08	-0.03	2.73	190.09	2,922.52	2,904.40	18.12	161.272			
5,000.00	3,145.12	807.00	807.00	55.89	12.08	-0.03	2.73	190.09	2,984.69	2,966.00	18.69	159.670			
5,100.00	3,145.06	807.00	807.00	58.63	12.08	-0.03	2.73	190.09	3,048.87	3,029.64	19.23	158.548			
5,196.36	3,145.00	807.00	807.00	61.26	12.08	-0.03	2.73	190.09	3,112.50	3,092.78	19.72	157.859			
5,200.00	3,145.00	807.00	807.00	61.36	12.08	-0.03	2.73	190.09	3,114.94	3,095.20	19.73	157.839			
5,211.94	3,145.03	807.00	807.00	61.69	12.08	-0.03	2.73	190.09	3,122.97	3,103.17	19.79	157.778			
5,300.00	3,145.34	807.00	807.00	64.10	12.08	-0.03	2.73	190.09	3,183.06	3,162.85	20.21	157.513			
5,400.00	3,145.69	807.00	807.00	66.84	12.08	-0.03	2.73	190.09	3,252.84	3,232.19	20.65	157.510			
5,500.00	3,146.04	807.00	807.00	69.58	12.08	-0.03	2.73	190.09	3,324.17	3,303.10	21.07	157.782			
5,600.00	3,146.39	807.00	807.00	72.33	12.08	-0.03	2.73	190.09	3,396.94	3,375.48	21.46	158.298			
5,700.00	3,146.74	807.00	807.00	75.07	12.08	-0.03	2.73	190.09	3,471.07	3,449.24	21.83	159.030			
5,800.00	3,147.09	807.00	807.00	77.81	12.08	-0.03	2.73	190.09	3,546.46	3,524.29	22.17	159.956			
5,900.00	3,147.44	807.00	807.00	80.56	12.08	-0.03	2.73	190.09	3,623.05	3,600.56	22.50	161.055			
6,000.00	3,147.79	807.00	807.00	83.31	12.08	-0.03	2.73	190.09	3,700.76	3,677.96	22.80	162.308			
6,100.00	3,148.14	807.00	807.00	86.05	12.08	-0.03	2.73	190.09	3,779.52	3,756.43	23.09	163.702			
6,200.00	3,148.49	807.00	807.00	88.80	12.08	-0.03	2.73	190.09	3,859.26	3,835.90	23.36	165.222			
6,300.00	3,148.84	807.00	807.00	91.55	12.08	-0.03	2.73	190.09	3,939.92	3,916.31	23.61	166.857			
6,345.44	3,149.00	807.00	807.00	92.80	12.08	-0.03	2.73	190.09	3,976.87	3,953.14	23.72	167.634			
6,382.61	3,148.95	807.00	807.00	93.82	12.08	-0.02	2.73	190.09	4,007.11	3,983.30	23.81	168.284			
6,400.00	3,148.84	807.00	807.00	94.30	12.08	-0.02	2.73	190.09	4,021.25	3,997.40	23.85	168.592			
6,500.00	3,148.22	807.00	807.00	97.05	12.08	-0.02	2.73	190.09	4,103.05	4,078.97	24.08	170.382			
6,600.00	3,147.60	807.00	807.00	99.80	12.08	-0.02	2.73	190.09	4,185.65	4,161.35	24.30	172.262			
6,700.00	3,146.98	807.00	807.00	102.55	12.08	-0.02	2.73	190.09	4,268.99	4,244.48	24.50	174.223			
6,800.00	3,146.36	807.00	807.00	105.30	12.08	-0.02	2.73	190.09	4,353.03	4,328.33	24.70	176.258			
6,900.00	3,145.73	807.00	807.00	108.05	12.08	-0.02	2.73	190.09	4,437.73	4,412.85	24.88	178.363			
7,000.00	3,145.11	807.00	807.00	110.80	12.08	-0.02	2.73	190.09	4,523.05	4,498.00	25.05	180.530			
7,100.00	3,144.49	807.00	807.00	113.55	12.08	-0.02	2.73	190.09	4,608.97	4,583.75	25.22	182.756			
7,200.00	3,143.87	807.00	807.00	116.30	12.08	-0.02	2.73	190.09	4,695.45	4,670.07	25.38	185.035			
7,300.00	3,143.25	807.00	807.00	119.05	12.08	-0.02	2.73	190.09	4,782.45	4,756.92	25.52	187.364			
7,400.00	3,142.62	807.00	807.00	121.81	12.08	-0.02	2.73	190.09	4,869.95	4,844.28	25.67	189.738			
7,500.00	3,142.00	807.00	807.00	124.56	12.08	-0.02	2.73	190.09	4,957.92	4,932.12	25.80	192.156			
7,600.00	3,141.38	807.00	807.00	127.31	12.08	-0.02	2.73	190.09	5,046.34	5,020.41	25.93	194.612			
7,700.00	3,140.76	807.00	807.00	130.07	12.08	-0.02	2.73	190.09	5,135.19	5,109.14	26.05	197.105			
7,800.00	3,140.14	807.00	807.00	132.82	12.08	-0.02	2.73	190.09	5,224.44	5,198.27	26.17	199.632			
7,821.70	3,140.00	807.00	807.00	133.42	12.08	-0.02	2.73	190.09	5,243.86	5,217.67	26.20	200.184			



TDS
Anticollision Report



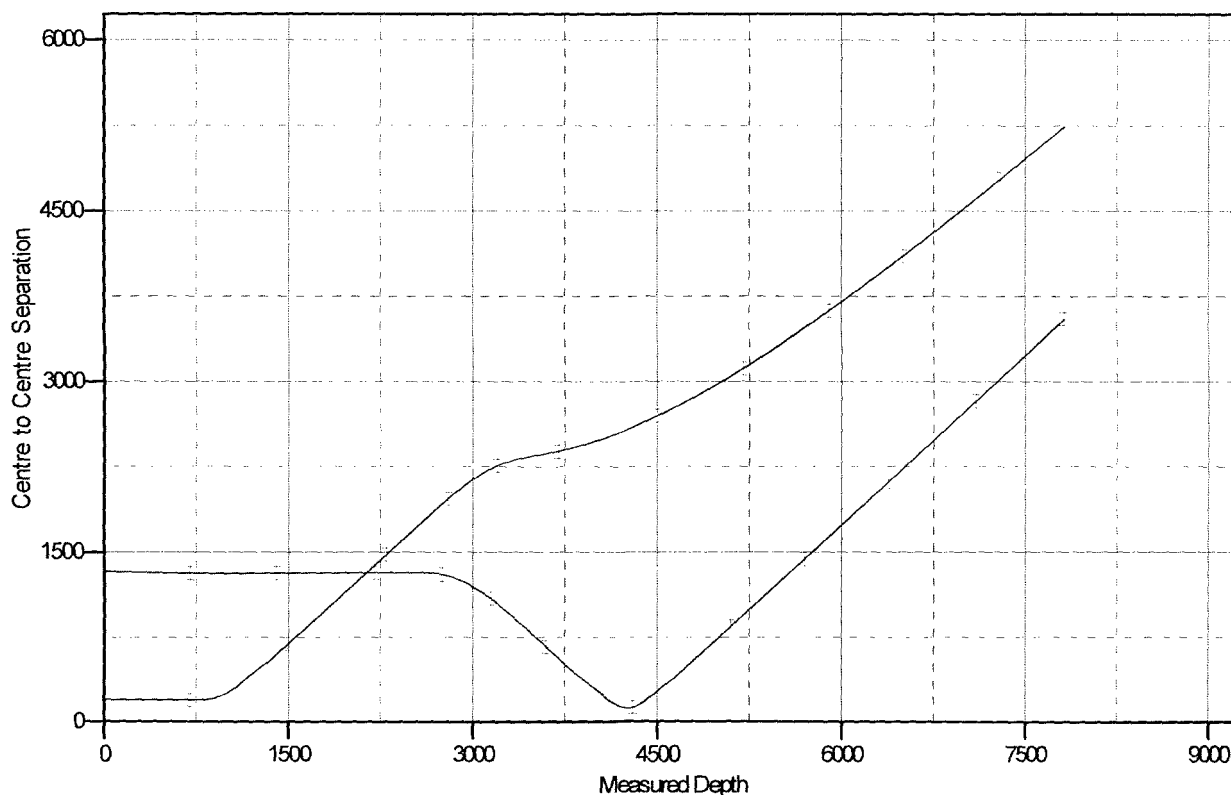
Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3592.00usft (Silver Oak 3)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Collier 22 State Com #43H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.09°

Ladder Plot



LEGEND

—•— State B 1969#023, OH, OHV0 - - - - - Roo 22 State #006, OH, OHV0

Company: COG Operating LLC
Project: Eddy County, NM (NAD-27 2015)
Reference Site: Collier 22 State Com #43H
Site Error: 0.00 usft
Reference Well: SHL: 1650' FNL, 140' FWL, Sec 22, T17S, R28E, Unit E
Well Error: 0.00 usft
Reference Wellbore: BHL: 1652' FNL, 220' FEL, Sec 22, T17S, R28E, Unit H
Reference Design: Design #2

Local Co-ordinate Reference: Site Collier 22 State Com #43H
TVD Reference: KB @ 3592.00usft (Silver Oak 3)
MD Reference: KB @ 3592.00usft (Silver Oak 3)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Single User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB @ 3592.00usft (Silver Oak 3)
 Offset Depths are relative to Offset Datum
 Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Collier 22 State Com #43H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.09°

