



CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)
Sec. 31, T 25 S., R 35 E
Square Bill Federal Com 1H

Wellbore #1
Plan #1

HOBBS OCD
SEP 26 2017
RECEIVED

Anticollision Report

13 March, 2017





Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference	Plan #1
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria
Interpolation Method:	MD Interval 100.00ft
Depth Range:	Unlimited
Results Limited by:	Maximum center-center distance of 10,000.00 ft
Warning Levels Evaluated at:	2.00 Sigma
Error Model:	ISCWSA
Scan Method:	Closest Approach 3D
Error Surface:	Circular Conic
Casing Method:	Not applied

Survey Tool Program Date 3/13/2017

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	19,620.00	Plan #1 (Wellbore #1)	MWD	MWD - Standard

Summary

Site Name	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Offset Well - Wellbore - Design						
Sec. 31, T 25 S., R 35 E						
Square Bill Federal Com 21H - Wellbore #1 - Plan #1	5,000.00	5,000.00	33.10	10.91	1.491	Level 3, CC
Square Bill Federal Com 21H - Wellbore #1 - Plan #1	5,100.00	5,098.88	33.19	10.57	1.467	Level 3, ES, SF
Square Bill Federal Com 22H - Wellbore #1 - Plan #1	5,000.00	4,999.20	32.90	10.71	1.483	Level 3, CC, ES
Square Bill Federal Com 22H - Wellbore #1 - Plan #1	19,620.25	19,997.59	411.58	133.77	1.481	Level 3, SF
Square Bill Federal Com 23H - Wellbore #1 - Plan #1	5,000.00	4,999.90	66.00	43.81	2.974	CC, ES, SF

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 21H - Wellbore #1 - Plan #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance		Minimum Separation		Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	89.65	0.20	33.10	33.10				
100.00	100.00	100.00	100.00	0.08	0.08	89.65	0.20	33.10	33.10	32.93	0.17	199.010	
200.00	200.00	200.00	200.00	0.31	0.31	89.65	0.20	33.10	33.10	32.48	0.62	53.747	
300.00	300.00	300.00	300.00	0.53	0.53	89.65	0.20	33.10	33.10	32.04	1.07	31.069	
400.00	400.00	400.00	400.00	0.76	0.76	89.65	0.20	33.10	33.10	31.59	1.51	21.850	
500.00	500.00	500.00	500.00	0.98	0.98	89.65	0.20	33.10	33.10	31.14	1.96	16.850	
600.00	600.00	600.00	600.00	1.21	1.21	89.65	0.20	33.10	33.10	30.69	2.41	13.712	
700.00	700.00	700.00	700.00	1.43	1.43	89.65	0.20	33.10	33.10	30.24	2.86	11.559	
800.00	800.00	800.00	800.00	1.66	1.66	89.65	0.20	33.10	33.10	29.79	3.31	9.991	
900.00	900.00	900.00	900.00	1.88	1.88	89.65	0.20	33.10	33.10	29.34	3.76	8.797	
1,000.00	1,000.00	1,000.00	1,000.00	2.11	2.11	89.65	0.20	33.10	33.10	28.89	4.21	7.858	
1,100.00	1,100.00	1,100.00	1,100.00	2.33	2.33	89.65	0.20	33.10	33.10	28.44	4.66	7.101	
1,200.00	1,200.00	1,200.00	1,200.00	2.56	2.56	89.65	0.20	33.10	33.10	27.99	5.11	6.476	
1,300.00	1,300.00	1,300.00	1,300.00	2.78	2.78	89.65	0.20	33.10	33.10	27.54	5.56	5.953	
1,400.00	1,400.00	1,400.00	1,400.00	3.01	3.01	89.65	0.20	33.10	33.10	27.09	6.01	5.507	
1,500.00	1,500.00	1,500.00	1,500.00	3.23	3.23	89.65	0.20	33.10	33.10	26.64	6.46	5.124	
1,600.00	1,600.00	1,600.00	1,600.00	3.45	3.45	89.65	0.20	33.10	33.10	26.19	6.91	4.791	
1,700.00	1,700.00	1,700.00	1,700.00	3.68	3.68	89.65	0.20	33.10	33.10	25.74	7.36	4.498	
1,800.00	1,800.00	1,800.00	1,800.00	3.90	3.90	89.65	0.20	33.10	33.10	25.29	7.81	4.239	
1,900.00	1,900.00	1,900.00	1,900.00	4.13	4.13	89.65	0.20	33.10	33.10	24.84	8.26	4.008	
2,000.00	2,000.00	2,000.00	2,000.00	4.35	4.35	89.65	0.20	33.10	33.10	24.39	8.71	3.801	
2,100.00	2,100.00	2,100.00	2,100.00	4.58	4.58	89.65	0.20	33.10	33.10	23.94	9.16	3.615	

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



Integrity Directional Services, LLC

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Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 21H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)						
2,200.00	2,200.00	2,200.00	2,200.00	4.80	4.80	89.65	0.20	33.10	33.10	23.49	9.61	3.446		
2,300.00	2,300.00	2,300.00	2,300.00	5.03	5.03	89.65	0.20	33.10	33.10	23.04	10.06	3.292		
2,400.00	2,400.00	2,400.00	2,400.00	5.25	5.25	89.65	0.20	33.10	33.10	22.60	10.51	3.151		
2,500.00	2,500.00	2,500.00	2,500.00	5.48	5.48	89.65	0.20	33.10	33.10	22.15	10.96	3.021		
2,600.00	2,600.00	2,600.00	2,600.00	5.70	5.70	89.65	0.20	33.10	33.10	21.70	11.40	2.902		
2,700.00	2,700.00	2,700.00	2,700.00	5.93	5.93	89.65	0.20	33.10	33.10	21.25	11.85	2.792		
2,800.00	2,800.00	2,800.00	2,800.00	6.15	6.15	89.65	0.20	33.10	33.10	20.80	12.30	2.690		
2,900.00	2,900.00	2,900.00	2,900.00	6.38	6.38	89.65	0.20	33.10	33.10	20.35	12.75	2.595		
3,000.00	3,000.00	3,000.00	3,000.00	6.60	6.60	89.65	0.20	33.10	33.10	19.90	13.20	2.507		
3,100.00	3,100.00	3,100.00	3,100.00	6.83	6.83	89.65	0.20	33.10	33.10	19.45	13.65	2.425		
3,200.00	3,200.00	3,200.00	3,200.00	7.05	7.05	89.65	0.20	33.10	33.10	19.00	14.10	2.347		
3,300.00	3,300.00	3,300.00	3,300.00	7.28	7.28	89.65	0.20	33.10	33.10	18.55	14.55	2.275		
3,400.00	3,400.00	3,400.00	3,400.00	7.50	7.50	89.65	0.20	33.10	33.10	18.10	15.00	2.207		
3,500.00	3,500.00	3,500.00	3,500.00	7.73	7.73	89.65	0.20	33.10	33.10	17.65	15.45	2.142		
3,600.00	3,600.00	3,600.00	3,600.00	7.95	7.95	89.65	0.20	33.10	33.10	17.20	15.90	2.082		
3,700.00	3,700.00	3,700.00	3,700.00	8.17	8.17	89.65	0.20	33.10	33.10	16.75	16.35	2.025		
3,800.00	3,800.00	3,800.00	3,800.00	8.40	8.40	89.65	0.20	33.10	33.10	16.30	16.80	1.970		
3,900.00	3,900.00	3,900.00	3,900.00	8.62	8.62	89.65	0.20	33.10	33.10	15.85	17.25	1.919		
4,000.00	4,000.00	4,000.00	4,000.00	8.85	8.85	89.65	0.20	33.10	33.10	15.40	17.70	1.870		
4,100.00	4,100.00	4,100.00	4,100.00	9.07	9.07	89.65	0.20	33.10	33.10	14.95	18.15	1.824		
4,200.00	4,200.00	4,200.00	4,200.00	9.30	9.30	89.65	0.20	33.10	33.10	14.50	18.60	1.780		
4,300.00	4,300.00	4,300.00	4,300.00	9.52	9.52	89.65	0.20	33.10	33.10	14.05	19.05	1.738		
4,400.00	4,400.00	4,400.00	4,400.00	9.75	9.75	89.65	0.20	33.10	33.10	13.60	19.50	1.698		
4,500.00	4,500.00	4,500.00	4,500.00	9.97	9.97	89.65	0.20	33.10	33.10	13.15	19.95	1.660		
4,600.00	4,600.00	4,600.00	4,600.00	10.20	10.20	89.65	0.20	33.10	33.10	12.71	20.40	1.623		
4,700.00	4,700.00	4,700.00	4,700.00	10.42	10.42	89.65	0.20	33.10	33.10	12.26	20.84	1.588		
4,800.00	4,800.00	4,800.00	4,800.00	10.65	10.65	89.65	0.20	33.10	33.10	11.81	21.29	1.554		
4,900.00	4,900.00	4,900.00	4,900.00	10.87	10.87	89.65	0.20	33.10	33.10	11.36	21.74	1.522		
5,000.00	5,000.00	5,000.00	5,000.00	11.10	11.10	89.65	0.20	33.10	33.10	10.91	22.19	1.491 Level 3, CC		
5,100.00	5,099.98	5,098.88	5,098.86	11.31	11.31	24.08	0.57	34.77	33.19	10.57	22.62	1.467 Level 3, ES, SF		
5,200.00	5,199.89	5,197.74	5,197.59	11.52	11.51	25.05	1.69	39.76	34.35	11.32	23.03	1.491 Level 3		
5,300.00	5,299.79	5,297.32	5,296.86	11.73	11.72	25.04	3.38	47.34	37.97	14.52	23.45	1.619		
5,400.00	5,399.70	5,397.25	5,396.47	11.95	11.93	24.97	5.12	55.10	41.75	17.88	23.87	1.749		
5,500.00	5,499.60	5,497.17	5,496.08	12.16	12.14	24.91	6.85	62.87	45.53	21.23	24.30	1.874		
5,600.00	5,599.51	5,597.10	5,595.69	12.37	12.36	24.87	8.59	70.64	49.32	24.59	24.73	1.994		
5,700.00	5,699.41	5,697.03	5,695.30	12.59	12.57	24.83	10.32	78.40	53.10	27.94	25.16	2.110		
5,800.00	5,799.32	5,796.96	5,794.91	12.80	12.79	24.79	12.06	86.17	56.88	31.29	25.59	2.222		
5,900.00	5,899.22	5,896.89	5,894.52	13.02	13.01	24.76	13.79	93.94	60.66	34.63	26.03	2.331		
6,000.00	5,999.12	5,996.82	5,994.13	13.23	13.23	24.73	15.53	101.70	64.44	37.97	26.47	2.435		
6,100.00	6,099.03	6,096.74	6,093.75	13.45	13.46	24.71	17.27	109.47	68.22	41.32	26.91	2.535		
6,200.00	6,198.93	6,196.67	6,193.36	13.67	13.68	24.69	19.00	117.24	72.00	44.65	27.35	2.633		
6,300.00	6,298.84	6,296.60	6,292.97	13.89	13.91	24.67	20.74	125.00	75.79	47.99	27.80	2.727		
6,400.00	6,398.74	6,396.53	6,392.58	14.11	14.14	24.65	22.47	132.77	79.57	51.32	28.24	2.817		
6,500.00	6,498.65	6,496.46	6,492.19	14.33	14.37	24.63	24.21	140.54	83.35	54.66	28.69	2.905		
6,600.00	6,598.55	6,596.39	6,591.80	14.55	14.60	24.62	25.94	148.30	87.13	57.99	29.14	2.990		
6,700.00	6,698.46	6,696.32	6,691.41	14.77	14.83	24.61	27.68	156.07	90.91	61.32	29.59	3.072		
6,800.00	6,798.36	6,796.24	6,791.02	14.99	15.06	24.59	29.41	163.84	94.69	64.64	30.05	3.151		
6,900.00	6,898.26	6,896.17	6,890.63	15.21	15.29	24.58	31.15	171.60	98.47	67.97	30.50	3.228		
7,000.00	6,998.17	6,996.10	6,990.24	15.43	15.53	24.57	32.89	179.37	102.26	71.30	30.96	3.303		
7,100.00	7,098.07	7,096.03	7,089.86	15.65	15.76	24.56	34.62	187.14	106.04	74.62	31.42	3.375		
7,200.00	7,197.98	7,195.96	7,189.47	15.88	16.00	24.55	36.36	194.90	109.82	77.94	31.88	3.445		
7,300.00	7,297.88	7,295.89	7,289.08	16.10	16.24	24.54	38.09	202.67	113.60	81.26	32.34	3.513		

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Reference		Offset		Semi Major Axis			Distance							Offset Well Error: 0.00 ft		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning			
7,400.00	7,397.79	7,395.82	7,388.69	16.33	16.48	24.54	39.83	210.44	117.38	84.58	32.80	3.579				
7,500.00	7,497.69	7,495.74	7,488.30	16.55	16.72	24.53	41.56	218.20	121.16	87.90	33.27	3.642				
7,600.00	7,597.60	7,595.67	7,587.91	16.77	16.96	24.52	43.30	225.97	124.94	91.21	33.73	3.704				
7,700.00	7,697.50	7,695.60	7,687.52	17.00	17.20	24.51	45.03	233.74	128.73	94.53	34.20	3.764				
7,800.00	7,797.40	7,795.53	7,787.13	17.22	17.44	24.51	46.77	241.50	132.51	97.85	34.66	3.823				
7,900.00	7,897.31	7,895.46	7,886.74	17.45	17.68	24.50	48.51	249.27	136.29	101.16	35.13	3.880				
8,000.00	7,997.21	7,995.39	7,986.36	17.68	17.92	24.50	50.24	257.04	140.07	104.47	35.60	3.935				
8,100.00	8,097.12	8,095.31	8,085.97	17.90	18.17	24.49	51.98	264.80	143.85	107.78	36.07	3.988				
8,200.00	8,197.02	8,195.24	8,185.58	18.13	18.41	24.49	53.71	272.57	147.63	111.09	36.54	4.040				
8,300.00	8,296.93	8,295.17	8,285.19	18.36	18.65	24.48	55.45	280.34	151.41	114.40	37.01	4.091				
8,400.00	8,396.83	8,395.10	8,384.80	18.58	18.90	24.48	57.18	288.10	155.20	117.71	37.48	4.140				
8,500.00	8,496.74	8,495.03	8,484.41	18.81	19.15	24.47	58.92	295.87	158.98	121.02	37.96	4.189				
8,600.00	8,596.64	8,594.96	8,584.02	19.04	19.39	24.47	60.65	303.64	162.76	124.33	38.43	4.235				
8,700.00	8,696.54	8,694.89	8,683.63	19.27	19.64	24.46	62.39	311.40	166.54	127.64	38.90	4.281				
8,800.00	8,796.45	8,794.81	8,783.24	19.49	19.89	24.46	64.13	319.17	170.32	130.94	39.38	4.325				
8,900.00	8,896.35	8,894.74	8,882.86	19.72	20.13	24.46	65.86	326.93	174.10	134.25	39.86	4.368				
9,000.00	8,996.26	8,994.67	8,982.47	19.95	20.38	24.45	67.60	334.70	177.88	137.55	40.33	4.411				
9,100.00	9,096.16	9,094.60	9,082.08	20.18	20.63	24.45	69.33	342.47	181.67	140.86	40.81	4.452				
9,200.00	9,196.07	9,194.53	9,181.69	20.41	20.88	24.45	71.07	350.23	185.45	144.16	41.29	4.492				
9,300.00	9,295.97	9,294.46	9,281.30	20.64	21.13	24.44	72.80	358.00	189.23	147.46	41.77	4.531				
9,400.00	9,395.88	9,394.38	9,380.91	20.87	21.38	24.44	74.54	365.77	193.01	150.77	42.24	4.569				
9,500.00	9,495.78	9,494.31	9,480.52	21.09	21.63	24.44	76.27	373.53	196.79	154.07	42.72	4.606				
9,600.00	9,595.69	9,594.24	9,580.13	21.32	21.88	24.44	78.01	381.30	200.57	157.37	43.20	4.642				
9,700.00	9,695.59	9,694.17	9,679.74	21.55	22.13	24.43	79.75	389.07	204.36	160.67	43.69	4.678				
9,800.00	9,795.49	9,794.10	9,779.36	21.78	22.38	24.43	81.48	396.83	208.14	163.97	44.17	4.713				
9,900.00	9,895.40	9,894.03	9,878.97	22.01	22.63	24.43	83.22	404.60	211.92	167.27	44.65	4.746				
10,000.00	9,995.30	9,993.96	9,978.58	22.24	22.89	24.43	84.95	412.37	215.70	170.57	45.13	4.780				
10,100.00	10,095.21	10,093.88	10,078.19	22.47	23.14	24.42	86.69	420.13	219.48	173.87	45.61	4.812				
10,200.00	10,195.11	10,193.81	10,177.80	22.70	23.39	24.42	88.42	427.90	223.26	177.17	46.10	4.843				
10,300.00	10,295.02	10,293.74	10,277.41	22.94	23.64	24.42	90.16	435.67	227.04	180.47	46.58	4.874				
10,400.00	10,394.92	10,393.67	10,377.02	23.17	23.90	24.42	91.89	443.43	230.83	183.76	47.06	4.905				
10,500.00	10,494.83	10,493.60	10,476.63	23.40	24.15	24.42	93.63	451.20	234.61	187.06	47.55	4.934				
10,600.00	10,594.73	10,593.53	10,576.24	23.63	24.40	24.41	95.37	458.97	238.39	190.36	48.03	4.963				
10,700.00	10,694.63	10,693.45	10,675.86	23.86	24.66	24.41	97.10	466.73	242.17	193.65	48.52	4.991				
10,800.00	10,794.54	10,793.38	10,775.47	24.09	24.91	24.41	98.84	474.50	245.95	196.95	49.00	5.019				
10,900.00	10,894.44	10,893.31	10,875.08	24.32	25.17	24.41	100.57	482.27	249.73	200.25	49.49	5.046				
11,000.00	10,994.35	10,993.24	10,974.69	24.55	25.42	24.41	102.31	490.03	253.51	203.54	49.97	5.073				
11,100.00	11,094.25	11,093.17	11,074.30	24.78	25.68	24.41	104.04	497.80	257.30	206.84	50.46	5.099				
11,200.00	11,194.16	11,193.10	11,173.91	25.02	25.93	24.40	105.78	505.57	261.08	210.13	50.95	5.124				
11,300.00	11,294.06	11,293.03	11,273.52	25.25	26.19	24.40	107.51	513.33	264.86	213.42	51.43	5.149				
11,400.00	11,393.97	11,392.95	11,373.13	25.48	26.44	24.40	109.25	521.10	268.64	216.72	51.92	5.174				
11,500.00	11,493.87	11,492.88	11,472.74	25.71	26.70	24.40	110.99	528.87	272.42	220.01	52.41	5.198				
11,600.00	11,593.77	11,592.81	11,572.35	25.94	26.95	24.40	112.72	536.63	276.20	223.31	52.90	5.222				
11,700.00	11,693.68	11,692.74	11,671.97	26.18	27.21	24.40	114.46	544.40	279.99	226.60	53.39	5.245				
11,800.00	11,793.58	11,792.67	11,771.58	26.41	27.47	24.40	116.19	552.17	283.77	229.89	53.87	5.267				
11,900.00	11,893.49	11,892.60	11,871.19	26.64	27.72	24.39	117.93	559.93	287.55	233.19	54.36	5.289				
12,000.00	11,993.35	11,992.50	11,970.78	26.87	27.98	65.36	119.66	567.70	291.35	236.50	54.85	5.312				
12,100.00	12,093.33	12,090.78	12,068.75	27.12	28.23	85.81	121.37	575.34	295.91	240.56	55.35	5.346				
12,200.00	12,183.28	12,183.38	12,161.05	27.37	28.47	94.37	122.98	582.53	304.52	248.68	55.84	5.453				
12,300.00	12,265.19	12,269.83	12,247.22	27.65	28.69	102.00	124.71	589.25	323.04	266.70	56.34	5.734				
12,400.00	12,333.48	12,384.55	12,359.71	27.97	28.99	110.63	143.91	597.91	351.69	294.73	56.96	6.175				
12,500.00	12,385.17	12,530.38	12,490.68	28.36	29.39	118.74	205.96	607.73	384.34	326.58	57.76	6.655				

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 21H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance								Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor			
12,600.00	12,417.99	12,724.43	12,624.98	28.86	29.99	125.76	343.85	617.33	412.94	354.09	58.85	7.017			
12,700.00	12,430.52	12,970.31	12,699.70	29.44	31.08	129.21	575.21	621.67	426.44	365.92	60.52	7.046			
12,800.00	12,426.66	13,099.34	12,696.51	30.12	31.87	129.26	704.14	620.58	426.76	364.77	61.98	6.885			
12,900.00	12,421.55	13,199.33	12,692.26	30.89	32.59	129.35	804.04	619.60	427.29	363.81	63.48	6.732			
13,000.00	12,416.44	13,299.33	12,688.00	31.74	33.40	129.44	903.94	618.63	427.82	362.68	65.14	6.567			
13,100.00	12,411.33	13,399.33	12,683.74	32.68	34.30	129.53	1,003.84	617.65	428.36	361.38	66.97	6.396			
13,200.00	12,406.23	13,499.32	12,679.48	33.69	35.27	129.62	1,103.74	616.67	428.89	359.94	68.95	6.220			
13,300.00	12,401.12	13,599.32	12,675.22	34.76	36.30	129.71	1,203.65	615.69	429.43	358.37	71.06	6.043			
13,400.00	12,396.01	13,699.32	12,670.97	35.90	37.40	129.80	1,303.55	614.71	429.97	356.67	73.30	5.866			
13,500.00	12,390.90	13,799.31	12,666.71	37.09	38.55	129.88	1,403.45	613.73	430.51	354.87	75.64	5.691			
13,600.00	12,385.80	13,899.31	12,662.45	38.33	39.76	129.97	1,503.35	612.75	431.05	352.96	78.09	5.520			
13,700.00	12,380.69	13,999.31	12,658.19	39.62	41.01	130.06	1,603.25	611.77	431.59	350.97	80.62	5.353			
13,800.00	12,375.58	14,099.30	12,653.93	40.94	42.30	130.14	1,703.15	610.79	432.13	348.89	83.24	5.191			
13,900.00	12,370.47	14,199.30	12,649.68	42.31	43.63	130.23	1,803.05	609.82	432.67	346.74	85.94	5.035			
14,000.00	12,365.37	14,299.30	12,645.42	43.71	45.00	130.32	1,902.95	608.84	433.22	344.52	88.70	4.884			
14,100.00	12,360.26	14,399.29	12,641.16	45.14	46.39	130.40	2,002.85	607.86	433.76	342.23	91.53	4.739			
14,200.00	12,355.15	14,499.28	12,636.90	46.67	47.82	130.49	2,102.75	606.88	434.29	339.00	94.29	4.595			
14,300.00	12,350.04	14,599.27	12,632.65	48.26	49.27	129.94	2,202.58	605.90	434.80	336.86	97.04	4.441			
14,400.00	12,344.93	14,699.26	12,628.39	49.91	50.75	129.52	2,302.41	604.92	435.29	334.67	100.01	4.283			
14,500.00	12,339.82	14,799.25	12,624.14	51.61	52.25	129.10	2,402.23	603.94	435.76	332.44	103.02	4.133			
14,600.00	12,334.71	14,899.24	12,619.88	53.37	53.76	128.68	2,502.05	602.97	436.21	330.11	106.07	3.990			
14,700.00	12,329.60	14,999.23	12,615.63	55.18	55.30	128.25	2,601.87	601.99	436.64	327.68	109.16	3.853			
14,800.00	12,324.49	15,099.22	12,611.37	57.04	56.85	127.81	2,701.70	601.01	437.05	325.14	112.29	3.724			
14,900.00	12,319.38	15,199.21	12,607.12	58.95	58.42	127.37	2,801.52	600.03	437.44	322.49	115.44	3.601			
15,000.00	12,314.27	15,299.20	12,602.86	60.91	60.01	126.93	2,901.34	599.05	437.81	319.74	118.63	3.483			
15,100.00	12,309.16	15,399.19	12,598.60	62.92	61.52	126.51	2,998.58	598.10	438.16	316.88	121.75	3.375			
15,193.23	12,354.28	15,481.88	12,597.42	61.75	62.66	126.36	3,084.47	597.26	410.07	285.67	124.40	3.296			
15,200.00	12,354.27	15,488.12	12,597.42	61.86	62.74	126.36	3,090.71	597.20	410.08	285.48	124.60	3.291			
15,300.00	12,354.06	15,586.36	12,598.07	63.49	64.16	126.46	3,188.95	596.24	410.59	282.94	127.65	3.217			
15,400.00	12,353.85	15,686.35	12,598.81	65.14	65.76	126.57	3,288.94	595.26	411.15	280.25	130.90	3.141			
15,500.00	12,353.64	15,786.35	12,599.55	66.80	67.40	126.68	3,388.92	594.28	411.71	277.52	134.19	3.068			
15,600.00	12,353.43	15,886.35	12,600.28	68.46	69.04	126.78	3,488.91	593.30	412.27	274.77	137.50	2.998			
15,700.00	12,353.22	15,986.34	12,601.02	70.13	70.69	126.89	3,588.90	592.32	412.83	272.01	140.82	2.932			
15,800.00	12,353.01	16,086.34	12,601.76	71.81	72.35	126.99	3,688.89	591.34	413.39	269.23	144.17	2.867			
15,900.00	12,352.80	16,186.33	12,602.50	73.50	74.02	127.10	3,788.88	590.36	413.96	266.44	147.52	2.806			
16,000.00	12,352.59	16,286.33	12,603.24	75.19	75.70	127.20	3,888.86	589.38	414.53	263.63	150.89	2.747			
16,100.00	12,352.38	16,386.32	12,603.98	76.89	77.38	127.31	3,988.85	588.40	415.09	260.82	154.28	2.691			
16,200.00	12,352.17	16,486.32	12,604.72	78.60	79.07	127.41	4,088.84	587.42	415.66	257.99	157.67	2.636			
16,300.00	12,351.96	16,586.31	12,605.46	80.31	80.77	127.52	4,188.83	586.44	416.24	255.16	161.08	2.584			
16,400.00	12,351.75	16,686.31	12,606.20	82.03	82.47	127.62	4,288.82	585.46	416.81	252.31	164.50	2.534			
16,500.00	12,351.54	16,786.31	12,606.94	83.75	84.18	127.73	4,388.80	584.48	417.38	249.46	167.93	2.486			
16,600.00	12,351.33	16,886.30	12,607.67	85.47	85.89	127.83	4,488.79	583.50	417.96	246.59	171.36	2.439			
16,700.00	12,351.12	16,986.30	12,608.41	87.20	87.61	127.93	4,588.78	582.52	418.53	243.72	174.81	2.394			
16,800.00	12,350.91	17,086.29	12,609.15	88.94	89.33	128.04	4,688.77	581.54	419.11	240.85	178.26	2.351			
16,900.00	12,350.71	17,186.29	12,609.89	90.67	91.05	128.14	4,788.76	580.56	419.69	237.96	181.73	2.309			
17,000.00	12,350.50	17,286.28	12,610.63	92.42	92.78	128.24	4,888.74	579.58	420.27	235.07	185.20	2.269			
17,100.00	12,350.29	17,386.28	12,611.37	94.16	94.51	128.34	4,988.73	578.60	420.85	232.18	188.67	2.231			
17,200.00	12,350.08	17,486.27	12,612.11	95.91	96.25	128.44	5,088.72	577.62	421.44	229.28	192.16	2.193			
17,300.00	12,349.87	17,586.27	12,612.85	97.66	97.99	128.55	5,188.71	576.64	422.02	226.37	195.65	2.157			
17,400.00	12,349.66	17,686.26	12,613.59	99.41	99.73	128.65	5,288.70	575.66	422.61	223.46	199.14	2.122			
17,500.00	12,349.45	17,786.26	12,614.33	101.17	101.48	128.75	5,388.68	574.68	423.19	220.55	202.64	2.088			
17,600.00	12,349.24	17,886.26	12,615.06	102.92	103.23	128.85	5,488.67	573.70	423.78	217.63	206.15	2.056			

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



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 21H - Wellbore #1 - Plan #1													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	
17,700.00	12,349.03	17,986.25	12,615.80	104.68	104.98	128.95	5,588.66	572.72	424.37	214.71	209.66	2.024	
17,800.00	12,348.82	18,086.25	12,616.54	106.45	106.73	129.05	5,688.65	571.74	424.96	211.78	213.18	1.993	
17,900.00	12,348.61	18,186.24	12,617.28	108.21	108.49	129.15	5,788.63	570.76	425.56	208.85	216.70	1.964	
18,000.00	12,348.40	18,286.24	12,618.02	109.98	110.25	129.25	5,888.62	569.78	426.15	205.92	220.23	1.935	
18,100.00	12,348.19	18,386.23	12,618.76	111.75	112.01	129.35	5,988.61	568.80	426.74	202.99	223.76	1.907	
18,200.00	12,347.98	18,486.23	12,619.50	113.52	113.77	129.45	6,088.60	567.82	427.34	200.05	227.29	1.880	
18,300.00	12,347.77	18,586.22	12,620.24	115.29	115.54	129.55	6,188.59	566.84	427.94	197.11	230.83	1.854	
18,400.00	12,347.56	18,686.22	12,620.98	117.07	117.30	129.64	6,288.57	565.87	428.54	194.17	234.37	1.828	
18,500.00	12,347.35	18,786.22	12,621.71	118.84	119.07	129.74	6,388.56	564.89	429.14	191.22	237.92	1.804	
18,600.00	12,347.14	18,886.21	12,622.45	120.62	120.84	129.84	6,488.55	563.91	429.74	188.27	241.46	1.780	
18,700.00	12,346.93	18,986.21	12,623.19	122.40	122.62	129.94	6,588.54	562.93	430.34	185.32	245.02	1.756	
18,800.00	12,346.72	19,086.20	12,623.93	124.18	124.39	130.04	6,688.53	561.95	430.94	182.37	248.57	1.734	
18,900.00	12,346.51	19,186.20	12,624.67	125.96	126.17	130.13	6,788.51	560.97	431.55	179.42	252.13	1.712	
19,000.00	12,346.30	19,286.19	12,625.41	127.75	127.94	130.23	6,888.50	559.99	432.16	176.47	255.69	1.690	
19,100.00	12,346.09	19,386.19	12,626.15	129.53	129.72	130.33	6,988.49	559.01	432.76	173.51	259.25	1.669	
19,200.00	12,345.88	19,486.18	12,626.89	131.32	131.50	130.42	7,088.48	558.03	433.37	170.56	262.82	1.649	
19,300.00	12,345.67	19,586.18	12,627.63	133.10	133.28	130.52	7,188.47	557.05	433.98	167.60	266.38	1.629	
19,400.00	12,345.46	19,686.17	12,628.37	134.89	135.06	130.61	7,288.45	556.07	434.59	164.64	269.95	1.610	
19,500.00	12,345.25	19,786.17	12,629.10	136.68	136.85	130.71	7,388.44	555.09	435.21	161.68	273.53	1.591	
19,600.00	12,345.04	19,886.17	12,629.84	138.47	138.63	130.80	7,488.43	554.11	435.82	158.72	277.10	1.573	
19,620.25	12,345.00	19,906.42	12,629.99	138.83	138.99	130.82	7,508.68	553.91	435.94	158.12	277.83	1.569	



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error: 0.00 ft
Survey Program: 0-MWD													Offset Well Error: 0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)			
0.00	0.00	0.00	0.00	0.00	0.00	-90.35	-0.20	-32.90	32.91				
100.00	100.00	99.20	99.20	0.08	0.08	-90.35	-0.20	-32.90	32.90	32.74	0.17	198.601	
200.00	200.00	199.20	199.20	0.31	0.31	-90.35	-0.20	-32.90	32.90	32.29	0.61	53.579	
300.00	300.00	299.20	299.20	0.53	0.53	-90.35	-0.20	-32.90	32.90	31.84	1.06	30.934	
400.00	400.00	399.20	399.20	0.76	0.76	-90.35	-0.20	-32.90	32.90	31.39	1.51	21.744	
500.00	500.00	499.20	499.20	0.98	0.98	-90.35	-0.20	-32.90	32.90	30.94	1.96	16.763	
600.00	600.00	599.20	599.20	1.21	1.21	-90.35	-0.20	-32.90	32.90	30.49	2.41	13.639	
700.00	700.00	699.20	699.20	1.43	1.43	-90.35	-0.20	-32.90	32.90	30.04	2.86	11.497	
800.00	800.00	799.20	799.20	1.66	1.65	-90.35	-0.20	-32.90	32.90	29.59	3.31	9.936	
900.00	900.00	899.20	899.20	1.88	1.88	-90.35	-0.20	-32.90	32.90	29.14	3.76	8.748	
1,000.00	1,000.00	999.20	999.20	2.11	2.10	-90.35	-0.20	-32.90	32.90	28.69	4.21	7.814	
1,100.00	1,100.00	1,099.20	1,099.20	2.33	2.33	-90.35	-0.20	-32.90	32.90	28.24	4.66	7.060	
1,200.00	1,200.00	1,199.20	1,199.20	2.56	2.55	-90.35	-0.20	-32.90	32.90	27.79	5.11	6.439	
1,300.00	1,300.00	1,299.20	1,299.20	2.78	2.78	-90.35	-0.20	-32.90	32.90	27.34	5.56	5.919	
1,400.00	1,400.00	1,399.20	1,399.20	3.01	3.00	-90.35	-0.20	-32.90	32.90	26.89	6.01	5.476	
1,500.00	1,500.00	1,499.20	1,499.20	3.23	3.23	-90.35	-0.20	-32.90	32.90	26.44	6.46	5.095	
1,600.00	1,600.00	1,599.20	1,599.20	3.45	3.45	-90.35	-0.20	-32.90	32.90	25.99	6.91	4.763	
1,700.00	1,700.00	1,699.20	1,699.20	3.68	3.68	-90.35	-0.20	-32.90	32.90	25.54	7.36	4.472	
1,800.00	1,800.00	1,799.20	1,799.20	3.90	3.90	-90.35	-0.20	-32.90	32.90	25.09	7.81	4.214	
1,900.00	1,900.00	1,899.20	1,899.20	4.13	4.13	-90.35	-0.20	-32.90	32.90	24.64	8.26	3.985	
2,000.00	2,000.00	1,999.20	1,999.20	4.35	4.35	-90.35	-0.20	-32.90	32.90	24.20	8.71	3.779	
2,100.00	2,100.00	2,099.20	2,099.20	4.58	4.58	-90.35	-0.20	-32.90	32.90	23.75	9.16	3.594	
2,200.00	2,200.00	2,199.20	2,199.20	4.80	4.80	-90.35	-0.20	-32.90	32.90	23.30	9.60	3.425	
2,300.00	2,300.00	2,299.20	2,299.20	5.03	5.03	-90.35	-0.20	-32.90	32.90	22.85	10.05	3.272	
2,400.00	2,400.00	2,399.20	2,399.20	5.25	5.25	-90.35	-0.20	-32.90	32.90	22.40	10.50	3.132	
2,500.00	2,500.00	2,499.20	2,499.20	5.48	5.48	-90.35	-0.20	-32.90	32.90	21.95	10.95	3.004	
2,600.00	2,600.00	2,599.20	2,599.20	5.70	5.70	-90.35	-0.20	-32.90	32.90	21.50	11.40	2.885	
2,700.00	2,700.00	2,699.20	2,699.20	5.93	5.93	-90.35	-0.20	-32.90	32.90	21.05	11.85	2.776	
2,800.00	2,800.00	2,799.20	2,799.20	6.15	6.15	-90.35	-0.20	-32.90	32.90	20.60	12.30	2.674	
2,900.00	2,900.00	2,899.20	2,899.20	6.38	6.37	-90.35	-0.20	-32.90	32.90	20.15	12.75	2.580	
3,000.00	3,000.00	2,999.20	2,999.20	6.60	6.60	-90.35	-0.20	-32.90	32.90	19.70	13.20	2.492	
3,100.00	3,100.00	3,099.20	3,099.20	6.83	6.82	-90.35	-0.20	-32.90	32.90	19.25	13.65	2.410	
3,200.00	3,200.00	3,199.20	3,199.20	7.05	7.05	-90.35	-0.20	-32.90	32.90	18.80	14.10	2.333	
3,300.00	3,300.00	3,299.20	3,299.20	7.28	7.27	-90.35	-0.20	-32.90	32.90	18.35	14.55	2.261	
3,400.00	3,400.00	3,399.20	3,399.20	7.50	7.50	-90.35	-0.20	-32.90	32.90	17.90	15.00	2.194	
3,500.00	3,500.00	3,499.20	3,499.20	7.73	7.72	-90.35	-0.20	-32.90	32.90	17.45	15.45	2.130	
3,600.00	3,600.00	3,599.20	3,599.20	7.95	7.95	-90.35	-0.20	-32.90	32.90	17.00	15.90	2.069	
3,700.00	3,700.00	3,699.20	3,699.20	8.17	8.17	-90.35	-0.20	-32.90	32.90	16.55	16.35	2.013	
3,800.00	3,800.00	3,799.20	3,799.20	8.40	8.40	-90.35	-0.20	-32.90	32.90	16.10	16.80	1.959	
3,900.00	3,900.00	3,899.20	3,899.20	8.62	8.62	-90.35	-0.20	-32.90	32.90	15.65	17.25	1.908	
4,000.00	4,000.00	3,999.20	3,999.20	8.85	8.85	-90.35	-0.20	-32.90	32.90	15.20	17.70	1.859	
4,100.00	4,100.00	4,099.20	4,099.20	9.07	9.07	-90.35	-0.20	-32.90	32.90	14.75	18.15	1.813	
4,200.00	4,200.00	4,199.20	4,199.20	9.30	9.30	-90.35	-0.20	-32.90	32.90	14.31	18.60	1.769	
4,300.00	4,300.00	4,299.20	4,299.20	9.52	9.52	-90.35	-0.20	-32.90	32.90	13.86	19.04	1.728	
4,400.00	4,400.00	4,399.20	4,399.20	9.75	9.75	-90.35	-0.20	-32.90	32.90	13.41	19.49	1.688	
4,500.00	4,500.00	4,499.20	4,499.20	9.97	9.97	-90.35	-0.20	-32.90	32.90	12.96	19.94	1.650	
4,600.00	4,600.00	4,599.20	4,599.20	10.20	10.20	-90.35	-0.20	-32.90	32.90	12.51	20.39	1.613	
4,700.00	4,700.00	4,699.20	4,699.20	10.42	10.42	-90.35	-0.20	-32.90	32.90	12.06	20.84	1.578	
4,800.00	4,800.00	4,799.20	4,799.20	10.65	10.65	-90.35	-0.20	-32.90	32.90	11.61	21.29	1.545	
4,900.00	4,900.00	4,899.20	4,899.20	10.87	10.87	-90.35	-0.20	-32.90	32.90	11.16	21.74	1.513	
5,000.00	5,000.00	4,999.20	4,999.20	11.10	11.09	-90.35	-0.20	-32.90	32.90	10.71	22.19	1.483 Level 3, CC, ES	
5,100.00	5,099.98	5,099.18	5,099.18	11.31	11.32	-157.63	-0.20	-32.90	34.51	11.87	22.63	1.525	

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Tooface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
5,200.00	5,199.89	5,199.09	5,199.09	11.52	11.54	-160.04	-0.20	-32.90	38.48	15.41	23.07	1.668		
5,300.00	5,299.79	5,298.99	5,298.99	11.73	11.77	-162.04	-0.20	-32.90	42.62	19.11	23.50	1.813		
5,400.00	5,399.70	5,398.90	5,398.90	11.95	11.99	-163.69	-0.20	-32.90	46.79	22.85	23.94	1.955		
5,500.00	5,499.60	5,498.80	5,498.80	12.16	12.22	-165.07	-0.20	-32.90	51.00	26.63	24.38	2.092		
5,600.00	5,599.51	5,598.71	5,598.71	12.37	12.44	-166.24	-0.20	-32.90	55.24	30.42	24.81	2.226		
5,700.00	5,699.41	5,698.61	5,698.61	12.59	12.67	-167.24	-0.20	-32.90	59.49	34.24	25.25	2.356		
5,800.00	5,799.32	5,798.52	5,798.52	12.80	12.89	-168.11	-0.20	-32.90	63.76	38.07	25.69	2.482		
5,900.00	5,899.22	5,898.42	5,898.42	13.02	13.12	-168.87	-0.20	-32.90	68.04	41.91	26.13	2.604		
6,000.00	5,999.12	5,998.32	5,998.32	13.23	13.34	-169.53	-0.20	-32.90	72.34	45.76	26.57	2.722		
6,100.00	6,099.03	6,098.23	6,098.23	13.45	13.57	-170.13	-0.20	-32.90	76.64	49.62	27.02	2.837		
6,200.00	6,198.93	6,198.13	6,198.13	13.67	13.79	-170.66	-0.20	-32.90	80.95	53.49	27.46	2.948		
6,300.00	6,298.84	6,298.04	6,298.04	13.89	14.01	-171.14	-0.20	-32.90	85.26	57.36	27.90	3.056		
6,400.00	6,398.74	6,397.94	6,397.94	14.11	14.24	-171.57	-0.20	-32.90	89.58	61.24	28.34	3.160		
6,500.00	6,498.65	6,497.85	6,497.85	14.33	14.46	-171.96	-0.20	-32.90	93.91	65.12	28.79	3.262		
6,600.00	6,598.55	6,597.75	6,597.75	14.55	14.69	-172.31	-0.20	-32.90	98.24	69.00	29.23	3.360		
6,700.00	6,698.46	6,697.66	6,697.66	14.77	14.91	-172.64	-0.20	-32.90	102.57	72.89	29.68	3.456		
6,800.00	6,798.36	6,797.56	6,797.56	14.99	15.14	-172.94	-0.20	-32.90	106.91	76.78	30.13	3.549		
6,900.00	6,898.26	6,897.46	6,897.46	15.21	15.36	-173.22	-0.20	-32.90	111.24	80.67	30.57	3.639		
7,000.00	6,998.17	6,997.37	6,997.37	15.43	15.59	-173.47	-0.20	-32.90	115.58	84.57	31.02	3.726		
7,100.00	7,098.07	7,097.27	7,097.27	15.65	15.81	-173.71	-0.20	-32.90	119.93	88.46	31.47	3.811		
7,200.00	7,197.98	7,197.18	7,197.18	15.88	16.04	-173.93	-0.20	-32.90	124.27	92.36	31.91	3.894		
7,300.00	7,297.88	7,297.08	7,297.08	16.10	16.26	-174.14	-0.20	-32.90	128.62	96.26	32.36	3.974		
7,400.00	7,397.79	7,396.99	7,396.99	16.33	16.48	-174.33	-0.20	-32.90	132.97	100.16	32.81	4.053		
7,500.00	7,497.69	7,496.89	7,496.89	16.55	16.71	-174.51	-0.20	-32.90	137.32	104.06	33.26	4.129		
7,600.00	7,597.60	7,596.80	7,596.80	16.77	16.93	-174.68	-0.20	-32.90	141.67	107.96	33.71	4.203		
7,700.00	7,697.50	7,696.70	7,696.70	17.00	17.16	-174.84	-0.20	-32.90	146.02	111.86	34.16	4.275		
7,800.00	7,797.40	7,796.60	7,796.60	17.22	17.38	-174.99	-0.20	-32.90	150.37	115.77	34.61	4.345		
7,900.00	7,897.31	7,896.51	7,896.51	17.45	17.61	-175.13	-0.20	-32.90	154.73	119.67	35.06	4.414		
8,000.00	7,997.21	7,996.41	7,996.41	17.68	17.83	-175.26	-0.20	-32.90	159.08	123.57	35.51	4.480		
8,100.00	8,097.12	8,096.32	8,096.32	17.90	18.06	-175.39	-0.20	-32.90	163.44	127.48	35.96	4.545		
8,200.00	8,197.02	8,196.22	8,196.22	18.13	18.28	-175.51	-0.20	-32.90	167.79	131.38	36.41	4.609		
8,300.00	8,296.93	8,296.13	8,296.13	18.36	18.51	-175.62	-0.20	-32.90	172.15	135.29	36.86	4.670		
8,400.00	8,396.83	8,396.03	8,396.03	18.58	18.73	-175.73	-0.20	-32.90	176.51	139.20	37.31	4.731		
8,500.00	8,496.74	8,495.94	8,495.94	18.81	18.95	-175.83	-0.20	-32.90	180.87	143.10	37.76	4.789		
8,600.00	8,596.64	8,595.84	8,595.84	19.04	19.18	-175.93	-0.20	-32.90	185.23	147.01	38.22	4.847		
8,700.00	8,696.54	8,695.74	8,695.74	19.27	19.40	-176.03	-0.20	-32.90	189.59	150.92	38.67	4.903		
8,800.00	8,796.45	8,795.65	8,795.65	19.49	19.63	-176.12	-0.20	-32.90	193.95	154.82	39.12	4.958		
8,900.00	8,896.35	8,895.55	8,895.55	19.72	19.85	-176.20	-0.20	-32.90	198.31	158.73	39.57	5.011		
9,000.00	8,996.26	8,995.46	8,995.46	19.95	20.08	-176.28	-0.20	-32.90	202.67	162.64	40.03	5.063		
9,100.00	9,096.16	9,095.36	9,095.36	20.18	20.30	-176.36	-0.20	-32.90	207.03	166.55	40.48	5.114		
9,200.00	9,196.07	9,195.27	9,195.27	20.41	20.53	-176.44	-0.20	-32.90	211.39	170.46	40.93	5.164		
9,300.00	9,295.97	9,295.17	9,295.17	20.64	20.75	-176.51	-0.20	-32.90	215.75	174.36	41.39	5.213		
9,400.00	9,395.88	9,395.08	9,395.08	20.87	20.98	-176.58	-0.20	-32.90	220.11	178.27	41.84	5.261		
9,500.00	9,495.78	9,494.98	9,494.98	21.09	21.20	-176.64	-0.20	-32.90	224.48	182.18	42.29	5.307		
9,600.00	9,595.69	9,594.89	9,594.89	21.32	21.42	-176.71	-0.20	-32.90	228.84	186.09	42.75	5.353		
9,700.00	9,695.59	9,694.79	9,694.79	21.55	21.65	-176.77	-0.20	-32.90	233.20	190.00	43.20	5.398		
9,800.00	9,795.49	9,794.69	9,794.69	21.78	21.87	-176.83	-0.20	-32.90	237.57	193.91	43.66	5.442		
9,900.00	9,895.40	9,894.60	9,894.60	22.01	22.10	-176.89	-0.20	-32.90	241.93	197.82	44.11	5.484		
10,000.00	9,995.30	9,994.50	9,994.50	22.24	22.32	-176.94	-0.20	-32.90	246.29	201.73	44.57	5.526		
10,100.00	10,095.21	10,094.41	10,094.41	22.47	22.55	-177.00	-0.20	-32.90	250.66	205.64	45.02	5.568		
10,200.00	10,195.11	10,194.31	10,194.31	22.70	22.77	-177.05	-0.20	-32.90	255.02	209.55	45.48	5.608		
10,300.00	10,295.02	10,294.22	10,294.22	22.94	23.00	-177.10	-0.20	-32.90	259.39	213.46	45.93	5.647		

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 22H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)							
10,400.00	10,394.92	10,394.12	10,394.12	23.17	23.22	-177.14	-0.20	-32.90	263.75	217.36	46.39	5.686			
10,500.00	10,494.83	10,494.03	10,494.03	23.40	23.45	-177.19	-0.20	-32.90	268.12	221.27	46.84	5.724			
10,600.00	10,594.73	10,593.93	10,593.93	23.63	23.67	-177.24	-0.20	-32.90	272.48	225.18	47.30	5.761			
10,700.00	10,694.63	10,693.83	10,693.83	23.86	23.89	-177.28	-0.20	-32.90	276.85	229.09	47.75	5.797			
10,800.00	10,794.54	10,793.74	10,793.74	24.09	24.12	-177.32	-0.20	-32.90	281.21	233.00	48.21	5.833			
10,900.00	10,894.44	10,893.64	10,893.64	24.32	24.34	-177.36	-0.20	-32.90	285.58	236.91	48.67	5.868			
11,000.00	10,994.35	10,993.55	10,993.55	24.55	24.57	-177.40	-0.20	-32.90	289.94	240.82	49.12	5.903			
11,100.00	11,094.25	11,093.45	11,093.45	24.78	24.79	-177.44	-0.20	-32.90	294.31	244.73	49.58	5.936			
11,200.00	11,194.16	11,193.36	11,193.36	25.02	25.02	-177.48	-0.20	-32.90	298.68	248.64	50.03	5.969			
11,300.00	11,294.06	11,293.26	11,293.26	25.25	25.24	-177.51	-0.20	-32.90	303.04	252.55	50.49	6.002			
11,400.00	11,393.97	11,393.17	11,393.17	25.48	25.47	-177.55	-0.20	-32.90	307.41	256.46	50.95	6.034			
11,500.00	11,493.87	11,493.07	11,493.07	25.71	25.69	-177.58	-0.20	-32.90	311.77	260.37	51.40	6.065			
11,600.00	11,593.77	11,592.97	11,592.97	25.94	25.92	-177.62	-0.20	-32.90	316.14	264.28	51.86	6.096			
11,700.00	11,693.68	11,692.88	11,692.88	26.18	26.14	-177.65	-0.20	-32.90	320.51	268.19	52.32	6.126			
11,800.00	11,793.58	11,792.78	11,792.78	26.41	26.36	-177.68	-0.20	-32.90	324.87	272.10	52.77	6.156			
11,900.00	11,893.49	11,892.69	11,892.69	26.64	26.59	-177.71	-0.20	-32.90	329.24	276.01	53.23	6.185			
12,000.00	11,993.35	11,992.55	11,992.55	26.87	26.81	-136.81	-0.20	-32.90	333.98	280.30	53.69	6.221			
12,100.00	12,091.33	12,090.53	12,090.53	27.12	27.03	-120.44	-0.20	-32.90	344.81	290.66	54.15	6.368			
12,200.00	12,183.28	12,182.48	12,182.48	27.37	27.24	-120.07	-0.20	-32.90	365.47	310.86	54.61	6.692			
12,300.00	12,265.19	12,308.42	12,307.88	27.65	27.52	-124.21	8.36	-32.98	396.52	341.35	55.17	7.187			
12,400.00	12,333.48	12,502.01	12,485.53	27.97	27.93	-129.77	81.87	-33.70	424.53	368.64	55.89	7.595			
12,500.00	12,385.17	12,744.25	12,643.92	28.36	28.54	-132.12	261.71	-35.45	438.13	381.22	56.91	7.699			
12,600.00	12,417.99	12,988.45	12,694.91	28.86	29.57	-129.23	497.80	-37.76	430.79	372.37	58.42	7.373			
12,700.00	12,430.52	13,086.93	12,691.18	29.44	30.13	-128.37	596.20	-38.72	421.03	361.46	59.57	7.067			
12,740.70	12,430.78	13,127.58	12,689.64	29.71	30.39	-128.21	636.83	-39.11	419.99	359.88	60.11	6.987			
12,800.00	12,426.66	13,186.90	12,687.39	30.12	30.80	-128.42	696.11	-39.69	421.12	360.21	60.91	6.914			
12,900.00	12,421.55	13,286.89	12,683.60	30.89	31.55	-128.56	796.02	-40.66	421.94	359.51	62.44	6.758			
13,000.00	12,416.44	13,386.89	12,679.81	31.74	32.39	-128.70	895.93	-41.64	422.77	358.63	64.13	6.592			
13,100.00	12,411.33	13,486.88	12,676.02	32.68	33.31	-128.84	995.85	-42.61	423.60	357.61	65.99	6.419			
13,200.00	12,406.23	13,586.87	12,672.23	33.69	34.31	-128.98	1,095.76	-43.59	424.43	356.43	67.99	6.242			
13,300.00	12,401.12	13,686.86	12,668.44	34.76	35.37	-129.12	1,195.68	-44.56	425.26	355.13	70.13	6.064			
13,400.00	12,396.01	13,786.85	12,664.65	35.90	36.49	-129.25	1,295.59	-45.54	426.10	353.71	72.39	5.886			
13,500.00	12,390.90	13,886.84	12,660.86	37.09	37.67	-129.39	1,395.51	-46.51	426.93	352.18	74.75	5.711			
13,600.00	12,385.80	13,986.83	12,657.07	38.33	38.89	-129.53	1,495.42	-47.49	427.77	350.55	77.22	5.540			
13,700.00	12,380.69	14,086.83	12,653.28	39.62	40.16	-129.66	1,595.34	-48.46	428.62	348.84	79.78	5.372			
13,800.00	12,375.58	14,186.82	12,649.49	40.94	41.48	-129.80	1,695.25	-49.43	429.46	347.04	82.42	5.211			
13,900.00	12,370.47	14,286.81	12,645.70	42.31	42.83	-129.93	1,795.17	-50.41	430.31	345.17	85.14	5.054			
14,000.00	12,365.37	14,386.80	12,641.91	43.71	44.21	-130.07	1,895.08	-51.38	431.16	343.24	87.92	4.904			
14,100.00	12,360.26	14,486.79	12,638.12	45.14	45.63	-130.20	1,995.00	-52.36	432.01	341.24	90.77	4.760			
14,200.00	12,356.73	14,586.78	12,634.33	46.47	47.08	-130.17	2,094.91	-53.33	431.85	338.30	93.54	4.616			
14,300.00	12,356.16	14,686.73	12,630.54	47.76	48.55	-129.83	2,194.78	-54.31	429.78	333.47	96.31	4.462			
14,400.00	12,355.95	14,786.67	12,626.75	49.26	50.04	-129.46	2,294.64	-55.28	427.49	328.20	99.30	4.305			
14,500.00	12,355.74	14,886.60	12,622.96	50.77	51.55	-129.09	2,394.50	-56.25	425.23	322.90	102.33	4.156			
14,600.00	12,355.53	14,986.54	12,619.17	52.31	53.09	-128.71	2,494.36	-57.23	422.98	317.58	105.40	4.013			
14,700.00	12,355.32	15,086.48	12,615.38	53.86	54.64	-128.33	2,594.22	-58.20	420.75	312.25	108.50	3.878			
14,800.00	12,355.11	15,186.41	12,611.60	55.43	56.21	-127.95	2,694.08	-59.17	418.54	306.90	111.64	3.749			
14,900.00	12,354.90	15,286.35	12,607.81	57.02	57.79	-127.56	2,793.94	-60.15	416.35	301.54	114.81	3.626			
15,000.00	12,354.69	15,386.28	12,604.02	58.62	59.39	-127.16	2,893.80	-61.12	414.18	296.17	118.01	3.510			
15,100.00	12,354.48	15,486.22	12,600.23	60.23	61.00	-126.77	2,993.66	-62.10	412.03	290.79	121.23	3.399			
15,200.00	12,354.27	15,578.78	12,598.03	61.86	62.26	-126.54	3,086.19	-63.00	410.74	286.62	124.12	3.309			
15,231.59	12,354.20	15,608.93	12,597.93	62.37	62.69	-126.54	3,116.33	-63.29	410.71	285.65	125.07	3.284			
15,300.00	12,354.06	15,677.34	12,597.80	63.49	63.81	-126.54	3,184.74	-63.96	410.73	283.42	127.30	3.226			

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
15,400.00	12,353.85	15,777.34	12,597.62	65.14	65.45	-126.54	3,284.73	-64.93	410.75	280.16	130.59	3.145		
15,500.00	12,353.64	15,877.34	12,597.44	66.80	67.10	-126.55	3,384.73	-65.91	410.77	276.88	133.89	3.068		
15,600.00	12,353.43	15,977.34	12,597.26	68.46	68.75	-126.55	3,484.72	-66.89	410.79	273.57	137.21	2.994		
15,700.00	12,353.22	16,077.34	12,597.08	70.13	70.42	-126.55	3,584.72	-67.86	410.81	270.25	140.55	2.923		
15,800.00	12,353.01	16,177.34	12,596.90	71.81	72.09	-126.56	3,684.71	-68.84	410.83	266.92	143.91	2.855		
15,900.00	12,352.80	16,277.34	12,596.72	73.50	73.78	-126.56	3,784.71	-69.81	410.85	263.57	147.28	2.790		
16,000.00	12,352.59	16,377.34	12,596.54	75.19	75.46	-126.56	3,884.70	-70.79	410.87	260.21	150.66	2.727		
16,100.00	12,352.38	16,477.34	12,596.36	76.89	77.16	-126.56	3,984.70	-71.76	410.89	256.83	154.05	2.667		
16,200.00	12,352.17	16,577.34	12,596.18	78.60	78.86	-126.57	4,084.69	-72.74	410.91	253.45	157.46	2.610		
16,300.00	12,351.96	16,677.34	12,596.00	80.31	80.56	-126.57	4,184.69	-73.71	410.93	250.05	160.88	2.554		
16,400.00	12,351.75	16,777.34	12,595.82	82.03	82.28	-126.57	4,284.68	-74.69	410.95	246.64	164.30	2.501		
16,500.00	12,351.54	16,877.34	12,595.64	83.75	83.99	-126.58	4,384.68	-75.66	410.97	243.23	167.74	2.450		
16,600.00	12,351.33	16,977.34	12,595.46	85.47	85.71	-126.58	4,484.68	-76.64	410.99	239.80	171.19	2.401		
16,700.00	12,351.12	17,077.34	12,595.28	87.20	87.44	-126.58	4,584.67	-77.61	411.01	236.36	174.64	2.353		
16,800.00	12,350.91	17,177.34	12,595.09	88.94	89.17	-126.59	4,684.67	-78.59	411.02	232.92	178.10	2.308		
16,900.00	12,350.71	17,277.34	12,594.91	90.67	90.90	-126.59	4,784.66	-79.56	411.04	229.47	181.57	2.264		
17,000.00	12,350.50	17,377.34	12,594.73	92.42	92.64	-126.59	4,884.66	-80.54	411.06	226.01	185.05	2.221		
17,100.00	12,350.29	17,477.34	12,594.55	94.16	94.38	-126.59	4,984.65	-81.51	411.08	222.55	188.54	2.180		
17,200.00	12,350.08	17,577.34	12,594.37	95.91	96.12	-126.60	5,084.65	-82.49	411.10	219.08	192.03	2.141		
17,300.00	12,349.87	17,677.34	12,594.19	97.66	97.87	-126.60	5,184.64	-83.46	411.12	215.60	195.52	2.103		
17,400.00	12,349.66	17,777.34	12,594.01	99.41	99.62	-126.60	5,284.64	-84.44	411.14	212.12	199.03	2.066		
17,500.00	12,349.45	17,877.34	12,593.83	101.17	101.37	-126.61	5,384.63	-85.41	411.16	208.63	202.54	2.030		
17,600.00	12,349.24	17,977.34	12,593.65	102.92	103.12	-126.61	5,484.63	-86.39	411.18	205.14	206.05	1.996		
17,700.00	12,349.03	18,077.34	12,593.47	104.68	104.88	-126.61	5,584.62	-87.36	411.20	201.64	209.57	1.962		
17,800.00	12,348.82	18,177.34	12,593.29	106.45	106.64	-126.62	5,684.62	-88.34	411.22	198.13	213.09	1.930		
17,900.00	12,348.61	18,277.34	12,593.11	108.21	108.40	-126.62	5,784.61	-89.31	411.24	194.63	216.62	1.898		
18,000.00	12,348.40	18,377.34	12,592.93	109.98	110.17	-126.62	5,884.61	-90.29	411.26	191.12	220.15	1.868		
18,100.00	12,348.19	18,477.34	12,592.75	111.75	111.93	-126.62	5,984.60	-91.26	411.28	187.60	223.68	1.839		
18,200.00	12,347.98	18,577.34	12,592.57	113.52	113.70	-126.63	6,084.60	-92.24	411.30	184.08	227.22	1.810		
18,300.00	12,347.77	18,677.34	12,592.39	115.29	115.47	-126.63	6,184.59	-93.21	411.32	180.56	230.77	1.782		
18,400.00	12,347.56	18,777.34	12,592.21	117.07	117.25	-126.63	6,284.59	-94.19	411.34	177.03	234.31	1.756		
18,500.00	12,347.35	18,877.34	12,592.03	118.84	119.02	-126.64	6,384.58	-95.16	411.36	173.50	237.86	1.729		
18,600.00	12,347.14	18,977.34	12,591.84	120.62	120.79	-126.64	6,484.58	-96.14	411.38	169.97	241.41	1.704		
18,700.00	12,346.93	19,077.34	12,591.66	122.40	122.57	-126.64	6,584.57	-97.12	411.40	166.43	244.97	1.679		
18,800.00	12,346.72	19,177.34	12,591.48	124.18	124.35	-126.65	6,684.57	-98.09	411.42	162.89	248.53	1.655		
18,900.00	12,346.51	19,277.34	12,591.30	125.96	126.13	-126.65	6,784.56	-99.07	411.44	159.35	252.09	1.632		
19,000.00	12,346.30	19,377.34	12,591.12	127.75	127.91	-126.65	6,884.56	-100.04	411.46	155.81	255.66	1.609		
19,100.00	12,346.09	19,477.34	12,590.94	129.53	129.69	-126.65	6,984.55	-101.02	411.48	152.26	259.22	1.587		
19,200.00	12,345.88	19,577.34	12,590.76	131.32	131.48	-126.66	7,084.55	-101.99	411.50	148.71	262.79	1.566		
19,300.00	12,345.67	19,677.34	12,590.58	133.10	133.26	-126.66	7,184.54	-102.97	411.52	145.16	266.36	1.545		
19,400.00	12,345.46	19,777.34	12,590.40	134.89	135.05	-126.66	7,284.54	-103.94	411.54	141.60	269.94	1.525		
19,500.00	12,345.25	19,877.34	12,590.22	136.68	136.83	-126.67	7,384.53	-104.92	411.56	138.05	273.51	1.505		
19,600.00	12,345.04	19,977.34	12,590.04	138.47	138.62	-126.67	7,484.53	-105.89	411.58	134.49	277.09	1.485 Level 3		
19,620.25	12,345.00	19,997.59	12,590.00	138.83	138.99	-126.67	7,504.78	-106.09	411.58	133.77	277.82	1.481 Level 3, SF		

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 23H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance				Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor		
0.00	0.00	0.00	0.00	0.00	0.00	-90.43	-0.50	-66.00	66.00					
100.00	100.00	99.90	99.90	0.08	0.08	-90.43	-0.50	-66.00	66.00	65.84	0.17	397.019		
200.00	200.00	199.90	199.90	0.31	0.31	-90.43	-0.50	-66.00	66.00	65.39	0.62	107.210		
300.00	300.00	299.90	299.90	0.53	0.53	-90.43	-0.50	-66.00	66.00	64.94	1.07	61.964		
400.00	400.00	399.90	399.90	0.76	0.76	-90.43	-0.50	-66.00	66.00	64.49	1.51	43.574		
500.00	500.00	499.90	499.90	0.98	0.98	-90.43	-0.50	-66.00	66.00	64.04	1.96	33.602		
600.00	600.00	599.90	599.90	1.21	1.21	-90.43	-0.50	-66.00	66.00	63.59	2.41	27.344		
700.00	700.00	699.90	699.90	1.43	1.43	-90.43	-0.50	-66.00	66.00	63.14	2.86	23.051		
800.00	800.00	799.90	799.90	1.66	1.66	-90.43	-0.50	-66.00	66.00	62.69	3.31	19.923		
900.00	900.00	899.90	899.90	1.88	1.88	-90.43	-0.50	-66.00	66.00	62.24	3.76	17.543		
1,000.00	1,000.00	999.90	999.90	2.11	2.11	-90.43	-0.50	-66.00	66.00	61.79	4.21	15.670		
1,100.00	1,100.00	1,099.90	1,099.90	2.33	2.33	-90.43	-0.50	-66.00	66.00	61.34	4.66	14.159		
1,200.00	1,200.00	1,199.90	1,199.90	2.56	2.56	-90.43	-0.50	-66.00	66.00	60.89	5.11	12.914		
1,300.00	1,300.00	1,299.90	1,299.90	2.78	2.78	-90.43	-0.50	-66.00	66.00	60.44	5.56	11.870		
1,400.00	1,400.00	1,399.90	1,399.90	3.01	3.00	-90.43	-0.50	-66.00	66.00	59.99	6.01	10.982		
1,500.00	1,500.00	1,499.90	1,499.90	3.23	3.23	-90.43	-0.50	-66.00	66.00	59.54	6.46	10.218		
1,600.00	1,600.00	1,599.90	1,599.90	3.45	3.45	-90.43	-0.50	-66.00	66.00	59.09	6.91	9.553		
1,700.00	1,700.00	1,699.90	1,699.90	3.68	3.68	-90.43	-0.50	-66.00	66.00	58.64	7.36	8.969		
1,800.00	1,800.00	1,799.90	1,799.90	3.90	3.90	-90.43	-0.50	-66.00	66.00	58.19	7.81	8.453		
1,900.00	1,900.00	1,899.90	1,899.90	4.13	4.13	-90.43	-0.50	-66.00	66.00	57.74	8.26	7.993		
2,000.00	2,000.00	1,999.90	1,999.90	4.35	4.35	-90.43	-0.50	-66.00	66.00	57.29	8.71	7.580		
2,100.00	2,100.00	2,099.90	2,099.90	4.58	4.58	-90.43	-0.50	-66.00	66.00	56.85	9.16	7.208		
2,200.00	2,200.00	2,199.90	2,199.90	4.80	4.80	-90.43	-0.50	-66.00	66.00	56.40	9.61	6.871		
2,300.00	2,300.00	2,299.90	2,299.90	5.03	5.03	-90.43	-0.50	-66.00	66.00	55.95	10.06	6.564		
2,400.00	2,400.00	2,399.90	2,399.90	5.25	5.25	-90.43	-0.50	-66.00	66.00	55.50	10.51	6.283		
2,500.00	2,500.00	2,499.90	2,499.90	5.48	5.48	-90.43	-0.50	-66.00	66.00	55.05	10.95	6.025		
2,600.00	2,600.00	2,599.90	2,599.90	5.70	5.70	-90.43	-0.50	-66.00	66.00	54.60	11.40	5.787		
2,700.00	2,700.00	2,699.90	2,699.90	5.93	5.93	-90.43	-0.50	-66.00	66.00	54.15	11.85	5.568		
2,800.00	2,800.00	2,799.90	2,799.90	6.15	6.15	-90.43	-0.50	-66.00	66.00	53.70	12.30	5.365		
2,900.00	2,900.00	2,899.90	2,899.90	6.38	6.38	-90.43	-0.50	-66.00	66.00	53.25	12.75	5.175		
3,000.00	3,000.00	2,999.90	2,999.90	6.60	6.60	-90.43	-0.50	-66.00	66.00	52.80	13.20	4.999		
3,100.00	3,100.00	3,099.90	3,099.90	6.83	6.83	-90.43	-0.50	-66.00	66.00	52.35	13.65	4.835		
3,200.00	3,200.00	3,199.90	3,199.90	7.05	7.05	-90.43	-0.50	-66.00	66.00	51.90	14.10	4.680		
3,300.00	3,300.00	3,299.90	3,299.90	7.28	7.28	-90.43	-0.50	-66.00	66.00	51.45	14.55	4.536		
3,400.00	3,400.00	3,399.90	3,399.90	7.50	7.50	-90.43	-0.50	-66.00	66.00	51.00	15.00	4.400		
3,500.00	3,500.00	3,499.90	3,499.90	7.73	7.72	-90.43	-0.50	-66.00	66.00	50.55	15.45	4.272		
3,600.00	3,600.00	3,599.90	3,599.90	7.95	7.95	-90.43	-0.50	-66.00	66.00	50.10	15.90	4.151		
3,700.00	3,700.00	3,699.90	3,699.90	8.17	8.17	-90.43	-0.50	-66.00	66.00	49.65	16.35	4.037		
3,800.00	3,800.00	3,799.90	3,799.90	8.40	8.40	-90.43	-0.50	-66.00	66.00	49.20	16.80	3.929		
3,900.00	3,900.00	3,899.90	3,899.90	8.62	8.62	-90.43	-0.50	-66.00	66.00	48.75	17.25	3.827		
4,000.00	4,000.00	3,999.90	3,999.90	8.85	8.85	-90.43	-0.50	-66.00	66.00	48.30	17.70	3.729		
4,100.00	4,100.00	4,099.90	4,099.90	9.07	9.07	-90.43	-0.50	-66.00	66.00	47.85	18.15	3.637		
4,200.00	4,200.00	4,199.90	4,199.90	9.30	9.30	-90.43	-0.50	-66.00	66.00	47.41	18.60	3.549		
4,300.00	4,300.00	4,299.90	4,299.90	9.52	9.52	-90.43	-0.50	-66.00	66.00	46.96	19.05	3.465		
4,400.00	4,400.00	4,399.90	4,399.90	9.75	9.75	-90.43	-0.50	-66.00	66.00	46.51	19.50	3.385		
4,500.00	4,500.00	4,499.90	4,499.90	9.97	9.97	-90.43	-0.50	-66.00	66.00	46.06	19.95	3.309		
4,600.00	4,600.00	4,599.90	4,599.90	10.20	10.20	-90.43	-0.50	-66.00	66.00	45.61	20.40	3.236		
4,700.00	4,700.00	4,699.90	4,699.90	10.42	10.42	-90.43	-0.50	-66.00	66.00	45.16	20.84	3.166		
4,800.00	4,800.00	4,799.90	4,799.90	10.65	10.65	-90.43	-0.50	-66.00	66.00	44.71	21.29	3.100		
4,900.00	4,900.00	4,899.90	4,899.90	10.87	10.87	-90.43	-0.50	-66.00	66.00	44.26	21.74	3.035		
5,000.00	5,000.00	4,999.90	4,999.90	11.10	11.10	-90.43	-0.50	-66.00	66.00	43.81	22.19	2.974 CC, ES, SF		
5,100.00	5,099.98	5,097.59	5,097.57	11.31	11.31	-156.83	-0.18	-67.63	69.27	46.65	22.62	3.063		

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 23H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning	
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)						
5,200.00	5,199.89	5,194.75	5,194.60	11.52	11.50	-157.27	0.78	-72.49	78.17	55.15	23.03	3.395		
5,300.00	5,299.79	5,292.74	5,292.28	11.73	11.71	-157.25	2.29	-80.22	90.04	66.59	23.44	3.841		
5,400.00	5,399.70	5,391.99	5,391.17	11.95	11.92	-157.19	3.91	-88.43	102.29	78.42	23.86	4.286		
5,500.00	5,499.60	5,491.24	5,490.06	12.16	12.13	-157.15	5.52	-96.64	114.54	90.25	24.29	4.716		
5,600.00	5,599.51	5,590.48	5,588.96	12.37	12.34	-157.11	7.13	-104.86	126.79	102.07	24.71	5.130		
5,700.00	5,699.41	5,689.73	5,687.85	12.59	12.56	-157.08	8.74	-113.07	139.04	113.89	25.14	5.530		
5,800.00	5,799.32	5,788.98	5,786.74	12.80	12.78	-157.05	10.36	-121.28	151.29	125.71	25.58	5.915		
5,900.00	5,899.22	5,888.22	5,885.64	13.02	13.00	-157.03	11.97	-129.49	163.54	137.53	26.01	6.287		
6,000.00	5,999.12	5,987.47	5,984.53	13.23	13.22	-157.01	13.58	-137.70	175.79	149.34	26.45	6.646		
6,100.00	6,099.03	6,086.72	6,083.42	13.45	13.44	-157.00	15.20	-145.91	188.04	161.15	26.89	6.993		
6,200.00	6,198.93	6,185.96	6,182.32	13.67	13.67	-156.98	16.81	-154.12	200.29	172.96	27.33	7.327		
6,300.00	6,298.84	6,285.21	6,281.21	13.89	13.89	-156.97	18.42	-162.34	212.54	184.76	27.78	7.651		
6,400.00	6,398.74	6,384.46	6,380.10	14.11	14.12	-156.96	20.04	-170.55	224.79	196.57	28.23	7.964		
6,500.00	6,498.65	6,483.71	6,479.00	14.33	14.35	-156.95	21.65	-178.76	237.04	208.37	28.68	8.266		
6,600.00	6,598.55	6,582.95	6,577.89	14.55	14.58	-156.94	23.26	-186.97	249.29	220.17	29.13	8.559		
6,700.00	6,698.46	6,682.20	6,676.78	14.77	14.81	-156.93	24.87	-195.18	261.54	231.96	29.58	8.842		
6,800.00	6,798.36	6,781.45	6,775.68	14.99	15.05	-156.92	26.49	-203.39	273.80	243.76	30.04	9.116		
6,900.00	6,898.26	6,880.69	6,874.57	15.21	15.28	-156.92	28.10	-211.60	286.05	255.55	30.49	9.381		
7,000.00	6,998.17	6,979.94	6,973.46	15.43	15.52	-156.91	29.71	-219.81	298.30	267.35	30.95	9.638		
7,100.00	7,098.07	7,079.19	7,072.36	15.65	15.75	-156.91	31.33	-228.03	310.55	279.14	31.41	9.887		
7,200.00	7,197.98	7,178.43	7,171.25	15.88	15.99	-156.90	32.94	-236.24	322.80	290.93	31.87	10.129		
7,300.00	7,297.88	7,277.68	7,270.14	16.10	16.23	-156.89	34.55	-244.45	335.05	302.72	32.33	10.363		
7,400.00	7,397.79	7,376.93	7,369.04	16.33	16.47	-156.89	36.16	-252.66	347.30	314.50	32.80	10.590		
7,500.00	7,497.69	7,476.17	7,467.93	16.55	16.71	-156.89	37.78	-260.87	359.55	326.29	33.26	10.810		
7,600.00	7,597.60	7,575.42	7,566.82	16.77	16.95	-156.88	39.39	-269.08	371.80	338.07	33.73	11.024		
7,700.00	7,697.50	7,674.67	7,665.72	17.00	17.19	-156.88	41.00	-277.29	384.05	349.86	34.19	11.232		
7,800.00	7,797.40	7,773.91	7,764.61	17.22	17.44	-156.87	42.62	-285.51	396.30	361.64	34.66	11.433		
7,900.00	7,897.31	7,873.16	7,863.50	17.45	17.68	-156.87	44.23	-293.72	408.55	373.42	35.13	11.629		
8,000.00	7,997.21	7,972.41	7,962.40	17.68	17.93	-156.87	45.84	-301.93	420.80	385.20	35.60	11.820		
8,100.00	8,097.12	8,071.65	8,061.29	17.90	18.17	-156.87	47.45	-310.14	433.05	396.98	36.07	12.005		
8,200.00	8,197.02	8,170.90	8,160.18	18.13	18.42	-156.86	49.07	-318.35	445.31	408.76	36.55	12.185		
8,300.00	8,296.93	8,270.15	8,259.08	18.36	18.66	-156.86	50.68	-326.56	457.56	420.54	37.02	12.360		
8,400.00	8,396.83	8,369.39	8,357.97	18.58	18.91	-156.86	52.29	-334.77	469.81	432.31	37.49	12.530		
8,500.00	8,496.74	8,468.64	8,456.86	18.81	19.16	-156.85	53.91	-342.98	482.06	444.09	37.97	12.696		
8,600.00	8,596.64	8,567.89	8,555.76	19.04	19.41	-156.85	55.52	-351.20	494.31	455.86	38.44	12.858		
8,700.00	8,696.54	8,667.13	8,654.65	19.27	19.66	-156.85	57.13	-359.41	506.56	467.64	38.92	13.015		
8,800.00	8,796.45	8,766.38	8,753.54	19.49	19.91	-156.85	58.74	-367.62	518.81	479.41	39.40	13.168		
8,900.00	8,896.35	8,865.63	8,852.44	19.72	20.16	-156.85	60.36	-375.83	531.06	491.18	39.88	13.317		
9,000.00	8,996.26	8,964.87	8,951.33	19.95	20.41	-156.84	61.97	-384.04	543.31	502.95	40.36	13.463		
9,100.00	9,096.16	9,064.12	9,050.22	20.18	20.66	-156.84	63.58	-392.25	555.56	514.73	40.84	13.605		
9,200.00	9,196.07	9,163.37	9,149.12	20.41	20.91	-156.84	65.20	-400.46	567.81	526.50	41.32	13.743		
9,300.00	9,295.97	9,262.61	9,248.01	20.64	21.16	-156.84	66.81	-408.68	580.06	538.27	41.80	13.878		
9,400.00	9,395.88	9,361.86	9,346.90	20.87	21.41	-156.84	68.42	-416.89	592.31	550.04	42.28	14.010		
9,500.00	9,495.78	9,461.11	9,445.80	21.09	21.67	-156.84	70.03	-425.10	604.56	561.80	42.76	14.139		
9,600.00	9,595.69	9,560.35	9,544.69	21.32	21.92	-156.83	71.65	-433.31	616.82	573.57	43.24	14.264		
9,700.00	9,695.59	9,659.60	9,643.58	21.55	22.17	-156.83	73.26	-441.52	629.07	585.34	43.73	14.387		
9,800.00	9,795.49	9,758.85	9,742.48	21.78	22.43	-156.83	74.87	-449.73	641.32	597.11	44.21	14.506		
9,900.00	9,895.40	9,858.09	9,841.37	22.01	22.68	-156.83	76.49	-457.94	653.57	608.87	44.69	14.623		
10,000.00	9,995.30	9,957.34	9,940.26	22.24	22.93	-156.83	78.10	-466.15	665.82	620.64	45.18	14.738		
10,100.00	10,095.21	10,056.59	10,039.16	22.47	23.19	-156.83	79.71	-474.37	678.07	632.41	45.66	14.849		
10,200.00	10,195.11	10,155.84	10,138.05	22.70	23.44	-156.83	81.32	-482.58	690.32	644.17	46.15	14.958		
10,300.00	10,295.02	10,255.08	10,236.94	22.94	23.70	-156.83	82.94	-490.79	702.57	655.94	46.64	15.065		

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



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at: 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 23H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
10,400.00	10,394.92	10,354.33	10,335.84	23.17	23.96	-156.83	84.55	-499.00	714.82	667.70	47.12	15.170			
10,500.00	10,494.83	10,453.58	10,434.73	23.40	24.21	-156.82	86.16	-507.21	727.07	679.46	47.61	15.272			
10,600.00	10,594.73	10,552.82	10,533.62	23.63	24.47	-156.82	87.78	-515.42	739.32	691.23	48.10	15.372			
10,700.00	10,694.63	10,652.07	10,632.52	23.86	24.72	-156.82	89.39	-523.63	751.57	702.99	48.58	15.470			
10,800.00	10,794.54	10,751.32	10,731.41	24.09	24.98	-156.82	91.00	-531.84	763.82	714.75	49.07	15.565			
10,900.00	10,894.44	10,850.56	10,830.30	24.32	25.24	-156.82	92.61	-540.06	776.08	726.51	49.56	15.659			
11,000.00	10,994.35	10,949.81	10,929.20	24.55	25.50	-156.82	94.23	-548.27	788.33	738.28	50.05	15.751			
11,100.00	11,094.25	11,049.06	11,028.09	24.78	25.75	-156.82	95.84	-556.48	800.58	750.04	50.54	15.841			
11,200.00	11,194.16	11,148.30	11,126.98	25.02	26.01	-156.82	97.45	-564.69	812.83	761.80	51.03	15.929			
11,300.00	11,294.06	11,247.55	11,225.88	25.25	26.27	-156.82	99.07	-572.90	825.08	773.56	51.52	16.015			
11,400.00	11,393.97	11,346.80	11,324.77	25.48	26.53	-156.82	100.68	-581.11	837.33	785.32	52.01	16.100			
11,500.00	11,493.87	11,446.04	11,423.66	25.71	26.79	-156.82	102.29	-589.32	849.58	797.08	52.50	16.183			
11,600.00	11,593.77	11,545.29	11,522.56	25.94	27.04	-156.81	103.90	-597.54	861.83	808.84	52.99	16.264			
11,700.00	11,693.68	11,644.54	11,621.45	26.18	27.30	-156.81	105.52	-605.75	874.08	820.60	53.48	16.344			
11,800.00	11,793.58	11,743.78	11,720.34	26.41	27.56	-156.81	107.13	-613.96	886.33	832.36	53.97	16.422			
11,900.00	11,893.49	11,843.03	11,819.24	26.64	27.82	-156.81	108.74	-622.17	898.58	844.12	54.46	16.499			
12,000.00	11,993.35	11,942.25	11,918.11	26.87	28.08	-115.50	110.36	-630.38	910.83	855.88	54.95	16.574			
12,100.00	12,093.25	12,039.87	12,015.37	27.12	28.34	-97.28	111.94	-638.46	923.12	867.67	55.45	16.647			
12,200.00	12,193.15	12,139.84	12,115.02	27.37	28.58	-94.67	113.44	-646.06	935.06	880.11	55.95	16.730			
12,300.00	12,293.05	12,239.15	12,214.04	27.65	28.79	-94.35	114.77	-652.87	946.91	892.06	56.44	16.814			
12,400.00	12,392.95	12,338.73	12,313.04	27.97	29.06	-95.52	124.70	-661.41	958.77	903.91	57.03	17.006			
12,500.00	12,492.85	12,438.28	12,412.91	28.36	29.45	-97.80	171.74	-672.69	990.00	932.19	57.81	17.124			
12,600.00	12,592.75	12,537.84	12,512.07	28.86	30.04	-101.07	296.94	-686.53	1,008.29	949.39	58.90	17.119			
12,700.00	12,692.65	12,637.36	12,611.20	29.44	31.21	-103.55	547.99	-697.86	1,018.12	957.47	60.65	16.787			
12,800.00	12,792.55	12,737.01	12,710.59	30.12	32.04	-103.69	686.93	-699.51	1,018.75	956.59	62.16	16.390			
12,900.00	12,892.45	12,836.58	12,810.01	30.89	32.76	-103.81	786.86	-700.48	1,019.26	955.62	63.64	16.016			
13,000.00	12,992.35	12,936.16	12,909.24	31.74	33.56	-103.92	886.79	-701.46	1,019.77	954.47	65.30	15.616			
13,100.00	13,092.25	13,035.54	13,008.24	32.68	34.45	-104.04	986.71	-702.43	1,020.29	953.16	67.12	15.200			
13,200.00	13,192.15	13,134.82	13,107.01	33.69	35.41	-104.15	1,086.64	-703.41	1,020.81	951.71	69.10	14.774			
13,300.00	13,292.05	13,234.29	13,206.20	34.76	36.44	-104.27	1,186.57	-704.38	1,021.34	950.14	71.20	14.344			
13,400.00	13,391.95	13,333.16	13,304.72	35.90	37.53	-104.39	1,286.50	-705.36	1,021.87	948.44	73.43	13.916			
13,500.00	13,491.85	13,432.56	13,403.64	37.09	38.68	-104.50	1,386.43	-706.33	1,022.40	946.63	75.77	13.494			
13,600.00	13,591.75	13,531.94	13,502.47	38.33	39.88	-104.62	1,486.35	-707.31	1,022.94	944.73	78.21	13.079			
13,700.00	13,691.65	13,631.40	13,601.59	39.62	41.13	-104.73	1,586.28	-708.28	1,023.48	942.74	80.74	12.676			
13,800.00	13,791.55	13,730.86	13,699.91	40.94	42.42	-104.85	1,686.21	-709.26	1,024.03	940.67	83.36	12.284			
13,900.00	13,891.45	13,830.34	13,798.83	42.31	43.74	-104.96	1,786.14	-710.23	1,024.58	938.53	86.05	11.907			
14,000.00	13,991.35	13,929.73	13,897.64	43.71	45.11	-105.08	1,886.07	-711.21	1,025.14	936.33	88.81	11.543			
14,100.00	14,091.25	14,029.04	14,000.00	45.14	46.41	-105.20	1,985.93	-712.15	1,025.76	934.21	91.55	11.204			
14,200.00	14,191.15	14,128.51	14,098.34	46.47	47.75	-105.35	2,085.84	-713.10	1,026.46	932.24	94.22	10.895			
14,300.00	14,291.05	14,227.96	14,197.03	47.76	49.19	-105.34	2,185.79	-714.07	1,026.43	929.47	96.96	10.586			
14,400.00	14,390.95	14,327.41	14,296.93	49.26	50.66	-105.32	2,285.72	-715.05	1,026.30	926.38	99.92	10.271			
14,500.00	14,490.85	14,426.51	14,395.22	50.77	52.15	-105.29	2,385.61	-716.03	1,026.17	923.24	102.93	9.970			
14,600.00	14,590.75	14,525.84	14,493.51	52.31	53.67	-105.26	2,485.50	-717.00	1,026.04	920.07	105.98	9.682			
14,700.00	14,690.65	14,625.36	14,592.40	53.86	55.20	-105.24	2,585.39	-717.98	1,025.92	916.85	109.06	9.407			
14,800.00	14,790.55	14,724.51	14,690.10	55.43	56.75	-105.21	2,685.29	-718.95	1,025.79	913.61	112.18	9.144			
14,900.00	14,890.45	14,823.83	14,788.39	57.02	58.31	-105.18	2,785.18	-719.93	1,025.66	910.33	115.33	8.893			
15,000.00	14,990.35	14,923.51	14,887.68	58.62	59.89	-105.15	2,885.07	-720.90	1,025.54	907.02	118.51	8.653			
15,100.00	15,090.25	15,022.84	14,988.98	60.23	61.49	-105.13	2,984.96	-721.88	1,025.41	903.69	121.72	8.424			
15,200.00	15,190.15	15,122.27	15,088.27	61.86	63.10	-105.10	3,084.85	-722.85	1,025.28	900.33	124.95	8.205			
15,300.00	15,290.05	15,221.56	15,186.56	63.49	64.71	-105.07	3,184.74	-723.83	1,025.16	896.95	128.21	7.996			
15,400.00	15,389.95	15,320.84	15,285.86	65.14	66.34	-105.05	3,284.63	-724.81	1,025.03	893.55	131.48	7.796			
15,500.00	15,489.85	15,419.73	15,384.15	66.80	67.98	-105.02	3,384.52	-725.78	1,024.90	890.13	134.78	7.604			

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



Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 23H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
15,600.00	12,353.43	15,858.14	12,618.44	68.46	69.63	-104.99	3,479.72	-726.76	1,024.78	886.69	138.09	7.421			
15,700.00	12,353.22	15,958.13	12,617.73	70.13	71.29	-104.97	3,579.71	-727.73	1,024.65	883.23	141.42	7.245			
15,800.00	12,353.01	16,058.13	12,617.03	71.81	72.96	-104.94	3,679.70	-728.71	1,024.53	879.76	144.77	7.077			
15,900.00	12,352.80	16,158.13	12,616.32	73.50	74.63	-104.91	3,779.69	-729.68	1,024.40	876.27	148.13	6.916			
16,000.00	12,352.59	16,258.13	12,615.61	75.19	76.31	-104.89	3,879.68	-730.66	1,024.28	872.77	151.51	6.761			
16,100.00	12,352.38	16,358.13	12,614.91	76.89	78.00	-104.86	3,979.68	-731.63	1,024.16	869.26	154.89	6.612			
16,200.00	12,352.17	16,458.13	12,614.20	78.60	79.69	-104.83	4,079.67	-732.61	1,024.03	865.74	158.29	6.469			
16,300.00	12,351.96	16,558.13	12,613.49	80.31	81.39	-104.80	4,179.66	-733.59	1,023.91	862.21	161.70	6.332			
16,400.00	12,351.75	16,658.13	12,612.79	82.03	83.10	-104.78	4,279.65	-734.56	1,023.78	858.66	165.12	6.200			
16,500.00	12,351.54	16,758.13	12,612.08	83.75	84.81	-104.75	4,379.64	-735.54	1,023.66	855.11	168.55	6.073			
16,600.00	12,351.33	16,858.12	12,611.37	85.47	86.52	-104.72	4,479.63	-736.51	1,023.54	851.54	172.00	5.951			
16,700.00	12,351.12	16,958.12	12,610.66	87.20	88.24	-104.70	4,579.62	-737.49	1,023.41	847.97	175.44	5.833			
16,800.00	12,350.91	17,058.12	12,609.96	88.94	89.96	-104.67	4,679.62	-738.46	1,023.29	844.39	178.90	5.720			
16,900.00	12,350.71	17,158.12	12,609.25	90.67	91.69	-104.64	4,779.61	-739.44	1,023.17	840.80	182.37	5.611			
17,000.00	12,350.50	17,258.12	12,608.54	92.42	93.42	-104.62	4,879.60	-740.41	1,023.05	837.21	185.84	5.505			
17,100.00	12,350.29	17,358.12	12,607.84	94.16	95.16	-104.59	4,979.59	-741.39	1,022.93	833.61	189.32	5.403			
17,200.00	12,350.08	17,458.12	12,607.13	95.91	96.90	-104.56	5,079.58	-742.37	1,022.80	830.00	192.80	5.305			
17,300.00	12,349.87	17,558.12	12,606.42	97.66	98.64	-104.53	5,179.57	-743.34	1,022.68	826.39	196.30	5.210			
17,400.00	12,349.66	17,658.11	12,605.72	99.41	100.38	-104.51	5,279.56	-744.32	1,022.56	822.77	199.79	5.118			
17,500.00	12,349.45	17,758.11	12,605.01	101.17	102.13	-104.48	5,379.56	-745.29	1,022.44	819.14	203.30	5.029			
17,600.00	12,349.24	17,858.11	12,604.30	102.92	103.88	-104.45	5,479.55	-746.27	1,022.32	815.51	206.81	4.943			
17,700.00	12,349.03	17,958.11	12,603.59	104.68	105.64	-104.43	5,579.54	-747.24	1,022.20	811.88	210.32	4.860			
17,800.00	12,348.82	18,058.11	12,602.89	106.45	107.39	-104.40	5,679.53	-748.22	1,022.08	808.24	213.84	4.780			
17,900.00	12,348.61	18,158.11	12,602.18	108.21	109.15	-104.37	5,779.52	-749.19	1,021.96	804.60	217.36	4.702			
18,000.00	12,348.40	18,258.11	12,601.47	109.98	110.91	-104.35	5,879.51	-750.17	1,021.84	800.95	220.89	4.626			
18,100.00	12,348.19	18,358.11	12,600.77	111.75	112.67	-104.32	5,979.51	-751.15	1,021.72	797.30	224.42	4.553			
18,200.00	12,347.98	18,458.10	12,600.06	113.52	114.44	-104.29	6,079.50	-752.12	1,021.60	793.64	227.96	4.482			
18,300.00	12,347.77	18,558.10	12,599.35	115.29	116.20	-104.26	6,179.49	-753.10	1,021.48	789.98	231.50	4.413			
18,400.00	12,347.56	18,658.10	12,598.65	117.07	117.97	-104.24	6,279.48	-754.07	1,021.36	786.32	235.04	4.345			
18,500.00	12,347.35	18,758.10	12,597.94	118.84	119.74	-104.21	6,379.47	-755.05	1,021.24	782.66	238.58	4.280			
18,600.00	12,347.14	18,858.10	12,597.23	120.62	121.51	-104.18	6,479.46	-756.02	1,021.12	778.99	242.13	4.217			
18,700.00	12,346.93	18,958.10	12,596.52	122.40	123.29	-104.16	6,579.45	-757.00	1,021.00	775.32	245.69	4.156			
18,800.00	12,346.72	19,058.10	12,595.82	124.18	125.06	-104.13	6,679.45	-757.97	1,020.89	771.64	249.24	4.096			
18,900.00	12,346.51	19,158.10	12,595.11	125.96	126.84	-104.10	6,779.44	-758.95	1,020.77	767.97	252.80	4.038			
19,000.00	12,346.30	19,258.09	12,594.40	127.75	128.62	-104.07	6,879.43	-759.93	1,020.65	764.29	256.36	3.981			
19,100.00	12,346.09	19,358.09	12,593.70	129.53	130.40	-104.05	6,979.42	-760.90	1,020.53	760.61	259.93	3.926			
19,200.00	12,345.88	19,458.09	12,592.99	131.32	132.18	-104.02	7,079.41	-761.88	1,020.42	756.92	263.49	3.873			
19,300.00	12,345.67	19,558.09	12,592.28	133.10	133.96	-103.99	7,179.40	-762.85	1,020.30	753.24	267.06	3.820			
19,400.00	12,345.46	19,658.09	12,591.58	134.89	135.74	-103.97	7,279.40	-763.83	1,020.18	749.55	270.63	3.770			
19,500.00	12,345.25	19,758.09	12,590.87	136.68	137.53	-103.94	7,379.39	-764.80	1,020.07	745.86	274.21	3.720			
19,600.00	12,345.04	19,858.09	12,590.16	138.47	139.31	-103.91	7,479.38	-765.78	1,019.95	742.17	277.78	3.672			
19,620.25	12,345.00	19,878.34	12,590.02	138.83	139.68	-103.91	7,499.63	-765.98	1,019.93	741.42	278.51	3.662			

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

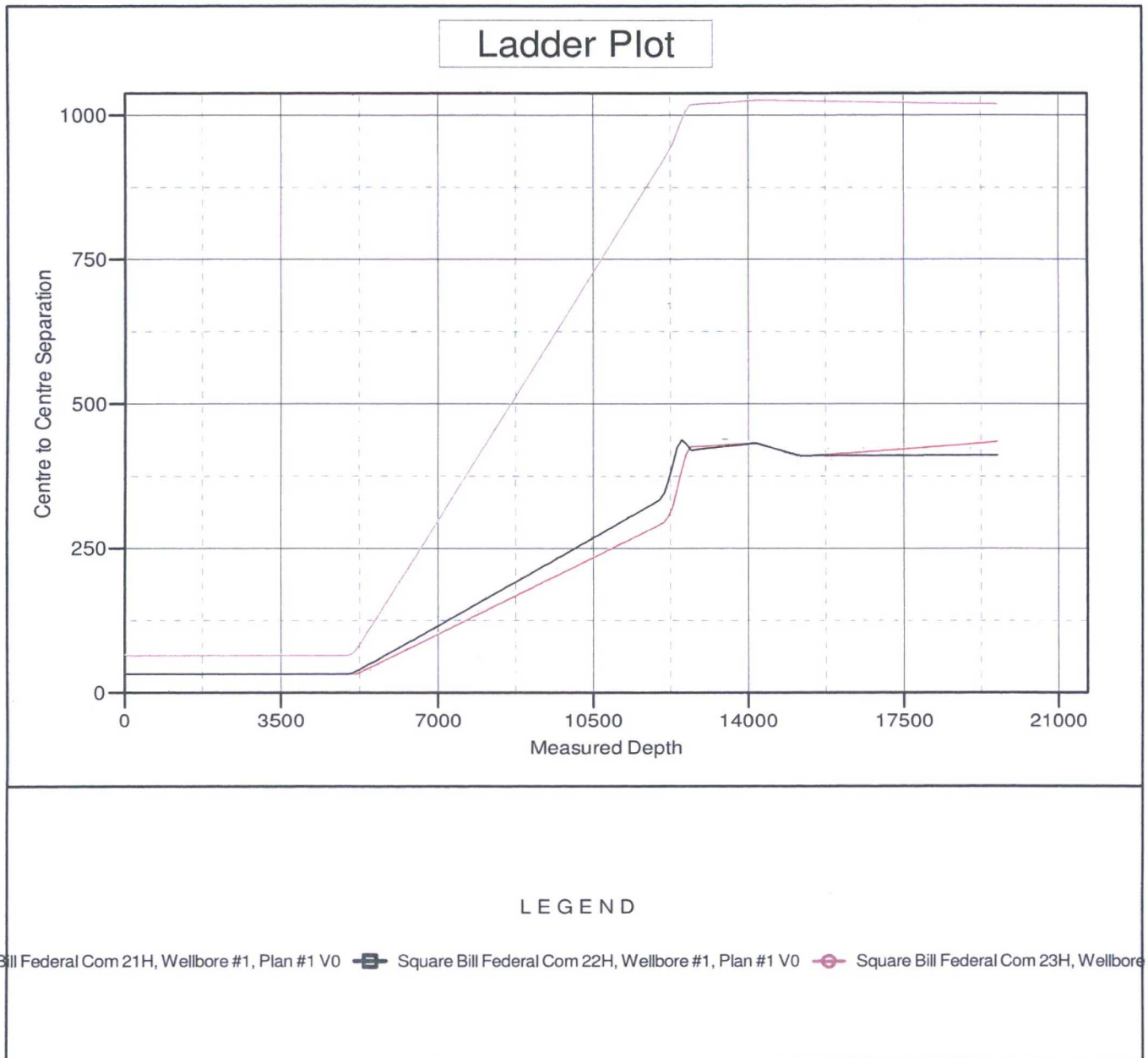


Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 31, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: Square Bill Federal Com 1H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 1H
TVD Reference: KB=26' @ 3300.40ft (McVay 8)
MD Reference: KB=26' @ 3300.40ft (McVay 8)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=26' @ 3300.40ft (McVay 8)
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: Square Bill Federal Com 1H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.50°





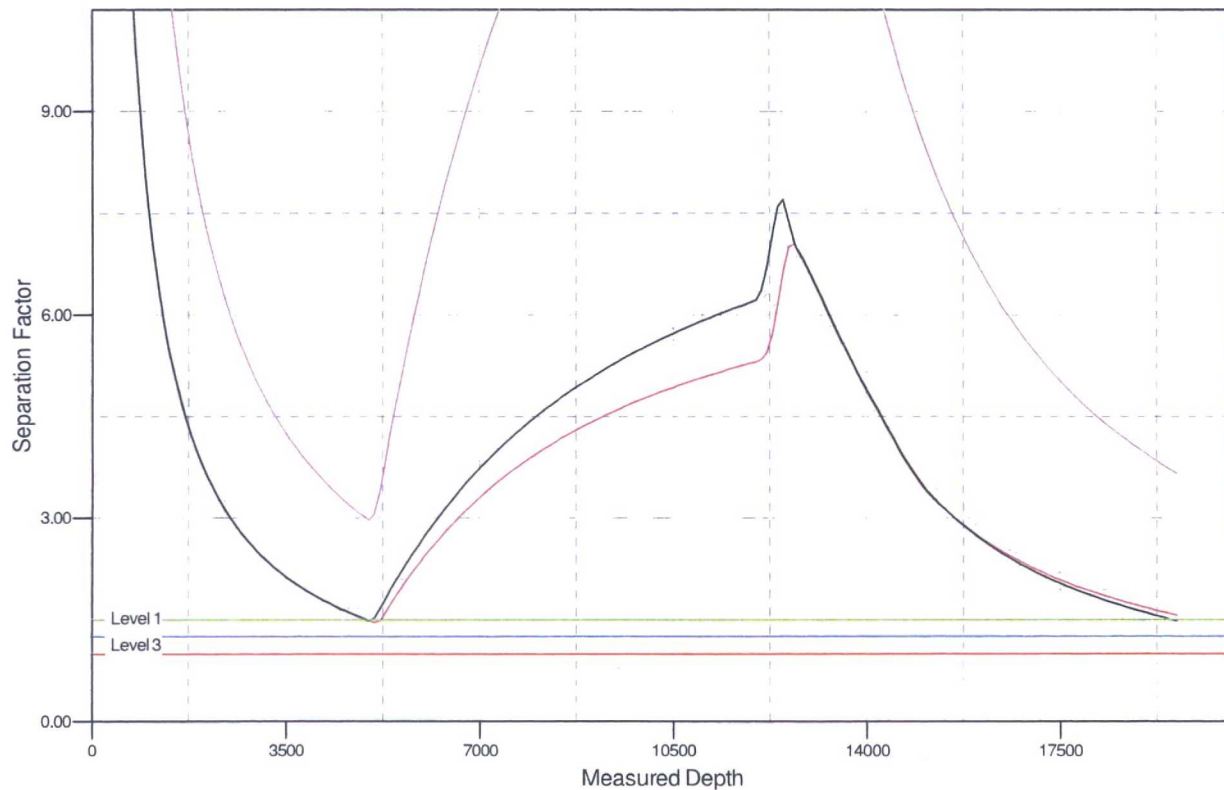
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Coordinates are relative to: Square Bill Federal Com 1H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.50°

Separation Factor Plot



LEGEND

Bill Federal Com 21H, Wellbore #1, Plan #1 V0 — Square Bill Federal Com 22H, Wellbore #1, Plan #1 V0 — Square Bill Federal Com 23H, Wellbore #