



CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 31, T 25 S., R 35 E

Square Bill Federal Com 23H

Wellbore #1

Plan #1

Anticollision Report

13 March, 2017





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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.00 ft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program **Date** 3/13/2017

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	19,880.93	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 1H - Wellbore #1 - Plan #1	4,966.63	4,966.73	66.00	43.96	2.994	CC
Square Bill Federal Com 1H - Wellbore #1 - Plan #1	5,000.00	5,000.00	66.00	43.81	2.974	ES, SF
Square Bill Federal Com 21H - Wellbore #1 - Plan #1	4,966.63	4,966.73	99.10	77.06	4.496	CC
Square Bill Federal Com 21H - Wellbore #1 - Plan #1	5,000.00	5,000.00	99.10	76.91	4.465	ES, SF
Square Bill Federal Com 22H - Wellbore #1 - Plan #1	5,000.00	4,999.30	33.10	10.91	1.492	Level 3, CC, ES, SF

Offset Design Sec. 31, T 25 S., R 35 E - Square Bill Federal Com 1H - 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)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.10	0.10	0.00	0.00	89.57	0.50	66.00	66.00				
100.00	100.00	100.10	100.10	0.08	0.08	89.57	0.50	66.00	66.00	65.84	0.17	396.285	
200.00	200.00	200.10	200.10	0.31	0.31	89.57	0.50	66.00	66.00	65.39	0.62	107.132	
300.00	300.00	300.10	300.10	0.53	0.53	89.57	0.50	66.00	66.00	64.94	1.07	61.938	
400.00	400.00	400.10	400.10	0.76	0.76	89.57	0.50	66.00	66.00	64.49	1.52	43.561	
500.00	500.00	500.10	500.10	0.98	0.98	89.57	0.50	66.00	66.00	64.04	1.96	33.594	
600.00	600.00	600.10	600.10	1.21	1.21	89.57	0.50	66.00	66.00	63.59	2.41	27.339	
700.00	700.00	700.10	700.10	1.43	1.43	89.57	0.50	66.00	66.00	63.14	2.86	23.047	
800.00	800.00	800.10	800.10	1.66	1.66	89.57	0.50	66.00	66.00	62.69	3.31	19.920	
900.00	900.00	900.10	900.10	1.88	1.88	89.57	0.50	66.00	66.00	62.24	3.76	17.541	
1,000.00	1,000.00	1,000.10	1,000.10	2.11	2.11	89.57	0.50	66.00	66.00	61.79	4.21	15.669	
1,100.00	1,100.00	1,100.10	1,100.10	2.33	2.33	89.57	0.50	66.00	66.00	61.34	4.66	14.158	
1,200.00	1,200.00	1,200.10	1,200.10	2.56	2.56	89.57	0.50	66.00	66.00	60.89	5.11	12.913	
1,300.00	1,300.00	1,300.10	1,300.10	2.78	2.78	89.57	0.50	66.00	66.00	60.44	5.56	11.869	
1,400.00	1,400.00	1,400.10	1,400.10	3.01	3.01	89.57	0.50	66.00	66.00	59.99	6.01	10.981	
1,500.00	1,500.00	1,500.10	1,500.10	3.23	3.23	89.57	0.50	66.00	66.00	59.54	6.46	10.217	
1,600.00	1,600.00	1,600.10	1,600.10	3.45	3.45	89.57	0.50	66.00	66.00	59.09	6.91	9.552	
1,700.00	1,700.00	1,700.10	1,700.10	3.68	3.68	89.57	0.50	66.00	66.00	58.64	7.36	8.969	
1,800.00	1,800.00	1,800.10	1,800.10	3.90	3.90	89.57	0.50	66.00	66.00	58.19	7.81	8.452	
1,900.00	1,900.00	1,900.10	1,900.10	4.13	4.13	89.57	0.50	66.00	66.00	57.74	8.26	7.992	
2,000.00	2,000.00	2,000.10	2,000.10	4.35	4.35	89.57	0.50	66.00	66.00	57.29	8.71	7.580	
2,100.00	2,100.00	2,100.10	2,100.10	4.58	4.58	89.57	0.50	66.00	66.00	56.84	9.16	7.208	

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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 1H - 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)						
2,200.00	2,200.00	2,200.10	2,200.10	4.80	4.80	89.57	0.50	66.00	66.00	56.40	9.61	6.870		
2,300.00	2,300.00	2,300.10	2,300.10	5.03	5.03	89.57	0.50	66.00	66.00	55.95	10.06	6.563		
2,400.00	2,400.00	2,400.10	2,400.10	5.25	5.25	89.57	0.50	66.00	66.00	55.50	10.51	6.282		
2,500.00	2,500.00	2,500.10	2,500.10	5.48	5.48	89.57	0.50	66.00	66.00	55.05	10.96	6.025		
2,600.00	2,600.00	2,600.10	2,600.10	5.70	5.70	89.57	0.50	66.00	66.00	54.60	11.40	5.787		
2,700.00	2,700.00	2,700.10	2,700.10	5.93	5.93	89.57	0.50	66.00	66.00	54.15	11.85	5.568		
2,800.00	2,800.00	2,800.10	2,800.10	6.15	6.15	89.57	0.50	66.00	66.00	53.70	12.30	5.364		
2,900.00	2,900.00	2,900.10	2,900.10	6.38	6.38	89.57	0.50	66.00	66.00	53.25	12.75	5.175		
3,000.00	3,000.00	3,000.10	3,000.10	6.60	6.60	89.57	0.50	66.00	66.00	52.80	13.20	4.999		
3,100.00	3,100.00	3,100.10	3,100.10	6.83	6.83	89.57	0.50	66.00	66.00	52.35	13.65	4.834		
3,200.00	3,200.00	3,200.10	3,200.10	7.05	7.05	89.57	0.50	66.00	66.00	51.90	14.10	4.680		
3,300.00	3,300.00	3,300.10	3,300.10	7.28	7.28	89.57	0.50	66.00	66.00	51.45	14.55	4.536		
3,400.00	3,400.00	3,400.10	3,400.10	7.50	7.50	89.57	0.50	66.00	66.00	51.00	15.00	4.400		
3,500.00	3,500.00	3,500.10	3,500.10	7.73	7.73	89.57	0.50	66.00	66.00	50.55	15.45	4.272		
3,600.00	3,600.00	3,600.10	3,600.10	7.95	7.95	89.57	0.50	66.00	66.00	50.10	15.90	4.151		
3,700.00	3,700.00	3,700.10	3,700.10	8.17	8.17	89.57	0.50	66.00	66.00	49.65	16.35	4.037		
3,800.00	3,800.00	3,800.10	3,800.10	8.40	8.40	89.57	0.50	66.00	66.00	49.20	16.80	3.929		
3,900.00	3,900.00	3,900.10	3,900.10	8.62	8.62	89.57	0.50	66.00	66.00	48.75	17.25	3.826		
4,000.00	4,000.00	4,000.10	4,000.10	8.85	8.85	89.57	0.50	66.00	66.00	48.30	17.70	3.729		
4,100.00	4,100.00	4,100.10	4,100.10	9.07	9.07	89.57	0.50	66.00	66.00	47.85	18.15	3.637		
4,200.00	4,200.00	4,200.10	4,200.10	9.30	9.30	89.57	0.50	66.00	66.00	47.40	18.60	3.549		
4,300.00	4,300.00	4,300.10	4,300.10	9.52	9.52	89.57	0.50	66.00	66.00	46.96	19.05	3.465		
4,400.00	4,400.00	4,400.10	4,400.10	9.75	9.75	89.57	0.50	66.00	66.00	46.51	19.50	3.385		
4,500.00	4,500.00	4,500.10	4,500.10	9.97	9.97	89.57	0.50	66.00	66.00	46.06	19.95	3.309		
4,600.00	4,600.00	4,600.10	4,600.10	10.20	10.20	89.57	0.50	66.00	66.00	45.61	20.40	3.236		
4,700.00	4,700.00	4,700.10	4,700.10	10.42	10.42	89.57	0.50	66.00	66.00	45.16	20.85	3.166		
4,800.00	4,800.00	4,800.10	4,800.10	10.65	10.65	89.57	0.50	66.00	66.00	44.71	21.29	3.099		
4,900.00	4,900.00	4,900.10	4,900.10	10.87	10.87	89.57	0.50	66.00	66.00	44.26	21.74	3.035		
4,966.63	4,966.63	4,966.73	4,966.73	11.02	11.02	89.57	0.50	66.00	66.00	43.96	22.04	2.994 CC		
5,000.00	5,000.00	5,000.00	5,000.00	11.10	11.10	89.57	0.50	66.00	66.00	43.81	22.19	2.974 ES, SF		
5,100.00	5,099.98	5,099.92	5,099.90	11.31	11.31	168.17	1.18	67.53	69.28	46.66	22.62	3.063		
5,200.00	5,199.84	5,196.89	5,196.78	11.52	11.52	167.70	2.87	71.37	78.29	55.26	23.03	3.399		
5,300.00	5,299.51	5,296.17	5,295.97	11.72	11.73	167.71	4.63	75.33	90.25	66.80	23.45	3.849		
5,400.00	5,399.15	5,395.42	5,395.12	11.93	11.94	167.77	6.38	79.30	102.50	78.63	23.87	4.294		
5,500.00	5,498.79	5,494.67	5,494.27	12.15	12.15	167.82	8.14	83.27	114.75	90.45	24.29	4.723		
5,600.00	5,598.48	5,593.91	5,593.42	12.36	12.36	167.85	9.89	87.23	127.00	102.28	24.72	5.137		
5,700.00	5,698.08	5,693.16	5,692.58	12.58	12.57	167.88	11.65	91.20	139.25	114.10	25.15	5.536		
5,800.00	5,797.73	5,792.41	5,791.73	12.80	12.78	167.91	13.40	95.17	151.50	125.91	25.59	5.921		
5,900.00	5,897.37	5,891.65	5,890.88	13.02	13.00	167.93	15.16	99.13	163.75	137.73	26.02	6.293		
6,000.00	5,997.01	5,990.90	5,990.03	13.25	13.21	167.95	16.91	103.10	176.00	149.54	26.46	6.652		
6,100.00	6,096.66	6,090.15	6,089.18	13.47	13.43	167.97	18.67	107.07	188.25	161.35	26.90	6.998		
6,200.00	6,196.30	6,189.39	6,188.34	13.70	13.65	167.98	20.42	111.03	200.50	173.16	27.34	7.333		
6,300.00	6,295.94	6,288.64	6,287.49	13.93	13.86	167.99	22.18	115.00	212.75	184.96	27.79	7.656		
6,400.00	6,395.59	6,387.89	6,386.64	14.16	14.08	168.00	23.93	118.97	225.00	196.77	28.24	7.969		
6,500.00	6,495.23	6,487.13	6,485.79	14.39	14.30	168.01	25.69	122.93	237.25	208.57	28.69	8.271		
6,600.00	6,594.88	6,586.38	6,584.94	14.62	14.52	168.02	27.44	126.90	249.50	220.37	29.14	8.563		
6,700.00	6,694.52	6,685.63	6,684.10	14.86	14.74	168.03	29.19	130.87	261.76	232.16	29.59	8.846		
6,800.00	6,794.16	6,784.87	6,783.25	15.09	14.95	168.04	30.95	134.83	274.01	243.96	30.05	9.120		
6,900.00	6,893.81	6,884.12	6,882.40	15.33	15.17	168.05	32.70	138.80	286.26	255.75	30.50	9.385		
7,000.00	6,993.45	6,983.37	6,981.55	15.56	15.40	168.05	34.46	142.77	298.51	267.55	30.96	9.642		
7,100.00	7,093.10	7,082.61	7,080.70	15.80	15.62	168.06	36.21	146.73	310.76	279.34	31.42	9.890		
7,200.00	7,192.74	7,181.86	7,179.86	16.04	15.84	168.06	37.97	150.70	323.01	291.13	31.88	10.132		

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7,300.00	7,292.38	7,281.11	7,279.01	16.28	16.06	168.07	39.72	154.67	335.26	302.92	32.34	10.365	
7,400.00	7,392.03	7,380.35	7,378.16	16.53	16.28	168.07	41.48	158.63	347.51	314.70	32.81	10.592	
7,500.00	7,491.67	7,479.60	7,477.31	16.77	16.50	168.08	43.23	162.60	359.76	326.49	33.27	10.812	
7,600.00	7,591.32	7,578.85	7,576.46	17.01	16.73	168.08	44.99	166.57	372.01	338.27	33.74	11.026	
7,700.00	7,690.96	7,678.09	7,675.62	17.26	16.95	168.09	46.74	170.53	384.26	350.06	34.21	11.233	
7,800.00	7,790.60	7,777.34	7,774.77	17.50	17.17	168.09	48.50	174.50	396.51	361.84	34.68	11.435	
7,900.00	7,890.25	7,876.59	7,873.92	17.75	17.40	168.09	50.25	178.46	408.76	373.62	35.15	11.631	
8,000.00	7,989.89	7,975.83	7,973.07	17.99	17.62	168.10	52.01	182.43	421.01	385.40	35.62	11.821	
8,100.00	8,089.54	8,075.08	8,072.22	18.24	17.85	168.10	53.76	186.40	433.27	397.18	36.09	12.006	
8,200.00	8,189.18	8,174.33	8,171.38	18.49	18.07	168.10	55.51	190.36	445.52	408.96	36.56	12.186	
8,300.00	8,288.82	8,273.57	8,270.53	18.74	18.30	168.10	57.27	194.33	457.77	420.73	37.03	12.361	
8,400.00	8,388.47	8,372.82	8,369.68	18.99	18.52	168.11	59.02	198.30	470.02	432.51	37.51	12.531	
8,500.00	8,488.11	8,472.07	8,468.83	19.24	18.75	168.11	60.78	202.26	482.27	444.28	37.98	12.697	
8,600.00	8,587.75	8,571.32	8,567.98	19.49	18.97	168.11	62.53	206.23	494.52	456.06	38.46	12.858	
8,700.00	8,687.40	8,670.56	8,667.13	19.74	19.20	168.11	64.29	210.20	506.77	467.83	38.94	13.015	
8,800.00	8,787.04	8,769.81	8,766.29	19.99	19.42	168.12	66.04	214.16	519.02	479.61	39.41	13.168	
8,900.00	8,886.69	8,869.06	8,865.44	20.24	19.65	168.12	67.80	218.13	531.27	491.38	39.89	13.317	
9,000.00	8,986.33	8,968.30	8,964.59	20.50	19.88	168.12	69.55	222.10	543.52	503.15	40.37	13.463	
9,100.00	9,085.97	9,067.55	9,063.74	20.75	20.10	168.12	71.31	226.06	555.77	514.92	40.85	13.604	
9,200.00	9,185.62	9,166.80	9,162.89	21.00	20.33	168.12	73.06	230.03	568.02	526.69	41.33	13.743	
9,300.00	9,285.26	9,266.04	9,262.05	21.26	20.56	168.12	74.82	234.00	580.27	538.46	41.81	13.878	
9,400.00	9,384.91	9,365.29	9,361.20	21.51	20.79	168.13	76.57	237.96	592.52	550.23	42.30	14.009	
9,500.00	9,484.55	9,464.54	9,460.35	21.76	21.01	168.13	78.33	241.93	604.78	562.00	42.78	14.138	
9,600.00	9,584.19	9,563.78	9,559.50	22.02	21.24	168.13	80.08	245.90	617.03	573.77	43.26	14.263	
9,700.00	9,683.84	9,663.03	9,658.65	22.28	21.47	168.13	81.83	249.86	629.28	585.53	43.74	14.385	
9,800.00	9,783.48	9,762.28	9,757.81	22.53	21.70	168.13	83.59	253.83	641.53	597.30	44.23	14.505	
9,900.00	9,883.13	9,861.52	9,856.96	22.79	21.93	168.13	85.34	257.80	653.78	609.07	44.71	14.622	
10,000.00	9,982.77	9,960.77	9,956.11	23.04	22.15	168.13	87.10	261.76	666.03	620.83	45.20	14.736	
10,100.00	10,082.41	10,060.02	10,055.26	23.30	22.38	168.14	88.85	265.73	678.28	632.60	45.68	14.848	
10,200.00	10,182.06	10,159.26	10,154.41	23.56	22.61	168.14	90.61	269.70	690.53	644.36	46.17	14.957	
10,300.00	10,281.70	10,258.51	10,253.57	23.82	22.84	168.14	92.36	273.66	702.78	656.13	46.66	15.063	
10,400.00	10,381.34	10,357.76	10,352.72	24.07	23.07	168.14	94.12	277.63	715.03	667.89	47.14	15.168	
10,500.00	10,480.99	10,457.00	10,451.87	24.33	23.30	168.14	95.87	281.59	727.28	679.65	47.63	15.270	
10,600.00	10,580.63	10,556.25	10,551.02	24.59	23.53	168.14	97.63	285.56	739.53	691.42	48.12	15.370	
10,700.00	10,680.28	10,655.50	10,650.17	24.85	23.76	168.14	99.38	289.53	751.78	703.18	48.60	15.467	
10,800.00	10,779.92	10,754.74	10,749.33	25.11	23.99	168.14	101.14	293.49	764.04	714.94	49.09	15.563	
10,900.00	10,879.56	10,853.99	10,848.48	25.37	24.22	168.14	102.89	297.46	776.29	726.70	49.58	15.657	
11,000.00	10,979.21	10,953.24	10,947.63	25.63	24.44	168.14	104.64	301.43	788.54	738.47	50.07	15.748	
11,100.00	11,078.85	11,052.48	11,046.78	25.89	24.67	168.15	106.40	305.39	800.79	750.23	50.56	15.838	
11,200.00	11,178.50	11,151.73	11,145.93	26.15	24.90	168.15	108.15	309.36	813.04	761.99	51.05	15.926	
11,300.00	11,278.14	11,250.98	11,245.09	26.41	25.13	168.15	109.91	313.33	825.29	773.75	51.54	16.012	
11,400.00	11,377.78	11,350.22	11,344.24	26.67	25.36	168.15	111.66	317.29	837.54	785.51	52.03	16.097	
11,500.00	11,477.43	11,449.47	11,443.39	26.93	25.59	168.15	113.42	321.26	849.79	797.27	52.52	16.180	
11,600.00	11,577.07	11,548.72	11,542.54	27.19	25.82	168.15	115.17	325.23	862.04	809.03	53.01	16.261	
11,700.00	11,676.72	11,647.96	11,641.69	27.45	26.06	168.15	116.93	329.19	874.29	820.79	53.50	16.341	
11,800.00	11,776.36	11,747.21	11,740.84	27.71	26.29	168.15	118.68	333.16	886.54	832.55	54.00	16.419	
11,900.00	11,876.00	11,846.46	11,840.00	27.97	26.52	168.15	120.44	337.13	898.79	844.31	54.49	16.495	
12,000.00	11,975.65	11,945.70	11,939.15	28.23	26.75	168.15	122.19	341.09	911.04	856.06	54.98	16.570	
12,100.00	12,075.29	12,043.77	12,036.70	28.49	26.98	167.78	123.95	344.95	923.34	867.86	55.47	16.645	
12,200.00	12,174.93	12,135.72	12,125.08	28.76	27.21	166.36	125.70	348.81	935.59	879.61	55.96	16.720	
12,300.00	12,274.21	12,218.57	12,199.36	29.02	27.42	111.27	127.45	352.66	947.84	891.36	56.44	16.795	
12,400.00	12,370.00	12,297.20	12,263.07	29.29	27.64	94.26	129.20	356.51	960.09	903.11	56.93	16.870	

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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 1H - 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)						
12,500.00	12,458.10	12,375.00	12,317.86	29.58	27.88	87.07	291.82	354.99	980.06	922.60	57.46	17.057		
12,600.00	12,534.69	12,446.69	12,359.84	29.88	28.14	82.66	349.84	356.23	993.27	935.25	58.02	17.120		
12,700.00	12,596.40	12,518.95	12,392.90	30.21	28.45	79.65	414.02	357.07	1,004.27	945.61	58.66	17.120		
12,800.00	12,640.54	12,590.25	12,415.67	30.60	28.81	77.68	481.51	357.47	1,012.39	952.99	59.41	17.042		
12,900.00	12,665.18	12,660.99	12,428.10	31.07	29.21	76.62	551.08	357.43	1,017.17	956.89	60.28	16.875		
13,000.00	12,669.52	12,731.50	12,430.15	31.63	29.64	76.39	621.50	356.97	1,018.41	957.14	61.27	16.622		
13,100.00	12,666.54	12,830.21	12,425.11	32.28	30.35	76.27	720.08	356.01	1,018.91	956.29	62.63	16.270		
13,200.00	12,663.56	12,930.19	12,420.01	33.03	31.14	76.16	819.92	355.04	1,019.42	955.26	64.17	15.887		
13,300.00	12,660.58	13,030.17	12,414.90	33.86	32.02	76.04	919.76	354.07	1,019.94	954.06	65.88	15.481		
13,400.00	12,657.60	13,130.15	12,409.79	34.78	32.98	75.92	1,019.60	353.10	1,020.46	952.70	67.76	15.061		
13,500.00	12,654.62	13,230.12	12,404.69	35.76	34.01	75.81	1,119.44	352.13	1,020.98	951.21	69.77	14.633		
13,600.00	12,651.64	13,330.10	12,399.58	36.82	35.10	75.69	1,219.29	351.16	1,021.51	949.59	71.92	14.204		
13,700.00	12,648.67	13,430.08	12,394.47	37.93	36.26	75.58	1,319.13	350.19	1,022.04	947.86	74.19	13.777		
13,800.00	12,645.69	13,530.06	12,389.37	39.10	37.46	75.46	1,418.97	349.22	1,022.58	946.02	76.56	13.357		
13,900.00	12,642.71	13,630.03	12,384.26	40.32	38.72	75.35	1,518.81	348.25	1,023.12	944.09	79.03	12.946		
14,000.00	12,639.73	13,730.01	12,379.16	41.58	40.01	75.23	1,618.66	347.28	1,023.66	942.07	81.59	12.546		
14,100.00	12,636.75	13,829.99	12,374.05	42.88	41.35	75.12	1,718.50	346.31	1,024.21	939.98	84.23	12.159		
14,200.00	12,633.77	13,929.97	12,368.94	44.22	42.73	75.00	1,818.34	345.34	1,024.76	937.81	86.95	11.786		
14,300.00	12,630.79	14,029.94	12,363.84	45.60	44.13	74.89	1,918.18	344.37	1,025.32	935.59	89.73	11.426		
14,400.00	12,628.75	14,132.49	12,358.73	46.92	45.57	74.73	2,020.60	343.37	1,026.10	933.61	92.49	11.094		
14,500.00	12,628.04	14,242.94	12,356.28	48.35	46.99	74.64	2,131.01	342.30	1,026.50	931.16	95.34	10.767		
14,600.00	12,627.34	14,343.16	12,356.07	49.80	48.41	74.67	2,231.23	341.32	1,026.37	928.16	98.21	10.451		
14,700.00	12,626.63	14,443.16	12,355.86	51.28	49.91	74.70	2,331.22	340.35	1,026.24	925.05	101.19	10.141		
14,800.00	12,625.92	14,543.16	12,355.65	52.78	51.44	74.72	2,431.21	339.38	1,026.12	921.90	104.22	9.846		
14,900.00	12,625.22	14,643.16	12,355.44	54.30	52.98	74.75	2,531.21	338.41	1,025.99	918.71	107.28	9.563		
15,000.00	12,624.51	14,743.16	12,355.23	55.84	54.54	74.78	2,631.20	337.44	1,025.86	915.48	110.38	9.294		
15,100.00	12,623.80	14,843.16	12,355.02	57.40	56.12	74.80	2,731.20	336.46	1,025.73	912.22	113.52	9.036		
15,200.00	12,623.09	14,943.16	12,354.81	58.97	57.71	74.83	2,831.19	335.49	1,025.61	908.93	116.68	8.790		
15,300.00	12,622.39	15,043.16	12,354.60	60.56	59.32	74.86	2,931.18	334.52	1,025.48	905.61	119.87	8.555		
15,400.00	12,621.68	15,143.15	12,354.39	62.16	60.93	74.88	3,031.18	333.55	1,025.35	902.26	123.09	8.330		
15,500.00	12,620.97	15,243.15	12,354.18	63.77	62.56	74.91	3,131.17	332.58	1,025.23	898.89	126.33	8.115		
15,600.00	12,620.27	15,343.15	12,353.97	65.39	64.20	74.94	3,231.16	331.60	1,025.10	895.50	129.60	7.910		
15,700.00	12,619.56	15,443.15	12,353.76	67.03	65.85	74.96	3,331.16	330.63	1,024.98	892.09	132.88	7.713		
15,800.00	12,618.85	15,543.15	12,353.55	68.67	67.51	74.99	3,431.15	329.66	1,024.85	888.67	136.19	7.525		
15,900.00	12,618.15	15,643.15	12,353.34	70.33	69.18	75.02	3,531.15	328.69	1,024.73	885.22	139.51	7.345		
16,000.00	12,617.44	15,743.15	12,353.13	71.99	70.86	75.05	3,631.14	327.71	1,024.60	881.76	142.84	7.173		
16,100.00	12,616.73	15,843.15	12,352.92	73.66	72.54	75.07	3,731.13	326.74	1,024.48	878.28	146.20	7.008		
16,200.00	12,616.02	15,943.14	12,352.71	75.33	74.23	75.10	3,831.13	325.77	1,024.35	874.79	149.56	6.849		
16,300.00	12,615.32	16,043.14	12,352.50	77.02	75.93	75.13	3,931.12	324.80	1,024.23	871.28	152.94	6.697		
16,400.00	12,614.61	16,143.14	12,352.29	78.71	77.63	75.15	4,031.12	323.83	1,024.10	867.77	156.34	6.551		
16,500.00	12,613.90	16,243.14	12,352.08	80.40	79.34	75.18	4,131.11	322.85	1,023.98	864.24	159.74	6.410		
16,600.00	12,613.20	16,343.14	12,351.87	82.10	81.05	75.21	4,231.10	321.88	1,023.86	860.70	163.16	6.275		
16,700.00	12,612.49	16,443.14	12,351.66	83.81	82.77	75.23	4,331.10	320.91	1,023.73	857.15	166.58	6.146		
16,800.00	12,611.78	16,543.14	12,351.45	85.52	84.49	75.26	4,431.09	319.94	1,023.61	853.59	170.02	6.021		
16,900.00	12,611.08	16,643.14	12,351.24	87.24	86.22	75.29	4,531.08	318.97	1,023.49	850.03	173.46	5.900		
17,000.00	12,610.37	16,743.13	12,351.03	88.96	87.95	75.31	4,631.08	317.99	1,023.36	846.45	176.91	5.785		
17,100.00	12,609.66	16,843.13	12,350.82	90.69	89.69	75.34	4,731.07	317.02	1,023.24	842.87	180.37	5.673		
17,200.00	12,608.95	16,943.13	12,350.61	92.42	91.43	75.37	4,831.07	316.05	1,023.12	839.28	183.84	5.565		
17,300.00	12,608.25	17,043.13	12,350.40	94.15	93.17	75.40	4,931.06	315.08	1,023.00	835.68	187.32	5.461		
17,400.00	12,607.54	17,143.13	12,350.20	95.89	94.91	75.42	5,031.05	314.11	1,022.87	832.07	190.80	5.361		
17,500.00	12,606.83	17,243.13	12,349.99	97.63	96.66	75.45	5,131.05	313.13	1,022.75	828.46	194.29	5.264		
17,600.00	12,606.13	17,343.13	12,349.78	99.37	98.41	75.48	5,231.04	312.16	1,022.63	824.85	197.78	5.170		

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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 1H - 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)						
17,700.00	12,605.42	17,443.13	12,349.57	101.12	100.17	75.50	5,331.03	311.19	1,022.51	821.23	201.28	5.080		
17,800.00	12,604.71	17,543.12	12,349.36	102.86	101.92	75.53	5,431.03	310.22	1,022.39	817.60	204.79	4.992		
17,900.00	12,604.01	17,643.12	12,349.15	104.62	103.68	75.56	5,531.02	309.25	1,022.27	813.97	208.30	4.908		
18,000.00	12,603.30	17,743.12	12,348.94	106.37	105.44	75.58	5,631.02	308.27	1,022.15	810.33	211.82	4.826		
18,100.00	12,602.59	17,843.12	12,348.73	108.13	107.21	75.61	5,731.01	307.30	1,022.03	806.69	215.34	4.746		
18,200.00	12,601.88	17,943.12	12,348.52	109.89	108.97	75.64	5,831.00	306.33	1,021.91	803.05	218.86	4.669		
18,300.00	12,601.18	18,043.12	12,348.31	111.65	110.74	75.67	5,931.00	305.36	1,021.79	799.40	222.39	4.595		
18,400.00	12,600.47	18,143.12	12,348.10	113.41	112.51	75.69	6,030.99	304.38	1,021.67	795.74	225.92	4.522		
18,500.00	12,599.76	18,243.12	12,347.89	115.18	114.28	75.72	6,130.99	303.41	1,021.55	792.09	229.46	4.452		
18,600.00	12,599.06	18,343.11	12,347.68	116.94	116.06	75.75	6,230.98	302.44	1,021.43	788.43	233.00	4.384		
18,700.00	12,598.35	18,443.11	12,347.47	118.71	117.83	75.77	6,330.97	301.47	1,021.31	784.76	236.55	4.318		
18,800.00	12,597.64	18,543.11	12,347.26	120.48	119.61	75.80	6,430.97	300.50	1,021.19	781.10	240.09	4.253		
18,900.00	12,596.94	18,643.11	12,347.05	122.26	121.39	75.83	6,530.96	299.52	1,021.07	777.43	243.64	4.191		
19,000.00	12,596.23	18,743.11	12,346.84	124.03	123.17	75.86	6,630.95	298.55	1,020.95	773.76	247.20	4.130		
19,100.00	12,595.52	18,843.11	12,346.63	125.81	124.95	75.88	6,730.95	297.58	1,020.84	770.08	250.76	4.071		
19,200.00	12,594.81	18,943.11	12,346.42	127.58	126.73	75.91	6,830.94	296.61	1,020.72	766.40	254.32	4.014		
19,300.00	12,594.11	19,043.11	12,346.21	129.36	128.51	75.94	6,930.94	295.64	1,020.60	762.72	257.88	3.958		
19,400.00	12,593.40	19,143.10	12,346.00	131.14	130.30	75.96	7,030.93	294.66	1,020.48	759.04	261.44	3.903		
19,500.00	12,592.69	19,243.10	12,345.79	132.92	132.09	75.99	7,130.92	293.69	1,020.37	755.36	265.01	3.850		
19,600.00	12,591.99	19,343.10	12,345.58	134.71	133.87	76.02	7,230.92	292.72	1,020.25	751.67	268.58	3.799		
19,700.00	12,591.28	19,443.10	12,345.37	136.49	135.66	76.05	7,330.91	291.75	1,020.13	747.98	272.15	3.748		
19,800.00	12,590.57	19,543.10	12,345.16	138.28	137.45	76.07	7,430.91	290.78	1,020.02	744.29	275.73	3.699		
19,863.89	12,590.12	19,606.99	12,345.03	139.42	138.59	76.09	7,494.79	290.15	1,019.94	741.93	278.01	3.669		
19,880.93	12,590.00	19,620.25	12,345.00	139.72	138.83	76.09	7,508.05	290.03	1,019.93	741.38	278.55	3.662		

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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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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 (°)	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)						
0.00	0.00	0.10	0.10	0.00	0.00	89.60	0.70	99.10	99.10					
100.00	100.00	100.10	100.10	0.08	0.08	89.60	0.70	99.10	99.10	98.94	0.17	595.026		
200.00	200.00	200.10	200.10	0.31	0.31	89.60	0.70	99.10	99.10	98.49	0.62	160.859		
300.00	300.00	300.10	300.10	0.53	0.53	89.60	0.70	99.10	99.10	98.04	1.07	93.000		
400.00	400.00	400.10	400.10	0.76	0.76	89.60	0.70	99.10	99.10	97.59	1.52	65.408		
500.00	500.00	500.10	500.10	0.98	0.98	89.60	0.70	99.10	99.10	97.14	1.96	50.442		
600.00	600.00	600.10	600.10	1.21	1.21	89.60	0.70	99.10	99.10	96.69	2.41	41.050		
700.00	700.00	700.10	700.10	1.43	1.43	89.60	0.70	99.10	99.10	96.24	2.86	34.606		
800.00	800.00	800.10	800.10	1.66	1.66	89.60	0.70	99.10	99.10	95.79	3.31	29.911		
900.00	900.00	900.10	900.10	1.88	1.88	89.60	0.70	99.10	99.10	95.34	3.76	26.337		
1,000.00	1,000.00	1,000.10	1,000.10	2.11	2.11	89.60	0.70	99.10	99.10	94.89	4.21	23.527		
1,100.00	1,100.00	1,100.10	1,100.10	2.33	2.33	89.60	0.70	99.10	99.10	94.44	4.66	21.258		
1,200.00	1,200.00	1,200.10	1,200.10	2.56	2.56	89.60	0.70	99.10	99.10	93.99	5.11	19.389		
1,300.00	1,300.00	1,300.10	1,300.10	2.78	2.78	89.60	0.70	99.10	99.10	93.54	5.56	17.821		
1,400.00	1,400.00	1,400.10	1,400.10	3.01	3.01	89.60	0.70	99.10	99.10	93.09	6.01	16.488		
1,500.00	1,500.00	1,500.10	1,500.10	3.23	3.23	89.60	0.70	99.10	99.10	92.64	6.46	15.341		
1,600.00	1,600.00	1,600.10	1,600.10	3.45	3.45	89.60	0.70	99.10	99.10	92.19	6.91	14.343		
1,700.00	1,700.00	1,700.10	1,700.10	3.68	3.68	89.60	0.70	99.10	99.10	91.74	7.36	13.467		
1,800.00	1,800.00	1,800.10	1,800.10	3.90	3.90	89.60	0.70	99.10	99.10	91.29	7.81	12.691		
1,900.00	1,900.00	1,900.10	1,900.10	4.13	4.13	89.60	0.70	99.10	99.10	90.84	8.26	12.001		
2,000.00	2,000.00	2,000.10	2,000.10	4.35	4.35	89.60	0.70	99.10	99.10	90.40	8.71	11.381		
2,100.00	2,100.00	2,100.10	2,100.10	4.58	4.58	89.60	0.70	99.10	99.10	89.95	9.16	10.822		
2,200.00	2,200.00	2,200.10	2,200.10	4.80	4.80	89.60	0.70	99.10	99.10	89.50	9.61	10.316		
2,300.00	2,300.00	2,300.10	2,300.10	5.03	5.03	89.60	0.70	99.10	99.10	89.05	10.06	9.855		
2,400.00	2,400.00	2,400.10	2,400.10	5.25	5.25	89.60	0.70	99.10	99.10	88.60	10.51	9.433		
2,500.00	2,500.00	2,500.10	2,500.10	5.48	5.48	89.60	0.70	99.10	99.10	88.15	10.96	9.046		
2,600.00	2,600.00	2,600.10	2,600.10	5.70	5.70	89.60	0.70	99.10	99.10	87.70	11.40	8.690		
2,700.00	2,700.00	2,700.10	2,700.10	5.93	5.93	89.60	0.70	99.10	99.10	87.25	11.85	8.360		
2,800.00	2,800.00	2,800.10	2,800.10	6.15	6.15	89.60	0.70	99.10	99.10	86.80	12.30	8.055		
2,900.00	2,900.00	2,900.10	2,900.10	6.38	6.38	89.60	0.70	99.10	99.10	86.35	12.75	7.771		
3,000.00	3,000.00	3,000.10	3,000.10	6.60	6.60	89.60	0.70	99.10	99.10	85.90	13.20	7.506		
3,100.00	3,100.00	3,100.10	3,100.10	6.83	6.83	89.60	0.70	99.10	99.10	85.45	13.65	7.259		
3,200.00	3,200.00	3,200.10	3,200.10	7.05	7.05	89.60	0.70	99.10	99.10	85.00	14.10	7.028		
3,300.00	3,300.00	3,300.10	3,300.10	7.28	7.28	89.60	0.70	99.10	99.10	84.55	14.55	6.810		
3,400.00	3,400.00	3,400.10	3,400.10	7.50	7.50	89.60	0.70	99.10	99.10	84.10	15.00	6.606		
3,500.00	3,500.00	3,500.10	3,500.10	7.73	7.73	89.60	0.70	99.10	99.10	83.65	15.45	6.414		
3,600.00	3,600.00	3,600.10	3,600.10	7.95	7.95	89.60	0.70	99.10	99.10	83.20	15.90	6.233		
3,700.00	3,700.00	3,700.10	3,700.10	8.17	8.17	89.60	0.70	99.10	99.10	82.75	16.35	6.061		
3,800.00	3,800.00	3,800.10	3,800.10	8.40	8.40	89.60	0.70	99.10	99.10	82.30	16.80	5.899		
3,900.00	3,900.00	3,900.10	3,900.10	8.62	8.62	89.60	0.70	99.10	99.10	81.85	17.25	5.745		
4,000.00	4,000.00	4,000.10	4,000.10	8.85	8.85	89.60	0.70	99.10	99.10	81.40	17.70	5.600		
4,100.00	4,100.00	4,100.10	4,100.10	9.07	9.07	89.60	0.70	99.10	99.10	80.95	18.15	5.461		
4,200.00	4,200.00	4,200.10	4,200.10	9.30	9.30	89.60	0.70	99.10	99.10	80.51	18.60	5.329		
4,300.00	4,300.00	4,300.10	4,300.10	9.52	9.52	89.60	0.70	99.10	99.10	80.06	19.05	5.203		
4,400.00	4,400.00	4,400.10	4,400.10	9.75	9.75	89.60	0.70	99.10	99.10	79.61	19.50	5.083		
4,500.00	4,500.00	4,500.10	4,500.10	9.97	9.97	89.60	0.70	99.10	99.10	79.16	19.95	4.969		
4,600.00	4,600.00	4,600.10	4,600.10	10.20	10.20	89.60	0.70	99.10	99.10	78.71	20.40	4.859		
4,700.00	4,700.00	4,700.10	4,700.10	10.42	10.42	89.60	0.70	99.10	99.10	78.26	20.85	4.754		
4,800.00	4,800.00	4,800.10	4,800.10	10.65	10.65	89.60	0.70	99.10	99.10	77.81	21.29	4.654		
4,900.00	4,900.00	4,900.10	4,900.10	10.87	10.87	89.60	0.70	99.10	99.10	77.36	21.74	4.558		
4,966.63	4,966.63	4,966.73	4,966.73	11.02	11.02	89.60	0.70	99.10	99.10	77.06	22.04	4.496 CC		
5,000.00	5,000.00	5,000.00	5,000.00	11.10	11.10	89.60	0.70	99.10	99.10	76.91	22.19	4.465 ES, 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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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				
5,100.00	5,099.98	5,096.72	5,096.70	11.31	11.30	168.46	1.06	100.69	102.46	79.85	22.61	4.531				
5,200.00	5,199.84	5,192.69	5,192.55	11.52	11.50	168.42	2.11	105.42	112.52	89.50	23.02	4.889				
5,300.00	5,299.51	5,290.08	5,289.64	11.72	11.70	168.39	3.76	112.77	127.99	104.56	23.43	5.463				
5,400.00	5,399.15	5,388.79	5,388.04	11.93	11.91	168.40	5.47	120.45	143.98	120.14	23.85	6.038				
5,500.00	5,498.79	5,487.51	5,486.44	12.15	12.12	168.40	7.18	128.12	159.98	135.71	24.27	6.592				
5,600.00	5,598.44	5,586.22	5,584.84	12.36	12.33	168.41	8.90	135.79	175.97	151.28	24.70	7.125				
5,700.00	5,698.08	5,684.93	5,683.24	12.58	12.55	168.41	10.61	143.46	191.97	166.84	25.13	7.640				
5,800.00	5,797.73	5,783.64	5,781.64	12.80	12.76	168.41	12.33	151.14	207.96	182.40	25.56	8.135				
5,900.00	5,897.37	5,882.36	5,880.04	13.02	12.98	168.42	14.04	158.81	223.96	197.95	26.00	8.613				
6,000.00	5,997.01	5,981.07	5,978.44	13.25	13.20	168.42	15.76	166.48	239.95	213.51	26.44	9.074				
6,100.00	6,096.66	6,079.78	6,076.84	13.47	13.42	168.42	17.47	174.15	255.94	229.05	26.89	9.518				
6,200.00	6,196.30	6,178.49	6,175.23	13.70	13.64	168.42	19.19	181.82	271.94	244.60	27.34	9.947				
6,300.00	6,295.94	6,277.21	6,273.63	13.93	13.86	168.42	20.90	189.50	287.93	260.14	27.79	10.361				
6,400.00	6,395.59	6,375.92	6,372.03	14.16	14.09	168.43	22.61	197.17	303.93	275.68	28.25	10.760				
6,500.00	6,495.23	6,474.63	6,470.43	14.39	14.32	168.43	24.33	204.84	319.92	291.22	28.70	11.146				
6,600.00	6,594.88	6,573.34	6,568.83	14.62	14.54	168.43	26.04	212.51	335.92	306.75	29.16	11.518				
6,700.00	6,694.52	6,672.06	6,667.23	14.86	14.77	168.43	27.76	220.18	351.91	322.29	29.63	11.878				
6,800.00	6,794.16	6,770.77	6,765.63	15.09	15.00	168.43	29.47	227.86	367.91	337.82	30.09	12.226				
6,900.00	6,893.81	6,869.48	6,864.03	15.33	15.23	168.43	31.19	235.53	383.90	353.34	30.56	12.563				
7,000.00	6,993.45	6,968.19	6,962.43	15.56	15.46	168.43	32.90	243.20	399.90	368.87	31.03	12.888				
7,100.00	7,093.10	7,066.91	7,060.83	15.80	15.69	168.43	34.62	250.87	415.89	384.39	31.50	13.203				
7,200.00	7,192.74	7,165.62	7,159.22	16.04	15.93	168.43	36.33	258.54	431.88	399.91	31.97	13.508				
7,300.00	7,292.38	7,264.33	7,257.62	16.28	16.16	168.43	38.04	266.22	447.88	415.43	32.45	13.803				
7,400.00	7,392.03	7,363.04	7,356.02	16.53	16.40	168.43	39.76	273.89	463.87	430.95	32.92	14.089				
7,500.00	7,491.67	7,461.76	7,454.42	16.77	16.63	168.44	41.47	281.56	479.87	446.46	33.40	14.366				
7,600.00	7,591.32	7,560.47	7,552.82	17.01	16.87	168.44	43.19	289.23	495.86	461.98	33.88	14.634				
7,700.00	7,690.96	7,659.18	7,651.22	17.26	17.11	168.44	44.90	296.91	511.86	477.49	34.37	14.895				
7,800.00	7,790.60	7,757.90	7,749.62	17.50	17.35	168.44	46.62	304.58	527.85	493.00	34.85	15.147				
7,900.00	7,890.25	7,856.61	7,848.02	17.75	17.59	168.44	48.33	312.25	543.85	508.51	35.33	15.392				
8,000.00	7,989.89	7,955.32	7,946.42	17.99	17.83	168.44	50.05	319.92	559.84	524.02	35.82	15.629				
8,100.00	8,089.54	8,054.03	8,044.82	18.24	18.07	168.44	51.76	327.59	575.83	539.53	36.31	15.860				
8,200.00	8,189.18	8,152.75	8,143.22	18.49	18.31	168.44	53.47	335.27	591.83	555.03	36.80	16.084				
8,300.00	8,288.82	8,251.46	8,241.61	18.74	18.55	168.44	55.19	342.94	607.82	570.54	37.29	16.301				
8,400.00	8,388.47	8,350.17	8,340.01	18.99	18.79	168.44	56.90	350.61	623.82	586.04	37.78	16.513				
8,500.00	8,488.11	8,448.88	8,438.41	19.24	19.03	168.44	58.62	358.28	639.81	601.54	38.27	16.718				
8,600.00	8,587.75	8,547.60	8,536.81	19.49	19.28	168.44	60.33	365.95	655.81	617.04	38.76	16.918				
8,700.00	8,687.40	8,646.31	8,635.21	19.74	19.52	168.44	62.05	373.63	671.80	632.54	39.26	17.112				
8,800.00	8,787.04	8,745.02	8,733.61	19.99	19.76	168.44	63.76	381.30	687.80	648.04	39.75	17.301				
8,900.00	8,886.69	8,843.73	8,832.01	20.24	20.01	168.44	65.48	388.97	703.79	663.54	40.25	17.485				
9,000.00	8,986.33	8,942.45	8,930.41	20.50	20.25	168.44	67.19	396.64	719.79	679.04	40.75	17.664				
9,100.00	9,085.97	9,041.16	9,028.81	20.75	20.50	168.44	68.90	404.31	735.78	694.53	41.25	17.839				
9,200.00	9,185.62	9,139.87	9,127.21	21.00	20.74	168.44	70.62	411.99	751.77	710.03	41.75	18.009				
9,300.00	9,285.26	9,238.58	9,225.61	21.26	20.99	168.44	72.33	419.66	767.77	725.52	42.25	18.174				
9,400.00	9,384.91	9,337.30	9,324.00	21.51	21.24	168.44	74.05	427.33	783.76	741.02	42.75	18.335				
9,500.00	9,484.55	9,436.01	9,422.40	21.76	21.48	168.44	75.76	435.00	799.76	756.51	43.25	18.492				
9,600.00	9,584.19	9,534.72	9,520.80	22.02	21.73	168.44	77.48	442.68	815.75	772.00	43.75	18.645				
9,700.00	9,683.84	9,633.43	9,619.20	22.28	21.98	168.44	79.19	450.35	831.75	787.49	44.25	18.795				
9,800.00	9,783.48	9,732.15	9,717.60	22.53	22.23	168.44	80.91	458.02	847.74	802.98	44.76	18.941				
9,900.00	9,883.13	9,830.86	9,816.00	22.79	22.47	168.44	82.62	465.69	863.74	818.47	45.26	19.083				
10,000.00	9,982.77	9,929.57	9,914.40	23.04	22.72	168.44	84.33	473.36	879.73	833.96	45.77	19.222				
10,100.00	10,082.41	10,028.28	10,012.80	23.30	22.97	168.44	86.05	481.04	895.72	849.45	46.27	19.357				
10,200.00	10,182.06	10,127.00	10,111.20	23.56	23.22	168.44	87.76	488.71	911.72	864.94	46.78	19.490				

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
10,300.00	10,281.70	10,225.71	10,209.60	23.82	23.47	168.44	89.48	496.38	927.71	880.43	47.29	19.619			
10,400.00	10,381.34	10,324.42	10,307.99	24.07	23.72	168.44	91.19	504.05	943.71	895.91	47.79	19.745			
10,500.00	10,480.99	10,423.14	10,406.39	24.33	23.97	168.44	92.91	511.72	959.70	911.40	48.30	19.868			
10,600.00	10,580.63	10,521.85	10,504.79	24.59	24.22	168.44	94.62	519.40	975.70	926.89	48.81	19.989			
10,700.00	10,680.28	10,620.56	10,603.19	24.85	24.47	168.44	96.34	527.07	991.69	942.37	49.32	20.107			
10,800.00	10,779.92	10,719.27	10,701.59	25.11	24.72	168.44	98.05	534.74	1,007.69	957.86	49.83	20.222			
10,900.00	10,879.56	10,817.99	10,799.99	25.37	24.97	168.44	99.76	542.41	1,023.68	973.34	50.34	20.335			
11,000.00	10,979.21	10,916.70	10,898.39	25.63	25.23	168.44	101.48	550.08	1,039.68	988.82	50.85	20.445			
11,100.00	11,078.85	11,015.41	11,000.79	25.89	25.48	168.44	103.19	557.76	1,055.67	1,004.31	51.36	20.553			
11,200.00	11,178.50	11,114.12	11,095.19	26.15	25.73	168.44	104.91	565.43	1,071.66	1,019.79	51.88	20.659			
11,300.00	11,278.14	11,212.84	11,193.59	26.41	25.98	168.44	106.62	573.10	1,087.66	1,035.27	52.39	20.762			
11,400.00	11,377.78	11,311.55	11,291.99	26.67	26.23	168.44	108.34	580.77	1,103.65	1,050.75	52.90	20.863			
11,500.00	11,477.43	11,410.26	11,390.38	26.93	26.49	168.44	110.05	588.45	1,119.65	1,066.24	53.41	20.962			
11,600.00	11,577.07	11,508.97	11,488.78	27.19	26.74	168.44	111.76	596.12	1,135.64	1,081.72	53.93	21.059			
11,700.00	11,676.72	11,607.69	11,587.18	27.45	26.99	168.44	113.48	603.79	1,151.64	1,097.20	54.44	21.154			
11,800.00	11,776.36	11,706.40	11,685.58	27.71	27.24	168.44	115.19	611.46	1,167.63	1,112.68	54.95	21.247			
11,900.00	11,876.00	11,805.11	11,783.98	27.97	27.50	168.44	116.91	619.13	1,183.63	1,128.16	55.47	21.339			
12,000.00	11,975.65	11,903.82	11,882.38	28.23	27.75	168.44	118.62	626.81	1,199.62	1,143.64	55.98	21.428			
12,100.00	12,075.29	12,002.54	11,980.78	28.49	28.00	168.44	120.34	634.48	1,215.61	1,159.12	56.50	21.516			
12,200.00	12,174.93	12,101.25	12,079.18	28.76	28.26	168.44	122.05	642.15	1,231.61	1,174.60	57.01	21.602			
12,300.00	12,274.21	12,199.69	12,177.30	29.02	28.51	115.34	123.76	649.80	1,247.59	1,190.06	57.53	21.686			
12,400.00	12,370.00	12,297.72	12,274.94	29.29	28.76	100.86	127.37	657.40	1,263.45	1,205.40	58.05	21.764			
12,500.00	12,458.10	12,402.56	12,376.82	29.58	29.04	96.12	149.86	665.21	1,278.75	1,220.13	58.61	21.816			
12,600.00	12,534.69	12,514.85	12,477.71	29.88	29.35	93.78	197.98	672.78	1,292.73	1,233.51	59.22	21.828			
12,700.00	12,596.40	12,635.37	12,570.34	30.21	29.70	92.47	274.29	679.52	1,304.62	1,244.71	59.91	21.777			
12,800.00	12,640.54	12,763.97	12,644.88	30.60	30.13	91.75	378.47	684.66	1,313.62	1,252.89	60.73	21.630			
12,900.00	12,665.18	12,899.00	12,690.46	31.07	30.71	91.40	505.07	687.40	1,319.07	1,257.29	61.78	21.351			
13,000.00	12,669.52	13,031.69	12,699.39	31.63	31.43	91.29	637.06	687.25	1,320.54	1,257.48	63.06	20.941			
13,100.00	12,666.54	13,131.68	12,695.14	32.28	32.09	91.24	736.96	686.27	1,320.50	1,256.13	64.37	20.513			
13,200.00	12,663.56	13,231.68	12,690.88	33.03	32.85	91.18	836.85	685.29	1,320.47	1,254.60	65.87	20.045			
13,300.00	12,660.58	13,331.67	12,686.62	33.86	33.69	91.13	936.75	684.31	1,320.44	1,252.89	67.55	19.548			
13,400.00	12,657.60	13,431.66	12,682.36	34.78	34.61	91.07	1,036.64	683.33	1,320.41	1,251.03	69.38	19.031			
13,500.00	12,654.62	13,531.65	12,678.11	35.76	35.60	91.02	1,136.54	682.35	1,320.39	1,249.02	71.36	18.503			
13,600.00	12,651.64	13,631.64	12,673.85	36.82	36.65	90.96	1,236.44	681.37	1,320.36	1,246.89	73.47	17.971			
13,700.00	12,648.67	13,731.64	12,669.59	37.93	37.77	90.90	1,336.33	680.39	1,320.34	1,244.64	75.70	17.442			
13,800.00	12,645.69	13,831.63	12,665.33	39.10	38.94	90.85	1,436.23	679.41	1,320.31	1,242.27	78.04	16.919			
13,900.00	12,642.71	13,931.62	12,661.07	40.32	40.16	90.79	1,536.13	678.44	1,320.29	1,239.81	80.47	16.406			
14,000.00	12,639.73	14,031.61	12,656.82	41.58	41.42	90.74	1,636.02	677.46	1,320.27	1,237.27	83.00	15.907			
14,100.00	12,636.75	14,131.60	12,652.56	42.88	42.73	90.68	1,735.92	676.48	1,320.25	1,234.64	85.61	15.422			
14,200.00	12,633.77	14,231.59	12,648.30	44.22	44.07	90.63	1,835.82	675.50	1,320.23	1,231.94	88.29	14.953			
14,300.00	12,630.79	14,331.59	12,644.04	45.60	45.45	90.57	1,935.71	674.52	1,320.21	1,229.17	91.04	14.501			
14,400.00	12,628.75	14,431.56	12,639.79	46.92	46.85	90.47	2,035.59	673.54	1,320.19	1,226.42	93.77	14.079			
14,500.00	12,628.04	14,531.50	12,635.53	48.35	48.29	90.32	2,135.43	672.56	1,320.16	1,223.52	96.63	13.661			
14,600.00	12,627.34	14,631.43	12,631.27	49.80	49.75	90.17	2,235.27	671.59	1,320.14	1,220.59	99.55	13.261			
14,700.00	12,626.63	14,731.37	12,627.02	51.28	51.23	90.01	2,335.11	670.61	1,320.13	1,217.62	102.51	12.878			
14,752.05	12,626.26	14,783.39	12,624.80	52.06	52.01	89.93	2,387.08	670.10	1,320.13	1,216.05	104.07	12.685			
14,800.00	12,625.92	14,831.31	12,622.76	52.78	52.73	89.86	2,434.95	669.63	1,320.13	1,214.61	105.52	12.511			
14,900.00	12,625.22	14,931.24	12,618.51	54.30	54.26	89.70	2,534.80	668.65	1,320.14	1,211.57	108.56	12.160			
15,000.00	12,624.51	15,031.18	12,614.25	55.84	55.80	89.55	2,634.64	667.67	1,320.16	1,208.51	111.65	11.825			
15,100.00	12,623.80	15,131.12	12,610.00	57.40	57.36	89.40	2,734.48	666.69	1,320.19	1,205.42	114.76	11.504			
15,200.00	12,623.09	15,231.05	12,605.74	58.97	58.94	89.24	2,834.32	665.72	1,320.22	1,202.32	117.91	11.197			
15,300.00	12,622.39	15,330.99	12,601.49	60.56	60.52	89.09	2,934.16	664.74	1,320.27	1,199.19	121.08	10.904			

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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 (°)	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)						
15,400.00	12,621.68	15,431.48	12,597.97	62.16	61.99	88.97	3,034.58	663.75	1,320.31	1,196.16	124.15	10.635		
15,500.00	12,620.97	15,532.12	12,597.67	63.77	63.36	88.98	3,135.21	662.77	1,320.30	1,193.18	127.13	10.386		
15,600.00	12,620.27	15,632.11	12,598.41	65.39	64.88	89.05	3,235.20	661.79	1,320.27	1,190.00	130.27	10.135		
15,700.00	12,619.56	15,732.10	12,599.14	67.03	66.51	89.11	3,335.18	660.81	1,320.25	1,186.71	133.54	9.887		
15,800.00	12,618.85	15,832.09	12,599.88	68.67	68.15	89.17	3,435.16	659.83	1,320.22	1,183.40	136.82	9.649		
15,900.00	12,618.15	15,932.08	12,600.62	70.33	69.79	89.24	3,535.14	658.85	1,320.20	1,180.08	140.12	9.422		
16,000.00	12,617.44	16,032.07	12,601.36	71.99	71.45	89.30	3,635.13	657.87	1,320.17	1,176.74	143.44	9.204		
16,100.00	12,616.73	16,132.06	12,602.10	73.66	73.12	89.36	3,735.11	656.89	1,320.15	1,173.38	146.77	8.995		
16,200.00	12,616.02	16,232.05	12,602.84	75.33	74.79	89.42	3,835.09	655.91	1,320.13	1,170.01	150.12	8.794		
16,300.00	12,615.32	16,332.04	12,603.58	77.02	76.47	89.49	3,935.07	654.93	1,320.12	1,166.63	153.48	8.601		
16,400.00	12,614.61	16,432.03	12,604.32	78.71	78.15	89.55	4,035.05	653.95	1,320.10	1,163.24	156.86	8.416		
16,500.00	12,613.90	16,532.02	12,605.06	80.40	79.85	89.61	4,135.04	652.97	1,320.08	1,159.83	160.25	8.238		
16,600.00	12,613.20	16,632.01	12,605.79	82.10	81.55	89.67	4,235.02	651.99	1,320.07	1,156.42	163.65	8.066		
16,700.00	12,612.49	16,732.00	12,606.53	83.81	83.25	89.74	4,335.00	651.01	1,320.06	1,153.00	167.06	7.902		
16,800.00	12,611.78	16,831.99	12,607.27	85.52	84.96	89.80	4,434.98	650.03	1,320.05	1,149.57	170.48	7.743		
16,900.00	12,611.08	16,931.98	12,608.01	87.24	86.67	89.86	4,534.96	649.05	1,320.04	1,146.13	173.91	7.590		
17,000.00	12,610.37	17,031.97	12,608.75	88.96	88.39	89.93	4,634.95	648.07	1,320.03	1,142.68	177.35	7.443		
17,100.00	12,609.66	17,131.96	12,609.49	90.69	90.11	89.99	4,734.93	647.09	1,320.03	1,139.23	180.80	7.301		
17,200.00	12,608.95	17,231.94	12,610.23	92.42	91.84	90.05	4,834.91	646.11	1,320.02	1,135.77	184.26	7.164		
17,300.00	12,608.25	17,331.93	12,610.97	94.15	93.57	90.11	4,934.89	645.13	1,320.02	1,132.30	187.72	7.032		
17,383.56	12,607.66	17,415.48	12,611.58	95.60	95.02	90.17	5,018.44	644.32	1,320.02	1,129.40	190.62	6.925		
17,400.00	12,607.54	17,431.92	12,611.71	95.89	95.31	90.18	5,034.87	644.15	1,320.02	1,128.83	191.19	6.904		
17,500.00	12,606.83	17,531.91	12,612.45	97.63	97.04	90.24	5,134.86	643.17	1,320.02	1,125.35	194.67	6.781		
17,600.00	12,606.13	17,631.90	12,613.18	99.37	98.78	90.30	5,234.84	642.20	1,320.03	1,121.87	198.15	6.662		
17,700.00	12,605.42	17,731.89	12,613.92	101.12	100.53	90.36	5,334.82	641.22	1,320.03	1,118.39	201.64	6.546		
17,800.00	12,604.71	17,831.88	12,614.66	102.86	102.28	90.43	5,434.80	640.24	1,320.04	1,114.90	205.14	6.435		
17,900.00	12,604.01	17,931.87	12,615.40	104.62	104.03	90.49	5,534.78	639.26	1,320.04	1,111.40	208.64	6.327		
18,000.00	12,603.30	18,031.86	12,616.14	106.37	105.78	90.55	5,634.77	638.28	1,320.05	1,107.90	212.15	6.222		
18,100.00	12,602.59	18,131.85	12,616.88	108.13	107.53	90.62	5,734.75	637.30	1,320.06	1,104.40	215.66	6.121		
18,200.00	12,601.88	18,231.84	12,617.62	109.89	109.29	90.68	5,834.73	636.32	1,320.07	1,100.90	219.18	6.023		
18,300.00	12,601.18	18,331.83	12,618.36	111.65	111.05	90.74	5,934.71	635.34	1,320.09	1,097.39	222.70	5.928		
18,400.00	12,600.47	18,431.82	12,619.10	113.41	112.81	90.80	6,034.69	634.36	1,320.10	1,093.88	226.22	5.835		
18,500.00	12,599.76	18,531.81	12,619.83	115.18	114.58	90.87	6,134.68	633.38	1,320.12	1,090.37	229.75	5.746		
18,600.00	12,599.06	18,631.80	12,620.57	116.94	116.34	90.93	6,234.66	632.40	1,320.14	1,086.85	233.29	5.659		
18,700.00	12,598.35	18,731.79	12,621.31	118.71	118.11	90.99	6,334.64	631.42	1,320.16	1,083.34	236.82	5.574		
18,800.00	12,597.64	18,831.78	12,622.05	120.48	119.88	91.06	6,434.62	630.44	1,320.18	1,079.82	240.36	5.492		
18,900.00	12,596.94	18,931.77	12,622.79	122.26	121.65	91.12	6,534.60	629.46	1,320.20	1,076.30	243.91	5.413		
19,000.00	12,596.23	19,031.76	12,623.53	124.03	123.42	91.18	6,634.59	628.48	1,320.23	1,072.77	247.46	5.335		
19,100.00	12,595.52	19,131.75	12,624.27	125.81	125.20	91.24	6,734.57	627.50	1,320.26	1,069.25	251.01	5.260		
19,200.00	12,594.81	19,231.74	12,625.01	127.58	126.97	91.31	6,834.55	626.52	1,320.28	1,065.72	254.56	5.187		
19,300.00	12,594.11	19,331.73	12,625.75	129.36	128.75	91.37	6,934.53	625.54	1,320.31	1,062.20	258.12	5.115		
19,400.00	12,593.40	19,431.71	12,626.49	131.14	130.53	91.43	7,034.51	624.56	1,320.34	1,058.67	261.67	5.046		
19,500.00	12,592.69	19,531.70	12,627.22	132.92	132.31	91.49	7,134.50	623.58	1,320.38	1,055.14	265.24	4.978		
19,600.00	12,591.99	19,631.69	12,627.96	134.71	134.09	91.56	7,234.48	622.60	1,320.41	1,051.61	268.80	4.912		
19,700.00	12,591.28	19,731.68	12,628.70	136.49	135.88	91.62	7,334.46	621.62	1,320.45	1,048.08	272.37	4.848		
19,800.00	12,590.57	19,831.67	12,629.44	138.28	137.66	91.68	7,434.44	620.64	1,320.48	1,044.55	275.94	4.785		
19,841.67	12,590.28	19,873.33	12,629.75	139.02	138.40	91.71	7,476.10	620.23	1,320.50	1,043.08	277.42	4.760		
19,880.93	12,590.00	19,907.35	12,630.00	139.72	139.01	91.73	7,510.12	619.90	1,320.53	1,041.79	278.73	4.738		

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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)						
0.00	0.00	0.00	0.00	0.00	0.00	89.48	0.30	33.10	33.11					
100.00	100.00	99.30	99.30	0.08	0.08	89.48	0.30	33.10	33.10	32.94	0.17	199.713		
200.00	200.00	199.30	199.30	0.31	0.31	89.48	0.30	33.10	33.10	32.49	0.61	53.886		
300.00	300.00	299.30	299.30	0.53	0.53	89.48	0.30	33.10	33.10	32.04	1.06	31.116		
400.00	400.00	399.30	399.30	0.76	0.76	89.48	0.30	33.10	33.10	31.59	1.51	21.873		
500.00	500.00	499.30	499.30	0.98	0.98	89.48	0.30	33.10	33.10	31.14	1.96	16.864		
600.00	600.00	599.30	599.30	1.21	1.21	89.48	0.30	33.10	33.10	30.69	2.41	13.721		
700.00	700.00	699.30	699.30	1.43	1.43	89.48	0.30	33.10	33.10	30.24	2.86	11.566		
800.00	800.00	799.30	799.30	1.66	1.65	89.48	0.30	33.10	33.10	29.79	3.31	9.996		
900.00	900.00	899.30	899.30	1.88	1.88	89.48	0.30	33.10	33.10	29.34	3.76	8.801		
1,000.00	1,000.00	999.30	999.30	2.11	2.10	89.48	0.30	33.10	33.10	28.89	4.21	7.862		
1,100.00	1,100.00	1,099.30	1,099.30	2.33	2.33	89.48	0.30	33.10	33.10	28.44	4.66	7.103		
1,200.00	1,200.00	1,199.30	1,199.30	2.56	2.55	89.48	0.30	33.10	33.10	27.99	5.11	6.478		
1,300.00	1,300.00	1,299.30	1,299.30	2.78	2.78	89.48	0.30	33.10	33.10	27.54	5.56	5.954		
1,400.00	1,400.00	1,399.30	1,399.30	3.01	3.00	89.48	0.30	33.10	33.10	27.09	6.01	5.509		
1,500.00	1,500.00	1,499.30	1,499.30	3.23	3.23	89.48	0.30	33.10	33.10	26.64	6.46	5.125		
1,600.00	1,600.00	1,599.30	1,599.30	3.45	3.45	89.48	0.30	33.10	33.10	26.19	6.91	4.792		
1,700.00	1,700.00	1,699.30	1,699.30	3.68	3.68	89.48	0.30	33.10	33.10	25.74	7.36	4.499		
1,800.00	1,800.00	1,799.30	1,799.30	3.90	3.90	89.48	0.30	33.10	33.10	25.29	7.81	4.240		
1,900.00	1,900.00	1,899.30	1,899.30	4.13	4.13	89.48	0.30	33.10	33.10	24.85	8.26	4.009		
2,000.00	2,000.00	1,999.30	1,999.30	4.35	4.35	89.48	0.30	33.10	33.10	24.40	8.71	3.802		
2,100.00	2,100.00	2,099.30	2,099.30	4.58	4.58	89.48	0.30	33.10	33.10	23.95	9.16	3.616		
2,200.00	2,200.00	2,199.30	2,199.30	4.80	4.80	89.48	0.30	33.10	33.10	23.50	9.60	3.446		
2,300.00	2,300.00	2,299.30	2,299.30	5.03	5.03	89.48	0.30	33.10	33.10	23.05	10.05	3.292		
2,400.00	2,400.00	2,399.30	2,399.30	5.25	5.25	89.48	0.30	33.10	33.10	22.60	10.50	3.151		
2,500.00	2,500.00	2,499.30	2,499.30	5.48	5.48	89.48	0.30	33.10	33.10	22.15	10.95	3.022		
2,600.00	2,600.00	2,599.30	2,599.30	5.70	5.70	89.48	0.30	33.10	33.10	21.70	11.40	2.903		
2,700.00	2,700.00	2,699.30	2,699.30	5.93	5.93	89.48	0.30	33.10	33.10	21.25	11.85	2.793		
2,800.00	2,800.00	2,799.30	2,799.30	6.15	6.15	89.48	0.30	33.10	33.10	20.80	12.30	2.691		
2,900.00	2,900.00	2,899.30	2,899.30	6.38	6.38	89.48	0.30	33.10	33.10	20.35	12.75	2.596		
3,000.00	3,000.00	2,999.30	2,999.30	6.60	6.60	89.48	0.30	33.10	33.10	19.90	13.20	2.507		
3,100.00	3,100.00	3,099.30	3,099.30	6.83	6.82	89.48	0.30	33.10	33.10	19.45	13.65	2.425		
3,200.00	3,200.00	3,199.30	3,199.30	7.05	7.05	89.48	0.30	33.10	33.10	19.00	14.10	2.348		
3,300.00	3,300.00	3,299.30	3,299.30	7.28	7.27	89.48	0.30	33.10	33.10	18.55	14.55	2.275		
3,400.00	3,400.00	3,399.30	3,399.30	7.50	7.50	89.48	0.30	33.10	33.10	18.10	15.00	2.207		
3,500.00	3,500.00	3,499.30	3,499.30	7.73	7.72	89.48	0.30	33.10	33.10	17.65	15.45	2.143		
3,600.00	3,600.00	3,599.30	3,599.30	7.95	7.95	89.48	0.30	33.10	33.10	17.20	15.90	2.082		
3,700.00	3,700.00	3,699.30	3,699.30	8.17	8.17	89.48	0.30	33.10	33.10	16.75	16.35	2.025		
3,800.00	3,800.00	3,799.30	3,799.30	8.40	8.40	89.48	0.30	33.10	33.10	16.30	16.80	1.971		
3,900.00	3,900.00	3,899.30	3,899.30	8.62	8.62	89.48	0.30	33.10	33.10	15.85	17.25	1.919		
4,000.00	4,000.00	3,999.30	3,999.30	8.85	8.85	89.48	0.30	33.10	33.10	15.40	17.70	1.871		
4,100.00	4,100.00	4,099.30	4,099.30	9.07	9.07	89.48	0.30	33.10	33.10	14.96	18.15	1.824		
4,200.00	4,200.00	4,199.30	4,199.30	9.30	9.30	89.48	0.30	33.10	33.10	14.51	18.60	1.780		
4,300.00	4,300.00	4,299.30	4,299.30	9.52	9.52	89.48	0.30	33.10	33.10	14.06	19.05	1.738		
4,400.00	4,400.00	4,399.30	4,399.30	9.75	9.75	89.48	0.30	33.10	33.10	13.61	19.49	1.698		
4,500.00	4,500.00	4,499.30	4,499.30	9.97	9.97	89.48	0.30	33.10	33.10	13.16	19.94	1.660		
4,600.00	4,600.00	4,599.30	4,599.30	10.20	10.20	89.48	0.30	33.10	33.10	12.71	20.39	1.623		
4,700.00	4,700.00	4,699.30	4,699.30	10.42	10.42	89.48	0.30	33.10	33.10	12.26	20.84	1.588		
4,800.00	4,800.00	4,799.30	4,799.30	10.65	10.65	89.48	0.30	33.10	33.10	11.81	21.29	1.555		
4,900.00	4,900.00	4,899.30	4,899.30	10.87	10.87	89.48	0.30	33.10	33.10	11.36	21.74	1.522		
5,000.00	5,000.00	4,999.30	4,999.30	11.10	11.10	89.48	0.30	33.10	33.10	10.91	22.19	1.492 Level 3, CC, ES, SF		
5,100.00	5,099.98	5,099.28	5,099.28	11.31	11.32	168.94	0.30	33.10	34.81	12.18	22.63	1.538		

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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)						
5,200.00	5,199.84	5,199.14	5,199.14	11.52	11.54	170.36	0.30	33.10	39.96	16.90	23.06	1.733		
5,300.00	5,299.51	5,298.81	5,298.81	11.72	11.77	171.98	0.30	33.10	47.99	24.50	23.49	2.043		
5,400.00	5,399.15	5,398.45	5,398.45	11.93	11.99	173.17	0.30	33.10	56.36	32.43	23.93	2.355		
5,500.00	5,498.79	5,498.09	5,498.09	12.15	12.22	174.06	0.30	33.10	64.74	40.37	24.36	2.657		
5,600.00	5,598.44	5,597.74	5,597.74	12.36	12.44	174.75	0.30	33.10	73.13	48.32	24.80	2.948		
5,700.00	5,698.08	5,697.38	5,697.38	12.58	12.66	175.29	0.30	33.10	81.53	56.28	25.24	3.229		
5,800.00	5,797.73	5,797.03	5,797.03	12.80	12.89	175.73	0.30	33.10	89.93	64.25	25.69	3.501		
5,900.00	5,897.37	5,896.67	5,896.67	13.02	13.11	176.09	0.30	33.10	98.34	72.21	26.13	3.763		
6,000.00	5,997.01	5,996.31	5,996.31	13.25	13.34	176.40	0.30	33.10	106.76	80.18	26.58	4.016		
6,100.00	6,096.66	6,095.96	6,095.96	13.47	13.56	176.67	0.30	33.10	115.17	88.14	27.03	4.261		
6,200.00	6,196.30	6,195.60	6,195.60	13.70	13.78	176.89	0.30	33.10	123.59	96.11	27.48	4.497		
6,300.00	6,295.94	6,295.24	6,295.24	13.93	14.01	177.09	0.30	33.10	132.01	104.08	27.93	4.726		
6,400.00	6,395.59	6,394.89	6,394.89	14.16	14.23	177.27	0.30	33.10	140.44	112.05	28.39	4.947		
6,500.00	6,495.23	6,494.53	6,494.53	14.39	14.46	177.42	0.30	33.10	148.86	120.01	28.84	5.161		
6,600.00	6,594.88	6,594.18	6,594.18	14.62	14.68	177.56	0.30	33.10	157.28	127.98	29.30	5.368		
6,700.00	6,694.52	6,693.82	6,693.82	14.86	14.90	177.68	0.30	33.10	165.71	135.95	29.76	5.568		
6,800.00	6,794.16	6,793.46	6,793.46	15.09	15.13	177.80	0.30	33.10	174.13	143.91	30.22	5.762		
6,900.00	6,893.81	6,893.11	6,893.11	15.33	15.35	177.90	0.30	33.10	182.56	151.88	30.68	5.951		
7,000.00	6,993.45	6,992.75	6,992.75	15.56	15.58	177.99	0.30	33.10	190.98	159.84	31.14	6.133		
7,100.00	7,093.10	7,092.40	7,092.40	15.80	15.80	178.08	0.30	33.10	199.41	167.81	31.60	6.310		
7,200.00	7,192.74	7,192.04	7,192.04	16.04	16.02	178.15	0.30	33.10	207.84	175.77	32.07	6.481		
7,300.00	7,292.38	7,291.68	7,291.68	16.28	16.25	178.23	0.30	33.10	216.26	183.73	32.53	6.648		
7,400.00	7,392.03	7,391.33	7,391.33	16.53	16.47	178.29	0.30	33.10	224.69	191.69	33.00	6.809		
7,500.00	7,491.67	7,490.97	7,490.97	16.77	16.70	178.35	0.30	33.10	233.12	199.66	33.46	6.966		
7,600.00	7,591.32	7,590.62	7,590.62	17.01	16.92	178.41	0.30	33.10	241.55	207.62	33.93	7.119		
7,700.00	7,690.96	7,690.26	7,690.26	17.26	17.14	178.46	0.30	33.10	249.98	215.58	34.40	7.267		
7,800.00	7,790.60	7,789.90	7,789.90	17.50	17.37	178.51	0.30	33.10	258.41	223.54	34.87	7.411		
7,900.00	7,890.25	7,889.55	7,889.55	17.75	17.59	178.56	0.30	33.10	266.84	231.50	35.34	7.551		
8,000.00	7,989.89	7,989.19	7,989.19	17.99	17.82	178.61	0.30	33.10	275.26	239.46	35.81	7.687		
8,100.00	8,089.54	8,088.84	8,088.84	18.24	18.04	178.65	0.30	33.10	283.69	247.41	36.28	7.819		
8,200.00	8,189.18	8,188.48	8,188.48	18.49	18.26	178.69	0.30	33.10	292.12	255.37	36.75	7.948		
8,300.00	8,288.82	8,288.12	8,288.12	18.74	18.49	178.72	0.30	33.10	300.55	263.33	37.23	8.074		
8,400.00	8,388.47	8,387.77	8,387.77	18.99	18.71	178.76	0.30	33.10	308.98	271.28	37.70	8.196		
8,500.00	8,488.11	8,487.41	8,487.41	19.24	18.94	178.79	0.30	33.10	317.41	279.24	38.17	8.315		
8,600.00	8,587.75	8,587.05	8,587.05	19.49	19.16	178.82	0.30	33.10	325.84	287.20	38.65	8.431		
8,700.00	8,687.40	8,686.70	8,686.70	19.74	19.38	178.85	0.30	33.10	334.27	295.15	39.12	8.544		
8,800.00	8,787.04	8,786.34	8,786.34	19.99	19.61	178.88	0.30	33.10	342.70	303.11	39.60	8.655		
8,900.00	8,886.69	8,885.99	8,885.99	20.24	19.83	178.91	0.30	33.10	351.13	311.06	40.07	8.762		
9,000.00	8,986.33	8,985.63	8,985.63	20.50	20.06	178.93	0.30	33.10	359.56	319.01	40.55	8.867		
9,100.00	9,085.97	9,085.27	9,085.27	20.75	20.28	178.96	0.30	33.10	367.99	326.97	41.03	8.969		
9,200.00	9,185.62	9,184.92	9,184.92	21.00	20.50	178.98	0.30	33.10	376.42	334.92	41.50	9.069		
9,300.00	9,285.26	9,284.56	9,284.56	21.26	20.73	179.00	0.30	33.10	384.85	342.87	41.98	9.167		
9,400.00	9,384.91	9,384.21	9,384.21	21.51	20.95	179.02	0.30	33.10	393.28	350.82	42.46	9.262		
9,500.00	9,484.55	9,483.85	9,483.85	21.76	21.17	179.04	0.30	33.10	401.72	358.78	42.94	9.355		
9,600.00	9,584.19	9,583.49	9,583.49	22.02	21.40	179.06	0.30	33.10	410.15	366.73	43.42	9.446		
9,700.00	9,683.84	9,683.14	9,683.14	22.28	21.62	179.08	0.30	33.10	418.58	374.68	43.90	9.535		
9,800.00	9,783.48	9,782.78	9,782.78	22.53	21.85	179.10	0.30	33.10	427.01	382.63	44.38	9.622		
9,900.00	9,883.13	9,882.43	9,882.43	22.79	22.07	179.12	0.30	33.10	435.44	390.58	44.86	9.707		
10,000.00	9,982.77	9,982.07	9,982.07	23.04	22.29	179.14	0.30	33.10	443.87	398.53	45.34	9.790		
10,100.00	10,082.41	10,081.71	10,081.71	23.30	22.52	179.15	0.30	33.10	452.30	406.48	45.82	9.871		
10,200.00	10,182.06	10,181.36	10,181.36	23.56	22.74	179.17	0.30	33.10	460.73	414.43	46.30	9.951		
10,300.00	10,281.70	10,281.00	10,281.00	23.82	22.97	179.18	0.30	33.10	469.16	422.38	46.78	10.029		

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



CONCITO

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Distance Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,400.00	10,381.34	10,380.64	10,380.64	24.07	23.19	179.20		0.30	33.10	477.59	430.33	47.26	10.105	
10,500.00	10,480.99	10,480.29	10,480.29	24.33	23.41	179.21		0.30	33.10	486.02	438.28	47.75	10.179	
10,600.00	10,580.63	10,579.93	10,579.93	24.59	23.64	179.22		0.30	33.10	494.45	446.23	48.23	10.252	
10,700.00	10,680.28	10,679.58	10,679.58	24.85	23.86	179.24		0.30	33.10	502.89	454.17	48.71	10.324	
10,800.00	10,779.92	10,779.22	10,779.22	25.11	24.09	179.25		0.30	33.10	511.32	462.12	49.19	10.394	
10,900.00	10,879.56	10,878.86	10,878.86	25.37	24.31	179.26		0.30	33.10	519.75	470.07	49.68	10.462	
11,000.00	10,979.21	10,978.51	10,978.51	25.63	24.53	179.27		0.30	33.10	528.18	478.02	50.16	10.530	
11,100.00	11,078.85	11,078.15	11,078.15	25.89	24.76	179.28		0.30	33.10	536.61	485.96	50.64	10.596	
11,200.00	11,178.50	11,177.80	11,177.80	26.15	24.98	179.30		0.30	33.10	545.04	493.91	51.13	10.660	
11,300.00	11,278.14	11,277.44	11,277.44	26.41	25.21	179.31		0.30	33.10	553.47	501.86	51.61	10.724	
11,400.00	11,377.78	11,377.08	11,377.08	26.67	25.43	179.32		0.30	33.10	561.90	509.81	52.10	10.786	
11,500.00	11,477.43	11,476.73	11,476.73	26.93	25.65	179.33		0.30	33.10	570.33	517.75	52.58	10.847	
11,600.00	11,577.07	11,576.37	11,576.37	27.19	25.88	179.34		0.30	33.10	578.76	525.70	53.07	10.906	
11,700.00	11,676.72	11,676.02	11,676.02	27.45	26.10	179.35		0.30	33.10	587.20	533.65	53.55	10.965	
11,800.00	11,776.36	11,775.66	11,775.66	27.71	26.33	179.36		0.30	33.10	595.63	541.59	54.04	11.023	
11,900.00	11,876.00	11,875.30	11,875.30	27.97	26.55	179.36		0.30	33.10	604.06	549.54	54.52	11.079	
12,000.00	11,975.65	11,974.95	11,974.95	28.23	26.77	179.37		0.30	33.10	612.49	557.48	55.01	11.135	
12,100.00	12,075.29	12,074.59	12,074.59	28.49	27.00	179.38		0.30	33.10	620.92	565.43	55.49	11.189	
12,200.00	12,174.93	12,174.23	12,174.23	28.76	27.22	179.39		0.30	33.10	629.35	573.37	55.98	11.243	
12,300.00	12,274.21	12,293.24	12,292.93	29.02	27.49	126.82		6.23	33.04	637.97	581.46	56.51	11.290	
12,400.00	12,370.00	12,427.40	12,420.74	29.29	27.78	111.85		45.54	32.66	645.36	588.28	57.07	11.308	
12,500.00	12,458.10	12,558.90	12,530.64	29.58	28.04	105.81		116.99	31.96	650.98	593.36	57.62	11.298	
12,600.00	12,534.69	12,685.18	12,614.07	29.88	28.36	101.65		211.28	31.04	654.96	596.72	58.24	11.246	
12,700.00	12,596.40	12,804.77	12,667.76	30.21	28.76	98.19		317.80	30.00	657.58	598.61	58.97	11.152	
12,800.00	12,640.54	12,917.28	12,692.67	30.60	29.22	95.14		427.23	28.94	659.14	599.31	59.82	11.018	
12,900.00	12,665.18	13,020.83	12,693.68	31.07	29.75	92.62		530.66	27.93	659.92	599.10	60.82	10.851	
13,000.00	12,669.52	13,120.34	12,689.91	31.63	30.34	91.83		630.09	26.96	660.21	598.24	61.97	10.654	
13,100.00	12,666.54	13,220.33	12,686.12	32.28	31.04	91.76		730.01	25.98	660.19	596.87	63.32	10.426	
13,200.00	12,663.56	13,320.33	12,682.33	33.03	31.83	91.69		829.93	25.01	660.17	595.31	64.85	10.179	
13,300.00	12,660.58	13,420.33	12,678.54	33.86	32.69	91.62		929.85	24.04	660.14	593.59	66.56	9.919	
13,400.00	12,657.60	13,520.32	12,674.75	34.78	33.64	91.55		1,029.77	23.06	660.12	591.70	68.42	9.648	
13,500.00	12,654.62	13,620.32	12,670.96	35.76	34.66	91.48		1,129.69	22.09	660.10	589.68	70.42	9.374	
13,600.00	12,651.64	13,720.32	12,667.17	36.82	35.74	91.41		1,229.61	21.11	660.08	587.52	72.56	9.098	
13,700.00	12,648.67	13,820.31	12,663.38	37.93	36.88	91.34		1,329.53	20.14	660.06	585.25	74.81	8.823	
13,800.00	12,645.69	13,920.31	12,659.59	39.10	38.07	91.27		1,429.45	19.16	660.04	582.87	77.17	8.553	
13,900.00	12,642.71	14,020.31	12,655.80	40.32	39.31	91.20		1,529.37	18.19	660.02	580.40	79.63	8.289	
14,000.00	12,639.73	14,120.30	12,652.01	41.58	40.60	91.13		1,629.29	17.21	660.01	577.83	82.18	8.031	
14,100.00	12,636.75	14,220.30	12,648.22	42.88	41.93	91.06		1,729.21	16.24	659.99	575.18	84.81	7.782	
14,200.00	12,633.77	14,320.30	12,644.43	44.22	43.29	90.99		1,829.13	15.27	659.98	572.47	87.51	7.541	
14,300.00	12,630.79	14,420.29	12,640.64	45.60	44.69	90.92		1,929.05	14.29	659.97	569.68	90.28	7.310	
14,400.00	12,628.75	14,520.28	12,636.85	46.92	46.11	90.76		2,028.96	13.32	659.94	566.91	93.03	7.094	
14,500.00	12,628.04	14,620.23	12,633.06	48.35	47.57	90.50		2,128.83	12.34	659.91	563.99	95.91	6.880	
14,600.00	12,627.34	14,720.18	12,629.27	49.80	49.04	90.23		2,228.71	11.37	659.89	561.04	98.85	6.676	
14,682.47	12,626.75	14,802.61	12,626.14	51.02	50.28	90.01		2,311.08	10.57	659.88	558.58	101.30	6.514	
14,700.00	12,626.63	14,820.13	12,625.48	51.28	50.54	89.96		2,328.58	10.39	659.88	558.06	101.83	6.480	
14,800.00	12,625.92	14,920.09	12,621.69	52.78	52.07	89.69		2,428.46	9.42	659.89	555.04	104.85	6.294	
14,900.00	12,625.22	15,020.04	12,617.90	54.30	53.61	89.43		2,528.34	8.45	659.92	552.01	107.91	6.115	
15,000.00	12,624.51	15,119.99	12,614.11	55.84	55.17	89.16		2,628.21	7.47	659.96	548.95	111.01	5.945	
15,100.00	12,623.80	15,219.94	12,610.33	57.40	56.74	88.89		2,728.09	6.50	660.01	545.87	114.14	5.782	
15,200.00	12,623.09	15,319.90	12,606.54	58.97	58.33	88.62		2,827.96	5.52	660.08	542.78	117.30	5.627	
15,300.00	12,622.39	15,419.85	12,602.75	60.56	59.93	88.36		2,927.84	4.55	660.16	539.67	120.49	5.479	
15,400.00	12,621.68	15,520.01	12,599.09	62.16	61.48	88.10		3,027.93	3.57	660.25	536.61	123.64	5.340	

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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)						
15,500.00	12,620.97	15,620.60	12,597.91	63.77	62.88	88.06	3,128.50	2.59	660.27	533.61	126.66	5.213		
15,600.00	12,620.27	15,720.60	12,597.73	65.39	64.52	88.10	3,228.50	1.62	660.25	530.34	129.91	5.082		
15,700.00	12,619.56	15,820.60	12,597.54	67.03	66.16	88.15	3,328.49	0.64	660.23	527.04	133.19	4.957		
15,800.00	12,618.85	15,920.59	12,597.36	68.67	67.81	88.20	3,428.48	-0.33	660.22	523.73	136.48	4.837		
15,900.00	12,618.15	16,020.59	12,597.18	70.33	69.47	88.24	3,528.48	-1.31	660.20	520.40	139.80	4.722		
16,000.00	12,617.44	16,120.59	12,597.00	71.99	71.14	88.29	3,628.47	-2.28	660.18	517.05	143.13	4.612		
16,100.00	12,616.73	16,220.59	12,596.82	73.66	72.82	88.33	3,728.46	-3.26	660.17	513.69	146.48	4.507		
16,200.00	12,616.02	16,320.59	12,596.64	75.33	74.50	88.38	3,828.46	-4.23	660.15	510.32	149.84	4.406		
16,300.00	12,615.32	16,420.59	12,596.46	77.02	76.20	88.42	3,928.45	-5.21	660.14	506.93	153.21	4.309		
16,400.00	12,614.61	16,520.59	12,596.28	78.71	77.89	88.47	4,028.45	-6.18	660.13	503.53	156.60	4.215		
16,500.00	12,613.90	16,620.58	12,596.10	80.40	79.60	88.52	4,128.44	-7.16	660.11	500.12	160.00	4.126		
16,600.00	12,613.20	16,720.58	12,595.92	82.10	81.30	88.56	4,228.43	-8.13	660.10	496.69	163.41	4.040		
16,700.00	12,612.49	16,820.58	12,595.74	83.81	83.02	88.61	4,328.43	-9.11	660.09	493.26	166.83	3.957		
16,800.00	12,611.78	16,920.58	12,595.56	85.52	84.74	88.65	4,428.42	-10.08	660.08	489.82	170.26	3.877		
16,900.00	12,611.08	17,020.58	12,595.38	87.24	86.46	88.70	4,528.41	-11.06	660.06	486.37	173.70	3.800		
17,000.00	12,610.37	17,120.58	12,595.20	88.96	88.19	88.74	4,628.41	-12.03	660.05	482.91	177.15	3.726		
17,100.00	12,609.66	17,220.58	12,595.02	90.69	89.92	88.79	4,728.40	-13.01	660.04	479.44	180.60	3.655		
17,200.00	12,608.95	17,320.58	12,594.84	92.42	91.65	88.84	4,828.40	-13.98	660.03	475.96	184.07	3.586		
17,300.00	12,608.25	17,420.57	12,594.66	94.15	93.39	88.88	4,928.39	-14.96	660.02	472.48	187.54	3.519		
17,400.00	12,607.54	17,520.57	12,594.47	95.89	95.13	88.93	5,028.38	-15.93	660.01	468.99	191.02	3.455		
17,500.00	12,606.83	17,620.57	12,594.29	97.63	96.88	88.97	5,128.38	-16.91	660.00	465.50	194.50	3.393		
17,600.00	12,606.13	17,720.57	12,594.11	99.37	98.62	89.02	5,228.37	-17.88	659.99	462.00	197.99	3.333		
17,700.00	12,605.42	17,820.57	12,593.93	101.12	100.37	89.06	5,328.36	-18.86	659.98	458.49	201.49	3.276		
17,800.00	12,604.71	17,920.57	12,593.75	102.86	102.13	89.11	5,428.36	-19.83	659.98	454.98	204.99	3.220		
17,900.00	12,604.01	18,020.57	12,593.57	104.62	103.88	89.15	5,528.35	-20.81	659.97	451.47	208.50	3.165		
18,000.00	12,603.30	18,120.56	12,593.39	106.37	105.64	89.20	5,628.35	-21.79	659.96	447.95	212.01	3.113		
18,100.00	12,602.59	18,220.56	12,593.21	108.13	107.40	89.25	5,728.34	-22.76	659.96	444.42	215.53	3.062		
18,200.00	12,601.88	18,320.56	12,593.03	109.89	109.17	89.29	5,828.33	-23.74	659.95	440.90	219.05	3.013		
18,300.00	12,601.18	18,420.56	12,592.85	111.65	110.93	89.34	5,928.33	-24.71	659.94	437.36	222.58	2.965		
18,400.00	12,600.47	18,520.56	12,592.67	113.41	112.70	89.38	6,028.32	-25.69	659.94	433.83	226.11	2.919		
18,500.00	12,599.76	18,620.56	12,592.49	115.18	114.47	89.43	6,128.31	-26.66	659.93	430.29	229.64	2.874		
18,600.00	12,599.06	18,720.56	12,592.31	116.94	116.24	89.47	6,228.31	-27.64	659.93	426.75	233.18	2.830		
18,700.00	12,598.35	18,820.55	12,592.13	118.71	118.01	89.52	6,328.30	-28.61	659.92	423.20	236.73	2.788		
18,800.00	12,597.64	18,920.55	12,591.95	120.48	119.79	89.57	6,428.29	-29.59	659.92	419.65	240.27	2.747		
18,900.00	12,596.94	19,020.55	12,591.77	122.26	121.56	89.61	6,528.29	-30.56	659.92	416.10	243.82	2.707		
19,000.00	12,596.23	19,120.55	12,591.59	124.03	123.34	89.66	6,628.28	-31.54	659.91	412.54	247.37	2.668		
19,100.00	12,595.52	19,220.55	12,591.41	125.81	125.12	89.70	6,728.28	-32.51	659.91	408.99	250.93	2.630		
19,200.00	12,594.81	19,320.55	12,591.22	127.58	126.90	89.75	6,828.27	-33.49	659.91	405.43	254.48	2.593		
19,300.00	12,594.11	19,420.55	12,591.04	129.36	128.68	89.79	6,928.26	-34.46	659.91	401.86	258.04	2.557		
19,400.00	12,593.40	19,520.54	12,590.86	131.14	130.46	89.84	7,028.26	-35.44	659.91	398.30	261.61	2.523		
19,500.00	12,592.69	19,620.54	12,590.68	132.92	132.25	89.89	7,128.25	-36.41	659.91	394.73	265.17	2.489		
19,600.00	12,591.99	19,720.54	12,590.50	134.71	134.03	89.93	7,228.24	-37.39	659.91	391.16	268.74	2.456		
19,647.82	12,591.65	19,768.37	12,590.42	135.56	134.89	89.95	7,276.07	-37.85	659.91	389.46	270.45	2.440		
19,700.00	12,591.28	19,820.54	12,590.32	136.49	135.82	89.98	7,328.24	-38.36	659.91	387.59	272.31	2.423		
19,800.00	12,590.57	19,920.54	12,590.14	138.28	137.61	90.02	7,428.23	-39.34	659.91	384.02	275.88	2.392		
19,847.36	12,590.24	19,967.90	12,590.06	139.12	138.45	90.05	7,475.59	-39.80	659.91	382.33	277.58	2.377		
19,880.93	12,590.00	19,998.73	12,590.00	139.72	139.01	90.06	7,506.42	-40.10	659.91	381.18	278.73	2.368		

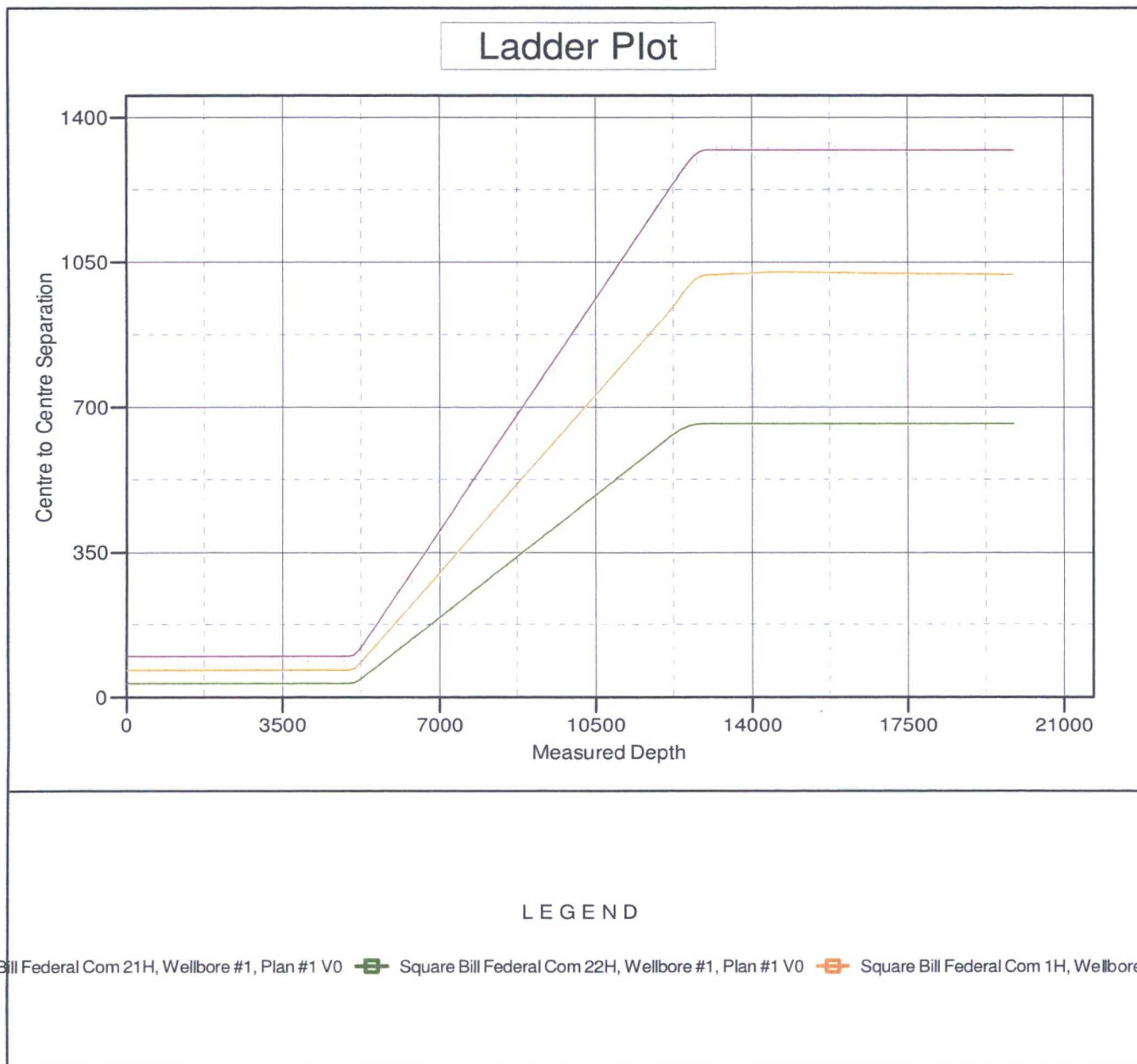
CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

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 23H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Square Bill Federal Com 23H
TVD Reference: KB=26' @ 3300.30ft (McVay 8)
MD Reference: KB=26' @ 3300.30ft (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' @ 3300.30ft (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 23H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.50°



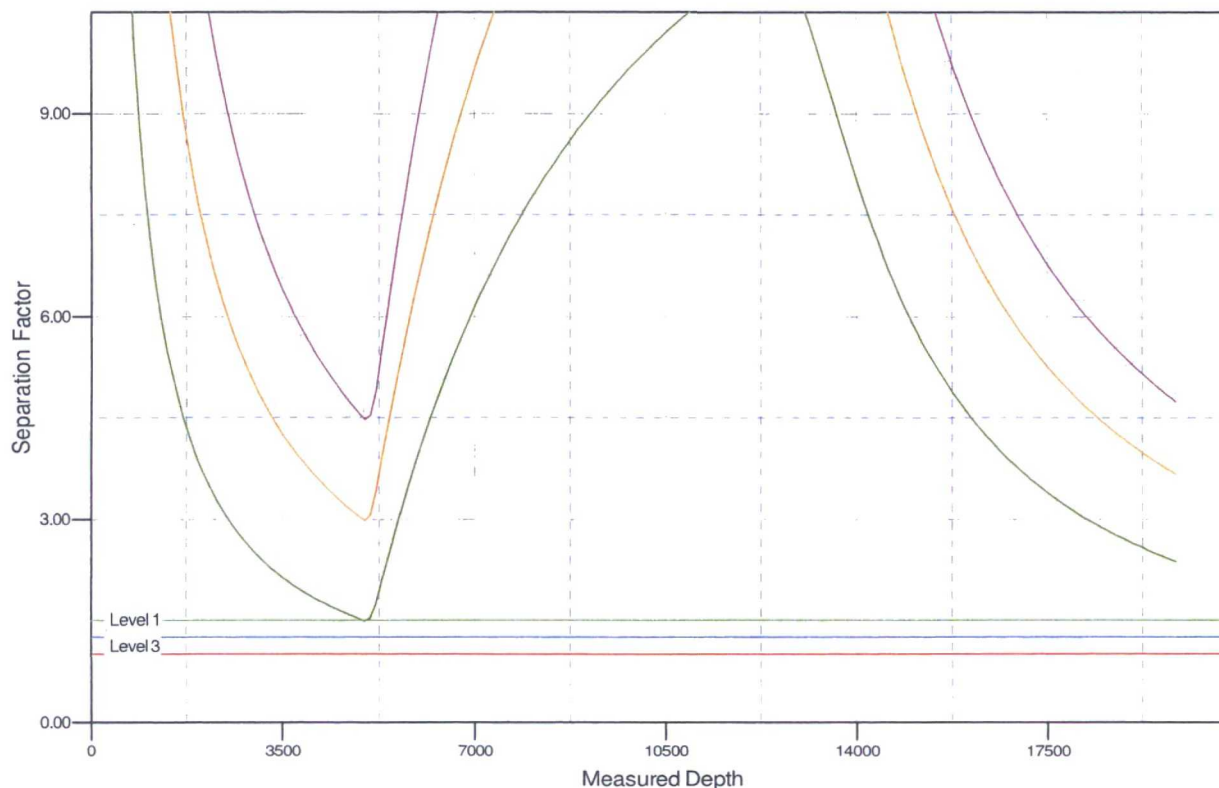
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Coordinates are relative to: Square Bill Federal Com 23H
 Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
 Grid Convergence at Surface is: 0.50°

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 1H, Wellbore #1