



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 12, T 21 S., R 33 E
Well: Bobwhite 12 State Com 7H
Wellbore: Wellbore #1
Plan: Plan #1 (Bobwhite 12 State Com 7H/Wellbore #1)



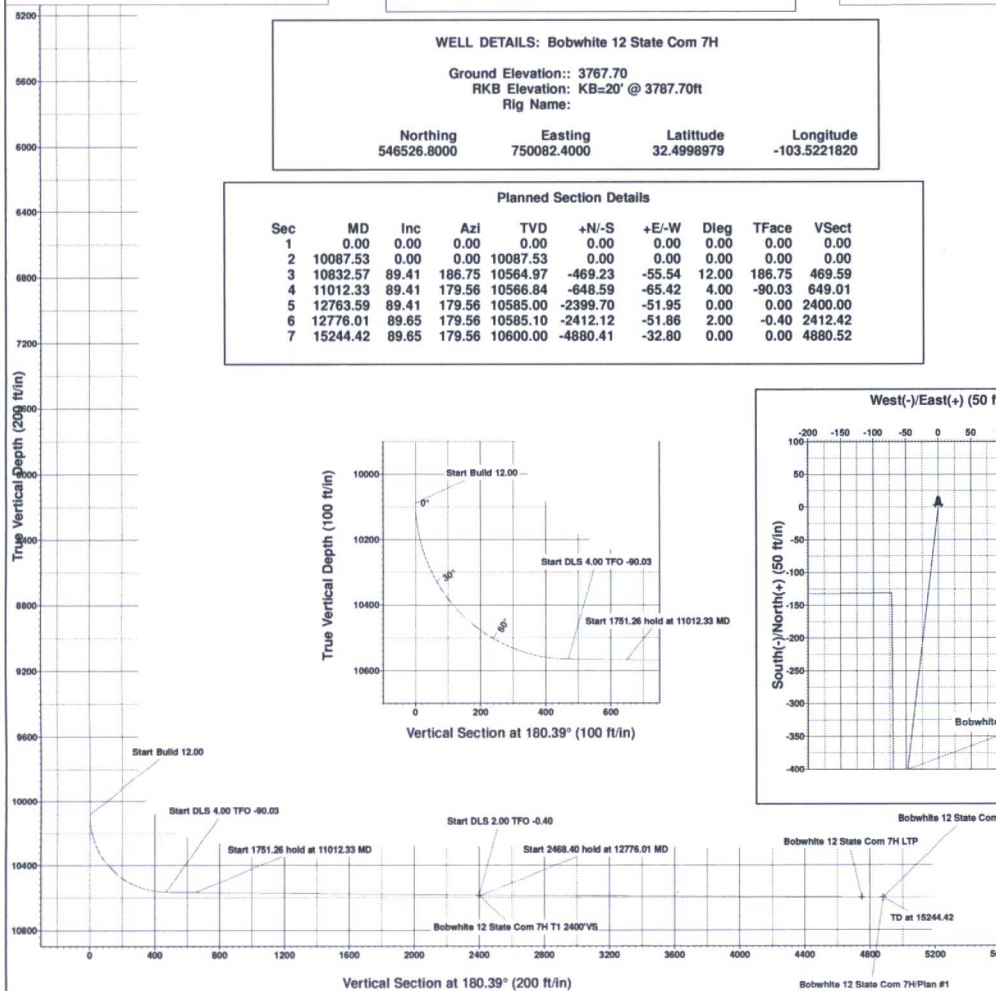
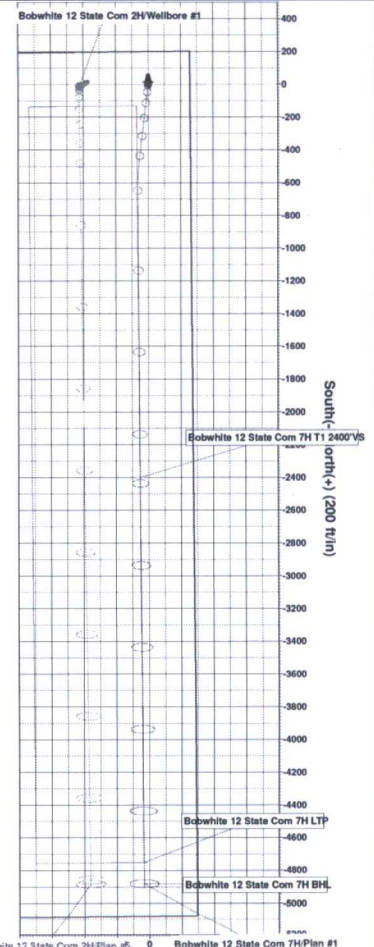
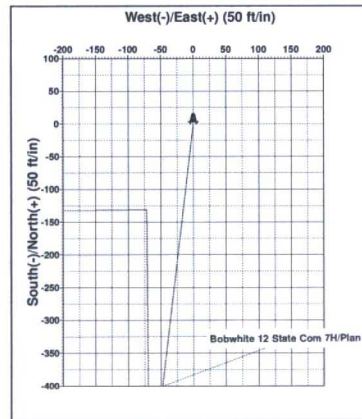
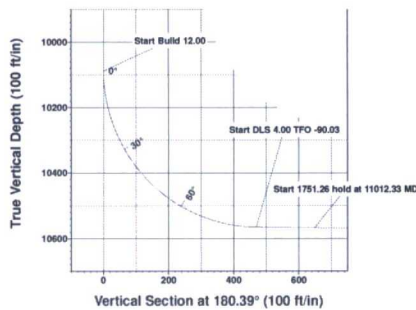
WELL DETAILS: Bobwhite 12 State Com 7H

Ground Elevation:: 3767.70
RKB Elevation: KB=20' @ 3787.70ft
Rig Name:

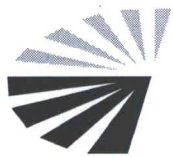
Northing	Easting	Latitude	Longitude
546526.8000	750082.4000	32.4998979	-103.5221820

Planned Section Details

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	10087.53	0.00	0.00	10087.53	0.00	0.00	0.00	0.00	0.00
3	10832.57	89.41	186.75	10564.97	-469.23	-55.54	12.00	186.75	469.59
4	11012.33	89.41	179.56	10566.84	-648.59	-65.42	4.00	-90.03	649.01
5	12763.59	89.41	179.56	10585.00	-2399.70	-51.95	0.00	0.00	2400.00
6	12776.01	89.65	179.56	10585.10	-2412.12	-51.86	2.00	-0.40	2412.42
7	15244.42	89.65	179.56	10600.00	-4880.41	-32.80	0.00	0.00	4880.52



PROJECT DETAILS: Lea County, NM (NAD27 NME)
Geodetic System: US State Plane 1927 (Exact solution)
Datum: NAD 1927 (NADCON CONUS)
Ellipsoid: Clarke 1866
Zone: New Mexico East 3001
System Datum: Mean Sea Level
Local North: Grid



CONCHO

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 12, T 21 S. , R 33 E

Bobwhite 12 State Com 7H

Wellbore #1

Plan #1

Anticollision Report

02 June, 2017





Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bobwhite 12 State Com 7H
Project:	Lea County, NM (NAD27 NME)	TVD Reference:	KB=20' @ 3787.70ft
Reference Site:	Sec. 12, T 21 S. , R 33 E	MD Reference:	KB=20' @ 3787.70ft
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bobwhite 12 State Com 7H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 ft	Output errors are at	2.00 sigma
Reference Wellbore	Wellbore #1	Database:	EDM 5000.1 Multi User Db
Reference Design:	Plan #1	Offset TVD Reference:	Offset Datum

Reference	Plan #1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00ft	Error Model:	ISCWSA
Depth Range:	Unlimited	Scan Method:	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 10,000.02 ft	Error Surface:	Circular Conic
Warning Levels Evaluated at:	2.00 Sigma	Casing Method:	Not applied

Survey Tool Program		Date 6/2/2017		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	15,244.42	Plan #1 (Wellbore #1)	MWD	MWD - Standard

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. 12, T 21 S. , R 33 E						
Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5	4,500.70	4,505.99	368.04	348.73	19.059	CC
Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5	15,244.42	15,522.39	463.31	279.75	2.524	ES, SF
Bobwhite 12 State Com 2H - Wellbore #1 - Wellbore #1	4,500.70	4,505.99	368.04	348.73	19.059	CC
Bobwhite 12 State Com 2H - Wellbore #1 - Wellbore #1	4,600.00	4,602.82	368.38	348.65	18.666	ES
Bobwhite 12 State Com 2H - Wellbore #1 - Wellbore #1	10,100.00	10,100.00	426.44	382.85	9.782	SF

Offset Design												Offset Site Error:	0.00 ft
Sec. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5												Offset Well Error:	0.00 ft
Survey Program: 100-MWD, 10100-MWD													
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	4.70	4.70	0.00	0.00	-89.20	5.60	-400.30	400.34				
100.00	100.00	103.05	103.05	0.09	0.10	-89.25	5.26	-400.59	400.63	400.44	0.19	2,118.807	
200.00	200.00	206.33	206.32	0.31	0.31	-89.36	4.46	-400.48	400.51	399.89	0.62	642.761	
300.00	300.00	305.01	305.00	0.54	0.51	-89.40	4.17	-400.34	400.36	399.31	1.05	379.704	
400.00	400.00	407.30	407.30	0.76	0.73	-89.48	3.61	-399.98	400.00	398.50	1.50	267.164	
500.00	500.00	506.21	506.20	0.99	0.94	-89.50	3.50	-399.52	399.54	397.61	1.93	207.349	
600.00	600.00	606.70	606.69	1.21	1.15	-89.52	3.33	-399.23	399.24	396.88	2.36	169.055	
700.00	700.00	705.81	705.79	1.44	1.35	-89.51	3.40	-398.62	398.64	395.84	2.79	142.742	
800.00	800.00	806.63	806.62	1.66	1.57	-89.54	3.21	-398.20	398.22	394.99	3.23	123.337	
900.00	900.00	905.28	905.26	1.89	1.77	-89.56	3.04	-397.90	397.91	394.25	3.66	108.725	
976.34	976.34	980.99	980.97	2.06	1.93	-89.58	2.92	-397.79	397.80	393.81	3.99	99.703	
1,000.00	1,000.00	1,004.17	1,004.16	2.11	1.98	-89.59	2.82	-397.80	397.81	393.72	4.09	97.225	
1,100.00	1,100.00	1,105.64	1,105.62	2.34	2.19	-89.61	2.69	-397.93	397.94	393.41	4.53	87.866	
1,200.00	1,200.00	1,207.66	1,207.63	2.56	2.41	-89.66	2.33	-397.56	397.58	392.61	4.97	80.027	
1,300.00	1,300.00	1,306.42	1,306.39	2.79	2.61	-89.67	2.27	-397.13	397.14	391.74	5.40	73.553	
1,388.24	1,388.24	1,393.06	1,393.04	2.99	2.79	-89.66	2.38	-396.93	396.94	391.16	5.78	68.683	
1,400.00	1,400.00	1,404.49	1,404.47	3.01	2.82	-89.64	2.47	-396.94	396.95	391.12	5.83	68.093	
1,500.00	1,500.00	1,505.24	1,505.21	3.24	3.03	-89.58	2.94	-396.98	396.99	390.73	6.26	63.367	
1,527.31	1,527.31	1,532.48	1,532.45	3.30	3.09	-89.57	2.98	-396.93	396.94	390.55	6.38	62.182	
1,600.00	1,600.00	1,603.94	1,603.92	3.46	3.24	-89.54	3.18	-397.07	397.08	390.39	6.70	59.297	
1,700.00	1,700.00	1,702.63	1,702.60	3.69	3.44	-89.49	3.56	-397.34	397.36	390.23	7.13	55.748	
1,800.00	1,800.00	1,804.25	1,804.22	3.91	3.65	-89.45	3.79	-397.60	397.62	390.06	7.57	52.555	

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. 12, T 21 S., R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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. 12, T 21 S., R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5													Offset Site Error:	0.00 ft
Survey Program: 100-MWD, 10100-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		
1,900.00	1,900.00	1,904.84	1,904.81	4.14	3.86	-89.48	3.61	-397.79	397.81	389.81	8.00	49.722		
1,900.11	1,900.11	1,904.94	1,904.91	4.14	3.87	-89.48	3.61	-397.79	397.81	389.81	8.00	49.719		
2,000.00	2,000.00	2,006.77	2,006.74	4.36	4.08	-89.52	3.34	-397.81	397.83	389.39	8.44	47.140		
2,082.25	2,082.25	2,087.08	2,087.05	4.55	4.25	-89.55	3.13	-397.57	397.58	388.79	8.79	45.219		
2,100.00	2,100.00	2,104.09	2,104.06	4.59	4.28	-89.55	3.14	-397.60	397.61	388.75	8.87	44.838		
2,200.00	2,200.00	2,206.41	2,206.38	4.81	4.50	-89.52	3.31	-397.24	397.25	387.95	9.31	42.684		
2,300.00	2,300.00	2,305.98	2,305.95	5.03	4.71	-89.53	3.26	-396.95	396.96	387.22	9.74	40.756		
2,400.00	2,400.00	2,406.85	2,406.82	5.26	4.92	-89.55	3.13	-396.51	396.53	386.35	10.18	38.966		
2,500.00	2,500.00	2,506.05	2,506.02	5.48	5.12	-89.60	2.75	-396.19	396.20	385.59	10.61	37.347		
2,600.00	2,600.00	2,607.34	2,607.30	5.71	5.34	-89.67	2.26	-395.49	395.51	384.46	11.05	35.805		
2,700.00	2,700.00	2,707.07	2,707.03	5.93	5.55	-89.76	1.65	-394.95	394.96	383.48	11.48	34.404		
2,800.00	2,800.00	2,807.32	2,807.27	6.16	5.76	-89.86	0.97	-393.98	393.99	382.08	11.92	33.067		
2,900.00	2,900.00	2,910.36	2,910.29	6.38	5.97	-90.03	-0.20	-393.09	393.13	380.77	12.36	31.816		
3,000.00	3,000.00	3,011.21	3,011.13	6.61	6.18	-90.14	-0.96	-391.57	391.62	378.83	12.79	30.612		
3,100.00	3,100.00	3,115.01	3,114.90	6.83	6.40	-90.26	-1.76	-389.47	389.60	376.36	13.24	29.434		
3,200.00	3,200.00	3,219.56	3,219.40	7.06	6.63	-90.41	-2.73	-386.13	386.42	372.74	13.68	28.240		
3,300.00	3,300.00	3,318.78	3,318.55	7.28	6.84	-90.49	-3.30	-382.44	382.70	368.58	14.12	27.106		
3,400.00	3,400.00	3,412.80	3,412.52	7.51	7.03	-90.46	-3.06	-379.69	379.78	365.24	14.54	26.117		
3,500.00	3,500.00	3,508.93	3,508.64	7.73	7.24	-90.26	-1.70	-378.50	378.53	363.56	14.97	25.290		
3,600.00	3,600.00	3,608.58	3,608.27	7.96	7.44	-90.01	-0.09	-377.46	377.48	362.08	15.40	24.510		
3,700.00	3,700.00	3,708.51	3,708.17	8.18	7.65	-89.74	1.69	-376.41	376.42	360.59	15.84	23.771		
3,800.00	3,800.00	3,809.10	3,808.74	8.41	7.86	-89.48	3.39	-375.32	375.36	359.09	16.27	23.069		
3,900.00	3,900.00	3,909.91	3,909.54	8.63	8.08	-89.24	4.95	-374.18	374.24	357.53	16.71	22.399		
4,000.00	4,000.00	4,009.32	4,008.92	8.86	8.29	-88.98	6.63	-372.99	373.07	355.93	17.14	21.765		
4,100.00	4,100.00	4,108.23	4,107.81	9.08	8.49	-88.70	8.44	-371.83	371.93	354.36	17.57	21.164		
4,200.00	4,200.00	4,209.52	4,209.08	9.31	8.71	-88.44	10.08	-370.68	370.84	352.83	18.01	20.589		
4,300.00	4,300.00	4,309.64	4,309.18	9.53	8.92	-88.18	11.75	-369.36	369.57	351.13	18.45	20.034		
4,400.00	4,400.00	4,408.21	4,407.72	9.75	9.12	-87.92	13.37	-368.23	368.49	349.61	18.88	19.518		
4,500.00	4,500.00	4,505.32	4,504.83	9.98	9.33	-87.76	14.36	-367.76	368.04	348.73	19.31	19.062		
4,500.70	4,500.70	4,505.99	4,505.50	9.98	9.33	-87.76	14.36	-367.76	368.04	348.73	19.31	19.059 CC		
4,600.00	4,600.00	4,602.82	4,602.33	10.20	9.53	-87.72	14.66	-368.08	368.38	348.65	19.74	18.666		
4,700.00	4,700.00	4,702.66	4,702.17	10.43	9.74	-87.76	14.46	-368.82	369.11	348.94	20.17	18.302		
4,800.00	4,800.00	4,804.58	4,804.09	10.65	9.95	-87.73	14.61	-369.19	369.48	348.87	20.61	17.931		
4,900.00	4,900.00	4,903.89	4,903.40	10.88	10.16	-87.74	14.61	-369.55	369.84	348.80	21.04	17.580		
5,000.00	5,000.00	5,002.33	5,001.83	11.10	10.36	-87.76	14.44	-369.89	370.19	348.72	21.47	17.244		
5,100.00	5,100.00	5,101.92	5,101.42	11.33	10.57	-87.85	13.91	-370.76	371.04	349.14	21.90	16.942		
5,200.00	5,200.00	5,201.40	5,200.89	11.55	10.78	-87.91	13.57	-371.86	372.13	349.80	22.33	16.664		
5,300.00	5,300.00	5,301.01	5,300.50	11.78	10.99	-87.94	13.40	-372.96	373.23	350.46	22.76	16.395		
5,400.00	5,400.00	5,401.82	5,401.30	12.00	11.20	-87.96	13.33	-373.90	374.15	350.96	23.20	16.128		
5,500.00	5,500.00	5,501.60	5,501.08	12.23	11.41	-87.92	13.61	-374.76	375.03	351.39	23.63	15.869		
5,600.00	5,600.00	5,603.03	5,602.50	12.45	11.62	-87.96	13.37	-375.33	375.58	351.51	24.07	15.604		
5,700.00	5,700.00	5,705.85	5,705.32	12.68	11.83	-88.04	12.84	-375.59	375.81	351.30	24.51	15.333		
5,704.65	5,704.65	5,709.98	5,709.45	12.69	11.84	-88.05	12.82	-375.58	375.80	351.27	24.53	15.321		
5,800.00	5,800.00	5,804.24	5,803.71	12.90	12.04	-88.12	12.37	-375.95	376.15	351.21	24.94	15.083		
5,900.00	5,900.00	5,900.68	5,900.15	13.13	12.24	-88.17	12.03	-376.33	376.55	351.19	25.37	14.845		
6,000.00	6,000.00	6,000.00	5,999.46	13.35	12.45	-88.24	11.62	-377.43	377.64	351.85	25.80	14.639		
6,100.00	6,100.00	6,101.44	6,100.89	13.58	12.66	-88.29	11.30	-378.57	378.76	352.53	26.23	14.438		
6,200.00	6,200.00	6,200.20	6,199.64	13.80	12.86	-88.35	10.95	-379.65	379.85	353.18	26.66	14.245		
6,300.00	6,300.00	6,300.00	6,299.43	14.03	13.07	-88.41	10.58	-380.95	381.14	354.04	27.10	14.065		
6,400.00	6,400.00	6,402.72	6,402.15	14.25	13.29	-88.49	10.08	-382.06	382.20	354.67	27.54	13.880		
6,500.00	6,500.00	6,500.00	6,499.42	14.47	13.49	-88.53	9.84	-383.13	383.30	355.33	27.97	13.706		
6,600.00	6,600.00	6,601.09	6,600.50	14.70	13.70	-88.62	9.25	-384.46	384.60	356.20	28.40	13.542		

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Anticollision Report



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Reference Wellbore: Wellbore #1
Reference Design: Plan #1

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Offset Design Sec. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5													Offset Site Error:	0.00 ft
Survey Program: 100-MWD, 10100-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		
6,700.00	6,700.00	6,697.59	6,696.99	14.92	13.90	-88.71	8.67	-385.71	385.88	357.05	28.83	13.386		
6,800.00	6,800.00	6,800.26	6,799.64	15.15	14.12	-88.82	7.99	-387.04	387.15	357.89	29.27	13.228		
6,900.00	6,900.00	6,900.00	6,899.37	15.37	14.33	-88.95	7.14	-388.43	388.54	358.84	29.70	13.082		
7,000.00	7,000.00	7,000.00	6,999.36	15.60	14.53	-89.09	6.20	-390.06	390.15	360.01	30.13	12.947		
7,100.00	7,100.00	7,097.91	7,097.25	15.82	14.74	-89.24	5.20	-391.58	391.69	361.13	30.56	12.816		
7,200.00	7,200.00	7,200.00	7,199.32	16.05	14.95	-89.41	4.08	-393.23	393.29	362.29	31.00	12.686		
7,300.00	7,300.00	7,297.72	7,297.01	16.27	15.16	-89.61	2.67	-394.84	394.92	363.49	31.43	12.565		
7,400.00	7,400.00	7,399.08	7,398.35	16.50	15.37	-89.83	1.20	-396.41	396.46	364.60	31.87	12.441		
7,500.00	7,500.00	7,499.89	7,499.14	16.72	15.58	-90.06	-0.44	-398.00	398.04	365.74	32.30	12.322		
7,600.00	7,600.00	7,599.15	7,598.37	16.95	15.79	-90.30	-2.08	-399.54	399.60	366.86	32.74	12.207		
7,700.00	7,700.00	7,699.10	7,698.29	17.17	16.00	-90.56	-3.89	-401.12	401.19	368.02	33.17	12.095		
7,800.00	7,800.00	7,803.31	7,802.49	17.40	16.22	-90.66	-4.66	-402.22	402.26	368.64	33.61	11.967		
7,900.00	7,900.00	7,901.89	7,901.07	17.62	16.42	-90.67	-4.74	-403.02	403.06	369.02	34.04	11.839		
8,000.00	8,000.00	8,002.51	8,001.68	17.85	16.63	-90.72	-5.05	-403.86	403.90	369.42	34.48	11.714		
8,100.00	8,100.00	8,103.02	8,102.19	18.07	16.84	-90.74	-5.21	-404.79	404.83	369.92	34.92	11.595		
8,200.00	8,200.00	8,203.41	8,202.57	18.30	17.05	-90.74	-5.22	-405.55	405.59	370.23	35.35	11.473		
8,300.00	8,300.00	8,306.93	8,306.09	18.52	17.27	-90.77	-5.46	-406.06	406.10	370.31	35.79	11.346		
8,305.53	8,305.53	8,311.17	8,310.33	18.53	17.28	-90.77	-5.46	-406.06	406.09	370.28	35.81	11.339		
8,400.00	8,400.00	8,402.01	8,401.17	18.75	17.47	-90.81	-5.78	-406.78	406.84	370.62	36.22	11.234		
8,500.00	8,500.00	8,500.86	8,500.01	18.97	17.68	-90.87	-6.21	-407.55	407.62	370.98	36.65	11.123		
8,600.00	8,600.00	8,601.22	8,600.37	19.20	17.89	-90.93	-6.63	-408.53	408.61	371.53	37.08	11.019		
8,700.00	8,700.00	8,700.94	8,700.08	19.42	18.10	-90.95	-6.81	-409.31	409.40	371.88	37.52	10.912		
8,800.00	8,800.00	8,802.23	8,801.37	19.64	18.31	-90.99	-7.10	-410.42	410.49	372.54	37.95	10.815		
8,900.00	8,900.00	8,900.00	8,899.13	19.87	18.51	-91.01	-7.26	-411.59	411.70	373.31	38.38	10.726		
9,000.00	9,000.00	8,997.26	8,996.37	20.09	18.72	-91.00	-7.18	-413.41	413.56	374.74	38.81	10.655		
9,100.00	9,100.00	9,095.77	9,094.86	20.32	18.93	-90.97	-7.06	-415.72	415.89	376.65	39.24	10.598		
9,200.00	9,200.00	9,195.19	9,194.24	20.54	19.13	-91.05	-7.63	-418.27	418.47	378.79	39.68	10.547		
9,300.00	9,300.00	9,293.07	9,292.08	20.77	19.34	-91.06	-7.81	-421.10	421.37	381.26	40.11	10.506		
9,400.00	9,400.00	9,394.26	9,393.22	20.99	19.55	-91.14	-8.47	-423.99	424.23	383.69	40.55	10.463		
9,500.00	9,500.00	9,502.49	9,501.43	21.22	19.78	-91.27	-9.41	-425.48	425.60	384.60	41.00	10.381		
9,600.00	9,600.00	9,600.00	9,598.94	21.44	19.99	-91.38	-10.28	-426.23	426.39	384.97	41.43	10.293		
9,700.00	9,700.00	9,706.63	9,705.56	21.67	20.21	-91.57	-11.70	-426.60	426.77	384.89	41.88	10.191		
9,725.24	9,725.24	9,731.24	9,730.16	21.72	20.26	-91.61	-12.01	-426.57	426.74	384.75	41.98	10.164		
9,800.00	9,800.00	9,804.74	9,803.66	21.89	20.41	-91.75	-13.03	-426.70	426.90	384.59	42.31	10.091		
9,900.00	9,900.00	9,907.88	9,906.77	22.12	20.63	-92.04	-15.15	-426.27	426.54	383.79	42.75	9.978		
10,000.00	10,000.00	10,007.12	10,005.99	22.34	20.84	-92.31	-17.20	-426.01	426.36	383.18	43.18	9.874		
10,013.67	10,013.67	10,019.05	10,017.92	22.37	20.86	-92.35	-17.45	-425.99	426.35	383.11	43.24	9.861		
10,087.53	10,087.53	10,093.33	10,092.19	22.54	21.02	-92.54	-18.91	-426.01	426.43	382.87	43.56	9.790		
10,100.00	10,100.00	10,106.05	10,104.90	22.56	21.05	80.70	-19.16	-426.00	426.40	382.79	43.61	9.778		
10,125.00	10,124.96	10,130.98	10,129.83	22.60	21.10	80.85	-19.52	-425.98	426.19	382.48	43.70	9.752		
10,150.00	10,149.82	10,155.78	10,154.63	22.65	21.15	81.22	-19.66	-425.97	425.77	381.98	43.80	9.721		
10,175.00	10,174.51	10,180.46	10,179.31	22.69	21.20	81.81	-19.66	-425.97	425.19	381.30	43.89	9.687		
10,200.00	10,198.96	10,204.91	10,203.76	22.73	21.25	82.57	-19.66	-425.97	424.47	380.48	43.99	9.650		
10,225.00	10,223.11	10,229.06	10,227.91	22.77	21.30	83.51	-19.66	-425.97	423.66	379.58	44.08	9.611		
10,250.00	10,246.88	10,252.83	10,251.68	22.82	21.35	84.60	-19.66	-425.97	422.82	378.65	44.17	9.572		
10,275.00	10,270.22	10,276.17	10,275.02	22.86	21.40	85.82	-19.66	-425.97	422.02	377.76	44.26	9.535		
10,300.00	10,293.06	10,299.01	10,297.86	22.90	21.45	87.16	-19.66	-425.97	421.34	376.99	44.35	9.501		
10,325.00	10,315.33	10,321.28	10,320.13	22.94	21.50	88.59	-19.66	-425.97	420.87	376.43	44.43	9.472		
10,348.55	10,335.75	10,341.70	10,340.55	22.97	21.54	90.00	-19.66	-425.97	420.70	376.19	44.51	9.451		
10,350.00	10,336.98	10,342.93	10,341.78	22.98	21.54	90.09	-19.66	-425.97	420.71	376.19	44.52	9.450		
10,375.00	10,357.94	10,363.89	10,362.74	23.01	21.59	91.61	-19.66	-425.97	420.95	376.35	44.60	9.438		
10,400.00	10,378.17	10,384.12	10,382.97	23.05	21.63	93.14	-19.66	-425.97	421.71	377.03	44.68	9.438		

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. 12, T 21 S. , R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5													Offset Site Error:	0.00 ft
Survey Program: 100-MWD, 10100-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		
10,425.00	10,397.60	10,407.42	10,406.27	23.10	21.68	94.93	-20.02	-425.96	423.01	378.24	44.78	9.447		
10,450.00	10,416.17	10,432.70	10,431.48	23.15	21.73	96.84	-21.68	-425.94	424.76	379.88	44.88	9.464		
10,475.00	10,433.85	10,459.08	10,457.68	23.21	21.79	98.77	-24.83	-425.90	426.93	381.94	44.99	9.488		
10,500.00	10,450.58	10,486.73	10,484.89	23.27	21.85	100.73	-29.68	-425.84	429.51	384.40	45.12	9.520		
10,525.00	10,466.31	10,515.80	10,513.16	23.33	21.91	102.73	-36.46	-425.75	432.46	387.22	45.24	9.558		
10,550.00	10,481.00	10,546.50	10,542.49	23.40	21.98	104.77	-45.48	-425.63	435.76	390.37	45.38	9.602		
10,575.00	10,494.62	10,579.04	10,572.89	23.48	22.05	106.86	-57.08	-425.48	439.33	393.80	45.53	9.649		
10,600.00	10,507.12	10,613.66	10,604.28	23.56	22.13	108.99	-71.66	-425.29	443.13	397.43	45.70	9.697		
10,625.00	10,518.47	10,650.65	10,636.56	23.65	22.22	111.18	-89.70	-425.06	447.07	401.19	45.88	9.745		
10,650.00	10,528.64	10,690.28	10,669.48	23.75	22.33	113.41	-111.75	-424.77	451.05	404.97	46.08	9.789		
10,675.00	10,537.60	10,732.86	10,702.68	23.85	22.45	115.67	-138.38	-424.43	454.96	408.66	46.30	9.827		
10,700.00	10,545.32	10,778.66	10,735.59	23.96	22.59	117.94	-170.20	-424.01	458.67	412.11	46.55	9.853		
10,725.00	10,551.80	10,827.92	10,767.41	24.08	22.76	120.21	-207.78	-423.52	462.02	415.17	46.84	9.864		
10,750.00	10,557.00	10,880.75	10,797.04	24.20	22.97	122.41	-251.49	-422.96	464.84	417.67	47.17	9.854		
10,775.00	10,560.91	10,937.13	10,823.12	24.33	23.23	124.50	-301.43	-422.31	466.96	419.40	47.56	9.818		
10,800.00	10,563.52	10,996.78	10,844.11	24.47	23.54	126.40	-357.22	-421.58	468.20	420.20	48.01	9.753		
10,825.00	10,564.83	11,059.16	10,858.44	24.61	23.90	128.06	-417.88	-420.80	468.40	419.89	48.51	9.655		
10,832.57	10,564.97	11,078.47	10,861.26	24.65	24.02	128.50	-436.98	-420.55	468.23	419.55	48.68	9.619		
10,900.00	10,565.67	11,178.29	10,865.69	25.06	24.71	129.61	-536.62	-419.25	463.54	413.77	49.77	9.313		
11,000.00	10,566.71	11,278.15	10,867.17	25.75	25.50	129.99	-636.46	-417.96	460.07	408.82	51.25	8.977		
11,012.33	10,566.84	11,290.48	10,867.35	25.84	25.60	130.01	-648.79	-417.80	460.02	408.57	51.44	8.942		
11,100.00	10,567.75	11,378.15	10,868.65	26.54	26.40	130.08	-736.44	-416.66	459.91	406.97	52.94	8.687		
11,200.00	10,568.78	11,478.14	10,870.13	27.44	27.38	130.16	-836.42	-415.36	459.79	404.97	54.82	8.387		
11,300.00	10,569.82	11,578.14	10,871.61	28.43	28.45	130.25	-936.40	-414.06	459.67	402.79	56.88	8.081		
11,400.00	10,570.86	11,678.14	10,873.09	29.49	29.60	130.33	-1,036.38	-412.76	459.55	400.46	59.09	7.777		
11,500.00	10,571.90	11,778.14	10,874.57	30.63	30.81	130.42	-1,136.35	-411.46	459.44	397.99	61.44	7.477		
11,600.00	10,572.93	11,878.13	10,876.05	31.83	32.08	130.50	-1,236.33	-410.17	459.32	395.40	63.92	7.186		
11,700.00	10,573.97	11,978.13	10,877.52	33.10	33.41	130.59	-1,336.31	-408.87	459.20	392.70	66.50	6.905		
11,800.00	10,575.01	12,078.13	10,879.00	34.41	34.78	130.67	-1,436.29	-407.57	459.09	389.91	69.18	6.636		
11,900.00	10,576.04	12,178.13	10,880.48	35.76	36.19	130.76	-1,536.27	-406.27	458.98	387.03	71.95	6.379		
12,000.00	10,577.08	12,278.12	10,881.96	37.16	37.63	130.84	-1,636.25	-404.97	458.87	384.07	74.80	6.135		
12,100.00	10,578.12	12,378.12	10,883.44	38.60	39.11	130.93	-1,736.22	-403.67	458.76	381.05	77.71	5.904		
12,200.00	10,579.16	12,478.12	10,884.92	40.06	40.62	131.01	-1,836.20	-402.37	458.65	377.96	80.68	5.685		
12,300.00	10,580.19	12,578.12	10,886.40	41.56	42.15	131.10	-1,936.18	-401.08	458.54	374.82	83.71	5.478		
12,400.00	10,581.23	12,678.12	10,887.88	43.08	43.71	131.18	-2,036.16	-399.78	458.43	371.64	86.79	5.282		
12,500.00	10,582.27	12,778.11	10,889.36	44.63	45.29	131.27	-2,136.14	-398.48	458.32	368.41	89.91	5.097		
12,600.00	10,583.30	12,878.11	10,890.84	46.19	46.88	131.35	-2,236.12	-397.18	458.22	365.14	93.07	4.923		
12,700.00	10,584.34	12,978.11	10,892.32	47.78	48.49	131.44	-2,336.09	-395.88	458.11	361.84	96.27	4.759		
12,763.59	10,585.00	13,041.70	10,893.26	48.79	49.53	131.49	-2,399.67	-395.06	458.04	359.72	98.32	4.659		
12,768.04	10,585.04	13,046.14	10,893.32	48.86	49.60	131.50	-2,404.12	-395.00	458.04	359.58	98.46	4.652		
12,776.01	10,585.10	13,054.12	10,893.44	48.99	49.73	131.51	-2,412.09	-394.90	458.05	359.33	98.72	4.640		
12,800.00	10,585.25	13,078.10	10,893.80	49.38	50.12	131.54	-2,436.07	-394.58	458.09	358.60	99.50	4.604		
12,900.00	10,585.85	13,178.10	10,895.27	50.99	51.76	131.66	-2,536.05	-393.29	458.28	355.53	102.76	4.460		
13,000.00	10,586.45	13,278.09	10,896.75	52.62	53.42	131.79	-2,636.02	-391.99	458.47	352.43	106.04	4.324		
13,100.00	10,587.06	13,378.09	10,898.23	54.27	55.08	131.91	-2,736.00	-390.69	458.66	349.32	109.35	4.195		
13,200.00	10,587.66	13,478.08	10,899.71	55.92	56.76	132.04	-2,835.97	-389.39	458.86	346.18	112.68	4.072		
13,300.00	10,588.26	13,578.08	10,901.19	57.59	58.44	132.16	-2,935.95	-388.09	459.05	343.03	116.03	3.956		
13,400.00	10,588.87	13,678.07	10,902.67	59.26	60.13	132.29	-3,035.92	-386.79	459.25	339.86	119.40	3.846		
13,500.00	10,589.47	13,778.07	10,904.15	60.95	61.83	132.41	-3,135.90	-385.49	459.45	336.67	122.78	3.742		
13,600.00	10,590.08	13,878.06	10,905.63	62.64	63.54	132.54	-3,235.87	-384.20	459.66	333.47	126.18	3.643		
13,700.00	10,590.68	13,978.06	10,907.11	64.34	65.26	132.66	-3,335.85	-382.90	459.86	330.26	129.60	3.548		
13,800.00	10,591.28	14,078.05	10,908.59	66.05	66.98	132.79	-3,435.83	-381.60	460.07	327.04	133.03	3.458		

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. 12, T 21 S. , R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Plan #5													Offset Site Error:	0.00 ft
Survey Program: 100-MWVD, 10100-MWVD													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		
13,900.00	10,591.89	14,178.05	10,910.07	67.76	68.71	132.91	-3,535.80	-380.30	460.28	323.81	136.47	3.373		
14,000.00	10,592.49	14,278.04	10,911.54	69.48	70.44	133.04	-3,635.78	-379.00	460.49	320.57	139.92	3.291		
14,100.00	10,593.09	14,378.04	10,913.02	71.20	72.18	133.16	-3,735.75	-377.70	460.70	317.32	143.38	3.213		
14,200.00	10,593.70	14,478.03	10,914.50	72.93	73.92	133.28	-3,835.73	-376.41	460.92	314.07	146.85	3.139		
14,300.00	10,594.30	14,578.03	10,915.98	74.67	75.66	133.41	-3,935.70	-375.11	461.14	310.81	150.33	3.067		
14,400.00	10,594.90	14,678.02	10,917.46	76.41	77.41	133.53	-4,035.68	-373.81	461.36	307.54	153.82	2.999		
14,500.00	10,595.51	14,778.02	10,918.94	78.15	79.17	133.66	-4,135.65	-372.51	461.58	304.26	157.32	2.934		
14,600.00	10,596.11	14,878.01	10,920.42	79.90	80.92	133.78	-4,235.63	-371.21	461.81	300.98	160.82	2.872		
14,700.00	10,596.71	14,978.01	10,921.90	81.65	82.68	133.90	-4,335.60	-369.91	462.03	297.70	164.34	2.812		
14,800.00	10,597.32	15,078.00	10,923.38	83.41	84.45	134.03	-4,435.58	-368.61	462.26	294.41	167.85	2.754		
14,900.00	10,597.92	15,178.00	10,924.86	85.16	86.21	134.15	-4,535.55	-367.32	462.49	291.12	171.38	2.699		
15,000.00	10,598.53	15,277.99	10,926.34	86.92	87.98	134.27	-4,635.53	-366.02	462.73	287.82	174.91	2.646		
15,100.00	10,599.13	15,377.98	10,927.81	88.69	89.76	134.40	-4,735.51	-364.72	462.96	284.52	178.44	2.594		
15,200.00	10,599.73	15,477.98	10,929.29	90.45	91.53	134.52	-4,835.48	-363.42	463.20	281.22	181.98	2.545		
15,244.42	10,600.00	15,522.39	10,929.95	91.24	92.32	134.57	-4,879.89	-362.84	463.31	279.75	183.56	2.524 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. 12, T 21 S. , R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Wellbore #1													Offset Site Error:	0.00 ft
Survey Program: 100-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		
0.00	0.00	4.70	4.70	0.00	0.00	-89.20	5.60	-400.30	400.34					
100.00	100.00	103.05	103.05	0.09	0.10	-89.25	5.26	-400.59	400.63	400.44	0.19	2,118.807		
200.00	200.00	206.33	206.32	0.31	0.31	-89.36	4.46	-400.48	400.51	399.89	0.62	642.761		
300.00	300.00	305.01	305.00	0.54	0.51	-89.40	4.17	-400.34	400.36	399.31	1.05	379.704		
400.00	400.00	407.30	407.30	0.76	0.73	-89.48	3.61	-399.98	400.00	398.50	1.50	267.164		
500.00	500.00	506.21	506.20	0.99	0.94	-89.50	3.50	-399.52	399.54	397.61	1.93	207.349		
600.00	600.00	606.70	606.69	1.21	1.15	-89.52	3.33	-399.23	399.24	396.88	2.36	169.055		
700.00	700.00	705.81	705.79	1.44	1.35	-89.51	3.40	-398.62	398.64	395.84	2.79	142.742		
800.00	800.00	806.63	806.62	1.66	1.57	-89.54	3.21	-398.20	398.22	394.99	3.23	123.337		
900.00	900.00	905.28	905.26	1.89	1.77	-89.56	3.04	-397.90	397.91	394.25	3.66	108.725		
976.34	976.34	980.99	980.97	2.06	1.93	-89.58	2.92	-397.79	397.80	393.81	3.99	99.703		
1,000.00	1,000.00	1,004.17	1,004.16	2.11	1.98	-89.59	2.82	-397.80	397.81	393.72	4.09	97.225		
1,100.00	1,100.00	1,105.64	1,105.62	2.34	2.19	-89.61	2.69	-397.93	397.94	393.41	4.53	87.866		
1,200.00	1,200.00	1,207.66	1,207.63	2.56	2.41	-89.66	2.33	-397.56	397.58	392.61	4.97	80.027		
1,300.00	1,300.00	1,306.42	1,306.39	2.79	2.61	-89.67	2.27	-397.13	397.14	391.74	5.40	73.553		
1,388.24	1,388.24	1,393.06	1,393.04	2.99	2.79	-89.66	2.38	-396.93	396.94	391.16	5.78	68.683		
1,400.00	1,400.00	1,404.49	1,404.47	3.01	2.82	-89.64	2.47	-396.94	396.95	391.12	5.83	68.093		
1,500.00	1,500.00	1,505.24	1,505.21	3.24	3.03	-89.58	2.94	-396.98	396.99	390.73	6.26	63.367		
1,527.31	1,527.31	1,532.48	1,532.45	3.30	3.09	-89.57	2.98	-396.93	396.94	390.55	6.38	62.182		
1,600.00	1,600.00	1,603.94	1,603.92	3.46	3.24	-89.54	3.18	-397.07	397.08	390.39	6.70	59.297		
1,700.00	1,700.00	1,702.63	1,702.60	3.69	3.44	-89.49	3.56	-397.34	397.36	390.23	7.13	55.748		
1,800.00	1,800.00	1,804.25	1,804.22	3.91	3.65	-89.45	3.79	-397.60	397.62	390.06	7.57	52.555		
1,900.00	1,900.00	1,904.84	1,904.81	4.14	3.86	-89.48	3.61	-397.79	397.81	389.81	8.00	49.722		
1,900.11	1,900.11	1,904.94	1,904.91	4.14	3.87	-89.48	3.61	-397.79	397.81	389.81	8.00	49.719		
2,000.00	2,000.00	2,006.77	2,006.74	4.36	4.08	-89.52	3.34	-397.81	397.83	389.39	8.44	47.140		
2,082.25	2,082.25	2,087.08	2,087.05	4.55	4.25	-89.55	3.13	-397.57	397.58	388.79	8.79	45.219		
2,100.00	2,100.00	2,104.09	2,104.06	4.59	4.28	-89.55	3.14	-397.60	397.61	388.75	8.87	44.838		
2,200.00	2,200.00	2,206.41	2,206.38	4.81	4.50	-89.52	3.31	-397.24	397.25	387.95	9.31	42.684		
2,300.00	2,300.00	2,305.98	2,305.95	5.03	4.71	-89.53	3.26	-396.95	396.96	387.22	9.74	40.756		
2,400.00	2,400.00	2,406.85	2,406.82	5.26	4.92	-89.55	3.13	-396.51	396.53	386.35	10.18	38.966		
2,500.00	2,500.00	2,506.05	2,506.02	5.48	5.12	-89.60	2.75	-396.19	396.20	385.59	10.61	37.347		
2,600.00	2,600.00	2,607.34	2,607.30	5.71	5.34	-89.67	2.26	-395.49	395.51	384.46	11.05	35.805		
2,700.00	2,700.00	2,707.07	2,707.03	5.93	5.55	-89.76	1.65	-394.95	394.96	383.48	11.48	34.404		
2,800.00	2,800.00	2,807.32	2,807.27	6.16	5.76	-89.86	0.97	-393.98	393.99	382.08	11.92	33.067		
2,900.00	2,900.00	2,910.36	2,910.29	6.38	5.97	-90.03	-0.20	-393.09	393.13	380.77	12.36	31.816		
3,000.00	3,000.00	3,011.21	3,011.13	6.61	6.18	-90.14	-0.96	-391.57	391.62	378.83	12.79	30.612		
3,100.00	3,100.00	3,115.01	3,114.90	6.83	6.40	-90.26	-1.76	-389.47	389.60	376.36	13.24	29.434		
3,200.00	3,200.00	3,219.56	3,219.40	7.06	6.63	-90.41	-2.73	-386.13	386.42	372.74	13.68	28.240		
3,300.00	3,300.00	3,318.78	3,318.55	7.28	6.84	-90.49	-3.30	-382.44	382.70	368.58	14.12	27.106		
3,400.00	3,400.00	3,412.80	3,412.52	7.51	7.03	-90.46	-3.06	-379.69	379.78	365.24	14.54	26.117		
3,500.00	3,500.00	3,508.93	3,508.64	7.73	7.24	-90.26	-1.70	-378.50	378.53	363.56	14.97	25.290		
3,600.00	3,600.00	3,608.58	3,608.27	7.96	7.44	-90.01	-0.09	-377.46	377.48	362.08	15.40	24.510		
3,700.00	3,700.00	3,708.51	3,708.17	8.18	7.65	-89.74	1.69	-376.41	376.42	360.59	15.84	23.771		
3,800.00	3,800.00	3,809.10	3,808.74	8.41	7.86	-89.48	3.39	-375.32	375.36	359.09	16.27	23.069		
3,900.00	3,900.00	3,909.91	3,909.54	8.63	8.08	-89.24	4.95	-374.18	374.24	357.53	16.71	22.399		
4,000.00	4,000.00	4,009.32	4,008.92	8.86	8.29	-88.98	6.63	-372.99	373.07	355.93	17.14	21.765		
4,100.00	4,100.00	4,108.23	4,107.81	9.08	8.49	-88.70	8.44	-371.83	371.93	354.36	17.57	21.164		
4,200.00	4,200.00	4,209.52	4,209.08	9.31	8.71	-88.44	10.08	-370.68	370.84	352.83	18.01	20.589		
4,300.00	4,300.00	4,309.64	4,309.18	9.53	8.92	-88.18	11.75	-369.36	369.57	351.13	18.45	20.034		
4,400.00	4,400.00	4,408.21	4,407.72	9.75	9.12	-87.92	13.37	-368.23	368.49	349.61	18.88	19.518		
4,500.00	4,500.00	4,505.32	4,504.83	9.98	9.33	-87.76	14.36	-367.76	368.04	348.73	19.31	19.062		
4,500.70	4,500.70	4,505.99	4,505.50	9.98	9.33	-87.76	14.36	-367.76	368.04	348.73	19.31	19.059 CC		

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



Integrity Directional Services, LLC

Anticollision Report



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Survey Program: 100-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		
4,600.00	4,600.00	4,602.82	4,602.33	10.20	9.53	-87.72	14.66	-368.08	368.38	348.65	19.74	18.666 ES		
4,700.00	4,700.00	4,702.66	4,702.17	10.43	9.74	-87.76	14.46	-368.82	369.11	348.94	20.17	18.302		
4,800.00	4,800.00	4,804.58	4,804.09	10.65	9.95	-87.73	14.61	-369.19	369.48	348.87	20.61	17.931		
4,900.00	4,900.00	4,903.89	4,903.40	10.88	10.16	-87.74	14.61	-369.55	369.84	348.80	21.04	17.580		
5,000.00	5,000.00	5,002.33	5,001.83	11.10	10.36	-87.76	14.44	-369.89	370.19	348.72	21.47	17.244		
5,100.00	5,100.00	5,101.92	5,101.42	11.33	10.57	-87.85	13.91	-370.76	371.04	349.14	21.90	16.942		
5,200.00	5,200.00	5,201.40	5,200.89	11.55	10.78	-87.91	13.57	-371.86	372.13	349.80	22.33	16.664		
5,300.00	5,300.00	5,301.01	5,300.50	11.78	10.99	-87.94	13.40	-372.96	373.23	350.46	22.76	16.395		
5,400.00	5,400.00	5,401.82	5,401.30	12.00	11.20	-87.96	13.33	-373.90	374.15	350.96	23.20	16.128		
5,500.00	5,500.00	5,501.60	5,501.08	12.23	11.41	-87.92	13.61	-374.76	375.03	351.39	23.63	15.869		
5,600.00	5,600.00	5,603.03	5,602.50	12.45	11.62	-87.96	13.37	-375.33	375.58	351.51	24.07	15.604		
5,700.00	5,700.00	5,705.85	5,705.32	12.68	11.83	-88.04	12.84	-375.59	375.81	351.30	24.51	15.333		
5,704.65	5,704.65	5,709.98	5,709.45	12.69	11.84	-88.05	12.82	-375.58	375.80	351.27	24.53	15.321		
5,800.00	5,800.00	5,804.24	5,803.71	12.90	12.04	-88.12	12.37	-375.95	376.15	351.21	24.94	15.083		
5,900.00	5,900.00	5,900.68	5,900.15	13.13	12.24	-88.17	12.03	-376.33	376.55	351.19	25.37	14.845		
6,000.00	6,000.00	6,000.00	5,999.46	13.35	12.45	-88.24	11.62	-377.43	377.64	351.85	25.80	14.639		
6,100.00	6,100.00	6,101.44	6,100.89	13.58	12.66	-88.29	11.30	-378.57	378.76	352.53	26.23	14.438		
6,200.00	6,200.00	6,200.20	6,199.64	13.80	12.86	-88.35	10.95	-379.65	379.85	353.18	26.66	14.245		
6,300.00	6,300.00	6,300.00	6,299.43	14.03	13.07	-88.41	10.58	-380.95	381.14	354.04	27.10	14.065		
6,400.00	6,400.00	6,402.72	6,402.15	14.25	13.29	-88.49	10.08	-382.06	382.20	354.67	27.54	13.880		
6,500.00	6,500.00	6,500.00	6,499.42	14.47	13.49	-88.53	9.84	-383.13	383.30	355.33	27.97	13.706		
6,600.00	6,600.00	6,601.09	6,600.50	14.70	13.70	-88.62	9.25	-384.46	384.60	356.20	28.40	13.542		
6,700.00	6,700.00	6,697.59	6,696.99	14.92	13.90	-88.71	8.67	-385.71	385.88	357.05	28.83	13.386		
6,800.00	6,800.00	6,800.26	6,799.64	15.15	14.12	-88.82	7.99	-387.04	387.15	357.89	29.27	13.228		
6,900.00	6,900.00	6,900.00	6,899.37	15.37	14.33	-88.95	7.14	-388.43	388.54	358.84	29.70	13.082		
7,000.00	7,000.00	7,000.00	6,999.36	15.60	14.53	-89.09	6.20	-390.06	390.15	360.01	30.13	12.947		
7,100.00	7,100.00	7,097.91	7,097.25	15.82	14.74	-89.24	5.20	-391.58	391.69	361.13	30.56	12.816		
7,200.00	7,200.00	7,200.00	7,199.32	16.05	14.95	-89.41	4.08	-393.23	393.29	362.29	31.00	12.686		
7,300.00	7,300.00	7,297.72	7,297.01	16.27	15.16	-89.61	2.67	-394.84	394.92	363.49	31.43	12.565		
7,400.00	7,400.00	7,399.08	7,398.35	16.50	15.37	-89.83	1.20	-396.41	396.46	364.60	31.87	12.441		
7,500.00	7,500.00	7,499.89	7,499.14	16.72	15.58	-90.06	-0.44	-398.00	398.04	365.74	32.30	12.322		
7,600.00	7,600.00	7,599.15	7,598.37	16.95	15.79	-90.30	-2.08	-399.54	399.60	366.86	32.74	12.207		
7,700.00	7,700.00	7,699.10	7,698.29	17.17	16.00	-90.56	-3.89	-401.12	401.19	368.02	33.17	12.095		
7,800.00	7,800.00	7,803.31	7,802.49	17.40	16.22	-90.66	-4.66	-402.22	402.26	368.64	33.61	11.967		
7,900.00	7,900.00	7,901.89	7,901.07	17.62	16.42	-90.67	-4.74	-403.02	403.06	369.02	34.04	11.839		
8,000.00	8,000.00	8,002.51	8,001.68	17.85	16.63	-90.72	-5.05	-403.86	403.90	369.42	34.48	11.714		
8,100.00	8,100.00	8,103.02	8,102.19	18.07	16.84	-90.74	-5.21	-404.79	404.83	369.92	34.92	11.595		
8,200.00	8,200.00	8,203.41	8,202.57	18.30	17.05	-90.74	-5.22	-405.55	405.59	370.23	35.35	11.473		
8,300.00	8,300.00	8,306.93	8,306.09	18.52	17.27	-90.77	-5.46	-406.06	406.10	370.31	35.79	11.346		
8,305.53	8,305.53	8,311.17	8,310.33	18.53	17.28	-90.77	-5.46	-406.06	406.09	370.28	35.81	11.339		
8,400.00	8,400.00	8,402.01	8,401.17	18.75	17.47	-90.81	-5.78	-406.78	406.84	370.62	36.22	11.234		
8,500.00	8,500.00	8,500.86	8,500.01	18.97	17.68	-90.87	-6.21	-407.55	407.62	370.98	36.65	11.123		
8,600.00	8,600.00	8,601.22	8,600.37	19.20	17.89	-90.93	-6.63	-408.53	408.61	371.53	37.08	11.019		
8,700.00	8,700.00	8,700.94	8,700.08	19.42	18.10	-90.95	-6.81	-409.31	409.40	371.88	37.52	10.912		
8,800.00	8,800.00	8,802.23	8,801.37	19.64	18.31	-90.99	-7.10	-410.42	410.49	372.54	37.95	10.815		
8,900.00	8,900.00	8,900.00	8,899.13	19.87	18.51	-91.01	-7.26	-411.59	411.70	373.31	38.38	10.726		
9,000.00	9,000.00	8,997.26	8,996.37	20.09	18.72	-91.00	-7.18	-413.41	413.56	374.74	38.81	10.655		
9,100.00	9,100.00	9,095.77	9,094.86	20.32	18.93	-90.97	-7.06	-415.72	415.89	376.65	39.24	10.598		
9,200.00	9,200.00	9,195.19	9,194.24	20.54	19.13	-91.05	-7.63	-418.27	418.47	378.79	39.68	10.547		
9,300.00	9,300.00	9,293.07	9,292.08	20.77	19.34	-91.06	-7.81	-421.10	421.37	381.26	40.11	10.506		
9,400.00	9,400.00	9,394.26	9,393.22	20.99	19.55	-91.14	-8.47	-423.99	424.23	383.69	40.55	10.463		
9,500.00	9,500.00	9,502.49	9,501.43	21.22	19.78	-91.27	-9.41	-425.48	425.60	384.60	41.00	10.381		

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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		
9,600.00	9,600.00	9,600.00	9,598.94	21.44	19.99	-91.38	-10.28	-426.23	426.39	384.97	41.43	10.293		
9,700.00	9,700.00	9,706.63	9,705.56	21.67	20.21	-91.57	-11.70	-426.60	426.77	384.89	41.88	10.191		
9,725.24	9,725.24	9,731.24	9,730.16	21.72	20.26	-91.61	-12.01	-426.57	426.74	384.75	41.98	10.164		
9,800.00	9,800.00	9,804.74	9,803.66	21.89	20.41	-91.75	-13.03	-426.70	426.90	384.59	42.31	10.091		
9,900.00	9,900.00	9,907.88	9,906.77	22.12	20.63	-92.04	-15.15	-426.27	426.54	383.79	42.75	9.978		
10,000.00	10,000.00	10,007.12	10,005.99	22.34	20.84	-92.31	-17.20	-426.01	426.36	383.18	43.18	9.874		
10,013.67	10,013.67	10,019.05	10,017.92	22.37	20.86	-92.35	-17.45	-425.99	426.35	383.11	43.24	9.861		
10,087.53	10,087.53	10,093.33	10,092.19	22.54	21.02	-92.54	-18.91	-426.01	426.43	382.87	43.56	9.790		
10,095.15	10,095.15	10,100.00	10,098.85	22.55	21.03	80.70	-19.04	-426.00	426.42	382.83	43.59	9.783		
10,100.00	10,100.00	10,100.00	10,098.85	22.56	21.03	80.69	-19.04	-426.00	426.44	382.85	43.60	9.782 SF		
10,125.00	10,124.96	10,100.00	10,098.85	22.60	21.03	80.59	-19.04	-426.00	427.31	383.67	43.64	9.792		
10,150.00	10,149.82	10,100.00	10,098.85	22.65	21.03	80.34	-19.04	-426.00	429.42	385.74	43.68	9.831		
10,175.00	10,174.51	10,100.00	10,098.85	22.69	21.03	79.94	-19.04	-426.00	432.75	389.03	43.72	9.898		
10,200.00	10,198.96	10,100.00	10,098.85	22.73	21.03	79.40	-19.04	-426.00	437.27	393.50	43.77	9.991		
10,225.00	10,223.11	10,100.00	10,098.85	22.77	21.03	78.72	-19.04	-426.00	442.91	399.10	43.81	10.110		
10,250.00	10,246.88	10,100.00	10,098.85	22.82	21.03	77.90	-19.04	-426.00	449.63	405.78	43.85	10.254		
10,275.00	10,270.22	10,100.00	10,098.85	22.86	21.03	76.95	-19.04	-426.00	457.37	413.47	43.89	10.420		
10,300.00	10,293.06	10,100.00	10,098.85	22.90	21.03	75.87	-19.04	-426.00	466.04	422.11	43.93	10.608		
10,325.00	10,315.33	10,100.00	10,098.85	22.94	21.03	74.67	-19.04	-426.00	475.57	431.60	43.97	10.816		
10,350.00	10,336.98	10,100.00	10,098.85	22.98	21.03	73.36	-19.04	-426.00	485.90	441.89	44.01	11.041		
10,375.00	10,357.94	10,100.00	10,098.85	23.01	21.03	71.95	-19.04	-426.00	496.94	452.89	44.05	11.282		
10,400.00	10,378.17	10,100.00	10,098.85	23.05	21.03	70.45	-19.04	-426.00	508.61	464.52	44.09	11.537		
10,425.00	10,397.60	10,100.00	10,098.85	23.10	21.03	68.87	-19.04	-426.00	520.85	476.71	44.13	11.802		
10,450.00	10,416.17	10,100.00	10,098.85	23.15	21.03	67.23	-19.04	-426.00	533.58	489.39	44.18	12.076		
10,475.00	10,433.85	10,100.00	10,098.85	23.21	21.03	65.53	-19.04	-426.00	546.73	502.49	44.24	12.358		
10,500.00	10,450.58	10,100.00	10,098.85	23.27	21.03	63.79	-19.04	-426.00	560.24	515.94	44.30	12.646		
10,525.00	10,466.31	10,100.00	10,098.85	23.33	21.03	62.02	-19.04	-426.00	574.05	529.68	44.37	12.939		
10,550.00	10,481.00	10,100.00	10,098.85	23.40	21.03	60.23	-19.04	-426.00	588.10	543.66	44.44	13.234		
10,575.00	10,494.62	10,100.00	10,098.85	23.48	21.03	58.44	-19.04	-426.00	602.34	557.82	44.52	13.531		
10,600.00	10,507.12	10,100.00	10,098.85	23.56	21.03	56.66	-19.04	-426.00	616.71	572.11	44.60	13.828		
10,625.00	10,518.47	10,100.00	10,098.85	23.65	21.03	54.91	-19.04	-426.00	631.17	586.49	44.69	14.124		
10,650.00	10,528.64	10,100.00	10,098.85	23.75	21.03	53.18	-19.04	-426.00	645.68	600.90	44.78	14.418		
10,675.00	10,537.60	10,100.00	10,098.85	23.85	21.03	51.48	-19.04	-426.00	660.19	615.30	44.89	14.708		
10,700.00	10,545.32	10,100.00	10,098.85	23.96	21.03	49.84	-19.04	-426.00	674.67	629.67	45.00	14.994		
10,725.00	10,551.80	10,100.00	10,098.85	24.08	21.03	48.24	-19.04	-426.00	689.07	643.96	45.11	15.274		
10,750.00	10,557.00	10,100.00	10,098.85	24.20	21.03	46.70	-19.04	-426.00	703.36	658.13	45.24	15.549		
10,775.00	10,560.91	10,100.00	10,098.85	24.33	21.03	45.22	-19.04	-426.00	717.52	672.16	45.37	15.817		
10,800.00	10,563.52	10,100.00	10,098.85	24.47	21.03	43.80	-19.04	-426.00	731.52	686.02	45.50	16.077		
10,825.00	10,564.83	10,100.00	10,098.85	24.61	21.03	42.44	-19.04	-426.00	745.31	699.67	45.64	16.329		
10,832.57	10,564.97	10,100.00	10,098.85	24.65	21.03	42.04	-19.04	-426.00	749.45	703.76	45.69	16.404		
10,900.00	10,565.67	10,100.00	10,098.85	25.06	21.03	40.60	-19.04	-426.00	789.06	742.96	46.10	17.117		
11,000.00	10,566.71	10,100.00	10,098.85	25.75	21.03	37.76	-19.04	-426.00	856.94	810.16	46.78	18.317		
11,012.33	10,566.84	10,100.00	10,098.85	25.84	21.03	37.34	-19.04	-426.00	865.95	819.08	46.88	18.473		
11,100.00	10,567.75	10,100.00	10,098.85	26.54	21.03	37.34	-19.04	-426.00	932.35	884.77	47.58	19.596		
11,200.00	10,568.78	10,100.00	10,098.85	27.44	21.03	37.34	-19.04	-426.00	1,012.05	963.58	48.47	20.878		
11,300.00	10,569.82	10,100.00	10,098.85	28.43	21.03	37.34	-19.04	-426.00	1,095.09	1,045.63	49.46	22.141		
11,400.00	10,570.86	10,100.00	10,098.85	29.49	21.03	37.34	-19.04	-426.00	1,180.76	1,130.23	50.53	23.369		
11,500.00	10,571.90	10,100.00	10,098.85	30.63	21.03	37.34	-19.04	-426.00	1,268.52	1,216.86	51.67	24.553		
11,600.00	10,572.93	10,100.00	10,098.85	31.83	21.03	37.34	-19.04	-426.00	1,357.98	1,305.12	52.87	25.686		
11,700.00	10,573.97	10,100.00	10,098.85	33.10	21.03	37.34	-19.04	-426.00	1,448.82	1,394.69	54.13	26.766		
11,800.00	10,575.01	10,100.00	10,098.85	34.41	21.03	37.34	-19.04	-426.00	1,540.80	1,485.36	55.44	27.791		
11,900.00	10,576.04	10,100.00	10,098.85	35.76	21.03	37.34	-19.04	-426.00	1,633.72	1,576.92	56.80	28.763		

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. 12, T 21 S. , R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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													Offset Site Error:	0.00 ft
Sec. 12, T 21 S. , R 33 E - Bobwhite 12 State Com 2H - Wellbore #1 - Wellbore #1													Offset Well Error:	0.00 ft
Survey Program: 100-MWVD														
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	
12,000.00	10,577.08	10,100.00	10,098.85	37.16	21.03	37.34	-19.04	-426.00	1,727.42	1,669.23	58.20	29.682		
12,100.00	10,578.12	10,100.00	10,098.85	38.60	21.03	37.34	-19.04	-426.00	1,821.80	1,762.17	59.63	30.551		
12,200.00	10,579.16	10,100.00	10,098.85	40.06	21.03	37.34	-19.04	-426.00	1,916.75	1,855.65	61.10	31.372		
12,300.00	10,580.19	10,100.00	10,098.85	41.56	21.03	37.34	-19.04	-426.00	2,012.19	1,949.59	62.59	32.147		
12,400.00	10,581.23	10,100.00	10,098.85	43.08	21.03	37.34	-19.04	-426.00	2,108.05	2,043.93	64.12	32.879		
12,500.00	10,582.27	10,100.00	10,098.85	44.63	21.03	37.34	-19.04	-426.00	2,204.28	2,138.62	65.66	33.571		
12,600.00	10,583.30	10,100.00	10,098.85	46.19	21.03	37.34	-19.04	-426.00	2,300.83	2,233.60	67.23	34.226		
12,700.00	10,584.34	10,100.00	10,098.85	47.78	21.03	37.34	-19.04	-426.00	2,397.66	2,328.85	68.81	34.845		
12,763.59	10,585.00	10,100.00	10,098.85	48.79	21.03	37.34	-19.04	-426.00	2,459.37	2,389.54	69.83	35.221		
12,776.01	10,585.10	10,100.00	10,098.85	48.99	21.03	36.73	-19.04	-426.00	2,471.43	2,401.40	70.03	35.293		
12,800.00	10,585.25	10,100.00	10,098.85	49.38	21.03	36.73	-19.04	-426.00	2,494.72	2,424.31	70.41	35.431		
12,900.00	10,585.85	10,100.00	10,098.85	50.99	21.03	36.73	-19.04	-426.00	2,591.94	2,519.92	72.03	35.986		
13,000.00	10,586.45	10,100.00	10,098.85	52.62	21.03	36.73	-19.04	-426.00	2,689.38	2,615.72	73.66	36.512		
13,100.00	10,587.06	10,100.00	10,098.85	54.27	21.03	36.73	-19.04	-426.00	2,786.99	2,711.69	75.30	37.011		
13,200.00	10,587.66	10,100.00	10,098.85	55.92	21.03	36.73	-19.04	-426.00	2,884.76	2,807.81	76.96	37.486		
13,300.00	10,588.26	10,100.00	10,098.85	57.59	21.03	36.73	-19.04	-426.00	2,982.69	2,904.07	78.62	37.937		
13,400.00	10,588.87	10,100.00	10,098.85	59.26	21.03	36.73	-19.04	-426.00	3,080.74	3,000.45	80.30	38.367		
13,500.00	10,589.47	10,100.00	10,098.85	60.95	21.03	36.73	-19.04	-426.00	3,178.92	3,096.94	81.98	38.776		
13,600.00	10,590.08	10,100.00	10,098.85	62.64	21.03	36.73	-19.04	-426.00	3,277.21	3,193.54	83.67	39.167		
13,700.00	10,590.68	10,100.00	10,098.85	64.34	21.03	36.73	-19.04	-426.00	3,375.60	3,290.23	85.37	39.539		
13,800.00	10,591.28	10,100.00	10,098.85	66.05	21.03	36.73	-19.04	-426.00	3,474.08	3,387.00	87.08	39.895		
13,900.00	10,591.89	10,100.00	10,098.85	67.76	21.03	36.73	-19.04	-426.00	3,572.65	3,483.85	88.79	40.235		
14,000.00	10,592.49	10,100.00	10,098.85	69.48	21.03	36.73	-19.04	-426.00	3,671.29	3,580.77	90.51	40.561		
14,100.00	10,593.09	10,100.00	10,098.85	71.20	21.03	36.73	-19.04	-426.00	3,770.00	3,677.76	92.24	40.872		
14,200.00	10,593.70	10,100.00	10,098.85	72.93	21.03	36.73	-19.04	-426.00	3,868.78	3,774.81	93.97	41.171		
14,300.00	10,594.30	10,100.00	10,098.85	74.67	21.03	36.73	-19.04	-426.00	3,967.62	3,871.92	95.70	41.458		
14,400.00	10,594.90	10,100.00	10,098.85	76.41	21.03	36.73	-19.04	-426.00	4,066.52	3,969.08	97.44	41.733		
14,500.00	10,595.51	10,100.00	10,098.85	78.15	21.03	36.73	-19.04	-426.00	4,165.47	4,066.29	99.19	41.997		
14,600.00	10,596.11	10,100.00	10,098.85	79.90	21.03	36.73	-19.04	-426.00	4,264.47	4,163.54	100.93	42.250		
14,700.00	10,596.71	10,100.00	10,098.85	81.65	21.03	36.73	-19.04	-426.00	4,363.52	4,260.83	102.68	42.494		
14,800.00	10,597.32	10,100.00	10,098.85	83.41	21.03	36.73	-19.04	-426.00	4,462.61	4,358.17	104.44	42.729		
14,900.00	10,597.92	10,100.00	10,098.85	85.16	21.03	36.73	-19.04	-426.00	4,561.73	4,455.54	106.20	42.956		
15,000.00	10,598.53	10,100.00	10,098.85	86.92	21.03	36.73	-19.04	-426.00	4,660.90	4,552.94	107.96	43.174		
15,100.00	10,599.13	10,100.00	10,098.85	88.69	21.03	36.73	-19.04	-426.00	4,760.10	4,650.38	109.72	43.384		
15,200.00	10,599.73	10,100.00	10,098.85	90.45	21.03	36.73	-19.04	-426.00	4,859.33	4,747.84	111.49	43.586		
15,244.42	10,600.00	10,100.00	10,098.85	91.24	21.03	36.73	-19.04	-426.00	4,903.42	4,791.14	112.27	43.674		



Integrity Directional Services, LLC

Anticollision Report



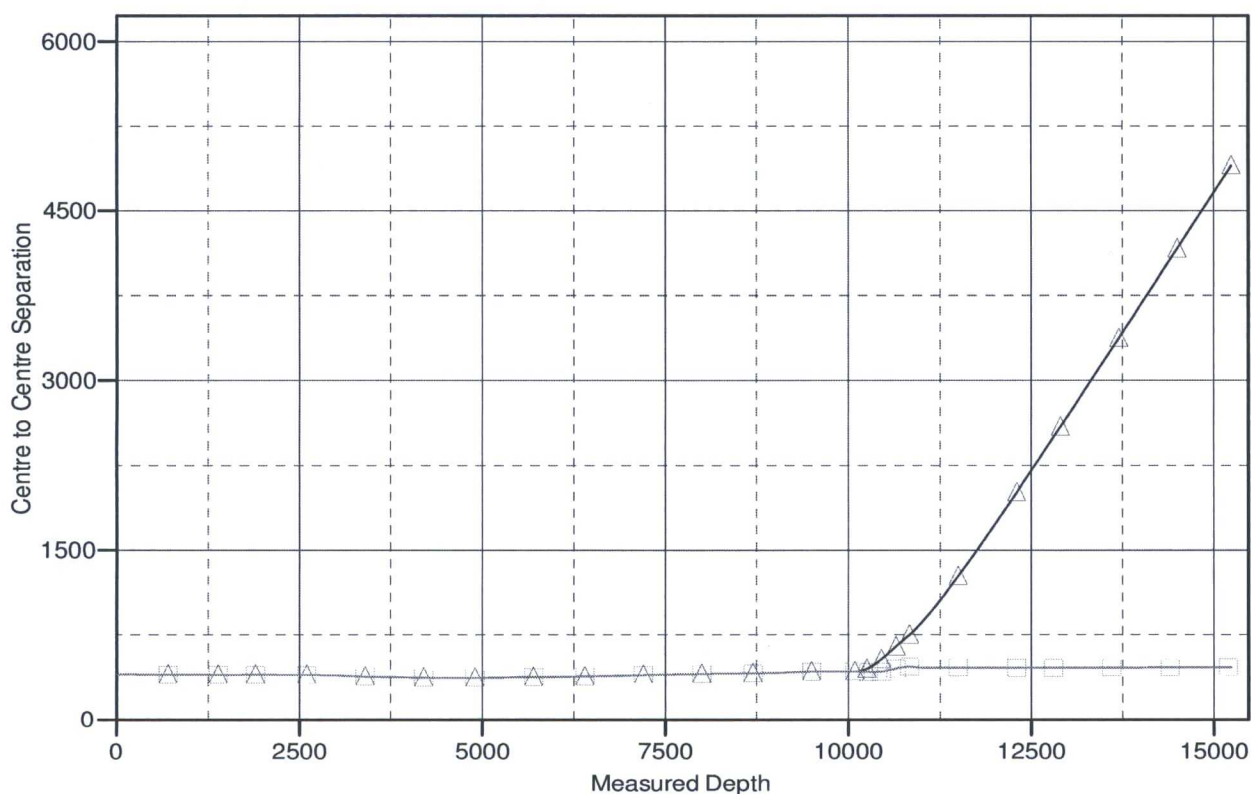
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 12, T 21 S. , R 33 E
Site Error: 0.00 ft
Reference Well: Bobwhite 12 State Com 7H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well Bobwhite 12 State Com 7H
TVD Reference: KB=20' @ 3787.70ft
MD Reference: KB=20' @ 3787.70ft
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=20' @ 3787.70ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.333333

Coordinates are relative to: Bobwhite 12 State Com 7H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.44°

Ladder Plot



LEGEND

12 State Com 2H, Wellbore #1, Wellbore #1 V0 Bobwhite 12 State Com 2H, Wellbore #1, Plan #5 V0

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



Integrity Directional Services, LLC
Anticollision Report



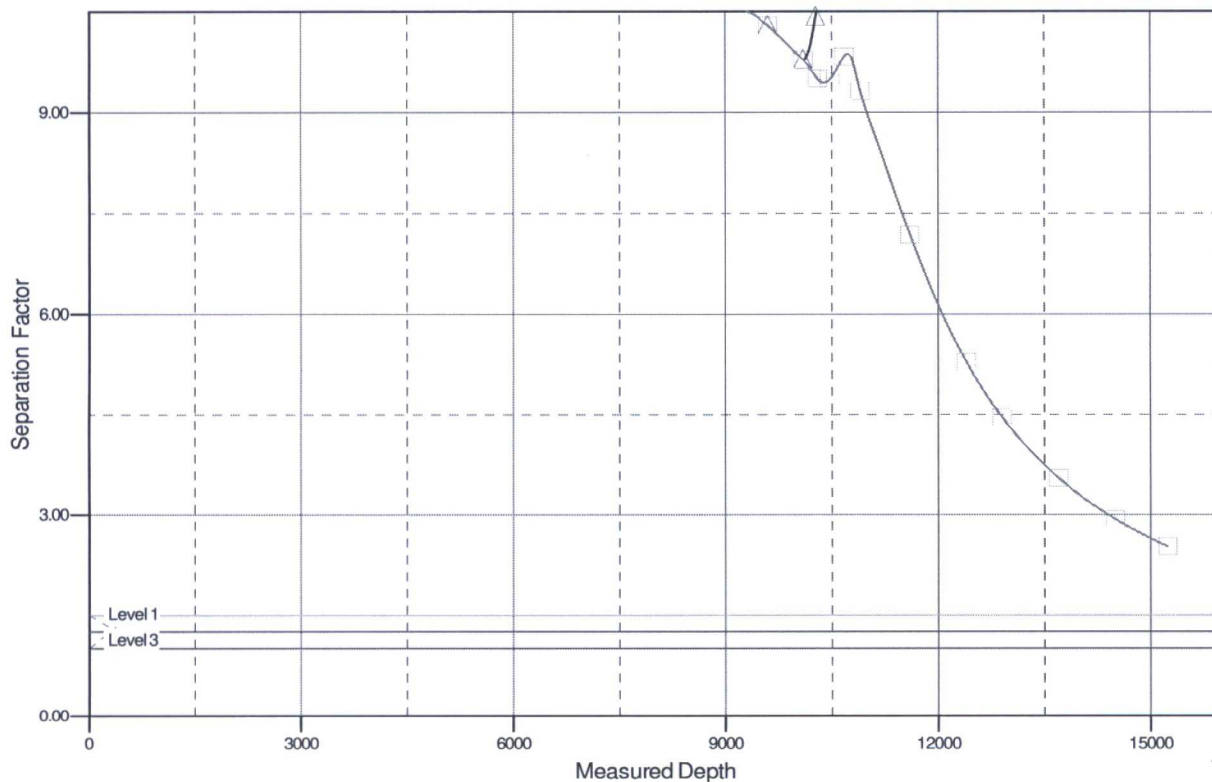
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 12, T 21 S. , R 33 E
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Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=20' @ 3787.70ft
Offset Depths are relative to Offset Datum
Central Meridian is -104.3333333

Coordinates are relative to: Bobwhite 12 State Com 7H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.44°

Separation Factor Plot



LEGEND

12 State Com 2H, Wellbore #1, Wellbore #1 V0 Bobwhite 12 State Com 2H, Wellbore #1, Plan #5 V0