



OCD – HOBBS
08/24/2016
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COG Operating L L C

Eddy County, NM (NAD 27 NME)

Sec. 36, T 22 S. , R 31 E

Bultaco State 3H

Wellbore #1

Plan#1

Anticollision Report

23 August, 2016





Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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:	Stations	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	8/23/2016		
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	15,480.78	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. 36, T 22 S. , R 31 E						
Bultaco St #1H - Wellbore #1 - Actual Wellbore	9,717.65	9,719.10	737.05	698.24	18.989	CC, ES
Bultaco St #1H - Wellbore #1 - Actual Wellbore	15,200.00	14,764.00	921.28	743.57	5.184	SF
Bultaco State 2H - Wellbore #1 - Actual Wellbore	15,239.42	14,650.00	977.50	798.12	5.450	CC, ES
Bultaco State 2H - Wellbore #1 - Actual Wellbore	15,300.00	14,650.00	979.37	798.92	5.427	SF
Livingston Ridge St 36 #1 - Wellbore #1 - Actual Wellbor	10,795.64	10,455.11	1,872.05	1,533.91	5.536	CC
Livingston Ridge St 36 #1 - Wellbore #1 - Actual Wellbor	10,800.00	10,455.08	1,872.06	1,533.88	5.536	ES
Livingston Ridge St 36 #1 - Wellbore #1 - Actual Wellbor	10,900.00	10,454.49	1,874.96	1,536.07	5.533	SF

Offset Design		Sec. 36, T 22 S. , R 31 E - Bultaco St #1H - Wellbore #1 - Actual Wellbore											Offset Site Error:		0.00 ft
Survey Program:		100-NS-GYRO-MS, 9480-MWD											Offset Well Error:		0.00 ft
Reference		Offset		Semi Major Axis			Distance							Warning	
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor			
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)				
0.00	0.00	0.00	0.00	0.00	0.00	76.05	188.50	758.90	781.96						
100.00	100.00	88.49	88.48	0.08	0.10	76.06	188.55	759.59	782.73	782.55	0.18	4,293.502			
200.00	200.00	189.71	189.69	0.31	0.35	76.09	188.46	761.24	784.30	783.65	0.65	1,197.740			
300.00	300.00	293.05	293.02	0.53	0.62	76.14	188.14	762.56	785.47	784.31	1.15	681.849			
400.00	400.00	398.42	398.39	0.76	0.89	76.17	187.91	763.29	786.08	784.44	1.65	476.513			
500.00	500.00	499.04	499.01	0.98	1.15	76.19	187.72	763.57	786.31	784.18	2.13	368.846			
600.00	600.00	602.84	602.81	1.21	1.29	76.20	187.57	763.55	786.25	783.75	2.50	314.610			
700.00	700.00	703.16	703.13	1.43	1.33	76.18	187.75	763.18	785.94	783.18	2.76	284.331			
800.00	800.00	804.42	804.39	1.66	1.41	76.12	188.44	762.57	785.52	782.45	3.06	256.462			
900.00	900.00	902.04	902.00	1.88	1.53	76.05	189.31	762.01	785.18	781.77	3.41	230.440			
1,000.00	1,000.00	1,002.93	1,002.89	2.11	1.69	75.97	190.26	761.52	784.93	781.14	3.79	206.967			
1,100.00	1,100.00	1,104.11	1,104.06	2.33	1.86	75.91	191.00	760.92	784.53	780.34	4.19	187.053			
1,155.25	1,155.25	1,156.01	1,155.96	2.46	1.96	75.89	191.21	760.74	784.40	779.98	4.42	177.524			
1,200.00	1,200.00	1,200.00	1,199.95	2.56	2.05	75.88	191.32	760.78	784.47	779.86	4.60	170.386			
1,300.00	1,300.00	1,299.46	1,299.40	2.78	2.26	75.88	191.43	761.00	784.70	779.67	5.04	155.735			
1,400.00	1,400.00	1,396.98	1,396.93	3.01	2.47	75.88	191.47	761.28	785.00	779.53	5.47	143.441			
1,500.00	1,500.00	1,498.40	1,498.34	3.23	2.69	75.89	191.50	761.67	785.37	779.45	5.92	132.708			
1,600.00	1,600.00	1,598.63	1,598.58	3.45	2.92	75.89	191.53	761.93	785.63	779.26	6.37	123.310			
1,700.00	1,700.00	1,698.14	1,698.09	3.68	3.15	75.89	191.62	762.18	785.91	779.07	6.83	115.011			
1,800.00	1,800.00	1,798.83	1,798.78	3.90	3.39	75.89	191.69	762.44	786.17	778.87	7.30	107.734			
1,900.00	1,900.00	1,898.50	1,898.45	4.13	3.62	75.90	191.63	762.70	786.41	778.66	7.75	101.485			

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



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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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9480-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
2,000.00	2,000.00	2,001.05	2,000.99	4.35	3.80	75.91	191.41	762.86	786.51	778.36	8.15	96.452	
2,100.00	2,100.00	2,101.36	2,101.30	4.58	3.91	75.93	191.20	762.83	786.43	777.94	8.49	92.617	
2,200.00	2,200.00	2,202.17	2,202.12	4.80	4.01	75.93	191.15	762.68	786.27	777.46	8.81	89.261	
2,300.00	2,300.00	2,301.44	2,301.38	5.03	4.11	75.93	191.14	762.52	786.11	776.98	9.13	86.064	
2,400.00	2,400.00	2,400.90	2,400.85	5.25	4.24	75.92	191.24	762.42	786.04	776.54	9.49	82.789	
2,460.25	2,460.25	2,460.81	2,460.75	5.39	4.35	75.91	191.33	762.38	786.02	776.29	9.74	80.734	
2,500.00	2,500.00	2,500.33	2,500.27	5.48	4.42	75.91	191.39	762.37	786.03	776.13	9.90	79.435	
2,600.00	2,600.00	2,601.07	2,601.01	5.70	4.60	75.90	191.53	762.32	786.01	775.71	10.30	76.292	
2,700.00	2,700.00	2,702.26	2,702.21	5.93	4.75	75.89	191.55	762.16	785.87	775.19	10.68	73.605	
2,800.00	2,800.00	2,800.72	2,800.66	6.15	4.91	75.89	191.59	762.03	785.75	774.69	11.06	71.053	
2,822.92	2,822.92	2,823.48	2,823.42	6.20	4.95	75.88	191.64	762.02	785.74	774.59	11.16	70.433	
2,900.00	2,900.00	2,900.00	2,899.94	6.38	5.11	75.87	191.83	762.00	785.77	774.29	11.48	68.428	
3,000.00	3,000.00	2,999.15	2,999.10	6.60	5.32	75.84	192.31	762.00	785.89	773.98	11.92	65.938	
3,100.00	3,100.00	3,097.99	3,097.93	6.83	5.53	75.78	193.10	762.06	786.15	773.79	12.36	63.607	
3,200.00	3,200.00	3,198.07	3,198.01	7.05	5.76	75.72	193.94	762.18	786.47	773.66	12.81	61.404	
3,300.00	3,300.00	3,298.24	3,298.17	7.28	5.98	75.69	194.42	762.37	786.78	773.52	13.26	59.342	
3,400.00	3,400.00	3,402.45	3,402.38	7.50	6.16	75.69	194.46	762.39	786.80	773.14	13.66	57.606	
3,486.30	3,486.30	3,486.86	3,486.80	7.69	6.30	75.69	194.51	762.27	786.70	772.70	13.99	56.220	
3,500.00	3,500.00	3,500.28	3,500.21	7.73	6.32	75.68	194.55	762.26	786.70	772.65	14.05	56.007	
3,600.00	3,600.00	3,602.47	3,602.41	7.95	6.51	75.67	194.74	762.10	786.59	772.12	14.46	54.382	
3,633.89	3,633.89	3,634.88	3,634.81	8.03	6.58	75.66	194.77	762.04	786.54	771.93	14.60	53.864	
3,700.00	3,700.00	3,700.00	3,699.93	8.17	6.70	75.65	194.91	762.09	786.62	771.75	14.88	52.882	
3,800.00	3,800.00	3,798.02	3,797.95	8.40	6.89	75.65	195.00	762.40	786.95	771.66	15.29	51.476	
3,900.00	3,900.00	3,899.20	3,899.13	8.62	7.05	75.67	194.85	762.70	787.20	771.52	15.67	50.227	
4,000.00	4,000.00	4,000.98	4,000.91	8.85	7.19	75.69	194.55	762.84	787.26	771.22	16.04	49.090	
4,100.00	4,100.00	4,101.70	4,101.63	9.07	7.33	75.71	194.35	762.79	787.16	770.76	16.40	48.001	
4,200.00	4,200.00	4,201.95	4,201.88	9.30	7.46	75.71	194.26	762.65	787.00	770.24	16.76	46.957	
4,300.00	4,300.00	4,302.32	4,302.24	9.52	7.59	75.72	194.08	762.49	786.80	769.69	17.11	45.978	
4,400.00	4,400.00	4,401.75	4,401.68	9.75	7.75	75.72	194.07	762.30	786.61	769.12	17.50	44.960	
4,500.00	4,500.00	4,501.53	4,501.46	9.97	7.94	75.70	194.21	762.12	786.48	768.57	17.91	43.914	
4,600.00	4,600.00	4,604.03	4,603.95	10.20	8.13	75.68	194.46	761.76	786.20	767.86	18.33	42.887	
4,700.00	4,700.00	4,704.54	4,704.46	10.42	8.33	75.64	194.84	761.16	785.72	766.96	18.75	41.902	
4,800.00	4,800.00	4,802.31	4,802.24	10.65	8.53	75.60	195.34	760.68	785.36	766.18	19.18	40.956	
4,900.00	4,900.00	4,904.79	4,904.71	10.87	8.74	75.55	195.93	760.10	784.96	765.35	19.61	40.019	
5,000.00	5,000.00	5,001.42	5,001.33	11.10	8.95	75.47	196.82	759.56	784.64	764.60	20.05	39.143	
5,100.00	5,100.00	5,102.03	5,101.94	11.32	9.17	75.36	198.26	759.03	784.50	764.00	20.49	38.280	
5,200.00	5,200.00	5,201.29	5,201.18	11.55	9.40	75.22	200.12	758.41	784.37	763.42	20.94	37.455	
5,300.00	5,300.00	5,304.92	5,304.78	11.77	9.63	75.07	202.04	757.56	784.05	762.65	21.40	36.639	
5,400.00	5,400.00	5,408.48	5,408.32	12.00	9.86	74.94	203.45	756.30	783.23	761.37	21.85	35.841	
5,500.00	5,500.00	5,502.95	5,502.78	12.22	10.07	74.85	204.56	755.39	782.60	760.31	22.29	35.112	
5,600.00	5,600.00	5,607.72	5,607.54	12.45	10.31	74.73	205.89	754.36	781.98	759.23	22.75	34.371	
5,700.00	5,700.00	5,707.87	5,707.68	12.67	10.53	74.62	207.20	753.05	781.07	757.87	23.20	33.665	
5,800.00	5,800.00	5,807.91	5,807.70	12.89	10.76	74.49	208.61	751.69	780.14	756.48	23.65	32.981	
5,900.00	5,900.00	5,904.77	5,904.54	13.12	10.98	74.39	209.78	750.65	779.42	755.32	24.10	32.338	
6,000.00	6,000.00	6,004.03	6,003.79	13.34	11.21	74.31	210.63	749.93	778.96	754.40	24.56	31.719	
6,100.00	6,100.00	6,106.66	6,106.42	13.57	11.45	74.25	211.33	749.09	778.35	753.33	25.02	31.112	
6,200.00	6,200.00	6,204.88	6,204.63	13.79	11.67	74.18	211.97	748.24	777.70	752.23	25.47	30.538	
6,300.00	6,300.00	6,302.45	6,302.20	14.02	11.90	74.12	212.70	747.66	777.33	751.41	25.92	29.987	
6,400.00	6,400.00	6,402.31	6,402.06	14.24	12.14	74.07	213.25	747.29	777.12	750.74	26.39	29.453	
6,500.00	6,500.00	6,503.57	6,503.31	14.47	12.38	74.04	213.66	746.87	776.83	749.98	26.85	28.933	
6,600.00	6,600.00	6,601.94	6,601.68	14.69	12.62	74.00	214.12	746.47	776.58	749.27	27.31	28.436	
6,648.29	6,648.29	6,649.07	6,648.81	14.80	12.73	73.98	214.30	746.38	776.54	749.01	27.53	28.210	

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Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9480-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	6,700.00	6,699.74	14.92	12.84	73.97	214.46	746.38	776.58	748.82	27.76	27.974	
6,800.00	6,800.00	6,799.29	6,799.03	15.14	13.07	73.95	214.79	746.46	776.75	748.54	28.21	27.537	
6,900.00	6,900.00	6,900.52	6,900.26	15.37	13.30	73.92	215.12	746.48	776.86	748.19	28.67	27.096	
7,000.00	7,000.00	7,001.68	7,001.42	15.59	13.54	73.91	215.31	746.38	776.82	747.68	29.14	26.662	
7,100.00	7,100.00	7,102.48	7,102.22	15.82	13.71	73.92	215.16	746.25	776.65	747.13	29.52	26.308	
7,200.00	7,200.00	7,205.12	7,204.85	16.04	13.81	73.95	214.60	746.00	776.27	746.42	29.85	26.007	
7,300.00	7,300.00	7,308.81	7,308.55	16.27	13.94	73.99	213.87	745.33	775.45	745.25	30.20	25.675	
7,400.00	7,400.00	7,410.07	7,409.79	16.49	14.07	74.04	212.95	744.41	774.32	743.76	30.57	25.333	
7,500.00	7,500.00	7,509.64	7,509.35	16.72	14.20	74.11	211.68	743.56	773.16	742.24	30.92	25.008	
7,600.00	7,600.00	7,610.45	7,610.15	16.94	14.32	74.19	210.25	742.72	771.97	740.70	31.27	24.691	
7,700.00	7,700.00	7,712.10	7,711.78	17.17	14.45	74.31	208.36	741.81	770.60	738.98	31.62	24.373	
7,800.00	7,800.00	7,811.67	7,811.32	17.39	14.58	74.44	206.36	740.88	769.16	737.19	31.97	24.062	
7,900.00	7,900.00	7,910.81	7,910.45	17.61	14.71	74.54	204.70	739.96	767.82	735.50	32.32	23.755	
8,000.00	8,000.00	8,013.18	8,012.79	17.84	14.85	74.65	202.81	739.00	766.42	733.73	32.69	23.447	
8,100.00	8,100.00	8,118.84	8,118.41	18.06	15.00	74.79	200.53	737.31	764.30	731.23	33.07	23.114	
8,200.00	8,200.00	8,215.44	8,214.97	18.29	15.15	74.94	198.08	735.98	762.31	728.87	33.43	22.800	
8,300.00	8,300.00	8,323.70	8,323.18	18.51	15.32	75.07	195.63	733.78	759.75	725.92	33.83	22.457	
8,400.00	8,400.00	8,422.70	8,422.12	18.74	15.48	75.22	193.03	731.38	756.74	722.51	34.22	22.113	
8,500.00	8,500.00	8,516.70	8,516.07	18.96	15.63	75.36	190.63	729.67	754.32	719.72	34.60	21.802	
8,600.00	8,600.00	8,614.73	8,614.07	19.19	15.80	75.46	188.85	728.18	752.40	717.41	34.99	21.505	
8,700.00	8,700.00	8,714.04	8,713.36	19.41	15.97	75.56	187.16	726.82	750.64	715.26	35.38	21.215	
8,800.00	8,800.00	8,812.54	8,811.84	19.64	16.14	75.65	185.58	725.54	748.98	713.20	35.78	20.934	
8,900.00	8,900.00	8,906.78	8,906.07	19.86	16.31	75.70	184.77	724.69	747.89	711.72	36.18	20.674	
9,000.00	9,000.00	9,009.60	9,008.88	20.09	16.49	75.79	183.39	724.00	746.91	710.34	36.58	20.420	
9,100.00	9,100.00	9,106.16	9,105.43	20.31	16.65	75.87	182.11	723.45	746.04	709.08	36.96	20.185	
9,200.00	9,200.00	9,206.01	9,205.27	20.54	16.81	75.96	180.87	723.10	745.39	708.04	37.35	19.959	
9,300.00	9,300.00	9,306.77	9,306.02	20.76	16.96	76.06	179.38	722.78	744.72	707.00	37.72	19.743	
9,400.00	9,400.00	9,413.05	9,412.27	20.99	17.05	76.21	177.25	722.03	743.56	705.53	38.03	19.551	
9,500.00	9,500.00	9,518.19	9,517.36	21.21	17.10	76.42	174.09	720.67	741.59	703.27	38.31	19.356	
9,600.00	9,600.00	9,620.60	9,619.69	21.44	17.11	76.65	170.65	718.89	739.12	700.57	38.54	19.176	
9,700.00	9,700.00	9,703.00	9,702.06	21.66	17.11	76.76	168.81	717.53	737.12	698.35	38.77	19.011	
9,717.65	9,717.65	9,719.10	9,718.15	21.70	17.11	76.74	169.12	717.39	737.05	698.24	38.81	18.989 CC, ES	
9,800.00	9,800.00	9,778.17	9,776.98	21.89	17.12	76.36	174.05	717.06	738.26	699.25	39.01	18.926	
9,900.00	9,900.00	9,860.00	9,856.70	22.11	17.14	74.99	192.17	716.47	743.09	703.84	39.25	18.932	
9,990.54	9,990.54	9,924.00	9,916.54	22.31	17.16	73.29	214.70	715.11	750.35	710.88	39.48	19.008	
10,000.00	10,000.00	9,924.00	9,916.54	22.33	17.16	75.66	214.70	715.11	751.33	711.83	39.50	19.022	
10,025.00	10,024.97	9,935.17	9,926.67	22.39	17.17	75.03	219.40	715.01	754.10	714.54	39.56	19.063	
10,050.00	10,049.85	9,948.10	9,938.26	22.45	17.17	74.36	225.15	714.95	756.96	717.34	39.62	19.105	
10,075.00	10,074.56	9,956.00	9,945.25	22.51	17.18	73.83	228.83	714.94	759.91	720.23	39.68	19.151	
10,100.00	10,099.04	9,975.54	9,962.26	22.56	17.19	73.06	238.43	714.99	762.81	723.06	39.75	19.192	
10,125.00	10,123.23	9,988.00	9,972.89	22.62	17.19	72.46	244.94	715.04	765.74	725.93	39.81	19.235	
10,150.00	10,147.05	10,005.64	9,987.61	22.67	17.20	71.80	254.66	715.12	768.60	728.72	39.88	19.274	
10,175.00	10,170.45	10,020.00	9,999.30	22.73	17.22	71.23	263.00	715.15	771.36	731.42	39.94	19.312	
10,200.00	10,193.35	10,042.84	10,017.35	22.78	17.24	70.55	276.99	715.01	773.91	733.89	40.02	19.336	
10,225.00	10,215.69	10,063.13	10,032.81	22.83	17.27	69.96	290.12	714.62	776.18	736.08	40.10	19.354	
10,250.00	10,237.42	10,083.00	10,047.46	22.88	17.31	69.43	303.53	714.06	778.18	737.99	40.19	19.365	
10,275.00	10,258.47	10,100.25	10,059.86	22.93	17.34	69.00	315.50	713.52	779.94	739.67	40.27	19.369	
10,300.00	10,278.79	10,115.00	10,070.29	22.98	17.37	68.66	325.93	713.08	781.48	741.13	40.35	19.368	
10,325.00	10,298.31	10,134.16	10,083.53	23.04	17.41	68.33	339.76	712.55	782.80	742.35	40.45	19.351	
10,350.00	10,316.99	10,147.00	10,092.21	23.10	17.44	68.11	349.22	712.21	783.93	743.38	40.54	19.335	
10,375.00	10,334.78	10,164.37	10,103.71	23.17	17.49	67.93	362.24	711.84	784.86	744.20	40.66	19.304	
10,400.00	10,351.63	10,179.00	10,113.18	23.24	17.53	67.81	373.38	711.67	785.67	744.90	40.77	19.272	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9480-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,425.00	10,367.48	10,191.50	10,121.11	23.31	17.57	67.75	383.05	711.62	786.34	745.46	40.88	19.235	
10,450.00	10,382.30	10,211.00	10,133.12	23.39	17.63	67.76	398.41	711.74	786.95	745.93	41.02	19.184	
10,475.00	10,396.05	10,211.00	10,133.12	23.47	17.63	67.71	398.41	711.74	787.39	746.29	41.10	19.156	
10,500.00	10,408.69	10,231.46	10,145.12	23.56	17.71	67.83	414.98	712.03	787.66	746.39	41.27	19.086	
10,525.00	10,420.18	10,243.00	10,151.54	23.66	17.75	67.91	424.56	712.22	787.84	746.43	41.41	19.027	
10,550.00	10,430.49	10,257.98	10,159.55	23.76	17.81	68.06	437.21	712.54	787.90	746.33	41.57	18.953	
10,575.00	10,439.60	10,275.00	10,168.24	23.87	17.88	68.29	451.84	713.03	787.89	746.14	41.75	18.871	
10,600.00	10,447.47	10,285.84	10,173.55	23.98	17.93	68.48	461.28	713.40	787.72	745.80	41.92	18.792	
10,625.00	10,454.10	10,307.00	10,183.53	24.10	18.03	68.88	479.93	714.19	787.42	745.29	42.14	18.687	
10,650.00	10,459.45	10,317.40	10,188.24	24.23	18.09	69.14	489.18	714.60	786.91	744.59	42.32	18.595	
10,675.00	10,463.52	10,332.90	10,195.05	24.36	18.17	69.55	503.09	715.28	786.27	743.74	42.53	18.486	
10,700.00	10,466.29	10,349.02	10,201.85	24.50	18.26	70.03	517.69	716.04	785.50	742.74	42.76	18.369	
10,725.00	10,467.76	10,365.55	10,208.50	24.65	18.35	70.56	532.80	716.85	784.59	741.59	43.00	18.245	
10,743.37	10,468.00	10,381.94	10,214.77	24.76	18.45	71.11	547.93	717.63	783.81	740.60	43.21	18.139	
10,800.00	10,467.67	10,464.66	10,241.84	25.12	19.01	73.12	626.03	718.12	780.36	736.24	44.13	17.684	
10,900.00	10,467.08	10,530.00	10,256.03	25.85	19.53	74.16	689.73	715.82	774.82	729.43	45.39	17.072	
11,000.00	10,466.48	10,616.13	10,266.03	26.69	20.32	74.94	775.22	713.51	773.09	726.07	47.02	16.443	
11,041.72	10,466.24	10,650.16	10,268.47	27.08	20.67	75.13	809.16	712.56	772.87	725.12	47.75	16.185	
11,100.00	10,465.89	10,697.40	10,271.18	27.63	21.15	75.37	856.31	711.65	773.29	724.51	48.78	15.852	
11,200.00	10,465.30	10,775.16	10,273.93	28.65	22.01	75.66	934.01	711.37	776.13	725.47	50.66	15.319	
11,300.00	10,464.71	10,854.08	10,274.43	29.76	22.91	75.82	1,012.91	712.93	781.91	729.24	52.67	14.845	
11,400.00	10,464.12	10,951.51	10,272.60	30.93	24.10	75.86	1,110.27	715.92	789.41	734.37	55.04	14.343	
11,500.00	10,463.53	11,091.22	10,271.21	32.17	25.77	75.93	1,249.96	716.26	793.85	735.90	57.94	13.700	
11,600.00	10,462.94	11,197.79	10,272.54	33.46	27.13	76.11	1,356.49	713.79	795.35	734.75	60.59	13.126	
11,700.00	10,462.35	11,297.20	10,273.15	34.81	28.53	76.22	1,455.87	711.30	796.85	733.51	63.33	12.581	
11,800.00	10,461.76	11,397.44	10,272.98	36.19	29.99	76.28	1,556.07	708.62	798.36	732.18	66.19	12.062	
11,900.00	10,461.17	11,497.71	10,273.10	37.62	31.40	76.36	1,656.31	705.96	799.84	730.82	69.02	11.589	
12,000.00	10,460.57	11,599.00	10,274.65	39.08	32.74	76.54	1,757.55	703.41	801.11	729.28	71.83	11.153	
12,100.00	10,459.98	11,696.12	10,276.16	40.57	34.17	76.71	1,854.63	701.04	802.47	727.72	74.75	10.736	
12,200.00	10,459.39	11,791.65	10,276.33	42.09	35.69	76.80	1,950.13	698.97	804.41	726.63	77.78	10.342	
12,300.00	10,458.80	11,886.09	10,275.20	43.64	37.20	76.80	2,044.55	697.26	807.01	726.18	80.84	9.983	
12,400.00	10,458.21	11,993.11	10,274.80	45.21	38.82	76.86	2,151.55	695.25	809.35	725.32	84.03	9.632	
12,500.00	10,457.62	12,088.55	10,275.29	46.79	40.26	76.97	2,246.98	693.60	811.65	724.59	87.06	9.323	
12,600.00	10,457.03	12,183.94	10,275.21	48.40	41.80	77.05	2,342.36	692.44	814.58	724.38	90.20	9.031	
12,700.00	10,456.44	12,283.06	10,274.84	50.02	43.44	77.11	2,441.48	691.41	817.75	724.29	93.46	8.749	
12,800.00	10,455.85	12,382.12	10,273.83	51.66	45.08	77.14	2,540.52	690.48	821.16	724.41	96.74	8.488	
12,900.00	10,455.26	12,483.97	10,272.43	53.31	46.74	77.13	2,642.36	689.18	824.32	724.26	100.05	8.239	
13,000.00	10,454.66	12,585.67	10,271.04	54.97	48.39	77.13	2,744.04	687.87	827.47	724.11	103.36	8.005	
13,100.00	10,454.07	12,685.82	10,270.68	56.65	50.00	77.19	2,844.18	686.39	830.21	723.57	106.64	7.785	
13,200.00	10,453.48	12,776.71	10,269.64	58.33	51.49	77.20	2,935.05	685.44	833.55	723.73	109.82	7.590	
13,300.00	10,452.89	12,869.76	10,268.20	60.02	53.05	77.20	3,028.09	685.58	838.13	725.05	113.08	7.412	
13,400.00	10,452.30	12,964.99	10,266.62	61.73	54.63	77.20	3,123.31	686.05	843.09	726.73	116.36	7.246	
13,500.00	10,451.71	13,059.37	10,265.39	63.44	56.18	77.24	3,217.67	687.40	848.87	729.26	119.61	7.097	
13,600.00	10,451.12	13,164.57	10,264.50	65.15	57.90	77.32	3,322.85	689.13	854.77	731.72	123.05	6.947	
13,700.00	10,450.53	13,262.45	10,266.15	66.88	59.46	77.55	3,420.70	690.59	859.98	733.64	126.34	6.807	
13,800.00	10,449.94	13,360.28	10,268.34	68.61	61.01	77.82	3,518.49	692.87	865.88	736.26	129.62	6.680	
13,900.00	10,449.35	13,458.89	10,271.26	70.34	62.56	78.14	3,617.02	695.23	871.74	738.83	132.91	6.559	
14,000.00	10,448.76	13,560.72	10,275.10	72.09	64.16	78.52	3,718.74	697.95	877.73	741.48	136.25	6.442	
14,100.00	10,448.16	13,656.55	10,278.59	73.83	65.73	78.86	3,814.48	700.40	883.67	744.10	139.57	6.332	
14,200.00	10,447.57	13,755.44	10,281.16	75.58	67.37	79.15	3,913.30	703.16	890.05	747.10	142.95	6.226	
14,300.00	10,446.98	13,851.93	10,283.67	77.34	68.97	79.42	4,009.71	705.97	896.59	750.28	146.31	6.128	
14,400.00	10,446.39	13,954.49	10,285.79	79.10	70.70	79.68	4,112.20	708.97	903.26	753.46	149.80	6.030	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandrill Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandrill Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design Sec. 36, T 22 S. , R 31 E - Bultaco St #1H - Wellbore #1 - Actual Wellbore												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9480-MWD												Offset Well Error:	0.00 ft
Reference	Offset	Semi Major Axis		Distance									
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
14,500.00	10,445.80	14,074.13	10,289.68	80.86	72.66	80.05	4,231.76	711.18	908.68	755.15	153.52	5.919	
14,600.00	10,445.21	14,185.27	10,294.33	82.63	74.50	80.43	4,342.79	711.15	912.10	754.97	157.12	5.805	
14,700.00	10,444.62	14,277.33	10,296.50	84.40	76.07	80.64	4,434.83	710.72	915.45	754.98	160.47	5.705	
14,800.00	10,444.03	14,372.22	10,294.28	86.17	77.71	80.58	4,529.68	710.85	920.13	756.24	163.88	5.614	
14,900.00	10,443.44	14,515.31	10,287.34	87.95	80.14	80.23	4,672.53	707.13	922.66	754.58	168.08	5.489	
15,000.00	10,442.85	14,623.33	10,282.74	89.73	81.97	79.97	4,780.26	700.85	921.81	750.12	171.69	5.369	
15,100.00	10,442.25	14,728.01	10,273.77	91.51	83.79	79.43	4,884.28	693.45	920.53	745.23	175.30	5.251	
15,149.46	10,441.96	14,764.00	10,270.07	92.39	84.42	79.20	4,919.98	690.70	919.90	743.09	176.81	5.203	
15,200.00	10,441.66	14,764.00	10,270.07	93.29	84.42	79.20	4,919.98	690.70	921.28	743.57	177.71	5.184 SF	
15,300.00	10,441.07	14,764.00	10,270.07	95.08	84.42	79.20	4,919.98	690.70	932.12	752.63	179.50	5.193	
15,400.00	10,440.48	14,764.00	10,270.07	96.86	84.42	79.20	4,919.98	690.70	953.38	772.10	181.28	5.259	
15,481.49	10,440.00	14,764.00	10,270.07	98.05	84.42	79.20	4,919.98	690.70	977.96	795.49	182.47	5.360	



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9364-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	0.00	0.00	0.00	0.00	-81.64	179.40	-1,220.50	1,233.62				
100.00	100.00	97.36	97.36	0.08	0.10	-81.63	179.54	-1,220.48	1,233.61	1,233.43	0.18	6,897.384	
200.00	200.00	199.31	199.31	0.31	0.36	-81.61	179.95	-1,220.32	1,233.52	1,232.85	0.67	1,845.998	
300.00	300.00	301.29	301.29	0.53	0.62	-81.59	180.36	-1,220.00	1,233.27	1,232.12	1.15	1,070.344	
400.00	400.00	401.76	401.75	0.76	0.86	-81.58	180.53	-1,219.62	1,232.92	1,231.31	1.61	763.639	
500.00	500.00	504.58	504.57	0.98	1.11	-81.56	180.82	-1,219.07	1,232.43	1,230.33	2.09	588.488	
600.00	600.00	602.69	602.68	1.21	1.37	-81.52	181.64	-1,218.43	1,231.90	1,229.33	2.58	478.331	
700.00	700.00	700.00	699.98	1.43	1.62	-81.47	182.68	-1,217.98	1,231.61	1,228.56	3.05	403.875	
766.63	766.63	764.02	763.99	1.58	1.78	-81.44	183.30	-1,217.83	1,231.55	1,228.19	3.36	366.787	
800.00	800.00	796.53	796.51	1.66	1.86	-81.43	183.58	-1,217.80	1,231.56	1,228.04	3.51	350.557	
900.00	900.00	889.39	889.36	1.88	2.04	-81.40	184.23	-1,218.02	1,231.90	1,227.98	3.92	314.392	
1,000.00	1,000.00	988.95	988.93	2.11	2.14	-81.39	184.42	-1,218.68	1,232.58	1,228.34	4.24	290.408	
1,100.00	1,100.00	1,104.88	1,104.84	2.33	2.20	-81.44	183.56	-1,218.91	1,232.68	1,228.14	4.53	271.915	
1,200.00	1,200.00	1,217.27	1,217.23	2.56	2.36	-81.46	182.84	-1,217.56	1,231.38	1,226.46	4.92	250.489	
1,300.00	1,300.00	1,300.00	1,299.95	2.78	2.54	-81.43	183.38	-1,216.43	1,230.18	1,224.85	5.33	231.017	
1,364.49	1,364.49	1,360.12	1,360.06	2.93	2.68	-81.39	184.21	-1,216.07	1,229.95	1,224.34	5.61	219.281	
1,400.00	1,400.00	1,389.49	1,389.42	3.01	2.75	-81.37	184.64	-1,216.12	1,230.08	1,224.33	5.76	213.678	
1,500.00	1,500.00	1,479.71	1,479.63	3.23	2.90	-81.33	185.58	-1,216.96	1,231.15	1,225.02	6.13	200.772	
1,600.00	1,600.00	1,588.60	1,588.52	3.45	3.01	-81.36	185.18	-1,218.35	1,232.38	1,225.91	6.47	190.608	
1,700.00	1,700.00	1,690.39	1,690.30	3.68	3.09	-81.41	184.13	-1,219.11	1,232.96	1,226.19	6.77	182.117	
1,800.00	1,800.00	1,792.84	1,792.74	3.90	3.22	-81.43	183.77	-1,219.65	1,233.43	1,226.31	7.12	173.159	
1,900.00	1,900.00	1,891.81	1,891.71	4.13	3.36	-81.44	183.69	-1,220.06	1,233.82	1,226.33	7.49	164.655	
2,000.00	2,000.00	1,996.73	1,996.63	4.35	3.50	-81.47	183.13	-1,220.42	1,234.09	1,226.24	7.85	157.208	
2,100.00	2,100.00	2,106.59	2,106.49	4.58	3.65	-81.49	182.55	-1,220.08	1,233.70	1,225.47	8.23	149.913	
2,200.00	2,200.00	2,200.00	2,199.90	4.80	3.82	-81.48	182.77	-1,219.56	1,233.19	1,224.56	8.63	142.933	
2,231.58	2,231.58	2,228.88	2,228.78	4.87	3.88	-81.47	182.96	-1,219.50	1,233.14	1,224.39	8.76	140.802	
2,300.00	2,300.00	2,290.27	2,290.16	5.03	4.01	-81.45	183.34	-1,219.62	1,233.34	1,224.30	9.04	136.465	
2,400.00	2,400.00	2,388.99	2,388.88	5.25	4.18	-81.45	183.51	-1,220.25	1,234.00	1,224.57	9.44	130.787	
2,500.00	2,500.00	2,510.83	2,510.72	5.48	4.36	-81.49	182.63	-1,220.17	1,233.84	1,224.00	9.84	125.405	
2,600.00	2,600.00	2,616.31	2,616.18	5.70	4.54	-81.48	182.47	-1,218.64	1,232.37	1,222.13	10.24	120.343	
2,700.00	2,700.00	2,700.00	2,699.86	5.93	4.70	-81.44	183.34	-1,217.68	1,231.41	1,220.78	10.63	115.828	
2,735.55	2,735.55	2,732.89	2,732.75	6.01	4.77	-81.41	183.83	-1,217.54	1,231.34	1,220.56	10.78	114.227	
2,800.00	2,800.00	2,788.67	2,788.52	6.15	4.89	-81.38	184.59	-1,217.62	1,231.56	1,220.52	11.04	111.546	
2,900.00	2,900.00	2,881.90	2,881.74	6.38	5.06	-81.35	185.34	-1,218.46	1,232.58	1,221.14	11.44	107.742	
3,000.00	3,000.00	2,991.48	2,991.32	6.60	5.23	-81.38	184.87	-1,219.62	1,233.56	1,221.73	11.83	104.239	
3,100.00	3,100.00	3,100.65	3,100.49	6.83	5.38	-81.43	183.75	-1,219.89	1,233.65	1,221.45	12.21	101.055	
3,200.00	3,200.00	3,202.14	3,201.97	7.05	5.53	-81.46	183.13	-1,219.64	1,233.32	1,220.74	12.58	98.032	
3,300.00	3,300.00	3,301.51	3,301.33	7.28	5.69	-81.47	182.87	-1,219.32	1,232.96	1,220.00	12.97	95.096	
3,400.00	3,400.00	3,400.35	3,400.18	7.50	5.86	-81.47	182.74	-1,219.05	1,232.68	1,219.31	13.36	92.254	
3,500.00	3,500.00	3,502.73	3,502.55	7.73	6.05	-81.47	182.76	-1,218.70	1,232.33	1,218.56	13.78	89.436	
3,600.00	3,600.00	3,602.46	3,602.29	7.95	6.25	-81.45	183.08	-1,218.22	1,231.91	1,217.71	14.20	86.739	
3,700.00	3,700.00	3,700.00	3,699.82	8.17	6.45	-81.42	183.75	-1,217.76	1,231.55	1,216.92	14.63	84.199	
3,800.00	3,800.00	3,798.00	3,797.82	8.40	6.65	-81.37	184.74	-1,217.43	1,231.37	1,216.32	15.05	81.804	
3,900.00	3,900.00	3,909.39	3,909.20	8.62	6.88	-81.33	185.53	-1,216.69	1,230.82	1,215.31	15.51	79.377	
4,000.00	4,000.00	4,007.13	4,006.93	8.85	7.07	-81.34	185.25	-1,215.87	1,229.94	1,214.02	15.92	77.276	
4,100.00	4,100.00	4,106.54	4,106.34	9.07	7.26	-81.34	185.08	-1,215.10	1,229.15	1,212.81	16.33	75.252	
4,200.00	4,200.00	4,200.00	4,199.80	9.30	7.46	-81.31	185.55	-1,214.66	1,228.75	1,211.99	16.75	73.337	
4,212.97	4,212.97	4,210.08	4,209.88	9.33	7.47	-81.31	185.63	-1,214.64	1,228.75	1,211.94	16.80	73.129	
4,300.00	4,300.00	4,290.54	4,290.34	9.52	7.62	-81.29	186.08	-1,214.81	1,229.00	1,211.85	17.15	71.681	
4,400.00	4,400.00	4,391.25	4,391.04	9.75	7.77	-81.29	186.20	-1,215.37	1,229.56	1,212.05	17.52	70.192	
4,500.00	4,500.00	4,494.36	4,494.16	9.97	7.90	-81.32	185.65	-1,215.85	1,229.94	1,212.07	17.88	68.805	
4,600.00	4,600.00	4,602.32	4,602.11	10.20	8.06	-81.37	184.62	-1,215.92	1,229.87	1,211.61	18.25	67.374	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9364-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	
4,700.00	4,700.00	4,700.00	4,699.78	10.42	8.21	-81.42	183.48	-1,215.77	1,229.54	1,210.91	18.63	65.999	
4,800.00	4,800.00	4,798.43	4,798.21	10.65	8.36	-81.48	182.23	-1,215.79	1,229.37	1,210.36	19.01	64.679	
4,811.61	4,811.61	4,809.04	4,808.81	10.67	8.38	-81.48	182.10	-1,215.81	1,229.37	1,210.32	19.05	64.535	
4,900.00	4,900.00	4,888.86	4,888.63	10.87	8.50	-81.51	181.48	-1,216.18	1,229.67	1,210.31	19.37	63.485	
5,000.00	5,000.00	4,993.83	4,993.60	11.10	8.66	-81.52	181.50	-1,216.77	1,230.24	1,210.48	19.76	62.254	
5,100.00	5,100.00	5,094.35	5,094.12	11.32	8.84	-81.50	181.95	-1,216.97	1,230.50	1,210.33	20.16	61.023	
5,200.00	5,200.00	5,195.82	5,195.58	11.55	9.03	-81.47	182.61	-1,217.07	1,230.69	1,210.11	20.58	59.801	
5,300.00	5,300.00	5,293.47	5,293.23	11.77	9.22	-81.43	183.37	-1,217.17	1,230.91	1,209.92	20.99	58.637	
5,400.00	5,400.00	5,391.54	5,391.30	12.00	9.41	-81.40	184.11	-1,217.46	1,231.32	1,209.91	21.40	57.528	
5,500.00	5,500.00	5,488.83	5,488.59	12.22	9.59	-81.37	184.90	-1,217.92	1,231.90	1,210.09	21.81	56.472	
5,600.00	5,600.00	5,586.27	5,586.01	12.45	9.78	-81.33	185.85	-1,218.57	1,232.71	1,210.48	22.23	55.461	
5,700.00	5,700.00	5,688.73	5,688.46	12.67	9.98	-81.28	186.98	-1,219.26	1,233.54	1,210.89	22.65	54.454	
5,800.00	5,800.00	5,790.18	5,789.91	12.89	10.19	-81.23	188.10	-1,219.74	1,234.18	1,211.10	23.08	53.466	
5,900.00	5,900.00	5,888.60	5,888.32	13.12	10.39	-81.19	189.05	-1,220.24	1,234.83	1,211.32	23.51	52.527	
6,000.00	6,000.00	5,987.76	5,987.48	13.34	10.59	-81.17	189.73	-1,220.89	1,235.59	1,211.66	23.93	51.632	
6,100.00	6,100.00	6,089.01	6,088.72	13.57	10.78	-81.15	190.14	-1,221.59	1,236.33	1,211.98	24.35	50.774	
6,200.00	6,200.00	6,191.31	6,191.03	13.79	10.97	-81.15	190.27	-1,222.19	1,236.93	1,212.17	24.76	49.954	
6,300.00	6,300.00	6,289.60	6,289.31	14.02	11.14	-81.16	190.21	-1,222.75	1,237.48	1,212.32	25.16	49.189	
6,400.00	6,400.00	6,387.90	6,387.61	14.24	11.31	-81.17	190.00	-1,223.49	1,238.19	1,212.64	25.55	48.462	
6,500.00	6,500.00	6,486.12	6,485.82	14.47	11.48	-81.19	189.81	-1,224.36	1,239.04	1,213.09	25.95	47.750	
6,600.00	6,600.00	6,586.33	6,586.03	14.69	11.68	-81.18	190.02	-1,225.26	1,239.96	1,213.59	26.37	47.023	
6,700.00	6,700.00	6,687.21	6,686.91	14.92	11.86	-81.19	189.96	-1,226.15	1,240.82	1,214.04	26.78	46.334	
6,800.00	6,800.00	6,803.21	6,802.89	15.14	12.04	-81.26	188.48	-1,226.65	1,241.06	1,213.88	27.18	45.664	
6,900.00	6,900.00	6,900.00	6,899.67	15.37	12.17	-81.34	186.84	-1,226.68	1,240.83	1,213.30	27.54	45.063	
6,917.43	6,917.43	6,914.43	6,914.10	15.41	12.19	-81.35	186.60	-1,226.72	1,240.83	1,213.24	27.60	44.965	
7,000.00	7,000.00	6,995.14	6,994.80	15.59	12.31	-81.41	185.29	-1,227.02	1,240.93	1,213.03	27.90	44.479	
7,100.00	7,100.00	7,082.32	7,081.95	15.82	12.44	-81.51	183.36	-1,227.91	1,241.62	1,213.36	28.26	43.936	
7,200.00	7,200.00	7,162.61	7,162.17	16.04	12.58	-81.64	180.67	-1,229.90	1,243.59	1,214.97	28.62	43.455	
7,300.00	7,300.00	7,255.57	7,254.98	16.27	12.74	-81.84	176.98	-1,233.62	1,246.97	1,217.96	29.00	42.995	
7,400.00	7,400.00	7,352.66	7,351.91	16.49	12.91	-82.05	172.91	-1,237.48	1,250.32	1,220.92	29.40	42.528	
7,500.00	7,500.00	7,450.65	7,449.74	16.72	13.09	-82.24	169.32	-1,241.79	1,254.18	1,224.38	29.80	42.082	
7,600.00	7,600.00	7,556.64	7,555.57	16.94	13.28	-82.44	165.48	-1,246.10	1,257.72	1,227.50	30.22	41.614	
7,700.00	7,700.00	7,663.68	7,662.47	17.17	13.48	-82.63	161.59	-1,249.89	1,260.77	1,230.13	30.65	41.138	
7,800.00	7,800.00	7,771.18	7,769.86	17.39	13.68	-82.83	157.71	-1,253.05	1,263.23	1,232.16	31.07	40.655	
7,900.00	7,900.00	7,874.11	7,872.70	17.61	13.87	-83.00	154.20	-1,255.56	1,265.23	1,233.74	31.49	40.180	
8,000.00	8,000.00	7,975.91	7,974.42	17.84	14.07	-83.14	151.24	-1,257.84	1,267.10	1,235.20	31.91	39.712	
8,100.00	8,100.00	8,073.65	8,072.12	18.06	14.26	-83.26	148.80	-1,259.95	1,268.95	1,236.63	32.32	39.259	
8,200.00	8,200.00	8,170.36	8,168.78	18.29	14.45	-83.37	146.61	-1,262.26	1,271.06	1,238.32	32.74	38.823	
8,300.00	8,300.00	8,267.95	8,266.31	18.51	14.65	-83.47	144.67	-1,264.78	1,273.40	1,240.24	33.16	38.397	
8,400.00	8,400.00	8,366.42	8,364.73	18.74	14.86	-83.56	143.06	-1,267.43	1,275.90	1,242.30	33.59	37.979	
8,500.00	8,500.00	8,463.97	8,462.24	18.96	15.06	-83.62	142.03	-1,270.12	1,278.52	1,244.49	34.03	37.574	
8,600.00	8,600.00	8,565.27	8,563.50	19.19	15.28	-83.63	142.15	-1,272.91	1,281.26	1,246.80	34.47	37.172	
8,700.00	8,700.00	8,665.98	8,664.17	19.41	15.50	-83.60	143.03	-1,275.40	1,283.82	1,248.91	34.91	36.776	
8,800.00	8,800.00	8,766.59	8,764.75	19.64	15.72	-83.60	143.37	-1,277.97	1,286.39	1,251.04	35.35	36.386	
8,900.00	8,900.00	8,867.34	8,865.47	19.86	15.94	-83.61	143.46	-1,280.47	1,288.88	1,253.08	35.80	36.003	
9,000.00	9,000.00	8,973.32	8,971.42	20.09	16.16	-83.57	144.64	-1,282.79	1,291.18	1,254.93	36.25	35.619	
9,100.00	9,100.00	9,096.29	9,094.36	20.31	16.40	-83.47	146.94	-1,284.04	1,292.42	1,255.71	36.71	35.208	
9,200.00	9,200.00	9,211.58	9,209.63	20.54	16.56	-83.41	148.19	-1,283.38	1,291.96	1,254.87	37.10	34.825	
9,300.00	9,300.00	9,311.10	9,309.15	20.76	16.68	-83.39	148.56	-1,282.41	1,291.04	1,253.60	37.44	34.479	
9,388.75	9,388.75	9,387.91	9,385.95	20.96	16.72	-83.37	148.99	-1,281.65	1,290.28	1,252.60	37.68	34.243	
9,400.00	9,400.00	9,396.00	9,394.03	20.99	16.72	-83.35	149.34	-1,281.63	1,290.30	1,252.59	37.71	34.220	
9,500.00	9,500.00	9,573.54	9,568.93	21.21	16.74	-82.11	176.81	-1,275.19	1,289.38	1,251.44	37.95	33.979	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design													Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9364-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		
9,600.00	9,600.00	9,716.64	9,703.55	21.44	16.79	-80.01	221.37	-1,256.79	1,280.56	1,242.34	38.22	33.501		
9,700.00	9,700.00	9,790.13	9,770.41	21.66	16.85	-78.66	249.82	-1,245.92	1,272.83	1,234.32	38.51	33.053		
9,800.00	9,800.00	9,840.00	9,814.42	21.89	16.91	-77.61	272.47	-1,239.90	1,269.60	1,230.81	38.79	32.730		
9,844.99	9,844.99	9,872.00	9,842.19	21.99	16.95	-76.89	287.92	-1,236.16	1,269.25	1,230.31	38.94	32.598		
9,900.00	9,900.00	9,914.55	9,878.11	22.11	17.02	-75.86	310.14	-1,231.11	1,269.72	1,230.58	39.13	32.446		
9,990.54	9,990.54	9,987.38	9,935.42	22.31	17.19	-73.84	353.80	-1,220.71	1,272.03	1,232.52	39.51	32.198		
10,000.00	10,000.00	9,993.21	9,939.77	22.33	17.21	-71.13	357.57	-1,219.81	1,272.41	1,232.86	39.54	32.176		
10,025.00	10,024.97	10,008.36	9,950.91	22.39	17.25	-70.59	367.56	-1,217.43	1,273.29	1,233.65	39.65	32.117		
10,050.00	10,049.85	10,023.19	9,961.62	22.45	17.30	-70.10	377.54	-1,215.08	1,274.01	1,234.26	39.75	32.052		
10,075.00	10,074.56	10,035.00	9,970.03	22.51	17.34	-69.72	385.62	-1,213.21	1,274.54	1,234.70	39.84	31.990		
10,100.00	10,099.04	10,050.00	9,980.57	22.56	17.39	-69.30	396.04	-1,210.88	1,274.92	1,234.97	39.95	31.913		
10,125.00	10,123.23	10,057.81	9,986.00	22.62	17.42	-69.09	401.52	-1,209.73	1,275.15	1,235.12	40.03	31.852		
10,150.00	10,147.05	10,067.00	9,992.36	22.67	17.45	-68.88	408.03	-1,208.41	1,275.24	1,235.12	40.12	31.784		
10,175.00	10,170.45	10,077.90	9,999.80	22.73	17.49	-68.66	415.85	-1,206.91	1,275.16	1,234.95	40.22	31.706		
10,200.00	10,193.35	10,087.59	10,006.32	22.78	17.53	-68.50	422.91	-1,205.64	1,274.94	1,234.63	40.31	31.630		
10,225.00	10,215.69	10,099.00	10,013.87	22.83	17.57	-68.35	431.34	-1,204.22	1,274.55	1,234.14	40.40	31.545		
10,250.00	10,237.42	10,145.84	10,043.44	22.88	17.78	-67.64	467.01	-1,197.37	1,273.47	1,232.81	40.66	31.320		
10,275.00	10,258.47	10,165.56	10,055.29	22.93	17.88	-67.47	482.43	-1,194.15	1,271.94	1,231.14	40.81	31.169		
10,300.00	10,278.79	10,189.26	10,069.22	22.98	18.00	-67.31	501.19	-1,190.18	1,270.00	1,229.01	40.99	30.987		
10,325.00	10,298.31	10,205.82	10,078.74	23.04	18.10	-67.33	514.45	-1,187.36	1,267.66	1,226.52	41.14	30.817		
10,350.00	10,316.99	10,220.69	10,087.01	23.10	18.18	-67.43	526.53	-1,184.82	1,265.02	1,223.74	41.28	30.642		
10,375.00	10,334.78	10,226.00	10,089.91	23.17	18.21	-67.68	530.90	-1,183.92	1,262.15	1,220.77	41.38	30.502		
10,400.00	10,351.63	10,239.40	10,096.96	23.24	18.30	-67.88	542.07	-1,181.69	1,259.05	1,217.51	41.53	30.315		
10,425.00	10,367.48	10,250.00	10,102.24	23.31	18.36	-68.14	551.11	-1,180.01	1,255.82	1,214.15	41.67	30.136		
10,450.00	10,382.30	10,258.00	10,106.05	23.39	18.41	-68.46	558.04	-1,178.80	1,252.44	1,210.64	41.80	29.960		
10,475.00	10,396.05	10,266.29	10,109.85	23.47	18.47	-68.80	565.30	-1,177.57	1,248.89	1,206.95	41.94	29.776		
10,500.00	10,408.69	10,275.00	10,113.70	23.56	18.53	-69.17	573.01	-1,176.30	1,245.15	1,203.06	42.09	29.582		
10,525.00	10,420.18	10,290.00	10,119.97	23.66	18.63	-69.55	586.46	-1,174.15	1,241.21	1,198.92	42.29	29.348		
10,550.00	10,430.49	10,300.00	10,123.96	23.76	18.71	-69.98	595.52	-1,172.74	1,237.07	1,194.61	42.47	29.130		
10,575.00	10,439.60	10,322.00	10,132.43	23.87	18.87	-70.45	615.61	-1,169.74	1,232.69	1,189.95	42.74	28.841		
10,600.00	10,447.47	10,322.00	10,132.43	23.98	18.87	-70.98	615.61	-1,169.74	1,228.13	1,185.28	42.85	28.658		
10,625.00	10,454.10	10,339.51	10,138.88	24.10	19.01	-71.56	631.74	-1,167.54	1,223.35	1,180.24	43.11	28.377		
10,650.00	10,459.45	10,354.00	10,144.05	24.23	19.12	-72.20	645.17	-1,165.93	1,218.52	1,175.17	43.35	28.108		
10,675.00	10,463.52	10,362.89	10,147.14	24.36	19.19	-72.85	653.46	-1,165.01	1,213.53	1,169.97	43.56	27.861		
10,700.00	10,466.29	10,378.16	10,152.22	24.50	19.32	-73.58	667.77	-1,163.44	1,208.37	1,164.55	43.82	27.575		
10,725.00	10,467.76	10,391.65	10,156.50	24.65	19.43	-74.35	680.49	-1,162.09	1,203.06	1,158.98	44.08	27.294		
10,743.37	10,468.00	10,400.00	10,159.05	24.76	19.50	-74.92	688.41	-1,161.29	1,199.10	1,154.84	44.26	27.092		
10,800.00	10,467.67	10,435.54	10,169.16	25.12	19.82	-75.35	722.33	-1,158.17	1,187.41	1,142.46	44.94	26.421		
10,900.00	10,467.08	10,508.00	10,187.79	25.85	20.51	-76.15	792.10	-1,152.27	1,168.54	1,122.18	46.37	25.203		
11,000.00	10,466.48	10,561.40	10,199.18	26.69	21.06	-76.66	844.16	-1,148.98	1,152.95	1,105.20	47.76	24.142		
11,100.00	10,465.89	10,628.74	10,210.57	27.63	21.80	-77.17	910.47	-1,146.20	1,140.67	1,091.24	49.43	23.076		
11,200.00	10,465.30	10,700.00	10,219.17	28.65	22.63	-77.56	981.18	-1,144.40	1,131.14	1,079.86	51.28	22.057		
11,300.00	10,464.71	10,769.54	10,224.94	29.76	23.48	-77.83	1,050.47	-1,143.86	1,124.21	1,070.97	53.24	21.117		
11,400.00	10,464.12	10,835.55	10,227.41	30.93	24.32	-77.95	1,116.42	-1,144.60	1,120.11	1,064.86	55.25	20.272		
11,500.00	10,463.53	10,913.15	10,228.02	32.17	25.34	-77.99	1,193.99	-1,146.89	1,118.48	1,060.96	57.51	19.447		
11,538.33	10,463.30	10,944.70	10,227.92	32.67	25.77	-78.00	1,225.51	-1,148.18	1,118.36	1,059.92	58.44	19.137		
11,600.00	10,462.94	11,000.00	10,227.27	33.46	26.53	-77.98	1,280.74	-1,150.76	1,118.61	1,058.62	60.00	18.644		
11,700.00	10,462.35	11,085.77	10,225.09	34.81	27.76	-77.91	1,366.36	-1,155.35	1,119.98	1,057.42	62.56	17.902		
11,800.00	10,461.76	11,198.90	10,221.55	36.19	29.30	-77.78	1,479.27	-1,161.38	1,121.52	1,056.03	65.50	17.124		
11,900.00	10,461.17	11,318.45	10,220.45	37.62	30.83	-77.75	1,598.71	-1,166.35	1,121.44	1,052.99	68.45	16.384		
12,000.00	10,460.57	11,442.95	10,222.50	39.08	32.54	-77.86	1,723.17	-1,168.61	1,118.31	1,046.69	71.62	15.614		
12,100.00	10,459.98	11,548.26	10,224.04	40.57	34.07	-77.94	1,828.45	-1,170.47	1,115.40	1,040.75	74.65	14.943		

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 100-NS-GYRO-MS, 9364-MWD												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
12,200.00	10,459.39	11,651.35	10,226.45	42.09	35.63	-78.05	1,931.51	-1,170.93	1,110.96	1,033.24	77.72	14.294	
12,300.00	10,458.80	11,761.94	10,228.67	43.64	37.31	-78.15	2,042.07	-1,171.65	1,106.86	1,025.91	80.95	13.674	
12,400.00	10,458.21	11,856.84	10,230.31	45.21	38.82	-78.22	2,136.96	-1,171.41	1,101.89	1,017.86	84.03	13.113	
12,500.00	10,457.62	11,950.97	10,230.85	46.79	40.36	-78.23	2,231.09	-1,171.62	1,097.63	1,010.47	87.15	12.594	
12,600.00	10,457.03	12,042.71	10,230.33	48.40	41.88	-78.19	2,322.82	-1,172.15	1,093.94	1,003.66	90.28	12.117	
12,700.00	10,456.44	12,175.20	10,229.29	50.02	43.98	-78.11	2,455.30	-1,171.26	1,089.05	995.05	94.00	11.586	
12,800.00	10,455.85	12,266.24	10,228.15	51.66	45.50	-78.02	2,546.31	-1,169.65	1,083.20	986.05	97.16	11.149	
12,900.00	10,455.26	12,361.63	10,226.24	53.31	47.10	-77.89	2,641.68	-1,168.48	1,078.05	977.64	100.41	10.736	
13,000.00	10,454.66	12,463.54	10,225.53	54.97	48.68	-77.82	2,743.58	-1,167.33	1,072.72	969.07	103.66	10.349	
13,100.00	10,454.07	12,553.47	10,225.03	56.65	50.17	-77.77	2,833.51	-1,166.92	1,068.02	961.20	106.82	9.998	
13,200.00	10,453.48	12,660.81	10,223.06	58.33	51.96	-77.65	2,940.83	-1,166.59	1,063.77	953.48	110.29	9.645	
13,300.00	10,452.89	12,774.60	10,222.63	60.02	53.80	-77.58	3,054.59	-1,164.44	1,057.58	943.76	113.83	9.291	
13,400.00	10,452.30	12,877.41	10,222.73	61.73	55.49	-77.54	3,157.38	-1,162.44	1,051.30	934.09	117.22	8.969	
13,500.00	10,451.71	12,971.67	10,224.89	63.44	57.03	-77.62	3,251.60	-1,160.82	1,044.78	924.31	120.46	8.673	
13,600.00	10,451.12	13,064.43	10,226.15	65.15	58.61	-77.65	3,344.35	-1,159.87	1,039.12	915.36	123.76	8.396	
13,700.00	10,450.53	13,152.61	10,226.74	66.88	60.15	-77.66	3,432.52	-1,159.47	1,034.18	907.15	127.03	8.141	
13,800.00	10,449.94	13,243.73	10,226.38	68.61	61.74	-77.63	3,523.64	-1,160.03	1,030.49	900.14	130.35	7.906	
13,900.00	10,449.35	13,336.63	10,225.25	70.34	63.36	-77.57	3,616.53	-1,160.95	1,027.36	893.65	133.70	7.684	
14,000.00	10,448.76	13,431.13	10,223.87	72.09	64.92	-77.49	3,711.00	-1,162.60	1,025.00	887.99	137.01	7.481	
14,100.00	10,448.16	13,523.99	10,223.37	73.83	66.43	-77.47	3,803.84	-1,164.77	1,023.04	882.78	140.26	7.294	
14,200.00	10,447.57	13,623.62	10,222.45	75.58	68.11	-77.44	3,903.41	-1,167.78	1,021.83	878.13	143.70	7.111	
14,300.00	10,446.98	13,718.76	10,223.34	77.34	69.69	-77.50	3,998.51	-1,170.80	1,020.37	873.34	147.03	6.940	
14,397.10	10,446.41	13,805.86	10,223.44	79.05	71.24	-77.53	4,085.53	-1,174.32	1,019.93	869.64	150.29	6.787	
14,400.00	10,446.39	13,808.50	10,223.43	79.10	71.29	-77.53	4,088.17	-1,174.44	1,019.93	869.55	150.39	6.782	
14,500.00	10,445.80	13,911.47	10,222.98	80.86	73.06	-77.54	4,191.03	-1,179.09	1,020.08	866.16	153.92	6.627	
14,600.00	10,445.21	14,032.58	10,225.46	82.63	75.00	-77.71	4,312.03	-1,183.55	1,018.89	861.26	157.63	6.464	
14,700.00	10,444.62	14,175.93	10,233.51	84.40	77.33	-78.15	4,455.13	-1,185.01	1,014.30	852.57	161.73	6.272	
14,800.00	10,444.03	14,284.00	10,238.48	86.17	79.12	-78.38	4,563.05	-1,182.66	1,006.84	841.55	165.29	6.091	
14,900.00	10,443.44	14,382.13	10,241.57	87.95	80.81	-78.51	4,661.12	-1,180.47	999.65	830.89	168.76	5.924	
15,000.00	10,442.85	14,482.70	10,243.39	89.73	82.52	-78.56	4,761.63	-1,177.83	992.35	820.11	172.24	5.761	
15,100.00	10,442.25	14,582.12	10,243.96	91.51	84.21	-78.55	4,861.00	-1,174.97	985.05	809.33	175.72	5.606	
15,200.00	10,441.66	14,650.00	10,243.43	93.29	85.38	-78.48	4,928.85	-1,172.85	978.29	799.62	178.67	5.475	
15,239.42	10,441.43	14,650.00	10,243.43	93.99	85.38	-78.48	4,928.85	-1,172.85	977.50	798.12	179.37	5.450 CC, ES	
15,300.00	10,441.07	14,650.00	10,243.43	95.08	85.38	-78.48	4,928.85	-1,172.85	979.37	798.92	180.45	5.427 SF	
15,400.00	10,440.48	14,650.00	10,243.43	96.86	85.38	-78.48	4,928.85	-1,172.85	990.60	808.36	182.24	5.436	
15,481.49	10,440.00	14,650.00	10,243.43	98.05	85.38	-78.48	4,928.85	-1,172.85	1,007.02	823.59	183.43	5.490	



Integrity Directional Services, LLC

Anticollision Report



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 204-Inclinometer only												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	0.00	0.00	0.00	0.00	-76.61	450.80	-1,893.40	1,946.38				
100.00	100.00	86.30	86.30	0.08	2.34	-76.61	450.80	-1,893.40	1,946.33	1,943.91	2.42	804.802	
200.00	200.00	186.30	186.30	0.31	5.04	-76.61	450.80	-1,893.40	1,946.33	1,940.98	5.35	363.860	
300.00	300.00	286.30	286.30	0.53	7.99	-76.61	450.80	-1,893.40	1,946.33	1,937.81	8.52	228.394	
400.00	400.00	386.30	386.30	0.76	10.99	-76.61	450.80	-1,893.40	1,946.33	1,934.58	11.75	165.694	
500.00	500.00	486.30	486.30	0.98	13.99	-76.61	450.80	-1,893.40	1,946.33	1,931.36	14.97	130.003	
600.00	600.00	586.30	586.30	1.21	16.99	-76.61	450.80	-1,893.40	1,946.33	1,928.13	18.20	106.964	
700.00	700.00	686.31	686.30	1.43	19.99	-76.61	450.80	-1,893.40	1,946.33	1,924.91	21.42	90.860	
800.00	800.00	786.31	786.30	1.66	22.99	-76.61	450.80	-1,893.40	1,946.33	1,921.68	24.65	78.972	
900.00	900.00	886.32	886.30	1.88	25.99	-76.61	450.80	-1,893.40	1,946.33	1,918.46	27.87	69.834	
1,000.00	1,000.00	986.32	986.30	2.11	28.99	-76.61	450.80	-1,893.40	1,946.33	1,915.23	31.10	62.592	
1,100.00	1,100.00	1,086.32	1,086.30	2.33	31.99	-76.61	450.80	-1,893.40	1,946.33	1,912.01	34.32	56.711	
1,200.00	1,200.00	1,186.33	1,186.30	2.56	34.99	-76.61	450.80	-1,893.40	1,946.33	1,908.78	37.55	51.839	
1,300.00	1,300.00	1,286.33	1,286.30	2.78	37.99	-76.61	450.80	-1,893.40	1,946.33	1,905.56	40.77	47.739	
1,400.00	1,400.00	1,386.33	1,386.30	3.01	40.99	-76.61	450.80	-1,893.40	1,946.33	1,902.33	44.00	44.240	
1,500.00	1,500.00	1,486.33	1,486.30	3.23	43.99	-76.61	450.80	-1,893.40	1,946.33	1,899.11	47.22	41.218	
1,600.00	1,600.00	1,586.35	1,586.30	3.45	46.99	-76.61	450.80	-1,893.40	1,946.33	1,895.88	50.45	38.583	
1,700.00	1,700.00	1,686.35	1,686.30	3.68	49.99	-76.61	450.80	-1,893.40	1,946.33	1,892.66	53.67	36.265	
1,800.00	1,800.00	1,786.35	1,786.30	3.90	52.99	-76.61	450.80	-1,893.40	1,946.33	1,889.44	56.89	34.209	
1,900.00	1,900.00	1,886.35	1,886.30	4.13	55.99	-76.61	450.80	-1,893.40	1,946.33	1,886.21	60.12	32.374	
1,965.51	1,965.51	1,951.86	1,951.81	4.28	57.96	-76.61	450.80	-1,893.40	1,946.33	1,884.10	62.23	31.275	
2,000.00	2,000.00	1,983.00	1,982.95	4.35	58.89	-76.61	450.80	-1,893.40	1,946.33	1,883.09	63.24	30.775	
2,100.00	2,100.00	2,086.35	2,086.30	4.58	61.99	-76.61	450.80	-1,893.40	1,946.33	1,879.76	66.57	29.238	
2,200.00	2,200.00	2,186.35	2,186.30	4.80	64.99	-76.61	450.80	-1,893.40	1,946.33	1,876.54	69.79	27.887	
2,300.00	2,300.00	2,286.35	2,286.30	5.03	67.99	-76.61	450.80	-1,893.40	1,946.33	1,873.31	73.02	26.655	
2,400.00	2,400.00	2,386.36	2,386.30	5.25	70.99	-76.61	450.80	-1,893.40	1,946.33	1,870.09	76.24	25.528	
2,500.00	2,500.00	2,486.36	2,486.30	5.48	73.99	-76.61	450.80	-1,893.40	1,946.33	1,866.86	79.47	24.492	
2,600.00	2,600.00	2,586.43	2,586.30	5.70	76.99	-76.61	450.80	-1,893.40	1,946.33	1,863.63	82.70	23.536	
2,700.00	2,700.00	2,686.43	2,686.30	5.93	79.99	-76.61	450.80	-1,893.40	1,946.33	1,860.41	85.92	22.653	
2,800.00	2,800.00	2,786.43	2,786.30	6.15	82.99	-76.61	450.80	-1,893.40	1,946.33	1,857.18	89.14	21.833	
2,900.00	2,900.00	2,886.43	2,886.30	6.38	85.99	-76.61	450.80	-1,893.40	1,946.33	1,853.96	92.37	21.071	
3,000.00	3,000.00	2,986.46	2,986.30	6.60	88.99	-76.61	450.80	-1,893.40	1,946.33	1,850.73	95.60	20.360	
3,100.00	3,100.00	3,086.46	3,086.30	6.83	91.99	-76.61	450.80	-1,893.40	1,946.33	1,847.51	98.82	19.696	
3,200.00	3,200.00	3,186.46	3,186.30	7.05	94.99	-76.61	450.80	-1,893.40	1,946.33	1,844.29	102.04	19.073	
3,300.00	3,300.00	3,286.46	3,286.30	7.28	97.99	-76.61	450.80	-1,893.40	1,946.33	1,841.06	105.27	18.489	
3,400.00	3,400.00	3,386.46	3,386.30	7.50	100.99	-76.61	450.80	-1,893.40	1,946.33	1,837.84	108.49	17.939	
3,500.00	3,500.00	3,486.48	3,486.30	7.73	103.99	-76.61	450.80	-1,893.40	1,946.33	1,834.61	111.72	17.422	
3,600.00	3,600.00	3,586.48	3,586.30	7.95	106.99	-76.61	450.80	-1,893.40	1,946.33	1,831.39	114.94	16.933	
3,700.00	3,700.00	3,686.48	3,686.30	8.17	109.99	-76.61	450.80	-1,893.40	1,946.33	1,828.16	118.17	16.471	
3,800.00	3,800.00	3,786.48	3,786.30	8.40	112.99	-76.61	450.80	-1,893.40	1,946.33	1,824.94	121.39	16.033	
3,900.00	3,900.00	3,886.53	3,886.30	8.62	116.00	-76.61	450.80	-1,893.40	1,946.33	1,821.71	124.62	15.618	
4,000.00	4,000.00	3,986.66	3,986.30	8.85	119.00	-76.61	450.80	-1,893.40	1,946.33	1,818.48	127.85	15.224	
4,100.00	4,100.00	4,086.66	4,086.30	9.07	122.00	-76.61	450.80	-1,893.40	1,946.33	1,815.26	131.07	14.849	
4,200.00	4,200.00	4,186.66	4,186.30	9.30	125.00	-76.61	450.80	-1,893.40	1,946.33	1,812.03	134.30	14.493	
4,264.61	4,264.61	4,251.26	4,250.91	9.44	126.94	-76.61	450.80	-1,893.40	1,946.33	1,809.95	136.38	14.271	
4,300.00	4,300.00	4,281.00	4,280.48	9.52	127.83	-76.61	450.80	-1,893.40	1,946.34	1,808.98	137.35	14.170	
4,400.00	4,400.00	4,386.82	4,386.30	9.75	131.00	-76.61	450.80	-1,893.40	1,946.33	1,805.58	140.75	13.828	
4,500.00	4,500.00	4,487.03	4,486.30	9.97	134.01	-76.61	450.80	-1,893.40	1,946.33	1,802.35	143.98	13.518	
4,600.00	4,600.00	4,587.11	4,586.30	10.20	137.01	-76.61	450.80	-1,893.40	1,946.33	1,799.12	147.21	13.221	
4,700.00	4,700.00	4,687.11	4,686.30	10.42	140.01	-76.61	450.80	-1,893.40	1,946.33	1,795.89	150.44	12.938	
4,800.00	4,800.00	4,787.11	4,786.30	10.65	143.01	-76.61	450.80	-1,893.40	1,946.33	1,792.67	153.66	12.666	
4,900.00	4,900.00	4,887.35	4,886.30	10.87	146.02	-76.61	450.80	-1,893.40	1,946.33	1,789.44	156.89	12.405	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 204-Inclinometer only												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	
5,000.00	5,000.00	4,987.35	4,986.30	11.10	149.02	-76.61	450.80	-1,893.40	1,946.33	1,786.21	160.12	12.156	
5,100.00	5,100.00	5,087.35	5,086.30	11.32	152.02	-76.61	450.80	-1,893.40	1,946.33	1,782.99	163.34	11.916	
5,200.00	5,200.00	5,187.35	5,186.30	11.55	155.02	-76.61	450.80	-1,893.40	1,946.33	1,779.76	166.57	11.685	
5,300.00	5,300.00	5,287.35	5,286.30	11.77	158.02	-76.61	450.80	-1,893.40	1,946.33	1,776.54	169.79	11.463	
5,400.00	5,400.00	5,387.35	5,386.30	12.00	161.02	-76.61	450.80	-1,893.40	1,946.33	1,773.31	173.02	11.249	
5,500.00	5,500.00	5,487.35	5,486.30	12.22	164.02	-76.61	450.80	-1,893.40	1,946.33	1,770.09	176.24	11.044	
5,600.00	5,600.00	5,587.36	5,586.30	12.45	167.02	-76.61	450.80	-1,893.40	1,946.33	1,766.86	179.47	10.845	
5,700.00	5,700.00	5,687.36	5,686.30	12.67	170.02	-76.61	450.80	-1,893.40	1,946.33	1,763.64	182.69	10.654	
5,800.00	5,800.00	5,787.36	5,786.30	12.89	173.02	-76.61	450.80	-1,893.40	1,946.33	1,760.41	185.92	10.469	
5,900.00	5,900.00	5,887.36	5,886.30	13.12	176.02	-76.61	450.80	-1,893.40	1,946.33	1,757.19	189.14	10.290	
6,000.00	6,000.00	5,987.36	5,986.30	13.34	179.02	-76.61	450.80	-1,893.40	1,946.33	1,753.96	192.37	10.118	
6,100.00	6,100.00	6,087.36	6,086.30	13.57	182.02	-76.61	450.80	-1,893.40	1,946.33	1,750.74	195.59	9.951	
6,200.00	6,200.00	6,187.36	6,186.30	13.79	185.02	-76.61	450.80	-1,893.40	1,946.33	1,747.51	198.81	9.790	
6,300.00	6,300.00	6,287.36	6,286.30	14.02	188.02	-76.61	450.80	-1,893.40	1,946.33	1,744.29	202.04	9.633	
6,400.00	6,400.00	6,387.37	6,386.30	14.24	191.02	-76.61	450.80	-1,893.40	1,946.33	1,741.07	205.26	9.482	
6,500.00	6,500.00	6,487.37	6,486.30	14.47	194.02	-76.61	450.80	-1,893.40	1,946.33	1,737.84	208.49	9.335	
6,600.00	6,600.00	6,587.37	6,586.30	14.69	197.02	-76.61	450.80	-1,893.40	1,946.33	1,734.62	211.71	9.193	
6,700.00	6,700.00	6,687.37	6,686.30	14.92	200.02	-76.61	450.80	-1,893.40	1,946.33	1,731.39	214.94	9.055	
6,800.00	6,800.00	6,787.37	6,786.30	15.14	203.02	-76.61	450.80	-1,893.40	1,946.33	1,728.17	218.16	8.921	
6,900.00	6,900.00	6,887.37	6,886.30	15.37	206.02	-76.61	450.80	-1,893.40	1,946.33	1,724.94	221.39	8.791	
7,000.00	7,000.00	6,987.37	6,986.30	15.59	209.02	-76.61	450.80	-1,893.40	1,946.33	1,721.72	224.61	8.665	
7,100.00	7,100.00	7,087.37	7,086.30	15.82	212.02	-76.61	450.80	-1,893.40	1,946.33	1,718.49	227.84	8.543	
7,200.00	7,200.00	7,187.37	7,186.30	16.04	215.02	-76.61	450.80	-1,893.40	1,946.33	1,715.27	231.06	8.423	
7,300.00	7,300.00	7,287.37	7,286.30	16.27	218.02	-76.61	450.80	-1,893.40	1,946.33	1,712.04	234.29	8.307	
7,365.50	7,365.50	7,352.87	7,351.80	16.41	219.99	-76.61	450.80	-1,893.40	1,946.33	1,709.93	236.40	8.233	
7,400.00	7,400.00	7,384.00	7,382.92	16.49	220.92	-76.61	450.80	-1,893.40	1,946.33	1,708.92	237.41	8.198	
7,500.00	7,500.00	7,487.38	7,486.30	16.72	224.02	-76.61	450.80	-1,893.40	1,946.33	1,705.59	240.74	8.085	
7,600.00	7,600.00	7,587.38	7,586.30	16.94	227.02	-76.61	450.80	-1,893.40	1,946.33	1,702.37	243.96	7.978	
7,700.00	7,700.00	7,687.38	7,686.30	17.17	230.02	-76.61	450.80	-1,893.40	1,946.33	1,699.14	247.19	7.874	
7,800.00	7,800.00	7,787.38	7,786.30	17.39	233.02	-76.61	450.80	-1,893.40	1,946.33	1,695.92	250.41	7.773	
7,900.00	7,900.00	7,887.38	7,886.30	17.61	236.02	-76.61	450.80	-1,893.40	1,946.33	1,692.69	253.64	7.674	
8,000.00	8,000.00	7,987.39	7,986.30	17.84	239.02	-76.61	450.80	-1,893.40	1,946.33	1,689.47	256.86	7.577	
8,100.00	8,100.00	8,087.39	8,086.30	18.06	242.02	-76.61	450.80	-1,893.40	1,946.33	1,686.24	260.09	7.483	
8,200.00	8,200.00	8,187.39	8,186.30	18.29	245.02	-76.61	450.80	-1,893.40	1,946.33	1,683.02	263.31	7.392	
8,300.00	8,300.00	8,287.39	8,286.30	18.51	248.02	-76.61	450.80	-1,893.40	1,946.33	1,679.79	266.54	7.302	
8,400.00	8,400.00	8,387.39	8,386.30	18.74	251.02	-76.61	450.80	-1,893.40	1,946.33	1,676.57	269.76	7.215	
8,500.00	8,500.00	8,487.39	8,486.30	18.96	254.02	-76.61	450.80	-1,893.40	1,946.33	1,673.34	272.99	7.130	
8,600.00	8,600.00	8,587.39	8,586.30	19.19	257.02	-76.61	450.80	-1,893.40	1,946.33	1,670.12	276.21	7.047	
8,700.00	8,700.00	8,687.39	8,686.30	19.41	260.02	-76.61	450.80	-1,893.40	1,946.33	1,666.89	279.43	6.965	
8,800.00	8,800.00	8,787.39	8,786.30	19.64	263.02	-76.61	450.80	-1,893.40	1,946.33	1,663.67	282.66	6.886	
8,900.00	8,900.00	8,887.39	8,886.30	19.86	266.02	-76.61	450.80	-1,893.40	1,946.33	1,660.45	285.88	6.808	
9,000.00	9,000.00	8,987.40	8,986.30	20.09	269.02	-76.61	450.80	-1,893.40	1,946.33	1,657.22	289.11	6.732	
9,100.00	9,100.00	9,087.40	9,086.30	20.31	272.02	-76.61	450.80	-1,893.40	1,946.33	1,654.00	292.33	6.658	
9,200.00	9,200.00	9,187.40	9,186.30	20.54	275.02	-76.61	450.80	-1,893.40	1,946.33	1,650.77	295.56	6.585	
9,300.00	9,300.00	9,287.40	9,286.30	20.76	278.02	-76.61	450.80	-1,893.40	1,946.33	1,647.55	298.78	6.514	
9,400.00	9,400.00	9,387.40	9,386.30	20.99	281.02	-76.61	450.80	-1,893.40	1,946.33	1,644.32	302.01	6.445	
9,500.00	9,500.00	9,487.40	9,486.30	21.21	284.02	-76.61	450.80	-1,893.40	1,946.33	1,641.10	305.23	6.377	
9,600.00	9,600.00	9,587.41	9,586.30	21.44	287.02	-76.61	450.80	-1,893.40	1,946.33	1,637.87	308.46	6.310	
9,700.00	9,700.00	9,687.41	9,686.30	21.66	290.02	-76.61	450.80	-1,893.40	1,946.33	1,634.65	311.68	6.245	
9,800.00	9,800.00	9,787.41	9,786.30	21.89	293.02	-76.61	450.80	-1,893.40	1,946.33	1,631.42	314.91	6.181	
9,900.00	9,900.00	9,887.41	9,886.30	22.11	296.02	-76.61	450.80	-1,893.40	1,946.33	1,628.20	318.13	6.118	
9,990.54	9,990.54	9,977.96	9,976.84	22.31	298.74	-76.61	450.80	-1,893.40	1,946.33	1,625.28	321.05	6.062	

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	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design												Offset Site Error:	0.00 ft
Survey Program: 204-Inclinometer only												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	
10,000.00	10,000.00	9,987.41	9,986.30	22.33	299.02	-74.13	450.80	-1,893.40	1,946.30	1,624.95	321.36	6.057	
10,025.00	10,024.97	10,012.38	10,011.27	22.39	299.77	-74.19	450.80	-1,893.40	1,945.99	1,623.83	322.16	6.040	
10,050.00	10,049.85	10,037.26	10,036.15	22.45	300.52	-74.34	450.80	-1,893.40	1,945.32	1,622.36	322.97	6.023	
10,075.00	10,074.56	10,061.97	10,060.86	22.51	301.26	-74.56	450.80	-1,893.40	1,944.30	1,620.54	323.76	6.005	
10,100.00	10,099.04	10,086.46	10,085.34	22.56	301.99	-74.86	450.80	-1,893.40	1,942.95	1,618.39	324.56	5.986	
10,125.00	10,123.23	10,110.64	10,109.53	22.62	302.72	-75.23	450.80	-1,893.40	1,941.27	1,615.93	325.34	5.967	
10,150.00	10,147.05	10,134.47	10,133.35	22.67	303.43	-75.67	450.80	-1,893.40	1,939.28	1,613.17	326.11	5.947	
10,175.00	10,170.45	10,157.86	10,156.75	22.73	304.14	-76.17	450.80	-1,893.40	1,937.00	1,610.13	326.86	5.926	
10,200.00	10,193.35	10,180.76	10,179.65	22.78	304.82	-76.74	450.80	-1,893.40	1,934.45	1,606.85	327.60	5.905	
10,225.00	10,215.69	10,203.10	10,201.99	22.83	305.49	-77.36	450.80	-1,893.40	1,931.66	1,603.33	328.32	5.883	
10,250.00	10,237.42	10,224.83	10,223.72	22.88	306.15	-78.03	450.80	-1,893.40	1,928.65	1,599.62	329.02	5.862	
10,275.00	10,258.47	10,245.88	10,244.77	22.93	306.78	-78.74	450.80	-1,893.40	1,925.45	1,595.74	329.71	5.840	
10,300.00	10,278.79	10,266.20	10,265.09	22.98	307.39	-79.49	450.80	-1,893.40	1,922.09	1,591.73	330.37	5.818	
10,325.00	10,298.31	10,285.72	10,284.61	23.04	307.97	-80.26	450.80	-1,893.40	1,918.62	1,587.60	331.01	5.796	
10,350.00	10,316.99	10,304.41	10,303.29	23.10	308.53	-81.06	450.80	-1,893.40	1,915.05	1,583.41	331.63	5.775	
10,375.00	10,334.78	10,322.20	10,321.08	23.17	309.07	-81.87	450.80	-1,893.40	1,911.43	1,579.19	332.23	5.753	
10,400.00	10,351.63	10,339.04	10,337.93	23.24	309.57	-82.68	450.80	-1,893.40	1,907.78	1,574.97	332.81	5.732	
10,425.00	10,367.48	10,354.90	10,353.78	23.31	310.05	-83.49	450.80	-1,893.40	1,904.15	1,570.80	333.36	5.712	
10,450.00	10,382.30	10,369.72	10,368.60	23.39	310.49	-84.28	450.80	-1,893.40	1,900.58	1,566.69	333.88	5.692	
10,475.00	10,396.05	10,383.47	10,382.35	23.47	310.90	-85.05	450.80	-1,893.40	1,897.08	1,562.71	334.38	5.673	
10,500.00	10,408.69	10,396.11	10,394.99	23.56	311.28	-85.79	450.80	-1,893.40	1,893.71	1,558.87	334.85	5.655	
10,525.00	10,420.18	10,407.60	10,406.48	23.66	311.63	-86.49	450.80	-1,893.40	1,890.49	1,555.20	335.29	5.638	
10,550.00	10,430.49	10,417.91	10,416.79	23.76	311.94	-87.14	450.80	-1,893.40	1,887.45	1,551.76	335.70	5.622	
10,575.00	10,439.60	10,427.01	10,425.90	23.87	312.21	-87.74	450.80	-1,893.40	1,884.63	1,548.55	336.08	5.608	
10,600.00	10,447.47	10,434.89	10,433.77	23.98	312.45	-88.28	450.80	-1,893.40	1,882.04	1,545.61	336.43	5.594	
10,625.00	10,454.10	10,441.51	10,440.40	24.10	312.65	-88.76	450.80	-1,893.40	1,879.71	1,542.96	336.75	5.582	
10,650.00	10,459.45	10,446.87	10,445.75	24.23	312.81	-89.16	450.80	-1,893.40	1,877.67	1,540.63	337.04	5.571	
10,675.00	10,463.52	10,450.94	10,449.82	24.36	312.93	-89.50	450.80	-1,893.40	1,875.92	1,538.63	337.29	5.562	
10,700.00	10,466.29	10,453.71	10,452.59	24.50	313.01	-89.75	450.80	-1,893.40	1,874.49	1,536.98	337.51	5.554	
10,725.00	10,467.76	10,455.17	10,454.06	24.65	313.06	-89.93	450.80	-1,893.40	1,873.38	1,535.68	337.70	5.547	
10,743.37	10,468.00	10,455.42	10,454.30	24.76	313.06	-90.01	450.80	-1,893.40	1,872.78	1,534.96	337.82	5.544	
10,795.64	10,467.69	10,455.11	10,453.99	25.09	313.05	-90.00	450.80	-1,893.40	1,872.05	1,533.91	338.15	5.536 CC	
10,800.00	10,467.67	10,455.08	10,453.97	25.12	313.05	-90.00	450.80	-1,893.40	1,872.06	1,533.88	338.17	5.536 ES	
10,900.00	10,467.08	10,454.49	10,453.38	25.85	313.03	-89.98	450.80	-1,893.40	1,874.96	1,536.07	338.89	5.533 SF	
11,000.00	10,466.48	10,453.90	10,452.78	26.69	313.02	-89.96	450.80	-1,893.40	1,883.17	1,543.46	339.71	5.543	
11,100.00	10,465.89	10,453.31	10,452.19	27.63	313.00	-89.94	450.80	-1,893.40	1,896.63	1,556.00	340.63	5.568	
11,200.00	10,465.30	10,452.72	10,451.60	28.65	312.98	-89.93	450.80	-1,893.40	1,915.22	1,573.59	341.64	5.606	
11,300.00	10,464.71	10,452.13	10,451.01	29.76	312.96	-89.91	450.80	-1,893.40	1,938.80	1,596.08	342.72	5.657	
11,400.00	10,464.12	10,451.54	10,450.42	30.93	312.95	-89.89	450.80	-1,893.40	1,967.19	1,623.31	343.88	5.721	
11,500.00	10,463.53	10,450.95	10,449.83	32.17	312.93	-89.87	450.80	-1,893.40	2,000.17	1,655.07	345.10	5.796	
11,600.00	10,462.94	10,450.36	10,449.24	33.46	312.91	-89.85	450.80	-1,893.40	2,037.54	1,691.16	346.37	5.882	
11,700.00	10,462.35	10,449.77	10,448.65	34.81	312.89	-89.84	450.80	-1,893.40	2,079.04	1,731.34	347.70	5.979	
11,800.00	10,461.76	10,449.17	10,448.06	36.19	312.88	-89.82	450.80	-1,893.40	2,124.45	1,775.38	349.07	6.086	
11,900.00	10,461.17	10,448.58	10,447.47	37.62	312.86	-89.80	450.80	-1,893.40	2,173.51	1,823.03	350.48	6.202	
12,000.00	10,460.57	10,447.99	10,446.87	39.08	312.84	-89.78	450.80	-1,893.40	2,225.99	1,874.07	351.92	6.325	
12,100.00	10,459.98	10,447.40	10,446.28	40.57	312.82	-89.76	450.80	-1,893.40	2,281.64	1,928.24	353.40	6.456	
12,200.00	10,459.39	10,446.81	10,445.69	42.09	312.80	-89.75	450.80	-1,893.40	2,340.24	1,985.35	354.90	6.594	
12,300.00	10,458.80	10,446.22	10,445.10	43.64	312.79	-89.73	450.80	-1,893.40	2,401.58	2,045.16	356.43	6.738	
12,400.00	10,458.21	10,445.63	10,444.51	45.21	312.77	-89.71	450.80	-1,893.40	2,465.45	2,107.48	357.98	6.887	
12,500.00	10,457.62	10,445.04	10,443.92	46.79	312.75	-89.69	450.80	-1,893.40	2,531.66	2,172.12	359.55	7.041	
12,600.00	10,457.03	10,444.45	10,443.33	48.40	312.73	-89.67	450.80	-1,893.40	2,600.04	2,238.90	361.13	7.200	
12,700.00	10,456.44	10,443.86	10,442.74	50.02	312.72	-89.66	450.80	-1,893.40	2,670.40	2,307.66	362.74	7.362	

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



Integrity Directional Services, LLC

Anticollision Report



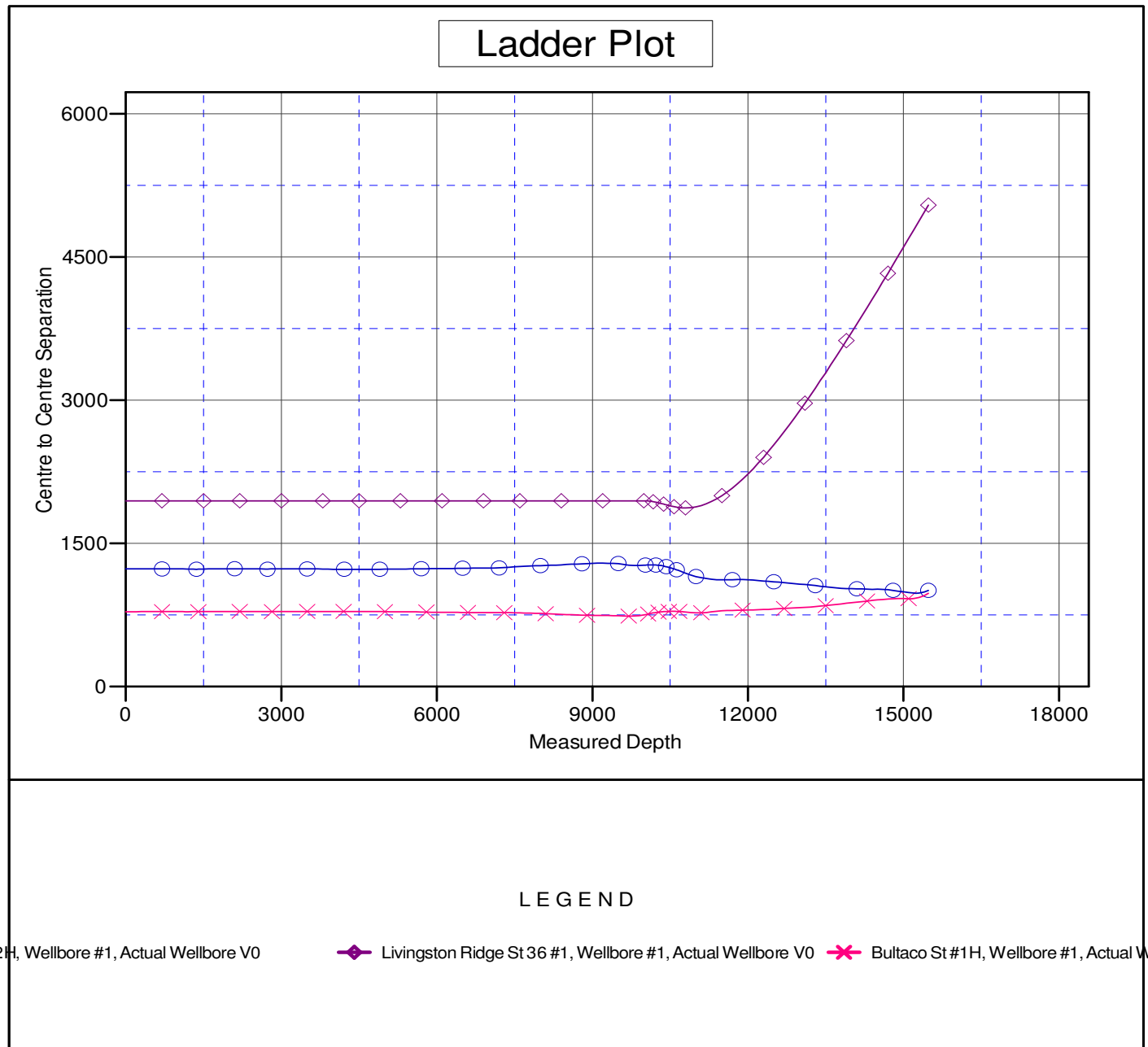
Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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

Offset Design Sec. 36, T 22 S. , R 31 E - Livingston Ridge St 36 #1 - Wellbore #1 - Actual Wellbore												Offset Site Error:	0.00 ft
Survey Program: 204-Inclinometer only												Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis			Distance						
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
12,800.00	10,455.85	10,443.26	10,442.15	51.66	312.70	-89.64	450.80	-1,893.40	2,742.61	2,378.25	364.36	7.527	
12,900.00	10,455.26	10,442.67	10,441.56	53.31	312.68	-89.62	450.80	-1,893.40	2,816.52	2,450.53	365.99	7.696	
13,000.00	10,454.66	10,442.08	10,440.96	54.97	312.66	-89.60	450.80	-1,893.40	2,891.99	2,524.36	367.64	7.866	
13,100.00	10,454.07	10,441.49	10,440.37	56.65	312.64	-89.58	450.80	-1,893.40	2,968.92	2,599.63	369.29	8.039	
13,200.00	10,453.48	10,440.90	10,439.78	58.33	312.63	-89.57	450.80	-1,893.40	3,047.18	2,676.23	370.96	8.214	
13,300.00	10,452.89	10,440.31	10,439.19	60.02	312.61	-89.55	450.80	-1,893.40	3,126.69	2,754.06	372.63	8.391	
13,400.00	10,452.30	10,439.72	10,438.60	61.73	312.59	-89.53	450.80	-1,893.40	3,207.34	2,833.02	374.32	8.568	
13,500.00	10,451.71	10,439.13	10,438.01	63.44	312.57	-89.51	450.80	-1,893.40	3,289.06	2,913.05	376.01	8.747	
13,600.00	10,451.12	10,438.54	10,437.42	65.15	312.56	-89.49	450.80	-1,893.40	3,371.76	2,994.05	377.71	8.927	
13,700.00	10,450.53	10,437.95	10,436.83	66.88	312.54	-89.47	450.80	-1,893.40	3,455.37	3,075.96	379.42	9.107	
13,800.00	10,449.94	10,437.35	10,436.24	68.61	312.52	-89.46	450.80	-1,893.40	3,539.84	3,158.71	381.13	9.288	
13,900.00	10,449.35	10,436.76	10,435.65	70.34	312.50	-89.44	450.80	-1,893.40	3,625.09	3,242.25	382.85	9.469	
14,000.00	10,448.76	10,436.17	10,435.06	72.09	312.49	-89.42	450.80	-1,893.40	3,711.09	3,326.51	384.57	9.650	
14,100.00	10,448.16	10,435.58	10,434.46	73.83	312.47	-89.40	450.80	-1,893.40	3,797.76	3,411.46	386.30	9.831	
14,200.00	10,447.57	10,434.99	10,433.87	75.58	312.45	-89.38	450.80	-1,893.40	3,885.08	3,497.05	388.03	10.012	
14,300.00	10,446.98	10,434.40	10,433.28	77.34	312.43	-89.37	450.80	-1,893.40	3,973.00	3,583.23	389.77	10.193	
14,400.00	10,446.39	10,433.81	10,432.69	79.10	312.41	-89.35	450.80	-1,893.40	4,061.47	3,669.96	391.51	10.374	
14,500.00	10,445.80	10,433.22	10,432.10	80.86	312.40	-89.33	450.80	-1,893.40	4,150.47	3,757.21	393.26	10.554	
14,600.00	10,445.21	10,432.63	10,431.51	82.63	312.38	-89.31	450.80	-1,893.40	4,239.96	3,844.95	395.01	10.734	
14,700.00	10,444.62	10,432.04	10,430.92	84.40	312.36	-89.29	450.80	-1,893.40	4,329.91	3,933.15	396.76	10.913	
14,800.00	10,444.03	10,431.45	10,430.33	86.17	312.34	-89.28	450.80	-1,893.40	4,420.29	4,021.77	398.51	11.092	
14,900.00	10,443.44	10,430.85	10,429.74	87.95	312.33	-89.26	450.80	-1,893.40	4,511.07	4,110.80	400.27	11.270	
15,000.00	10,442.85	10,430.26	10,429.15	89.73	312.31	-89.24	450.80	-1,893.40	4,602.24	4,200.21	402.03	11.447	
15,100.00	10,442.25	10,429.67	10,428.55	91.51	312.29	-89.22	450.80	-1,893.40	4,693.77	4,289.97	403.80	11.624	
15,200.00	10,441.66	10,429.08	10,427.96	93.29	312.27	-89.20	450.80	-1,893.40	4,785.64	4,380.07	405.56	11.800	
15,300.00	10,441.07	10,428.49	10,427.37	95.08	312.25	-89.19	450.80	-1,893.40	4,877.82	4,470.49	407.33	11.975	
15,400.00	10,440.48	10,427.90	10,426.78	96.86	312.24	-89.17	450.80	-1,893.40	4,970.31	4,561.21	409.10	12.149	
15,481.49	10,440.00	10,427.42	10,426.30	98.05	312.22	-89.15	450.80	-1,893.40	5,045.89	4,635.62	410.27	12.299	



Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandril Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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 Depths are relative to KB=26' @ 3504.70ft (Scandril Freedom) Coordinates are relative to: Bultaco State 3H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W Grid Convergence at Surface is: 0.32°

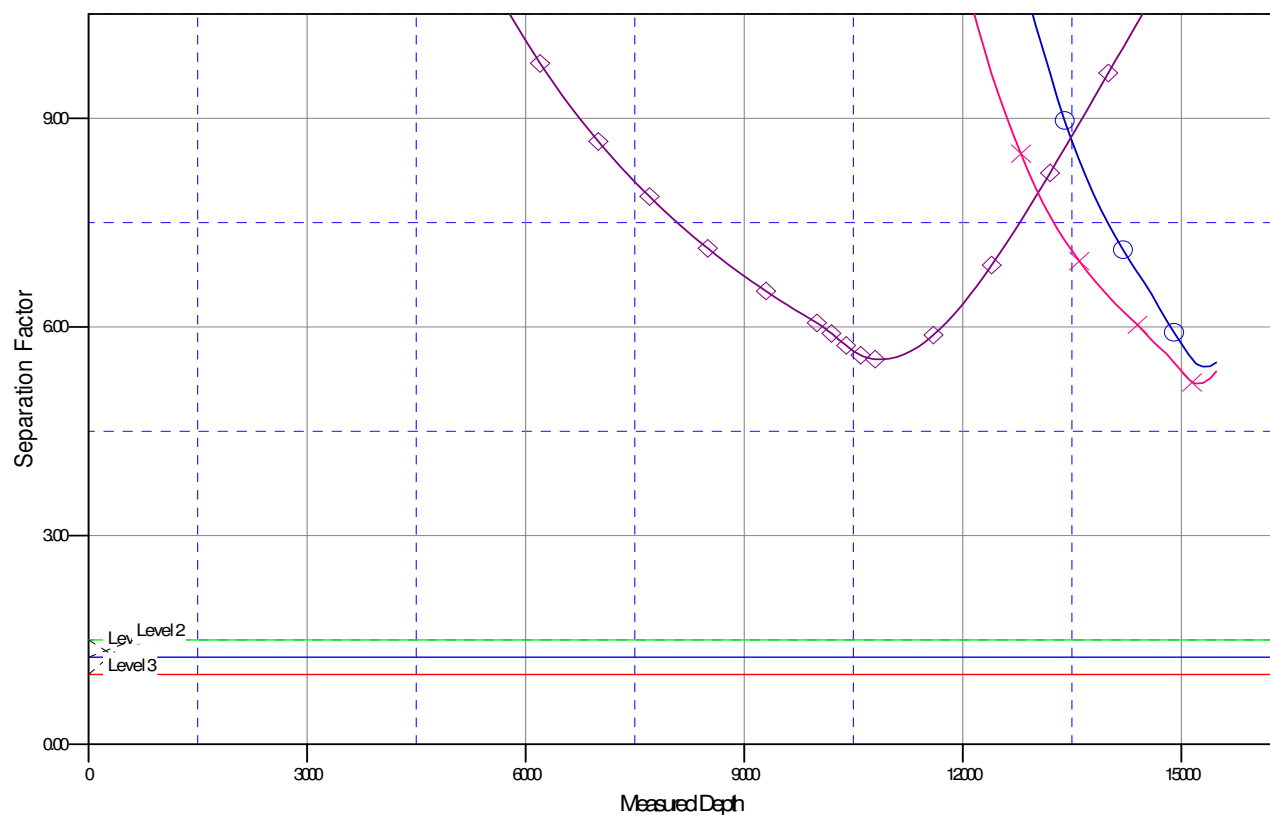




Company:	COG Operating L L C	Local Co-ordinate Reference:	Well Bultaco State 3H
Project:	Eddy County, NM (NAD 27 NME)	TVD Reference:	KB=26' @ 3504.70ft (Scandrell Freedom)
Reference Site:	Sec. 36, T 22 S. , R 31 E	MD Reference:	KB=26' @ 3504.70ft (Scandrell Freedom)
Site Error:	0.00 ft	North Reference:	Grid
Reference Well:	Bultaco State 3H	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 Depths are relative to KB=26' @ 3504.70ft (Scandrell Freedom) Coordinates are relative to: Bultaco State 3H
Offset Depths are relative to Offset Datum Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Central Meridian is 104° 20' 0.000 W Grid Convergence at Surface is: 0.32°

Separation Factor Plot



LEGEND

2H, Wellbore #1, Actual Wellbore V0 ◆ Livingston Ridge St 36 #1, Wellbore #1, Actual Wellbore V0 ✕ Bultaco St #1H, Wellbore #1, Actual Wellbore V0