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COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 16, T 25 S. , R 35 E

White Falcon 16 Federal Com 11H

Wellbore #1

Plan #1

Anticollision Report

21 March, 2017





Integrity Directional Services, LLC

Anticollision Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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

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

Survey Tool Program Date 3/21/2017

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	22,209.98	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. 16, T 25 S. , R 35 E						
White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #	6,000.00	5,999.90	40.00	13.31	1.499	Level 3, CC, ES
White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #	22,209.98	22,436.58	396.68	23.34	1.063	Level 2, SF
White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #	5,966.63	5,966.73	40.04	13.50	1.509	CC
White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #	22,209.98	22,455.22	384.81	11.53	1.031	Level 2, ES, SF

Offset Design Sec. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1												Offset Site Error:	0.00 ft
Survey Program: 0-MWD												Offset Well Error:	0.00 ft
Reference Measured Depth (ft)	Vertical Depth (ft)	Offset Measured Depth (ft)	Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	89.43	0.40	40.00	40.00				
100.00	100.00	99.90	99.90	0.08	0.08	89.43	0.40	40.00	40.00	39.84	0.17	240.623	
200.00	200.00	199.90	199.90	0.31	0.31	89.43	0.40	40.00	40.00	39.39	0.62	64.977	
300.00	300.00	299.90	299.90	0.53	0.53	89.43	0.40	40.00	40.00	38.94	1.07	37.555	
400.00	400.00	399.90	399.90	0.76	0.76	89.43	0.40	40.00	40.00	38.49	1.51	26.409	
500.00	500.00	499.90	499.90	0.98	0.98	89.43	0.40	40.00	40.00	38.04	1.96	20.365	
600.00	600.00	599.90	599.90	1.21	1.21	89.43	0.40	40.00	40.00	37.59	2.41	16.572	
700.00	700.00	699.90	699.90	1.43	1.43	89.43	0.40	40.00	40.00	37.14	2.86	13.971	
800.00	800.00	799.90	799.90	1.66	1.66	89.43	0.40	40.00	40.00	36.69	3.31	12.075	
900.00	900.00	899.90	899.90	1.88	1.88	89.43	0.40	40.00	40.00	36.24	3.76	10.632	
1,000.00	1,000.00	999.90	999.90	2.11	2.11	89.43	0.40	40.00	40.00	35.79	4.21	9.497	
1,100.00	1,100.00	1,099.90	1,099.90	2.33	2.33	89.43	0.40	40.00	40.00	35.34	4.66	8.582	
1,200.00	1,200.00	1,199.90	1,199.90	2.56	2.56	89.43	0.40	40.00	40.00	34.89	5.11	7.827	
1,300.00	1,300.00	1,299.90	1,299.90	2.78	2.78	89.43	0.40	40.00	40.00	34.44	5.56	7.194	
1,400.00	1,400.00	1,399.90	1,399.90	3.01	3.00	89.43	0.40	40.00	40.00	33.99	6.01	6.656	
1,500.00	1,500.00	1,499.90	1,499.90	3.23	3.23	89.43	0.40	40.00	40.00	33.54	6.46	6.193	
1,600.00	1,600.00	1,599.90	1,599.90	3.45	3.45	89.43	0.40	40.00	40.00	33.09	6.91	5.790	
1,700.00	1,700.00	1,699.90	1,699.90	3.68	3.68	89.43	0.40	40.00	40.00	32.64	7.36	5.436	
1,800.00	1,800.00	1,799.90	1,799.90	3.90	3.90	89.43	0.40	40.00	40.00	32.19	7.81	5.123	
1,900.00	1,900.00	1,899.90	1,899.90	4.13	4.13	89.43	0.40	40.00	40.00	31.74	8.26	4.844	
2,000.00	2,000.00	1,999.90	1,999.90	4.35	4.35	89.43	0.40	40.00	40.00	31.29	8.71	4.594	
2,100.00	2,100.00	2,099.90	2,099.90	4.58	4.58	89.43	0.40	40.00	40.00	30.85	9.16	4.369	
2,200.00	2,200.00	2,199.90	2,199.90	4.80	4.80	89.43	0.40	40.00	40.00	30.40	9.61	4.164	

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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TVD Reference: KB=26' @ 3272.50ft
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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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
2,300.00	2,300.00	2,299.90	2,299.90	5.03	5.03	89.43	0.40	40.00	40.00	29.95	10.06	3.978			
2,400.00	2,400.00	2,399.90	2,399.90	5.25	5.25	89.43	0.40	40.00	40.00	29.50	10.51	3.808			
2,500.00	2,500.00	2,499.90	2,499.90	5.48	5.48	89.43	0.40	40.00	40.00	29.05	10.95	3.652			
2,600.00	2,600.00	2,599.90	2,599.90	5.70	5.70	89.43	0.40	40.00	40.00	28.60	11.40	3.508			
2,700.00	2,700.00	2,699.90	2,699.90	5.93	5.93	89.43	0.40	40.00	40.00	28.15	11.85	3.375			
2,800.00	2,800.00	2,799.90	2,799.90	6.15	6.15	89.43	0.40	40.00	40.00	27.70	12.30	3.251			
2,900.00	2,900.00	2,899.90	2,899.90	6.38	6.38	89.43	0.40	40.00	40.00	27.25	12.75	3.137			
3,000.00	3,000.00	2,999.90	2,999.90	6.60	6.60	89.43	0.40	40.00	40.00	26.80	13.20	3.030			
3,100.00	3,100.00	3,099.90	3,099.90	6.83	6.83	89.43	0.40	40.00	40.00	26.35	13.65	2.930			
3,200.00	3,200.00	3,199.90	3,199.90	7.05	7.05	89.43	0.40	40.00	40.00	25.90	14.10	2.837			
3,300.00	3,300.00	3,299.90	3,299.90	7.28	7.28	89.43	0.40	40.00	40.00	25.45	14.55	2.749			
3,400.00	3,400.00	3,399.90	3,399.90	7.50	7.50	89.43	0.40	40.00	40.00	25.00	15.00	2.667			
3,500.00	3,500.00	3,499.90	3,499.90	7.73	7.72	89.43	0.40	40.00	40.00	24.55	15.45	2.589			
3,600.00	3,600.00	3,599.90	3,599.90	7.95	7.95	89.43	0.40	40.00	40.00	24.10	15.90	2.516			
3,700.00	3,700.00	3,699.90	3,699.90	8.17	8.17	89.43	0.40	40.00	40.00	23.65	16.35	2.447			
3,800.00	3,800.00	3,799.90	3,799.90	8.40	8.40	89.43	0.40	40.00	40.00	23.20	16.80	2.381			
3,900.00	3,900.00	3,899.90	3,899.90	8.62	8.62	89.43	0.40	40.00	40.00	22.75	17.25	2.319			
4,000.00	4,000.00	3,999.90	3,999.90	8.85	8.85	89.43	0.40	40.00	40.00	22.30	17.70	2.260			
4,100.00	4,100.00	4,099.90	4,099.90	9.07	9.07	89.43	0.40	40.00	40.00	21.85	18.15	2.204			
4,200.00	4,200.00	4,199.90	4,199.90	9.30	9.30	89.43	0.40	40.00	40.00	21.41	18.60	2.151			
4,300.00	4,300.00	4,299.90	4,299.90	9.52	9.52	89.43	0.40	40.00	40.00	20.96	19.05	2.100			
4,400.00	4,400.00	4,399.90	4,399.90	9.75	9.75	89.43	0.40	40.00	40.00	20.51	19.50	2.052			
4,500.00	4,500.00	4,499.90	4,499.90	9.97	9.97	89.43	0.40	40.00	40.00	20.06	19.95	2.006			
4,600.00	4,600.00	4,599.90	4,599.90	10.20	10.20	89.43	0.40	40.00	40.00	19.61	20.40	1.961			
4,700.00	4,700.00	4,699.90	4,699.90	10.42	10.42	89.43	0.40	40.00	40.00	19.16	20.84	1.919			
4,800.00	4,800.00	4,799.90	4,799.90	10.65	10.65	89.43	0.40	40.00	40.00	18.71	21.29	1.879			
4,900.00	4,900.00	4,899.90	4,899.90	10.87	10.87	89.43	0.40	40.00	40.00	18.26	21.74	1.840			
5,000.00	5,000.00	4,999.90	4,999.90	11.10	11.10	89.43	0.40	40.00	40.00	17.81	22.19	1.802			
5,100.00	5,100.00	5,099.90	5,099.90	11.32	11.32	89.43	0.40	40.00	40.00	17.36	22.64	1.767			
5,200.00	5,200.00	5,199.90	5,199.90	11.55	11.55	89.43	0.40	40.00	40.00	16.91	23.09	1.732			
5,300.00	5,300.00	5,299.90	5,299.90	11.77	11.77	89.43	0.40	40.00	40.00	16.46	23.54	1.699			
5,400.00	5,400.00	5,399.90	5,399.90	12.00	12.00	89.43	0.40	40.00	40.00	16.01	23.99	1.667			
5,500.00	5,500.00	5,499.90	5,499.90	12.22	12.22	89.43	0.40	40.00	40.00	15.56	24.44	1.637			
5,600.00	5,600.00	5,599.90	5,599.90	12.45	12.45	89.43	0.40	40.00	40.00	15.11	24.89	1.607			
5,700.00	5,700.00	5,699.90	5,699.90	12.67	12.67	89.43	0.40	40.00	40.00	14.66	25.34	1.579			
5,800.00	5,800.00	5,799.90	5,799.90	12.89	12.89	89.43	0.40	40.00	40.00	14.21	25.79	1.551			
5,900.00	5,900.00	5,899.90	5,899.90	13.12	13.12	89.43	0.40	40.00	40.00	13.76	26.24	1.525			
6,000.00	6,000.00	5,999.90	5,999.90	13.34	13.34	89.43	0.40	40.00	40.00	13.31	26.69	1.499	Level 3, CC, ES		
6,100.00	6,100.00	6,098.49	6,098.47	13.57	13.55	89.43	0.42	41.69	41.72	14.60	27.12	1.538			
6,200.00	6,200.00	6,197.95	6,197.84	13.79	13.75	89.43	0.45	46.00	46.04	18.50	27.54	1.672			
6,300.00	6,300.00	6,297.85	6,297.63	14.02	13.95	89.44	0.50	50.47	50.53	22.56	27.97	1.807			
6,400.00	6,400.00	6,397.75	6,397.43	14.24	14.15	89.44	0.54	54.95	55.01	26.62	28.39	1.937			
6,500.00	6,500.00	6,497.65	6,497.23	14.47	14.35	89.44	0.58	59.43	59.50	30.67	28.82	2.064			
6,600.00	6,600.00	6,597.55	6,597.03	14.69	14.56	89.45	0.62	63.91	63.98	34.73	29.25	2.187			
6,700.00	6,700.00	6,697.45	6,696.83	14.92	14.76	89.45	0.66	68.39	68.46	38.79	29.68	2.307			
6,800.00	6,800.00	6,797.34	6,796.63	15.14	14.97	89.45	0.70	72.87	72.95	42.84	30.11	2.423			
6,900.00	6,900.00	6,897.24	6,896.43	15.37	15.17	89.45	0.74	77.35	77.43	46.89	30.54	2.535			
7,000.00	7,000.00	6,997.14	6,996.23	15.59	15.38	89.45	0.78	81.83	81.92	50.94	30.97	2.645			
7,100.00	7,100.00	7,097.04	7,096.03	15.82	15.59	89.46	0.82	86.31	86.40	55.00	31.40	2.751			
7,200.00	7,200.00	7,196.94	7,195.82	16.04	15.80	89.46	0.86	90.79	90.88	59.05	31.84	2.855			
7,300.00	7,300.00	7,296.84	7,295.62	16.27	16.01	89.46	0.90	95.27	95.37	63.10	32.27	2.955			
7,400.00	7,400.00	7,396.74	7,395.42	16.49	16.22	89.46	0.94	99.75	99.85	67.14	32.71	3.053			

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Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N-S (ft)	+E-W (ft)	Between Centres (ft)	Between Ellipses (ft)					
7,500.00	7,500.00	7,496.64	7,495.22	16.72	16.43	89.46	0.98	104.23	104.34	71.19	33.14	3.148			
7,600.00	7,600.00	7,596.54	7,595.02	16.94	16.64	89.46	1.02	108.71	108.82	75.24	33.58	3.241			
7,700.00	7,700.00	7,696.44	7,694.82	17.17	16.85	89.46	1.06	113.19	113.30	79.29	34.02	3.331			
7,800.00	7,800.00	7,796.34	7,794.62	17.39	17.07	89.46	1.10	117.66	117.79	83.33	34.46	3.419			
7,900.00	7,900.00	7,896.24	7,894.42	17.61	17.28	89.46	1.15	122.14	122.27	87.38	34.89	3.504			
8,000.00	8,000.00	7,996.14	7,994.22	17.84	17.49	89.46	1.19	126.62	126.76	91.42	35.33	3.587			
8,100.00	8,100.00	8,096.04	8,094.02	18.06	17.71	89.46	1.23	131.10	131.24	95.47	35.77	3.669			
8,200.00	8,200.00	8,195.94	8,193.81	18.29	17.93	89.46	1.27	135.58	135.72	99.51	36.22	3.748			
8,300.00	8,300.00	8,295.84	8,293.61	18.51	18.14	89.46	1.31	140.06	140.21	103.55	36.66	3.825			
8,400.00	8,400.00	8,395.74	8,393.41	18.74	18.36	89.47	1.35	144.54	144.69	107.59	37.10	3.900			
8,500.00	8,500.00	8,495.64	8,493.21	18.96	18.58	89.47	1.39	149.02	149.18	111.64	37.54	3.974			
8,600.00	8,600.00	8,595.53	8,593.01	19.19	18.79	89.47	1.43	153.50	153.66	115.68	37.98	4.045			
8,700.00	8,700.00	8,695.43	8,692.81	19.41	19.01	89.47	1.47	157.98	158.14	119.72	38.43	4.116			
8,800.00	8,800.00	8,795.33	8,792.61	19.64	19.23	89.47	1.51	162.46	162.63	123.76	38.87	4.184			
8,900.00	8,900.00	8,895.23	8,892.41	19.86	19.45	89.47	1.55	166.94	167.11	127.80	39.31	4.251			
9,000.00	9,000.00	8,895.13	8,892.21	20.09	19.67	89.47	1.59	171.42	171.60	131.84	39.76	4.316			
9,100.00	9,100.00	9,095.03	9,092.00	20.31	19.89	89.47	1.63	175.90	176.08	135.88	40.20	4.380			
9,200.00	9,200.00	9,194.93	9,191.80	20.54	20.11	89.47	1.67	180.38	180.56	139.91	40.65	4.442			
9,300.00	9,300.00	9,294.83	9,291.60	20.76	20.33	89.47	1.71	184.85	185.05	143.95	41.10	4.503			
9,400.00	9,400.00	9,394.73	9,391.40	20.99	20.56	89.47	1.75	189.33	189.53	147.99	41.54	4.562			
9,500.00	9,500.00	9,494.63	9,491.20	21.21	20.78	89.47	1.80	193.81	194.02	152.03	41.99	4.621			
9,600.00	9,600.00	9,594.53	9,591.00	21.44	21.00	89.47	1.84	198.29	198.50	156.07	42.44	4.678			
9,700.00	9,700.00	9,694.43	9,690.80	21.66	21.22	89.47	1.88	202.77	202.98	160.10	42.88	4.733			
9,800.00	9,800.00	9,794.33	9,790.60	21.89	21.45	89.47	1.92	207.25	207.47	164.14	43.33	4.788			
9,900.00	9,900.00	9,894.23	9,890.40	22.11	21.67	89.47	1.96	211.73	211.95	168.17	43.78	4.841			
10,000.00	10,000.00	9,994.13	9,990.20	22.34	21.89	89.47	2.00	216.21	216.44	172.21	44.23	4.894			
10,100.00	10,100.00	10,094.03	10,089.99	22.56	22.12	89.47	2.04	220.69	220.92	176.24	44.68	4.945			
10,200.00	10,200.00	10,193.93	10,189.79	22.78	22.34	89.47	2.08	225.17	225.40	180.28	45.12	4.995			
10,300.00	10,300.00	10,293.82	10,289.59	23.01	22.56	89.47	2.12	229.65	229.89	184.31	45.57	5.044			
10,400.00	10,400.00	10,393.72	10,389.39	23.23	22.79	89.47	2.16	234.13	234.37	188.35	46.02	5.092			
10,500.00	10,500.00	10,493.62	10,489.19	23.46	23.01	89.47	2.20	238.61	238.86	192.38	46.47	5.140			
10,600.00	10,600.00	10,593.52	10,588.99	23.68	23.24	89.47	2.24	243.09	243.34	196.42	46.92	5.186			
10,700.00	10,700.00	10,693.42	10,688.79	23.91	23.47	89.47	2.28	247.57	247.82	200.45	47.37	5.231			
10,800.00	10,800.00	10,793.32	10,788.59	24.13	23.69	89.47	2.32	252.04	252.31	204.48	47.82	5.276			
10,900.00	10,900.00	10,893.22	10,888.39	24.36	23.92	89.47	2.36	256.52	256.79	208.52	48.28	5.319			
11,000.00	11,000.00	10,993.12	10,988.18	24.58	24.14	89.47	2.41	261.00	261.28	212.55	48.73	5.362			
11,100.00	11,100.00	11,093.02	11,087.98	24.81	24.37	89.47	2.45	265.48	265.76	216.58	49.18	5.404			
11,200.00	11,200.00	11,192.92	11,187.78	25.03	24.60	89.47	2.49	269.96	270.24	220.62	49.63	5.445			
11,300.00	11,300.00	11,292.82	11,287.58	25.26	24.82	89.47	2.53	274.44	274.73	224.65	50.08	5.486			
11,400.00	11,400.00	11,392.72	11,387.38	25.48	25.05	89.47	2.57	278.92	279.21	228.68	50.53	5.525			
11,500.00	11,500.00	11,492.62	11,487.18	25.71	25.28	89.47	2.61	283.40	283.70	232.71	50.99	5.564			
11,600.00	11,600.00	11,592.52	11,586.98	25.93	25.51	89.47	2.65	287.88	288.18	236.74	51.44	5.603			
11,700.00	11,700.00	11,692.42	11,686.78	26.16	25.73	89.47	2.69	292.36	292.67	240.78	51.89	5.640			
11,800.00	11,800.00	11,792.32	11,786.58	26.38	25.96	89.47	2.73	296.84	297.15	244.81	52.34	5.677			
11,900.00	11,899.42	11,891.64	11,885.80	26.56	26.19	-91.18	2.77	301.29	301.74	248.99	52.75	5.721			
12,000.00	11,994.83	11,986.95	11,981.02	26.72	26.41	-95.58	2.81	305.56	308.27	255.15	53.13	5.802			
12,100.00	12,082.06	12,082.21	12,076.11	26.87	26.61	-102.01	0.71	309.85	321.27	267.78	53.49	6.006			
12,200.00	12,157.29	12,195.82	12,186.77	27.06	26.84	-108.88	-23.27	315.02	340.47	286.57	53.90	6.317			
12,300.00	12,217.23	12,329.36	12,305.17	27.30	27.12	-115.15	-83.78	320.86	362.47	308.04	54.43	6.660			
12,400.00	12,259.27	12,488.53	12,417.81	27.64	27.50	-120.37	-195.04	326.86	382.64	327.50	55.14	6.940			
12,500.00	12,281.57	12,673.60	12,494.64	28.06	28.15	-123.60	-362.07	331.74	395.41	339.20	56.21	7.035			
12,600.00	12,285.64	12,826.61	12,508.58	28.57	28.92	-124.14	-514.00	333.67	397.50	340.01	57.50	6.914			

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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
12,700.00	12,286.95	12,926.61	12,509.87	29.19	29.55	-124.13	-613.99	334.58	397.49	338.76	58.74	6.767			
12,800.00	12,288.27	13,026.61	12,511.15	29.90	30.28	-124.13	-713.97	335.49	397.48	337.31	60.18	6.605			
12,900.00	12,289.58	13,126.61	12,512.44	30.70	31.09	-124.12	-813.96	336.40	397.48	335.68	61.80	6.432			
13,000.00	12,290.90	13,226.61	12,513.72	31.60	31.99	-124.12	-913.95	337.32	397.47	333.88	63.59	6.251			
13,100.00	12,292.21	13,326.61	12,515.00	32.57	32.97	-124.11	-1,013.94	338.23	397.46	331.93	65.53	6.065			
13,200.00	12,293.53	13,426.61	12,516.29	33.61	34.01	-124.11	-1,113.92	339.14	397.45	329.83	67.62	5.878			
13,300.00	12,294.84	13,526.61	12,517.57	34.71	35.12	-124.10	-1,213.91	340.06	397.44	327.60	69.84	5.691			
13,400.00	12,296.16	13,626.61	12,518.86	35.88	36.29	-124.10	-1,313.90	340.97	397.43	325.26	72.17	5.507			
13,500.00	12,297.47	13,726.61	12,520.14	37.10	37.52	-124.10	-1,413.89	341.88	397.42	322.81	74.61	5.326			
13,600.00	12,298.79	13,826.61	12,521.42	38.37	38.79	-124.09	-1,513.87	342.79	397.42	320.26	77.15	5.151			
13,700.00	12,300.10	13,926.61	12,522.71	39.68	40.10	-124.09	-1,613.86	343.71	397.41	317.63	79.77	4.982			
13,800.00	12,301.42	14,026.61	12,523.99	41.03	41.45	-124.08	-1,713.85	344.62	397.40	314.92	82.48	4.818			
13,900.00	12,302.73	14,126.61	12,525.28	42.41	42.84	-124.08	-1,813.84	345.53	397.39	312.14	85.25	4.661			
14,000.00	12,304.05	14,226.61	12,526.56	43.83	44.26	-124.07	-1,913.82	346.44	397.38	309.29	88.09	4.511			
14,100.00	12,305.36	14,326.61	12,527.84	45.28	45.70	-124.07	-2,013.81	347.36	397.37	306.39	90.99	4.367			
14,200.00	12,306.68	14,426.61	12,529.13	46.76	47.18	-124.06	-2,113.80	348.27	397.36	303.43	93.94	4.230			
14,300.00	12,307.99	14,526.61	12,530.41	48.26	48.68	-124.06	-2,213.79	349.18	397.36	300.42	96.93	4.099			
14,400.00	12,309.31	14,626.61	12,531.70	49.78	50.20	-124.05	-2,313.77	350.10	397.35	297.37	99.98	3.974			
14,500.00	12,310.62	14,726.61	12,532.98	51.32	51.74	-124.05	-2,413.76	351.01	397.34	294.28	103.06	3.855			
14,600.00	12,311.94	14,826.61	12,534.26	52.88	53.30	-124.05	-2,513.75	351.92	397.33	291.15	106.18	3.742			
14,700.00	12,313.25	14,926.61	12,535.55	54.45	54.87	-124.04	-2,613.74	352.83	397.32	287.99	109.33	3.634			
14,800.00	12,314.57	15,026.61	12,536.83	56.05	56.47	-124.04	-2,713.72	353.75	397.31	284.80	112.51	3.531			
14,900.00	12,315.88	15,126.61	12,538.12	57.65	58.07	-124.03	-2,813.71	354.66	397.30	281.58	115.72	3.433			
15,000.00	12,317.20	15,226.61	12,539.40	59.27	59.69	-124.03	-2,913.70	355.57	397.29	278.34	118.96	3.340			
15,100.00	12,318.51	15,326.61	12,540.68	60.90	61.32	-124.02	-3,013.69	356.49	397.29	275.07	122.22	3.251			
15,200.00	12,319.83	15,426.61	12,541.97	62.54	62.96	-124.02	-3,113.67	357.40	397.28	271.78	125.50	3.166			
15,300.00	12,321.14	15,526.61	12,543.25	64.19	64.61	-124.01	-3,213.66	358.31	397.27	268.47	128.80	3.084			
15,400.00	12,322.46	15,626.61	12,544.54	65.85	66.27	-124.01	-3,313.65	359.22	397.26	265.14	132.12	3.007			
15,500.00	12,323.77	15,726.61	12,545.82	67.52	67.94	-124.00	-3,413.64	360.14	397.25	261.79	135.46	2.933			
15,600.00	12,325.09	15,826.61	12,547.10	69.20	69.61	-124.00	-3,513.63	361.05	397.24	258.43	138.81	2.862			
15,700.00	12,326.40	15,926.61	12,548.39	70.89	71.30	-124.00	-3,613.61	361.96	397.23	255.05	142.18	2.794			
15,800.00	12,327.72	16,026.61	12,549.67	72.58	72.99	-123.99	-3,713.60	362.87	397.23	251.66	145.57	2.729			
15,900.00	12,329.03	16,126.61	12,550.96	74.28	74.69	-123.99	-3,813.59	363.79	397.22	248.26	148.96	2.667			
16,000.00	12,330.35	16,226.61	12,552.24	75.98	76.39	-123.98	-3,913.58	364.70	397.21	244.84	152.37	2.607			
16,100.00	12,331.66	16,326.61	12,553.52	77.69	78.10	-123.98	-4,013.56	365.61	397.20	241.41	155.79	2.550			
16,200.00	12,332.98	16,426.61	12,554.81	79.41	79.81	-123.97	-4,113.55	366.53	397.19	237.97	159.22	2.495			
16,300.00	12,334.29	16,526.61	12,556.09	81.13	81.53	-123.97	-4,213.54	367.44	397.18	234.53	162.66	2.442			
16,400.00	12,335.61	16,626.61	12,557.38	82.85	83.26	-123.96	-4,313.53	368.35	397.17	231.07	166.11	2.391			
16,500.00	12,336.92	16,726.61	12,558.66	84.58	84.98	-123.96	-4,413.51	369.26	397.17	227.60	169.56	2.342			
16,600.00	12,338.24	16,826.61	12,559.94	86.31	86.72	-123.95	-4,513.50	370.18	397.16	224.13	173.03	2.295			
16,700.00	12,339.55	16,926.61	12,561.23	88.05	88.45	-123.95	-4,613.49	371.09	397.15	220.65	176.50	2.250			
16,800.00	12,340.86	17,026.61	12,562.51	89.79	90.19	-123.95	-4,713.48	372.00	397.14	217.16	179.98	2.207			
16,900.00	12,342.18	17,126.61	12,563.80	91.54	91.94	-123.94	-4,813.46	372.92	397.13	213.66	183.47	2.165			
17,000.00	12,343.49	17,226.61	12,565.08	93.28	93.68	-123.94	-4,913.45	373.83	397.12	210.16	186.97	2.124			
17,100.00	12,344.81	17,326.61	12,566.36	95.03	95.43	-123.93	-5,013.44	374.74	397.12	206.65	190.47	2.085			
17,200.00	12,346.12	17,426.61	12,567.65	96.79	97.19	-123.93	-5,113.43	375.65	397.11	203.13	193.97	2.047			
17,300.00	12,347.44	17,526.61	12,568.93	98.54	98.94	-123.92	-5,213.41	376.57	397.10	199.61	197.48	2.011			
17,400.00	12,348.75	17,626.61	12,570.22	100.30	100.70	-123.92	-5,313.40	377.48	397.09	196.09	201.00	1.976			
17,500.00	12,350.07	17,726.61	12,571.50	102.06	102.46	-123.91	-5,413.39	378.39	397.08	192.56	204.52	1.942			
17,600.00	12,351.38	17,826.61	12,572.78	103.83	104.22	-123.91	-5,513.38	379.30	397.07	189.02	208.05	1.909			
17,700.00	12,352.70	17,926.61	12,574.07	105.59	105.99	-123.90	-5,613.36	380.22	397.06	185.49	211.58	1.877			
17,800.00	12,354.01	18,026.61	12,575.35	107.36	107.75	-123.90	-5,713.35	381.13	397.06	181.94	215.11	1.846			

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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 21H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft
Survey Program: 0-MWD													Offset Well Error:		0.00 ft		
Reference		Offset		Semi Major Axis			Distance										
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre	Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning					
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)						
17,900.00	12,355.33	18,126.61	12,576.64	109.13	109.52	-123.90	-5,813.34	382.04	397.05	178.39	218.65	1.816					
18,000.00	12,356.64	18,226.61	12,577.92	110.90	111.29	-123.89	-5,913.33	382.96	397.04	174.84	222.19	1.787					
18,100.00	12,357.96	18,326.61	12,579.20	112.67	113.07	-123.89	-6,013.31	383.87	397.03	171.29	225.74	1.759					
18,200.00	12,359.27	18,426.61	12,580.49	114.45	114.84	-123.88	-6,113.30	384.78	397.02	167.73	229.29	1.732					
18,300.00	12,360.59	18,526.61	12,581.77	116.23	116.62	-123.88	-6,213.29	385.69	397.01	164.17	232.84	1.705					
18,400.00	12,361.90	18,626.61	12,583.06	118.00	118.40	-123.87	-6,313.28	386.61	397.00	160.60	236.40	1.679					
18,500.00	12,363.22	18,726.61	12,584.34	119.78	120.18	-123.87	-6,413.27	387.52	397.00	157.04	239.96	1.654					
18,600.00	12,364.53	18,826.61	12,585.62	121.57	121.96	-123.86	-6,513.25	388.43	396.99	153.47	243.52	1.630					
18,700.00	12,365.85	18,926.61	12,586.91	123.35	123.74	-123.86	-6,613.24	389.34	396.98	149.89	247.09	1.607					
18,800.00	12,367.16	19,026.61	12,588.19	125.13	125.52	-123.85	-6,713.23	390.26	396.97	146.32	250.65	1.584					
18,900.00	12,368.48	19,126.61	12,589.48	126.92	127.31	-123.85	-6,813.22	391.17	396.96	142.74	254.22	1.561					
19,000.00	12,369.79	19,226.61	12,590.76	128.70	129.09	-123.85	-6,913.20	392.08	396.95	139.16	257.80	1.540					
19,100.00	12,371.11	19,326.61	12,592.04	130.49	130.88	-123.84	-7,013.19	393.00	396.94	135.57	261.37	1.519					
19,200.00	12,372.42	19,426.61	12,593.33	132.28	132.67	-123.84	-7,113.18	393.91	396.94	131.99	264.95	1.498 Level 3					
19,300.00	12,373.74	19,526.61	12,594.61	134.07	134.46	-123.83	-7,213.17	394.82	396.93	128.40	268.53	1.478 Level 3					
19,400.00	12,375.05	19,626.61	12,595.90	135.86	136.25	-123.83	-7,313.15	395.73	396.92	124.81	272.11	1.459 Level 3					
19,500.00	12,376.37	19,726.61	12,597.18	137.65	138.04	-123.82	-7,413.14	396.65	396.91	121.22	275.69	1.440 Level 3					
19,600.00	12,377.68	19,826.61	12,598.46	139.44	139.83	-123.82	-7,513.13	397.56	396.90	117.63	279.28	1.421 Level 3					
19,700.00	12,379.00	19,926.61	12,599.75	141.24	141.62	-123.81	-7,613.12	398.47	396.89	114.03	282.86	1.403 Level 3					
19,800.00	12,380.31	20,026.61	12,601.03	143.03	143.42	-123.81	-7,713.10	399.39	396.89	110.43	286.45	1.386 Level 3					
19,900.00	12,381.63	20,126.61	12,602.32	144.83	145.21	-123.80	-7,813.09	400.30	396.88	106.83	290.04	1.368 Level 3					
20,000.00	12,382.94	20,226.61	12,603.60	146.62	147.01	-123.80	-7,913.08	401.21	396.87	103.23	293.63	1.352 Level 3					
20,100.00	12,384.26	20,326.61	12,604.88	148.42	148.81	-123.80	-8,013.07	402.12	396.86	99.63	297.23	1.335 Level 3					
20,200.00	12,385.57	20,426.61	12,606.17	150.22	150.60	-123.79	-8,113.05	403.04	396.85	96.03	300.82	1.319 Level 3					
20,300.00	12,386.89	20,526.61	12,607.45	152.02	152.40	-123.79	-8,213.04	403.95	396.84	92.42	304.42	1.304 Level 3					
20,400.00	12,388.20	20,626.61	12,608.74	153.82	154.20	-123.78	-8,313.03	404.86	396.83	88.82	308.02	1.288 Level 3					
20,500.00	12,389.52	20,726.61	12,610.02	155.62	156.00	-123.78	-8,413.02	405.77	396.83	85.21	311.62	1.273 Level 3					
20,600.00	12,390.83	20,826.61	12,611.30	157.42	157.80	-123.77	-8,513.00	406.69	396.82	81.60	315.22	1.259 Level 3					
20,700.00	12,392.15	20,926.61	12,612.59	159.22	159.60	-123.77	-8,612.99	407.60	396.81	77.99	318.82	1.245 Level 2					
20,800.00	12,393.46	21,026.61	12,613.87	161.02	161.40	-123.76	-8,712.98	408.51	396.80	74.38	322.42	1.231 Level 2					
20,900.00	12,394.78	21,126.61	12,615.16	162.82	163.20	-123.76	-8,812.97	409.43	396.79	70.77	326.03	1.217 Level 2					
21,000.00	12,396.09	21,226.61	12,616.44	164.63	165.01	-123.75	-8,912.95	410.34	396.78	67.15	329.63	1.204 Level 2					
21,100.00	12,397.41	21,326.61	12,617.72	166.43	166.81	-123.75	-9,012.94	411.25	396.78	63.54	333.24	1.191 Level 2					
21,200.00	12,398.72	21,426.61	12,619.01	168.23	168.61	-123.75	-9,112.93	412.16	396.77	59.92	336.85	1.178 Level 2					
21,300.00	12,400.04	21,526.61	12,620.29	170.04	170.42	-123.74	-9,212.92	413.08	396.76	56.30	340.46	1.165 Level 2					
21,400.00	12,401.35	21,626.61	12,621.58	171.84	172.22	-123.74	-9,312.91	413.99	396.75	52.68	344.07	1.153 Level 2					
21,500.00	12,402.66	21,726.61	12,622.86	173.65	174.03	-123.73	-9,412.89	414.90	396.74	49.07	347.68	1.141 Level 2					
21,600.00	12,403.98	21,826.61	12,624.14	175.45	175.83	-123.73	-9,512.88	415.82	396.73	45.45	351.29	1.129 Level 2					
21,700.00	12,405.29	21,926.61	12,625.43	177.26	177.64	-123.72	-9,612.87	416.73	396.72	41.82	354.90	1.118 Level 2					
21,800.00	12,406.61	22,026.61	12,626.71	179.07	179.45	-123.72	-9,712.86	417.64	396.72	38.20	358.51	1.107 Level 2					
21,900.00	12,407.92	22,126.61	12,628.00	180.87	181.25	-123.71	-9,812.84	418.55	396.71	34.58	362.13	1.095 Level 2					
22,000.00	12,409.24	22,226.61	12,629.28	182.68	183.06	-123.71	-9,912.83	419.47	396.70	30.96	365.74	1.085 Level 2					
22,100.00	12,410.55	22,326.61	12,630.56	184.49	184.87	-123.70	-10,012.82	420.38	396.69	27.33	369.36	1.074 Level 2					
22,200.00	12,411.87	22,426.61	12,631.85	186.30	186.68	-123.70	-10,112.81	421.29	396.68	23.71	372.98	1.064 Level 2					
22,209.98	12,412.00	22,436.58	12,631.98	186.48	186.86	-123.70	-10,122.78	421.38	396.68	23.34	373.34	1.063 Level 2, 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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #1		Offset Site Error:		0.00 ft	
Survey Program: 0-MWD													Offset Well Error:		0.00 ft			
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Offset Wellbore Centre		Distance		Minimum Separation (ft)	Separation Factor	Warning					
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		+N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)								
0.00	0.00	0.10	0.10	0.00	0.00	-90.52	-0.37	-40.04	40.04									
100.00	100.00	100.10	100.10	0.08	0.08	-90.52	-0.37	-40.04	40.04	39.88	0.17	240.415						
200.00	200.00	200.10	200.10	0.31	0.31	-90.52	-0.37	-40.04	40.04	39.43	0.62	64.994						
300.00	300.00	300.10	300.10	0.53	0.53	-90.52	-0.37	-40.04	40.04	38.98	1.07	37.576						
400.00	400.00	400.10	400.10	0.76	0.76	-90.52	-0.37	-40.04	40.04	38.53	1.52	26.428						
500.00	500.00	500.10	500.10	0.98	0.98	-90.52	-0.37	-40.04	40.04	38.08	1.96	20.381						
600.00	600.00	600.10	600.10	1.21	1.21	-90.52	-0.37	-40.04	40.04	37.63	2.41	16.586						
700.00	700.00	700.10	700.10	1.43	1.43	-90.52	-0.37	-40.04	40.04	37.18	2.86	13.982						
800.00	800.00	800.10	800.10	1.66	1.66	-90.52	-0.37	-40.04	40.04	36.73	3.31	12.085						
900.00	900.00	900.10	900.10	1.88	1.88	-90.52	-0.37	-40.04	40.04	36.28	3.76	10.641						
1,000.00	1,000.00	1,000.10	1,000.10	2.11	2.11	-90.52	-0.37	-40.04	40.04	35.83	4.21	9.506						
1,100.00	1,100.00	1,100.10	1,100.10	2.33	2.33	-90.52	-0.37	-40.04	40.04	35.38	4.66	8.589						
1,200.00	1,200.00	1,200.10	1,200.10	2.56	2.56	-90.52	-0.37	-40.04	40.04	34.93	5.11	7.834						
1,300.00	1,300.00	1,300.10	1,300.10	2.78	2.78	-90.52	-0.37	-40.04	40.04	34.48	5.56	7.201						
1,400.00	1,400.00	1,400.10	1,400.10	3.01	3.01	-90.52	-0.37	-40.04	40.04	34.03	6.01	6.662						
1,500.00	1,500.00	1,500.10	1,500.10	3.23	3.23	-90.52	-0.37	-40.04	40.04	33.58	6.46	6.198						
1,600.00	1,600.00	1,600.10	1,600.10	3.45	3.45	-90.52	-0.37	-40.04	40.04	33.13	6.91	5.795						
1,700.00	1,700.00	1,700.10	1,700.10	3.68	3.68	-90.52	-0.37	-40.04	40.04	32.68	7.36	5.441						
1,800.00	1,800.00	1,800.10	1,800.10	3.90	3.90	-90.52	-0.37	-40.04	40.04	32.23	7.81	5.128						
1,900.00	1,900.00	1,900.10	1,900.10	4.13	4.13	-90.52	-0.37	-40.04	40.04	31.78	8.26	4.849						
2,000.00	2,000.00	2,000.10	2,000.10	4.35	4.35	-90.52	-0.37	-40.04	40.04	31.33	8.71	4.598						
2,100.00	2,100.00	2,100.10	2,100.10	4.58	4.58	-90.52	-0.37	-40.04	40.04	30.88	9.16	4.373						
2,200.00	2,200.00	2,200.10	2,200.10	4.80	4.80	-90.52	-0.37	-40.04	40.04	30.43	9.61	4.168						
2,300.00	2,300.00	2,300.10	2,300.10	5.03	5.03	-90.52	-0.37	-40.04	40.04	29.99	10.06	3.982						
2,400.00	2,400.00	2,400.10	2,400.10	5.25	5.25	-90.52	-0.37	-40.04	40.04	29.54	10.51	3.811						
2,500.00	2,500.00	2,500.10	2,500.10	5.48	5.48	-90.52	-0.37	-40.04	40.04	29.09	10.96	3.655						
2,600.00	2,600.00	2,600.10	2,600.10	5.70	5.70	-90.52	-0.37	-40.04	40.04	28.64	11.40	3.511						
2,700.00	2,700.00	2,700.10	2,700.10	5.93	5.93	-90.52	-0.37	-40.04	40.04	28.19	11.85	3.378						
2,800.00	2,800.00	2,800.10	2,800.10	6.15	6.15	-90.52	-0.37	-40.04	40.04	27.74	12.30	3.254						
2,900.00	2,900.00	2,900.10	2,900.10	6.38	6.38	-90.52	-0.37	-40.04	40.04	27.29	12.75	3.140						
3,000.00	3,000.00	3,000.10	3,000.10	6.60	6.60	-90.52	-0.37	-40.04	40.04	26.84	13.20	3.033						
3,100.00	3,100.00	3,100.10	3,100.10	6.83	6.83	-90.52	-0.37	-40.04	40.04	26.39	13.65	2.933						
3,200.00	3,200.00	3,200.10	3,200.10	7.05	7.05	-90.52	-0.37	-40.04	40.04	25.94	14.10	2.839						
3,300.00	3,300.00	3,300.10	3,300.10	7.28	7.28	-90.52	-0.37	-40.04	40.04	25.49	14.55	2.752						
3,400.00	3,400.00	3,400.10	3,400.10	7.50	7.50	-90.52	-0.37	-40.04	40.04	25.04	15.00	2.669						
3,500.00	3,500.00	3,500.10	3,500.10	7.73	7.73	-90.52	-0.37	-40.04	40.04	24.59	15.45	2.592						
3,600.00	3,600.00	3,600.10	3,600.10	7.95	7.95	-90.52	-0.37	-40.04	40.04	24.14	15.90	2.518						
3,700.00	3,700.00	3,700.10	3,700.10	8.17	8.17	-90.52	-0.37	-40.04	40.04	23.69	16.35	2.449						
3,800.00	3,800.00	3,800.10	3,800.10	8.40	8.40	-90.52	-0.37	-40.04	40.04	23.24	16.80	2.384						
3,900.00	3,900.00	3,900.10	3,900.10	8.62	8.62	-90.52	-0.37	-40.04	40.04	22.79	17.25	2.321						
4,000.00	4,000.00	4,000.10	4,000.10	8.85	8.85	-90.52	-0.37	-40.04	40.04	22.34	17.70	2.262						
4,100.00	4,100.00	4,100.10	4,100.10	9.07	9.07	-90.52	-0.37	-40.04	40.04	21.89	18.15	2.206						
4,200.00	4,200.00	4,200.10	4,200.10	9.30	9.30	-90.52	-0.37	-40.04	40.04	21.44	18.60	2.153						
4,300.00	4,300.00	4,300.10	4,300.10	9.52	9.52	-90.52	-0.37	-40.04	40.04	20.99	19.05	2.102						
4,400.00	4,400.00	4,400.10	4,400.10	9.75	9.75	-90.52	-0.37	-40.04	40.04	20.55	19.50	2.054						
4,500.00	4,500.00	4,500.10	4,500.10	9.97	9.97	-90.52	-0.37	-40.04	40.04	20.10	19.95	2.008						
4,600.00	4,600.00	4,600.10	4,600.10	10.20	10.20	-90.52	-0.37	-40.04	40.04	19.65	20.40	1.963						
4,700.00	4,700.00	4,700.10	4,700.10	10.42	10.42	-90.52	-0.37	-40.04	40.04	19.20	20.85	1.921						
4,800.00	4,800.00	4,800.10	4,800.10	10.65	10.65	-90.52	-0.37	-40.04	40.04	18.75	21.29	1.880						
4,900.00	4,900.00	4,900.10	4,900.10	10.87	10.87	-90.52	-0.37	-40.04	40.04	18.30	21.74	1.841						
5,000.00	5,000.00	5,000.10	5,000.10	11.10	11.10	-90.52	-0.37	-40.04	40.04	17.85	22.19	1.804						
5,100.00	5,100.00	5,100.10	5,100.10	11.32	11.32	-90.52	-0.37	-40.04	40.04	17.40	22.64	1.768						

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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Toolface (°)	Distance		Minimum Separation (ft)	Separation Factor	Warning			
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)				Between Centres (ft)	Between Ellipses (ft)	
5,200.00	5,200.00	5,200.10	5,200.10	11.55	11.55	-90.52	-0.37	-40.04	40.04	16.95	23.09	1.734		
5,300.00	5,300.00	5,300.10	5,300.10	11.77	11.77	-90.52	-0.37	-40.04	40.04	16.50	23.54	1.701		
5,400.00	5,400.00	5,400.10	5,400.10	12.00	12.00	-90.52	-0.37	-40.04	40.04	16.05	23.99	1.669		
5,500.00	5,500.00	5,500.10	5,500.10	12.22	12.22	-90.52	-0.37	-40.04	40.04	15.60	24.44	1.638		
5,600.00	5,600.00	5,600.10	5,600.10	12.45	12.45	-90.52	-0.37	-40.04	40.04	15.15	24.89	1.609		
5,700.00	5,700.00	5,700.10	5,700.10	12.67	12.67	-90.52	-0.37	-40.04	40.04	14.70	25.34	1.580		
5,800.00	5,800.00	5,800.10	5,800.10	12.89	12.90	-90.52	-0.37	-40.04	40.04	14.25	25.79	1.553		
5,900.00	5,900.00	5,900.10	5,900.10	13.12	13.12	-90.52	-0.37	-40.04	40.04	13.80	26.24	1.526		
5,966.63	5,966.63	5,966.73	5,966.73	13.27	13.27	-90.52	-0.37	-40.04	40.04	13.50	26.54	1.509 CC		
6,000.00	6,000.00	6,000.00	6,000.00	13.34	13.34	-90.52	-0.37	-40.04	40.04	13.35	26.69	1.500		
6,100.00	6,100.00	6,098.68	6,098.66	13.57	13.55	-90.52	-0.38	-41.74	41.77	14.64	27.12	1.540		
6,200.00	6,200.00	6,198.15	6,198.03	13.79	13.75	-90.52	-0.42	-46.04	46.09	18.55	27.54	1.673		
6,300.00	6,300.00	6,298.05	6,297.83	14.02	13.95	-90.52	-0.46	-50.52	50.58	22.61	27.97	1.808		
6,400.00	6,400.00	6,397.95	6,397.63	14.24	14.15	-90.52	-0.50	-55.00	55.06	26.67	28.39	1.939		
6,500.00	6,500.00	6,497.84	6,497.43	14.47	14.35	-90.52	-0.54	-59.48	59.54	30.72	28.82	2.066		
6,600.00	6,600.00	6,597.74	6,597.23	14.69	14.55	-90.52	-0.58	-63.96	64.03	34.78	29.25	2.189		
6,700.00	6,700.00	6,697.64	6,697.03	14.92	14.76	-90.52	-0.62	-68.44	68.51	38.84	29.68	2.309		
6,800.00	6,800.00	6,797.54	6,796.83	15.14	14.96	-90.52	-0.66	-72.92	73.00	42.89	30.11	2.425		
6,900.00	6,900.00	6,897.44	6,896.63	15.37	15.17	-90.52	-0.70	-77.40	77.48	46.94	30.54	2.537		
7,000.00	7,000.00	6,997.34	6,996.42	15.59	15.38	-90.52	-0.75	-81.88	81.96	51.00	30.97	2.647		
7,100.00	7,100.00	7,097.24	7,096.22	15.82	15.58	-90.52	-0.79	-86.36	86.45	55.05	31.40	2.753		
7,200.00	7,200.00	7,197.14	7,196.02	16.04	15.79	-90.52	-0.83	-90.84	90.93	59.10	31.83	2.856		
7,300.00	7,300.00	7,297.04	7,295.82	16.27	16.00	-90.52	-0.87	-95.32	95.42	63.15	32.27	2.957		
7,400.00	7,400.00	7,396.94	7,395.62	16.49	16.21	-90.52	-0.91	-99.80	99.90	67.20	32.70	3.055		
7,500.00	7,500.00	7,496.84	7,495.42	16.72	16.42	-90.52	-0.95	-104.27	104.38	71.25	33.14	3.150		
7,600.00	7,600.00	7,596.74	7,595.22	16.94	16.63	-90.52	-0.99	-108.75	108.87	75.29	33.58	3.242		
7,700.00	7,700.00	7,696.64	7,695.02	17.17	16.85	-90.52	-1.03	-113.23	113.35	79.34	34.01	3.333		
7,800.00	7,800.00	7,796.54	7,794.82	17.39	17.06	-90.52	-1.07	-117.71	117.84	83.39	34.45	3.420		
7,900.00	7,900.00	7,896.44	7,894.62	17.61	17.27	-90.52	-1.11	-122.19	122.32	87.43	34.89	3.506		
8,000.00	8,000.00	7,996.34	7,994.41	17.84	17.49	-90.52	-1.15	-126.67	126.80	91.48	35.33	3.589		
8,100.00	8,100.00	8,096.24	8,094.21	18.06	17.70	-90.52	-1.19	-131.15	131.29	95.52	35.77	3.670		
8,200.00	8,200.00	8,196.13	8,194.01	18.29	17.92	-90.52	-1.23	-135.63	135.77	99.56	36.21	3.750		
8,300.00	8,300.00	8,296.03	8,293.81	18.51	18.14	-90.52	-1.27	-140.11	140.26	103.61	36.65	3.827		
8,400.00	8,400.00	8,395.93	8,393.61	18.74	18.35	-90.52	-1.31	-144.59	144.74	107.65	37.09	3.902		
8,500.00	8,500.00	8,495.83	8,493.41	18.96	18.57	-90.52	-1.36	-149.07	149.22	111.69	37.53	3.976		
8,600.00	8,600.00	8,595.73	8,593.21	19.19	18.79	-90.52	-1.40	-153.55	153.71	115.73	37.98	4.047		
8,700.00	8,700.00	8,695.63	8,693.01	19.41	19.01	-90.52	-1.44	-158.03	158.19	119.77	38.42	4.117		
8,800.00	8,800.00	8,795.53	8,792.81	19.64	19.23	-90.52	-1.48	-162.51	162.68	123.81	38.86	4.186		
8,900.00	8,900.00	8,895.43	8,892.60	19.86	19.45	-90.52	-1.52	-166.99	167.16	127.85	39.31	4.252		
9,000.00	9,000.00	8,995.33	8,992.40	20.09	19.67	-90.52	-1.56	-171.46	171.64	131.89	39.75	4.318		
9,100.00	9,100.00	9,095.23	9,092.20	20.31	19.89	-90.52	-1.60	-175.94	176.13	135.93	40.20	4.381		
9,200.00	9,200.00	9,195.13	9,192.00	20.54	20.11	-90.52	-1.64	-180.42	180.61	139.97	40.64	4.444		
9,300.00	9,300.00	9,295.03	9,291.80	20.76	20.33	-90.52	-1.68	-184.90	185.10	144.01	41.09	4.505		
9,400.00	9,400.00	9,394.93	9,391.60	20.99	20.55	-90.52	-1.72	-189.38	189.58	148.04	41.54	4.564		
9,500.00	9,500.00	9,494.83	9,491.40	21.21	20.77	-90.52	-1.76	-193.86	194.06	152.08	41.98	4.622		
9,600.00	9,600.00	9,594.73	9,591.20	21.44	20.99	-90.52	-1.80	-198.34	198.55	156.12	42.43	4.679		
9,700.00	9,700.00	9,694.63	9,691.00	21.66	21.22	-90.52	-1.84	-202.82	203.03	160.15	42.88	4.735		
9,800.00	9,800.00	9,794.53	9,790.80	21.89	21.44	-90.52	-1.88	-207.30	207.52	164.19	43.33	4.790		
9,900.00	9,900.00	9,894.43	9,890.59	22.11	21.66	-90.52	-1.92	-211.78	212.00	168.23	43.77	4.843		
10,000.00	10,000.00	9,994.32	9,990.39	22.34	21.89	-90.52	-1.96	-216.26	216.48	172.26	44.22	4.895		
10,100.00	10,100.00	10,094.22	10,090.19	22.56	22.11	-90.52	-2.01	-220.74	220.97	176.30	44.67	4.947		
10,200.00	10,200.00	10,194.12	10,189.99	22.78	22.34	-90.52	-2.05	-225.22	225.45	180.33	45.12	4.997		

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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error:	0.00 ft
Survey Program: 0-MWD													Offset Well Error:	0.00 ft
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)	Semi Major Axis (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)	Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
10,300.00	10,300.00	10,294.02	10,289.79	23.01	22.56	-90.52	-90.52	-2.09	-229.70	229.94	184.37	45.57	5.046	
10,400.00	10,400.00	10,393.92	10,389.59	23.23	22.79	-90.52	-90.52	-2.13	-234.17	234.42	188.40	46.02	5.094	
10,500.00	10,500.00	10,493.82	10,489.39	23.46	23.01	-90.52	-90.52	-2.17	-238.65	238.90	192.43	46.47	5.141	
10,600.00	10,600.00	10,593.72	10,589.19	23.68	23.24	-90.52	-90.52	-2.21	-243.13	243.39	196.47	46.92	5.187	
10,700.00	10,700.00	10,693.62	10,688.99	23.91	23.46	-90.52	-90.52	-2.25	-247.61	247.87	200.50	47.37	5.233	
10,800.00	10,800.00	10,793.52	10,788.78	24.13	23.69	-90.52	-90.52	-2.29	-252.09	252.36	204.53	47.82	5.277	
10,900.00	10,900.00	10,893.42	10,888.58	24.36	23.91	-90.52	-90.52	-2.33	-256.57	256.84	208.57	48.27	5.321	
11,000.00	11,000.00	10,993.32	10,988.38	24.58	24.14	-90.52	-90.52	-2.37	-261.05	261.32	212.60	48.72	5.363	
11,100.00	11,100.00	11,093.22	11,088.18	24.81	24.37	-90.52	-90.52	-2.41	-265.53	265.81	216.63	49.18	5.405	
11,200.00	11,200.00	11,193.12	11,187.98	25.03	24.59	-90.52	-90.52	-2.45	-270.01	270.29	220.67	49.63	5.446	
11,300.00	11,300.00	11,293.02	11,287.78	25.26	24.82	-90.52	-90.52	-2.49	-274.49	274.78	224.70	50.08	5.487	
11,400.00	11,400.00	11,392.92	11,387.58	25.48	25.05	-90.52	-90.52	-2.53	-278.97	279.26	228.73	50.53	5.526	
11,500.00	11,500.00	11,492.82	11,487.38	25.71	25.28	-90.52	-90.52	-2.57	-283.45	283.74	232.76	50.98	5.565	
11,600.00	11,600.00	11,592.72	11,587.18	25.93	25.50	-90.52	-90.52	-2.62	-287.93	288.23	236.79	51.44	5.604	
11,700.00	11,700.00	11,692.61	11,686.98	26.16	25.73	-90.52	-90.52	-2.66	-292.41	292.71	240.82	51.89	5.641	
11,800.00	11,800.00	11,792.51	11,786.77	26.38	25.96	-90.52	-90.52	-2.70	-296.88	297.20	244.85	52.34	5.678	
11,900.00	11,899.42	11,891.84	11,886.00	26.56	26.19	91.17	91.17	-2.74	-301.34	301.79	249.04	52.75	5.721	
12,000.00	11,994.83	11,987.15	11,981.22	26.72	26.41	95.57	95.57	-2.78	-305.61	308.31	255.18	53.13	5.803	
12,100.00	12,082.06	12,078.55	12,072.52	26.87	26.61	101.85	101.85	-3.39	-309.70	321.64	268.15	53.49	6.013	
12,200.00	12,157.29	12,190.03	12,182.10	27.06	26.84	109.10	109.10	-21.81	-314.45	342.64	288.75	53.89	6.358	
12,300.00	12,217.23	12,323.24	12,303.09	27.30	27.11	115.86	115.86	-76.27	-319.37	367.43	313.02	54.41	6.753	
12,400.00	12,259.27	12,486.46	12,423.72	27.64	27.47	121.71	121.71	-184.95	-323.76	390.78	335.67	55.10	7.092	
12,500.00	12,281.57	12,682.55	12,510.41	28.06	28.11	125.49	125.49	-359.29	-326.01	405.93	349.76	56.17	7.227	
12,600.00	12,285.64	12,845.34	12,526.39	28.57	28.92	126.11	126.11	-520.74	-325.21	408.35	350.86	57.49	7.102	
12,700.00	12,286.95	12,945.34	12,527.26	29.19	29.55	126.06	126.06	-620.74	-324.31	408.09	349.36	58.73	6.948	
12,800.00	12,288.27	13,045.34	12,528.13	29.90	30.27	126.01	126.01	-720.73	-323.41	407.83	347.66	60.17	6.778	
12,900.00	12,289.58	13,145.34	12,529.00	30.70	31.08	125.96	125.96	-820.72	-322.51	407.57	345.78	61.79	6.596	
13,000.00	12,290.90	13,245.34	12,529.87	31.60	31.98	125.91	125.91	-920.71	-321.61	407.31	343.73	63.57	6.407	
13,100.00	12,292.21	13,345.34	12,530.74	32.57	32.95	125.86	125.86	-1,020.70	-320.71	407.05	341.53	65.52	6.213	
13,200.00	12,293.53	13,445.33	12,531.61	33.61	34.00	125.81	125.81	-1,120.69	-319.81	406.79	339.19	67.60	6.017	
13,300.00	12,294.84	13,545.33	12,532.48	34.71	35.10	125.75	125.75	-1,220.68	-318.91	406.53	336.71	69.82	5.823	
13,400.00	12,296.16	13,645.33	12,533.35	35.88	36.27	125.70	125.70	-1,320.67	-318.01	406.27	334.12	72.15	5.631	
13,500.00	12,297.47	13,745.33	12,534.22	37.10	37.49	125.65	125.65	-1,420.66	-317.10	406.01	331.42	74.59	5.443	
13,600.00	12,298.79	13,845.33	12,535.09	38.37	38.76	125.60	125.60	-1,520.66	-316.20	405.76	328.63	77.12	5.261	
13,700.00	12,300.10	13,945.33	12,535.96	39.68	40.07	125.55	125.55	-1,620.65	-315.30	405.50	325.75	79.75	5.085	
13,800.00	12,301.42	14,045.33	12,536.83	41.03	41.42	125.50	125.50	-1,720.64	-314.40	405.24	322.79	82.45	4.915	
13,900.00	12,302.73	14,145.33	12,537.70	42.41	42.81	125.45	125.45	-1,820.63	-313.50	404.98	319.76	85.22	4.752	
14,000.00	12,304.05	14,245.33	12,538.57	43.83	44.22	125.40	125.40	-1,920.62	-312.60	404.73	316.67	88.06	4.596	
14,100.00	12,305.36	14,345.33	12,539.44	45.28	45.67	125.34	125.34	-2,020.61	-311.70	404.47	313.52	90.95	4.447	
14,200.00	12,306.68	14,445.32	12,540.31	46.76	47.14	125.29	125.29	-2,120.60	-310.80	404.21	310.31	93.90	4.305	
14,300.00	12,307.99	14,545.32	12,541.18	48.26	48.64	125.24	125.24	-2,220.59	-309.90	403.96	307.06	96.90	4.169	
14,400.00	12,309.31	14,645.32	12,542.05	49.78	50.16	125.19	125.19	-2,320.58	-309.00	403.70	303.76	99.94	4.039	
14,500.00	12,310.62	14,745.32	12,542.92	51.32	51.70	125.14	125.14	-2,420.58	-308.09	403.45	300.43	103.02	3.916	
14,600.00	12,311.94	14,845.32	12,543.79	52.88	53.26	125.09	125.09	-2,520.57	-307.19	403.19	297.05	106.14	3.799	
14,700.00	12,313.25	14,945.32	12,544.66	54.45	54.83	125.03	125.03	-2,620.56	-306.29	402.94	293.65	109.29	3.687	
14,800.00	12,314.57	15,045.32	12,545.53	56.05	56.42	124.98	124.98	-2,720.55	-305.39	402.68	290.21	112.47	3.580	
14,900.00	12,315.88	15,145.32	12,546.40	57.65	58.03	124.93	124.93	-2,820.54	-304.49	402.43	286.75	115.68	3.479	
15,000.00	12,317.20	15,245.32	12,547.27	59.27	59.64	124.88	124.88	-2,920.53	-303.59	402.17	283.26	118.91	3.382	
15,100.00	12,318.51	15,345.32	12,548.14	60.90	61.27	124.83	124.83	-3,020.52	-302.69	401.92	279.75	122.17	3.290	
15,200.00	12,319.83	15,445.32	12,549.01	62.54	62.91	124.77	124.77	-3,120.51	-301.79	401.67	276.21	125.45	3.202	
15,300.00	12,321.14	15,545.31	12,549.88	64.19	64.56	124.72	124.72	-3,220.51	-300.89	401.42	272.66	128.76	3.118	
15,400.00	12,322.46	15,645.31	12,550.75	65.85	66.22	124.67	124.67	-3,320.50	-299.98	401.16	269.09	132.08	3.037	

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. 16, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S., R 35 E - White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #1														Offset Site Error:	0.00 ft
Survey Program: 0-MWD														Offset Well Error:	0.00 ft
Reference		Offset		Semi Major Axis		Highside Tooface (")	Distance		Between Centres (ft)	Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning		
Measured Depth (ft)	Vertical Depth (ft)	Measured Depth (ft)	Vertical Depth (ft)	Reference (ft)	Offset (ft)		Offset Wellbore Centre +N/-S (ft)	+E/-W (ft)							
15,500.00	12,323.77	15,745.31	12,551.62	67.52	67.89	124.62	-3,420.49	-299.08	400.91	265.50	135.41	2.961			
15,600.00	12,325.09	15,845.31	12,552.49	69.20	69.57	124.56	-3,520.48	-298.18	400.66	261.89	138.77	2.887			
15,700.00	12,326.40	15,945.31	12,553.36	70.89	71.25	124.51	-3,620.47	-297.28	400.41	258.27	142.14	2.817			
15,800.00	12,327.72	16,045.31	12,554.23	72.58	72.94	124.46	-3,720.46	-296.38	400.16	254.64	145.52	2.750			
15,900.00	12,329.03	16,145.31	12,555.10	74.28	74.64	124.41	-3,820.45	-295.48	399.91	250.99	148.91	2.685			
16,000.00	12,330.35	16,245.31	12,555.97	75.98	76.34	124.35	-3,920.44	-294.58	399.66	247.34	152.32	2.624			
16,100.00	12,331.66	16,345.31	12,556.84	77.69	78.05	124.30	-4,020.44	-293.68	399.41	243.67	155.74	2.565			
16,200.00	12,332.98	16,445.31	12,557.71	79.41	79.76	124.25	-4,120.43	-292.78	399.16	239.99	159.17	2.508			
16,300.00	12,334.29	16,545.30	12,558.58	81.13	81.48	124.20	-4,220.42	-291.88	398.91	236.30	162.61	2.453			
16,400.00	12,335.61	16,645.30	12,559.45	82.85	83.21	124.14	-4,320.41	-290.97	398.66	232.60	166.06	2.401			
16,500.00	12,336.92	16,745.30	12,560.32	84.58	84.93	124.09	-4,420.40	-290.07	398.41	228.90	169.51	2.350			
16,600.00	12,338.24	16,845.30	12,561.19	86.31	86.67	124.04	-4,520.39	-289.17	398.16	225.18	172.98	2.302			
16,700.00	12,339.55	16,945.30	12,562.06	88.05	88.40	123.98	-4,620.38	-288.27	397.92	221.46	176.45	2.255			
16,800.00	12,340.86	17,045.30	12,562.93	89.79	90.14	123.93	-4,720.37	-287.37	397.67	217.73	179.93	2.210			
16,900.00	12,342.18	17,145.30	12,563.80	91.54	91.89	123.88	-4,820.36	-286.47	397.42	214.00	183.42	2.167			
17,000.00	12,343.49	17,245.30	12,564.66	93.28	93.63	123.82	-4,920.36	-285.57	397.17	210.26	186.91	2.125			
17,100.00	12,344.81	17,345.30	12,565.53	95.03	95.38	123.77	-5,020.35	-284.67	396.93	206.51	190.41	2.085			
17,200.00	12,346.12	17,445.30	12,566.40	96.79	97.13	123.72	-5,120.34	-283.77	396.68	202.76	193.92	2.046			
17,300.00	12,347.44	17,545.29	12,567.27	98.54	98.89	123.66	-5,220.33	-282.87	396.44	199.00	197.43	2.008			
17,400.00	12,348.75	17,645.29	12,568.14	100.30	100.65	123.61	-5,320.32	-281.96	396.19	195.24	200.95	1.972			
17,500.00	12,350.07	17,745.29	12,569.01	102.06	102.41	123.55	-5,420.31	-281.06	395.94	191.48	204.47	1.936			
17,600.00	12,351.38	17,845.29	12,569.88	103.83	104.17	123.50	-5,520.30	-280.16	395.70	187.71	207.99	1.902			
17,700.00	12,352.70	17,945.29	12,570.75	105.59	105.93	123.45	-5,620.29	-279.26	395.46	183.93	211.53	1.870			
17,800.00	12,354.01	18,045.29	12,571.62	107.36	107.70	123.39	-5,720.29	-278.36	395.21	180.15	215.06	1.838			
17,900.00	12,355.33	18,145.29	12,572.49	109.13	109.47	123.34	-5,820.28	-277.46	394.97	176.37	218.60	1.807			
18,000.00	12,356.64	18,245.29	12,573.36	110.90	111.24	123.29	-5,920.27	-276.56	394.72	172.58	222.14	1.777			
18,100.00	12,357.96	18,345.29	12,574.23	112.67	113.01	123.23	-6,020.26	-275.66	394.48	168.79	225.69	1.748			
18,200.00	12,359.27	18,445.29	12,575.10	114.45	114.79	123.18	-6,120.25	-274.76	394.24	165.00	229.24	1.720			
18,300.00	12,360.59	18,545.28	12,575.97	116.23	116.56	123.12	-6,220.24	-273.86	394.00	161.21	232.79	1.693			
18,400.00	12,361.90	18,645.28	12,576.84	118.00	118.34	123.07	-6,320.23	-272.95	393.75	157.41	236.35	1.666			
18,500.00	12,363.22	18,745.28	12,577.71	119.78	120.12	123.01	-6,420.22	-272.05	393.51	153.61	239.90	1.640			
18,600.00	12,364.53	18,845.28	12,578.58	121.57	121.90	122.96	-6,520.21	-271.15	393.27	149.81	243.47	1.615			
18,700.00	12,365.85	18,945.28	12,579.45	123.35	123.68	122.90	-6,620.21	-270.25	393.03	146.00	247.03	1.591			
18,800.00	12,367.16	19,045.28	12,580.32	125.13	125.47	122.85	-6,720.20	-269.35	392.79	142.19	250.60	1.567			
18,900.00	12,368.48	19,145.28	12,581.19	126.92	127.25	122.80	-6,820.19	-268.45	392.55	138.38	254.17	1.544			
19,000.00	12,369.79	19,245.28	12,582.06	128.70	129.04	122.74	-6,920.18	-267.55	392.31	134.57	257.74	1.522			
19,100.00	12,371.11	19,345.28	12,582.93	130.49	130.82	122.69	-7,020.17	-266.65	392.07	130.76	261.32	1.500			
19,200.00	12,372.42	19,445.28	12,583.80	132.28	132.61	122.63	-7,120.16	-265.75	391.83	126.94	264.89	1.479 Level 3			
19,300.00	12,373.74	19,545.27	12,584.67	134.07	134.40	122.58	-7,220.15	-264.84	391.59	123.12	268.47	1.459 Level 3			
19,400.00	12,375.05	19,645.27	12,585.54	135.86	136.19	122.52	-7,320.14	-263.94	391.35	119.30	272.05	1.439 Level 3			
19,500.00	12,376.37	19,745.27	12,586.41	137.65	137.98	122.47	-7,420.13	-263.04	391.12	115.48	275.64	1.419 Level 3			
19,600.00	12,377.68	19,845.27	12,587.28	139.44	139.78	122.41	-7,520.13	-262.14	390.88	111.66	279.22	1.400 Level 3			
19,700.00	12,379.00	19,945.27	12,588.15	141.24	141.57	122.36	-7,620.12	-261.24	390.64	107.83	282.81	1.381 Level 3			
19,800.00	12,380.31	20,045.27	12,589.02	143.03	143.36	122.30	-7,720.11	-260.34	390.40	104.01	286.40	1.363 Level 3			
19,900.00	12,381.63	20,145.27	12,589.89	144.83	145.16	122.24	-7,820.10	-259.44	390.17	100.18	289.99	1.345 Level 3			
20,000.00	12,382.94	20,245.27	12,590.76	146.62	146.95	122.19	-7,920.09	-258.54	389.93	96.35	293.58	1.328 Level 3			
20,100.00	12,384.26	20,345.27	12,591.63	148.42	148.75	122.13	-8,020.08	-257.64	389.70	92.52	297.17	1.311 Level 3			
20,200.00	12,385.57	20,445.27	12,592.50	150.22	150.55	122.08	-8,120.07	-256.74	389.46	88.69	300.77	1.295 Level 3			
20,300.00	12,386.89	20,545.26	12,593.37	152.02	152.35	122.02	-8,220.06	-255.83	389.23	84.86	304.36	1.279 Level 3			
20,400.00	12,388.20	20,645.26	12,594.24	153.82	154.14	121.97	-8,320.06	-254.93	388.99	81.03	307.96	1.263 Level 3			
20,500.00	12,389.52	20,745.26	12,595.11	155.62	155.94	121.91	-8,420.05	-254.03	388.76	77.20	311.56	1.248 Level 2			
20,600.00	12,390.83	20,845.26	12,595.98	157.42	157.74	121.86	-8,520.04	-253.13	388.52	73.36	315.16	1.233 Level 2			

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. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
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. 16, T 25 S. , R 35 E - White Falcon 16 Federal Com 22H - Wellbore #1 - Plan #1													Offset Site Error: 0.00 ft	
Survey Program: 0-MWD													Offset Well Error: 0.00 ft	
Reference		Offset		Semi Major Axis			Distance							
Measured Depth	Vertical Depth	Measured Depth	Vertical Depth	Reference	Offset	Highside Toolface	Offset Wellbore Centre		Between Centres	Between Ellipses	Minimum Separation	Separation Factor	Warning	
(ft)	(ft)	(ft)	(ft)	(ft)	(ft)	(°)	+N/-S (ft)	+E/-W (ft)	(ft)	(ft)	(ft)			
20,700.00	12,392.15	20,945.26	12,596.85	159.22	159.54	121.80	-8,620.03	-252.23	388.29	69.53	318.76	1.218 Level 2		
20,800.00	12,393.46	21,045.26	12,597.72	161.02	161.35	121.74	-8,720.02	-251.33	388.06	65.69	322.37	1.204 Level 2		
20,900.00	12,394.78	21,145.26	12,598.59	162.82	163.15	121.69	-8,820.01	-250.43	387.82	61.85	325.97	1.190 Level 2		
21,000.00	12,396.09	21,245.26	12,599.46	164.63	164.95	121.63	-8,920.00	-249.53	387.59	58.01	329.58	1.176 Level 2		
21,100.00	12,397.41	21,345.26	12,600.33	166.43	166.75	121.58	-9,019.99	-248.63	387.36	54.18	333.18	1.163 Level 2		
21,200.00	12,398.72	21,445.26	12,601.20	168.23	168.56	121.52	-9,119.98	-247.73	387.13	50.34	336.79	1.149 Level 2		
21,300.00	12,400.04	21,545.25	12,602.07	170.04	170.36	121.46	-9,219.98	-246.82	386.90	46.50	340.40	1.137 Level 2		
21,400.00	12,401.35	21,645.25	12,602.94	171.84	172.17	121.41	-9,319.97	-245.92	386.66	42.66	344.01	1.124 Level 2		
21,500.00	12,402.66	21,745.25	12,603.81	173.65	173.97	121.35	-9,419.96	-245.02	386.43	38.81	347.62	1.112 Level 2		
21,600.00	12,403.98	21,845.25	12,604.68	175.45	175.78	121.29	-9,519.95	-244.12	386.20	34.97	351.23	1.100 Level 2		
21,700.00	12,405.29	21,945.25	12,605.55	177.26	177.58	121.24	-9,619.94	-243.22	385.97	31.13	354.84	1.088 Level 2		
21,800.00	12,406.61	22,045.25	12,606.42	179.07	179.39	121.18	-9,719.93	-242.32	385.74	27.29	358.46	1.076 Level 2		
21,900.00	12,407.92	22,145.25	12,607.29	180.87	181.20	121.12	-9,819.92	-241.42	385.51	23.44	362.07	1.065 Level 2		
22,000.00	12,409.24	22,245.25	12,608.16	182.68	183.00	121.07	-9,919.91	-240.52	385.29	19.60	365.69	1.054 Level 2		
22,100.00	12,410.55	22,345.25	12,609.03	184.49	184.81	121.01	-10,019.91	-239.62	385.06	15.76	369.30	1.043 Level 2		
22,200.00	12,411.87	22,445.25	12,609.90	186.30	186.62	120.95	-10,119.90	-238.72	384.83	11.91	372.92	1.032 Level 2		
22,209.98	12,412.00	22,455.22	12,609.98	186.48	186.80	120.95	-10,129.87	-238.63	384.81	11.53	373.28	1.031 Level 2, ES, SF		

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



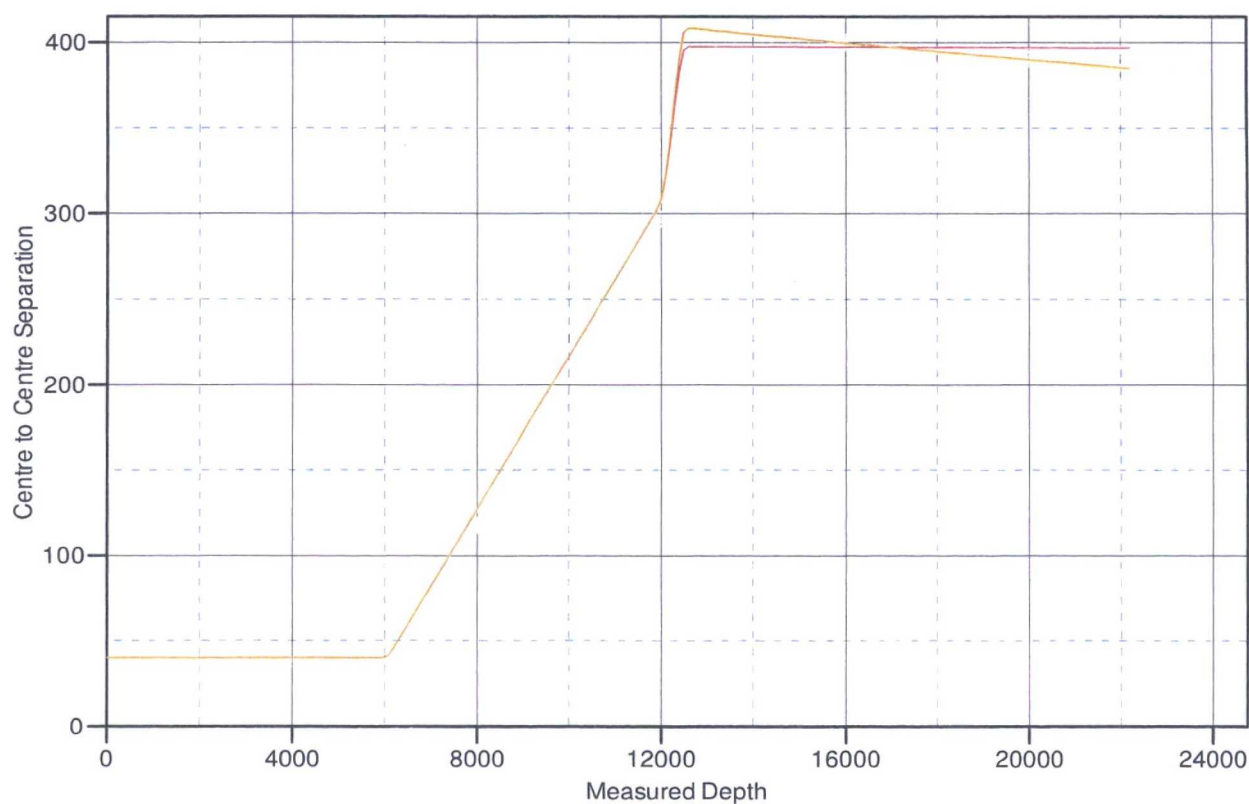
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S. , R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=26' @ 3272.50ft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

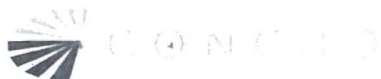
Coordinates are relative to: White Falcon 16 Federal Com 11H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.51°

Ladder Plot



LEGEND

6 Federal Com 21H, Wellbore #1, Plan #1 V0 — White Falcon 16 Federal Com 22H, Wellbore #1, Plan #1 V0



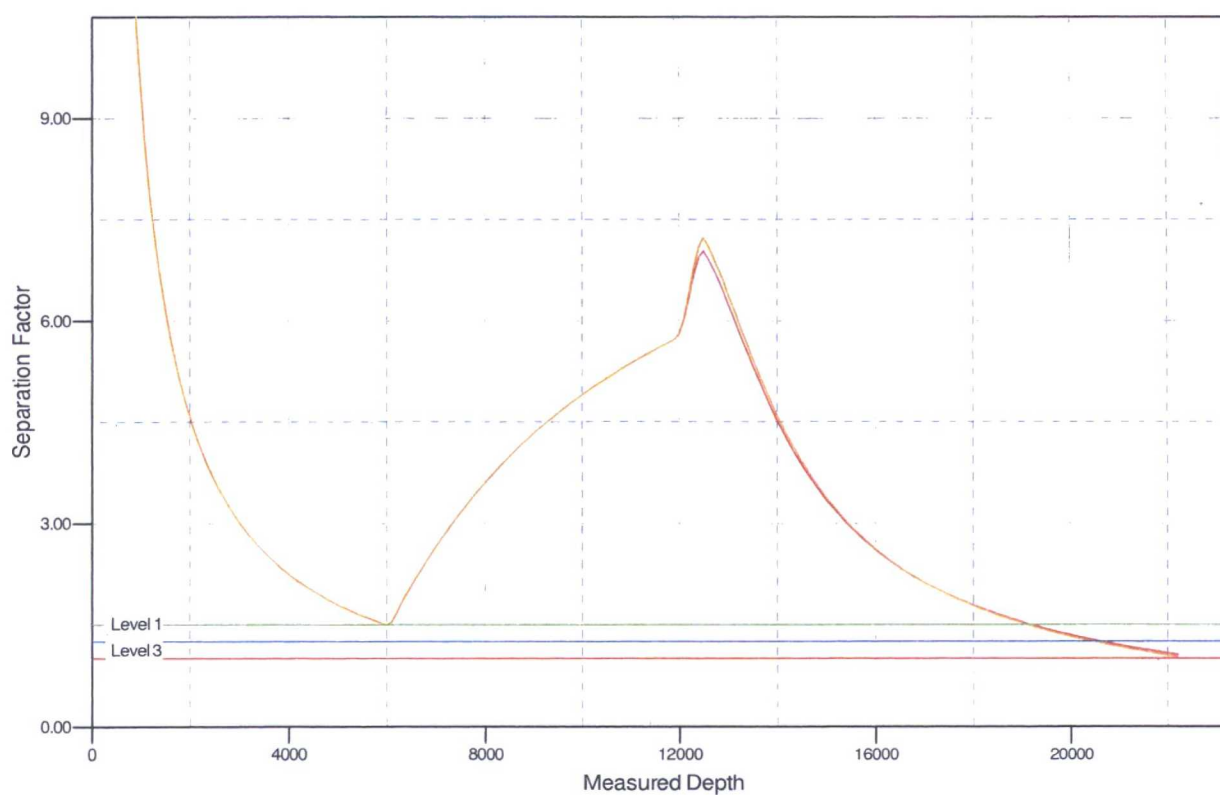
Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Reference Site: Sec. 16, T 25 S., R 35 E
Site Error: 0.00 ft
Reference Well: White Falcon 16 Federal Com 11H
Well Error: 0.00 ft
Reference Wellbore: Wellbore #1
Reference Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Output errors are at 2.00 sigma
Database: EDM 5000.1 Multi User Db
Offset TVD Reference: Offset Datum

Reference Depths are relative to KB=26' @ 3272.50ft
Offset Depths are relative to Offset Datum
Central Meridian is 104° 20' 0.000 W

Coordinates are relative to: White Falcon 16 Federal Com 11H
Coordinate System is US State Plane 1927 (Exact solution), New Mexico East 30
Grid Convergence at Surface is: 0.51°

Separation Factor Plot



LEGEND

6 Federal Com 21H, Wellbore #1, Plan #1 V0 — White Falcon 16 Federal Com 22H, Wellbore #1, Plan #1 V0



COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Plan: Plan #1 (White Falcon 16 Federal Com 11H/Wellbore #1)



WELL DETAILS: White Falcon 16 Federal Com 11H

Ground Elevation: 3246.50
RKB Elevation: KB=26' @ 3272.50ft
Rig Name:

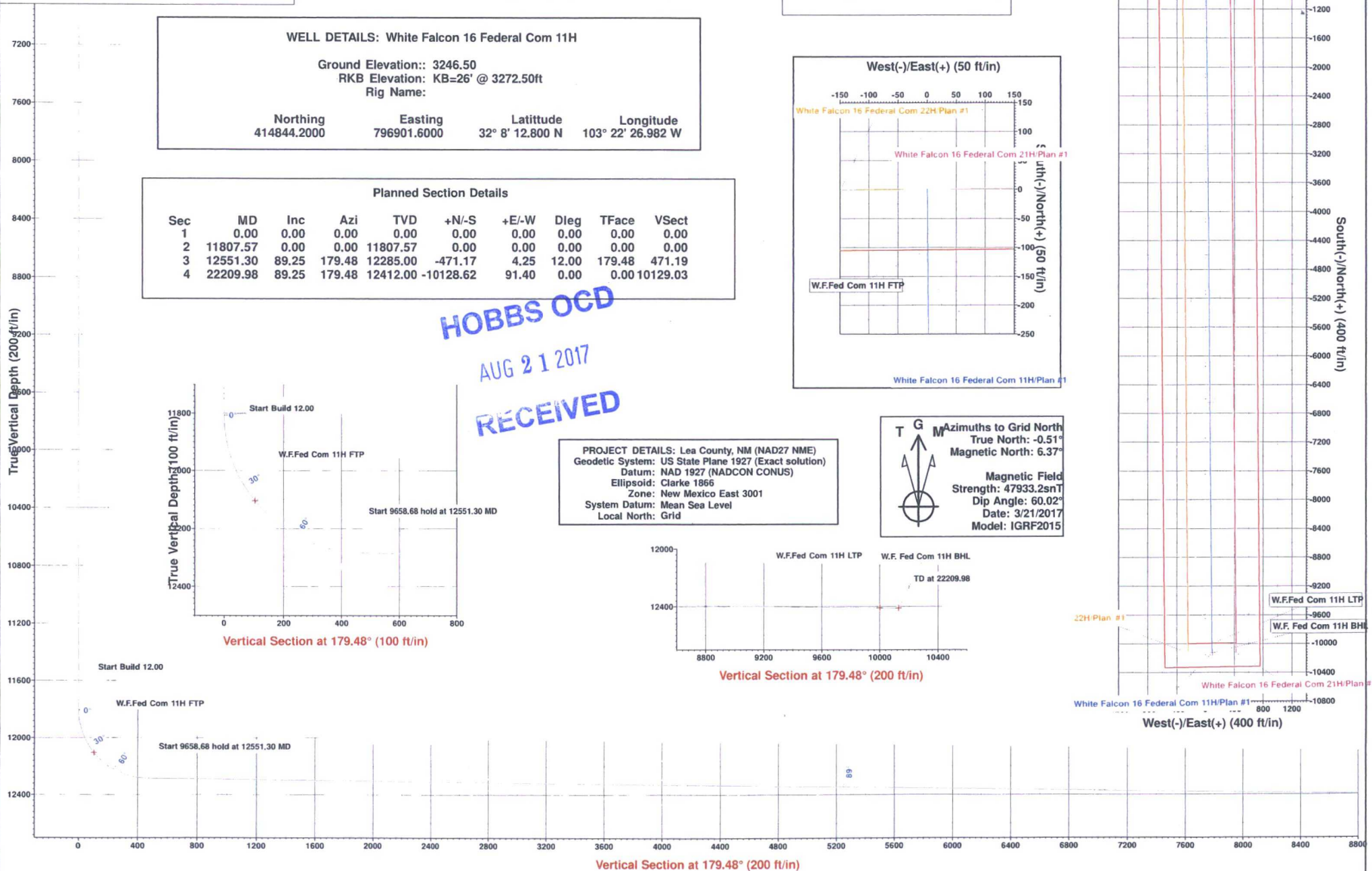
Northing	Easting	Latitude	Longitude
414844.2000	796901.6000	32° 8' 12.800 N	103° 22' 26.982 W

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	11807.57	0.00	0.00	11807.57	0.00	0.00	0.00	0.00	0.00
3	12551.30	89.25	179.48	12285.00	-471.17	4.25	12.00	179.48	471.19
4	22209.98	89.25	179.48	12412.00	-10128.62	91.40	0.00	0.00	10129.03

HOBBS OCD
AUG 21 2017
RECEIVED

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

HOBBS OCD

AUG 21 2017

RECEIVED

COG Operating L L C

Lea County, NM (NAD27 NME)

Sec. 16, T 25 S. , R 35 E

White Falcon 16 Federal Com 11H

Wellbore #1

Plan: Plan #1

Standard Survey Report

21 March, 2017





Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

HOBBS OCD

AUG 21 2017

RECEIVED

Project	Lea County, NM (NAD27 NME)		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec. 16, T 25 S. , R 35 E		
Site Position:		Northing:	414,844.2000 usft
From:	Map	Easting:	796,901.6000 usft
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "
		Latitude:	32° 8' 12.800 N
		Longitude:	103° 22' 26.982 W
		Grid Convergence:	0.51 °

Well	White Falcon 16 Federal Com 11H		
Well Position	+N/-S	0.00 ft	Latitude: 32° 8' 12.800 N
	+E/-W	0.00 ft	Longitude: 103° 22' 26.982 W
Position Uncertainty	0.00 ft	Wellhead Elevation:	0.00 ft
		Ground Level:	3,246.50 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/21/2017	6.88	60.02	47,933

Design	Plan #1				
Audit Notes:					
Version:	Phase:	PLAN	Tie On Depth:		0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)	
	0.00	0.00	0.00	179.48	

Survey Tool Program	Date	3/21/2017			
From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description	
0.00	22,209.98	Plan #1 (Wellbore #1)	MWD	MWD - Standard	

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S. , R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	0.00	0.00	0.00	0.00	0.00	0.00
10,200.00	0.00	0.00	10,200.00	0.00	0.00	0.00	0.00	0.00	0.00
10,300.00	0.00	0.00	10,300.00	0.00	0.00	0.00	0.00	0.00	0.00
10,400.00	0.00	0.00	10,400.00	0.00	0.00	0.00	0.00	0.00	0.00
10,500.00	0.00	0.00	10,500.00	0.00	0.00	0.00	0.00	0.00	0.00
10,600.00	0.00	0.00	10,600.00	0.00	0.00	0.00	0.00	0.00	0.00
10,700.00	0.00	0.00	10,700.00	0.00	0.00	0.00	0.00	0.00	0.00
10,800.00	0.00	0.00	10,800.00	0.00	0.00	0.00	0.00	0.00	0.00
10,900.00	0.00	0.00	10,900.00	0.00	0.00	0.00	0.00	0.00	0.00
11,000.00	0.00	0.00	11,000.00	0.00	0.00	0.00	0.00	0.00	0.00
11,100.00	0.00	0.00	11,100.00	0.00	0.00	0.00	0.00	0.00	0.00
11,200.00	0.00	0.00	11,200.00	0.00	0.00	0.00	0.00	0.00	0.00
11,300.00	0.00	0.00	11,300.00	0.00	0.00	0.00	0.00	0.00	0.00
11,400.00	0.00	0.00	11,400.00	0.00	0.00	0.00	0.00	0.00	0.00
11,500.00	0.00	0.00	11,500.00	0.00	0.00	0.00	0.00	0.00	0.00
11,600.00	0.00	0.00	11,600.00	0.00	0.00	0.00	0.00	0.00	0.00
11,700.00	0.00	0.00	11,700.00	0.00	0.00	0.00	0.00	0.00	0.00
11,800.00	0.00	0.00	11,800.00	0.00	0.00	0.00	0.00	0.00	0.00
11,807.57	0.00	0.00	11,807.57	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 12.00									
11,900.00	11.09	179.48	11,899.42	-8.92	0.08	8.92	12.00	12.00	0.00
12,000.00	23.09	179.48	11,994.83	-38.25	0.35	38.25	12.00	12.00	0.00
12,100.00	35.09	179.48	12,082.06	-86.78	0.78	86.78	12.00	12.00	0.00
12,200.00	47.09	179.48	12,157.29	-152.38	1.38	152.39	12.00	12.00	0.00
12,300.00	59.09	179.48	12,217.23	-232.19	2.10	232.20	12.00	12.00	0.00
12,400.00	71.09	179.48	12,259.27	-322.72	2.91	322.74	12.00	12.00	0.00
12,500.00	83.09	179.48	12,281.57	-420.01	3.79	420.03	12.00	12.00	0.00
12,551.30	89.25	179.48	12,285.00	-471.17	4.25	471.19	12.00	12.00	0.00
Start 9658.68 hold at 12551.30 MD									
12,600.00	89.25	179.48	12,285.64	-519.86	4.69	519.89	0.00	0.00	0.00
12,700.00	89.25	179.48	12,286.95	-619.85	5.59	619.88	0.00	0.00	0.00
12,800.00	89.25	179.48	12,288.27	-719.84	6.50	719.87	0.00	0.00	0.00
12,900.00	89.25	179.48	12,289.58	-819.83	7.40	819.86	0.00	0.00	0.00
13,000.00	89.25	179.48	12,290.90	-919.81	8.30	919.85	0.00	0.00	0.00
13,100.00	89.25	179.48	12,292.21	-1,019.80	9.20	1,019.84	0.00	0.00	0.00
13,200.00	89.25	179.48	12,293.53	-1,119.79	10.10	1,119.83	0.00	0.00	0.00
13,300.00	89.25	179.48	12,294.84	-1,219.78	11.01	1,219.83	0.00	0.00	0.00
13,400.00	89.25	179.48	12,296.16	-1,319.76	11.91	1,319.82	0.00	0.00	0.00
13,500.00	89.25	179.48	12,297.47	-1,419.75	12.81	1,419.81	0.00	0.00	0.00
13,600.00	89.25	179.48	12,298.79	-1,519.74	13.71	1,519.80	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,700.00	89.25	179.48	12,300.10	-1,619.73	14.62	1,619.79	0.00	0.00	0.00
13,800.00	89.25	179.48	12,301.42	-1,719.71	15.52	1,719.78	0.00	0.00	0.00
13,900.00	89.25	179.48	12,302.73	-1,819.70	16.42	1,819.77	0.00	0.00	0.00
14,000.00	89.25	179.48	12,304.05	-1,919.69	17.32	1,919.77	0.00	0.00	0.00
14,100.00	89.25	179.48	12,305.36	-2,019.67	18.23	2,019.76	0.00	0.00	0.00
14,200.00	89.25	179.48	12,306.68	-2,119.66	19.13	2,119.75	0.00	0.00	0.00
14,300.00	89.25	179.48	12,307.99	-2,219.65	20.03	2,219.74	0.00	0.00	0.00
14,400.00	89.25	179.48	12,309.31	-2,319.64	20.93	2,319.73	0.00	0.00	0.00
14,500.00	89.25	179.48	12,310.62	-2,419.62	21.83	2,419.72	0.00	0.00	0.00
14,600.00	89.25	179.48	12,311.94	-2,519.61	22.74	2,519.71	0.00	0.00	0.00
14,700.00	89.25	179.48	12,313.25	-2,619.60	23.64	2,619.70	0.00	0.00	0.00
14,800.00	89.25	179.48	12,314.57	-2,719.59	24.54	2,719.70	0.00	0.00	0.00
14,900.00	89.25	179.48	12,315.88	-2,819.57	25.44	2,819.69	0.00	0.00	0.00
15,000.00	89.25	179.48	12,317.20	-2,919.56	26.35	2,919.68	0.00	0.00	0.00
15,100.00	89.25	179.48	12,318.51	-3,019.55	27.25	3,019.67	0.00	0.00	0.00
15,200.00	89.25	179.48	12,319.83	-3,119.53	28.15	3,119.66	0.00	0.00	0.00
15,300.00	89.25	179.48	12,321.14	-3,219.52	29.05	3,219.65	0.00	0.00	0.00
15,400.00	89.25	179.48	12,322.46	-3,319.51	29.96	3,319.64	0.00	0.00	0.00
15,500.00	89.25	179.48	12,323.77	-3,419.50	30.86	3,419.64	0.00	0.00	0.00
15,600.00	89.25	179.48	12,325.09	-3,519.48	31.76	3,519.63	0.00	0.00	0.00
15,700.00	89.25	179.48	12,326.40	-3,619.47	32.66	3,619.62	0.00	0.00	0.00
15,800.00	89.25	179.48	12,327.72	-3,719.46	33.56	3,719.61	0.00	0.00	0.00
15,900.00	89.25	179.48	12,329.03	-3,819.45	34.47	3,819.60	0.00	0.00	0.00
16,000.00	89.25	179.48	12,330.35	-3,919.43	35.37	3,919.59	0.00	0.00	0.00
16,100.00	89.25	179.48	12,331.66	-4,019.42	36.27	4,019.58	0.00	0.00	0.00
16,200.00	89.25	179.48	12,332.98	-4,119.41	37.17	4,119.57	0.00	0.00	0.00
16,300.00	89.25	179.48	12,334.29	-4,219.39	38.08	4,219.57	0.00	0.00	0.00
16,400.00	89.25	179.48	12,335.61	-4,319.38	38.98	4,319.56	0.00	0.00	0.00
16,500.00	89.25	179.48	12,336.92	-4,419.37	39.88	4,419.55	0.00	0.00	0.00
16,600.00	89.25	179.48	12,338.24	-4,519.36	40.78	4,519.54	0.00	0.00	0.00
16,700.00	89.25	179.48	12,339.55	-4,619.34	41.68	4,619.53	0.00	0.00	0.00
16,800.00	89.25	179.48	12,340.86	-4,719.33	42.59	4,719.52	0.00	0.00	0.00
16,900.00	89.25	179.48	12,342.18	-4,819.32	43.49	4,819.51	0.00	0.00	0.00
17,000.00	89.25	179.48	12,343.49	-4,919.31	44.39	4,919.51	0.00	0.00	0.00
17,100.00	89.25	179.48	12,344.81	-5,019.29	45.29	5,019.50	0.00	0.00	0.00
17,200.00	89.25	179.48	12,346.12	-5,119.28	46.20	5,119.49	0.00	0.00	0.00
17,300.00	89.25	179.48	12,347.44	-5,219.27	47.10	5,219.48	0.00	0.00	0.00
17,400.00	89.25	179.48	12,348.75	-5,319.25	48.00	5,319.47	0.00	0.00	0.00
17,500.00	89.25	179.48	12,350.07	-5,419.24	48.90	5,419.46	0.00	0.00	0.00
17,600.00	89.25	179.48	12,351.38	-5,519.23	49.81	5,519.45	0.00	0.00	0.00
17,700.00	89.25	179.48	12,352.70	-5,619.22	50.71	5,619.45	0.00	0.00	0.00
17,800.00	89.25	179.48	12,354.01	-5,719.20	51.61	5,719.44	0.00	0.00	0.00
17,900.00	89.25	179.48	12,355.33	-5,819.19	52.51	5,819.43	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



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Wellbore: Wellbore #1
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Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
18,000.00	89.25	179.48	12,356.64	-5,919.18	53.41	5,919.42	0.00	0.00	0.00
18,100.00	89.25	179.48	12,357.96	-6,019.17	54.32	6,019.41	0.00	0.00	0.00
18,200.00	89.25	179.48	12,359.27	-6,119.15	55.22	6,119.40	0.00	0.00	0.00
18,300.00	89.25	179.48	12,360.59	-6,219.14	56.12	6,219.39	0.00	0.00	0.00
18,400.00	89.25	179.48	12,361.90	-6,319.13	57.02	6,319.38	0.00	0.00	0.00
18,500.00	89.25	179.48	12,363.22	-6,419.11	57.93	6,419.38	0.00	0.00	0.00
18,600.00	89.25	179.48	12,364.53	-6,519.10	58.83	6,519.37	0.00	0.00	0.00
18,700.00	89.25	179.48	12,365.85	-6,619.09	59.73	6,619.36	0.00	0.00	0.00
18,800.00	89.25	179.48	12,367.16	-6,719.08	60.63	6,719.35	0.00	0.00	0.00
18,900.00	89.25	179.48	12,368.48	-6,819.06	61.53	6,819.34	0.00	0.00	0.00
19,000.00	89.25	179.48	12,369.79	-6,919.05	62.44	6,919.33	0.00	0.00	0.00
19,100.00	89.25	179.48	12,371.11	-7,019.04	63.34	7,019.32	0.00	0.00	0.00
19,200.00	89.25	179.48	12,372.42	-7,119.03	64.24	7,119.32	0.00	0.00	0.00
19,300.00	89.25	179.48	12,373.74	-7,219.01	65.14	7,219.31	0.00	0.00	0.00
19,400.00	89.25	179.48	12,375.05	-7,319.00	66.05	7,319.30	0.00	0.00	0.00
19,500.00	89.25	179.48	12,376.37	-7,418.99	66.95	7,419.29	0.00	0.00	0.00
19,600.00	89.25	179.48	12,377.68	-7,518.97	67.85	7,519.28	0.00	0.00	0.00
19,700.00	89.25	179.48	12,379.00	-7,618.96	68.75	7,619.27	0.00	0.00	0.00
19,800.00	89.25	179.48	12,380.31	-7,718.95	69.66	7,719.26	0.00	0.00	0.00
19,900.00	89.25	179.48	12,381.63	-7,818.94	70.56	7,819.26	0.00	0.00	0.00
20,000.00	89.25	179.48	12,382.94	-7,918.92	71.46	7,919.25	0.00	0.00	0.00
20,100.00	89.25	179.48	12,384.26	-8,018.91	72.36	8,019.24	0.00	0.00	0.00
20,200.00	89.25	179.48	12,385.57	-8,118.90	73.26	8,119.23	0.00	0.00	0.00
20,300.00	89.25	179.48	12,386.89	-8,218.89	74.17	8,219.22	0.00	0.00	0.00
20,400.00	89.25	179.48	12,388.20	-8,318.87	75.07	8,319.21	0.00	0.00	0.00
20,500.00	89.25	179.48	12,389.52	-8,418.86	75.97	8,419.20	0.00	0.00	0.00
20,600.00	89.25	179.48	12,390.83	-8,518.85	76.87	8,519.19	0.00	0.00	0.00
20,700.00	89.25	179.48	12,392.15	-8,618.84	77.78	8,619.19	0.00	0.00	0.00
20,800.00	89.25	179.48	12,393.46	-8,718.82	78.68	8,719.18	0.00	0.00	0.00
20,900.00	89.25	179.48	12,394.78	-8,818.81	79.58	8,819.17	0.00	0.00	0.00
21,000.00	89.25	179.48	12,396.09	-8,918.80	80.48	8,919.16	0.00	0.00	0.00
21,100.00	89.25	179.48	12,397.41	-9,018.78	81.39	9,019.15	0.00	0.00	0.00
21,200.00	89.25	179.48	12,398.72	-9,118.77	82.29	9,119.14	0.00	0.00	0.00
21,300.00	89.25	179.48	12,400.04	-9,218.76	83.19	9,219.13	0.00	0.00	0.00
21,400.00	89.25	179.48	12,401.35	-9,318.75	84.09	9,319.13	0.00	0.00	0.00
21,500.00	89.25	179.48	12,402.66	-9,418.73	84.99	9,419.12	0.00	0.00	0.00
21,600.00	89.25	179.48	12,403.98	-9,518.72	85.90	9,519.11	0.00	0.00	0.00
21,700.00	89.25	179.48	12,405.29	-9,618.71	86.80	9,619.10	0.00	0.00	0.00
21,800.00	89.25	179.48	12,406.61	-9,718.70	87.70	9,719.09	0.00	0.00	0.00
21,900.00	89.25	179.48	12,407.92	-9,818.68	88.60	9,819.08	0.00	0.00	0.00
22,000.00	89.25	179.48	12,409.24	-9,918.67	89.51	9,919.07	0.00	0.00	0.00
22,100.00	89.25	179.48	12,410.55	-10,018.66	90.41	10,019.07	0.00	0.00	0.00
22,200.00	89.25	179.48	12,411.87	-10,118.64	91.31	10,119.06	0.00	0.00	0.00



Integrity Directional Services, LLC

Survey Report



Company: COG Operating L L C
Project: Lea County, NM (NAD27 NME)
Site: Sec. 16, T 25 S., R 35 E
Well: White Falcon 16 Federal Com 11H
Wellbore: Wellbore #1
Design: Plan #1

Local Co-ordinate Reference: Well White Falcon 16 Federal Com 11H
TVD Reference: KB=26' @ 3272.50ft
MD Reference: KB=26' @ 3272.50ft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: EDM 5000.1 Multi User Db

Planned Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
22,209.98	89.25	179.48	12,412.00	-10,128.62	91.40	10,129.03	0.00	0.00	0.00
TD at 22209.98									

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
W.F.Fed Com 11H FT	0.00	0.00	12,105.13	-104.05	1.13	414,740.1498	796,902.7286	32° 8' 11.771 N	103° 22' 26.980 W
- plan misses target center by 0.19ft at 12128.79ft MD (12105.10 TVD, -104.03 N, 0.94 E)									
- Point									
W.F.Fed Com 11H LT	0.00	0.00	12,410.29	-9,998.67	90.14	404,845.5509	796,991.7445	32° 6' 33.854 N	103° 22' 26.969 W
- plan misses target center by 0.08ft at 22080.01ft MD (12410.29 TVD, -9998.67 N, 90.23 E)									
- Point									
W.F. Fed Com 11H B	0.00	0.00	12,412.00	-10,128.62	91.40	404,715.6000	796,993.0000	32° 6' 32.568 N	103° 22' 26.968 W
- plan hits target center									
- Point									

Plan Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
11,808	11,808	0	0	Start Build 12.00
12,551	12,285	-471	4	Start 9658.68 hold at 12551.30 MD
22,210	12,412	-10,129	91	TD at 22209.98

Checked By: _____ Approved By: _____ Date: _____