



## **Entek GRB, Inc.**

**Routt Co., CO  
Sec.32-T12N-R88W  
Butter Lake Fed 32-10L**

**Wellbore #2-ST  
Design #1**

# **Anticollision Report**

**11 May, 2011**





<b>Company:</b>	Entek GRB, Inc.	<b>Local Co-ordinate Reference:</b>	Well Butter Lake Fed 32-10L
<b>Project:</b>	Rouff Co., CO	<b>TVD Reference:</b>	WELL @ 7518.00usft
<b>Reference Site:</b>	Sec.32-T12N-R88W	<b>MD Reference:</b>	WELL @ 7518.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Butter Lake Fed 32-10L	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2-ST	<b>Database:</b>	EDM 5000.1 EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

<b>Reference</b>	Design #1		
<b>Filter type:</b>	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
<b>Interpolation Method:</b>	Stations	<b>Error Model:</b>	ISCWSA
<b>Depth Range:</b>	Unlimited	<b>Scan Method:</b>	Closest Approach 3D
<b>Results Limited by:</b>	Maximum center-center distance of 10,000.00 usft	<b>Error Surface:</b>	Elliptical Conic
<b>Warning Levels Evaluated at:</b>	2.00 Sigma	<b>Casing Method:</b>	Not applied

<b>Survey Tool Program</b>	Date 03/07/11			
<b>From (usft)</b>	<b>To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Description</b>
1,704.00	4,542.00	Survey #1 (Wellbore #1)	MWD	MWD - Standard
4,542.00	8,926.77	Design #1 (Wellbore #2-ST)	MWD	MWD - Standard

<b>Summary</b>						
<b>Site Name</b>	<b>Reference Measured Depth (usft)</b>	<b>Offset Measured Depth (usft)</b>	<b>Distance Between Centres (usft)</b>	<b>Distance Between Ellipses (usft)</b>	<b>Separation Factor</b>	<b>Warning</b>
<b>Offset Well - Wellbore - Design</b>						
Sec.32-T12N-R88W						
Butter Lake Fed 32-10L - Wellbore #1 - Wellbore #1	4,787.26	4,787.26	0.00	-1.11	0.002	Level 1, CC
Butter Lake Fed 32-10L - Wellbore #1 - Wellbore #1	4,800.00	4,800.00	0.00	-1.17	0.002	Level 1, SF
Butter Lake Fed 32-10L - Wellbore #1 - Wellbore #1	4,900.00	4,900.00	0.00	-1.56	0.003	Level 1, ES

<b>Offset Design</b>												<b>Offset Site Error:</b>	0.00 usft
Survey Program: 1704-MWD												<b>Offset Well Error:</b>	0.00 usft
<b>Reference</b>		<b>Offset</b>		<b>Semi Major Axis</b>			<b>Distance</b>					<b>Warning</b>	
<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Measured Depth (usft)</b>	<b>Vertical Depth (usft)</b>	<b>Reference (usft)</b>	<b>Offset (usft)</b>	<b>Azimuth from North (°)</b>	<b>Offset Wellbore Centre +N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Between Centres (usft)</b>	<b>Between Ellipses (usft)</b>	<b>Minimum Separation (usft)</b>	<b>Separation Factor</b>	
4,542.00	4,538.72	4,542.00	4,538.72	0.00	0.00	-179.95	147.33	-64.34	0.00	0.00	0.00	N/A	
4,600.00	4,596.66	4,600.00	4,596.66	0.13	0.13	-178.55	149.42	-65.84	0.00	-0.25	0.25	0.015	Level 1
4,700.00	4,696.55	4,700.00	4,696.55	0.35	0.36	-165.66	153.35	-68.30	0.00	-0.69	0.69	0.004	Level 1
4,787.26	4,783.71	4,787.26	4,783.71	0.55	0.56	-118.11	157.12	-70.34	0.00	-1.11	1.11	0.002	Level 1, CC
4,800.00	4,796.43	4,800.00	4,796.43	0.58	0.59	-106.83	157.69	-70.63	0.00	-1.17	1.17	0.002	Level 1, SF
4,898.00	4,894.30	4,898.00	4,894.30	0.80	0.81	-53.85	162.34	-72.78	0.00	-1.53	1.54	0.003	Level 1
4,900.00	4,896.30	4,900.00	4,896.30	0.81	0.82	-64.09	162.43	-72.82	0.00	-1.56	1.56	0.003	Level 1, ES
5,000.00	4,996.08	4,999.96	4,996.10	1.04	1.05	-118.07	167.58	-74.88	2.56	0.48	2.08	1.230	Level 2
5,100.00	5,095.55	5,099.66	5,095.64	1.28	1.28	-118.65	173.00	-76.85	10.13	7.60	2.53	4.004	
5,200.00	5,194.42	5,198.84	5,194.64	1.53	1.51	-119.17	178.45	-78.84	22.89	19.91	2.98	7.683	
5,270.44	5,263.57	5,268.23	5,263.92	1.73	1.68	-119.41	182.31	-80.24	34.98	31.68	3.30	10.608	
5,300.00	5,292.48	5,297.26	5,292.89	1.81	1.75	-119.48	183.94	-80.83	40.59	37.14	3.44	11.792	
5,400.00	5,390.30	5,395.45	5,390.90	2.10	1.98	-119.58	189.48	-82.83	59.54	55.62	3.93	15.167	
5,500.00	5,488.11	5,493.62	5,488.89	2.41	2.21	-119.58	195.08	-84.87	78.49	74.12	4.36	17.988	
5,600.00	5,585.93	5,590.83	5,585.94	3.20	2.43	-119.68	200.29	-87.27	97.94	93.75	4.19	23.368	
5,700.00	5,683.74	5,687.65	5,682.60	3.87	2.66	-119.88	204.77	-90.37	118.38	114.35	4.03	29.376	
5,800.00	5,781.56	5,784.07	5,778.87	4.39	2.88	-120.13	208.55	-94.15	139.77	135.73	4.05	34.554	
5,900.00	5,879.37	5,880.06	5,874.71	4.87	3.11	-120.41	211.62	-98.62	162.13	157.99	4.14	39.164	
6,000.00	5,977.19	5,976.51	5,971.01	5.32	3.32	-120.80	213.80	-103.45	185.26	180.98	4.29	43.219	
6,100.00	6,075.00	6,073.96	6,068.34	5.76	3.53	-121.27	215.37	-108.13	208.56	203.94	4.62	45.157	
6,200.00	6,172.82	6,173.77	6,168.07	6.19	3.73	-121.94	216.08	-111.93	231.50	226.63	4.87	47.544	
6,300.00	6,270.63	6,273.10	6,267.37	6.62	3.93	-122.65	216.86	-114.28	253.24	248.13	5.11	49.541	
6,400.00	6,368.45	6,371.78	6,366.03	7.04	4.13	-123.36	217.47	-115.94	274.55	269.18	5.37	51.172	

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



# Great White Directional Services, LLC

## Anticollision Report



<b>Company:</b>	Entek GRB, Inc.	<b>Local Co-ordinate Reference:</b>	Well Butter Lake Fed 32-10L
<b>Project:</b>	Routt Co., CO	<b>TVD Reference:</b>	WELL @ 7518.00usft
<b>Reference Site:</b>	Sec.32-T12N-R88W	<b>MD Reference:</b>	WELL @ 7518.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Butter Lake Fed 32-10L	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2-ST	<b>Database:</b>	EDM 5000.1 EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Offset Design												Offset Site Error:	0.00 usft	
Survey Program: 1704-MWD												Offset Well Error:		0.00 usft
Reference		Offset		Semi Major Axis			Distance					Warning		
Measured Depth (usft)	Vertical Depth (usft)	Measured Depth (usft)	Vertical Depth (usft)	Reference (usft)	Offset (usft)	Azimuth from North (°)	Offset Wellbore Centre +N/-S (usft)	+E/-W (usft)	Between Centres (usft)	Between Ellipses (usft)	Minimum Separation (usft)		Separation Factor	
6,500.00	6,466.26	6,468.65	6,462.89	7.46	4.32	-124.06	217.70	-117.26	295.85	290.21	5.63	52.507		
6,600.00	6,564.08	6,563.99	6,558.21	7.88	4.52	-124.61	217.92	-119.13	317.66	311.71	5.95	53.363		
6,700.00	6,661.89	6,664.49	6,658.70	8.30	4.73	-125.09	218.21	-121.02	339.41	333.11	6.30	53.906		
6,800.00	6,759.71	6,761.09	6,755.28	8.72	4.93	-125.52	218.60	-122.60	360.92	354.26	6.65	54.243		
6,900.00	6,857.52	6,859.56	6,853.74	9.14	5.12	-125.93	218.80	-124.07	382.44	375.42	7.02	54.478		
7,000.00	6,955.34	6,956.60	6,950.77	9.56	5.32	-126.35	218.73	-125.26	403.93	396.55	7.38	54.705		
7,100.00	7,053.15	7,053.79	7,047.94	9.98	5.52	-126.63	219.15	-127.13	425.70	417.91	7.79	54.655		
7,200.00	7,150.97	7,154.06	7,148.18	10.40	5.73	-126.77	220.37	-129.27	447.18	438.96	8.22	54.373		
7,300.00	7,248.78	7,251.15	7,245.25	10.83	5.94	-126.95	221.64	-130.81	468.18	459.53	8.65	54.140		
7,400.00	7,346.59	7,345.32	7,339.41	11.25	6.13	-127.18	222.02	-132.44	489.83	480.78	9.06	54.091		
7,500.00	7,444.41	7,445.99	7,440.05	11.67	6.34	-127.39	222.18	-134.37	511.78	502.31	9.48	53.994		
7,600.00	7,542.22	7,546.93	7,540.98	12.10	6.55	-127.53	223.42	-135.79	532.70	522.79	9.92	53.705		
7,700.00	7,640.04	7,647.48	7,641.49	12.52	6.77	-127.56	225.53	-137.48	553.32	542.94	10.38	53.298		
7,800.00	7,737.85	7,750.54	7,744.48	12.94	6.99	-127.50	228.89	-139.17	573.22	562.35	10.87	52.753		
7,900.00	7,835.67	7,847.88	7,841.76	13.37	7.20	-127.46	232.35	-140.36	592.61	581.27	11.34	52.279		
8,000.00	7,933.48	7,944.43	7,938.25	13.80	7.41	-127.44	235.50	-141.74	612.34	600.54	11.80	51.884		
8,100.00	8,031.30	8,043.47	8,037.21	14.22	7.63	-127.38	239.07	-143.25	631.93	619.65	12.28	51.458		
8,200.00	8,129.11	8,137.08	8,130.78	14.65	7.83	-127.42	241.43	-144.53	652.05	639.32	12.73	51.219		
8,300.00	8,226.93	8,240.19	8,233.85	15.08	8.05	-127.48	243.73	-145.38	671.92	658.73	13.19	50.943		
8,400.00	8,324.74	8,339.10	8,332.73	15.51	8.26	-127.51	246.58	-146.14	691.36	677.70	13.65	50.636		
8,500.00	8,422.56	8,435.93	8,429.50	15.94	8.47	-127.50	249.80	-147.32	710.89	696.77	14.13	50.327		
8,600.00	8,520.37	8,533.40	8,526.90	16.37	8.69	-127.47	253.07	-148.68	730.54	715.94	14.60	50.039		
8,700.00	8,618.19	8,630.80	8,624.25	16.80	8.90	-127.47	255.97	-149.87	750.27	735.21	15.06	49.811		
8,800.00	8,716.00	8,727.99	8,721.41	17.23	9.10	-127.52	258.32	-150.73	770.08	754.56	15.52	49.632		
8,900.00	8,813.82	8,825.03	8,818.42	17.66	9.31	-127.58	260.51	-151.65	790.04	774.07	15.97	49.466		
8,926.77	8,840.00	8,830.00	8,823.39	17.77	9.32	-127.63	260.62	-151.70	795.68	779.62	16.05	49.573		

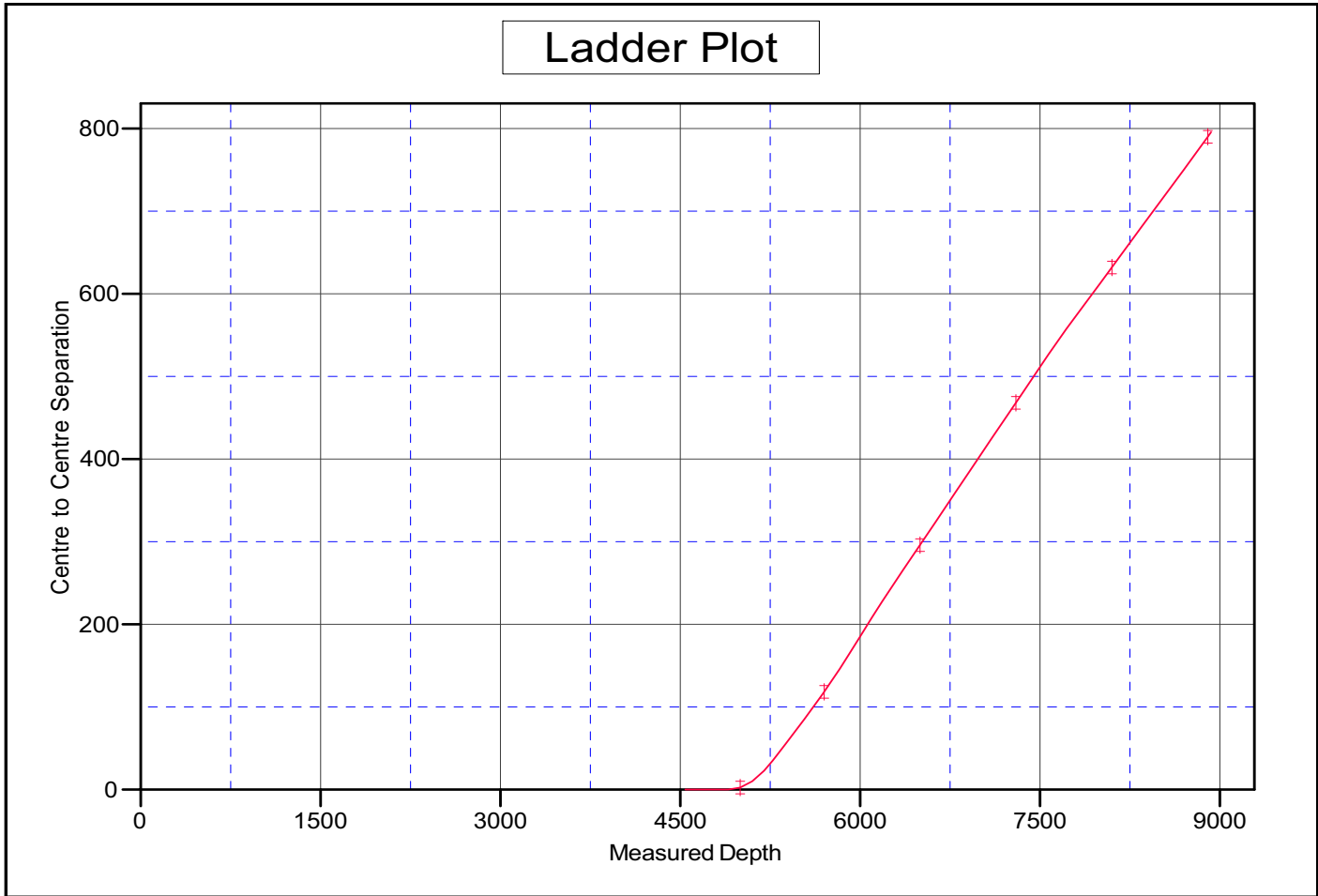
CC - Min centre to center distance or convergent point, SF - min separation factor, ES - min ellipse separation



<b>Company:</b>	Entek GRB, Inc.	<b>Local Co-ordinate Reference:</b>	Well Butter Lake Fed 32-10L
<b>Project:</b>	Routt Co., CO	<b>TVD Reference:</b>	WELL @ 7518.00usft
<b>Reference Site:</b>	Sec.32-T12N-R88W	<b>MD Reference:</b>	WELL @ 7518.00usft
<b>Site Error:</b>	0.00 usft	<b>North Reference:</b>	True
<b>Reference Well:</b>	Butter Lake Fed 32-10L	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Well Error:</b>	0.00 usft	<b>Output errors are at</b>	2.00 sigma
<b>Reference Wellbore</b>	Wellbore #2-ST	<b>Database:</b>	EDM 5000.1 EDMDBBW
<b>Reference Design:</b>	Design #1	<b>Offset TVD Reference:</b>	Reference Datum

Reference Depths are relative to WELL @ 7518.00usft  
 Offset Depths are relative to Offset Datum  
 Central Meridian is 105° 30' 0.000 W

Coordinates are relative to: Butter Lake Fed 32-10L  
 Coordinate System is US State Plane 1983, Colorado Northern Zone  
 Grid Convergence at Surface is: -1.15°



LEGEND

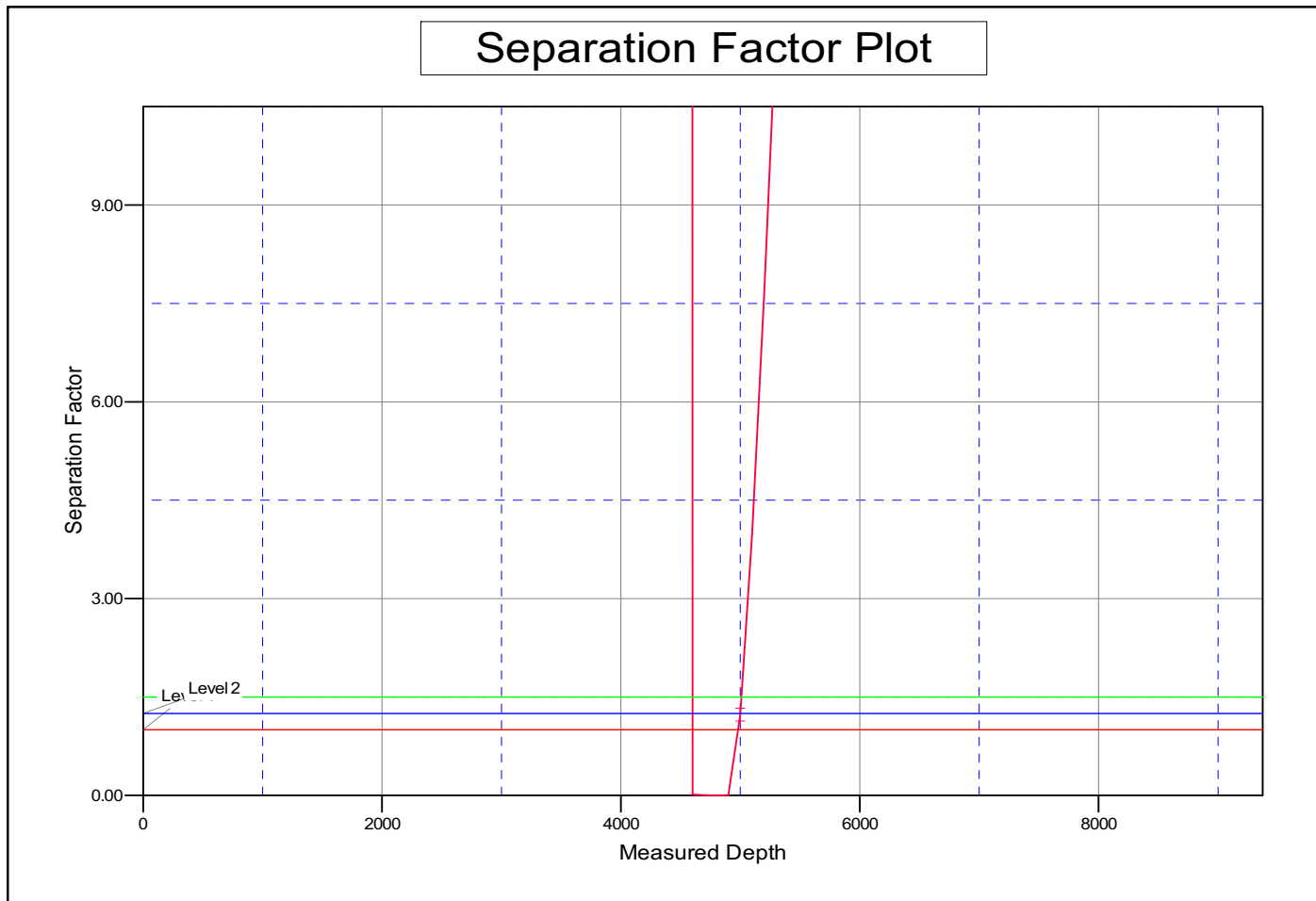
ter Lake Fed 32-10L, Wellbore #1, Wellbore #1 V0



<b>Company:</b>	Entek GRB, Inc.	<b>Local Co-ordinate Reference:</b>	Well Butter Lake Fed 32-10L
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Central Meridian is 105° 30' 0.000 W

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Coordinate System is US State Plane 1983, Colorado Northern Zone  
Grid Convergence at Surface is: -1.15°



LEGEND

ter Lake Fed 32-10L, Wellbore #1, Wellbore #1 V0