

# Conoco Phillips Company

Adams County, Colorado

Sec. 26-T3S-R65W

Reserve 3-65 26-1H

Plan B

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

02 July, 2014

Well Coordinates: 1,159,209.00 N, 3,241,990.62 E (39° 46' 01.82" N, 104° 38' 20.93" W)

Ground Level: 5,485.00 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 70

Centered on Well Reserve 3-65 26-1H

KB 24 @ 5509.00usft (H&P 276)

N

True

API - US Survey Feet - Custom

**HALLIBURTON**

**Design Report for Reserve 3-65 26-1H - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
2,008.00	0.17	186.97	2,007.93	-8.39	12.39	12.44	0.05
<b>Tie-On to Gyro Surveys @ 2008.00 ft</b>							
2,108.00	0.43	183.36	2,107.93	-8.92	12.35	12.41	0.26
<b>First Sperry MWD Survey @ 2108.00 ft</b>							
2,203.00	0.49	186.77	2,202.93	-9.67	12.29	12.34	0.07
2,297.00	0.41	185.49	2,296.93	-10.41	12.21	12.27	0.09
2,392.00	0.40	170.40	2,391.92	-11.07	12.23	12.29	0.11
2,487.00	0.31	149.77	2,486.92	-11.62	12.41	12.48	0.16
2,582.00	0.31	141.20	2,581.92	-12.04	12.70	12.77	0.05
2,677.00	0.28	139.77	2,676.92	-12.42	13.02	13.09	0.03
2,771.00	0.98	340.28	2,770.92	-11.84	12.89	12.96	1.33
2,866.00	1.18	333.57	2,865.90	-10.20	12.18	12.24	0.25
2,961.00	1.23	336.63	2,960.88	-8.39	11.34	11.39	0.09
3,056.00	1.32	337.59	3,055.85	-6.44	10.52	10.56	0.10
3,150.00	1.30	334.81	3,149.83	-4.47	9.65	9.68	0.07
3,245.00	1.49	337.01	3,244.80	-2.36	8.71	8.73	0.21
3,340.00	1.07	313.89	3,339.78	-0.61	7.59	7.60	0.69
3,434.00	1.23	309.15	3,433.76	0.63	6.18	6.17	0.20
3,529.00	1.41	311.34	3,528.73	2.05	4.51	4.50	0.20
3,623.00	0.45	300.30	3,622.72	3.00	3.32	3.30	1.03
3,718.00	0.53	282.27	3,717.72	3.28	2.57	2.55	0.18
3,813.00	0.64	269.89	3,812.71	3.37	1.61	1.59	0.18
3,907.00	0.84	238.20	3,906.71	3.01	0.50	0.48	0.48
4,002.00	1.16	227.13	4,001.69	1.99	-0.80	-0.81	0.39
4,097.00	1.43	210.86	4,096.67	0.32	-2.11	-2.11	0.48
4,192.00	0.00	300.91	4,191.66	-0.70	-2.72	-2.71	1.51
4,286.00	0.20	194.39	4,285.66	-0.86	-2.76	-2.75	0.21
4,381.00	0.48	188.83	4,380.65	-1.41	-2.86	-2.85	0.30
4,476.00	0.75	198.00	4,475.65	-2.40	-3.11	-3.10	0.30
4,571.00	0.92	200.51	4,570.64	-3.70	-3.57	-3.55	0.18
4,665.00	1.09	200.17	4,664.62	-5.25	-4.15	-4.12	0.18
4,760.00	1.32	202.56	4,759.60	-7.11	-4.88	-4.84	0.25
4,855.00	1.36	283.60	4,854.59	-7.85	-6.39	-6.35	1.83
4,949.00	1.47	281.30	4,948.56	-7.35	-8.66	-8.62	0.13
5,044.00	0.63	299.31	5,043.54	-6.86	-10.31	-10.27	0.94
5,138.00	0.44	174.25	5,137.54	-6.97	-10.72	-10.68	1.01
5,233.00	1.00	196.23	5,232.53	-8.13	-10.92	-10.87	0.65
5,328.00	1.52	194.53	5,327.51	-10.14	-11.47	-11.41	0.55
5,423.00	0.28	310.97	5,422.50	-11.21	-11.96	-11.89	1.75
5,517.00	0.12	295.12	5,516.50	-11.02	-12.22	-12.16	0.18
5,612.00	0.25	203.26	5,611.50	-11.16	-12.39	-12.33	0.30
5,706.00	0.62	185.15	5,705.49	-11.86	-12.52	-12.45	0.42
5,801.00	0.80	164.75	5,800.49	-13.01	-12.39	-12.32	0.32
5,896.00	1.30	2.08	5,895.48	-12.57	-12.18	-12.10	2.19
5,990.00	1.31	6.16	5,989.45	-10.44	-12.02	-11.96	0.10
6,084.00	0.88	351.58	6,083.44	-8.66	-12.01	-11.96	0.54
6,179.00	0.87	337.57	6,178.43	-7.27	-12.40	-12.35	0.22
6,274.00	0.92	5.96	6,273.41	-5.84	-12.59	-12.56	0.46
6,369.00	0.90	28.78	6,368.40	-4.43	-12.15	-12.13	0.38

**Design Report for Reserve 3-65 26-1H - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,463.00	0.93	41.91	6,462.39	-3.22	-11.29	-11.27	0.22
6,558.00	1.24	57.74	6,557.37	-2.09	-9.90	-9.89	0.45
6,653.00	1.22	66.82	6,652.35	-1.15	-8.11	-8.10	0.21
6,748.00	1.14	68.17	6,747.33	-0.40	-6.30	-6.30	0.09
6,842.00	0.98	67.80	6,841.32	0.25	-4.69	-4.69	0.17
6,937.00	1.10	75.12	6,936.30	0.79	-3.05	-3.06	0.19
7,031.00	0.87	82.75	7,030.29	1.12	-1.47	-1.48	0.28
7,063.00	2.91	88.38	7,062.27	1.17	-0.42	-0.43	6.39
7,095.00	5.99	90.75	7,094.17	1.17	2.06	2.06	9.64
7,126.00	8.79	91.68	7,124.91	1.08	6.05	6.04	9.04
7,158.00	11.87	91.82	7,156.38	0.90	11.78	11.78	9.63
7,189.00	14.49	91.33	7,186.57	0.71	18.85	18.84	8.46
7,221.00	16.66	90.49	7,217.39	0.58	27.44	27.43	6.82
7,252.00	19.09	89.97	7,246.89	0.55	36.95	36.95	7.86
7,284.00	21.25	90.03	7,276.93	0.54	47.99	47.98	6.75
7,315.00	22.88	90.83	7,305.65	0.45	59.63	59.63	5.35
7,347.00	24.90	92.16	7,334.91	0.11	72.58	72.58	6.53
7,378.00	27.19	92.94	7,362.76	-0.50	86.18	86.18	7.47
7,410.00	29.25	92.69	7,390.96	-1.24	101.29	101.30	6.45
7,442.00	32.37	91.88	7,418.44	-1.89	117.67	117.68	9.84
7,473.00	34.87	91.11	7,444.25	-2.33	134.82	134.84	8.18
7,505.00	37.60	91.85	7,470.06	-2.83	153.73	153.74	8.64
7,537.00	40.46	92.79	7,494.91	-3.65	173.86	173.88	9.13
7,568.00	43.51	92.40	7,517.95	-4.58	194.58	194.60	9.87
7,600.00	46.41	91.50	7,540.60	-5.35	217.17	217.20	9.28
7,631.00	49.32	90.49	7,561.39	-5.74	240.15	240.18	9.69
7,663.00	52.26	90.66	7,581.62	-5.99	264.94	264.97	9.20
7,695.00	54.97	91.30	7,600.60	-6.43	290.70	290.73	8.62
7,726.00	58.29	91.82	7,617.65	-7.14	316.58	316.61	10.80
7,758.00	62.19	92.24	7,633.53	-8.13	344.33	344.37	12.24
7,789.00	66.31	92.18	7,646.99	-9.20	372.23	372.27	13.29
7,821.00	69.75	91.83	7,658.96	-10.24	401.88	401.93	10.80
7,853.00	73.16	91.23	7,669.14	-11.05	432.20	432.26	10.80
7,884.00	75.78	90.71	7,677.44	-11.55	462.06	462.12	8.60
7,916.00	78.88	90.60	7,684.46	-11.91	493.28	493.34	9.69
7,947.00	82.14	90.16	7,689.57	-12.11	523.85	523.91	10.61
7,979.00	84.68	89.72	7,693.24	-12.08	555.64	555.70	8.05
8,010.00	86.73	89.33	7,695.56	-11.82	586.55	586.61	6.73
8,042.00	89.94	89.71	7,696.49	-11.55	618.53	618.58	10.10
8,073.00	91.91	90.04	7,695.99	-11.49	649.52	649.58	6.44
8,105.00	91.30	90.42	7,695.09	-11.62	681.51	681.56	2.25
8,136.00	91.11	91.13	7,694.44	-12.03	712.50	712.56	2.37
8,150.00	91.17	91.52	7,694.16	-12.36	726.49	726.55	2.82
8,204.00	91.05	91.29	7,693.12	-13.68	780.47	780.53	0.48
8,298.00	90.37	90.68	7,691.95	-15.30	874.44	874.52	0.97
8,393.00	91.79	91.68	7,690.16	-17.25	969.40	969.49	1.83
8,488.00	92.23	92.08	7,686.83	-20.37	1,064.29	1,064.39	0.63
8,583.00	90.19	91.09	7,684.82	-22.99	1,159.23	1,159.34	2.39
8,677.00	89.69	91.17	7,684.92	-24.85	1,253.21	1,253.33	0.54
8,772.00	90.37	91.00	7,684.87	-26.65	1,348.19	1,348.32	0.74
8,867.00	90.31	90.70	7,684.31	-28.06	1,443.18	1,443.32	0.32

**Design Report for Reserve 3-65 26-1H - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,962.00	91.23	90.68	7,683.03	-29.20	1,538.16	1,538.31	0.97
9,056.00	91.92	91.01	7,680.45	-30.59	1,632.12	1,632.27	0.81
9,151.00	92.35	90.93	7,676.91	-32.19	1,727.04	1,727.20	0.46
9,246.00	92.84	90.85	7,672.61	-33.67	1,821.93	1,822.09	0.52
9,341.00	92.53	90.79	7,668.16	-35.03	1,916.82	1,916.99	0.33
9,436.00	92.47	91.24	7,664.01	-36.71	2,011.71	2,011.89	0.48
9,530.00	91.05	91.00	7,661.13	-38.54	2,105.64	2,105.83	1.53
9,625.00	91.11	91.27	7,659.34	-40.42	2,200.61	2,200.81	0.29
9,720.00	91.48	91.47	7,657.19	-42.70	2,295.56	2,295.77	0.44
9,815.00	90.56	91.10	7,655.50	-44.83	2,390.52	2,390.74	1.04
9,909.00	90.25	90.78	7,654.83	-46.37	2,484.50	2,484.73	0.47
10,004.00	90.86	91.16	7,653.91	-47.98	2,579.48	2,579.72	0.76
10,099.00	91.11	91.57	7,652.28	-50.24	2,674.44	2,674.69	0.51
10,193.00	91.55	91.73	7,650.10	-52.94	2,768.38	2,768.64	0.50
10,288.00	91.98	91.95	7,647.17	-55.99	2,863.28	2,863.56	0.51
10,383.00	91.67	91.26	7,644.15	-58.65	2,958.20	2,958.49	0.80
10,477.00	91.23	90.29	7,641.77	-59.92	3,052.16	3,052.45	1.13
10,572.00	91.48	90.54	7,639.52	-60.61	3,147.13	3,147.43	0.37
10,667.00	90.62	90.31	7,637.78	-61.32	3,242.11	3,242.41	0.94
10,761.00	90.80	90.78	7,636.62	-62.21	3,336.10	3,336.40	0.54
10,856.00	91.30	90.85	7,634.88	-63.56	3,431.07	3,431.38	0.53
10,951.00	91.17	90.92	7,632.83	-65.03	3,526.04	3,526.35	0.16
11,045.00	90.55	90.86	7,631.42	-66.49	3,620.01	3,620.34	0.66
11,140.00	89.75	90.64	7,631.17	-67.73	3,715.01	3,715.34	0.87
11,234.00	89.94	90.28	7,631.42	-68.49	3,809.00	3,809.33	0.43
11,330.00	91.61	90.11	7,630.12	-68.81	3,904.99	3,905.32	1.75
11,424.00	92.16	90.29	7,627.03	-69.14	3,998.94	3,999.27	0.62
11,518.00	91.61	89.49	7,623.94	-68.96	4,092.89	4,093.22	1.03
11,613.00	90.37	90.25	7,622.30	-68.74	4,187.87	4,188.20	1.53
11,707.00	88.27	91.01	7,623.41	-69.78	4,281.85	4,282.18	2.38
11,778.00	87.59	90.72	7,625.98	-70.85	4,352.80	4,353.13	1.04
<b>Final Sperry MWD Survey @ 11778.00 ft</b>							
11,843.00	87.59	90.72	7,628.71	-71.67	4,417.73	4,418.07	0.00
<b>Straight Line Projection to TD @ 11843.00 ft - Straight Line Projection to Bit</b>							

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
2,008.00	2,007.93	-8.39	12.39	Tie-On to Gyro Surveys @ 2008.00 ft
2,108.00	2,107.93	-8.92	12.35	First Sperry MWD Survey @ 2108.00 ft
11,778.00	7,625.98	-70.85	4,352.80	Final Sperry MWD Survey @ 11778.00 ft
11,843.00	7,628.71	-71.67	4,417.73	Straight Line Projection to TD @ 11843.00 ft
11,843.00	7,628.71	-71.67	4,417.73	Straight Line Projection to Bit

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
User	No Target (Freehand)	90.33	Slot	0.00	0.00	0.00

## Design Report for Reserve 3-65 26-1H - Actual Field Surveys

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
71.00	2,008.00	Surface_Gyro	NS-GYRO-MS
2,108.00	11,843.00	Vertical & Build & Lateral_Sperry MWD Surveys	MWD

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,038.00	2,037.93	9 5/8"	9-5/8	13-1/2

Wellbore Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Reserve 3-65 26-1H_Σ	0.00	0.00	0.00	0.03	0.00	1,159,209.03	3,241,990.62	39° 46' 1.819 N	104° 38' 20.929 W
- actual wellpath misses target center by 2007.99usft at 2008.00usft MD (2007.93 TVD, -8.39 N, 12.39 E)									
- Polygon									
Point 1				0.00	666.98	-399.17	1,159,872.10	3,241,584.99	
Point 2				0.00	621.55	2,248.00	1,159,852.37	3,244,232.46	
Point 3				0.00	577.49	4,900.52	1,159,834.06	3,246,885.26	
Point 4				0.00	-2,055.47	4,891.76	1,157,201.16	3,246,902.06	
Point 5				0.00	-4,689.52	4,882.71	1,154,567.17	3,246,918.58	
Point 6				0.00	-4,661.58	-402.35	1,154,543.80	3,241,633.54	
Point 7				0.00	666.98	-399.17	1,159,872.10	3,241,584.99	
Reserve 3-65 26-1H_Σ	0.00	0.00	0.00	0.03	0.00	1,159,209.03	3,241,990.62	39° 46' 1.819 N	104° 38' 20.929 W
- actual wellpath misses target center by 2007.99usft at 2008.00usft MD (2007.93 TVD, -8.39 N, 12.39 E)									
- Polygon									
Point 1				0.00	206.98	60.83	1,159,416.59	3,242,049.43	
Point 2				0.00	161.55	2,248.00	1,159,392.39	3,244,236.92	
Point 3				0.00	117.49	4,440.52	1,159,369.62	3,246,429.75	
Point 4				0.00	-2,055.47	4,431.76	1,157,196.69	3,246,442.09	
Point 5				0.00	-4,229.50	4,422.70	1,155,022.70	3,246,454.13	
Point 6				0.00	-4,201.58	57.65	1,155,008.24	3,242,089.05	
Point 7				0.00	206.98	60.83	1,159,416.59	3,242,049.43	
Reserve 3-65 26-1H_F	0.00	0.00	7,619.00	-74.25	4,417.97	1,159,177.64	3,246,409.07	39° 46' 1.081 N	104° 37' 24.352 W
- actual wellpath misses target center by 10.05usft at 11842.86usft MD (7628.71 TVD, -71.66 N, 4417.60 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.25 °/100usft	Maximum Dogleg over Survey:	13.29 °/100usft at 7,789.00 usft
Net Tortousity applicable to Plans:	0.48 °/100usft	Directional Difficulty Index:	6.012

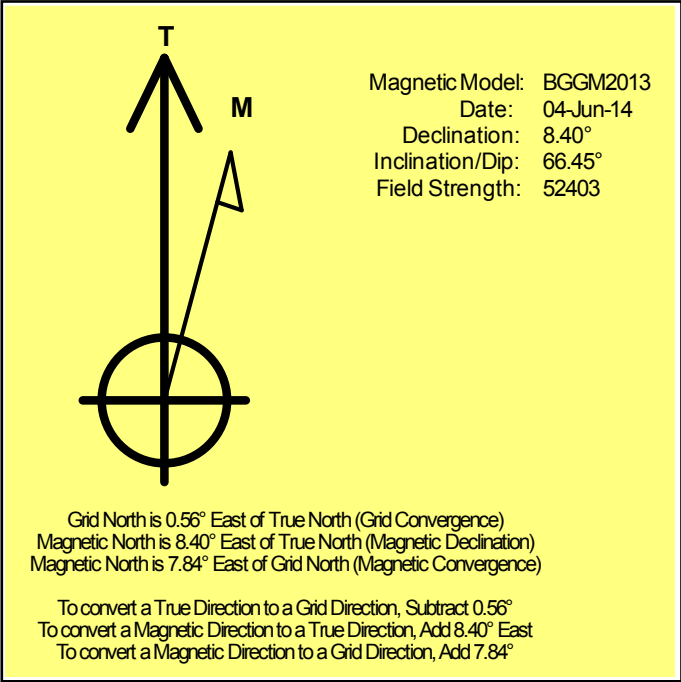
Audit Info

North Reference Sheet for Sec. 26-T3S-R65W - Reserve 3-65 26-1H - Plan B

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference .  
Vertical Depths are relative to KB 24 @ 5509.00usft (H&P 276). Northing and Easting are relative to Reserve 3-65 26-1H  
Coordinate System is US State Plane 1983, Colorado Northern Zone using datum North American Datum 1983, ellipsoid GRS 1980  
Projection method is Lambert Conformal Conic (2 parallel)  
Central Meridian is 105° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:40° 47' 0.000 N°  
False Easting: 3,000,000.00usft, False Northing: 1,000,000.00usft, Scale Reduction: 0.99999223

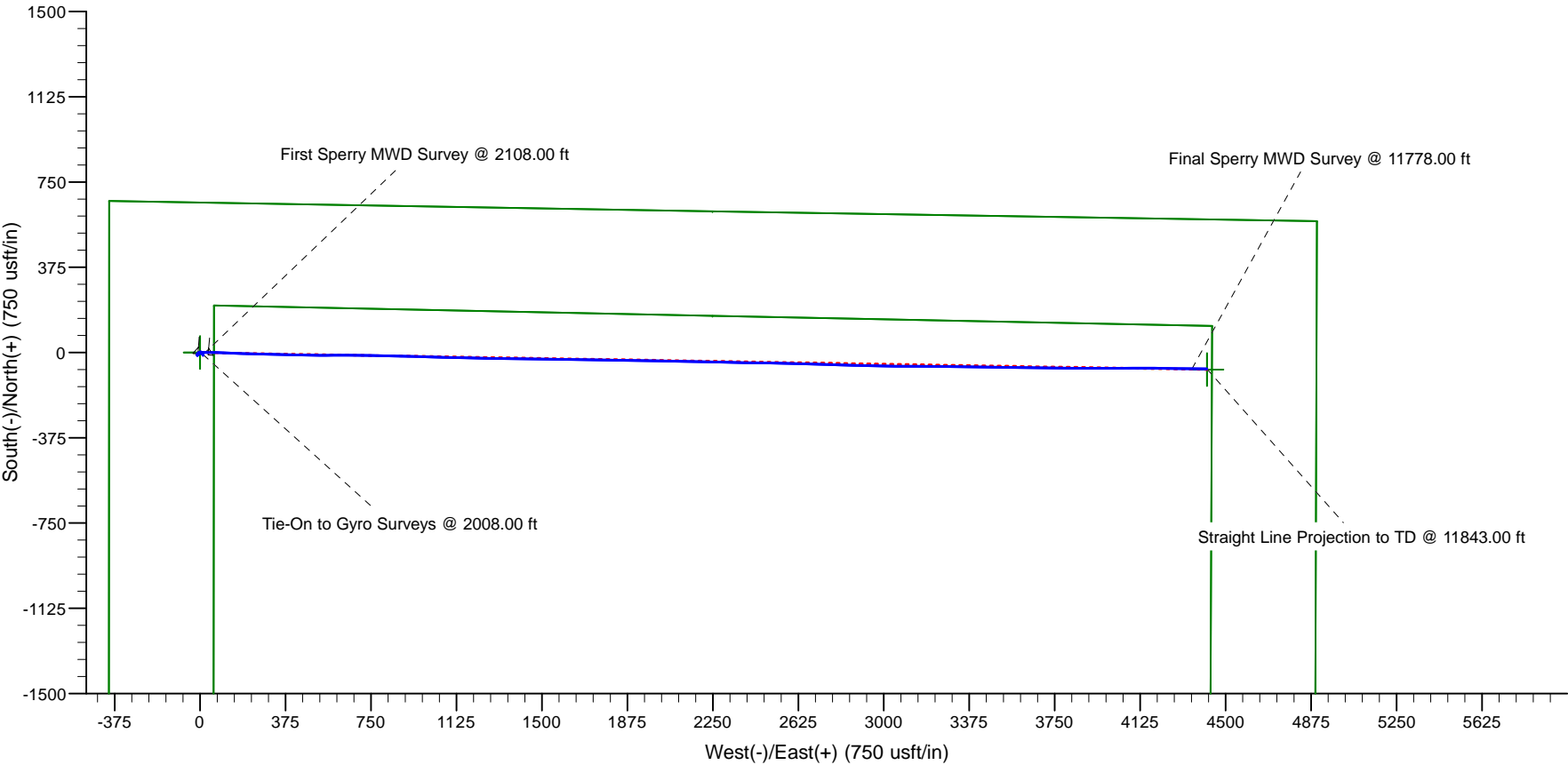
Grid Coordinates of Well: 1,159,209.00 usft N, 3,241,990.62 usft E  
Geographical Coordinates of Well: 39° 46' 01.82" N, 104° 38' 20.93" W  
Grid Convergence at Surface is: 0.56°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,843.00usft  
the Bottom Hole Displacement is 4,418.31usft in the Direction of 90.93° ( True).  
Magnetic Convergence at surface is: -7.84° ( 4 June 2014, , BGGM2013)



LEGEND

- Reserve 3-65 26-1H, Plan B, Rev B1
- Reserve 3-65 26-1H, Surface\_Gyro
- Reserve 3-65 26-1H, Sperry MWD Surveys



LEGEND

- Reserve 3-65 26-1H, Plan B, Rev B1
- Reserve 3-65 26-1H, Surface\_Gyro
- Reserve 3-65 26-1H, Sperry MWD Surveys

