

# SPERRY-SUN DRILLING SERVICES

## CERTIFIED SURVEY WORK SHEET

OPERATOR:	Whiting Oil and Gas
WELL:	Razor 11H-1415A
FIELD:	Red Tall
RIG:	Frontier 26
LEGALS:	Sec. 11-T10N-R58W
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Minimum Curvature
MAG. DECL. APPLIED:	7.46
VERTICAL SEC. DIR. :	180.22

SSDS Job Number :	902160032
Start Date of Job :	3/22/2015
End Date of Job :	3/31/2015
Lead Directional Driller:	Randy Bernatow
Directional Driller	Bogdan Cristian
Other SSDS DD's :	Francisco Pauda
SSDS MWD Engineers :	Scott Trowbridge
MWD :	Taylor Dunlop
MWD	0

Geo Pilot Engineer :

	Main Hole >		1st Side Track >		2nd Side Track >		3rd Side Track >		4th Side Track >
First MWD Survey Depth	174.00	MWD	Tie On		Tie On		Tie On		Tie On
		ESS	MWD						
Last Wireline Survey		Gyro							
	5234.00	KOP	KOP-ST1		KOP-ST2		KOP-ST3		KOP-ST4
		MWD	MWD		MWD		MWD		MWD
Last MWD Survey Depth	13778.00	MWD	MWD		MWD		MWD		MWD
Bit Extrapolation @ TD	13825.00	T.D.	T.D.		T.D.		T.D.		T.D.

The following Sperry Drilling Services personnel, certify the above survey information to be accurate to the best of our knowledge:

Print Name : Randy Bernatow      Print Name : Scott Trowbridge      Print Name : Francisco Pauda

Sign Name : *R. Bernatow*      Sign Name : *Scott Trowbridge*      Sign Name : *Francisco Pauda*

Print Name : Bogdan Cristian      Print Name : Taylor Dunlop      Print Name :

Sign Name : *Bogdan Cristian*      Sign Name : *Taylor Dunlop*      Sign Name :

Examples of  
Survey Types:

TieOn Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)  
MWD Sperry-Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's  
ESS Sperry-Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's  
Gyro Gyro Survey's ; Provided by third party vendor, or by Sperry-Sun Drilling Services (SSDS)  
SS Single Shot (SS) Survey's ; Provided by Sperry-Sun Drilling Services (SSDS) or third party vendor.

# Whiting Oil and Gas Corporation

Weld County, CO

Sec. 11-T10N-R58W (Razor 11H Pad)

Razor 11H-1415A

Plan C

Design: Actual Field Surveys

## Sperry Drilling Services

### Standard Report

15 April, 2015

Well Coordinates: 1,558,593.23 N, 3,463,443.47 E (40° 51' 16.91" N, 103° 49' 28.76" W)

Ground Level: 4,954.50 usft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Geodetic Scale Factor Applied

Version: 5000.1 Build: 73

Centered on Well Razor 11H-1415A

KB 22 @ 4976.50usft (Frontier 26)

N

True

API - US Survey Feet - Custom

## HALLIBURTON

**Design Report for Razor 11H-1415A - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
174.00	0.89	61.00	173.99	0.66	1.18	-0.66	0.51
<b>First Sperry MWD Survey @ 174.00 ft</b>							
267.00	0.52	58.28	266.99	1.23	2.17	-1.24	0.40
450.00	0.76	54.88	449.97	2.36	3.87	-2.38	0.13
542.00	0.67	55.38	541.97	3.02	4.81	-3.04	0.10
634.00	0.83	167.34	633.96	2.67	5.40	-2.69	1.35
726.00	1.68	123.49	725.94	1.28	6.67	-1.30	1.33
910.00	4.49	136.96	909.66	-5.47	13.84	5.42	1.57
1,094.00	5.69	157.78	1,092.95	-19.18	22.21	19.10	1.19
1,185.00	6.19	157.01	1,183.46	-27.88	25.83	27.78	0.56
1,277.00	6.03	157.20	1,274.93	-36.90	29.64	36.78	0.18
1,369.00	6.05	162.66	1,366.42	-45.98	32.96	45.85	0.62
1,460.00	4.66	172.22	1,457.03	-54.22	34.88	54.09	1.81
1,551.00	3.22	190.94	1,547.81	-60.39	34.90	60.26	2.10
1,643.00	3.77	198.46	1,639.64	-65.80	33.45	65.67	0.78
1,733.00	4.13	200.30	1,729.43	-71.64	31.39	71.53	0.42
1,781.00	4.33	200.67	1,777.30	-74.96	30.15	74.85	0.42
1,919.00	4.99	204.64	1,914.84	-85.29	25.81	85.19	0.53
2,012.00	0.68	249.01	2,007.71	-89.17	23.61	89.08	4.87
2,103.00	0.97	233.32	2,098.70	-89.82	22.49	89.73	0.40
2,194.00	1.01	252.99	2,189.69	-90.52	21.10	90.43	0.37
2,286.00	0.83	253.41	2,281.67	-90.94	19.69	90.87	0.20
2,469.00	1.33	47.08	2,464.66	-89.87	19.97	89.80	1.15
2,561.00	1.10	36.91	2,556.64	-88.44	21.28	88.36	0.34
2,652.00	0.98	30.20	2,647.62	-87.07	22.20	86.99	0.19
2,744.00	0.96	35.16	2,739.61	-85.76	23.04	85.67	0.09
2,836.00	1.21	35.27	2,831.60	-84.34	24.04	84.25	0.27
2,927.00	1.35	41.18	2,922.57	-82.75	25.31	82.65	0.21
3,019.00	1.41	341.07	3,014.55	-80.86	25.65	80.76	1.50
3,110.00	1.74	342.23	3,105.52	-78.48	24.87	78.39	0.36
3,201.00	1.47	7.20	3,196.48	-76.01	24.59	75.92	0.82
3,292.00	1.31	25.38	3,287.45	-73.91	25.18	73.82	0.51
3,384.00	1.07	356.25	3,379.44	-72.11	25.58	72.01	0.70
3,476.00	1.08	7.08	3,471.42	-70.39	25.63	70.29	0.22
3,568.00	1.09	10.21	3,563.40	-68.67	25.89	68.57	0.07
3,659.00	1.07	15.82	3,654.39	-67.00	26.28	66.90	0.12
3,751.00	1.30	13.10	3,746.37	-65.15	26.75	65.05	0.26
3,842.00	1.03	24.98	3,837.35	-63.41	27.33	63.30	0.40
3,934.00	1.00	20.76	3,929.33	-61.91	27.96	61.80	0.09
4,025.00	1.17	28.19	4,020.32	-60.35	28.68	60.24	0.24
4,116.00	1.07	337.50	4,111.30	-58.74	28.79	58.63	1.06
4,208.00	0.81	322.21	4,203.29	-57.43	28.07	57.33	0.39
4,299.00	0.88	313.16	4,294.28	-56.45	27.16	56.35	0.17
4,391.00	0.94	279.41	4,386.27	-55.84	25.90	55.74	0.58
4,482.00	0.63	258.45	4,477.26	-55.82	24.68	55.73	0.46
4,574.00	1.52	228.76	4,569.24	-56.73	23.26	56.64	1.11
4,665.00	1.83	238.82	4,660.21	-58.27	21.11	58.19	0.47
4,757.00	1.80	220.90	4,752.16	-60.13	18.91	60.05	0.62
4,850.00	1.01	214.58	4,845.13	-61.90	17.49	61.84	0.86

**Design Report for Razor 11H-1415A - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,942.00	1.00	197.13	4,937.12	-63.34	16.79	63.28	0.33
5,033.00	0.62	199.65	5,028.11	-64.56	16.39	64.50	0.42
5,125.00	3.98	169.79	5,120.02	-68.17	16.79	68.11	3.76
5,217.00	2.45	166.45	5,211.88	-73.23	17.82	73.16	1.67
5,264.00	5.52	171.02	5,258.76	-76.44	18.41	76.37	6.56
5,309.00	9.06	172.92	5,303.39	-82.09	19.18	82.02	7.88
5,356.00	12.93	174.07	5,349.51	-91.00	20.18	90.92	8.25
5,401.00	17.12	176.97	5,392.97	-102.63	21.05	102.55	9.46
5,448.00	20.99	174.93	5,437.38	-117.93	22.16	117.84	8.35
5,493.00	25.16	176.82	5,478.77	-135.51	23.40	135.42	9.41
5,540.00	29.25	179.75	5,520.57	-156.98	24.01	156.89	9.15
5,584.00	33.76	180.04	5,558.07	-179.97	24.05	179.88	10.26
5,631.00	38.24	180.57	5,596.09	-207.59	23.89	207.50	9.55
5,679.00	43.16	179.48	5,632.47	-238.88	23.89	238.79	10.36
5,726.00	48.19	179.97	5,665.30	-272.49	24.05	272.40	10.73
5,775.00	52.97	180.76	5,696.40	-310.33	23.80	310.24	9.83
5,822.00	58.68	182.94	5,722.79	-349.17	22.52	349.09	12.74
5,870.00	62.90	185.06	5,746.22	-390.95	19.58	390.88	9.60
5,917.00	65.33	184.37	5,766.73	-433.09	16.11	433.03	5.34
5,965.00	69.34	183.18	5,785.23	-477.28	13.20	477.23	8.66
6,012.00	73.18	182.49	5,800.32	-521.72	11.00	521.68	8.29
6,060.00	75.38	182.50	5,813.33	-567.88	8.99	567.84	4.58
6,107.00	77.44	182.79	5,824.37	-613.52	6.88	613.48	4.42
6,155.00	82.81	181.10	5,832.60	-660.76	5.28	660.73	11.71
6,183.00	86.89	180.40	5,835.11	-688.64	4.92	688.61	14.78
6,265.00	88.21	180.30	5,838.62	-770.56	4.42	770.54	1.61
6,359.00	92.10	179.37	5,838.36	-864.54	4.69	864.51	4.25
6,454.00	92.16	179.69	5,834.83	-959.47	5.47	959.44	0.34
6,548.00	90.77	180.57	5,832.43	-1,053.44	5.26	1,053.41	1.75
6,643.00	91.00	180.24	5,830.96	-1,148.42	4.58	1,148.40	0.42
6,738.00	91.09	180.51	5,829.23	-1,243.40	3.96	1,243.38	0.30
6,833.00	91.06	181.50	5,827.45	-1,338.37	2.30	1,338.35	1.04
6,928.00	90.21	180.95	5,826.39	-1,433.34	0.27	1,433.33	1.07
7,023.00	89.75	181.51	5,826.43	-1,528.32	-1.77	1,528.32	0.76
7,118.00	89.40	181.35	5,827.13	-1,623.29	-4.14	1,623.29	0.41
7,213.00	89.19	181.08	5,828.30	-1,718.26	-6.16	1,718.27	0.36
7,308.00	89.88	179.73	5,829.07	-1,813.25	-6.83	1,813.26	1.60
7,403.00	89.75	180.50	5,829.38	-1,908.25	-7.02	1,908.26	0.82
7,498.00	89.55	179.71	5,829.96	-2,003.25	-7.19	2,003.26	0.86
7,593.00	91.10	180.24	5,829.42	-2,098.24	-7.15	2,098.25	1.72
7,687.00	90.67	178.38	5,827.97	-2,192.22	-6.02	2,192.23	2.03
7,782.00	90.83	179.35	5,826.73	-2,287.19	-4.14	2,287.19	1.03
7,877.00	90.27	178.20	5,825.81	-2,382.16	-2.11	2,382.15	1.35
7,972.00	89.99	177.92	5,825.60	-2,477.11	1.11	2,477.09	0.42
8,067.00	89.70	178.22	5,825.85	-2,572.05	4.31	2,572.02	0.44
8,161.00	90.67	178.67	5,825.55	-2,666.02	6.86	2,665.97	1.14
8,255.00	90.78	178.40	5,824.36	-2,759.98	9.26	2,759.92	0.31
8,350.00	90.19	177.68	5,823.56	-2,854.92	12.51	2,854.85	0.98
8,445.00	91.41	178.84	5,822.23	-2,949.86	15.39	2,949.78	1.77
8,536.00	90.07	181.89	5,821.06	-3,040.84	14.81	3,040.76	3.66
8,628.00	89.84	181.84	5,821.13	-3,132.79	11.82	3,132.72	0.26

**Design Report for Razor 11H-1415A - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
8,719.00	89.72	181.81	5,821.48	-3,223.74	8.92	3,223.69	0.14
8,811.00	89.14	180.86	5,822.39	-3,315.71	6.78	3,315.66	1.21
8,901.00	91.46	181.13	5,821.92	-3,405.69	5.22	3,405.65	2.60
8,993.00	91.57	180.92	5,819.49	-3,497.65	3.57	3,497.61	0.26
9,083.00	90.40	181.09	5,817.94	-3,587.62	1.99	3,587.58	1.31
9,176.00	90.30	180.47	5,817.37	-3,680.61	0.73	3,680.58	0.68
9,267.00	90.03	180.61	5,817.11	-3,771.60	-0.13	3,771.57	0.33
9,359.00	89.80	180.44	5,817.25	-3,863.60	-0.97	3,863.57	0.31
9,451.00	89.20	180.19	5,818.05	-3,955.59	-1.48	3,955.57	0.71
9,543.00	88.79	179.66	5,819.66	-4,047.58	-1.36	4,047.55	0.73
9,634.00	89.22	179.51	5,821.25	-4,138.56	-0.70	4,138.53	0.50
9,727.00	91.10	180.57	5,820.99	-4,231.55	-0.77	4,231.53	2.32
9,817.00	91.71	180.51	5,818.78	-4,321.52	-1.61	4,321.50	0.68
9,909.00	92.58	180.40	5,815.34	-4,413.46	-2.34	4,413.43	0.95
10,002.00	91.75	182.04	5,811.82	-4,506.36	-4.32	4,506.35	1.98
10,094.00	90.69	182.04	5,809.86	-4,598.28	-7.60	4,598.28	1.15
10,185.00	89.94	181.15	5,809.36	-4,689.24	-10.13	4,689.25	1.28
10,277.00	87.21	181.05	5,811.65	-4,781.19	-11.90	4,781.20	2.97
10,370.00	87.66	179.94	5,815.81	-4,874.09	-12.70	4,874.11	1.29
10,461.00	89.82	179.88	5,817.81	-4,965.06	-12.55	4,965.08	2.37
10,553.00	89.93	179.25	5,818.01	-5,057.06	-11.86	5,057.07	0.70
10,645.00	90.31	178.76	5,817.82	-5,149.05	-10.26	5,149.05	0.67
10,737.00	90.13	182.11	5,817.47	-5,241.03	-10.96	5,241.03	3.65
10,828.00	89.79	180.32	5,817.53	-5,332.01	-12.89	5,332.02	2.00
10,920.00	89.99	179.77	5,817.71	-5,424.01	-12.96	5,424.02	0.64
11,011.00	90.42	179.66	5,817.38	-5,515.00	-12.51	5,515.01	0.49
11,103.00	90.60	178.89	5,816.56	-5,606.99	-11.34	5,606.99	0.86
11,194.00	89.99	180.07	5,816.10	-5,697.99	-10.52	5,697.98	1.46
11,286.00	88.01	181.72	5,817.70	-5,789.95	-11.95	5,789.96	2.80
11,378.00	87.96	181.84	5,820.94	-5,881.85	-14.81	5,881.86	0.14
11,469.00	88.21	181.86	5,823.98	-5,972.75	-17.74	5,972.78	0.28
11,562.00	89.32	181.57	5,825.98	-6,065.69	-20.53	6,065.72	1.23
11,653.00	89.76	181.46	5,826.71	-6,156.65	-22.93	6,156.70	0.50
11,744.00	90.20	180.01	5,826.74	-6,247.64	-24.10	6,247.69	1.67
11,836.00	90.42	179.56	5,826.25	-6,339.64	-23.75	6,339.68	0.54
11,927.00	90.87	179.76	5,825.22	-6,430.63	-23.21	6,430.67	0.54
12,019.00	90.49	179.29	5,824.13	-6,522.62	-22.45	6,522.66	0.66
12,110.00	90.74	179.40	5,823.15	-6,613.61	-21.41	6,613.64	0.30
12,202.00	90.83	179.04	5,821.89	-6,705.59	-20.16	6,705.62	0.40
12,294.00	89.81	179.65	5,821.38	-6,797.58	-19.11	6,797.61	1.29
12,386.00	89.97	179.32	5,821.55	-6,889.58	-18.28	6,889.60	0.40
12,477.00	89.52	180.25	5,821.96	-6,980.58	-17.94	6,980.60	1.14
12,568.00	89.67	180.10	5,822.60	-7,071.58	-18.22	7,071.59	0.23
12,660.00	90.13	179.75	5,822.76	-7,163.57	-18.10	7,163.59	0.63
12,751.00	90.23	179.01	5,822.48	-7,254.57	-17.11	7,254.58	0.82
12,842.00	91.08	178.74	5,821.44	-7,345.54	-15.33	7,345.55	0.98
12,934.00	91.79	180.35	5,819.13	-7,437.51	-14.60	7,437.51	1.91
13,026.00	91.57	181.05	5,816.44	-7,529.46	-15.72	7,529.47	0.80
13,118.00	91.35	180.64	5,814.09	-7,621.42	-17.08	7,621.43	0.51
13,209.00	90.84	181.68	5,812.35	-7,712.38	-18.92	7,712.40	1.27



**Design Report for Razor 11H-1415A - Actual Field Surveys**

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
13,301.00	89.92	181.63	5,811.74	-7,804.34	-21.57	7,804.37	1.00
13,392.00	88.49	182.36	5,813.01	-7,895.28	-24.74	7,895.31	1.76
13,484.00	88.74	182.38	5,815.23	-7,987.17	-28.54	7,987.22	0.27
13,575.00	88.56	181.37	5,817.37	-8,078.10	-31.52	8,078.16	1.13
13,666.00	88.26	180.74	5,819.90	-8,169.04	-33.20	8,169.11	0.77
13,758.00	88.95	180.64	5,822.14	-8,261.01	-34.30	8,261.08	0.76
13,778.00	89.07	180.69	5,822.48	-8,281.01	-34.54	8,281.08	0.65
<b>Final Sperry MWD Survey @ 13778.00 ft</b>							
13,825.00	89.07	180.69	5,823.25	-8,328.00	-35.10	8,328.07	0.00
<b>Straight Line Projection to TD @ 13825.00 ft</b>							

**Design Annotations**

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
174.00	173.99	0.66	1.18	First Sperry MWD Survey @ 174.00 ft
13,778.00	5,822.48	-8,281.01	-34.54	Final Sperry MWD Survey @ 13778.00 ft
13,825.00	5,823.25	-8,328.00	-35.10	Straight Line Projection to TD @ 13825.00 ft

**Vertical Section Information**

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target	Razor 11H-1415A_Rev C0_BHL	180.22	Slot	0.00	0.00	0.00

**Survey tool program**

From (usft)	To (usft)	Survey/Plan	Survey Tool
174.00	1,781.00	Surface_MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
1,919.00	6,183.00	Vertical & Build_MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
6,265.00	13,778.00	Lateral_MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
13,825.00	13,825.00	Projection to Bit_Blind	BLIND

**Casing Details**

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,840.00		9 5/8" (Estimated from Field Data)	9-5/8	13-1/2
6,215.00		7" (Estimated from Field Data)	7	8-3/4

**Design Report for Razor 11H-1415A - Actual Field Surveys****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
Razor 11H_Sec. 02 &	0.00	0.00	0.00	-13.15	26.90	1,558,580.59	3,463,470.61	40° 51' 16.780 N	103° 49' 28.410 W
- actual wellpath misses target center by 29.94usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	6,865.46	-4,883.43	1,565,352.65	3,458,458.29	
Point 2				0.00	6,890.10	215.09	1,565,473.61	3,463,555.49	
Point 3				0.00	-368.58	271.90	1,558,217.21	3,463,749.43	
Point 4				0.00	-405.61	-4,823.63	1,558,083.92	3,458,655.44	
Point 5				0.00	6,865.46	-4,883.43	1,565,352.65	3,458,458.29	
Razor 11H_Sec. 11 &	0.00	0.00	0.00	-13.15	26.90	1,558,580.59	3,463,470.61	40° 51' 16.780 N	103° 49' 28.410 W
- actual wellpath misses target center by 29.94usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	-605.61	-4,823.63	1,557,883.95	3,458,659.22	
Point 2				0.00	-568.58	271.90	1,558,017.24	3,463,753.21	
Point 3				0.00	-8,321.36	337.33	1,550,266.99	3,463,965.09	
Point 4				0.00	-8,339.09	-4,791.18	1,550,152.37	3,458,837.77	
Point 5				0.00	-605.61	-4,823.63	1,557,883.95	3,458,659.22	
Razor 11H_Sec. 11-T1	0.00	0.00	0.00	-13.15	26.90	1,558,580.59	3,463,470.61	40° 51' 16.780 N	103° 49' 28.410 W
- actual wellpath misses target center by 29.94usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	2,143.87	-4,927.52	1,560,631.01	3,458,503.41	
Point 2				0.00	2,180.91	350.29	1,560,767.76	3,463,779.64	
Point 3				0.00	-468.58	371.90	1,558,119.11	3,463,851.30	
Point 4				0.00	-505.61	-4,923.63	1,557,982.05	3,458,557.35	
Point 5				0.00	-468.58	371.90	1,558,119.11	3,463,851.30	
Point 6				0.00	-3,116.96	393.52	1,555,471.58	3,463,922.95	
Point 7				0.00	-3,155.09	-4,920.29	1,555,333.07	3,458,610.74	
Point 8				0.00	2,143.87	-4,927.52	1,560,631.01	3,458,503.41	
Razor 11H_Sec. 14-T1	0.00	0.00	0.00	-13.15	26.90	1,558,580.59	3,463,470.61	40° 51' 16.780 N	103° 49' 28.410 W
- actual wellpath misses target center by 29.94usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	-3,155.09	-4,920.29	1,555,333.07	3,458,610.74	
Point 2				0.00	-3,116.96	393.52	1,555,471.58	3,463,922.95	
Point 3				0.00	-8,421.36	437.33	1,550,168.89	3,464,066.97	
Point 4				0.00	-8,439.09	-4,891.18	1,550,050.50	3,458,739.68	
Point 5				0.00	-3,155.09	-4,920.29	1,555,333.07	3,458,610.74	
Razor 11H_Sec. 02-T1	0.00	0.00	0.00	-13.15	26.90	1,558,580.59	3,463,470.61	40° 51' 16.780 N	103° 49' 28.410 W
- actual wellpath misses target center by 29.94usft at 0.13usft MD (0.13 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				0.00	7,465.46	-4,983.43	1,565,950.66	3,458,346.97	
Point 2				0.00	7,490.10	315.09	1,566,075.40	3,463,644.14	
Point 3				0.00	2,180.91	350.29	1,560,767.76	3,463,779.64	
Point 4				0.00	2,143.87	-4,927.52	1,560,631.01	3,458,503.41	
Point 5				0.00	7,465.46	-4,983.43	1,565,950.66	3,458,346.97	
Razor 11H-1415A_Rev	0.00	0.00	5,865.00	-8,338.28	-31.52	1,550,255.74	3,463,569.49	40° 49' 54.520 N	103° 49' 29.170 W
- actual wellpath misses target center by 43.15usft at 13825.00usft MD (5823.25 TVD, -8328.00 N, -35.10 E)									
- Point									

**Directional Difficulty Index**

Average Dogleg over Survey:	1.51 °/100usft	Maximum Dogleg over Survey:	14.78 °/100usft at 6,183.00 usft
Net Tortousity applicable to Plans:	0.83 °/100usft	Directional Difficulty Index:	6.621

**Audit Info**

# North Reference Sheet for Sec. 11-T10N-R58W (Razor 11H Pad) - Razor 11H-1415A - Plan C

All data is in US Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.

Vertical Depths are relative to KB 22 @ 4976.50usft (Frontier 26). Northing and Easting are relative to Razor 11H-1415A

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: 1.00001236

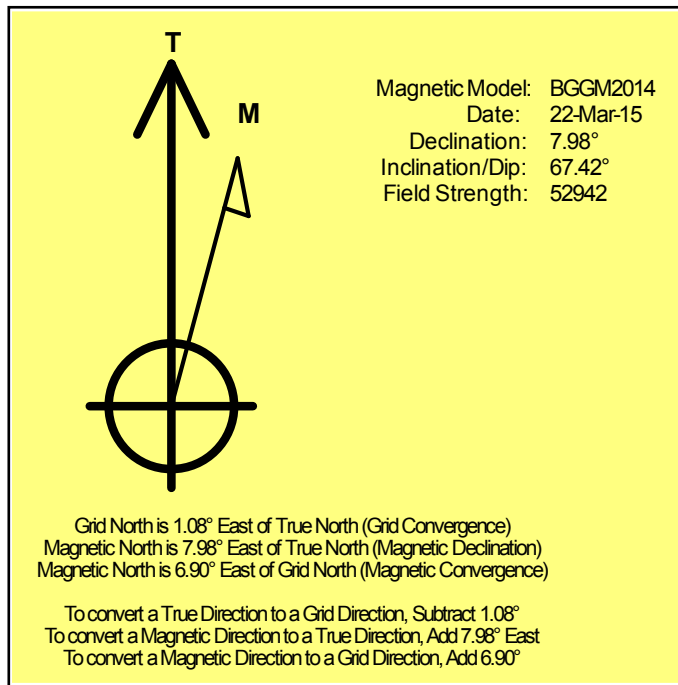
Grid Coordinates of Well: 1,558,593.23 usft N, 3,463,443.47 usft E

Geographical Coordinates of Well: 40° 51' 16.91" N, 103° 49' 28.76" W

Grid Convergence at Surface is: 1.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 13,825.00usft  
the Bottom Hole Displacement is 8,328.07usft in the Direction of 180.24° ( True).

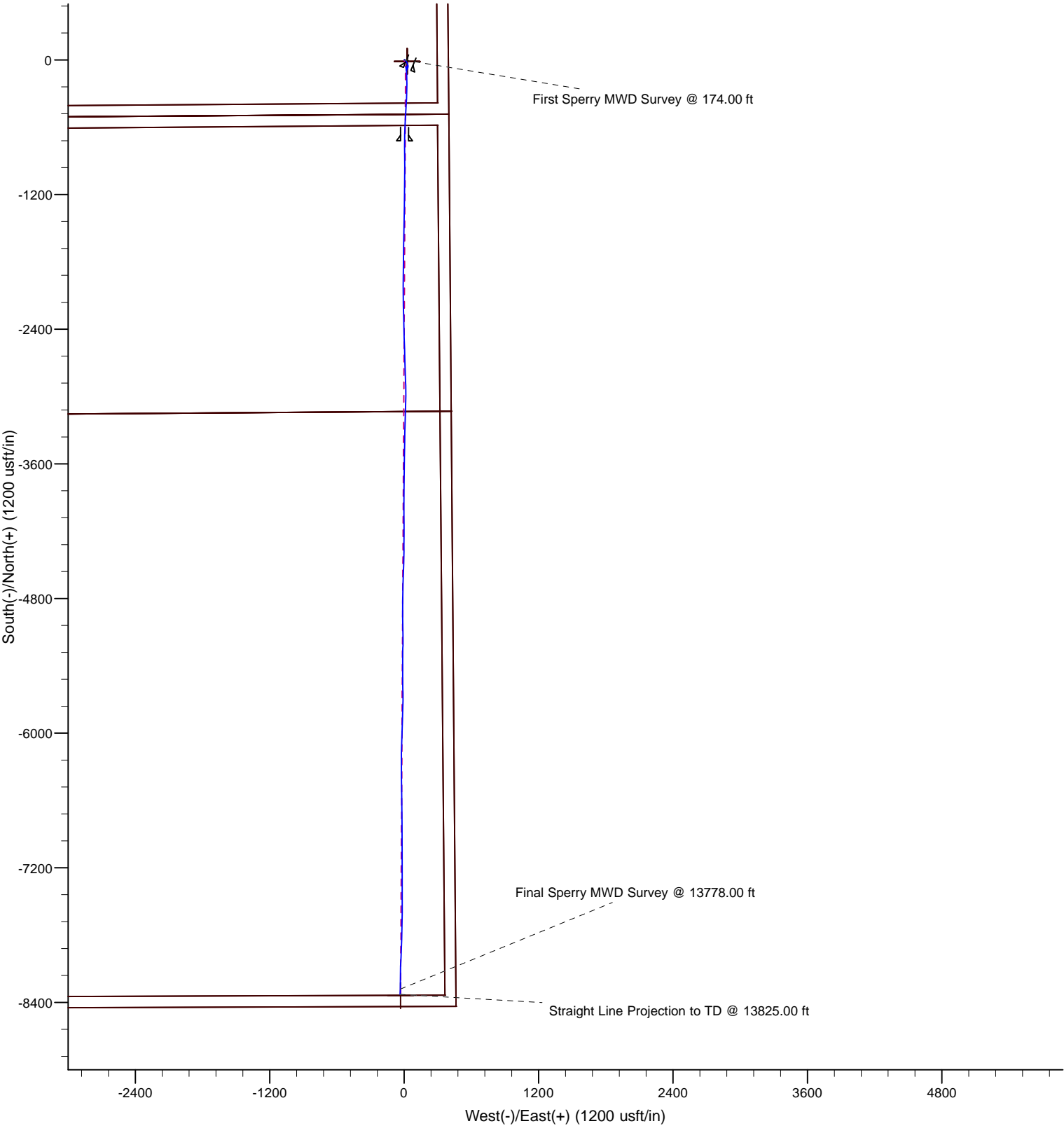
Magnetic Convergence at surface is: -6.90° (22 March 2015, , BGGM2014)





LEGEND

- Razor 11H-1415A, Plan C
- Actual Field Surveys



Project: Weld County, CO  
Site: Sec. 11-T10N-R58W (Razor 11H Pad)  
Well: Razor 11H-1415A

# Whiting Oil and Gas Corporation

**HALLIBURTON**  
Sperry Drilling

