

SPERRY-SUN DRILLING SERVICES

CERTIFIED SURVEY WORK SHEET

OPERATOR:	Whiting Oil and Gas
WELL:	Razor 27J-3409A
FIELD:	Red Tail
RIG:	Frontier 26
LEGALS:	Sec. 27-T10N-R58W
COUNTY:	Weld
STATE:	Colorado
CAL. METHOD:	Minimum Curvature
MAG. DECL. APPLIED:	7.52
VERTICAL SEC. DIR. :	182.85

SSDS Job Number :	901619872
Start Date of Job :	9/20/2014
End Date of Job :	10/9/2014
Lead Directional Driller:	Randy Bernatow
Directional Driller	Wes Garrett
Other SSDS DD's :	0
SSDS MWD Engineers :	Scott Trowbridge
MWD :	Cody Wurdeman
MWD	0

Geo Pilot Engineer :

First MWD Survey Depth

Last Wireline Survey

Last MWD Survey Depth
Bit Extrapolation @ TD

Main Hole =====>	1st Side Track =====>	2nd Side Track =====>	3rd Side Track =====>	4th Side Track =====>
177.00	MWD	8113.00	Tie On	Tie On
	ESS		MWD	
	Gyro			
5096.00	KOP	8167.00	KOP-ST1	KOP-ST2
	MWD		MWD	MWD
13069.00	MWD	13071.00	MWD	MWD
13113.00	T.D.	13115.00	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 :

Sign Name : 

Sign Name : 

Sign Name :

Print Name : Wes Garrett

Print Name : Cody Wurdeman

Print Name :

Sign Name : 

Sign Name :

Sign Name :

Examples of
Survey Types:

Tie On
MWD
ESS
Gyro
SS

Tie On to Surface Casing (Assumed Vertical), Tie On to existing MWD Survey (prior drilled hole)
Sperry-Sun Drilling Services (SSDS) Measurement While Drilling (MWD) Survey's
Sperry-Sun Drilling Services (SSDS) Electronic Survey System (ESS) Survey's
Gyro Survey's ; Provided by third party vendor, or by Sperry-Sun Drilling Services (SSDS)
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. 27-T10N-R58W (Razor #27J Pad)

Razor #27J-3409A

Plan C

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

24 October, 2014

Well Coordinates: 1,541,693.17 N, 3,457,037.80 E (40° 48' 31.14" N, 103° 50' 56.20" W)

Ground Level: 4,767.00 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 Razor #27J-3409A

KB 22 ft @ 4789.00usft (Frontier 26)

N

True

API - US Survey Feet - Custom

HALLIBURTON

Design Report for Razor #27J-3409A - 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
177.00	0.11	322.84	177.00	0.14	-0.10	-0.13	0.06
First Sperry MWD Survey @ 177.00 ft							
268.00	0.56	357.90	268.00	0.65	-0.17	-0.64	0.52
359.00	0.62	351.97	358.99	1.58	-0.26	-1.57	0.09
451.00	0.66	336.12	450.99	2.56	-0.54	-2.53	0.20
544.00	0.69	339.90	543.98	3.57	-0.95	-3.52	0.06
635.00	0.36	311.79	634.98	4.28	-1.35	-4.21	0.45
727.00	0.15	293.42	726.98	4.52	-1.68	-4.43	0.24
819.00	0.33	241.09	818.98	4.44	-2.02	-4.33	0.29
911.00	0.10	241.87	910.97	4.27	-2.32	-4.15	0.25
993.00	1.00	334.75	992.97	4.89	-2.69	-4.75	1.23
1,087.00	2.41	348.80	1,086.93	7.57	-3.42	-7.39	1.55
1,176.00	4.05	356.77	1,175.78	12.54	-3.97	-12.33	1.91
1,268.00	5.14	351.43	1,267.49	19.86	-4.76	-19.60	1.27
1,360.00	6.50	346.79	1,359.01	29.01	-6.57	-28.64	1.56
1,451.00	7.97	341.48	1,449.28	40.00	-9.75	-39.47	1.77
1,542.00	9.32	335.41	1,539.25	52.69	-14.82	-51.89	1.79
1,597.00	8.85	333.06	1,593.56	60.51	-18.59	-59.51	1.09
9 5/8"							
1,636.00	8.53	331.24	1,632.11	65.72	-21.34	-64.58	1.09
1,728.00	9.16	326.29	1,723.02	77.79	-28.69	-76.27	1.07
1,819.00	11.14	321.89	1,812.59	90.74	-38.13	-88.73	2.34
1,911.00	14.16	329.21	1,902.35	107.40	-49.38	-104.82	3.71
2,002.00	16.92	329.09	1,990.02	128.33	-61.89	-125.10	3.03
2,094.00	16.56	328.31	2,078.12	150.97	-75.65	-147.03	0.46
2,185.00	15.63	327.24	2,165.55	172.32	-89.10	-167.68	1.07
2,277.00	14.38	325.32	2,254.41	192.13	-102.30	-186.82	1.46
2,368.00	13.41	324.41	2,342.75	210.01	-114.87	-204.05	1.09
2,459.00	16.57	324.27	2,430.64	229.13	-128.60	-222.46	3.47
2,551.00	15.91	321.99	2,518.97	249.71	-144.02	-242.26	1.00
2,642.00	15.38	321.87	2,606.60	269.03	-159.16	-260.80	0.58
2,733.00	17.24	329.02	2,693.94	290.09	-173.55	-281.12	3.00
2,825.00	16.69	327.79	2,781.94	312.96	-187.61	-303.26	0.71
2,917.00	14.23	335.82	2,870.61	334.46	-199.29	-324.15	3.54
3,008.00	12.55	334.40	2,959.14	353.58	-208.14	-342.81	1.88
3,100.00	10.52	331.40	3,049.28	369.97	-216.48	-358.76	2.30
3,192.00	11.88	340.31	3,139.53	386.26	-223.69	-374.68	2.39
3,283.00	11.76	339.89	3,228.60	403.78	-230.04	-391.87	0.16
3,375.00	11.69	340.55	3,318.68	421.38	-236.36	-409.13	0.16
3,467.00	11.77	338.79	3,408.76	438.91	-242.86	-426.32	0.40
3,558.00	12.03	337.54	3,497.80	456.33	-249.84	-443.37	0.40
3,649.00	11.92	335.70	3,586.82	473.66	-257.33	-460.30	0.44
3,741.00	11.75	335.01	3,676.87	490.81	-265.20	-477.04	0.24
3,832.00	11.40	331.29	3,766.02	507.10	-273.43	-492.90	0.91
3,924.00	11.48	331.06	3,856.19	523.08	-282.23	-508.43	0.10
4,015.00	14.51	343.33	3,944.87	541.94	-289.89	-526.88	4.49
4,106.00	16.48	344.57	4,032.55	565.30	-296.59	-549.88	2.20
4,197.00	15.58	343.52	4,120.02	589.46	-303.49	-573.67	1.04
4,289.00	14.72	344.03	4,208.82	612.55	-310.21	-596.39	0.95

Design Report for Razor #27J-3409A - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,380.00	13.16	342.01	4,297.13	633.52	-316.60	-617.02	1.80
4,473.00	10.91	341.37	4,388.08	651.93	-322.68	-635.11	2.42
4,563.00	9.69	342.92	4,476.63	667.24	-327.62	-650.15	1.39
4,655.00	7.13	343.00	4,567.64	680.10	-331.57	-662.81	2.78
4,747.00	5.82	342.93	4,659.05	690.02	-334.61	-672.56	1.42
4,839.00	2.37	320.44	4,750.80	695.95	-337.19	-678.35	4.07
4,931.00	1.19	163.49	4,842.78	696.50	-338.13	-678.86	3.80
5,023.00	2.52	165.43	4,934.73	693.63	-337.35	-676.03	1.45
5,115.00	4.80	170.42	5,026.54	687.87	-336.20	-670.34	2.50
5,146.00	11.37	184.06	5,057.22	683.54	-336.20	-666.01	21.93
5,176.00	15.50	181.08	5,086.39	676.58	-336.48	-659.04	13.95
5,206.00	20.34	181.79	5,114.93	667.36	-336.72	-649.82	16.15
5,238.00	27.58	184.28	5,144.15	654.39	-337.45	-636.84	22.84
5,268.00	32.37	185.06	5,170.13	639.46	-338.68	-621.86	16.02
5,299.00	35.04	184.67	5,195.92	622.32	-340.13	-604.67	8.64
5,329.00	37.42	184.03	5,220.11	604.64	-341.48	-586.95	8.03
5,359.00	37.51	182.89	5,243.93	586.43	-342.58	-568.70	2.33
5,389.00	38.60	183.23	5,267.55	567.96	-343.56	-550.21	3.70
5,420.00	40.37	185.24	5,291.47	548.31	-345.03	-530.50	7.04
5,451.00	42.39	184.65	5,314.73	527.89	-346.79	-510.03	6.64
5,482.00	43.37	184.12	5,337.45	506.86	-348.40	-488.94	3.37
5,513.00	43.38	184.45	5,359.98	485.63	-349.99	-467.66	0.73
5,543.00	43.98	182.59	5,381.68	464.95	-351.26	-446.94	4.73
5,573.00	45.73	181.91	5,402.95	443.81	-352.09	-425.78	6.05
5,605.00	48.16	180.00	5,424.79	420.43	-352.47	-402.42	8.76
5,637.00	50.53	178.87	5,445.64	396.16	-352.23	-378.19	7.88
5,669.00	51.03	178.32	5,465.87	371.38	-351.62	-353.46	2.05
5,700.00	53.56	178.85	5,484.83	346.86	-351.02	-329.01	8.27
5,732.00	55.55	178.85	5,503.39	320.80	-350.50	-303.00	6.22
5,764.00	56.17	178.58	5,521.35	294.32	-349.90	-276.59	2.06
5,795.00	57.93	179.48	5,538.21	268.31	-349.46	-250.63	6.18
5,827.00	61.30	180.05	5,554.39	240.71	-349.35	-223.07	10.64
5,858.00	64.85	181.41	5,568.43	213.08	-349.71	-195.46	12.10
5,890.00	68.68	181.55	5,581.05	183.69	-350.47	-166.07	11.98
5,921.00	69.69	181.60	5,592.06	154.72	-351.27	-137.10	3.26
5,953.00	71.07	181.34	5,602.81	124.59	-352.04	-106.96	4.38
5,984.00	74.36	180.86	5,612.02	95.00	-352.61	-77.38	10.72
6,016.00	75.29	181.31	5,620.39	64.12	-353.19	-46.51	3.21
6,047.00	77.57	180.49	5,627.67	33.99	-353.66	-16.40	7.79
6,079.00	81.05	179.77	5,633.60	2.55	-353.73	15.01	11.10
6,112.00	82.15	179.43	5,638.42	-30.09	-353.51	47.60	3.49
6,150.00	83.84	179.63	5,643.06	-67.80	-353.19	85.25	4.49
7" Casing Pt. ~392' FML ~2259' FSL ~2367' FEL							
6,221.00	87.01	179.99	5,648.72	-138.57	-352.96	155.92	4.49
6,315.00	85.86	179.35	5,654.56	-232.38	-352.42	249.59	1.40
6,410.00	88.30	179.81	5,659.40	-327.25	-351.72	344.30	2.61
6,504.00	90.76	180.97	5,660.17	-421.24	-352.36	438.21	2.89
6,599.00	90.30	180.55	5,659.29	-516.22	-353.62	533.14	0.66
6,693.00	89.87	182.98	5,659.15	-610.17	-356.52	627.12	2.63
6,788.00	89.50	185.06	5,659.67	-704.93	-363.18	722.09	2.22
6,883.00	90.60	182.56	5,659.59	-799.71	-369.49	817.07	2.88

Design Report for Razor #27J-3409A - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
6,977.00	90.97	179.30	5,658.30	-893.68	-371.02	910.99	3.49
7,072.00	90.67	179.26	5,656.94	-988.66	-369.82	1,005.80	0.32
7,166.00	90.97	181.13	5,655.60	-1,082.65	-370.14	1,099.68	2.01
7,261.00	90.08	178.52	5,654.73	-1,177.63	-369.85	1,194.54	2.90
7,355.00	90.39	182.40	5,654.34	-1,271.61	-370.61	1,288.44	4.14
7,450.00	90.42	182.97	5,653.67	-1,366.50	-375.06	1,383.44	0.60
7,545.00	89.90	178.67	5,653.41	-1,461.47	-376.41	1,478.35	4.56
7,639.00	89.62	180.90	5,653.80	-1,555.46	-376.06	1,572.21	2.39
7,734.00	89.74	183.97	5,654.33	-1,650.36	-380.10	1,667.20	3.23
7,828.00	89.85	186.51	5,654.67	-1,743.96	-388.68	1,761.11	2.70
7,923.00	89.04	175.16	5,655.59	-1,838.79	-390.06	1,855.89	11.98
8,018.00	89.53	177.19	5,656.78	-1,933.57	-383.73	1,950.23	2.20
8,113.00	90.03	178.40	5,657.14	-2,028.49	-380.07	2,044.86	1.38
8,205.00	93.21	179.03	5,654.54	-2,120.42	-378.01	2,136.57	3.52
8,296.00	93.54	178.58	5,649.18	-2,211.24	-376.12	2,227.19	0.61
8,387.00	91.68	178.54	5,645.04	-2,302.12	-373.83	2,317.84	2.04
8,479.00	91.94	178.27	5,642.13	-2,394.04	-371.27	2,409.51	0.41
8,569.00	91.81	177.94	5,639.19	-2,483.94	-368.30	2,499.16	0.39
8,660.00	91.87	177.52	5,636.27	-2,574.82	-364.70	2,589.75	0.47
8,751.00	90.24	178.95	5,634.59	-2,665.76	-361.89	2,680.43	2.38
8,842.00	90.73	178.99	5,633.82	-2,756.74	-360.26	2,771.22	0.54
8,934.00	90.65	178.25	5,632.71	-2,848.70	-358.04	2,862.96	0.81
9,025.00	88.95	176.09	5,633.03	-2,939.58	-353.55	2,953.51	3.02
9,117.00	88.67	177.84	5,634.94	-3,031.43	-348.68	3,045.00	1.93
9,209.00	89.93	181.16	5,636.06	-3,123.41	-347.88	3,136.82	3.86
9,300.00	89.69	180.29	5,636.37	-3,214.40	-349.03	3,227.76	0.99
9,391.00	89.93	181.16	5,636.67	-3,305.39	-350.18	3,318.70	0.99
9,482.00	89.90	181.50	5,636.80	-3,396.36	-352.29	3,409.66	0.38
9,573.00	89.87	182.16	5,636.99	-3,487.32	-355.20	3,500.65	0.73
9,663.00	89.91	182.77	5,637.16	-3,577.23	-359.07	3,590.65	0.68
9,756.00	89.99	179.65	5,637.24	-3,670.20	-361.03	3,683.60	3.36
9,847.00	89.62	179.46	5,637.55	-3,761.20	-360.33	3,774.45	0.46
9,939.00	89.46	179.95	5,638.29	-3,853.19	-359.85	3,866.30	0.56
10,029.00	90.51	180.91	5,638.31	-3,943.19	-360.53	3,956.22	1.58
10,121.00	91.91	180.20	5,636.37	-4,035.16	-361.42	4,048.13	1.71
10,212.00	92.72	180.15	5,632.69	-4,126.08	-361.70	4,138.95	0.89
10,304.00	90.25	179.72	5,630.31	-4,218.05	-361.59	4,230.79	2.73
10,389.00	90.52	180.18	5,629.74	-4,303.04	-361.52	4,315.68	0.63
10,480.00	90.99	179.75	5,628.54	-4,394.04	-361.46	4,406.56	0.70
10,572.00	89.05	179.78	5,628.51	-4,486.03	-361.09	4,498.42	2.11
10,663.00	89.23	179.71	5,629.87	-4,577.02	-360.68	4,589.28	0.21
10,754.00	89.86	179.96	5,630.60	-4,668.02	-360.42	4,680.15	0.74
10,846.00	90.38	179.80	5,630.40	-4,760.01	-360.23	4,772.03	0.59
10,938.00	89.78	179.69	5,630.27	-4,852.01	-359.82	4,863.89	0.66
11,029.00	89.88	180.00	5,630.54	-4,943.01	-359.57	4,954.77	0.36
11,120.00	88.77	180.13	5,631.62	-5,034.00	-359.67	5,045.65	1.23
11,212.00	89.26	180.64	5,633.20	-5,125.99	-360.29	5,137.55	0.77
11,305.00	89.11	179.78	5,634.52	-5,218.98	-360.63	5,230.44	0.94
11,396.00	89.78	180.30	5,635.40	-5,309.97	-360.70	5,321.33	0.93
11,487.00	90.79	180.80	5,634.95	-5,400.97	-361.57	5,412.25	1.24
11,579.00	91.17	180.55	5,633.38	-5,492.95	-362.65	5,504.18	0.49

Design Report for Razor #27J-3409A - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
11,671.00	91.60	180.16	5,631.15	-5,584.92	-363.22	5,596.06	0.63
11,761.00	90.34	180.42	5,629.63	-5,674.90	-363.68	5,685.96	1.43
11,854.00	89.66	178.80	5,629.63	-5,767.89	-363.05	5,778.80	1.89
11,945.00	88.71	178.89	5,630.92	-5,858.87	-361.21	5,869.57	1.05
12,036.00	89.29	178.51	5,632.51	-5,949.83	-359.15	5,960.32	0.76
12,128.00	90.12	178.52	5,632.99	-6,041.79	-356.76	6,052.06	0.90
12,220.00	89.94	177.86	5,632.94	-6,133.75	-353.86	6,143.75	0.74
12,312.00	88.08	177.66	5,634.53	-6,225.66	-350.26	6,235.37	2.03
12,403.00	88.92	177.55	5,636.91	-6,316.55	-346.46	6,325.96	0.93
12,496.00	89.84	177.54	5,637.91	-6,409.46	-342.48	6,418.56	0.99
12,588.00	89.78	179.66	5,638.22	-6,501.42	-340.23	6,510.30	2.31
12,679.00	90.84	181.56	5,637.73	-6,592.41	-341.20	6,601.22	2.39
12,770.00	90.83	182.61	5,636.40	-6,683.34	-344.51	6,692.20	1.15
12,862.00	89.05	182.80	5,636.50	-6,775.23	-348.85	6,784.20	1.95
12,955.00	89.47	181.92	5,637.70	-6,868.15	-352.68	6,877.19	1.05
13,046.00	89.41	181.65	5,638.59	-6,959.10	-355.51	6,968.17	0.30
13,069.00	89.32	181.30	5,638.84	-6,982.09	-356.11	6,991.16	1.57
Final Sperry MWD Survey @ 13069.00 ft							
13,113.00	89.32	181.30	5,639.37	-7,026.07	-357.10	7,035.14	0.00
Straight Line Projection to TD @ 13113.00 ft ~ 606' FSL ~2483' FEL							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
177.00	177.00	0.14	-0.10	First Sperry MWD Survey @ 177.00 ft
13,069.00	5,638.84	-6,982.09	-356.11	Final Sperry MWD Survey @ 13069.00 ft
13,113.00	5,639.37	-7,026.07	-357.10	Straight Line Projection to TD @ 13113.00 ft ~ 606' FSL ~2483' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (usft)
				+N/_S (usft)	+E/-W (usft)	
Target		182.85	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
177.00	1,542.00	Surface_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
1,636.00	6,112.00	Vertical & Build_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
6,221.00	13,069.00	Lateral_Sperry MWD+IFR1+MS+sag	MWD+IFR1+MS+sag
13,113.00	13,113.00	Projection to TD_BLIND	BLIND

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,597.00		9 5/8"	9-5/8	13-1/2
6,150.00		7" Casing Pt. ~392' FML ~2259' FSL ~2367' FEL	7	8-3/4

Design Report for Razor #27J-3409A - 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 #27J_Sec 27_N	0.00	0.00	3.00	0.03	32.11	1,541,693.80	3,457,069.90	40° 48' 31.140 N	103° 50' 55.781 W
- actual wellpath misses target center by 32.11usft at 2.98usft MD (2.98 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				3.00	278.58	-3,304.21	1,541,910.82	3,453,761.07	
Point 2				3.00	361.51	1,974.88	1,542,092.02	3,459,037.72	
Razor #27J_Sec 27_1	0.00	0.00	3.00	0.03	32.11	1,541,693.80	3,457,069.90	40° 48' 31.140 N	103° 50' 55.781 W
- actual wellpath misses target center by 32.11usft at 2.98usft MD (2.98 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				3.00	178.58	-3,304.21	1,541,810.83	3,453,762.93	
Point 2				3.00	261.51	1,974.88	1,541,992.04	3,459,039.58	
Razor #27J_Southern_	0.00	0.00	3.00	0.02	0.00	1,541,693.19	3,457,037.80	40° 48' 31.140 N	103° 50' 56.198 W
- actual wellpath misses target center by 0.02usft at 3.00usft MD (3.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				3.00	-2,286.12	1,949.29	1,539,443.75	3,459,029.32	
Point 2				3.00	-7,023.63	2,035.30	1,534,708.65	3,459,203.52	
Point 3				3.00	-7,041.73	-3,081.49	1,534,595.28	3,454,087.93	
Point 4				3.00	-2,373.07	-3,133.14	1,539,262.19	3,453,949.37	
Point 5				3.00	2,330.24	-3,211.05	1,543,963.26	3,453,783.91	
Point 6				3.00	2,369.37	-662.93	1,544,049.82	3,456,330.87	
Point 7				3.00	2,408.06	1,863.59	1,544,135.54	3,458,856.24	
Point 8				3.00	-2,286.12	1,949.29	1,539,443.75	3,459,029.32	
Razor #27J_Southern_	0.00	0.00	3.00	0.02	0.00	1,541,693.19	3,457,037.80	40° 48' 31.140 N	103° 50' 56.198 W
- actual wellpath misses target center by 0.02usft at 3.00usft MD (3.00 TVD, 0.00 N, 0.00 E)									
- Polygon									
Point 1				3.00	-2,373.07	-3,233.14	1,539,260.33	3,453,849.39	
Point 2				3.00	-2,286.12	2,049.29	1,539,445.62	3,459,129.30	
Point 3				3.00	-7,623.63	2,135.30	1,534,110.61	3,459,314.68	
Point 4				3.00	-7,641.73	-3,181.49	1,533,993.52	3,453,999.12	
Point 5				3.00	-2,373.07	-3,233.14	1,539,260.33	3,453,849.39	
Point 6				3.00	2,930.24	-3,311.05	1,544,561.29	3,453,672.75	
Point 7				3.00	2,969.37	-662.93	1,544,649.72	3,456,319.70	
Point 8				3.00	3,008.06	1,963.59	1,544,737.30	3,458,945.05	
Point 9				3.00	-2,286.12	2,049.29	1,539,445.62	3,459,129.30	

Directional Difficulty Index

Average Dogleg over Survey:	2.11 °/100usft	Maximum Dogleg over Survey:	22.84 °/100usft at 5,238.00 usft
Net Tortousity applicable to Plans:	1.20 °/100usft	Directional Difficulty Index:	6.736

Audit Info

North Reference Sheet for Sec. 27-T10N-R58W (Razor #27J Pad) - Razor #27J-3409A - 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 ft @ 4789.00usft (Frontier 26). Northing and Easting are relative to Razor #27J-3409A

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: 1.00000421

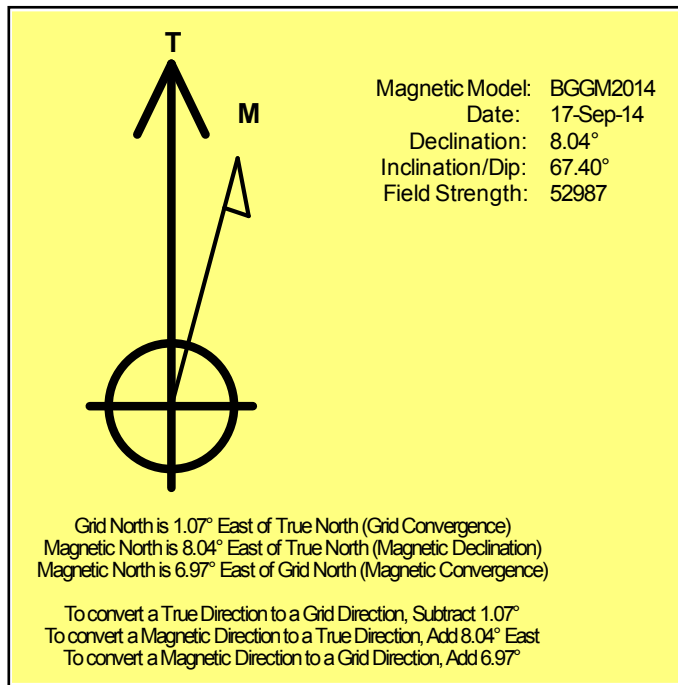
Grid Coordinates of Well: 1,541,693.17 usft N, 3,457,037.80 usft E

Geographical Coordinates of Well: 40° 48' 31.14" N, 103° 50' 56.20" W

Grid Convergence at Surface is: 1.07°

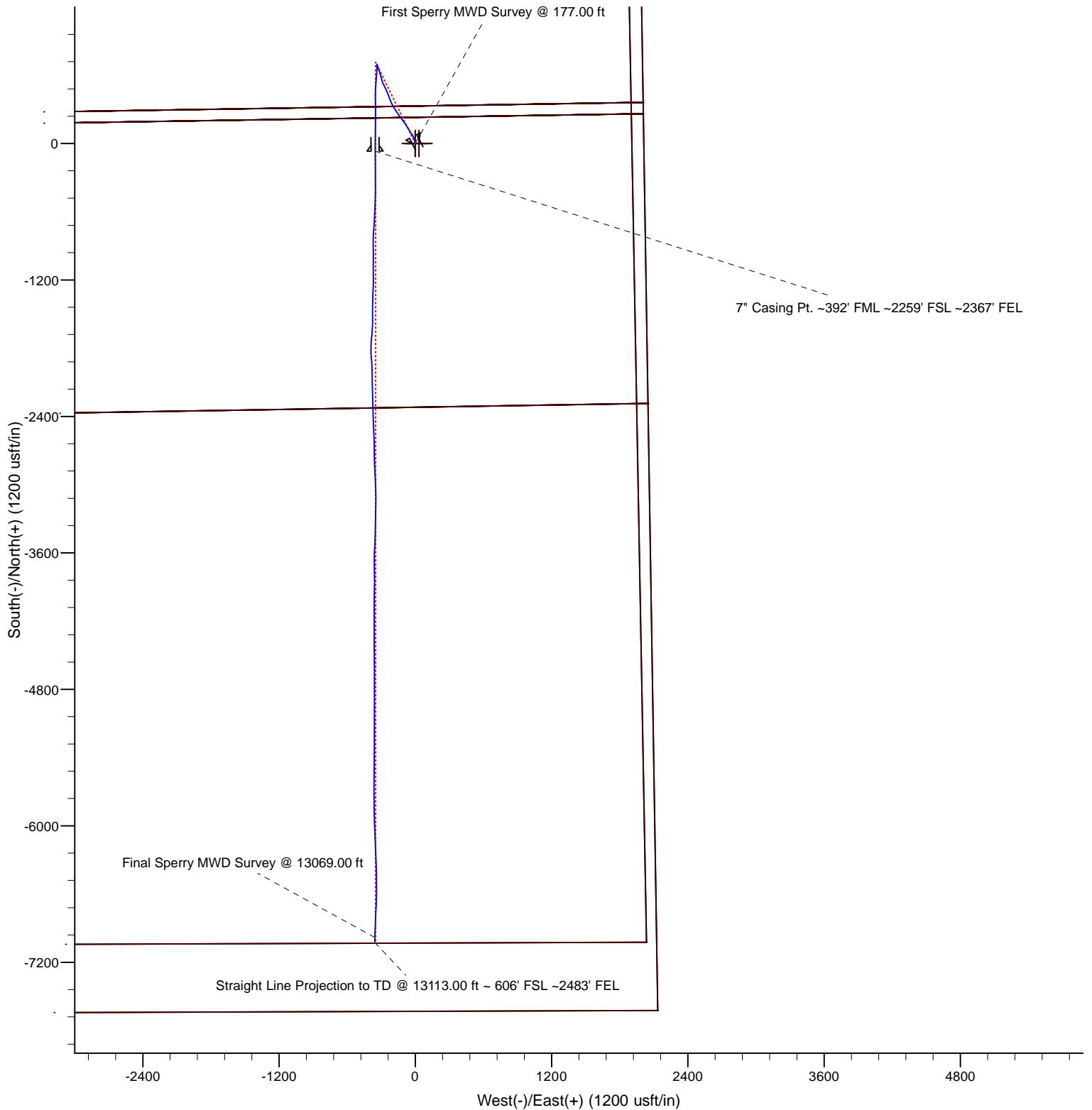
Based upon Minimum Curvature type calculations, at a Measured Depth of 13, 113.00usft the Bottom Hole Displacement is 7,035.14usft in the Direction of 182.91° (True).

Magnetic Convergence at surface is: -6.97° (17 September 2014, , BGGM2014)



LEGEND

- Razor #27J-3409A, Plan C
- Actual Field Surveys



Project: Weld County, CO

Site: Sec. 27-T10N-R58W (Razor #27J Pad)

Well: Razor #27J-3409A

Whiting Oil and Gas Corporation

HALLIBURTON

Sperry Drilling

