Whiting Oil and Gas Corporation

Weld County, CO
Sec. 26-T10N-R58W
Razor #26K-2305A

Plan B

Design: Actual Field Surveys

Sperry Drilling Services

Standard Report

10 April, 2014

Well Coordinates: 1,541,928.84 N, 3,461,025.71 E (40° 48' 32.73" N, 103° 50' 04.29" W)
Ground Level: 4,737.50 usft

Local Coordinate Origin:	Centered on Well Razor #26K-2305A
Viewing Datum:	KB 22 ft @ 4759.50usft (Frontier 26)
TVDs to System:	N
North Reference:	True
Unit System:	API - US Survey Feet - Custom

Geodetic Scale Factor Applied
Version: 5000.1 Build: 70

HALLIBURTON

Design Report for Razor #26K-2305A - 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
170.00	0.30	149.35	170.00	-0.38	0.23	-0.40	0.18
Sperry First Survey							
262.00	1.07	104.39	261.99	-0.80	1.18	-0.90	0.96
352.00	0.87	100.25	351.98	-1.13	2.67	-1.34	0.24
444.00	1.00	120.78	443.97	-1.67	4.05	-1.99	0.39
535.00	1.68	111.25	534.94	-2.56	5.97	-3.03	0.78
626.00	1.14	63.29	625.92	-2.64	8.02	-3.27	1.37
718.00	2.02	14.28	717.88	-0.65	9.24	-1.39	1.67
809.00	2.80	337.14	808.81	2.95	8.77	2.24	1.87
900.00	4.28	329.52	899.63	7.92	6.19	7.40	1.70
992.00	5.36	339.31	991.31	14.90	2.93	14.62	1.47
1,084.00	5.78	347.48	1,082.88	23.45	0.40	23.34	0.97
1,175.00	7.15	348.65	1,173.29	33.47	-1.70	33.50	1.51
1,267.00	6.64	341.13	1,264.63	44.12	-4.55	44.34	1.13
1,358.00	6.05	331.03	1,355.08	53.29	-8.58	53.81	1.38
1,450.00	5.90	310.76	1,446.59	60.62	-14.51	61.59	2.29
1,530.00	4.94	287.74	1,526.24	64.36	-20.90	65.82	2.94
1,637.00	5.06	270.73	1,632.84	65.82	-30.01	68.01	1.38
1,729.00	3.32	299.06	1,724.60	67.17	-36.40	69.86	2.89
1,820.00	4.26	329.02	1,815.40	71.35	-40.44	74.35	2.37
1,912.00	2.45	322.20	1,907.24	75.83	-43.40	79.06	2.01
2,003.00	2.72	314.52	1,998.15	78.88	-46.13	82.31	0.48
2,094.00	2.76	308.34	2,089.05	81.75	-49.39	85.44	0.33
2,186.00	2.58	310.74	2,180.95	84.48	-52.70	88.42	0.23
2,276.00	2.73	349.19	2,270.86	87.91	-54.64	91.99	1.95
2,368.00	3.46	343.27	2,362.72	92.72	-55.85	96.88	0.87
2,460.00	3.38	344.22	2,454.56	97.99	-57.38	102.26	0.11
2,551.00	5.98	334.35	2,545.25	104.84	-60.16	109.31	2.98
2,643.00	6.65	334.53	2,636.69	113.97	-64.53	118.76	0.73
2,734.00	6.33	325.00	2,727.11	122.84	-69.67	128.01	1.23
2,826.00	5.90	321.61	2,818.59	130.70	-75.52	136.32	0.61
2,917.00	2.64	329.57	2,909.32	136.17	-79.49	142.09	3.63
3,009.00	1.98	328.37	3,001.25	139.35	-81.39	145.41	0.72
3,100.00	3.57	336.61	3,092.14	143.29	-83.34	149.49	1.80
3,191.00	3.53	345.99	3,182.96	148.61	-85.15	154.94	0.64
3,283.00	3.07	353.39	3,274.81	153.81	-86.11	160.20	0.68
3,374.00	5.07	347.20	3,365.58	160.15	-87.29	166.61	2.25
3,466.00	5.45	346.77	3,457.19	168.37	-89.19	174.95	0.42
3,558.00	6.31	330.00	3,548.71	177.00	-92.71	183.84	2.08
3,650.00	3.99	318.72	3,640.34	183.78	-97.35	190.98	2.74
3,741.00	4.37	312.84	3,731.09	188.52	-101.99	196.07	0.63
3,833.00	4.19	309.94	3,822.84	193.06	-107.13	201.00	0.31
3,924.00	3.94	309.56	3,913.61	197.19	-112.09	205.51	0.28
4,016.00	3.75	314.95	4,005.40	201.32	-116.66	210.00	0.44
4,108.00	4.05	312.50	4,097.19	205.64	-121.18	214.67	0.37
4,200.00	4.89	330.96	4,188.91	211.27	-125.48	220.62	1.80
4,291.00	4.49	333.51	4,279.61	217.85	-128.95	227.46	0.50
4,382.00	3.77	327.96	4,370.37	223.57	-132.13	233.42	0.90
4,474.00	3.00	318.23	4,462.21	227.93	-135.34	238.02	1.04

Design Report for Razor #26K-2305A - Actual Field Surveys

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)
4,565.00	3.53	335.43	4,553.07	232.25	-138.09	242.55	1.22
4,656.00	3.90	339.54	4,643.87	237.70	-140.34	248.16	0.50
4,751.00	3.03	335.05	4,738.70	243.01	-142.52	253.62	0.96
4,847.00	3.79	340.74	4,834.53	248.30	-144.64	259.07	0.87
4,942.00	3.40	341.68	4,929.34	253.94	-146.56	264.84	0.42
5,037.00	2.36	340.42	5,024.22	258.46	-148.10	269.47	1.10
5,069.00	3.26	341.79	5,056.18	259.94	-148.61	270.99	2.82
5,100.00	6.72	329.93	5,087.06	262.35	-149.79	273.48	11.59
5,132.00	10.78	333.15	5,118.68	266.64	-152.08	277.94	12.77
5,164.00	15.00	336.82	5,149.87	273.12	-155.07	284.64	13.43
5,195.00	18.90	335.86	5,179.52	281.39	-158.70	293.18	12.61
5,227.00	22.46	334.10	5,209.45	291.63	-163.49	303.76	11.29
5,258.00	26.72	333.64	5,237.63	303.20	-169.17	315.75	13.76
5,290.00	30.51	337.24	5,265.72	317.14	-175.51	330.16	13.01
5,322.00	33.62	337.96	5,292.84	332.85	-181.98	346.33	9.79
5,353.00	33.87	337.63	5,318.61	348.79	-188.49	362.74	1.00
5,385.00	33.40	337.33	5,345.26	365.17	-195.28	379.61	1.56
5,417.00	35.49	334.36	5,371.65	381.67	-202.69	396.65	8.38
5,448.00	40.46	336.47	5,396.08	399.02	-210.61	414.57	16.57
5,480.00	43.87	337.08	5,419.79	418.76	-219.08	434.93	10.73
5,512.00	48.52	337.75	5,441.94	440.08	-227.94	456.88	14.61
5,543.00	54.25	336.83	5,461.27	462.41	-237.29	479.89	18.63
5,575.00	55.91	335.60	5,479.59	486.41	-247.88	504.67	6.07
5,607.00	55.72	335.75	5,497.57	510.54	-258.78	529.58	0.71
5,638.00	56.49	334.77	5,514.86	533.90	-269.55	553.74	3.61
5,670.00	56.85	332.62	5,532.44	557.87	-281.40	578.57	5.73
5,702.00	60.22	330.07	5,549.15	581.81	-294.49	603.48	12.53
5,733.00	61.15	329.41	5,564.32	605.16	-308.11	627.84	3.53
5,765.00	62.06	328.50	5,579.54	629.27	-322.63	653.04	3.79
5,796.00	63.84	327.42	5,593.64	652.67	-337.28	677.54	6.53
5,828.00	65.53	326.21	5,607.32	676.88	-353.11	702.94	6.29
5,860.00	67.69	325.53	5,620.03	701.19	-369.59	728.48	7.03
5,892.00	72.21	325.31	5,630.99	725.93	-386.65	754.51	14.14
5,923.00	78.01	324.76	5,638.96	750.47	-403.81	780.35	18.79
5,939.00	80.01	324.83	5,642.01	763.31	-412.87	793.86	12.51
5,966.00	83.79	325.17	5,645.81	785.20	-428.20	816.91	14.06
6,017.00	90.00	325.17	5,648.57	826.98	-457.27	860.88	12.18
Build Projection							

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
170.00	170.00	-0.38	0.23	Sperry First Survey
6,017.00	5,648.57	826.98	-457.27	Build Projection

Design Report for Razor #26K-2305A - Actual Field Surveys

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (usft)	Origin +E/-W (usft)	Start TVD (usft)
Target	Razor 26K-2305A C0 BHL	355.42	Slot	0.00	0.00	0.00

Survey tool program

From (usft)	To (usft)	Survey/Plan	Survey Tool
170.00	1,530.00	Surface_Sperry MWD Surveys	MWD+IFR1+MS+sag
1,637.00	6,017.00	Vertical and Build_Sperry MWD Surveys	MWD+IFR1+MS+sag

Casing Details

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,575.00	1,571.07	Surface	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
Razor 26K-2305A C	0.00	0.00	5,596.00	8,062.84	-646.46	1,549,978.15	3,460,227.93	40° 49' 52.399 N	103° 50' 12.700 W
- actual wellpath misses target center by 7238.52usft at 6017.00usft MD (5648.57 TVD, 826.98 N, -457.27 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	2.57 °/100usft	Maximum Dogleg over Survey:	18.79 °/100usft at 5,923.00 usft
Net Tortousity applicable to Plans:	1.06 °/100usft	Directional Difficulty Index:	5.207

Audit Info

North Reference Sheet for Sec. 26-T10N-R58W - Razor #26K-2305A - 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 22 ft @ 4759.50usft (Frontier 26). Northing and Easting are relative to Razor #26K-2305A
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: 1.00000428

Grid Coordinates of Well: 1,541,928.84 usft N, 3,461,025.71 usft E
Geographical Coordinates of Well: 40° 48' 32.73" N, 103° 50' 04.29" W
Grid Convergence at Surface is: 1.08°

Based upon Minimum Curvature type calculations, at a Measured Depth of 6,017.00usft
the Bottom Hole Displacement is 944.98usft in the Direction of 331.06° (True).

Magnetic Convergence at surface is: -7.00° (18 December 2013, , BGGM2013)