

Shell Exploration & Production Co. Inc.

Harper Co. KS (NAD-27)

Sec 10-T33S-R07W

Hudgens 3307 #10-1H

9858433

Wellbore #1

Design: Wellbore #1

Sperry Drilling Services

Combo Report With Grid North & True North

08 December, 2012

Surface UWI : 9858433

Well Coordinates: 187,889.07 N, 2,127,946.20 E (37° 10' 54.66" N, 098° 03' 39.04" W)

Ground Level: 1,363.00 ft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well Hudgens 3307 #10-1H

WELL @ 1394.70ft (Nabors 102 (31.7'))

N

True

API US New

Version: 2003.21 Build: 46

HALLIBURTON

Design Report for Hudgens 3307 #10-1H - Wellbore #1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
						Northing	Easting	Northing	Easting			
0.00	0.00	359.73	0.00	-1,394.70	0.00	0.00 N	0.00 E	187,889.07	2,127,946.20	0.00	0.00	
157.00	1.42	12.60	12.87	-1,237.72	156.98	1.90 N	0.43 E	187,890.97	2,127,946.62	0.90	1.94	Start MWD
191.00	1.94	9.93	10.20	-1,203.73	190.97	2.87 N	0.63 E	187,891.95	2,127,946.82	1.55	2.93	
250.00	3.55	10.77	11.04	-1,144.80	249.90	5.65 N	1.16 E	187,894.72	2,127,947.33	2.73	5.76	
280.00	4.20	9.23	9.50	-1,114.87	279.83	7.64 N	1.51 E	187,896.72	2,127,947.68	2.19	7.78	
311.00	5.16	10.74	11.01	-1,083.97	310.73	10.13 N	1.97 E	187,899.21	2,127,948.12	3.12	10.31	
341.00	5.91	10.05	10.32	-1,054.11	340.59	12.98 N	2.50 E	187,902.06	2,127,948.64	2.51	13.20	
423.00	6.69	7.09	7.36	-972.61	422.09	21.87 N	3.87 E	187,910.95	2,127,949.97	1.03	22.20	
544.00	6.92	6.42	6.69	-852.46	542.24	36.10 N	5.62 E	187,925.19	2,127,951.65	0.20	36.53	
605.00	7.90	12.68	12.95	-791.97	602.73	43.83 N	6.99 E	187,932.93	2,127,952.98	2.08	44.38	
695.00	9.25	32.42	32.69	-702.96	691.74	55.95 N	12.28 E	187,945.08	2,127,958.22	3.57	57.14	
786.00	10.24	46.88	47.15	-613.26	781.44	67.61 N	22.17 E	187,956.78	2,127,968.05	2.89	70.10	
884.00	11.24	57.80	58.07	-516.97	877.73	78.59 N	36.66 E	187,967.83	2,127,982.49	2.31	83.06	
976.00	12.47	63.96	64.23	-426.93	967.77	87.65 N	53.22 E	187,976.97	2,127,999.00	1.92	94.42	
1,070.00	14.00	66.62	66.89	-335.43	1,059.27	96.52 N	72.82 E	187,985.93	2,128,018.56	1.75	106.03	
1,164.00	16.28	69.96	70.23	-244.69	1,150.01	105.44 N	95.68 E	187,994.96	2,128,041.38	2.60	118.16	
1,259.00	16.00	71.11	71.38	-153.44	1,241.26	114.13 N	120.61 E	188,003.76	2,128,066.27	0.45	130.36	
1,353.00	14.64	67.94	68.21	-62.78	1,331.92	122.67 N	143.92 E	188,012.42	2,128,089.54	1.70	142.19	
1,448.00	14.53	66.73	67.00	29.16	1,423.86	131.79 N	166.04 E	188,021.64	2,128,111.62	0.34	154.40	
1,637.00	15.42	64.30	64.57	211.74	1,606.44	151.84 N	210.56 E	188,041.90	2,128,156.04	0.58	180.68	
1,826.00	16.68	73.71	73.98	393.40	1,788.10	170.12 N	259.33 E	188,060.41	2,128,204.73	1.53	205.81	
2,015.00	14.07	72.93	73.20	575.62	1,970.32	184.25 N	307.40 E	188,074.76	2,128,252.73	1.39	226.74	
2,204.00	13.79	72.33	72.60	759.06	2,153.76	197.62 N	350.89 E	188,088.34	2,128,296.16	0.17	246.26	
2,393.00	12.46	71.41	71.68	943.12	2,337.82	210.77 N	391.74 E	188,101.68	2,128,336.95	0.71	265.18	
2,582.00	11.89	68.04	68.31	1,127.87	2,522.57	224.37 N	429.19 E	188,115.46	2,128,374.33	0.48	284.05	
2,676.00	14.16	69.15	69.42	1,219.45	2,614.15	232.00 N	448.96 E	188,123.18	2,128,394.06	2.43	294.45	
2,771.00	16.63	69.45	69.72	1,311.03	2,705.73	240.79 N	472.59 E	188,132.09	2,128,417.65	2.60	306.57	
2,959.00	16.27	68.62	68.89	1,491.34	2,886.04	259.60 N	522.39 E	188,151.13	2,128,467.36	0.23	332.38	
3,148.00	13.33	66.95	67.22	1,674.05	3,068.75	277.58 N	567.19 E	188,169.32	2,128,512.07	1.57	356.64	
3,242.00	12.47	64.82	65.09	1,765.68	3,160.38	286.05 N	586.38 E	188,177.88	2,128,531.23	1.05	367.80	
3,337.00	11.03	62.80	63.07	1,858.68	3,253.38	294.49 N	603.79 E	188,186.40	2,128,548.60	1.58	378.66	
3,431.00	9.98	64.00	64.27	1,951.11	3,345.81	302.09 N	619.15 E	188,194.08	2,128,563.91	1.14	388.41	
3,526.00	9.56	71.20	71.47	2,044.73	3,439.43	308.18 N	634.04 E	188,200.23	2,128,578.78	1.36	396.58	
3,620.00	5.91	75.42	75.69	2,137.86	3,532.56	311.85 N	646.14 E	188,203.96	2,128,590.86	3.93	401.97	
3,714.00	3.30	63.34	63.61	2,231.55	3,626.25	314.25 N	653.25 E	188,206.40	2,128,597.96	2.95	405.37	
3,809.00	2.10	60.62	60.89	2,326.44	3,721.14	316.32 N	657.22 E	188,208.48	2,128,601.92	1.27	407.98	
3,903.00	1.68	61.32	61.59	2,420.39	3,815.09	317.81 N	659.94 E	188,209.98	2,128,604.63	0.45	409.85	

Design Report for Hudgens 3307 #10-1H - Wellbore #1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
						Northing	Easting	Northing	Easting			
3,998.00	1.29	60.18	60.45	2,515.36	3,910.06	319.00 N	662.09 E	188,211.18	2,128,606.78	0.41	411.34	
4,029.00	1.36	63.68	63.95	2,546.35	3,941.05	319.33 N	662.73 E	188,211.52	2,128,607.41	0.35	411.76	
4,061.00	1.20	61.34	61.61	2,578.34	3,973.04	319.66 N	663.36 E	188,211.85	2,128,608.05	0.53	412.18	
4,092.00	2.34	25.93	26.20	2,609.33	4,004.03	320.38 N	663.93 E	188,212.57	2,128,608.61	4.93	412.97	
4,124.00	5.49	10.41	10.68	2,641.25	4,035.95	322.47 N	664.50 E	188,214.67	2,128,609.17	10.30	415.13	
4,155.00	8.53	4.07	4.34	2,672.02	4,066.72	326.22 N	664.95 E	188,218.42	2,128,609.60	10.10	418.90	
4,186.00	11.90	1.61	1.88	2,702.52	4,097.22	331.71 N	665.23 E	188,223.91	2,128,609.86	10.96	424.37	
4,218.00	14.76	0.15	0.42	2,733.66	4,128.36	339.09 N	665.37 E	188,231.29	2,128,609.96	9.00	431.69	
4,249.00	17.81	358.13	358.40	2,763.41	4,158.11	347.78 N	665.26 E	188,239.98	2,128,609.82	10.01	440.27	
4,281.00	20.68	357.18	357.45	2,793.62	4,188.32	358.32 N	664.87 E	188,250.51	2,128,609.38	9.02	450.65	
4,312.00	23.26	358.99	359.26	2,822.37	4,217.07	369.91 N	664.55 E	188,262.10	2,128,609.00	8.60	462.07	
4,344.00	25.77	0.51	0.78	2,851.48	4,246.18	383.18 N	664.57 E	188,275.38	2,128,608.95	8.09	475.21	
4,375.00	29.03	0.60	0.87	2,879.00	4,273.70	397.44 N	664.77 E	188,289.64	2,128,609.09	10.52	489.35	
4,407.00	32.41	0.83	1.10	2,906.50	4,301.20	413.79 N	665.05 E	188,305.98	2,128,609.30	10.57	505.56	
4,438.00	35.42	1.12	1.39	2,932.23	4,326.93	431.08 N	665.43 E	188,323.28	2,128,609.59	9.72	522.73	
4,470.00	38.37	1.10	1.37	2,957.81	4,352.51	450.28 N	665.89 E	188,342.48	2,128,609.96	9.22	541.79	
4,501.00	41.75	0.76	1.03	2,981.54	4,376.24	470.22 N	666.31 E	188,362.43	2,128,610.29	10.93	561.59	
4,533.00	44.81	359.09	359.36	3,004.83	4,399.53	492.16 N	666.37 E	188,384.36	2,128,610.25	10.21	583.30	
4,564.00	47.53	359.16	359.43	3,026.30	4,421.00	514.52 N	666.14 E	188,406.72	2,128,609.91	8.78	605.39	
4,596.00	49.66	359.89	0.16	3,047.46	4,442.16	538.52 N	666.06 E	188,430.72	2,128,609.71	6.87	629.13	
4,627.00	52.63	0.60	0.87	3,066.91	4,461.61	562.66 N	666.28 E	188,454.86	2,128,609.82	9.75	653.04	
4,659.00	55.56	0.71	0.98	3,085.67	4,480.37	588.57 N	666.69 E	188,480.77	2,128,610.11	9.16	678.75	
4,690.00	59.67	0.91	1.18	3,102.27	4,496.97	614.74 N	667.19 E	188,506.94	2,128,610.48	13.27	704.71	
4,721.00	63.16	0.40	0.67	3,117.10	4,511.80	641.95 N	667.63 E	188,534.16	2,128,610.79	11.35	731.70	
4,753.00	65.87	0.43	0.70	3,130.87	4,525.57	670.83 N	667.97 E	188,563.04	2,128,611.00	8.47	760.33	
4,784.00	67.95	0.13	0.40	3,143.03	4,537.73	699.35 N	668.24 E	188,591.55	2,128,611.14	6.77	788.58	
4,816.00	70.67	359.36	359.63	3,154.33	4,549.03	729.28 N	668.25 E	188,621.49	2,128,611.01	8.79	818.20	
4,847.00	73.89	359.16	359.43	3,163.76	4,558.46	758.80 N	668.01 E	188,651.01	2,128,610.63	10.41	847.38	
4,879.00	78.13	358.90	359.17	3,171.50	4,566.20	789.84 N	667.63 E	188,682.05	2,128,610.10	13.27	878.04	
4,910.00	83.00	359.11	359.38	3,176.58	4,571.28	820.41 N	667.24 E	188,712.62	2,128,609.57	15.72	908.24	
4,979.00	88.98	359.85	0.12	3,181.40	4,576.10	889.21 N	666.94 E	188,781.41	2,128,608.95	8.73	976.27	
5,083.00	90.95	359.95	0.22	3,181.47	4,576.17	993.21 N	667.25 E	188,885.41	2,128,608.77	1.90	1,079.22	
5,144.00	90.22	0.46	0.73	3,180.84	4,575.54	1,054.20 N	667.76 E	188,946.40	2,128,608.98	1.46	1,139.64	
5,234.00	90.12	0.76	1.03	3,180.58	4,575.28	1,144.19 N	669.14 E	189,036.40	2,128,609.94	0.35	1,228.89	
5,325.00	90.03	0.94	1.21	3,180.46	4,575.16	1,235.17 N	670.92 E	189,127.39	2,128,611.29	0.22	1,319.17	
5,416.00	90.55	0.94	1.21	3,180.00	4,574.70	1,326.15 N	672.84 E	189,218.37	2,128,612.79	0.57	1,409.47	
5,507.00	89.45	359.45	359.72	3,180.00	4,574.70	1,417.14 N	673.58 E	189,309.37	2,128,613.10	2.04	1,499.62	

Design Report for Hudgens 3307 #10-1H - Wellbore #1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates (ft)		Map Coordinates (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
						Northing	Easting	Northing	Easting			
5,597.00	89.39	359.47	359.74	3,180.91	4,575.61	1,507.14 N	673.15 E	189,399.36	2,128,612.25	0.07	1,588.60	
5,688.00	89.11	359.35	359.62	3,182.10	4,576.80	1,598.13 N	672.65 E	189,490.35	2,128,611.31	0.33	1,678.57	
5,779.00	89.57	0.08	0.35	3,183.15	4,577.85	1,689.12 N	672.62 E	189,581.34	2,128,610.86	0.95	1,768.60	
5,870.00	91.11	1.14	1.41	3,182.61	4,577.31	1,780.11 N	674.02 E	189,672.33	2,128,611.83	2.05	1,858.83	
5,964.00	89.20	359.98	0.25	3,182.35	4,577.05	1,874.09 N	675.38 E	189,766.32	2,128,612.75	2.38	1,952.02	
6,059.00	89.85	359.80	0.07	3,183.14	4,577.84	1,969.08 N	675.65 E	189,861.31	2,128,612.56	0.71	2,046.06	
6,153.00	88.30	359.50	359.77	3,184.66	4,579.36	2,063.07 N	675.52 E	189,955.29	2,128,611.99	1.68	2,139.04	
6,247.00	91.32	0.22	0.49	3,184.97	4,579.67	2,157.06 N	675.73 E	190,049.28	2,128,611.76	3.30	2,232.07	
6,341.00	92.93	0.92	1.19	3,181.48	4,576.18	2,250.98 N	677.11 E	190,143.21	2,128,612.69	1.87	2,325.21	
6,436.00	90.65	0.76	1.03	3,178.52	4,573.22	2,345.91 N	678.95 E	190,238.15	2,128,614.09	2.41	2,419.40	
6,530.00	89.94	0.47	0.74	3,178.03	4,572.73	2,439.90 N	680.40 E	190,332.14	2,128,615.10	0.82	2,512.61	
6,625.00	90.40	359.48	359.75	3,177.75	4,572.45	2,534.89 N	680.80 E	190,427.14	2,128,615.05	1.15	2,606.67	
6,719.00	90.22	359.68	359.95	3,177.24	4,571.94	2,628.89 N	680.56 E	190,521.13	2,128,614.37	0.29	2,699.65	
6,814.00	90.62	359.54	359.81	3,176.55	4,571.25	2,723.89 N	680.36 E	190,616.13	2,128,613.72	0.45	2,793.62	
6,908.00	89.78	359.73	0.00	3,176.22	4,570.92	2,817.89 N	680.20 E	190,710.12	2,128,613.12	0.92	2,886.61	
7,002.00	90.90	359.25	359.52	3,175.66	4,570.36	2,911.88 N	679.81 E	190,804.12	2,128,612.28	1.30	2,979.56	
7,097.00	90.40	359.52	359.79	3,174.58	4,569.28	3,006.87 N	679.24 E	190,899.10	2,128,611.26	0.60	3,073.47	
7,191.00	91.23	359.60	359.87	3,173.24	4,567.94	3,100.86 N	678.96 E	190,993.09	2,128,610.54	0.89	3,166.43	
7,286.00	91.14	358.21	358.48	3,171.28	4,565.98	3,195.83 N	677.59 E	191,088.05	2,128,608.73	1.47	3,260.21	
7,380.00	89.85	357.53	357.80	3,170.47	4,565.17	3,289.77 N	674.54 E	191,181.98	2,128,605.24	1.55	3,352.72	
7,474.00	90.65	358.62	358.89	3,170.06	4,564.76	3,383.73 N	671.82 E	191,275.92	2,128,602.08	1.44	3,445.30	
7,569.00	89.05	358.71	358.98	3,170.31	4,565.01	3,478.71 N	670.06 E	191,370.89	2,128,599.86	1.69	3,539.03	
7,663.00	87.94	358.67	358.94	3,172.78	4,567.48	3,572.66 N	668.35 E	191,464.83	2,128,597.72	1.18	3,631.75	
7,758.00	88.77	0.31	0.58	3,175.50	4,570.20	3,667.62 N	667.96 E	191,559.79	2,128,596.87	1.93	3,725.65	
7,852.00	88.24	0.85	1.12	3,177.96	4,572.66	3,761.58 N	669.35 E	191,653.75	2,128,597.82	0.80	3,818.82	
7,947.00	88.42	0.19	0.46	3,180.72	4,575.42	3,856.53 N	670.66 E	191,748.70	2,128,598.69	0.72	3,912.96	
8,041.00	89.20	359.12	359.39	3,182.68	4,577.38	3,950.50 N	670.54 E	191,842.68	2,128,598.12	1.41	4,005.94	
8,136.00	90.74	359.35	359.62	3,182.73	4,577.43	4,045.50 N	669.72 E	191,937.67	2,128,596.85	1.64	4,099.82	
8,230.00	92.44	359.96	0.23	3,180.12	4,574.82	4,139.46 N	669.59 E	192,031.63	2,128,596.29	1.92	4,192.77	
8,325.00	92.43	359.56	359.83	3,176.08	4,570.78	4,234.37 N	669.64 E	192,126.54	2,128,595.89	0.42	4,286.70	
8,419.00	92.10	359.81	0.08	3,172.37	4,567.07	4,328.30 N	669.57 E	192,220.46	2,128,595.37	0.44	4,379.62	
8,513.00	92.93	0.54	0.81	3,168.24	4,562.94	4,422.20 N	670.30 E	192,314.37	2,128,595.66	1.18	4,472.65	
8,608.00	91.11	0.86	1.13	3,164.89	4,559.59	4,517.13 N	671.90 E	192,409.30	2,128,596.82	1.95	4,566.81	
8,693.00	90.86	0.34	0.61	3,163.43	4,558.13	4,602.10 N	673.19 E	192,494.28	2,128,597.71	0.68	4,651.08	Last MWD
8,719.14	90.86	0.34	0.61	3,163.04	4,557.74	4,628.24 N	673.47 E	192,520.42	2,128,597.86	0.00	4,676.98	Hudgens 3307 #10-1H PBHL



Design Report for Hudgens 3307 #10-1H - Wellbore #1

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft)	Local Coordinates Easting (ft)	Map Coordinates Northing (ft)	Map Coordinates Easting (ft)	Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
8,740.00	90.86	0.34	0.61	3,162.73	4,557.43	4,649.10 N	673.70 E	192,541.28	2,128,597.99	0.00	4,697.65	Projection to TD 8740.00 MD, 4557.43 TVD 4649.10 N, 673.70 E 309 FNL, 452 FEL

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
157.00	156.98	1.90	0.43	Start MWD
8,693.00	4,558.13	4,602.10	673.19	Last MWD
8,740.00	4,557.43	4,649.10	673.70	Projection to TD 8740.00 MD, 4557.43 TVD 4649.10 N, 673.70 E 309 FNL, 452 FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	8.31	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
157.00	8,740.00	Sperry MWD Surveys	MWD+SC

Design Targets

Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	()	()	()	()	()	()	()		
- Shape	()	()	()	()	()	()	()		

Design Report for Hudgens 3307 #10-1H - Wellbore #1

Directional Difficulty Index

Average Dogleg over Survey:	2.18 °/100ft	Maximum Dogleg over Survey:	15.72 °/100ft at 4,910.00 ft
Net Tortosity applicable to Plans:	0.52 °/100ft	Directional Difficulty Index:	6.268

Audit Info

North Reference Sheet for Sec 10-T33S-R07W - Hudgens 3307 #10-1H - Wellbore #1

All data is in Feet unless otherwise stated. Directions and Coordinates are relative to True North Reference.
Vertical Depths are relative to WELL @ 1394.70ft (Nabors 102 (31.7')). Northing and Easting are relative to Hudgens 3307 #10-1H
Coordinate System is US State Plane 1927 (Exact solution), Kansas South 1502 using datum NAD 1927 (NADCON CONUS), ellipsoid Clarke 1866
Projection method is Lambert Conformal Conic (2 parallel)
Central Meridian is 98° 30' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:37° 16' 0.000 N°
False Easting: 2,000,000.00ft, False Northing: 0.00ft, Scale Reduction: 1.00001775

Grid Coordinates of Well: 187,889.07 ft N, 2,127,946.20 ft E
Geographical Coordinates of Well: 37° 10' 54.66" N, 098° 03' 39.04" W
Grid Convergence at Surface is: 0.27°

Based upon Minimum Curvature type calculations, at a Measured Depth of 8,740.00ft
the Bottom Hole Displacement is 4,697.65ft in the Direction of 8.25° (True).
Magnetic Convergence at surface is: -4.37° (10 September 2012, , BGGM2012)

