

Job# 901724209

HP267

Devon

Reagan County, TX (NAD-83) University Sec 9 Blk 48
API# 383-38417

University 48-09 3H

2642' FSL & 1853' FEL

Wellbore #1

Survey: Sperry MWD Surveys

Sperry Drilling Services

Combo Report

13 October, 2014

Well Coordinates: 31° 07' 29.03" N
101° 19' 31.31" W

North American Datum 1983
Texas Central Zone
10,374,177.85 N
1,986,192.07 E

Ground Level: 2,711.00 ft

Local Coordinate Origin:

Viewing Datum:

TVDs to System:

North Reference:

Unit System:

Centered on Well University 48-09 3H

WELL @ 2736.00ft (HP267)

N

Grid

API US Survey Feet

Version: 5000.1 Build: 73

Report Version: Midcon Combo v1.50

HALLIBURTON

Survey Report for University 48-09 3H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (usft)	Easting (usft)			
0.00	0.00	0.00	-2,736.00	0.00	0.00 N	0.00 E	10,374,177.85	1,986,192.07	0.00	0.00	
86.00	0.37	200.02	-2,650.00	86.00	0.26 S	0.10 W	10,374,177.59	1,986,191.97	0.43	-0.26	First Sperry MWD Survey
146.00	0.55	192.57	-2,590.00	146.00	0.72 S	0.22 W	10,374,177.13	1,986,191.85	0.32	-0.73	
239.00	0.78	208.52	-2,497.01	238.99	1.72 S	0.62 W	10,374,176.13	1,986,191.45	0.32	-1.73	
333.00	0.86	201.89	-2,403.02	332.98	2.93 S	1.19 W	10,374,174.92	1,986,190.88	0.13	-2.96	
427.00	0.62	197.36	-2,309.03	426.97	4.07 S	1.61 W	10,374,173.78	1,986,190.46	0.26	-4.11	
554.00	0.55	187.98	-2,182.03	553.97	5.33 S	1.90 W	10,374,172.52	1,986,190.17	0.09	-5.38	
682.00	0.61	215.29	-2,054.04	681.96	6.50 S	2.38 W	10,374,171.35	1,986,189.69	0.22	-6.56	
809.00	0.53	187.40	-1,927.05	808.95	7.63 S	2.84 W	10,374,170.22	1,986,189.23	0.22	-7.71	
902.00	0.78	186.81	-1,834.05	901.95	8.69 S	2.97 W	10,374,169.16	1,986,189.10	0.27	-8.76	
976.00	0.58	184.26	-1,760.06	975.94	9.56 S	3.06 W	10,374,168.29	1,986,189.01	0.27	-9.64	
1,068.00	1.40	127.51	-1,668.07	1,067.93	10.71 S	2.20 W	10,374,167.14	1,986,189.87	1.29	-10.76	
1,161.00	1.34	123.99	-1,575.10	1,160.90	12.01 S	0.40 W	10,374,165.84	1,986,191.67	0.11	-12.01	
1,253.00	1.21	116.53	-1,483.12	1,252.88	13.04 S	1.36 E	10,374,164.81	1,986,193.43	0.23	-13.00	
1,345.00	1.14	111.45	-1,391.14	1,344.86	13.81 S	3.08 E	10,374,164.04	1,986,195.15	0.14	-13.72	
1,437.00	1.10	113.65	-1,299.16	1,436.84	14.50 S	4.74 E	10,374,163.35	1,986,196.81	0.06	-14.37	
1,531.00	2.03	107.93	-1,205.19	1,530.81	15.38 S	7.15 E	10,374,162.47	1,986,199.22	1.00	-15.17	
1,625.00	2.01	106.58	-1,111.25	1,624.75	16.36 S	10.32 E	10,374,161.49	1,986,202.39	0.05	-16.07	
1,720.00	2.93	104.96	-1,016.34	1,719.66	17.46 S	14.26 E	10,374,160.39	1,986,206.33	0.97	-17.07	
1,827.00	2.90	105.35	-909.48	1,826.52	18.88 S	19.51 E	10,374,158.97	1,986,211.58	0.03	-18.34	
1,921.00	3.58	112.41	-815.63	1,920.37	20.63 S	24.52 E	10,374,157.22	1,986,216.59	0.84	-19.96	
2,015.00	3.61	112.05	-721.81	2,014.19	22.86 S	29.97 E	10,374,154.99	1,986,222.04	0.04	-22.04	
2,110.00	3.15	92.99	-626.98	2,109.02	24.12 S	35.35 E	10,374,153.73	1,986,227.42	1.27	-23.15	
2,204.00	3.19	91.36	-533.12	2,202.88	24.32 S	40.55 E	10,374,153.53	1,986,232.62	0.10	-23.20	
2,298.00	3.04	91.65	-439.26	2,296.74	24.45 S	45.65 E	10,374,153.40	1,986,237.72	0.16	-23.20	
2,393.00	2.88	91.76	-344.39	2,391.61	24.60 S	50.56 E	10,374,153.25	1,986,242.63	0.17	-23.21	
2,487.00	2.75	89.91	-250.50	2,485.50	24.67 S	55.17 E	10,374,153.18	1,986,247.24	0.17	-23.15	
2,582.00	2.70	90.53	-155.61	2,580.39	24.68 S	59.69 E	10,374,153.17	1,986,251.76	0.06	-23.05	
2,677.00	2.52	88.98	-60.70	2,675.30	24.67 S	64.01 E	10,374,153.18	1,986,256.08	0.20	-22.91	
2,771.00	2.43	89.42	33.21	2,769.21	24.61 S	68.07 E	10,374,153.24	1,986,260.14	0.10	-22.75	
2,866.00	2.46	88.56	128.12	2,864.12	24.54 S	72.13 E	10,374,153.31	1,986,264.19	0.05	-22.56	
2,960.00	2.34	89.22	222.04	2,958.04	24.46 S	76.06 E	10,374,153.39	1,986,268.13	0.13	-22.38	
3,055.00	2.35	91.20	316.96	3,052.96	24.48 S	79.95 E	10,374,153.37	1,986,272.02	0.09	-22.29	
3,149.00	2.21	92.23	410.88	3,146.88	24.59 S	83.68 E	10,374,153.26	1,986,275.75	0.16	-22.30	
3,244.00	2.01	88.86	505.82	3,241.82	24.62 S	87.18 E	10,374,153.23	1,986,279.25	0.25	-22.24	
3,339.00	1.95	86.68	600.76	3,336.76	24.50 S	90.46 E	10,374,153.35	1,986,282.53	0.10	-22.03	
3,433.00	1.92	89.64	694.71	3,430.71	24.39 S	93.63 E	10,374,153.46	1,986,285.70	0.11	-21.84	
3,528.00	1.82	87.93	789.66	3,525.66	24.33 S	96.73 E	10,374,153.52	1,986,288.80	0.12	-21.69	
3,622.00	1.55	90.00	883.62	3,619.62	24.28 S	99.49 E	10,374,153.57	1,986,291.56	0.29	-21.56	
3,717.00	1.30	76.31	978.59	3,714.59	24.02 S	101.83 E	10,374,153.83	1,986,293.90	0.44	-21.24	
3,811.00	1.22	65.37	1,072.57	3,808.57	23.35 S	103.77 E	10,374,154.50	1,986,295.84	0.27	-20.52	

Survey Report for University 48-09 3H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (usft)	Easting (usft)			
3,905.00	1.65	83.63	1,166.54	3,902.54	22.78 S	106.03 E	10,374,155.07	1,986,298.10	0.66	-19.89	
4,000.00	2.33	89.14	1,261.48	3,997.48	22.60 S	109.32 E	10,374,155.25	1,986,301.39	0.74	-19.62	
4,094.00	1.95	98.17	1,355.41	4,091.41	22.80 S	112.81 E	10,374,155.05	1,986,304.88	0.54	-19.72	
4,189.00	1.53	96.35	1,450.37	4,186.37	23.17 S	115.67 E	10,374,154.68	1,986,307.74	0.45	-20.02	
4,283.00	1.35	96.31	1,544.34	4,280.34	23.43 S	118.02 E	10,374,154.42	1,986,310.09	0.19	-20.21	
4,377.00	1.95	88.22	1,638.30	4,374.30	23.51 S	120.72 E	10,374,154.34	1,986,312.79	0.68	-20.21	
4,472.00	3.09	92.06	1,733.21	4,469.21	23.55 S	124.89 E	10,374,154.30	1,986,316.96	1.21	-20.14	
4,566.00	2.60	94.18	1,827.09	4,563.09	23.79 S	129.55 E	10,374,154.06	1,986,321.62	0.53	-20.26	
4,660.00	2.07	88.84	1,921.01	4,657.01	23.91 S	133.37 E	10,374,153.94	1,986,325.44	0.61	-20.27	
4,755.00	1.63	86.39	2,015.96	4,751.96	23.79 S	136.44 E	10,374,154.06	1,986,328.51	0.47	-20.07	
4,849.00	2.67	86.89	2,109.90	4,845.90	23.59 S	139.96 E	10,374,154.26	1,986,332.03	1.11	-19.77	
4,943.00	2.06	85.55	2,203.82	4,939.82	23.34 S	143.83 E	10,374,154.51	1,986,335.90	0.65	-19.42	
5,038.00	1.82	73.71	2,298.76	5,034.76	22.79 S	146.98 E	10,374,155.06	1,986,339.05	0.49	-18.78	
5,132.00	2.94	78.99	2,392.68	5,128.68	21.91 S	150.78 E	10,374,155.94	1,986,342.85	1.21	-17.79	
5,227.00	2.70	73.29	2,487.56	5,223.56	20.80 S	155.31 E	10,374,157.05	1,986,347.38	0.39	-16.56	
5,321.00	1.89	68.97	2,581.49	5,317.49	19.61 S	158.88 E	10,374,158.24	1,986,350.95	0.88	-15.27	
5,416.00	1.55	66.31	2,676.45	5,412.45	18.53 S	161.52 E	10,374,159.32	1,986,353.59	0.37	-14.12	
5,510.00	2.35	69.63	2,770.39	5,506.39	17.35 S	164.49 E	10,374,160.50	1,986,356.56	0.86	-12.86	
5,605.00	1.95	65.87	2,865.32	5,601.32	16.01 S	167.79 E	10,374,161.84	1,986,359.86	0.45	-11.43	
5,700.00	2.60	83.55	2,960.25	5,696.25	15.10 S	171.41 E	10,374,162.75	1,986,363.48	1.00	-10.43	
5,795.00	2.23	73.50	3,055.16	5,791.16	14.34 S	175.32 E	10,374,163.51	1,986,367.39	0.59	-9.56	
5,889.00	2.01	65.74	3,149.10	5,885.10	13.14 S	178.58 E	10,374,164.71	1,986,370.65	0.38	-8.27	
5,984.00	1.45	55.02	3,244.06	5,980.06	11.77 S	181.08 E	10,374,166.08	1,986,373.15	0.68	-6.83	
6,078.00	1.82	68.73	3,338.02	6,074.02	10.54 S	183.45 E	10,374,167.31	1,986,375.52	0.57	-5.55	
6,141.00	1.85	55.15	3,400.99	6,136.99	9.60 S	185.21 E	10,374,168.25	1,986,377.28	0.69	-4.55	
6,172.00	4.59	24.50	3,431.94	6,167.94	8.18 S	186.14 E	10,374,169.67	1,986,378.21	10.14	-3.11	
6,204.00	8.69	16.47	3,463.72	6,199.72	4.70 S	187.35 E	10,374,173.15	1,986,379.42	13.11	0.40	
6,235.00	12.29	15.44	3,494.19	6,230.19	0.73 N	188.90 E	10,374,178.58	1,986,380.97	11.63	5.87	
6,267.00	15.26	16.94	3,525.27	6,261.27	8.04 N	191.03 E	10,374,185.89	1,986,383.10	9.35	13.24	
6,298.00	17.51	17.65	3,555.01	6,291.01	16.39 N	193.63 E	10,374,194.24	1,986,385.70	7.29	21.65	
6,330.00	20.01	17.73	3,585.31	6,321.31	26.19 N	196.76 E	10,374,204.04	1,986,388.83	7.81	31.54	
6,362.00	22.98	16.49	3,615.08	6,351.08	37.40 N	200.20 E	10,374,215.25	1,986,392.27	9.39	42.84	
6,393.00	25.22	14.58	3,643.37	6,379.37	49.60 N	203.58 E	10,374,227.45	1,986,395.65	7.65	55.12	
6,425.00	27.07	11.47	3,672.10	6,408.10	63.33 N	206.75 E	10,374,241.18	1,986,398.82	7.19	68.94	
6,456.00	28.16	7.10	3,699.57	6,435.57	77.51 N	209.06 E	10,374,255.36	1,986,401.13	7.42	83.17	
6,488.00	28.51	2.92	3,727.74	6,463.74	92.63 N	210.38 E	10,374,270.48	1,986,402.45	6.29	98.32	
6,519.00	28.76	358.55	3,754.95	6,490.95	107.47 N	210.57 E	10,374,285.32	1,986,402.64	6.80	113.17	
6,551.00	30.47	357.11	3,782.77	6,518.77	123.27 N	209.96 E	10,374,301.12	1,986,402.03	5.79	128.94	
6,582.00	31.96	357.35	3,809.28	6,545.28	139.32 N	209.19 E	10,374,317.17	1,986,401.26	4.82	144.96	
6,614.00	34.57	358.35	3,836.04	6,572.04	156.86 N	208.53 E	10,374,334.71	1,986,400.60	8.33	162.48	
6,646.00	37.83	358.86	3,861.86	6,597.86	175.75 N	208.08 E	10,374,353.60	1,986,400.15	10.23	181.35	

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Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (usft)	Easting (usft)			
6,677.00	41.34	358.46	3,885.74	6,621.74	195.49 N	207.61 E	10,374,373.34	1,986,399.68	11.35	201.07	
6,709.00	45.14	358.68	3,909.05	6,645.05	217.41 N	207.07 E	10,374,395.25	1,986,399.14	11.88	222.96	
6,740.00	48.76	359.74	3,930.21	6,666.21	240.05 N	206.76 E	10,374,417.90	1,986,398.83	11.94	245.59	
6,772.00	52.99	359.35	3,950.40	6,686.40	264.87 N	206.56 E	10,374,442.72	1,986,398.63	13.25	270.40	
6,803.00	55.94	359.56	3,968.41	6,704.41	290.09 N	206.32 E	10,374,467.94	1,986,398.39	9.53	295.60	
6,834.00	56.76	359.01	3,985.59	6,721.59	315.90 N	206.00 E	10,374,493.75	1,986,398.07	3.03	321.39	
6,866.00	60.36	359.76	4,002.28	6,738.28	343.19 N	205.71 E	10,374,521.04	1,986,397.78	11.43	348.66	
6,898.00	63.99	0.43	4,017.21	6,753.21	371.49 N	205.76 E	10,374,549.34	1,986,397.83	11.49	376.95	
6,929.00	67.44	1.59	4,029.96	6,765.96	399.73 N	206.26 E	10,374,577.58	1,986,398.33	11.64	405.20	
6,961.00	70.92	2.48	4,041.33	6,777.33	429.62 N	207.33 E	10,374,607.47	1,986,399.40	11.18	435.11	
6,992.00	74.36	3.92	4,050.58	6,786.58	459.16 N	208.98 E	10,374,637.01	1,986,401.05	11.95	464.68	
7,024.00	78.03	4.92	4,058.22	6,794.22	490.13 N	211.38 E	10,374,667.98	1,986,403.45	11.86	495.71	
7,056.00	82.70	4.43	4,063.57	6,799.57	521.57 N	213.95 E	10,374,699.42	1,986,406.02	14.67	527.20	
7,087.00	86.57	3.59	4,066.47	6,802.47	552.35 N	216.10 E	10,374,730.20	1,986,408.17	12.77	558.03	
7,119.00	88.45	2.76	4,067.86	6,803.86	584.27 N	217.87 E	10,374,762.12	1,986,409.94	6.42	589.99	
7,182.00	93.30	2.30	4,066.90	6,802.90	647.18 N	220.65 E	10,374,825.03	1,986,412.72	7.73	652.95	
7,276.00	91.48	0.47	4,062.98	6,798.98	741.07 N	222.92 E	10,374,918.91	1,986,414.99	2.74	746.86	
7,371.00	92.35	0.40	4,059.80	6,795.80	836.01 N	223.64 E	10,375,013.86	1,986,415.71	0.92	841.79	
7,465.00	89.80	358.23	4,058.04	6,794.04	929.97 N	222.52 E	10,375,107.82	1,986,414.59	3.56	935.69	
7,560.00	90.81	357.94	4,057.53	6,793.53	1,024.92 N	219.35 E	10,375,202.76	1,986,411.42	1.11	1,030.51	
7,654.00	91.51	357.39	4,055.63	6,791.63	1,118.82 N	215.52 E	10,375,296.67	1,986,407.59	0.95	1,124.27	
7,749.00	92.52	357.14	4,052.29	6,788.29	1,213.65 N	210.99 E	10,375,391.50	1,986,403.06	1.10	1,218.94	
7,843.00	90.71	358.47	4,049.64	6,785.64	1,307.54 N	207.39 E	10,375,485.39	1,986,399.46	2.39	1,312.70	
7,938.00	89.23	0.23	4,049.69	6,785.69	1,402.53 N	206.31 E	10,375,580.37	1,986,398.38	2.42	1,407.62	
8,033.00	91.01	1.67	4,049.49	6,785.49	1,497.51 N	207.89 E	10,375,675.35	1,986,399.96	2.41	1,502.61	
8,127.00	92.25	2.22	4,046.82	6,782.82	1,591.41 N	211.07 E	10,375,769.26	1,986,403.14	1.44	1,596.57	
8,222.00	91.21	359.22	4,043.95	6,779.95	1,686.35 N	212.27 E	10,375,864.20	1,986,404.34	3.34	1,691.50	
8,316.00	92.42	359.46	4,040.97	6,776.97	1,780.29 N	211.18 E	10,375,958.14	1,986,403.25	1.31	1,785.38	
8,411.00	91.28	1.03	4,037.90	6,773.90	1,875.24 N	211.59 E	10,376,053.08	1,986,403.66	2.04	1,880.30	
8,506.00	88.69	0.63	4,037.93	6,773.93	1,970.22 N	212.97 E	10,376,148.07	1,986,405.04	2.76	1,975.29	
8,601.00	89.40	0.48	4,039.51	6,775.51	2,065.20 N	213.89 E	10,376,243.05	1,986,405.96	0.76	2,070.26	
8,695.00	87.95	0.96	4,041.69	6,777.69	2,159.17 N	215.07 E	10,376,337.01	1,986,407.14	1.62	2,164.22	
8,790.00	89.09	1.22	4,044.14	6,780.14	2,254.12 N	216.87 E	10,376,431.96	1,986,408.94	1.23	2,259.18	
8,885.00	90.67	2.31	4,044.34	6,780.34	2,349.07 N	219.80 E	10,376,526.91	1,986,411.87	2.02	2,354.18	
8,979.00	91.04	359.65	4,042.94	6,778.94	2,443.03 N	221.41 E	10,376,620.88	1,986,413.48	2.86	2,448.16	
9,074.00	92.42	359.61	4,040.07	6,776.07	2,537.99 N	220.79 E	10,376,715.83	1,986,412.86	1.45	2,543.06	
9,169.00	89.83	359.45	4,038.20	6,774.20	2,632.96 N	220.02 E	10,376,810.80	1,986,412.09	2.73	2,637.97	
9,263.00	91.65	0.63	4,036.99	6,772.99	2,726.94 N	220.08 E	10,376,904.79	1,986,412.15	2.31	2,731.92	
9,358.00	88.72	359.78	4,036.68	6,772.68	2,821.93 N	220.42 E	10,376,999.78	1,986,412.49	3.21	2,826.89	
9,453.00	89.73	359.86	4,037.97	6,773.97	2,916.92 N	220.12 E	10,377,094.76	1,986,412.19	1.07	2,921.83	
9,547.00	90.98	359.69	4,037.38	6,773.38	3,010.92 N	219.75 E	10,377,188.76	1,986,411.82	1.34	3,015.78	

Survey Report for University 48-09 3H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates		Map Coordinates		Dogleg Rate (°/100usft)	Vertical Section (ft)	Comments
					Northing (ft)	Easting (ft)	Northing (usft)	Easting (usft)			
9,641.00	91.81	359.17	4,035.10	6,771.10	3,104.88 N	218.82 E	10,377,282.73	1,986,410.89	1.04	3,109.69	
9,736.00	89.13	357.57	4,034.32	6,770.32	3,199.83 N	216.12 E	10,377,377.67	1,986,408.19	3.29	3,204.53	
9,830.00	90.60	358.36	4,034.54	6,770.54	3,293.77 N	212.78 E	10,377,471.61	1,986,404.85	1.78	3,298.34	
9,925.00	88.99	0.90	4,034.88	6,770.88	3,388.75 N	212.17 E	10,377,566.60	1,986,404.23	3.17	3,393.27	
10,019.00	90.07	1.12	4,035.65	6,771.65	3,482.73 N	213.82 E	10,377,660.58	1,986,405.89	1.17	3,487.26	
10,114.00	91.85	0.63	4,034.06	6,770.06	3,577.70 N	215.27 E	10,377,755.55	1,986,407.34	1.94	3,582.24	
10,209.00	88.92	0.05	4,033.42	6,769.42	3,672.69 N	215.84 E	10,377,850.53	1,986,407.91	3.14	3,677.20	
10,303.00	89.93	0.11	4,034.36	6,770.36	3,766.68 N	215.97 E	10,377,944.53	1,986,408.04	1.08	3,771.17	
10,398.00	91.04	359.32	4,033.56	6,769.56	3,861.68 N	215.50 E	10,378,039.52	1,986,407.56	1.43	3,866.11	
10,492.00	88.59	1.22	4,033.86	6,769.86	3,955.66 N	215.94 E	10,378,133.51	1,986,408.01	3.30	3,960.08	
10,587.00	89.83	0.89	4,035.17	6,771.17	4,050.64 N	217.69 E	10,378,228.48	1,986,409.76	1.35	4,055.06	
10,682.00	91.28	1.34	4,034.25	6,770.25	4,145.61 N	219.54 E	10,378,323.45	1,986,411.60	1.60	4,150.05	
10,776.00	88.96	359.60	4,034.06	6,770.06	4,239.60 N	220.31 E	10,378,417.44	1,986,412.38	3.09	4,244.02	
10,871.00	90.94	1.57	4,034.14	6,770.14	4,334.58 N	221.28 E	10,378,512.43	1,986,413.35	2.94	4,339.00	
10,965.00	89.90	0.15	4,033.45	6,769.45	4,428.57 N	222.69 E	10,378,606.41	1,986,414.76	1.87	4,432.99	
11,060.00	88.49	359.11	4,034.78	6,770.78	4,523.55 N	222.07 E	10,378,701.39	1,986,414.14	1.84	4,527.92	
11,154.00	89.63	358.86	4,036.33	6,772.33	4,617.52 N	220.41 E	10,378,795.36	1,986,412.48	1.24	4,621.81	
11,249.00	91.01	359.40	4,035.80	6,771.80	4,712.51 N	218.97 E	10,378,890.35	1,986,411.04	1.56	4,716.72	
11,344.00	92.28	358.80	4,033.07	6,769.07	4,807.45 N	217.47 E	10,378,985.30	1,986,409.54	1.48	4,811.59	
11,438.00	89.66	359.36	4,031.48	6,767.48	4,901.42 N	215.97 E	10,379,079.26	1,986,408.04	2.85	4,905.48	
11,533.00	87.38	0.71	4,033.93	6,769.93	4,996.38 N	216.02 E	10,379,174.22	1,986,408.09	2.79	5,000.41	
11,627.00	88.35	0.53	4,037.43	6,773.43	5,090.31 N	217.04 E	10,379,268.15	1,986,409.11	1.05	5,094.33	
11,722.00	89.26	0.79	4,039.41	6,775.41	5,185.28 N	218.13 E	10,379,363.12	1,986,410.20	1.00	5,189.30	
11,817.00	90.54	0.62	4,039.58	6,775.58	5,280.27 N	219.30 E	10,379,458.11	1,986,411.37	1.36	5,284.28	
11,911.00	91.61	0.73	4,037.82	6,773.82	5,374.25 N	220.41 E	10,379,552.09	1,986,412.48	1.14	5,378.26	
12,006.00	92.79	0.60	4,034.17	6,770.17	5,469.17 N	221.51 E	10,379,647.01	1,986,413.58	1.25	5,473.17	
12,101.00	91.58	359.17	4,030.55	6,766.55	5,564.10 N	221.32 E	10,379,741.93	1,986,413.39	1.97	5,568.06	
12,195.00	90.27	0.02	4,029.03	6,765.03	5,658.08 N	220.66 E	10,379,835.92	1,986,412.73	1.66	5,661.99	
12,290.00	91.45	359.77	4,027.60	6,763.60	5,753.07 N	220.48 E	10,379,930.90	1,986,412.55	1.27	5,756.94	
12,384.00	90.30	1.42	4,026.17	6,762.17	5,847.04 N	221.46 E	10,380,024.88	1,986,413.53	2.14	5,850.91	
12,479.00	90.47	1.93	4,025.53	6,761.53	5,942.00 N	224.24 E	10,380,119.84	1,986,416.31	0.57	5,945.90	
12,573.00	89.76	358.86	4,025.34	6,761.34	6,035.99 N	224.88 E	10,380,213.82	1,986,416.95	3.35	6,039.87	
12,667.00	90.97	358.34	4,024.74	6,760.74	6,129.95 N	222.59 E	10,380,307.79	1,986,414.66	1.40	6,133.74	
12,762.00	89.66	359.51	4,024.22	6,760.22	6,224.93 N	220.80 E	10,380,402.77	1,986,412.87	1.85	6,228.64	
12,856.00	90.10	358.81	4,024.42	6,760.42	6,318.92 N	219.43 E	10,380,496.76	1,986,411.50	0.88	6,322.55	
12,950.00	90.57	358.35	4,023.87	6,759.87	6,412.89 N	217.10 E	10,380,590.73	1,986,409.17	0.70	6,416.42	
13,045.00	87.07	358.05	4,025.82	6,761.82	6,507.81 N	214.11 E	10,380,685.65	1,986,406.18	3.70	6,511.23	
13,140.00	87.14	0.17	4,030.62	6,766.62	6,602.67 N	212.64 E	10,380,780.51	1,986,404.71	2.23	6,606.01	
13,234.00	88.15	359.95	4,034.48	6,770.48	6,696.59 N	212.74 E	10,380,874.43	1,986,404.81	1.10	6,699.90	
13,329.00	87.95	1.40	4,037.72	6,773.72	6,791.53 N	213.86 E	10,380,969.36	1,986,405.93	1.54	6,794.83	
13,424.00	89.29	3.21	4,040.01	6,776.01	6,886.42 N	217.68 E	10,381,064.25	1,986,409.75	2.37	6,889.79	

Survey Report for University 48-09 3H - Sperry MWD Surveys

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft)	Local Coordinates Easting (ft)	Map Coordinates Northing (usft)	Map Coordinates Easting (usft)	Dogleg Rate (°/100usft)	Vertical Section (ft)	Comments
13,518.00	92.22	2.95	4,038.77	6,774.77	6,980.26 N	222.73 E	10,381,158.10	1,986,414.80	3.13	6,983.74	
13,613.00	91.92	0.13	4,035.33	6,771.33	7,075.16 N	225.28 E	10,381,252.99	1,986,417.35	2.98	7,078.67	
13,707.00	91.72	358.07	4,032.35	6,768.35	7,169.09 N	223.80 E	10,381,346.93	1,986,415.87	2.20	7,172.53	
13,802.00	92.66	358.06	4,028.72	6,764.72	7,263.97 N	220.60 E	10,381,441.80	1,986,412.67	0.99	7,267.28	
13,897.00	91.17	359.50	4,025.54	6,761.54	7,358.89 N	218.58 E	10,381,536.72	1,986,410.65	2.18	7,362.11	
13,991.00	92.32	359.56	4,022.68	6,758.68	7,452.84 N	217.81 E	10,381,630.67	1,986,409.88	1.23	7,456.01	
14,085.00	89.73	359.65	4,021.00	6,757.00	7,546.81 N	217.16 E	10,381,724.65	1,986,409.23	2.76	7,549.93	
14,180.00	90.87	0.10	4,020.50	6,756.50	7,641.81 N	216.95 E	10,381,819.64	1,986,409.02	1.29	7,644.88	
14,274.00	91.78	359.80	4,018.33	6,754.33	7,735.78 N	216.87 E	10,381,913.62	1,986,408.94	1.02	7,738.82	
14,288.00	92.01	359.73	4,017.87	6,753.87	7,749.78 N	216.81 E	10,381,927.61	1,986,408.88	1.72	7,752.81	Final Sperry MWD Survey
14,338.00	92.01	359.73	4,016.11	6,752.11	7,799.74 N	216.58 E	10,381,977.58	1,986,408.65	0.00	7,802.75	Projection to TD

Survey Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	Local Coordinates +E/-W (ft)	Comment
86.00	86.00	-0.26	-0.10	First Sperry MWD Survey
14,288.00	6,753.87	7,749.78	216.81	Final Sperry MWD Survey
14,338.00	6,752.11	7,799.74	216.58	Projection to TD

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/-S (ft)	Origin +E/-W (ft)	Start TVD (ft)
User	No Target (Freehand)	1.56	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
86.00	14,338.00	Sperry MWD Surveys	MWD

Survey Report for University 48-09 3H - Sperry MWD Surveys

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
University 48-09 3H BHL RevA2 ()	0.00	0.00	6,759.00	7,799.84	212.61	10,381,977.67	1,986,404.68	31° 8' 46.247 N	101° 19' 29.666 W
- survey misses target center by 7.95ft at 14337.87ft MD (6752.12 TVD, 7799.62 N, 216.58 E)									
- Point									

Directional Difficulty Index

Average Dogleg over Survey:	1.82 °/100usft	Maximum Dogleg over Survey:	14.67 °/100usft at 7,056.00 ft
Net Tortousity applicable to Plans:	0.75 °/100usft	Directional Difficulty Index:	6.644

Audit Info

SAP=346244

North Reference Sheet for University Sec 9 Blk 48 - University 48-09 3H - Wellbore #1

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

Vertical Depths are relative to WELL @ 2736.00ft (HP267). Northing and Easting are relative to University 48-09 3H

Coordinate System is US State Plane 1983, Texas Central Zone using datum North American Datum 1983, ellipsoid GRS 1980

Projection method is Lambert Conformal Conic (2 parallel)

Central Meridian is 100° 20' 0.000 W°, Longitude Origin:0° 0' 0.000 E°, Latitude Origin:31° 53' 0.000 N°

False Easting: 2,296,583.33usft, False Northing: 9,842,500.00usft, Scale Reduction: 0.99988405

Grid Coordinates of Well: 10,374,177.85 usft N, 1,986,192.07 usft E

Geographical Coordinates of Well: 31° 07' 29.03" N, 101° 19' 31.31" W

Grid Convergence at Surface is: -0.51°

Based upon Minimum Curvature type calculations, at a Measured Depth of 14,338.00ft
the Bottom Hole Displacement is 7,802.75ft in the Direction of 1.59° (Grid).

Magnetic Convergence at surface is: -6.67° (6 June 2014, , BGGM2014)

