

# Shell Exploration & Production Co. Inc.

Harper Co. KS (NAD-27)

Sec 34-T34S-R07W

Davis 3407 #27-2H/ Job# 9341868/ Nab 180

Wellbore #1

Design: Wellbore #1

## Sperry Drilling Services

# Combo Report With Grid North & True North

06 June, 2012

Well Coordinates: 140,195.98 N, 2,126,384.79 E (37° 03' 03.19" N, 098° 04' 01.07" W)

Ground Level: 1,402.00 ft

Local Coordinate Origin:

Centered on Well Davis 3407 #27-2H/ Job# 9341868/ Nab 180

Viewing Datum:

WELL @ 1425.80ft (Original Well Elev)

TVDs to System:

N

North Reference:

True

Unit System:

API-US-new

Version: 2003.21 Build: 43

**HALLIBURTON**

**Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - 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	1,425.80	0.00	0.00 N	0.00 E	140,195.98	2,126,384.79	0.00	0.00	
142.00	0.25	58.21	58.48	1,283.80	142.00	0.16 N	0.26 E	140,196.14	2,126,385.05	0.18	0.17	First MWD Survey
173.00	0.28	78.84	79.11	1,252.80	173.00	0.21 N	0.40 E	140,196.19	2,126,385.18	0.32	0.23	
204.00	0.50	131.02	131.29	1,221.80	204.00	0.14 N	0.57 E	140,196.12	2,126,385.36	1.28	0.16	
235.00	1.71	114.85	115.12	1,190.81	234.99	0.15 S	1.09 E	140,195.84	2,126,385.88	3.99	-0.11	
270.00	2.16	120.07	120.34	1,155.83	269.97	0.70 S	2.13 E	140,195.29	2,126,386.92	1.38	-0.62	
301.00	2.75	115.81	116.08	1,124.86	300.94	1.33 S	3.31 E	140,194.67	2,126,388.10	1.99	-1.20	
332.00	3.08	115.99	116.26	1,093.90	331.90	2.02 S	4.72 E	140,193.98	2,126,389.52	1.06	-1.84	
363.00	3.39	114.92	115.19	1,062.95	362.85	2.78 S	6.30 E	140,193.23	2,126,391.10	1.02	-2.54	
394.00	4.00	114.53	114.80	1,032.01	393.79	3.62 S	8.11 E	140,192.39	2,126,392.91	1.97	-3.32	
425.00	4.99	107.16	107.43	1,001.11	424.69	4.48 S	10.38 E	140,191.55	2,126,395.18	3.69	-4.09	
519.00	5.77	107.61	107.88	907.52	518.28	7.16 S	18.77 E	140,188.91	2,126,403.59	0.83	-6.45	
612.00	5.66	95.88	96.15	814.98	610.82	9.08 S	27.78 E	140,187.03	2,126,412.61	1.26	-8.04	
705.00	5.69	84.95	85.22	722.43	703.37	9.19 S	36.94 E	140,186.96	2,126,421.77	1.16	-7.81	
755.00	5.54	86.72	86.99	672.67	753.13	8.86 S	41.82 E	140,187.32	2,126,426.65	0.46	-7.30	
889.00	5.35	86.27	86.54	539.28	886.52	8.14 S	54.51 E	140,188.09	2,126,439.34	0.15	-6.11	
984.00	3.64	81.96	82.23	444.57	981.23	7.47 S	61.92 E	140,188.80	2,126,446.74	1.83	-5.16	
1,078.00	2.79	72.66	72.93	350.72	1,075.08	6.39 S	67.07 E	140,189.90	2,126,451.88	1.06	-3.89	
1,173.00	2.31	74.12	74.39	255.82	1,169.98	5.20 S	71.12 E	140,191.11	2,126,455.93	0.51	-2.55	
1,268.00	1.70	92.91	93.18	160.87	1,264.93	4.76 S	74.37 E	140,191.57	2,126,459.18	0.94	-1.99	
1,363.00	1.67	94.32	94.59	65.91	1,359.89	4.95 S	77.16 E	140,191.39	2,126,461.97	0.05	-2.08	
1,458.00	0.90	106.29	106.56	-29.06	1,454.86	5.27 S	79.25 E	140,191.08	2,126,464.06	0.85	-2.32	
1,553.00	0.44	97.77	98.04	-124.05	1,549.85	5.54 S	80.33 E	140,190.82	2,126,465.14	0.49	-2.55	
1,743.00	0.18	64.67	64.94	-314.05	1,739.85	5.51 S	81.32 E	140,190.85	2,126,466.13	0.16	-2.48	
1,933.00	0.34	46.94	47.21	-504.05	1,929.85	5.00 S	82.01 E	140,191.36	2,126,466.81	0.09	-1.95	
2,123.00	0.53	9.45	9.72	-694.04	2,119.84	3.75 S	82.57 E	140,192.61	2,126,467.37	0.17	-0.68	
2,313.00	0.37	18.09	18.36	-884.04	2,309.84	2.30 S	82.91 E	140,194.06	2,126,467.71	0.09	0.78	
2,503.00	0.21	65.49	65.76	-1,074.04	2,499.84	1.58 S	83.42 E	140,194.79	2,126,468.21	0.14	1.52	
2,693.00	0.31	48.77	49.04	-1,264.03	2,689.83	1.10 S	84.13 E	140,195.27	2,126,468.92	0.07	2.03	
2,882.00	0.26	74.56	74.83	-1,453.03	2,878.83	0.65 S	84.93 E	140,195.72	2,126,469.71	0.07	2.51	
3,072.00	0.23	86.88	87.15	-1,643.03	3,068.83	0.52 S	85.72 E	140,195.86	2,126,470.51	0.03	2.67	
3,262.00	0.30	30.38	30.65	-1,833.03	3,258.83	0.07 S	86.36 E	140,196.31	2,126,471.14	0.14	3.14	
3,452.00	0.56	12.69	12.96	-2,023.02	3,448.82	1.26 N	86.82 E	140,197.64	2,126,471.60	0.15	4.49	
3,642.00	0.59	19.39	19.66	-2,213.01	3,638.81	3.09 N	87.36 E	140,199.47	2,126,472.13	0.04	6.33	
3,831.00	0.20	333.43	333.70	-2,402.01	3,827.81	4.30 N	87.54 E	140,200.68	2,126,472.30	0.25	7.55	
4,021.00	0.31	314.45	314.72	-2,592.01	4,017.81	4.96 N	87.03 E	140,201.34	2,126,471.79	0.07	8.19	
4,078.00	1.02	347.41	347.68	-2,649.00	4,074.80	5.56 N	86.81 E	140,201.94	2,126,471.57	1.37	8.78	

## Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - 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			
4,109.00	1.87	344.23	344.50	-2,679.99	4,105.79	6.32 N	86.61 E	140,202.70	2,126,471.37	2.75	9.53	
4,141.00	3.39	3.05	3.32	-2,711.96	4,137.76	7.77 N	86.53 E	140,204.15	2,126,471.28	5.40	10.98	
4,173.00	5.98	7.59	7.86	-2,743.85	4,169.65	10.36 N	86.81 E	140,206.75	2,126,471.55	8.17	13.58	
4,204.00	7.94	8.73	9.00	-2,774.62	4,200.42	14.08 N	87.37 E	140,210.46	2,126,472.09	6.34	17.31	
4,236.00	9.52	1.34	1.61	-2,806.25	4,232.05	18.91 N	87.79 E	140,215.29	2,126,472.49	6.05	22.16	
4,268.00	11.46	358.41	358.68	-2,837.71	4,263.51	24.73 N	87.79 E	140,221.12	2,126,472.46	6.29	27.98	
4,300.00	14.11	356.18	356.45	-2,868.92	4,294.72	31.80 N	87.47 E	140,228.19	2,126,472.11	8.42	35.03	
4,331.00	16.95	356.99	357.26	-2,898.78	4,324.58	40.09 N	87.02 E	140,236.47	2,126,471.62	9.19	43.30	
4,362.00	18.71	357.92	358.19	-2,928.29	4,354.09	49.57 N	86.65 E	140,245.95	2,126,471.21	5.75	52.76	
4,393.00	21.09	358.15	358.42	-2,957.44	4,383.24	60.12 N	86.34 E	140,256.50	2,126,470.85	7.68	63.29	
4,425.00	24.01	358.64	358.91	-2,986.99	4,412.79	72.39 N	86.06 E	140,268.76	2,126,470.51	9.14	75.53	
4,457.00	26.79	357.14	357.41	-3,015.89	4,441.69	86.10 N	85.61 E	140,282.48	2,126,469.99	8.92	89.22	
4,488.00	28.42	357.04	357.31	-3,043.36	4,469.16	100.45 N	84.95 E	140,296.82	2,126,469.26	5.26	103.54	Start of Tangent
4,520.00	28.83	356.32	356.59	-3,071.45	4,497.25	115.76 N	84.13 E	140,312.13	2,126,468.38	1.67	118.81	
4,552.00	29.46	355.37	355.64	-3,099.40	4,525.20	131.31 N	83.07 E	140,327.67	2,126,467.25	2.44	134.30	
4,583.00	29.32	354.30	354.57	-3,126.41	4,552.21	146.47 N	81.77 E	140,342.82	2,126,465.88	1.75	149.40	
4,615.00	29.48	354.29	354.56	-3,154.29	4,580.09	162.10 N	80.29 E	140,358.45	2,126,464.32	0.50	164.98	
4,646.00	29.17	353.47	353.74	-3,181.32	4,607.12	177.21 N	78.74 E	140,373.55	2,126,462.70	1.64	180.01	
4,678.00	29.99	353.37	353.64	-3,209.15	4,634.95	192.91 N	77.00 E	140,389.24	2,126,460.89	2.57	195.64	End of Tangent
4,710.00	32.81	355.54	355.81	-3,236.46	4,662.26	209.51 N	75.48 E	140,405.83	2,126,459.30	9.49	212.17	
4,741.00	35.03	357.18	357.45	-3,262.18	4,687.98	226.77 N	74.47 E	140,423.10	2,126,458.21	7.75	229.38	
4,773.00	37.02	358.15	358.42	-3,288.06	4,713.86	245.58 N	73.80 E	140,441.90	2,126,457.44	6.47	248.15	
4,804.00	40.61	358.66	358.93	-3,312.21	4,738.01	265.00 N	73.35 E	140,461.32	2,126,456.91	11.63	267.55	
4,836.00	45.08	358.58	358.85	-3,335.67	4,761.47	286.75 N	72.93 E	140,483.07	2,126,456.39	13.97	289.27	
4,868.00	48.54	359.20	359.47	-3,357.57	4,783.37	310.08 N	72.59 E	140,506.39	2,126,455.94	10.90	312.56	
4,893.85	52.30	359.71	359.98	-3,374.03	4,799.83	330.00 N	72.50 E	140,526.31	2,126,455.75	14.63	332.46	Cross 330' FSL @ 4,893.85' MD (330' FSL / 2120 FWL)
4,899.00	53.05	359.80	0.07	-3,377.16	4,802.96	334.09 N	72.50 E	140,530.41	2,126,455.74	14.63	336.56	
4,931.00	58.58	359.29	359.56	-3,395.13	4,820.93	360.55 N	72.41 E	140,556.87	2,126,455.52	17.33	363.00	
4,963.00	62.99	357.70	357.97	-3,410.74	4,836.54	388.47 N	71.80 E	140,584.78	2,126,454.78	14.45	390.87	
5,042.00	76.11	356.83	357.10	-3,438.29	4,864.09	462.26 N	68.60 E	140,658.55	2,126,451.24	16.64	464.49	
5,074.00	81.78	357.12	357.39	-3,444.42	4,870.22	493.61 N	67.09 E	140,689.90	2,126,449.59	17.74	495.77	
5,106.00	86.92	358.00	358.27	-3,447.57	4,873.37	525.43 N	65.89 E	140,721.70	2,126,448.23	16.29	527.51	
5,137.00	90.40	358.98	359.25	-3,448.29	4,874.09	556.40 N	65.22 E	140,752.68	2,126,447.42	11.66	558.44	
5,169.00	92.87	359.46	359.73	-3,447.38	4,873.18	588.39 N	64.93 E	140,784.66	2,126,446.99	7.86	590.39	
5,201.00	92.44	0.20	0.47	-3,445.90	4,871.70	620.35 N	64.99 E	140,816.63	2,126,446.89	2.67	622.34	
5,232.00	92.56	0.06	0.33	-3,444.55	4,870.35	651.32 N	65.21 E	140,847.60	2,126,446.97	0.59	653.30	
5,264.00	92.38	359.95	0.22	-3,443.17	4,868.97	683.29 N	65.36 E	140,879.57	2,126,446.97	0.66	685.25	

**Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - 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			
5,296.00	92.10	0.20	0.47	-3,441.92	4,867.72	715.27 N	65.55 E	140,911.54	2,126,447.02	1.17	717.21	
5,327.00	91.73	1.47	1.74	-3,440.88	4,866.68	746.24 N	66.15 E	140,942.52	2,126,447.47	4.26	748.19	
5,359.00	91.20	2.97	3.24	-3,440.06	4,865.86	778.20 N	67.54 E	140,974.49	2,126,448.71	4.97	780.17	
5,391.00	90.43	3.33	3.60	-3,439.61	4,865.41	810.14 N	69.45 E	141,006.43	2,126,450.47	2.66	812.16	
5,422.00	91.08	3.84	4.11	-3,439.20	4,865.00	841.07 N	71.53 E	141,037.37	2,126,452.41	2.67	843.15	
5,454.00	91.91	3.21	3.48	-3,438.36	4,864.16	872.99 N	73.65 E	141,069.30	2,126,454.38	3.26	875.12	
5,485.00	92.65	3.10	3.37	-3,437.13	4,862.93	903.91 N	75.50 E	141,100.23	2,126,456.09	2.41	906.09	
5,516.00	92.87	3.41	3.68	-3,435.64	4,861.44	934.81 N	77.40 E	141,131.14	2,126,457.85	1.23	937.04	
5,547.00	92.96	3.41	3.68	-3,434.06	4,859.86	965.71 N	79.39 E	141,162.04	2,126,459.69	0.29	967.99	
5,579.00	93.33	2.95	3.22	-3,432.31	4,858.11	997.60 N	81.31 E	141,193.95	2,126,461.47	1.84	999.94	
5,610.00	93.76	2.89	3.16	-3,430.39	4,856.19	1,028.49 N	83.03 E	141,224.85	2,126,463.04	1.40	1,030.87	
5,641.00	94.20	2.75	3.02	-3,428.24	4,854.04	1,059.38 N	84.70 E	141,255.73	2,126,464.57	1.49	1,061.79	
5,672.00	93.55	2.58	2.85	-3,426.14	4,851.94	1,090.26 N	86.28 E	141,286.63	2,126,466.01	2.17	1,092.72	
5,703.00	92.90	2.57	2.84	-3,424.40	4,850.20	1,121.18 N	87.82 E	141,317.55	2,126,467.40	2.10	1,123.67	
5,734.00	92.10	2.64	2.91	-3,423.05	4,848.85	1,152.11 N	89.37 E	141,348.49	2,126,468.81	2.59	1,154.63	
5,765.00	91.29	2.58	2.85	-3,422.13	4,847.93	1,183.05 N	90.93 E	141,379.44	2,126,470.22	2.62	1,185.62	
5,796.00	90.62	2.41	2.68	-3,421.61	4,847.41	1,214.01 N	92.43 E	141,410.41	2,126,471.57	2.23	1,216.61	
5,827.00	90.55	2.34	2.61	-3,421.30	4,847.10	1,244.98 N	93.86 E	141,441.38	2,126,472.86	0.32	1,247.61	
5,858.00	90.71	2.19	2.46	-3,420.96	4,846.76	1,275.95 N	95.23 E	141,472.35	2,126,474.09	0.71	1,278.60	
5,889.00	91.20	2.05	2.32	-3,420.44	4,846.24	1,306.92 N	96.52 E	141,503.33	2,126,475.24	1.64	1,309.60	
5,920.00	91.63	1.87	2.14	-3,419.67	4,845.47	1,337.88 N	97.73 E	141,534.30	2,126,476.30	1.50	1,340.59	
5,951.00	91.63	2.13	2.40	-3,418.79	4,844.59	1,368.85 N	98.95 E	141,565.27	2,126,477.38	0.84	1,371.58	
5,983.00	90.71	3.09	3.36	-3,418.14	4,843.94	1,400.80 N	100.56 E	141,597.23	2,126,478.84	4.15	1,403.57	
6,014.00	89.72	3.14	3.41	-3,418.02	4,843.82	1,431.74 N	102.39 E	141,628.18	2,126,480.53	3.20	1,434.56	
6,045.00	89.97	2.94	3.21	-3,418.11	4,843.91	1,462.69 N	104.18 E	141,659.14	2,126,482.17	1.03	1,465.55	
6,076.00	90.43	2.48	2.75	-3,418.00	4,843.80	1,493.65 N	105.79 E	141,690.10	2,126,483.64	2.10	1,496.55	
6,107.00	90.74	3.22	3.49	-3,417.68	4,843.48	1,524.60 N	107.48 E	141,721.06	2,126,485.19	2.59	1,527.54	
6,139.00	90.31	3.81	4.08	-3,417.39	4,843.19	1,556.53 N	109.59 E	141,753.00	2,126,487.15	2.28	1,559.53	
6,169.00	89.78	3.87	4.14	-3,417.36	4,843.16	1,586.45 N	111.74 E	141,782.93	2,126,489.16	1.78	1,589.51	
6,200.00	90.09	3.38	3.65	-3,417.40	4,843.20	1,617.38 N	113.85 E	141,813.87	2,126,491.12	1.87	1,620.49	
6,231.00	90.56	3.15	3.42	-3,417.22	4,843.02	1,648.32 N	115.76 E	141,844.82	2,126,492.89	1.69	1,651.48	
6,262.00	90.92	2.99	3.26	-3,416.82	4,842.62	1,679.27 N	117.57 E	141,875.77	2,126,494.55	1.27	1,682.48	
6,293.00	90.46	2.47	2.74	-3,416.45	4,842.25	1,710.22 N	119.19 E	141,906.73	2,126,496.03	2.24	1,713.47	
6,325.00	90.49	2.36	2.63	-3,416.18	4,841.98	1,742.18 N	120.69 E	141,938.70	2,126,497.38	0.36	1,745.47	
6,356.00	91.23	2.37	2.64	-3,415.72	4,841.52	1,773.15 N	122.11 E	141,969.67	2,126,498.66	2.39	1,776.46	
6,386.00	91.63	2.16	2.43	-3,414.97	4,840.77	1,803.11 N	123.44 E	141,999.64	2,126,499.85	1.51	1,806.45	
6,417.00	92.35	2.31	2.58	-3,413.89	4,839.69	1,834.06 N	124.79 E	142,030.60	2,126,501.06	2.37	1,837.43	

**Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - 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			
6,448.00	92.55	1.93	2.20	-3,412.57	4,838.37	1,865.01 N	126.08 E	142,061.55	2,126,502.21	1.38	1,868.40	
6,479.00	91.88	1.44	1.71	-3,411.37	4,837.17	1,895.96 N	127.14 E	142,092.51	2,126,503.12	2.68	1,899.38	
6,511.00	90.59	1.17	1.44	-3,410.68	4,836.48	1,927.94 N	128.02 E	142,124.49	2,126,503.85	4.12	1,931.37	
6,543.00	89.14	1.56	1.83	-3,410.76	4,836.56	1,959.93 N	128.93 E	142,156.48	2,126,504.62	4.69	1,963.37	
6,574.00	89.45	1.44	1.71	-3,411.14	4,836.94	1,990.91 N	129.89 E	142,187.47	2,126,505.43	1.07	1,994.36	
6,606.00	89.75	1.36	1.63	-3,411.36	4,837.16	2,022.90 N	130.82 E	142,219.46	2,126,506.21	0.97	2,026.36	
6,637.00	90.15	0.71	0.98	-3,411.39	4,837.19	2,053.89 N	131.53 E	142,250.45	2,126,506.78	2.46	2,057.36	
6,669.00	90.89	1.08	1.35	-3,411.10	4,836.90	2,085.88 N	132.18 E	142,282.45	2,126,507.28	2.59	2,089.35	
6,701.00	91.33	0.94	1.21	-3,410.48	4,836.28	2,117.87 N	132.89 E	142,314.44	2,126,507.84	1.44	2,121.34	
6,732.00	90.92	1.39	1.66	-3,409.87	4,835.67	2,148.85 N	133.67 E	142,345.43	2,126,508.48	1.96	2,152.34	
6,764.00	91.26	1.11	1.38	-3,409.26	4,835.06	2,180.83 N	134.52 E	142,377.41	2,126,509.18	1.38	2,184.33	
6,795.00	92.50	0.74	1.01	-3,408.24	4,834.04	2,211.81 N	135.17 E	142,408.39	2,126,509.68	4.17	2,215.31	
6,827.00	92.40	0.87	1.14	-3,406.88	4,832.68	2,243.78 N	135.77 E	142,440.36	2,126,510.13	0.51	2,247.27	
6,858.00	91.82	1.02	1.29	-3,405.73	4,831.53	2,274.75 N	136.42 E	142,471.33	2,126,510.64	1.93	2,278.25	
6,890.00	91.79	1.12	1.39	-3,404.73	4,830.53	2,306.72 N	137.17 E	142,503.31	2,126,511.24	0.33	2,310.23	
6,922.00	91.76	0.99	1.26	-3,403.74	4,829.54	2,338.70 N	137.91 E	142,535.29	2,126,511.83	0.42	2,342.21	
6,953.00	92.07	1.25	1.52	-3,402.70	4,828.50	2,369.67 N	138.66 E	142,566.27	2,126,512.44	1.30	2,373.19	
6,985.00	91.57	1.49	1.76	-3,401.68	4,827.48	2,401.64 N	139.58 E	142,598.24	2,126,513.21	1.73	2,405.17	
7,016.00	90.37	1.50	1.77	-3,401.16	4,826.96	2,432.62 N	140.53 E	142,629.23	2,126,514.02	3.87	2,436.17	
7,048.00	90.25	1.30	1.57	-3,400.99	4,826.79	2,464.61 N	141.46 E	142,661.21	2,126,514.80	0.73	2,468.16	
7,080.00	90.62	1.37	1.64	-3,400.74	4,826.54	2,496.60 N	142.36 E	142,693.21	2,126,515.55	1.18	2,500.16	
7,111.00	91.11	0.93	1.20	-3,400.27	4,826.07	2,527.58 N	143.13 E	142,724.20	2,126,516.17	2.12	2,531.16	
7,143.00	90.89	0.82	1.09	-3,399.72	4,825.52	2,559.57 N	143.77 E	142,756.19	2,126,516.67	0.77	2,563.15	
7,175.00	90.31	0.58	0.85	-3,399.38	4,825.18	2,591.56 N	144.31 E	142,788.18	2,126,517.06	1.96	2,595.14	
7,206.00	90.74	0.49	0.76	-3,399.10	4,824.90	2,622.56 N	144.74 E	142,819.18	2,126,517.35	1.42	2,626.13	
7,238.00	91.70	0.42	0.69	-3,398.42	4,824.22	2,654.55 N	145.15 E	142,851.17	2,126,517.61	3.01	2,658.11	
7,270.00	91.33	0.71	0.98	-3,397.57	4,823.37	2,686.54 N	145.62 E	142,883.16	2,126,517.92	1.47	2,690.09	
7,301.00	89.66	0.96	1.23	-3,397.30	4,823.10	2,717.53 N	146.21 E	142,914.15	2,126,518.38	5.45	2,721.08	
7,333.00	88.74	1.22	1.49	-3,397.75	4,823.55	2,749.52 N	146.97 E	142,946.14	2,126,518.99	2.99	2,753.08	
7,365.00	89.29	0.69	0.96	-3,398.30	4,824.10	2,781.50 N	147.66 E	142,978.13	2,126,519.52	2.39	2,785.07	
7,396.00	90.31	0.05	0.32	-3,398.41	4,824.21	2,812.50 N	148.00 E	143,009.13	2,126,519.73	3.88	2,816.06	
7,428.00	89.75	0.15	0.42	-3,398.39	4,824.19	2,844.50 N	148.21 E	143,041.13	2,126,519.78	1.78	2,848.04	
7,459.00	90.18	359.93	0.20	-3,398.41	4,824.21	2,875.50 N	148.38 E	143,072.13	2,126,519.81	1.56	2,879.03	
7,491.00	90.83	359.59	359.86	-3,398.13	4,823.93	2,907.50 N	148.39 E	143,104.13	2,126,519.68	2.29	2,911.00	
7,523.00	91.48	359.74	0.01	-3,397.48	4,823.28	2,939.49 N	148.36 E	143,136.12	2,126,519.49	2.08	2,942.97	
7,555.00	91.70	359.62	359.89	-3,396.59	4,822.39	2,971.48 N	148.33 E	143,168.11	2,126,519.31	0.78	2,974.94	
7,586.00	91.88	359.05	359.32	-3,395.63	4,821.43	3,002.46 N	148.12 E	143,199.09	2,126,518.96	1.93	3,005.89	

**Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - Wellbore #1**

Measured Depth (ft)	Inclination (°)	Grid Azimuth (°)	True Azimuth (°)	TVD below System (ft)	Vertical Depth (ft)	Local Coordinates Northing (ft) Easting (ft)		Map Coordinates Northing (ft) Easting (ft)		Dogleg Rate (°/100ft)	Vertical Section (ft)	Comments
7,618.00	90.89	359.13	359.40	-3,394.85	4,820.65	3,034.45 N	147.76 E	143,231.08	2,126,518.45	3.10	3,037.85	
7,650.00	89.44	359.16	359.43	-3,394.76	4,820.56	3,066.45 N	147.43 E	143,263.07	2,126,517.98	4.53	3,069.81	
7,681.00	89.38	359.61	359.88	-3,395.08	4,820.88	3,097.45 N	147.25 E	143,294.07	2,126,517.65	1.46	3,100.78	
7,713.00	88.80	359.17	359.44	-3,395.59	4,821.39	3,129.44 N	147.06 E	143,326.06	2,126,517.31	2.27	3,132.74	
7,745.00	88.24	359.01	359.28	-3,396.41	4,822.21	3,161.43 N	146.70 E	143,358.05	2,126,516.80	1.82	3,164.70	
7,808.00	89.01	0.26	0.53	-3,397.93	4,823.73	3,224.41 N	146.59 E	143,421.03	2,126,516.40	2.33	3,227.63	
7,903.00	91.04	0.40	0.67	-3,397.88	4,823.68	3,319.40 N	147.59 E	143,516.02	2,126,516.96	2.14	3,322.59	
7,998.00	91.70	0.54	0.81	-3,395.61	4,821.41	3,414.36 N	148.82 E	143,610.99	2,126,517.74	0.71	3,417.53	
8,093.00	89.11	0.45	0.72	-3,394.94	4,820.74	3,509.34 N	150.08 E	143,705.98	2,126,518.57	2.73	3,512.50	
8,188.00	89.32	0.72	0.99	-3,396.24	4,822.04	3,604.32 N	151.50 E	143,800.96	2,126,519.55	0.36	3,607.46	
8,282.00	90.68	0.45	0.72	-3,396.24	4,822.04	3,698.31 N	152.90 E	143,894.95	2,126,520.51	1.48	3,701.44	
8,377.00	90.52	1.01	1.28	-3,395.25	4,821.05	3,793.29 N	154.56 E	143,989.94	2,126,521.73	0.61	3,796.41	
8,472.00	90.28	359.89	0.16	-3,394.59	4,820.39	3,888.28 N	155.76 E	144,084.93	2,126,522.48	1.21	3,891.38	
8,567.00	90.74	0.00	0.27	-3,393.74	4,819.54	3,983.27 N	156.11 E	144,179.93	2,126,522.40	0.50	3,986.32	
8,662.00	89.54	0.48	0.75	-3,393.51	4,819.31	4,078.27 N	156.96 E	144,274.93	2,126,522.80	1.36	4,081.28	
8,757.00	92.03	0.24	0.51	-3,392.21	4,818.01	4,173.25 N	158.00 E	144,369.91	2,126,523.40	2.63	4,176.24	
8,852.00	92.24	0.77	1.04	-3,388.67	4,814.47	4,268.17 N	159.29 E	144,464.84	2,126,524.25	0.60	4,271.14	
8,947.00	90.49	0.26	0.53	-3,386.40	4,812.20	4,363.13 N	160.59 E	144,559.80	2,126,525.11	1.92	4,366.09	
9,042.00	88.95	359.88	0.15	-3,386.87	4,812.67	4,458.13 N	161.15 E	144,654.80	2,126,525.23	1.67	4,461.03	
9,137.00	89.41	0.24	0.51	-3,388.23	4,814.03	4,553.11 N	161.70 E	144,749.79	2,126,525.34	0.61	4,555.98	
9,231.00	89.72	359.50	359.77	-3,388.94	4,814.74	4,647.11 N	161.93 E	144,843.78	2,126,525.13	0.85	4,649.92	
9,326.00	91.30	359.93	0.20	-3,388.10	4,813.90	4,742.10 N	161.90 E	144,938.77	2,126,524.66	1.72	4,744.84	
9,421.00	90.92	359.90	0.17	-3,386.26	4,812.06	4,837.08 N	162.21 E	145,033.76	2,126,524.53	0.40	4,839.77	
9,516.00	90.03	359.96	0.23	-3,385.47	4,811.27	4,932.08 N	162.54 E	145,128.75	2,126,524.42	0.94	4,934.71	
9,527.92	90.14	359.88	0.14	-3,385.45	4,811.25	4,944.00 N	162.58 E	145,140.67	2,126,524.40	1.20	4,946.63	Cross 330' FNL @9,527.92' MD (330' FNL / 2289 FWL)
9,594.00	90.77	359.39	359.66	-3,384.92	4,810.72	5,010.08 N	162.47 E	145,206.75	2,126,523.98	1.20	5,012.65	Last MWD Survey
9,650.00	90.77	359.39	359.66	-3,384.17	4,809.97	5,066.07 N	162.13 E	145,262.74	2,126,523.39	0.00	5,068.60	Projected to TD

**Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - Wellbore #1**

**Design Annotations**

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
142.00	142.00	0.16	0.26	First MWD Survey
4,488.00	4,469.16	100.45	84.95	Start of Tangent
4,678.00	4,634.95	192.91	77.00	End of Tangent
4,893.85	4,799.83	330.00	72.50	Cross 330' FSL @ 4,893.85' MD (330' FSL / 2120 FWL)
9,527.92	4,811.25	4,944.00	162.58	Cross 330' FNL @9,527.92' MD (330' FNL / 2289 FWL)
9,594.00	4,810.72	5,010.08	162.47	Last MWD Survey
9,650.00	4,809.97	5,066.07	162.13	Projected 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)	2.13	Slot	0.00	0.00	0.00

**Survey tool program**

From (ft)	To (ft)	Survey/Plan	Survey Tool
142.00	9,650.00	MWD	MWD+SC

**Design Targets**

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

**Directional Difficulty Index**

Average Dogleg over Survey:	1.97 °/100ft	Maximum Dogleg over Survey:	17.74 °/100ft at 5,074.00 ft
Net Tortousity applicable to Plans:	0.87 °/100ft	Directional Difficulty Index:	6.289

Design Report for Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - Wellbore #1

---

Audit Info



**North Reference Sheet for Sec 34-T34S-R07W - Davis 3407 #27-2H/ Job# 9341868/ Nab 180 - 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 @ 1425.80ft (Original Well Elev). Northing and Easting are relative to Davis 3407 #27-2H/ Job# 9341868/ Nab 180

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: 1.00004941

Grid Coordinates of Well: 140,195.98 ft N, 2,126,384.79 ft E

Geographical Coordinates of Well: 37° 03' 03.19" N, 098° 04' 01.07" W

Grid Convergence at Surface is: 0.27°

Based upon Minimum Curvature type calculations, at a Measured Depth of 9,650.00ft the Bottom Hole Displacement is 5,068.66ft in the Direction of 1.83° (True).

Magnetic Convergence at surface is: -4.47° (27 February 2012, , BGGM2011)

