

Noble Energy

Weld County, CO

Sec. 25-T7N-R64W

Thunderhead USX AB 25-99 HZ

Wellbore #1

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

08 June, 2010

Well Coordinates: 1,445,086.27 N, 3,276,444.01 E (40° 33' 03.26" N, 104° 30' 18.66" W)

Ground Level: 4,783.00 ft

Local Coordinate Origin: Centered on Well Thunderhead USX AB 25-99 HZ

Viewing Datum: RKB - 13' @ 4796.00ft (Original Well Elev)

TVDs to System: N

North Reference: Grid

Unit System: API - US Survey Feet - Custom

Geodetic Scale Factor Applied

Version: 2003.16 Build: 43I

HALLIBURTON

Design Report for Thunderhead USX AB 25-99 HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
742.00	0.00	0.00	742.00	0.00	0.00	0.00	0.00
Surface Casing Assumed Vertical at 742.00ft							
777.00	0.32	0.99	777.00	0.10	0.00	-0.07	0.91
First MWD Survey							
906.00	0.44	35.43	906.00	0.86	0.30	-0.37	0.20
1,034.00	0.74	33.47	1,033.99	1.95	1.04	-0.57	0.23
1,163.00	0.74	47.92	1,162.98	3.20	2.11	-0.64	0.14
1,291.00	0.68	44.73	1,290.97	4.30	3.26	-0.54	0.06
1,419.00	0.69	47.46	1,418.96	5.36	4.36	-0.46	0.03
1,548.00	0.71	54.24	1,547.95	6.35	5.58	-0.24	0.07
1,676.00	0.77	50.78	1,675.94	7.36	6.89	0.03	0.06
1,805.00	0.88	47.94	1,804.93	8.57	8.30	0.24	0.09
1,933.00	0.74	36.12	1,932.91	9.90	9.52	0.23	0.17
2,061.00	0.54	63.32	2,060.91	10.83	10.54	0.34	0.28
2,190.00	0.26	96.92	2,189.90	11.07	11.38	0.79	0.27
2,318.00	0.03	70.62	2,317.90	11.05	11.70	1.04	0.18
2,447.00	0.69	173.11	2,446.90	10.29	11.82	1.65	0.54
2,575.00	0.74	168.99	2,574.89	8.71	12.07	2.90	0.06
2,747.00	0.98	175.70	2,746.87	6.16	12.40	4.88	0.15
2,961.00	0.84	196.19	2,960.84	2.82	12.10	6.93	0.16
3,089.00	0.71	193.85	3,088.83	1.15	11.64	7.74	0.10
3,218.00	0.50	195.28	3,217.82	-0.17	11.31	8.39	0.16
3,347.00	0.35	172.81	3,346.82	-1.10	11.21	8.95	0.17
3,475.00	1.09	188.59	3,474.81	-2.69	11.07	9.94	0.59
3,604.00	1.07	196.09	3,603.79	-5.06	10.56	11.18	0.11
3,732.00	1.53	182.90	3,731.75	-7.92	10.14	12.82	0.43
3,861.00	2.15	175.31	3,860.69	-12.05	10.25	15.71	0.52
3,989.00	2.66	170.06	3,988.57	-17.37	10.96	19.85	0.43
4,118.00	2.43	167.45	4,117.45	-22.99	12.07	24.49	0.20
4,246.00	2.34	163.56	4,245.34	-28.14	13.40	28.98	0.14
4,375.00	2.07	165.62	4,374.24	-32.92	14.72	33.21	0.22
4,503.00	1.92	149.64	4,502.16	-37.01	16.38	37.21	0.45
4,632.00	1.89	151.38	4,631.09	-40.74	18.49	41.29	0.05
4,760.00	1.72	153.73	4,759.03	-44.32	20.35	45.09	0.14
4,889.00	1.19	125.08	4,887.99	-46.83	22.31	48.23	0.69
5,017.00	1.43	99.04	5,015.96	-47.84	24.97	50.87	0.50
5,145.00	1.61	101.93	5,143.91	-48.46	28.31	53.74	0.15
5,274.00	1.53	97.20	5,272.86	-49.05	31.79	56.69	0.12
5,402.00	1.23	79.58	5,400.83	-49.02	34.84	58.90	0.40
5,530.00	1.58	72.81	5,528.79	-48.25	37.87	60.59	0.30
5,659.00	1.34	77.86	5,657.75	-47.41	41.05	62.34	0.21
5,788.00	1.21	92.91	5,786.71	-47.16	43.88	64.25	0.28
5,932.00	1.30	97.62	5,930.68	-47.45	47.02	66.75	0.10
5,987.00	1.76	104.66	5,985.66	-47.75	48.45	68.00	0.90
6,073.00	5.05	146.17	6,071.51	-51.23	51.84	72.85	4.55
6,116.00	10.23	148.69	6,114.11	-56.07	54.88	78.37	12.07
6,158.00	14.45	135.43	6,155.14	-62.99	60.50	87.20	12.04
6,201.00	19.03	137.70	6,196.31	-72.00	68.99	99.55	10.76
6,244.00	21.32	138.84	6,236.66	-83.07	78.85	114.32	5.40

Design Report for Thunderhead USX AB 25-99 HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
6,287.00	24.38	137.08	6,276.29	-95.46	90.04	130.95	7.29
6,330.00	27.40	135.35	6,314.97	-109.00	103.04	149.69	7.24
6,373.00	28.64	136.10	6,352.93	-123.47	117.14	169.87	3.00
6,415.00	29.86	131.19	6,389.58	-137.61	131.99	190.37	6.41
6,458.00	33.72	131.33	6,426.12	-152.55	149.02	213.01	8.98
6,501.00	36.64	135.12	6,461.26	-169.53	167.04	237.77	8.48
6,544.00	39.34	133.65	6,495.15	-188.03	185.96	264.23	6.62
6,587.00	41.99	130.78	6,527.77	-206.84	206.72	292.23	7.54
6,629.00	45.06	133.56	6,558.22	-226.26	228.13	321.15	8.61
6,672.00	48.55	135.52	6,587.65	-248.26	250.46	352.48	8.77
6,715.00	51.50	137.65	6,615.27	-272.20	273.10	385.35	7.84
6,758.00	54.10	138.41	6,641.27	-297.66	295.99	419.46	6.21
6,801.00	57.38	137.19	6,665.47	-323.98	319.87	454.87	7.98
6,843.00	61.26	136.48	6,686.90	-350.32	344.58	490.90	9.35
6,886.00	63.90	135.50	6,706.70	-377.76	371.10	529.01	6.46
6,929.00	66.08	134.11	6,724.88	-405.22	398.75	567.96	5.86
6,972.00	67.30	135.27	6,741.90	-432.99	426.82	607.43	3.77
7,015.00	69.36	135.98	6,757.77	-461.55	454.76	647.34	5.03
7,046.00	71.10	137.03	6,768.26	-482.72	474.84	676.46	6.45
7,121.00	73.03	141.26	6,791.36	-536.68	521.49	747.37	5.95
7,152.00	73.15	139.86	6,800.38	-559.59	540.33	776.77	4.34
7,182.00	73.08	137.30	6,809.09	-581.11	559.32	805.33	8.17
7,213.00	74.12	135.49	6,817.85	-602.64	579.83	835.01	6.53
7,244.00	76.02	133.89	6,825.83	-623.70	601.12	864.95	7.90
7,307.00	82.32	133.49	6,837.67	-666.42	645.85	926.79	10.02
7,338.00	85.18	133.43	6,841.04	-687.62	668.21	957.60	9.23
7,369.00	88.03	133.33	6,842.88	-708.87	690.70	988.55	9.20
7,401.00	88.95	133.05	6,843.72	-730.76	714.02	1,020.53	3.01
7,433.00	89.51	132.37	6,844.15	-752.47	737.54	1,052.53	2.75
7,464.00	89.81	131.67	6,844.33	-773.22	760.57	1,083.53	2.46
7,496.00	89.94	131.62	6,844.40	-794.48	784.48	1,115.52	0.44
7,527.00	89.26	132.01	6,844.62	-815.15	807.58	1,146.51	2.53
7,591.00	90.68	131.99	6,844.65	-857.97	855.14	1,210.50	2.22
7,653.00	91.60	132.02	6,843.42	-899.45	901.20	1,272.48	1.48
7,685.00	91.11	132.09	6,842.66	-920.88	924.96	1,304.47	1.55
7,717.00	90.86	131.73	6,842.11	-942.25	948.77	1,336.46	1.37
7,749.00	89.32	131.39	6,842.06	-963.48	972.71	1,368.45	4.93
7,780.00	87.53	131.56	6,842.91	-984.01	995.93	1,399.42	5.80
7,811.00	87.22	131.47	6,844.33	-1,004.53	1,019.12	1,430.38	1.04
7,843.00	87.28	131.26	6,845.87	-1,025.65	1,043.10	1,462.33	0.68
7,874.00	88.15	130.96	6,847.11	-1,046.02	1,066.44	1,493.29	2.97
7,906.00	89.88	131.07	6,847.66	-1,067.02	1,090.58	1,525.27	5.42
7,937.00	90.86	131.54	6,847.46	-1,087.48	1,113.87	1,556.25	3.51
7,969.00	91.42	131.23	6,846.82	-1,108.63	1,137.87	1,588.23	2.00
8,000.00	90.62	130.43	6,846.27	-1,128.89	1,161.33	1,619.21	3.65
8,032.00	89.69	129.86	6,846.18	-1,149.52	1,185.79	1,651.17	3.41
8,064.00	89.63	128.68	6,846.37	-1,169.78	1,210.56	1,683.10	3.69
8,095.00	89.38	129.90	6,846.64	-1,189.41	1,234.55	1,714.04	4.02
8,127.00	88.46	131.26	6,847.24	-1,210.22	1,258.85	1,746.00	5.13
8,159.00	87.90	130.14	6,848.26	-1,231.08	1,283.10	1,777.96	3.91
8,191.00	88.58	130.26	6,849.24	-1,251.72	1,307.53	1,809.91	2.16

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8,223.00	89.01	130.46	6,849.91	-1,272.44	1,331.91	1,841.87	1.48
8,254.00	89.75	130.25	6,850.25	-1,292.51	1,355.53	1,872.84	2.48
8,285.00	90.86	130.26	6,850.08	-1,312.54	1,379.18	1,903.80	3.58
8,318.00	91.23	130.14	6,849.48	-1,333.84	1,404.39	1,936.76	1.18
8,350.00	91.24	129.54	6,848.79	-1,354.34	1,428.95	1,968.71	1.87
8,381.00	91.17	129.18	6,848.14	-1,373.99	1,452.91	1,999.64	1.18
8,412.00	91.42	129.11	6,847.44	-1,393.56	1,476.95	2,030.56	0.84
8,444.00	92.28	129.18	6,846.41	-1,413.75	1,501.75	2,062.47	2.70
8,476.00	93.21	129.52	6,844.87	-1,434.01	1,526.47	2,094.37	3.09
8,508.00	93.64	129.50	6,842.96	-1,454.33	1,551.12	2,126.26	1.35
8,540.00	94.02	129.23	6,840.82	-1,474.59	1,575.80	2,158.13	1.46
8,571.00	93.83	129.29	6,838.70	-1,494.16	1,599.75	2,188.99	0.64
8,603.00	92.47	129.06	6,836.94	-1,514.34	1,624.52	2,220.87	4.31
8,634.00	91.85	129.25	6,835.78	-1,533.90	1,648.54	2,251.78	2.09
8,666.00	91.97	128.94	6,834.71	-1,554.07	1,673.36	2,283.69	1.04
8,697.00	92.16	128.74	6,833.59	-1,573.50	1,697.49	2,314.59	0.89
8,729.00	91.42	129.17	6,832.59	-1,593.61	1,722.36	2,346.50	2.67
8,760.00	89.20	128.27	6,832.43	-1,613.00	1,746.54	2,377.41	7.73
8,792.00	88.33	127.77	6,833.11	-1,632.70	1,771.75	2,409.29	3.14
8,823.00	86.79	128.46	6,834.43	-1,651.82	1,796.12	2,440.15	5.44
8,855.00	86.92	128.74	6,836.19	-1,671.75	1,821.09	2,472.01	0.96
8,886.00	87.53	129.38	6,837.69	-1,691.26	1,845.13	2,502.90	2.85
8,918.00	87.78	129.06	6,839.00	-1,711.48	1,869.90	2,534.81	1.27
8,949.00	88.33	129.52	6,840.05	-1,731.10	1,893.88	2,565.73	2.31
8,981.00	88.70	129.89	6,840.88	-1,751.53	1,918.49	2,597.66	1.63
9,013.00	89.32	130.44	6,841.43	-1,772.17	1,942.94	2,629.62	2.59
9,044.00	89.63	131.00	6,841.72	-1,792.39	1,966.43	2,660.60	2.06
9,076.00	89.94	131.41	6,841.84	-1,813.47	1,990.51	2,692.58	1.61
9,108.00	90.31	131.68	6,841.77	-1,834.70	2,014.46	2,724.57	1.43
9,139.00	90.80	131.65	6,841.47	-1,855.30	2,037.61	2,755.56	1.58
9,171.00	90.43	131.26	6,841.13	-1,876.49	2,061.60	2,787.55	1.68
9,202.00	90.31	130.82	6,840.92	-1,896.84	2,084.98	2,818.53	1.47
9,234.00	89.88	130.71	6,840.87	-1,917.73	2,109.21	2,850.51	1.39
9,266.00	89.44	130.67	6,841.06	-1,938.60	2,133.48	2,882.48	1.38
9,297.00	88.89	130.72	6,841.51	-1,958.81	2,156.98	2,913.46	1.78
9,329.00	88.46	130.62	6,842.25	-1,979.66	2,181.24	2,945.42	1.38
9,361.00	87.53	130.93	6,843.37	-2,000.54	2,205.46	2,977.38	3.06
9,393.00	87.28	130.68	6,844.82	-2,021.43	2,229.66	3,009.32	1.10
9,425.00	86.85	130.67	6,846.46	-2,042.26	2,253.90	3,041.26	1.34
9,456.00	86.66	131.30	6,848.22	-2,062.56	2,277.26	3,072.19	2.12
9,488.00	86.72	132.24	6,850.06	-2,083.84	2,301.09	3,104.13	2.94
9,520.00	87.66	133.19	6,851.63	-2,105.52	2,324.57	3,136.09	4.17
9,551.00	87.90	133.81	6,852.83	-2,126.84	2,347.04	3,167.07	2.14
9,583.00	87.65	134.04	6,854.07	-2,149.03	2,370.07	3,199.04	1.06
9,614.00	87.90	133.89	6,855.28	-2,170.53	2,392.36	3,230.01	0.94
9,646.00	88.21	134.03	6,856.36	-2,192.73	2,415.39	3,261.98	1.06
9,678.00	88.52	134.82	6,857.28	-2,215.12	2,438.23	3,293.96	2.65
9,709.00	88.52	134.62	6,858.08	-2,236.93	2,460.25	3,324.94	0.64
9,741.00	88.46	134.50	6,858.92	-2,259.37	2,483.04	3,356.91	0.42
9,772.00	88.64	134.68	6,859.71	-2,281.13	2,505.11	3,387.89	0.82
9,804.00	88.64	134.68	6,860.47	-2,303.62	2,527.86	3,419.86	0.00

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9,836.00	88.70	135.01	6,861.21	-2,326.18	2,550.54	3,451.84	1.05
9,867.00	88.70	134.69	6,861.91	-2,348.04	2,572.51	3,482.81	1.03
9,899.00	89.14	134.93	6,862.51	-2,370.59	2,595.21	3,514.79	1.57
9,931.00	89.44	134.82	6,862.91	-2,393.16	2,617.89	3,546.77	1.00
9,962.00	90.18	135.52	6,863.01	-2,415.15	2,639.74	3,577.75	3.29
9,994.00	90.19	135.45	6,862.91	-2,437.97	2,662.18	3,609.71	0.22
10,025.00	91.42	136.50	6,862.48	-2,460.25	2,683.72	3,640.67	5.22
10,057.00	90.37	135.45	6,861.98	-2,483.26	2,705.95	3,672.62	4.64
10,088.00	89.32	134.69	6,862.06	-2,505.21	2,727.85	3,703.59	4.18
10,120.00	88.33	134.46	6,862.72	-2,527.66	2,750.64	3,735.57	3.18
10,151.00	89.01	134.40	6,863.43	-2,549.36	2,772.77	3,766.56	2.20
10,183.00	89.07	133.45	6,863.97	-2,571.55	2,795.81	3,798.55	2.97
10,215.00	89.20	133.58	6,864.45	-2,593.58	2,819.01	3,830.54	0.57
10,246.00	90.43	133.82	6,864.55	-2,615.00	2,841.43	3,861.54	4.04
10,278.00	91.73	134.22	6,863.95	-2,637.23	2,864.43	3,893.52	4.25
10,309.00	92.59	134.75	6,862.78	-2,658.94	2,886.53	3,924.49	3.26
10,341.00	92.78	134.55	6,861.28	-2,681.40	2,909.27	3,956.44	0.86
10,373.00	91.24	133.47	6,860.16	-2,703.62	2,932.27	3,988.41	5.88
10,405.00	90.37	132.66	6,859.71	-2,725.47	2,955.65	4,020.41	3.71
10,436.00	90.25	132.48	6,859.54	-2,746.44	2,978.48	4,051.41	0.70
10,468.00	90.56	132.36	6,859.32	-2,768.02	3,002.10	4,083.41	1.04
10,499.00	90.68	132.00	6,858.98	-2,788.84	3,025.07	4,114.40	1.22
10,531.00	90.37	131.88	6,858.69	-2,810.23	3,048.87	4,146.40	1.04
10,562.00	90.31	131.68	6,858.51	-2,830.88	3,071.99	4,177.39	0.67
10,594.00	90.12	131.74	6,858.38	-2,852.17	3,095.88	4,209.38	0.62
10,626.00	89.94	131.82	6,858.37	-2,873.49	3,119.74	4,241.38	0.62
10,657.00	90.12	131.33	6,858.35	-2,894.06	3,142.93	4,272.37	1.68
10,689.00	90.19	131.21	6,858.27	-2,915.17	3,166.98	4,304.35	0.43
10,721.00	90.37	130.77	6,858.11	-2,936.16	3,191.14	4,336.33	1.49
10,752.00	90.80	130.79	6,857.79	-2,956.41	3,214.61	4,367.31	1.39
10,784.00	90.86	130.20	6,857.33	-2,977.18	3,238.94	4,399.28	1.85
10,815.00	90.80	129.89	6,856.88	-2,997.13	3,262.67	4,430.23	1.02
10,846.00	89.81	129.69	6,856.71	-3,016.97	3,286.49	4,461.19	3.26
10,878.00	89.20	127.48	6,856.99	-3,036.92	3,311.50	4,493.09	7.16
10,910.00	89.94	128.22	6,857.23	-3,056.56	3,336.77	4,524.96	3.27
10,942.00	91.11	129.09	6,856.94	-3,076.54	3,361.76	4,556.87	4.56
10,973.00	91.42	126.11	6,856.25	-3,095.45	3,386.31	4,587.73	9.66
11,005.00	91.54	126.27	6,855.43	-3,114.34	3,412.13	4,619.49	0.62
11,037.00	90.68	125.69	6,854.81	-3,133.13	3,438.02	4,651.25	3.24
11,068.00	89.81	125.35	6,854.67	-3,151.15	3,463.25	4,681.99	3.01
11,100.00	88.76	125.02	6,855.07	-3,169.58	3,489.40	4,713.70	3.44
11,131.00	88.58	124.88	6,855.79	-3,187.34	3,514.80	4,744.39	0.74
11,163.00	88.15	124.41	6,856.71	-3,205.52	3,541.12	4,776.04	1.99
11,195.00	87.96	124.89	6,857.79	-3,223.70	3,567.43	4,807.69	1.61
11,227.00	88.02	125.31	6,858.92	-3,242.09	3,593.59	4,839.37	1.33
11,258.00	87.78	125.25	6,860.05	-3,259.99	3,618.88	4,870.07	0.80
11,290.00	88.21	124.85	6,861.17	-3,278.35	3,645.06	4,901.75	1.83
11,322.00	88.15	124.68	6,862.19	-3,296.59	3,671.33	4,933.41	0.56
11,354.00	88.09	124.46	6,863.24	-3,314.74	3,697.67	4,965.05	0.71
11,385.00	88.27	124.28	6,864.22	-3,332.23	3,723.25	4,995.69	0.82

Design Report for Thunderhead USX AB 25-99 HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
11,417.00	88.21	124.41	6,865.20	-3,350.27	3,749.65	5,027.31	0.45
11,449.00	87.78	124.07	6,866.32	-3,368.27	3,776.09	5,058.93	1.71
11,480.00	87.34	124.01	6,867.64	-3,385.60	3,801.76	5,089.52	1.43
11,507.00	86.91	123.78	6,869.00	-3,400.64	3,824.14	5,116.15	1.81
Final MWD Survey							
11,565.00	86.91	123.78	6,872.12	-3,432.84	3,872.28	5,173.33	0.00
Survey Projection to TD - Estimated BHL: 1521' FSL, 666' FEL							

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
742.00	742.00	0.00	0.00	Surface Casing Assumed Vertical at 742.00ft
777.00	777.00	0.10	0.00	First MWD Survey
11,507.00	6,869.00	-3,400.64	3,824.14	Final MWD Survey
11,565.00	6,872.12	-3,432.84	3,872.28	Survey Projection to TD
11,565.00	6,872.12	-3,432.84	3,872.28	Estimated BHL: 1521' FSL, 666' FEL

Vertical Section Information

Angle Type	Target	Azimuth (°)	Origin Type	Origin		Start TVD (ft)
				+N/-S (ft)	+E/-W (ft)	
Target	Thunderhead USX AB 25-99HZ BHL 082609	132.94	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
742.00	11,565.00	MWD Surveys	MWD

Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
Thunderhead USX - actual wellpath misses target center by 416.46ft at 6601.43ft MD (6538.41 TVD, -213.27 N, 214.05 E) - Polygon Point 1 Point 2	0.30	0.00	6,825.00	0.00	0.00	1,445,086.27	3,276,444.01	40° 33' 3.258 N	104° 30' 18.662 W
				578.00	-537.84	1,444,548.44	3,277,021.99		
				3,873.75	-3,604.72	1,441,481.65	3,280,317.65		
Thunderhead USX - actual wellpath misses target center by 179.84ft at 11565.00ft MD (6872.12 TVD, -3432.84 N, 3872.28 E) - Point	0.00	0.00	6,819.40	-3,604.77	3,873.75	1,441,481.60	3,280,317.65	40° 32' 27.208 N	104° 29' 29.015 W
Thunderhead USX - actual wellpath misses target center by 965.97ft at 11565.00ft MD (6872.12 TVD, -3432.84 N, 3872.28 E) - Point	0.00	0.00	6,782.50	-3,925.78	4,698.16	1,441,160.60	3,281,142.03	40° 32' 23.943 N	104° 29' 18.385 W

North Reference Sheet for Sec. 25-T7N-R64W - Thunderhead USX AB 25-99 HZ - Wellbore #1

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

Vertical Depths are relative to RKB - 13' @ 4796.00ft (Original Well Elev). Northing and Easting are relative to Thunderhead USX AB 25-99 HZ

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: 3,000,000.00ft, False Northing: 1,000,000.00ft, Scale Reduction: 0.99997054

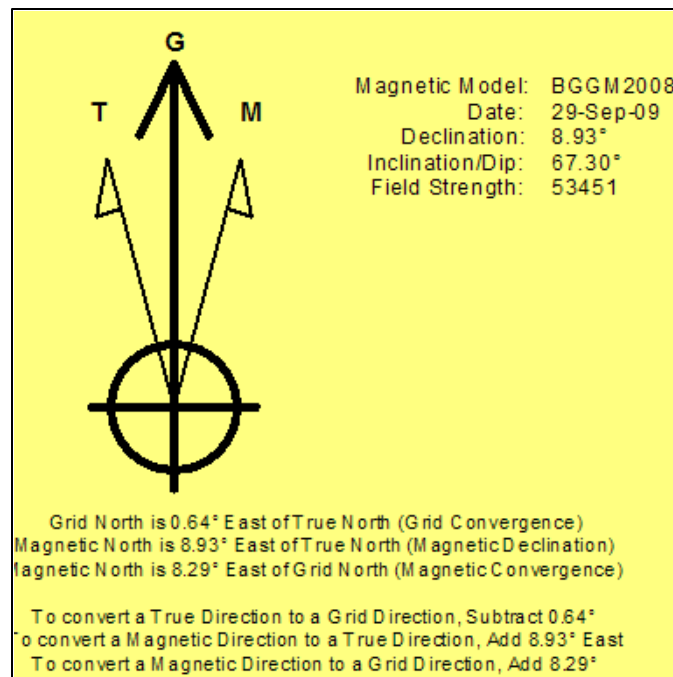
Grid Coordinates of Well: 1,445,086.27 ft N, 3,276,444.01 ft E

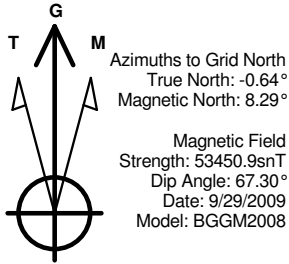
Geographical Coordinates of Well: 40° 33' 03.26" N, 104° 30' 18.66" W

Grid Convergence at Surface is: 0.64°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,565.00ft the Bottom Hole Displacement is 5,174.84ft in the Direction of 131.56° (Grid).

Magnetic Convergence at surface is: -8.29° (29 September 2009, , BGGM2008)

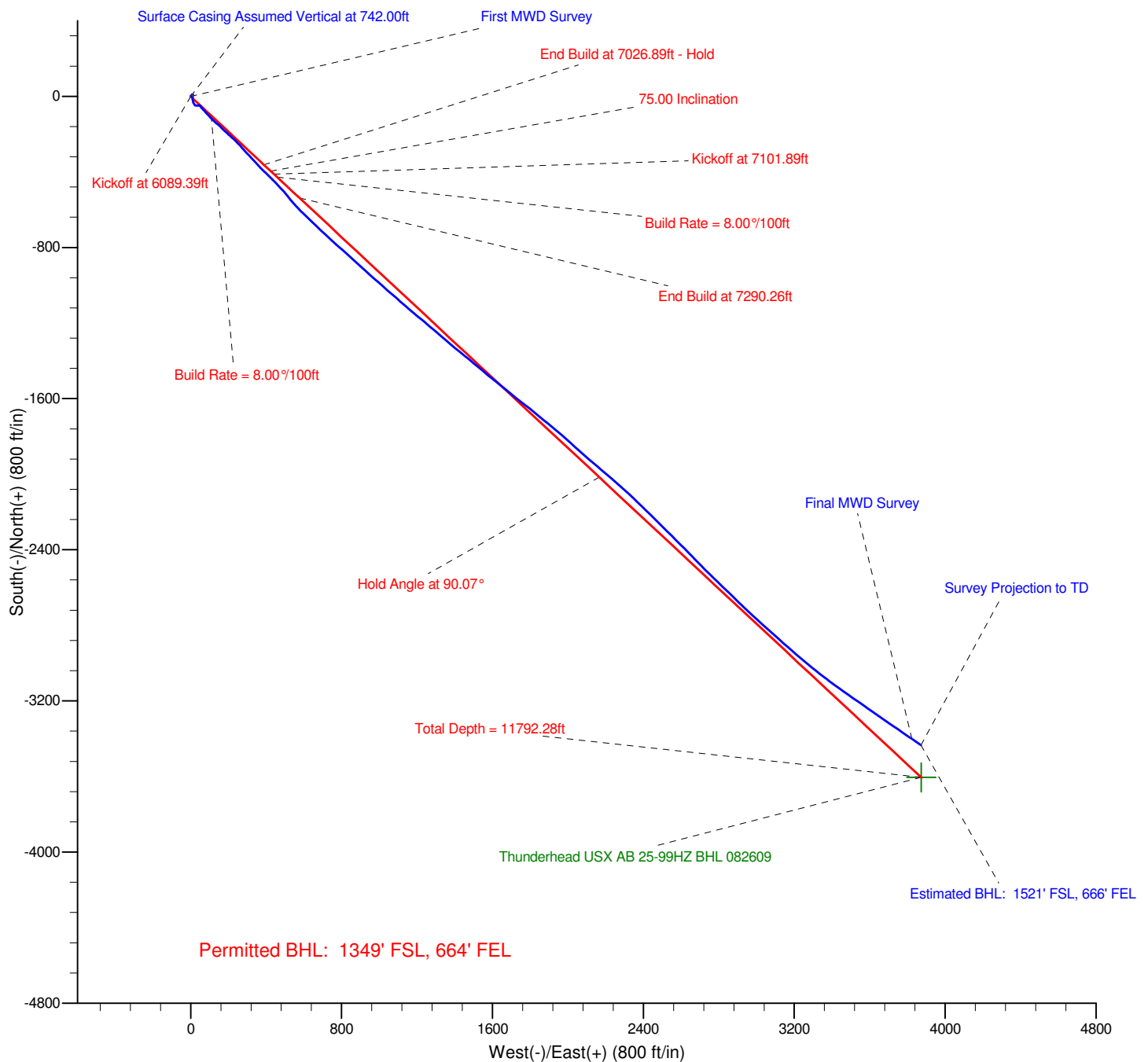




LEGEND

- Thunderhead USX AB 25-99 HZ, Wellbore #1, Plan #5 Proposed
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Thunderhead USX AB25-99HZ well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

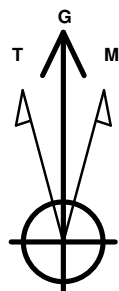


Project: Weld County, CO
Site: Sec. 25-T7N-R64W
Well: Thunderhead USX AB 25-99 HZ

Noble Energy

HALLIBURTON

Sperry Drilling



Azimuths to Grid North
True North: -0.64°
Magnetic North: 8.29°

Magnetic Field
Strength: 53450.9snT
Dip Angle: 67.30°
Date: 9/29/2009
Model: BGGM2008

LEGEND

- Thunderhead USX AB 25-99 HZ, Wellbore #1, Plan #5 Proposal V0
- MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Thunderhead USX AB25-99HZ well located at Weld County, CO. At the conclusion of the job Halliburton performed a final survey on the well. Noble Energy has requested that Halliburton provide them the distances from BHL to section lines from that final survey to allow Noble Energy to meet its requirements under Colorado law. These distances are generated by a mathematical algorithm based on rough data collected after the well is drilled. Halliburton considers it to be a rough estimate only and it is not to be relied upon in any application where accurate data is required. In consideration for Halliburton releasing this data to Noble Energy, Noble Energy agrees to release Halliburton from any consequences of it or anyone else relying on such data.

