Noble Energy

Weld County, CO (NAD 83)
Sec. 35-T11N-R61W
Cox PC GK35-99HZ

Design: MWD Survey

Sperry Drilling Services

Final Survey Report

07 March, 2011

Well Coordinates: 1,563,352.16 N, 3,364,505.51 E (40° 52' 20.42" N, 104° 10' 55.20" W)
Ground Level: 5,084.00 ft

Local Coordinate Origin:	Centered on Site Sec. 35-T11N-R61W
Viewing Datum:	KB @ 5108.00ft (Rig KB)
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 Cox PC GK35-99HZ - 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
1,553.00	0.14	237.96	1,553.00	-1.01	-1.61	-1.66	0.01
First Sperry MWD Survey							
1,868.00	0.19	188.31	1,868.00	-1.73	-2.01	-2.10	0.05
2,188.00	0.26	219.22	2,187.99	-2.82	-2.55	-2.70	0.04
2,347.00	0.39	209.33	2,346.99	-3.57	-3.04	-3.23	0.09
2,442.00	1.57	305.34	2,441.98	-3.10	-4.26	-4.42	1.74
2,538.00	4.07	309.12	2,537.86	-0.18	-7.98	-7.97	2.61
2,601.00	5.42	319.48	2,600.64	3.49	-11.64	-11.44	2.53
2,664.00	7.04	325.70	2,663.27	8.94	-15.75	-15.24	2.78
2,728.00	8.49	327.06	2,726.68	16.14	-20.53	-19.62	2.28
2,792.00	9.22	328.07	2,789.91	24.46	-25.81	-24.44	1.17
2,855.00	9.29	324.24	2,852.10	32.87	-31.45	-29.61	0.98
2,919.00	9.59	318.18	2,915.23	41.04	-38.03	-35.73	1.62
2,983.00	10.10	316.01	2,978.29	49.05	-45.48	-42.73	0.99
3,046.00	9.72	315.37	3,040.35	56.81	-53.05	-49.87	0.63
3,110.00	9.34	316.16	3,103.46	64.40	-60.45	-56.84	0.63
3,173.00	9.90	313.19	3,165.58	71.79	-67.93	-63.92	1.19
3,237.00	10.03	313.72	3,228.61	79.41	-75.97	-71.53	0.25
3,301.00	9.74	312.77	3,291.66	86.94	-83.98	-79.11	0.52
3,364.00	9.73	313.67	3,353.76	94.23	-91.74	-86.46	0.24
3,428.00	9.33	313.35	3,416.87	101.53	-99.42	-93.73	0.63
3,492.00	9.35	313.32	3,480.02	108.65	-106.98	-100.89	0.03
3,555.00	9.21	314.08	3,542.20	115.67	-114.32	-107.84	0.30
3,619.00	9.50	319.24	3,605.35	123.24	-121.45	-114.54	1.39
3,683.00	10.16	320.37	3,668.41	131.58	-128.50	-121.13	1.07
3,746.00	9.80	316.51	3,730.46	139.75	-135.73	-127.90	1.21
3,810.00	9.46	317.23	3,793.55	147.57	-143.05	-134.79	0.56
3,873.00	9.52	318.42	3,855.69	155.26	-150.03	-141.33	0.33
3,937.00	9.60	315.34	3,918.80	163.02	-157.29	-148.16	0.81
4,001.00	9.62	314.98	3,981.91	170.60	-164.82	-155.27	0.10
4,064.00	9.92	311.56	4,043.99	177.92	-172.61	-162.64	1.04
4,128.00	9.68	311.24	4,107.06	185.12	-180.78	-170.41	0.38
4,192.00	8.77	307.98	4,170.23	191.67	-188.67	-177.93	1.64
4,255.00	7.56	302.89	4,232.59	196.88	-195.94	-184.90	2.24
4,319.00	5.14	301.34	4,296.19	200.65	-201.92	-190.67	3.79
4,383.00	2.39	288.90	4,360.05	202.58	-205.63	-194.27	4.46
4,446.00	1.64	293.80	4,423.01	203.37	-207.70	-196.29	1.22
4,510.00	0.09	100.34	4,487.00	203.73	-208.49	-197.06	2.70
4,574.00	0.58	143.07	4,551.00	203.46	-208.25	-196.83	0.81
4,637.00	0.73	169.65	4,614.00	202.81	-207.98	-196.60	0.53
4,701.00	0.97	179.83	4,677.99	201.87	-207.91	-196.58	0.44
4,764.00	0.95	160.35	4,740.98	200.84	-207.73	-196.46	0.52
4,828.00	0.90	190.90	4,804.97	199.85	-207.65	-196.43	0.77
4,892.00	1.40	211.50	4,868.96	198.69	-208.15	-197.00	1.00
4,955.00	0.96	217.78	4,931.95	197.62	-208.88	-197.78	0.73
5,019.00	0.73	215.66	4,995.94	196.86	-209.44	-198.39	0.36
5,082.00	0.29	339.95	5,058.94	196.68	-209.73	-198.68	1.47
5,273.00	0.43	136.36	5,249.94	196.62	-209.40	-198.36	0.37
5,592.00	0.65	27.74	5,568.93	197.35	-207.73	-196.65	0.28

Design Report for Cox PC GK35-99HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
5,846.00	0.91	44.20	5,822.91	200.08	-205.66	-194.43	0.13
5,907.00	1.15	46.32	5,883.90	200.85	-204.88	-193.61	0.40
5,971.00	1.54	59.95	5,947.88	201.72	-203.67	-192.35	0.78
6,003.00	5.49	78.83	5,979.81	202.23	-201.79	-190.45	12.70
6,035.00	10.19	84.00	6,011.51	202.82	-197.47	-186.11	14.84
6,066.00	12.25	86.42	6,041.91	203.32	-191.46	-180.08	6.82
6,098.00	12.05	83.99	6,073.19	203.88	-184.75	-173.35	1.72
6,130.00	12.99	88.40	6,104.43	204.33	-177.84	-166.42	4.19
6,162.00	14.94	89.82	6,135.49	204.44	-170.12	-158.70	6.19
6,194.00	17.41	89.32	6,166.22	204.51	-161.20	-149.80	7.73
6,226.00	18.97	91.74	6,196.62	204.41	-151.22	-139.83	5.42
6,257.00	20.34	91.25	6,225.81	204.14	-140.79	-129.44	4.45
6,289.00	22.67	87.67	6,255.58	204.27	-129.07	-117.73	8.35
6,321.00	25.46	85.58	6,284.80	205.05	-116.05	-104.68	9.12
6,353.00	27.96	85.19	6,313.38	206.21	-101.71	-90.30	7.83
6,385.00	30.46	87.23	6,341.31	207.23	-86.13	-74.69	8.41
6,416.00	33.92	89.47	6,367.54	207.69	-69.63	-58.19	11.80
6,448.00	37.03	91.27	6,393.60	207.56	-51.06	-39.66	10.25
6,480.00	40.14	90.60	6,418.61	207.24	-31.11	-19.75	9.81
6,512.00	42.32	89.65	6,442.68	207.20	-10.02	1.30	7.09
6,544.00	44.87	88.36	6,465.85	207.59	12.04	23.35	8.44
6,575.00	48.03	87.64	6,487.21	208.37	34.49	45.81	10.33
6,607.00	51.06	87.24	6,507.97	209.46	58.81	70.16	9.52
6,639.00	54.17	88.89	6,527.40	210.31	84.22	95.57	10.55
6,671.00	56.74	89.92	6,545.54	210.58	110.57	121.90	8.46
6,703.00	59.40	90.18	6,562.46	210.56	137.73	149.02	8.34
6,735.00	62.06	89.41	6,578.11	210.66	165.64	176.89	8.57
6,766.00	65.04	88.95	6,591.91	211.06	193.39	204.62	9.70
6,798.00	67.57	88.29	6,604.77	211.77	222.68	233.91	8.13
6,830.00	69.48	88.10	6,616.49	212.70	252.44	263.68	5.99
6,862.00	71.53	88.09	6,627.17	213.71	282.59	293.83	6.41
6,894.00	74.58	88.17	6,636.49	214.71	313.18	324.43	9.53
6,926.00	76.69	87.85	6,644.43	215.78	344.16	355.42	6.66
6,958.00	78.26	88.22	6,651.37	216.85	375.38	386.66	5.03
6,990.00	79.98	88.07	6,657.41	217.87	406.79	418.07	5.39
7,015.00	81.73	88.35	6,661.38	218.64	431.46	442.75	7.09
7,152.00	84.99	88.37	6,677.22	222.54	567.46	578.76	2.38
7,216.00	86.73	88.14	6,681.84	224.48	631.26	642.57	2.74
7,279.00	88.70	88.21	6,684.35	226.48	694.18	705.51	3.13
7,343.00	89.13	87.87	6,685.57	228.67	758.13	769.48	0.86
7,407.00	89.94	88.36	6,686.08	230.78	822.09	833.46	1.48
7,470.00	90.49	90.81	6,685.85	231.23	885.08	896.39	3.99
7,534.00	89.69	91.20	6,685.75	230.11	949.07	960.22	1.39
7,597.00	90.99	90.51	6,685.37	229.17	1,012.06	1,023.06	2.34
7,661.00	90.62	90.71	6,684.47	228.49	1,076.05	1,086.92	0.66
7,725.00	89.81	89.04	6,684.23	228.63	1,140.05	1,150.83	2.90
7,788.00	90.62	89.07	6,684.00	229.67	1,203.04	1,213.78	1.29
7,852.00	90.06	88.90	6,683.62	230.80	1,267.03	1,277.74	0.91
7,916.00	90.80	90.83	6,683.14	230.95	1,331.02	1,341.65	3.23
7,980.00	90.49	92.22	6,682.42	229.25	1,395.00	1,405.43	2.23
8,043.00	90.43	90.34	6,681.91	227.84	1,457.97	1,468.24	2.99

Design Report for Cox PC GK35-99HZ - MWD Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
8,107.00	90.12	89.65	6,681.60	227.85	1,521.97	1,532.14	1.18
8,171.00	90.93	88.77	6,681.02	228.73	1,585.96	1,596.08	1.87
8,234.00	89.75	87.64	6,680.64	230.70	1,648.93	1,659.06	2.59
8,298.00	91.05	87.56	6,680.20	233.38	1,712.87	1,723.06	2.04
8,362.00	90.93	87.15	6,679.09	236.34	1,776.79	1,787.04	0.67
8,425.00	90.25	86.81	6,678.44	239.66	1,839.70	1,850.04	1.21
8,489.00	91.30	88.03	6,677.58	242.54	1,903.63	1,914.03	2.51
8,553.00	91.79	87.99	6,675.85	244.76	1,967.57	1,977.99	0.77
8,616.00	90.31	88.78	6,674.70	246.53	2,030.53	2,040.96	2.66
8,680.00	89.75	88.62	6,674.66	247.99	2,094.51	2,104.93	0.91
8,744.00	90.43	89.08	6,674.56	249.27	2,158.50	2,168.89	1.28
8,807.00	90.56	89.14	6,674.02	250.25	2,221.49	2,231.84	0.23
8,871.00	90.68	89.39	6,673.33	251.07	2,285.48	2,295.78	0.43
8,935.00	90.99	89.69	6,672.39	251.58	2,349.47	2,359.70	0.67
8,998.00	90.43	90.08	6,671.61	251.71	2,412.46	2,422.61	1.08
9,062.00	89.75	90.37	6,671.51	251.46	2,476.46	2,486.50	1.16
9,126.00	89.75	90.80	6,671.79	250.81	2,540.46	2,550.36	0.67
9,189.00	90.99	90.34	6,671.39	250.18	2,603.45	2,613.23	2.10
9,253.00	90.37	90.05	6,670.63	249.96	2,667.45	2,677.12	1.07
9,317.00	90.43	89.85	6,670.18	250.02	2,731.45	2,741.02	0.33
9,380.00	90.19	89.70	6,669.84	250.26	2,794.45	2,803.94	0.45
9,444.00	90.25	90.90	6,669.59	249.93	2,858.44	2,867.82	1.88
9,508.00	90.25	91.55	6,669.31	248.56	2,922.43	2,931.64	1.02
9,571.00	89.88	90.71	6,669.24	247.32	2,985.41	2,994.46	1.46
9,635.00	88.76	90.22	6,670.00	246.80	3,049.41	3,058.33	1.91
9,698.00	88.89	90.06	6,671.29	246.64	3,112.39	3,121.22	0.33
9,762.00	89.01	90.26	6,672.47	246.47	3,176.38	3,185.10	0.36
9,826.00	89.69	90.61	6,673.19	245.98	3,240.38	3,248.97	1.19
9,889.00	89.38	90.44	6,673.70	245.40	3,303.37	3,311.84	0.56
9,953.00	90.93	91.23	6,673.53	244.47	3,367.36	3,375.69	2.72
10,017.00	90.25	90.23	6,672.87	243.66	3,431.35	3,439.54	1.89
10,080.00	91.17	90.75	6,672.09	243.12	3,494.34	3,502.40	1.68
10,144.00	91.24	90.76	6,670.74	242.27	3,558.32	3,566.24	0.11
10,208.00	89.81	90.77	6,670.16	241.42	3,622.31	3,630.09	2.23
10,271.00	90.62	91.15	6,669.92	240.36	3,685.30	3,692.93	1.42
10,335.00	89.32	90.82	6,669.95	239.26	3,749.29	3,756.76	2.10
10,398.00	90.31	91.29	6,670.16	238.10	3,812.28	3,819.59	1.74
10,462.00	90.49	90.65	6,669.71	237.02	3,876.27	3,883.43	1.04
10,526.00	90.31	90.56	6,669.26	236.34	3,940.26	3,947.29	0.31
10,590.00	90.12	89.75	6,669.02	236.17	4,004.26	4,011.18	1.30
10,653.00	90.19	88.97	6,668.85	236.87	4,067.26	4,074.12	1.24
10,717.00	91.17	88.71	6,668.09	238.17	4,131.24	4,138.08	1.58
10,781.00	92.35	87.86	6,666.13	240.08	4,195.18	4,202.03	2.27
10,844.00	93.46	87.66	6,662.94	242.54	4,258.05	4,264.94	1.79
10,908.00	93.83	87.65	6,658.87	245.16	4,321.87	4,328.81	0.58
10,972.00	92.84	88.35	6,655.14	247.39	4,385.72	4,392.68	1.89
11,027.00	93.03	89.14	6,652.33	248.59	4,440.63	4,447.58	1.48
Final Sperry MWD Survey							
11,080.00	93.03	89.14	6,649.53	249.38	4,493.55	4,500.47	0.00

Survey Projection to TD - Estimated BHL: 704' FSL, 678' FEL

Design Report for Cox PC GK35-99HZ - MWD Survey

Design Annotations

Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates +N/-S (ft)	+E/-W (ft)	Comment
1,553.00	1,553.00	-1.01	-1.61	First Sperry MWD Survey
11,027.00	6,652.33	248.59	4,440.63	Final Sperry MWD Survey
11,080.00	6,649.53	249.38	4,493.55	Survey Projection to TD
11,080.00	6,649.53	249.38	4,493.55	Estimated BHL: 704' FSL, 678' FEL

Vertical Section Information

	Angle Type	Target	Azimuth (°)	Origin Type	Origin +N/_S (ft)	Origin +E/-W (ft)	Start TVD (ft)
	Target	Cox PC GK35-99HZ_I Rev2_BHL Tgt	86.87	Slot	0.00	0.00	0.00

Survey tool program

From (ft)	To (ft)	Survey/Plan	Survey Tool
1,553.00	11,080.00	Sperry 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
Cox PC	0.00	0.00	0.00	0.00	0.00	1,563,352.16	3,364,505.51	40° 52' 20.424 N	104° 10' 55.200 W
- actual wellpath hits target center									
- Polygon									
Point 1				386.00	105.00	1,563,457.16	3,364,891.52		
Point 2				274.00	4,190.00	1,567,542.22	3,364,779.52		
Point 3				4,561.00	4,200.00	1,567,552.22	3,369,066.58		
Point 4				4,571.00	153.00	1,563,505.16	3,369,076.58		
Point 5				386.00	105.00	1,563,457.16	3,364,891.52		
Cox PC	0.00	0.00	6,637.00	245.80	4,496.53	1,563,597.96	3,369,002.11	40° 52' 22.188 N	104° 9' 56.628 W
- actual wellpath misses target center by 13.37ft at 11080.00ft MD (6649.53 TVD, 249.38 N, 4493.55 E)									
- Point									
Cox PC	0.00	0.00	0.00	0.00	0.00	1,563,352.16	3,364,505.51	40° 52' 20.424 N	104° 10' 55.200 W
- actual wellpath hits target center									
- Polygon									
Point 1				-214.00	-495.00	1,562,857.15	3,364,291.51		
Point 2				-326.00	4,790.00	1,568,142.23	3,364,179.51		
Point 3				5,161.00	4,800.00	1,568,152.23	3,369,666.59		
Point 4				5,171.00	-447.00	1,562,905.15	3,369,676.59		
Point 5				-214.00	-495.00	1,562,857.15	3,364,291.51		

North Reference Sheet for Sec. 35-T11N-R61W - Cox PC GK35-99HZ

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

Vertical Depths are relative to KB @ 5108.00ft (Rig KB). Northing and Easting are relative to Sec. 35-T11N-R61W

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: 1.00001566

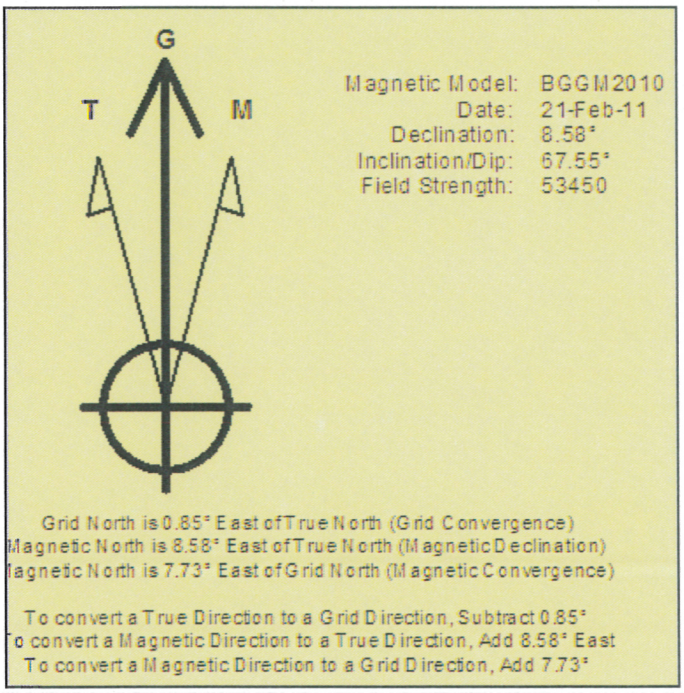
Grid Coordinates of Well: 1,563,352.16 ft N, 3,364,505.51 ft E

Geographical Coordinates of Well: 40° 52' 20.42" N, 104° 10' 55.20" W

Grid Convergence at Surface is: 0.85°

Based upon Minimum Curvature type calculations, at a Measured Depth of 11,080.00ft
the Bottom Hole Displacement is 4,500.47ft in the Direction of 86.82° (Grid).

Magnetic Convergence at surface is: -7.73° (21 February 2011, , BGGM2010)



Project: Weld County, CO (NAD 83)
Site: Sec. 35-T11N-R61W
Well: Cox PC GK35-99HZ

Noble Energy

HALLIBURTON
Sperry Drilling

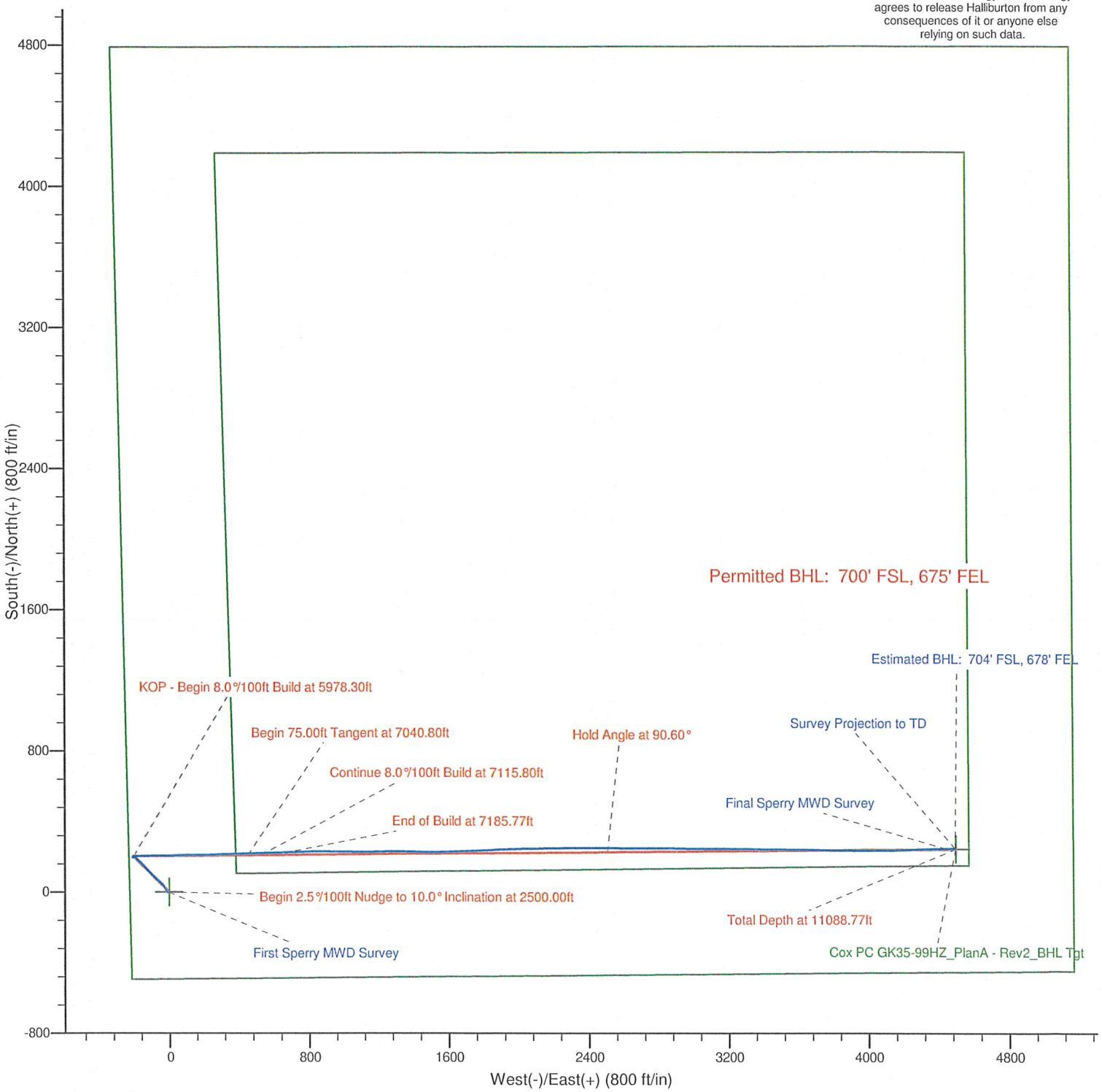
Azimuths to Grid North
True North: -0.85°
Magnetic North: 7.72°

Magnetic Field
Strength: 53449.9snT
Dip Angle: 67.55°
Date: 2/21/2011
Model: BGGM2010

LEGEND

Cox PC GK35-99HZ,
MWD Survey

Halliburton Energy Services, Inc. ("Halliburton") recently completed directional drilling and MWD operations at the Cox PC GK35-99HZ 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 (NAD 83)
Site: Sec. 35-T11N-R61W
Well: Cox PC GK35-99HZ

Noble Energy

HALLIBURTON
Sperry Drilling

Azimuths to Grid North
True North: -0.85°
Magnetic North: 7.72°

Magnetic Field
Strength: 53449.9snT
Dip Angle: 67.55°
Date: 2/21/2011
Model: BGGM2010

LEGEND

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