



Noble Energy Inc.

**Weld County, CO
Sec 16, T4N, R65W
Boulter G21-69HN**

Wellbore #1

Survey: MWD FINAL

DDC Survey Report

12 November, 2012



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Boulter G21-69HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4831.0usft (H&P #323)
Site:	Sec 16, T4N, R65W	MD Reference:	WELL @ 4831.0usft (H&P #323)
Well:	Boulter G21-69HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Project	Weld County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Northern Zone		

Site		Sec 16, T4N, R65W			
Site Position:		Northing:	1,355,932.57 usft	Latitude:	40° 18' 26.748 N
From:	Lat/Long	Easting:	3,232,700.14 usft	Longitude:	104° 39' 56.196 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.54 °

Well	Boulter G21-69HN					
Well Position	+N-S	0.0 usft	Northing:	1,355,925.46 usft	Latitude:	40° 18' 26.676 N
	+E-W	0.0 usft	Easting:	3,232,719.73 usft	Longitude:	104° 39' 55.944 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,807.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	10/18/2012	8.62	66.95	52,952

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N-S (usft)	+E-W (usft)	Direction (°)	
	0.0	0.0	0.0	97.06	

Survey Program		Date	11/12/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
726.0	13,544.0	MWD (Wellbore #1)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N-S (usft)	+E-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
652.0	0.00	0.00	652.0	0.0	0.0	0.0	0.00	0.00	0.00
TIE IN @ 652' MD / 652' TVD									
652.1	0.00	172.30	652.1	0.0	0.0	0.0	0.00	0.00	0.00
726.0	0.20	172.30	726.0	-0.1	0.0	0.0	0.27	0.27	0.00
1,001.0	0.50	223.60	1,001.0	-1.5	-0.7	-0.6	0.15	0.11	18.65
1,276.0	0.40	243.10	1,276.0	-2.8	-2.4	-2.1	0.07	-0.04	7.09
1,555.0	0.30	227.40	1,555.0	-3.7	-3.8	-3.4	0.05	-0.04	-5.63
1,745.0	0.30	162.60	1,745.0	-4.5	-4.1	-3.5	0.17	0.00	-34.11
1,840.0	3.80	187.90	1,839.9	-7.9	-4.4	-3.4	3.72	3.68	26.63
1,935.0	5.40	184.40	1,934.6	-15.5	-5.2	-3.2	1.71	1.68	-3.68
2,030.0	6.20	178.20	2,029.1	-25.0	-5.4	-2.3	1.07	0.84	-6.53

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2,125.0	8.00	176.50	2,123.4	-36.8	-4.8	-0.2	1.91	1.89	-1.79
2,220.0	10.00	177.90	2,217.2	-51.6	-4.1	2.3	2.12	2.11	1.47
2,315.0	10.50	176.30	2,310.7	-68.5	-3.2	5.2	0.61	0.53	-1.68
2,410.0	11.70	178.40	2,403.9	-86.8	-2.4	8.3	1.33	1.26	2.21
2,505.0	13.40	181.20	2,496.6	-107.4	-2.4	10.8	1.90	1.79	2.95
2,600.0	14.70	177.20	2,588.8	-130.4	-2.0	14.0	1.71	1.37	-4.21
2,695.0	16.80	179.50	2,680.2	-156.2	-1.3	17.9	2.31	2.21	2.42
2,790.0	17.00	177.90	2,771.1	-183.8	-0.7	21.9	0.53	0.21	-1.68
2,885.0	17.60	175.60	2,861.8	-212.0	0.9	27.0	0.96	0.63	-2.42
2,980.0	17.10	175.30	2,952.5	-240.3	3.2	32.7	0.53	-0.53	-0.32
3,075.0	15.10	180.20	3,043.8	-266.6	4.3	37.0	2.54	-2.11	5.16
3,170.0	17.20	181.20	3,135.0	-293.0	3.9	39.9	2.23	2.21	1.05
3,265.0	16.00	180.70	3,226.1	-320.1	3.5	42.8	1.27	-1.26	-0.53
3,360.0	14.30	176.60	3,317.8	-344.9	4.0	46.4	2.11	-1.79	-4.32
CROSSED HARD LINE @ 3408' MD / 3365' TVD									
3,408.2	14.30	175.84	3,364.5	-356.8	4.8	48.6	0.39	0.00	-1.58
3,455.0	14.30	175.10	3,409.8	-368.3	5.7	51.0	0.39	0.00	-1.58
3,550.0	15.20	170.30	3,501.7	-392.3	8.8	57.0	1.60	0.95	-5.05
3,645.0	14.80	176.60	3,593.5	-416.7	11.6	62.8	1.77	-0.42	6.63
3,740.0	14.30	176.60	3,685.4	-440.5	13.1	67.1	0.53	-0.53	0.00
3,835.0	15.60	174.90	3,777.2	-464.9	14.9	71.9	1.44	1.37	-1.79
3,930.0	18.30	184.60	3,868.1	-492.5	14.8	75.3	4.11	2.84	10.21
4,026.0	20.80	183.70	3,958.5	-524.6	12.5	76.9	2.62	2.60	-0.94
4,120.0	21.10	180.90	4,046.3	-558.1	11.2	79.7	1.11	0.32	-2.98
4,216.0	17.10	174.90	4,137.0	-589.5	12.2	84.5	4.64	-4.17	-6.25
4,311.0	18.00	181.40	4,227.6	-618.1	13.0	88.9	2.27	0.95	6.84
4,406.0	18.40	182.80	4,317.9	-647.7	12.0	91.5	0.62	0.42	1.47
4,500.0	15.90	182.10	4,407.7	-675.4	10.8	93.7	2.67	-2.66	-0.74
4,595.0	15.70	183.20	4,499.1	-701.3	9.6	95.7	0.38	-0.21	1.16
4,691.0	16.00	184.60	4,591.4	-727.4	7.8	97.1	0.51	0.31	1.46
4,785.0	12.40	184.00	4,682.5	-750.4	6.0	98.2	3.83	-3.83	-0.64
4,880.0	12.50	184.40	4,775.3	-770.8	4.5	99.2	0.14	0.11	0.42
4,975.0	11.10	178.80	4,868.3	-790.2	3.9	101.0	1.90	-1.47	-5.89
5,071.0	9.20	176.80	4,962.8	-807.1	4.6	103.7	2.01	-1.98	-2.08
CROSSED HARD LINE @ 5131' MD / 5022' TVD									
5,130.5	9.53	184.24	5,021.5	-816.8	4.5	104.8	2.11	0.56	12.50
5,166.0	9.80	188.40	5,056.5	-822.7	3.8	104.9	2.11	0.76	11.72
5,260.0	8.80	186.70	5,149.3	-837.8	1.8	104.7	1.10	-1.06	-1.81
5,356.0	6.50	183.50	5,244.4	-850.5	0.6	105.1	2.44	-2.40	-3.33
5,451.0	7.00	182.60	5,338.7	-861.6	0.0	105.9	0.54	0.53	-0.95
5,546.0	4.70	173.10	5,433.3	-871.3	0.2	107.3	2.62	-2.42	-10.00
5,640.0	4.00	172.60	5,527.0	-878.4	1.1	109.1	0.75	-0.74	-0.53
5,735.0	2.80	163.10	5,621.8	-883.9	2.2	110.8	1.39	-1.26	-10.00

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Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,831.0	1.90	160.50	5,717.7	-887.6	3.4	112.5	0.94	-0.94	-2.71
5,926.0	1.30	169.10	5,812.7	-890.2	4.1	113.5	0.68	-0.63	9.05
6,021.0	1.20	188.60	5,907.7	-892.2	4.2	113.8	0.46	-0.11	20.53
6,116.0	1.20	183.20	6,002.6	-894.2	4.0	113.9	0.12	0.00	-5.68
6,211.0	1.20	170.50	6,097.6	-896.1	4.1	114.2	0.28	0.00	-13.37
6,306.0	1.40	161.50	6,192.6	-898.2	4.6	115.0	0.30	0.21	-9.47
6,374.0	1.60	164.20	6,260.6	-899.9	5.2	115.7	0.31	0.29	3.97
6,393.0	1.30	168.00	6,279.6	-900.4	5.3	115.9	1.66	-1.58	20.00
6,428.0	1.20	159.40	6,314.6	-901.1	5.5	116.2	0.61	-0.29	-24.57
6,488.0	3.20	92.40	6,374.5	-901.8	7.4	118.2	4.91	3.33	-111.67
6,533.0	6.80	87.20	6,419.3	-901.7	11.3	122.0	8.05	8.00	-11.56
6,583.0	11.60	83.80	6,468.7	-901.0	19.3	129.9	9.66	9.60	-6.80
6,628.0	14.20	92.80	6,512.6	-900.8	29.3	139.8	7.29	5.78	20.00
6,678.0	17.10	92.60	6,560.7	-901.4	42.7	153.2	5.80	5.80	-0.40
6,723.0	19.70	86.30	6,603.4	-901.2	56.9	167.3	7.27	5.78	-14.00
6,773.0	24.00	87.00	6,649.8	-900.2	75.5	185.6	8.62	8.60	1.40
6,818.0	27.40	89.60	6,690.3	-899.6	95.0	204.9	7.96	7.56	5.78
6,868.0	29.10	91.40	6,734.4	-899.8	118.7	228.4	3.80	3.40	3.60
6,913.0	31.70	92.60	6,773.2	-900.6	141.4	251.0	5.93	5.78	2.67
6,963.0	36.50	90.00	6,814.6	-901.2	169.4	278.9	10.03	9.60	-5.20
7,008.0	41.00	87.40	6,849.7	-900.6	197.6	306.8	10.63	10.00	-5.78
7,058.0	45.40	88.40	6,886.1	-899.3	231.8	340.5	8.91	8.80	2.00
7,103.0	48.60	89.50	6,916.8	-898.7	264.7	373.1	7.33	7.11	2.44
7,154.0	53.40	90.00	6,948.9	-898.6	304.3	412.4	9.44	9.41	0.98
7,199.0	58.60	90.30	6,974.0	-898.7	341.6	449.4	11.57	11.56	0.67
7,249.0	63.20	90.00	6,998.4	-898.8	385.3	492.8	9.21	9.20	-0.60
7,294.0	66.30	89.60	7,017.5	-898.6	426.0	533.2	6.94	6.89	-0.89
7,344.0	69.30	89.50	7,036.4	-898.3	472.2	579.1	6.00	6.00	-0.20
7,389.0	73.30	90.00	7,050.9	-898.1	514.9	621.3	8.95	8.89	1.11
7,438.0	76.20	89.80	7,063.7	-898.0	562.1	668.2	5.93	5.92	-0.41
7,483.0	79.10	89.80	7,073.4	-897.8	606.1	711.8	6.44	6.44	0.00
7,534.0	85.60	89.10	7,080.2	-897.4	656.6	761.9	12.82	12.75	-1.37
7,592.0	89.30	89.50	7,082.7	-896.7	714.5	819.3	6.42	6.38	0.69
7,684.0	91.10	89.50	7,082.4	-895.8	806.5	910.5	1.96	1.96	0.00
7,776.0	91.40	89.30	7,080.4	-894.9	898.5	1,001.7	0.39	0.33	-0.22
7,867.0	91.40	90.00	7,078.2	-894.3	989.5	1,091.9	0.77	0.00	0.77
7,958.0	90.10	88.90	7,077.0	-893.5	1,080.4	1,182.1	1.87	-1.43	-1.21
8,050.0	89.90	88.60	7,077.0	-891.4	1,172.4	1,273.1	0.39	-0.22	-0.33
8,142.0	89.90	88.20	7,077.2	-888.9	1,264.4	1,364.1	0.43	0.00	-0.43
8,234.0	90.00	88.10	7,077.2	-885.9	1,356.3	1,454.9	0.15	0.11	-0.11
8,326.0	90.40	88.10	7,076.9	-882.9	1,448.3	1,545.8	0.43	0.43	0.00
8,417.0	89.20	88.80	7,077.2	-880.4	1,539.3	1,635.8	1.53	-1.32	0.77
8,512.0	91.40	88.10	7,076.7	-877.8	1,634.2	1,729.7	2.43	2.32	-0.74
8,607.0	89.40	88.80	7,076.1	-875.3	1,729.2	1,823.6	2.23	-2.11	0.74

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8,702.0	89.90	89.30	7,076.6	-873.7	1,824.2	1,917.7	0.74	0.53	0.53
8,797.0	90.80	90.30	7,076.1	-873.4	1,919.1	2,011.9	1.42	0.95	1.05
CROSSED HARD LINE @ 8805' MD / 7076' TVD									
8,804.6	90.72	90.32	7,076.0	-873.4	1,926.7	2,019.5	1.07	-1.05	0.21
8,892.0	89.80	90.50	7,075.6	-874.0	2,014.1	2,106.3	1.07	-1.05	0.21
8,987.0	91.10	90.50	7,074.8	-874.8	2,109.1	2,200.7	1.37	1.37	0.00
9,082.0	88.30	89.10	7,075.3	-874.5	2,204.1	2,294.9	3.30	-2.95	-1.47
9,177.0	89.30	88.90	7,077.3	-872.9	2,299.1	2,388.9	1.07	1.05	-0.21
9,272.0	89.70	88.90	7,078.1	-871.0	2,394.1	2,483.0	0.42	0.42	0.00
9,367.0	90.60	89.60	7,077.9	-869.8	2,489.1	2,577.1	1.20	0.95	0.74
9,462.0	90.60	87.90	7,076.9	-867.7	2,584.0	2,671.1	1.79	0.00	-1.79
9,557.0	91.40	90.70	7,075.2	-866.6	2,679.0	2,765.2	3.06	0.84	2.95
9,652.0	90.70	89.50	7,073.5	-866.7	2,774.0	2,859.5	1.46	-0.74	-1.26
9,747.0	90.50	89.80	7,072.5	-866.1	2,869.0	2,953.7	0.38	-0.21	0.32
9,842.0	89.60	90.30	7,072.4	-866.2	2,964.0	3,048.0	1.08	-0.95	0.53
9,937.0	90.80	90.00	7,072.1	-866.5	3,059.0	3,142.3	1.30	1.26	-0.32
10,032.0	89.60	89.50	7,071.8	-866.1	3,154.0	3,236.5	1.37	-1.26	-0.53
10,127.0	90.70	90.00	7,071.5	-865.6	3,249.0	3,330.7	1.27	1.16	0.53
10,222.0	88.40	89.80	7,072.3	-865.5	3,343.9	3,425.0	2.43	-2.42	-0.21
10,317.0	88.60	89.80	7,074.7	-865.1	3,438.9	3,519.2	0.21	0.21	0.00
10,412.0	89.90	90.70	7,076.0	-865.6	3,533.9	3,613.5	1.66	1.37	0.95
10,507.0	90.90	91.40	7,075.3	-867.3	3,628.9	3,708.0	1.28	1.05	0.74
10,602.0	89.90	91.40	7,074.7	-869.6	3,723.8	3,802.5	1.05	-1.05	0.00
10,696.0	89.70	91.10	7,075.0	-871.7	3,817.8	3,896.0	0.38	-0.21	-0.32
10,791.0	89.50	91.10	7,075.7	-873.5	3,912.8	3,990.5	0.21	-0.21	0.00
10,886.0	90.40	89.80	7,075.7	-874.2	4,007.8	4,084.9	1.66	0.95	-1.37
10,981.0	90.80	90.00	7,074.7	-874.1	4,102.8	4,179.1	0.47	0.42	0.21
11,076.0	90.80	90.50	7,073.4	-874.5	4,197.8	4,273.4	0.53	0.00	0.53
11,171.0	91.10	91.40	7,071.8	-876.1	4,292.8	4,367.9	1.00	0.32	0.95
11,266.0	90.80	91.10	7,070.3	-878.1	4,387.7	4,462.4	0.45	-0.32	-0.32
11,360.0	89.00	89.30	7,070.4	-878.5	4,481.7	4,555.7	2.71	-1.91	-1.91
11,392.0	89.00	89.30	7,071.0	-878.1	4,513.7	4,587.4	0.00	0.00	0.00
11,455.0	89.60	88.90	7,071.8	-877.1	4,576.7	4,649.8	1.14	0.95	-0.63
11,550.0	90.50	88.80	7,071.7	-875.2	4,671.7	4,743.8	0.95	0.95	-0.11
11,645.0	90.20	88.80	7,071.1	-873.2	4,766.6	4,837.8	0.32	-0.32	0.00
11,740.0	90.70	88.20	7,070.3	-870.7	4,861.6	4,931.8	0.82	0.53	-0.63
11,835.0	90.80	88.10	7,069.1	-867.6	4,956.6	5,025.6	0.15	0.11	-0.11
11,929.0	90.50	88.10	7,068.0	-864.5	5,050.5	5,118.5	0.32	-0.32	0.00
12,025.0	89.80	87.90	7,067.8	-861.2	5,146.4	5,213.3	0.76	-0.73	-0.21
12,120.0	91.50	88.90	7,066.7	-858.5	5,241.4	5,307.2	2.08	1.79	1.05
12,215.0	91.40	89.10	7,064.3	-856.9	5,336.3	5,401.2	0.24	-0.11	0.21
12,309.0	89.90	88.80	7,063.2	-855.1	5,430.3	5,494.3	1.63	-1.60	-0.32
12,404.0	89.40	89.10	7,063.8	-853.4	5,525.3	5,588.3	0.61	-0.53	0.32

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Boulter G21-69HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4831.0usft (H&P #323)
Site:	Sec 16, T4N, R65W	MD Reference:	WELL @ 4831.0usft (H&P #323)
Well:	Boulter G21-69HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,499.0	90.00	89.60	7,064.3	-852.3	5,620.3	5,682.4	0.82	0.63	0.53
12,594.0	90.30	89.50	7,064.1	-851.6	5,715.3	5,776.6	0.33	0.32	-0.11
12,689.0	89.80	89.30	7,064.0	-850.6	5,810.3	5,870.8	0.57	-0.53	-0.21
12,784.0	90.50	89.50	7,063.7	-849.6	5,905.3	5,964.9	0.77	0.74	0.21
12,879.0	90.80	88.90	7,062.7	-848.3	6,000.3	6,059.0	0.71	0.32	-0.63
12,974.0	92.10	89.10	7,060.3	-846.6	6,095.2	6,153.1	1.38	1.37	0.21
13,069.0	92.40	89.80	7,056.5	-845.7	6,190.1	6,247.1	0.80	0.32	0.74
13,164.0	91.60	89.60	7,053.2	-845.2	6,285.1	6,341.3	0.87	-0.84	-0.21
13,259.0	90.00	90.20	7,051.9	-845.0	6,380.1	6,435.6	1.80	-1.68	0.63
13,354.0	90.70	89.80	7,051.3	-845.0	6,475.1	6,529.8	0.85	0.74	-0.42
13,449.0	90.80	90.50	7,050.1	-845.3	6,570.1	6,624.1	0.74	0.11	0.74
13,488.0	91.40	90.00	7,049.3	-845.4	6,609.0	6,662.8	2.00	1.54	-1.28
TD @ 13544' MD / 7048' TVD									
13,544.0	91.40	90.00	7,047.9	-845.4	6,665.0	6,718.4	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
652.1	652.1	0.0	0.0	TIE IN @ 652' MD / 652' TVD
3,408.2	3,364.5	-356.8	4.8	CROSSED HARD LINE @ 3408' MD / 3365' TVD
5,130.5	5,021.5	-816.8	4.5	CROSSED HARD LINE @ 5131' MD / 5022' TVD
8,804.6	7,076.0	-873.4	1,926.7	CROSSED HARD LINE @ 8805' MD / 7076' TVD
13,544.0	7,047.9	-845.4	6,665.0	TD @ 13544' MD / 7048' TVD

Checked By: _____ Approved By: _____ Date: _____



Survey Certification Sheet

Noble Energy
Company

RM-12816
Job Number

11/12/2012
Date

Sec16,T4N,R65W
Lease

Boulter G21-69HN
Well Name

Weld,CO
County & State

Surveyed from a depth of: 652 feet to 13544 feet MD

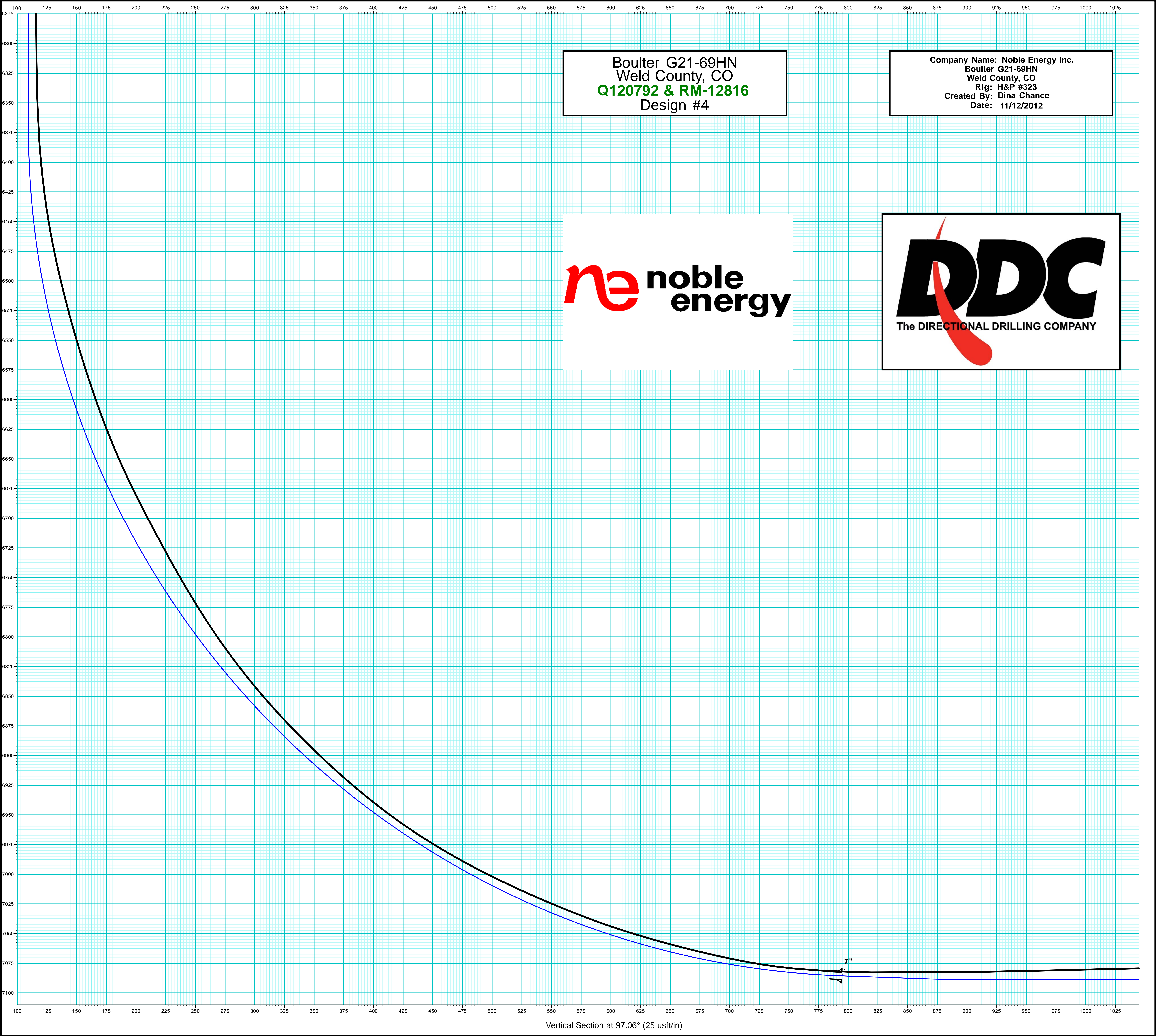
Type of Survey: MWD

Directional Supervisor/Surveyor: Boyd Wolff

The data and calculations for this survey have been checked by me and conform to the standards and procedures set forth by **The Directional Drilling Company (DDC)**. This report represents a true and correct Directional survey of this well based on the original data obtained at the well site. Wellbore Coordinates are calculated using minimum curvature.

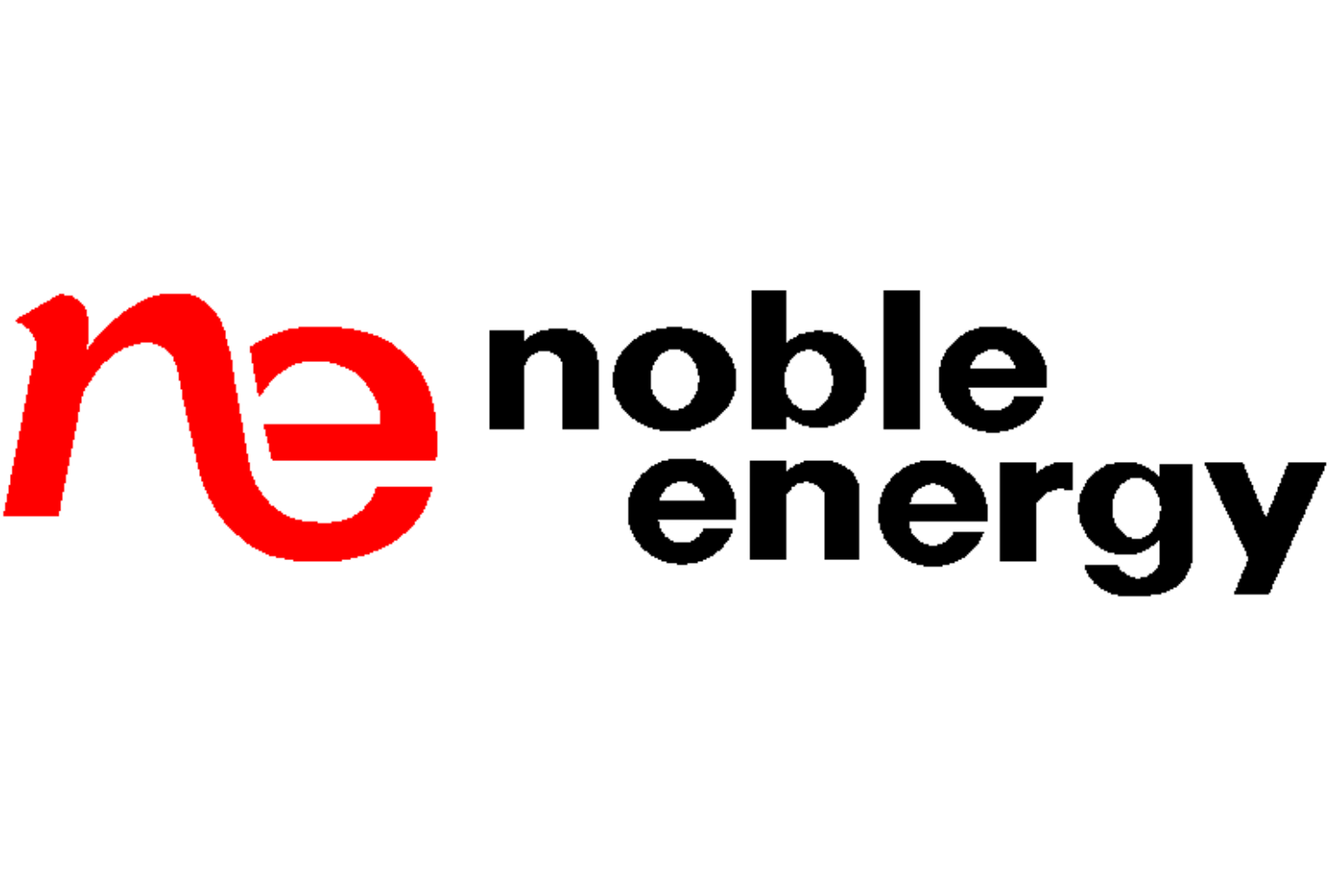
Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company, ou=GM
of Guidance Services,
email=larryw@directionaldrillers.com,
c=US
Date: 2012.11.13 15:47:38 -06'00'

Larry Wright
MWD General Manager



Boulter G21-69HN
Weld County, CO
Q120792 & RM-12816
Design #4

Company Name: Noble Energy Inc.
Boulter G21-69HN
Weld County, CO
Rig: H&P #323
Created By: Dina Chance
Date: 11/12/2012



Vertical Section at 97.06° (25 usft/in)

Company Name: Noble Energy Inc.
Boulder G21-69HN
Weld County, CO
Rig: H&P #323
Created By: Dina Chance
Date: 11/12/2012

Boulder G21-69HN
Weld County, CO
Q120792 & RM-12816
Design #4



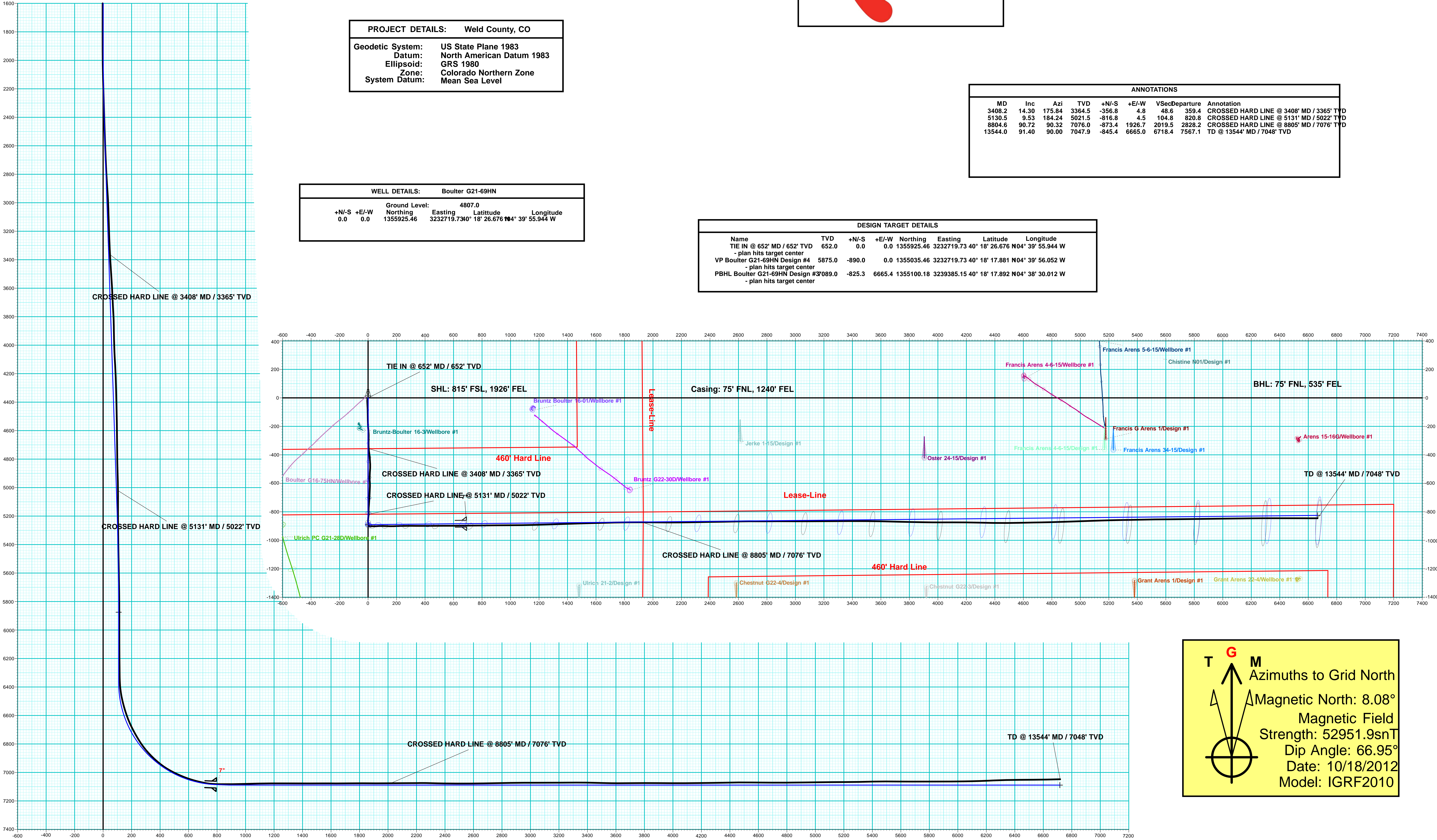
PROJECT DETAILS: Weld County, CO	
Geodetic System:	US State Plane 1983
Datum:	North American Datum 1983
Ellipsoid:	GRS 1980
Zone:	Colorado Northern Zone
System Datum:	Mean Sea Level

WELL DETAILS:		Boulder G21-69HN			
		Ground Level:		4807.0	
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1355925.46	3232719.73	40° 18' 26.676" N	104° 39' 55.944 W

ANNOTATIONS							
MD	Inc	Azi	TVD	+N/-S	+E/-W	VSec	Departure
3408.2	14.30	175.84	3364.5	-356.8	4.8	48.6	359.4
5130.5	9.53	184.24	5021.5	-816.8	4.5	104.8	820.8
8804.6	90.72	90.32	7076.0	-873.4	1926.7	2019.5	2828.2
13544.0	91.40	90.00	7047.9	-845.4	6665.0	6718.4	7567.1

CROSSED HARD LINE @ 3408' MD / 3365' TVD
CROSSED HARD LINE @ 5131' MD / 5022' TVD
CROSSED HARD LINE @ 8805' MD / 7076' TVD
TD @ 13544' MD / 7048' TVD

DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
TIE IN @ 652' MD / 652' TVD	652.0	0.0	0.0	1355925.46	3232719.73	40° 18' 26.676" N	104° 39' 55.944" W
- plan hits target center							
VP Boulder G21-69HN Design #4	5875.0	-890.0	0.0	1355035.46	3232719.73	40° 18' 17.881" N	104° 39' 56.052" W
- plan hits target center							
PBHL Boulder G21-69HN Design #3	7089.0	-825.3	6665.4	1355100.18	3239385.15	40° 18' 17.892" N	104° 38' 30.012" W
- plan hits target center							



Vertical Section at 97.06° (200 usft/in)

T G M
Azimuths to Grid North
Magnetic North: 8.08°
Magnetic Field
Strength: 52951.9snT
Dip Angle: 66.95°
Date: 10/18/2012
Model: IGRF2010