



Noble Energy Inc.

Weld County, CO

Sec 14, T4N, R67W, 6th PM

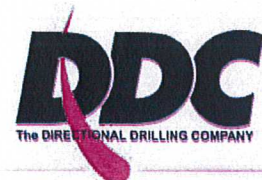
Stroh PC O13-79HN

Wellbore #1

Survey: MWD **FINAL**

DDC Survey Report

26 November, 2012



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Stroh PC O13-79HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4868.0usft (H&P #323)
Site:	Sec 14, T4N, R67W, 6th PM	MD Reference:	WELL @ 4868.0usft (H&P #323)
Well:	Stroh PC O13-79HN	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 14, T4N, R67W, 6th PM				
Site Position:		Northing:	1,354,723.74 usft	Latitude:	40° 18' 19.008 N
From:	Lat/Long	Easting:	3,181,935.65 usft	Longitude:	104° 50' 51.576 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.42 °

Well	Stroh PC O13-79HN					
Well Position	+N/-S	0.0 usft	Northing:	1,354,723.74 usft	Latitude:	40° 18' 19.008 N
	+E/-W	0.0 usft	Easting:	3,181,935.65 usft	Longitude:	104° 50' 51.576 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,844.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/7/2012	8.71	66.91	52,925

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	355.23	

Survey Program		Date	11/26/2012	
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
816.0	11,574.0	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)
TIE IN @ 777' MD / 777' TVD									
777.0	0.00	0.00	777.0	0.0	0.0	0.0	0.00	0.00	0.00
816.0	0.30	333.30	816.0	0.1	0.0	0.1	0.77	0.77	0.00
1,091.0	0.30	325.60	1,091.0	1.3	-0.8	1.4	0.01	0.00	-2.80
1,366.0	0.70	321.20	1,366.0	3.2	-2.2	3.4	0.15	0.15	-1.60
1,648.0	0.90	330.50	1,648.0	6.5	-4.4	6.8	0.08	0.07	3.30
1,933.0	1.30	291.80	1,932.9	9.7	-8.5	10.3	0.29	0.14	-13.58
2,218.0	1.10	239.80	2,217.9	9.5	-13.9	10.6	0.37	-0.07	-18.25
2,503.0	1.00	217.80	2,502.8	6.1	-17.8	7.6	0.14	-0.04	-7.72
2,599.0	3.10	235.70	2,598.7	4.0	-20.4	5.7	2.26	2.19	18.65
2,694.0	4.90	252.10	2,693.5	1.3	-26.4	3.5	2.23	1.89	17.26

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Well:	Stroh PC O13-79HN	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)
2,789.0	7.20	253.90	2,788.0	-1.6	-36.0	1.4	2.43	2.42	1.89
2,884.0	8.40	254.00	2,882.1	-5.1	-48.4	-1.1	1.26	1.26	0.11
2,979.0	10.50	251.20	2,975.8	-9.9	-63.2	-4.6	2.26	2.21	-2.95
3,074.0	12.00	244.90	3,069.0	-16.8	-80.4	-10.1	2.04	1.58	-6.63
3,168.0	12.30	251.90	3,160.9	-24.1	-98.8	-15.8	1.60	0.32	7.45
3,264.0	13.30	247.40	3,254.5	-31.5	-118.7	-21.5	1.47	1.04	-4.69
3,359.0	13.40	248.20	3,346.9	-39.8	-139.0	-28.1	0.22	0.11	0.84
3,454.0	13.70	251.00	3,439.3	-47.5	-159.8	-34.1	0.76	0.32	2.95
3,549.0	13.00	242.40	3,531.7	-56.2	-179.9	-41.0	2.21	-0.74	-9.05
3,644.0	13.30	245.60	3,624.2	-65.6	-199.4	-48.8	0.83	0.32	3.37
3,739.0	14.10	244.70	3,716.5	-75.1	-219.8	-56.5	0.87	0.84	-0.95
3,834.0	15.20	244.40	3,808.4	-85.4	-241.5	-65.0	1.16	1.16	-0.32
3,929.0	15.60	248.60	3,900.0	-95.5	-264.6	-73.1	1.25	0.42	4.42
4,024.0	15.60	248.10	3,991.5	-104.9	-288.3	-80.5	0.14	0.00	-0.53
CROSSED SECTION LINE @ 4046' MD / 4013' TVD									
4,046.1	14.57	248.73	4,012.9	-107.0	-293.7	-82.2	4.71	-4.65	2.85
4,119.0	11.20	251.60	4,083.9	-112.6	-309.0	-86.5	4.71	-4.63	3.94
4,213.0	9.60	251.80	4,176.4	-117.9	-325.1	-90.4	1.70	-1.70	0.21
4,308.0	9.60	253.30	4,270.0	-122.6	-340.2	-93.9	0.26	0.00	1.58
4,403.0	7.70	255.30	4,364.0	-126.5	-353.9	-96.7	2.02	-2.00	2.11
4,498.0	7.30	251.00	4,458.1	-130.1	-365.8	-99.2	0.73	-0.42	-4.53
4,593.0	6.70	257.70	4,552.4	-133.3	-376.9	-101.4	1.07	-0.63	7.05
4,688.0	6.20	266.30	4,646.8	-134.8	-387.4	-102.1	1.14	-0.53	9.05
4,783.0	5.50	261.90	4,741.3	-135.7	-397.1	-102.2	0.87	-0.74	-4.63
4,878.0	4.50	258.60	4,836.0	-137.1	-405.2	-102.9	1.09	-1.05	-3.47
4,973.0	2.30	263.50	4,930.8	-138.1	-410.8	-103.4	2.33	-2.32	5.16
5,068.0	0.80	38.90	5,025.8	-137.8	-412.3	-103.0	3.08	-1.58	142.53
5,163.0	0.70	37.80	5,120.8	-136.8	-411.5	-102.1	0.11	-0.11	-1.16
5,258.0	0.70	358.50	5,215.8	-135.8	-411.1	-101.1	0.50	0.00	-41.37
5,352.0	1.90	61.90	5,309.8	-134.4	-409.8	-99.9	1.81	1.28	67.45
5,447.0	1.10	53.10	5,404.7	-133.2	-407.7	-98.8	0.87	-0.84	-9.26
5,542.0	0.80	76.30	5,499.7	-132.5	-406.3	-98.2	0.51	-0.32	24.42
5,637.0	0.30	326.80	5,594.7	-132.1	-405.8	-97.9	0.99	-0.53	-115.26
5,732.0	0.80	288.70	5,689.7	-131.7	-406.5	-97.4	0.62	0.53	-40.11
5,827.0	1.40	293.40	5,784.7	-131.0	-408.2	-96.6	0.64	0.63	4.95
5,922.0	0.80	15.70	5,879.7	-129.9	-409.1	-95.4	1.60	-0.63	86.63
6,017.0	0.90	322.80	5,974.7	-128.7	-409.4	-94.2	0.80	0.11	-55.68
6,112.0	1.40	299.20	6,069.6	-127.5	-410.9	-92.9	0.71	0.53	-24.84
6,206.0	1.70	289.20	6,163.6	-126.5	-413.2	-91.7	0.43	0.32	-10.64
6,301.0	2.00	283.40	6,258.6	-125.6	-416.1	-90.6	0.37	0.32	-6.11
6,410.0	2.30	279.70	6,367.5	-124.8	-420.1	-89.5	0.30	0.28	-3.39
6,485.0	2.40	282.20	6,442.4	-124.2	-423.1	-88.6	0.19	0.13	3.33
6,530.0	2.20	347.40	6,487.4	-123.2	-424.3	-87.5	5.52	-0.44	144.89

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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)
6,580.0	7.00	2.30	6,537.2	-119.2*	-424.3	-83.5	9.81	9.60	29.80
6,625.0	9.40	4.30	6,581.7	-112.8	-424.0	-77.2	5.37	5.33	4.44
6,675.0	13.70	9.70	6,630.7	-102.9	-422.7	-67.4	8.86	8.60	10.80
6,720.0	17.80	8.80	6,674.0	-90.8	-420.7	-55.5	9.13	9.11	-2.00
6,770.0	20.20	6.20	6,721.3	-74.7	-418.6	-39.6	5.09	4.80	-5.20
6,815.0	22.40	4.80	6,763.2	-58.4	-417.0	-23.5	5.02	4.89	-3.11
6,865.0	26.60	6.40	6,808.7	-37.8	-415.0	-3.2	8.50	8.40	3.20
6,910.0	29.90	6.20	6,848.3	-16.6	-412.7	17.7	7.34	7.33	-0.44
6,960.0	33.70	6.00	6,890.8	9.6	-409.9	43.6	7.60	7.60	-0.40
7,005.0	37.40	6.20	6,927.4	35.6	-407.1	69.3	8.23	8.22	0.44
7,055.0	42.50	6.20	6,965.8	67.5	-403.6	100.8	10.20	10.20	0.00
7,100.0	47.60	5.50	6,997.5	99.1	-400.4	132.1	11.39	11.33	-1.56
7,150.0	52.40	5.70	7,029.7	137.3	-396.6	169.8	9.60	9.60	0.40
7,195.0	55.70	3.50	7,056.1	173.6	-393.7	205.7	8.33	7.33	-4.89
7,245.0	58.60	3.40	7,083.2	215.5	-391.2	247.3	5.80	5.80	-0.20
7,290.0	60.90	3.20	7,105.9	254.3	-389.0	285.8	5.13	5.11	-0.44
7,340.0	65.30	2.10	7,128.5	298.8	-386.9	330.0	9.02	8.80	-2.20
7,385.0	69.60	1.30	7,145.7	340.3	-385.7	371.2	9.70	9.56	-1.78
7,434.0	72.70	3.20	7,161.6	386.7	-383.9	417.3	7.31	6.33	3.88
7,479.0	75.30	4.80	7,174.0	429.8	-380.8	460.0	6.71	5.78	3.56
7,529.0	79.90	3.90	7,184.7	478.5	-377.1	508.2	9.37	9.20	-1.80
7,653.0	87.80	0.70	7,198.0	601.6	-372.2	630.4	6.87	6.37	-2.58
7,748.0	89.50	359.50	7,200.2	696.5	-372.1	725.1	2.19	1.79	-1.26
7,843.0	90.50	359.10	7,200.2	791.5	-373.2	819.8	1.13	1.05	-0.42
7,938.0	90.00	359.00	7,199.8	886.5	-374.8	914.6	0.54	-0.53	-0.11
8,033.0	92.20	359.50	7,198.0	981.5	-376.0	1,009.4	2.37	2.32	0.53
8,128.0	89.70	359.00	7,196.4	1,076.5	-377.3	1,104.1	2.68	-2.63	-0.53
8,223.0	89.50	358.60	7,197.1	1,171.4	-379.3	1,198.9	0.47	-0.21	-0.42
8,318.0	90.40	359.30	7,197.2	1,266.4	-381.0	1,293.7	1.20	0.95	0.74
8,413.0	90.40	359.10	7,196.5	1,361.4	-382.3	1,388.5	0.21	0.00	-0.21
8,508.0	90.40	0.70	7,195.8	1,456.4	-382.5	1,483.2	1.68	0.00	1.68
8,603.0	90.80	2.50	7,194.8	1,551.4	-379.9	1,577.6	1.94	0.42	1.89
8,698.0	91.20	2.00	7,193.2	1,646.3	-376.1	1,671.8	0.67	0.42	-0.53
8,793.0	88.50	1.80	7,193.4	1,741.2	-373.0	1,766.2	2.85	-2.84	-0.21
8,888.0	89.30	0.20	7,195.3	1,836.2	-371.3	1,860.7	1.88	0.84	-1.68
8,983.0	89.50	359.90	7,196.2	1,931.2	-371.2	1,955.3	0.38	0.21	-0.32
9,078.0	88.70	359.30	7,197.7	2,026.1	-371.9	2,050.1	1.05	-0.84	-0.63
9,173.0	89.50	0.20	7,199.2	2,121.1	-372.3	2,144.8	1.27	0.84	0.95
9,267.0	88.90	359.30	7,200.5	2,215.1	-372.7	2,238.4	1.15	-0.64	-0.96
9,363.0	91.60	0.00	7,200.1	2,311.1	-373.3	2,334.2	2.91	2.81	0.73
9,458.0	91.10	359.10	7,197.9	2,406.1	-374.1	2,428.9	1.08	-0.53	-0.95
9,553.0	90.80	359.00	7,196.3	2,501.1	-375.6	2,523.6	0.33	-0.32	-0.11
9,648.0	91.50	0.90	7,194.4	2,596.0	-375.7	2,618.3	2.13	0.74	2.00

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Survey

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9,743.0	91.10	0.60	7,192.3	2,691.0	-374.5	2,712.8	0.53	-0.42	-0.32
9,838.0	90.20	359.70	7,191.2	2,786.0	-374.2	2,807.5	1.34	-0.95	-0.95
9,933.0	90.80	0.60	7,190.3	2,881.0	-374.0	2,902.1	1.14	0.63	0.95
10,028.0	90.10	359.70	7,189.6	2,976.0	-373.7	2,996.7	1.20	-0.74	-0.95
10,123.0	90.60	0.40	7,189.0	3,071.0	-373.6	3,091.4	0.91	0.53	0.74
10,218.0	90.40	0.00	7,188.2	3,166.0	-373.3	3,186.0	0.47	-0.21	-0.42
10,313.0	89.90	359.70	7,187.9	3,261.0	-373.6	3,280.7	0.61	-0.53	-0.32
10,408.0	89.00	358.80	7,188.9	3,356.0	-374.8	3,375.5	1.34	-0.95	-0.95
10,503.0	90.50	359.50	7,189.3	3,450.9	-376.2	3,470.3	1.74	1.58	0.74
10,598.0	90.10	359.10	7,188.8	3,545.9	-377.4	3,565.0	0.60	-0.42	-0.42
10,693.0	91.40	0.40	7,187.5	3,640.9	-377.8	3,659.7	1.94	1.37	1.37
10,788.0	91.20	359.90	7,185.4	3,735.9	-377.5	3,754.3	0.57	-0.21	-0.53
10,883.0	91.10	0.70	7,183.5	3,830.9	-377.0	3,849.0	0.85	-0.11	0.84
10,978.0	89.30	0.90	7,183.1	3,925.9	-375.7	3,943.5	1.91	-1.89	0.21
11,073.0	88.60	0.00	7,184.9	4,020.8	-375.0	4,038.1	1.20	-0.74	-0.95
11,168.0	89.50	0.90	7,186.4	4,115.8	-374.2	4,132.7	1.34	0.95	0.95
11,262.0	88.80	0.20	7,187.8	4,209.8	-373.3	4,226.3	1.05	-0.74	-0.74
11,357.0	89.70	359.30	7,189.1	4,304.8	-373.7	4,321.0	1.34	0.95	-0.95
11,452.0	88.50	358.80	7,190.6	4,399.8	-375.3	4,415.7	1.37	-1.26	-0.53
11,519.0	87.90	359.10	7,192.7	4,466.7	-376.5	4,482.6	1.00	-0.90	0.45
TD @ 11574' MD / 7195' TVD									
11,574.0	87.90	359.10	7,194.7	4,521.7	-377.4	4,537.4	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
777.0	777.0	0.0	0.0	TIE IN @ 777' MD / 777' TVD
4,046.1	4,012.9	-107.0	-293.7	CROSSED SECTION LINE @ 4046' MD / 4013' TVD
11,574.0	7,194.7	4,521.7	-377.4	TD @ 11574' MD / 7195' TVD

Checked By: _____ Approved By: _____ Date: _____



Survey Certification Sheet

Noble Energy
Company

RM-12866
Job Number

11/26/2012
Date

Sec14,T4N,R67W,6th PM
Lease

Stroh PC O13-79HN
Well Name

Weld,CO
County & State

Surveyed from a depth of: 777 feet to 11574 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Kurt Buresh

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: 2012.11.27 14:57:43 -06'00'

Larry Wright
MWD General Manager

Company Name: Noble Energy Inc.
Stroh PC O13-79HN
Weld County, CO
Rig: H&P #323
Created By: Dina Chance
Date: 11/26/2012

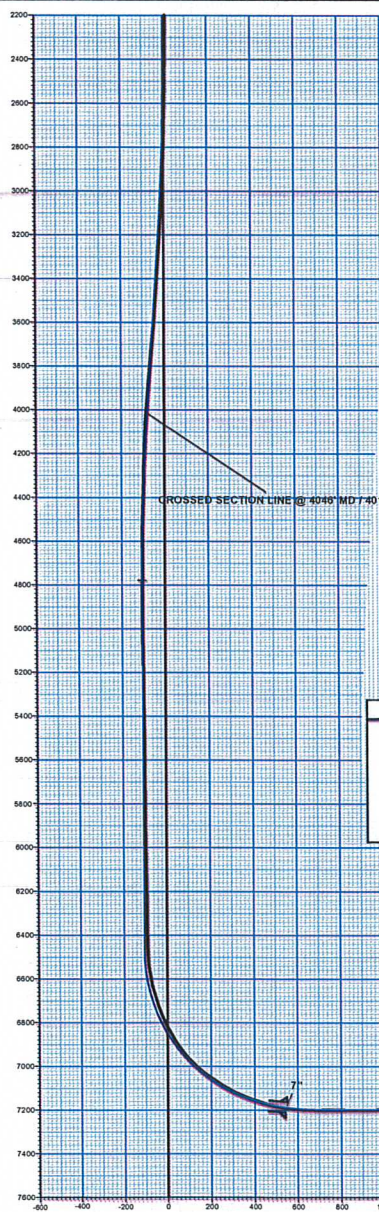
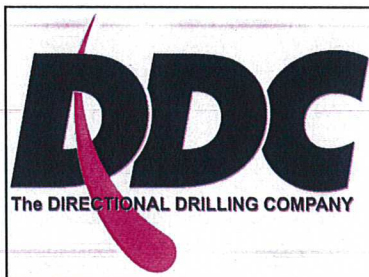
Stroh PC O13-79HN
Weld County, CO
Q120845 & RM-12866
Design #1

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

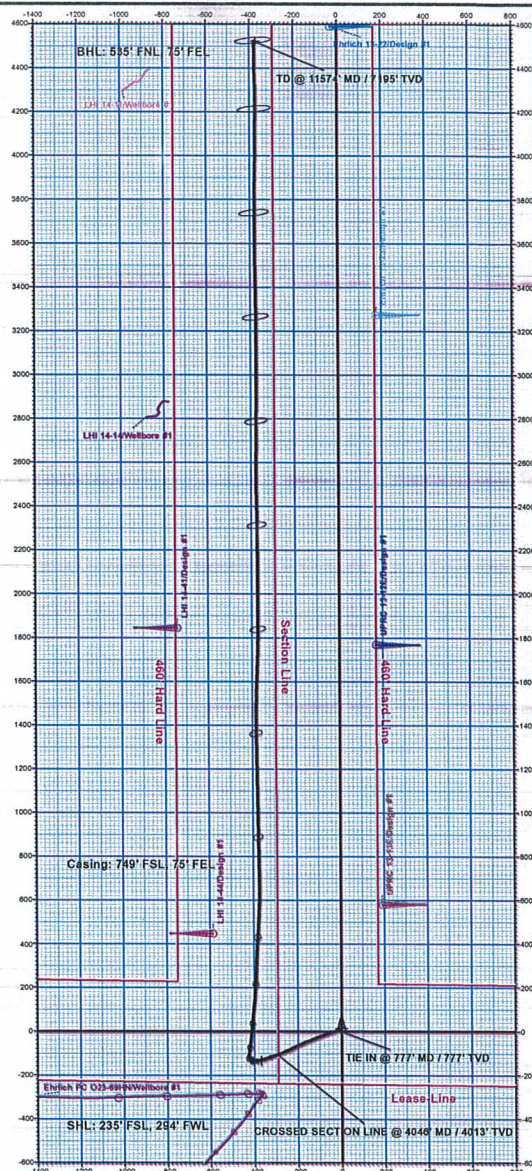
WELL DETAILS: Stroh PC O13-79HN

Ground Level: 4844.0
+N/-S +E/-W Northing Easting Longitude
0.0 0.0 1354723.74 3181935.65 40° 18' 19.008 N 104° 50' 51.576 W



DESIGN TARGET DETAILS							
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
TIE IN @ 777' MD / 777' TVD	777.0	0.0	0.0	1354723.74	3181935.65	40° 18' 19.008 N	104° 50' 51.576 W
- plan hits target center							
VP Stroh PC O13-79HN	4779.5	-135.0	-369.0	1354588.74	3181566.65	40° 18' 17.701 N	104° 50' 56.352 W
- plan hits target center							
PBHL Stroh PC O13-79HN	7188.5	4521.9	-370.7	1359245.63	3181564.97	40° 19' 3.720 N	104° 50' 55.932 W
- plan hits target center							

ANNOTATIONS									
MD	Inc	Azi	TVD	+N/-S	+E/-W	Vsect	Departure	Annotation	
4046.1	14.57	246.73	4012.9	-107.0	-293.7	-82.2	322.9	CROSSED SECTION LINE @ 4046' MD / 4013' TVD	
11574.0	87.60	356.10	7194.7	4521.7	-377.4	4537.4	6127.2	TD @ 11574' MD / 7195' TVD	

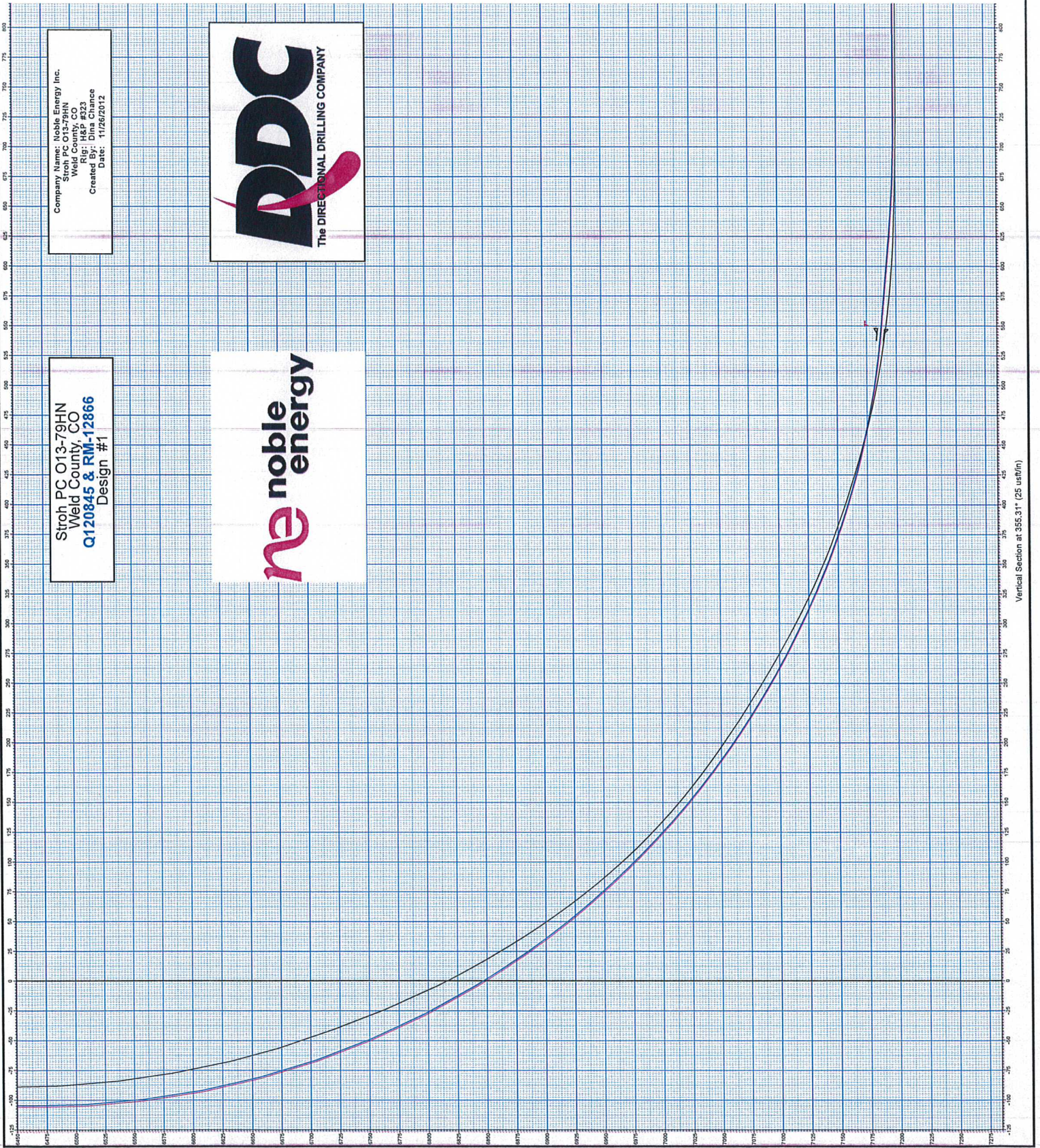


Azimuths to Grid North
 Magnetic North: 8.29°
 Magnetic Field
 Strength: 52925.3snT
 Dip Angle: 66.91°
 Date: 11/7/2012
 Model: IGRF2010

Vertical Section at 355.31° (200 usft/in)

Stroh PC 013-79HN
Weld County, CO
Q120845 & RM-12866
Design #1

Company Name: Noble Energy Inc.
Stroh PC 013-79HN
Weld County, CO
Created By: Dina Chance
Date: 11/26/2012



Vertical Section at 355.31° (25 uat/m)