

Noble Energy Inc.

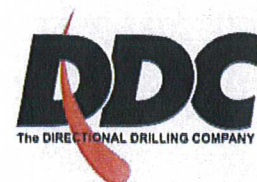
**Weld County, CO
Sec 9, T9N, R58W
ROHN LD09-62HN**

Wellbore #1

Survey: MWD FINAL

DDC Survey Report

26 September, 2012



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well ROHN LD09-62HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4743.0usft (H&P #326)
Site:	Sec 9, T9N, R58W	MD Reference:	WELL @ 4743.0usft (H&P #326)
Well:	ROHN LD09-62HN	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 9, T9N, R58W			
Site Position:		Northing:	1,523,890.74 usft	Latitude:	40° 45' 35.850 N
From:	Map	Easting:	3,453,841.03 usft	Longitude:	103° 51' 42.040 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	1.06 °

Well	ROHN LD09-62HN					
Well Position	+N/-S	0.0 usft	Northing:	1,523,890.74 usft	Latitude:	40° 45' 35.850 N
	+E/-W	0.0 usft	Easting:	3,453,841.03 usft	Longitude:	103° 51' 42.040 W
Position Uncertainty	0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,713.0 usft	

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	9/5/2012	8.23	67.44	53,283

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	271.20	

Survey Program	Date 9/25/2012			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
1,506.0	9,981.0	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)
1,501.0	0.00	0.00	1,501.0	0.0	0.0	0.0	0.00	0.00	0.00
TIE IN @ 1501' MD / 1501' TVD									
1,501.1	0.00	258.10	1,501.1	0.0	0.0	0.0	0.00	0.00	0.00
1,506.0	0.50	258.10	1,506.0	0.0	0.0	0.0	10.20	10.20	0.00
1,787.0	0.30	273.00	1,787.0	-0.2	-2.0	2.0	0.08	-0.07	5.30
1,880.0	2.20	68.70	1,880.0	0.4	-0.5	0.5	2.66	2.04	167.42
1,973.0	4.80	77.00	1,972.8	2.0	4.9	-4.9	2.84	2.80	8.92
2,066.0	7.30	72.40	2,065.3	4.6	14.3	-14.2	2.74	2.69	-4.95
2,159.0	9.20	67.80	2,157.3	9.2	26.9	-26.7	2.16	2.04	-4.95
2,251.0	11.50	63.80	2,247.8	16.1	41.9	-41.6	2.62	2.50	-4.35
2,345.0	13.70	67.30	2,339.5	24.5	60.6	-60.1	2.48	2.34	3.72

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well ROHN LD09-62HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4743.0usft (H&P #326)
Site:	Sec 9, T9N, R58W	MD Reference:	WELL @ 4743.0usft (H&P #326)
Well:	ROHN LD09-62HN	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)
2,437.0	16.10	67.90	2,428.4	33.5	82.5	-81.7	2.61	2.61	0.65
2,532.0	16.40	67.00	2,519.6	43.7	107.0	-106.1	0.41	0.32	-0.95
2,626.0	16.20	66.10	2,609.9	54.2	131.2	-130.0	0.34	-0.21	-0.96
2,718.0	15.60	64.60	2,698.3	64.7	154.1	-152.7	0.79	-0.65	-1.63
2,810.0	16.00	67.90	2,786.9	74.8	177.0	-175.4	1.07	0.43	3.59
2,902.0	14.10	67.60	2,875.7	83.8	199.1	-197.3	2.07	-2.07	-0.33
2,997.0	14.10	75.00	2,967.8	91.2	221.0	-219.1	1.90	0.00	7.79
3,091.0	15.70	72.90	3,058.7	97.9	244.2	-242.1	1.80	1.70	-2.23
3,187.0	16.50	70.90	3,150.9	106.2	269.5	-267.3	1.01	0.83	-2.08
3,282.0	16.80	70.50	3,241.9	115.2	295.2	-292.8	0.34	0.32	-0.42
3,377.0	17.10	71.30	3,332.8	124.3	321.4	-318.7	0.40	0.32	0.84
3,472.0	16.40	65.20	3,423.8	134.4	346.8	-343.9	1.99	-0.74	-6.42
3,567.0	14.30	70.00	3,515.4	144.0	370.0	-366.9	2.58	-2.21	5.05
3,662.0	11.70	66.30	3,608.0	151.9	389.9	-386.6	2.87	-2.74	-3.89
3,757.0	9.40	66.10	3,701.3	158.9	405.8	-402.4	2.42	-2.42	-0.21
3,852.0	7.50	66.80	3,795.3	164.5	418.6	-415.0	2.00	-2.00	0.74
3,947.0	6.80	68.80	3,889.6	169.0	429.5	-425.9	0.78	-0.74	2.11
4,042.0	6.20	71.90	3,984.0	172.6	439.6	-435.9	0.73	-0.63	3.26
4,137.0	5.50	70.40	4,078.5	175.7	448.8	-445.0	0.75	-0.74	-1.58
4,232.0	3.40	78.40	4,173.2	177.8	455.8	-452.0	2.30	-2.21	8.42
4,327.0	1.30	122.80	4,268.1	177.8	459.5	-455.7	2.77	-2.21	46.74
4,422.0	1.50	115.00	4,363.1	176.7	461.5	-457.7	0.29	0.21	-8.21
4,517.0	1.10	149.60	4,458.0	175.4	463.1	-459.4	0.91	-0.42	36.42
4,602.0	0.80	181.50	4,743.0	171.0	464.5	-460.8	0.21	-0.11	11.19
4,697.0	0.50	174.90	4,838.0	169.9	464.5	-460.8	0.32	-0.32	-6.95
4,929.0	0.30	195.70	4,870.0	169.7	464.5	-460.8	0.76	-0.63	65.00
4,992.0	0.20	48.70	4,933.0	169.6	464.5	-460.9	0.76	-0.16	-233.33
5,087.0	7.60	271.70	5,027.7	169.9	458.3	-454.7	8.16	7.79	-144.21
5,132.0	12.50	276.40	5,072.0	170.6	450.5	-446.9	11.03	10.89	10.44
5,182.0	17.00	265.50	5,120.4	170.6	437.9	-434.2	10.54	9.00	-21.80
5,227.0	20.50	269.50	5,163.0	170.0	423.4	-419.8	8.28	7.78	8.89
5,277.0	22.10	274.70	5,209.6	170.7	405.3	-401.6	4.95	3.20	10.40
5,322.0	25.00	273.50	5,250.8	172.0	387.3	-383.7	6.53	6.44	-2.67
5,372.0	30.40	270.80	5,295.1	172.8	364.1	-360.4	11.09	10.80	-5.40
5,417.0	34.00	269.10	5,333.1	172.8	340.2	-336.5	8.25	8.00	-3.78
5,467.0	38.30	267.10	5,373.5	171.8	310.7	-307.0	8.92	8.60	-4.00
5,512.0	40.00	266.30	5,408.4	170.1	282.3	-278.7	3.94	3.78	-1.78
5,562.0	42.80	264.30	5,445.9	167.4	249.4	-245.8	6.19	5.60	-4.00
5,607.0	45.80	266.00	5,478.1	164.8	218.1	-214.6	7.17	6.67	3.78
5,657.0	49.40	266.50	5,511.8	162.3	181.2	-177.8	7.24	7.20	1.00
5,702.0	52.50	268.10	5,540.2	160.7	146.3	-142.9	7.42	6.89	3.56
5,752.0	57.20	269.70	5,568.9	159.9	105.5	-102.1	9.76	9.40	3.20
5,797.0	61.60	271.90	5,591.8	160.5	66.8	-63.4	10.64	9.78	4.89

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well ROHN LD09-62HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4743.0usft (H&P #326)
Site:	Sec 9, T9N, R58W	MD Reference:	WELL @ 4743.0usft (H&P #326)
Well:	ROHN LD09-62HN	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)
5,847.0	66.40	270.20	5,613.8	161.3	21.8	-18.5	10.07	9.60	-3.40
5,892.0	67.40	269.20	5,631.4	161.1	-19.6	22.9	3.02	2.22	-2.22
5,942.0	68.50	268.10	5,650.2	160.0	-65.9	69.2	3.00	2.20	-2.20
CROSSED HARD LINE @ 5983' MD / 5663' TVD									
5,982.5	73.27	267.92	5,663.4	158.7	-104.1	107.4	11.79	11.78	-0.45
5,987.0	73.80	267.90	5,664.7	158.5	-108.4	111.7	11.79	11.78	-0.43
6,037.0	79.10	268.60	5,676.4	157.0	-157.0	160.2	10.69	10.60	1.40
6,083.0	80.60	268.30	5,684.5	155.8	-202.3	205.5	3.32	3.26	-0.65
6,175.0	84.00	268.60	5,696.9	153.3	-293.4	296.5	3.71	3.70	0.33
6,267.0	89.30	268.20	5,702.2	150.8	-385.2	388.2	5.78	5.76	-0.43
6,362.0	89.50	269.20	5,703.2	148.6	-480.1	483.1	1.07	0.21	1.05
6,457.0	89.90	268.40	5,703.7	146.6	-575.1	578.0	0.94	0.42	-0.84
6,552.0	90.30	268.90	5,703.6	144.4	-670.1	672.9	0.67	0.42	0.53
6,647.0	90.80	269.00	5,702.7	142.6	-765.1	767.9	0.54	0.53	0.11
6,742.0	91.50	268.70	5,700.7	140.7	-860.0	862.8	0.80	0.74	-0.32
6,837.0	90.60	269.80	5,699.0	139.5	-955.0	957.7	1.50	-0.95	1.16
6,932.0	91.40	269.90	5,697.3	139.3	-1,050.0	1,052.7	0.85	0.84	0.11
7,027.0	89.90	270.10	5,696.3	139.3	-1,145.0	1,147.6	1.59	-1.58	0.21
7,122.0	90.20	270.60	5,696.2	139.8	-1,240.0	1,242.6	0.61	0.32	0.53
7,217.0	91.00	270.20	5,695.2	140.5	-1,334.9	1,337.6	0.94	0.84	-0.42
7,312.0	91.40	270.80	5,693.2	141.3	-1,429.9	1,432.6	0.76	0.42	0.63
7,407.0	91.70	271.50	5,690.6	143.2	-1,524.9	1,527.5	0.80	0.32	0.74
7,502.0	90.20	270.20	5,689.1	144.6	-1,619.8	1,622.5	2.09	-1.58	-1.37
7,597.0	90.40	270.40	5,688.6	145.1	-1,714.8	1,717.5	0.30	0.21	0.21
7,692.0	91.00	270.50	5,687.4	145.9	-1,809.8	1,812.5	0.64	0.63	0.11
7,787.0	91.70	270.50	5,685.2	146.7	-1,904.8	1,907.5	0.74	0.74	0.00
7,882.0	90.90	270.00	5,683.0	147.1	-1,999.8	2,002.4	0.99	-0.84	-0.53
7,977.0	91.00	269.30	5,681.4	146.5	-2,094.8	2,097.4	0.74	0.11	-0.74
8,072.0	90.80	267.70	5,679.9	144.1	-2,189.7	2,192.2	1.70	-0.21	-1.68
8,167.0	90.50	267.00	5,678.9	139.7	-2,284.6	2,287.0	0.80	-0.32	-0.74
8,262.0	88.90	268.50	5,679.4	135.9	-2,379.5	2,381.8	2.31	-1.68	1.58
8,357.0	89.40	268.80	5,680.8	133.7	-2,474.5	2,476.7	0.61	0.53	0.32
8,452.0	90.20	269.40	5,681.1	132.2	-2,569.5	2,571.7	1.05	0.84	0.63
8,547.0	90.80	269.40	5,680.3	131.2	-2,664.5	2,666.6	0.63	0.63	0.00
8,642.0	91.40	270.00	5,678.4	130.7	-2,759.4	2,761.6	0.89	0.63	0.63
8,737.0	91.10	269.80	5,676.4	130.5	-2,854.4	2,856.5	0.38	-0.32	-0.21
8,832.0	91.50	269.10	5,674.2	129.6	-2,949.4	2,951.5	0.85	0.42	-0.74
8,927.0	90.60	268.50	5,672.5	127.6	-3,044.3	3,046.4	1.14	-0.95	-0.63
9,022.0	90.80	269.60	5,671.3	126.1	-3,139.3	3,141.3	1.18	0.21	1.16
9,117.0	91.50	269.40	5,669.4	125.2	-3,234.3	3,236.2	0.77	0.74	-0.21
9,212.0	91.80	271.10	5,666.7	125.7	-3,329.3	3,331.2	1.82	0.32	1.79
9,307.0	91.20	271.80	5,664.2	128.1	-3,424.2	3,426.1	0.97	-0.63	0.74
9,402.0	88.30	270.40	5,664.6	129.9	-3,519.2	3,521.1	3.39	-3.05	-1.47

Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well ROHN LD09-62HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4743.0usft (H&P #326)
Site:	Sec 9, T9N, R58W	MD Reference:	WELL @ 4743.0usft (H&P #326)
Well:	ROHN LD09-62HN	North Reference:	Grid
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

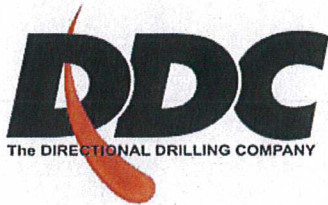
Survey

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)
9,497.0	89.60	270.00	5,666.3	130.2	-3,614.1	3,616.1	1.43	1.37	-0.42
9,592.0	90.50	270.20	5,666.3	130.4	-3,709.1	3,711.1	0.97	0.95	0.21
9,687.0	91.10	270.60	5,664.9	131.0	-3,804.1	3,806.0	0.76	0.63	0.42
9,782.0	91.70	270.80	5,662.6	132.2	-3,899.1	3,901.0	0.67	0.63	0.21
9,877.0	92.40	270.70	5,659.2	133.4	-3,994.0	3,995.9	0.74	0.74	-0.11
9,927.0	92.80	270.60	5,656.9	134.0	-4,044.0	4,045.9	0.82	0.80	-0.20
TD @ 9981' MD / 5654' TVD									
9,981.0	92.80	270.60	5,654.3	134.6	-4,097.9	4,099.8	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,501.1	1,501.1	0.0	0.0	TIE IN @ 1501' MD / 1501' TVD
5,982.5	5,663.4	158.7	-104.1	CROSSED HARD LINE @ 5983' MD / 5663' TVD
9,981.0	5,654.3	134.6	-4,097.9	TD @ 9981' MD / 5654' TVD

Checked By: _____ Approved By: _____ Date: _____



Survey Certification Sheet

Noble Energy
Company

RM-12702
Job Number

10/01/2012
Date

Sec 9,T9N,R58W,6thPM
Lease

Rohn LD09-62HN
Well Name

Weld,CO
County & State

Surveyed from a depth of: 1501 feet to 9981 feet MD

Type of Survey: MWD

Directional Supervisor/Surveyor: Dan Brown

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.

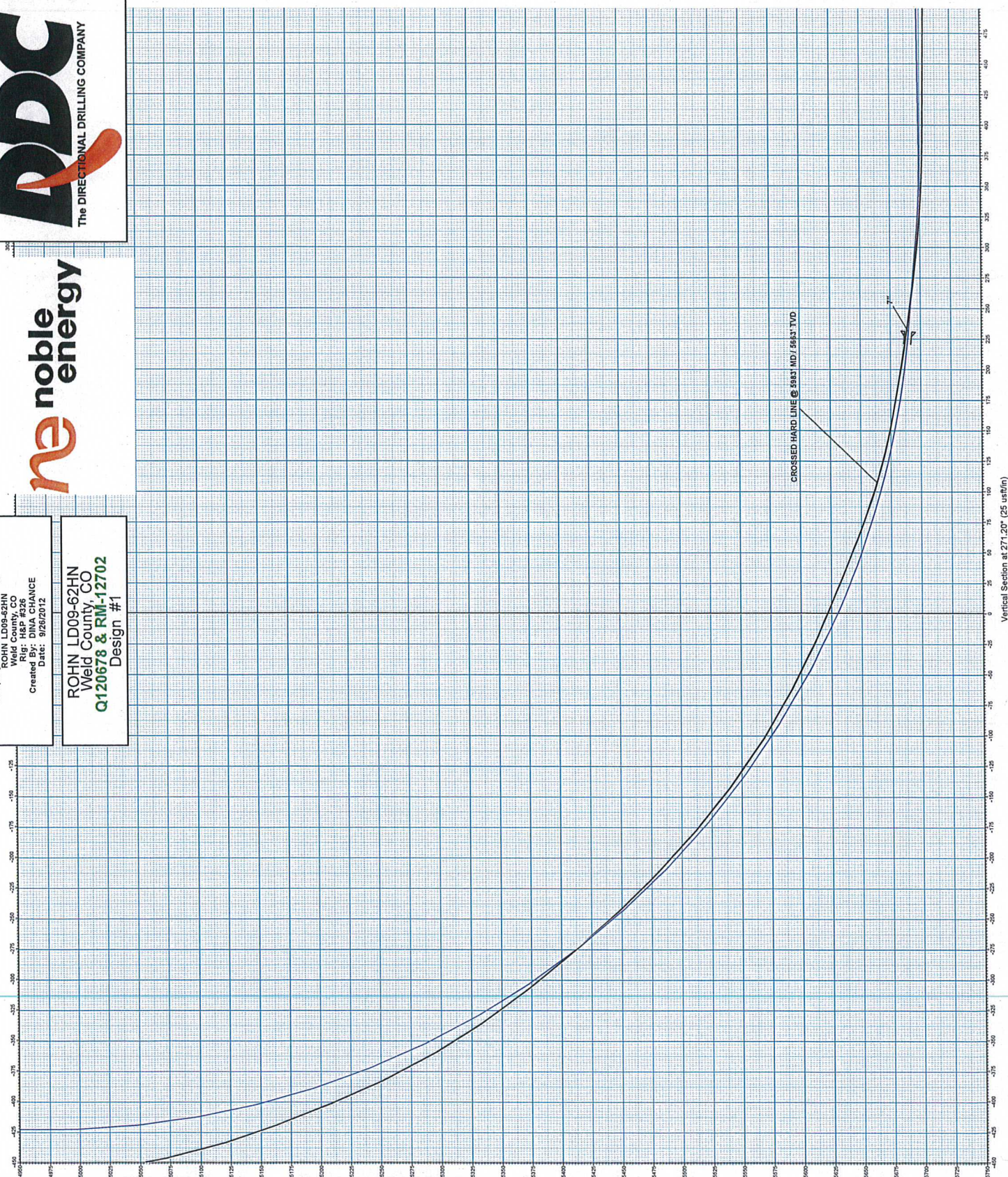
Digitally signed by Larry Wright
DN: cn=Larry Wright, o=The
Directional Drilling Company,
ou=GM of Guidance Services,
email=larryw@directionaldrillers.
com, c=US
Date: 2012.10.03 12:50:54 -05'00'

Larry Wright
MWD General Manager



Company Name: Noble Energy Inc.
ROHN LD09-62HN
Weld County, CO
Rig: H&P #326
Created By: DINA CHANCE
Date: 9/26/2012

ROHN LD09-62HN
Weld County, CO
Q120678 & RM-12702
Design #1



Company Name: Noble Energy Inc.
 Rohn LD09-62HN
 Weld County, CO
 Ref: DNA CHANCE
 Created By: DNA CHANCE
 Date: 9/6/2012

ROHN LD09-62HN
 Weld County, CO
 Q120678 & RM-12702
 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: Rohn LD09-62HN			
	Ground Level:	4713.0	Longitude
+NLS +E/W	North	122890.14	103° 51' 42.04" W
0.0 0.0	East	340341.35	45° 33' 59" N



DESIGN TARGET DETAILS					
Name	TVD	+NLS	+E/W	North	Longitude
TIE IN @ 1501' MD / 1501' TVD	601.0	0.0	0.0	122890.14	103° 51' 42.04" W
VP Rohn LD09-62HN	4100.0	153.0	426.0	122449.74	103° 51' 36.47" W
plan hits target center					
PPH - plan hits target center	666.1	85.6	-4098.5	123376.29	103° 52' 35.27" W

ANNOTATIONS					
MD	Inc	+NLS	+E/W	Vse	Annotation
9882.5	73.27	157.7	426.0	122449.74	Crossed Hard Line @ 5983' MD / 5983' TVD
9881.0	72.29	154.5	4097.9	123376.29	TD @ 9881' MD / 5654' TVD

