



Noble Energy Inc.

Weld County, CO
Sec 25, T4N, R66W
Roy K25-63-1HN

Wellbore #1

Survey: MWD FINAL

DDC Survey Report

19 June, 2012



Company:	Noble Energy Inc.	Local Co-ordinate Reference:	Well Roy K25-63-1HN
Project:	Weld County, CO	TVD Reference:	WELL @ 4827.0usft (H&P #323)
Site:	Sec 25, T4N, R66W	MD Reference:	WELL @ 4827.0usft (H&P #323)
Well:	Roy K25-63-1HN	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 25, T4N, R66W				
Site Position:		Northing:	1,345,628.21 usft	Latitude:	40° 16' 46.200 N	
From:	Lat/Long	Easting:	3,218,519.76 usft	Longitude:	104° 43' 0.408 W	
Position Uncertainty:		0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.51 °

Well	Roy K25-63-1HN					
Well Position	+N-S	0.0 usft	Northing:	1,345,562.46 usft	Latitude:	40° 16' 45.552 N
	+E-W	0.0 usft	Easting:	3,218,500.81 usft	Longitude:	104° 43' 0.660 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	usft	Ground Level:	4,803.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/26/2012	8.71	66.93	52,982

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	266.36	

Survey Program		Date	6/19/2012		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
615.0	11,460.0	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 @ 615' MD / 615' TVD									
615.0	0.00	0.00	615.0	0.0	0.0	0.0	0.00	0.00	0.00
694.0	0.40	165.20	694.0	-0.3	0.1	-0.1	0.51	0.51	0.00
786.0	0.40	172.90	786.0	-0.9	0.2	-0.1	0.06	0.00	8.37
1,062.0	0.30	175.90	1,062.0	-2.6	0.4	-0.2	0.04	-0.04	1.09
1,344.0	0.30	179.40	1,344.0	-4.0	0.4	-0.2	0.01	0.00	1.24
1,629.0	0.10	336.70	1,629.0	-4.6	0.3	0.0	0.14	-0.07	55.19
1,914.0	1.30	326.20	1,914.0	-1.6	-1.6	1.7	0.42	0.42	-3.68
2,199.0	0.30	260.80	2,198.9	0.9	-4.1	4.0	0.42	-0.35	-22.95
2,294.0	1.90	164.80	2,293.9	-0.6	-3.9	4.0	2.06	1.68	-101.05

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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)
2,389.0	4.00	161.30	2,388.8	-5.3	-2.5	2.8	2.22	2.21	-3.68
2,484.0	5.40	152.00	2,483.5	-12.4	0.7	0.1	1.67	1.47	-9.79
2,579.0	6.20	141.80	2,578.0	-20.4	6.0	-4.7	1.37	0.84	-10.74
2,674.0	7.90	136.50	2,672.3	-29.1	13.6	-11.8	1.91	1.79	-5.58
2,769.0	9.60	138.80	2,766.1	-39.8	23.4	-20.8	1.83	1.79	2.42
2,864.0	11.10	142.50	2,859.6	-53.0	34.1	-30.7	1.73	1.58	3.89
2,959.0	11.30	143.50	2,952.8	-67.8	45.2	-40.8	0.29	0.21	1.05
3,054.0	9.00	144.10	3,046.3	-81.3	55.1	-49.9	2.42	-2.42	0.63
3,150.0	8.70	142.30	3,141.2	-93.1	64.0	-57.9	0.43	-0.31	-1.88
3,244.0	8.00	143.20	3,234.2	-104.0	72.2	-65.5	0.76	-0.74	0.96
3,339.0	5.40	140.70	3,328.5	-112.7	79.0	-71.7	2.75	-2.74	-2.63
3,434.0	5.50	136.50	3,423.1	-119.5	85.0	-77.2	0.43	0.11	-4.42
3,529.0	4.00	142.70	3,517.7	-125.4	90.1	-82.0	1.67	-1.58	6.53
3,624.0	3.40	123.20	3,612.6	-129.6	94.5	-86.1	1.46	-0.63	-20.53
3,719.0	2.60	114.90	3,707.4	-132.1	98.8	-90.2	0.96	-0.84	-8.74
3,814.0	2.50	109.10	3,802.3	-133.6	102.7	-94.0	0.29	-0.11	-6.11
3,909.0	2.30	123.30	3,897.2	-135.4	106.3	-97.5	0.66	-0.21	14.95
4,004.0	1.50	111.40	3,992.2	-136.9	109.0	-100.1	0.93	-0.84	-12.53
4,099.0	0.80	49.70	4,087.2	-136.9	110.7	-101.8	1.39	-0.74	-64.95
4,194.0	0.20	292.60	4,182.2	-136.4	111.1	-102.2	0.96	-0.63	-123.26
4,289.0	1.10	187.10	4,277.2	-137.2	110.8	-101.9	1.23	0.95	-111.05
4,384.0	0.70	175.20	4,372.2	-138.7	110.7	-101.7	0.46	-0.42	-12.53
4,669.0	0.30	280.60	4,657.1	-140.3	110.1	-101.0	0.29	-0.14	36.98
4,954.0	2.20	101.70	4,942.1	-141.3	114.8	-105.6	0.88	0.67	-62.77
5,049.0	1.50	106.60	5,037.0	-142.0	117.7	-108.5	0.75	-0.74	5.16
5,144.0	0.70	131.90	5,132.0	-142.8	119.4	-110.1	0.97	-0.84	26.63
5,240.0	0.40	137.20	5,228.0	-143.4	120.0	-110.7	0.32	-0.31	5.52
5,335.0	0.30	287.50	5,323.0	-143.6	120.0	-110.7	0.71	-0.11	158.21
5,430.0	0.70	50.70	5,418.0	-143.1	120.2	-110.9	0.95	0.42	129.68
5,715.0	0.40	136.90	5,703.0	-142.8	122.3	-112.9	0.27	-0.11	30.25
6,000.0	1.20	184.50	5,988.0	-146.5	122.7	-113.2	0.34	0.28	16.70
6,240.0	0.90	182.20	6,227.9	-150.8	122.4	-112.6	0.13	-0.13	-0.96
6,280.0	0.80	174.10	6,267.9	-151.4	122.4	-112.6	0.39	-0.25	-20.25
6,311.0	0.90	193.50	6,298.9	-151.9	122.4	-112.5	0.98	0.32	62.58
6,356.0	3.60	251.30	6,343.9	-152.7	121.0	-111.1	7.14	6.00	128.44
6,406.0	7.80	259.60	6,393.6	-153.8	116.2	-106.2	8.54	8.40	16.60
6,451.0	10.30	271.00	6,438.1	-154.3	109.1	-99.1	6.81	5.56	25.33
6,501.0	13.40	274.50	6,487.0	-153.7	98.9	-88.9	6.36	6.20	7.00
6,546.0	15.60	273.60	6,530.6	-153.0	87.7	-77.8	4.91	4.89	-2.00
6,596.0	17.50	270.80	6,578.5	-152.4	73.4	-63.6	4.12	3.80	-5.60
6,641.0	19.40	266.60	6,621.2	-152.8	59.2	-49.4	5.15	4.22	-9.33
6,691.0	21.40	268.90	6,668.0	-153.4	41.8	-32.0	4.31	4.00	4.60
6,736.0	21.30	270.30	6,710.0	-153.6	25.4	-15.6	1.15	-0.22	3.11
6,787.0	24.10	274.50	6,757.0	-152.7	5.8	4.0	6.34	5.49	8.24

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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)
6,832.0	27.20	279.40	6,797.6	-150.3	-13.6	23.1	8.34	6.89	10.89
6,882.0	31.30	273.30	6,841.2	-147.7	-37.8	47.1	10.13	8.20	-12.20
6,927.0	31.90	275.70	6,879.5	-145.8	-61.3	70.5	3.10	1.33	5.33
CROSSED HARD LINE @ 6975' MD / 6920' TVD									
6,975.0	34.11	276.28	6,919.8	-143.1	-87.3	96.2	4.65	4.60	1.20
6,977.0	34.20	276.30	6,921.4	-143.0	-88.4	97.3	4.65	4.60	1.13
7,022.0	38.80	275.70	6,957.6	-140.2	-115.0	123.7	10.25	10.22	-1.33
7,072.0	43.60	274.90	6,995.2	-137.1	-147.8	156.2	9.66	9.60	-1.60
7,167.0	55.30	273.30	7,056.9	-132.1	-219.7	227.7	12.38	12.32	-1.68
7,262.0	67.70	275.90	7,102.1	-125.3	-302.7	310.1	13.27	13.05	2.74
7,307.0	73.00	276.40	7,117.2	-120.8	-344.9	351.8	11.82	11.78	1.11
7,357.0	80.30	276.40	7,128.8	-115.3	-393.2	399.7	14.60	14.60	0.00
7,389.0	85.00	276.10	7,132.9	-111.9	-424.7	431.0	14.72	14.69	-0.94
7,411.0	87.40	275.40	7,134.3	-109.7	-446.6	452.6	11.36	10.91	-3.18
7,486.0	89.00	275.20	7,136.7	-102.8	-521.2	526.7	2.15	2.13	-0.27
7,550.0	90.50	272.20	7,137.0	-98.6	-585.1	590.1	5.24	2.34	-4.69
7,581.0	90.80	271.70	7,136.6	-97.6	-616.0	621.0	1.88	0.97	-1.61
7,645.0	91.40	269.40	7,135.4	-97.0	-680.0	684.8	3.71	0.94	-3.59
7,740.0	91.20	267.50	7,133.2	-99.5	-775.0	779.7	2.01	-0.21	-2.00
7,803.0	90.60	267.10	7,132.2	-102.5	-837.9	842.7	1.14	-0.95	-0.63
7,835.0	90.40	266.80	7,131.9	-104.2	-869.8	874.7	1.13	-0.63	-0.94
7,930.0	88.80	265.50	7,132.6	-110.6	-964.6	969.7	2.17	-1.68	-1.37
8,025.0	90.70	265.70	7,133.0	-117.9	-1,059.3	1,064.7	2.01	2.00	0.21
8,120.0	90.30	266.10	7,132.2	-124.7	-1,154.1	1,159.7	0.60	-0.42	0.42
8,215.0	87.40	266.40	7,134.1	-130.9	-1,248.8	1,254.6	3.07	-3.05	0.32
8,310.0	87.80	266.20	7,138.1	-137.0	-1,343.6	1,349.5	0.47	0.42	-0.21
8,405.0	87.80	265.70	7,141.7	-143.7	-1,438.3	1,444.5	0.53	0.00	-0.53
8,500.0	90.80	266.20	7,142.9	-150.4	-1,533.0	1,539.5	3.20	3.16	0.53
8,595.0	90.50	265.90	7,141.8	-156.9	-1,627.8	1,634.4	0.45	-0.32	-0.32
8,690.0	89.90	265.40	7,141.5	-164.2	-1,722.5	1,729.4	0.82	-0.63	-0.53
8,785.0	90.00	266.20	7,141.6	-171.1	-1,817.2	1,824.4	0.85	0.11	0.84
8,880.0	90.20	268.90	7,141.4	-175.2	-1,912.1	1,919.4	2.85	0.21	2.84
8,975.0	91.30	269.00	7,140.2	-176.9	-2,007.1	2,014.3	1.16	1.16	0.11
9,039.0	91.00	269.00	7,138.9	-178.0	-2,071.1	2,078.2	0.47	-0.47	0.00
9,070.0	89.90	268.50	7,138.6	-178.7	-2,102.1	2,109.2	3.90	-3.55	-1.61
9,134.0	88.60	268.50	7,139.5	-180.4	-2,166.1	2,173.1	2.03	-2.03	0.00
9,165.0	87.60	267.80	7,140.5	-181.4	-2,197.0	2,204.1	3.94	-3.23	-2.26
9,260.0	87.30	267.50	7,144.7	-185.3	-2,291.8	2,299.0	0.45	-0.32	-0.32
9,323.0	87.50	267.60	7,147.6	-188.0	-2,354.7	2,361.9	0.35	0.32	0.16
9,355.0	88.60	267.50	7,148.7	-189.3	-2,386.7	2,393.9	3.45	3.44	-0.31
9,387.0	89.20	268.20	7,149.3	-190.5	-2,418.6	2,425.9	2.88	1.88	2.19
9,450.0	90.00	267.80	7,149.7	-192.7	-2,481.6	2,488.8	1.42	1.27	-0.63
9,545.0	90.80	268.20	7,149.1	-196.0	-2,576.5	2,583.8	0.94	0.84	0.42

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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)
9,640.0	91.40	268.00	7,147.2	-199.2	-2,671.5	2,678.7	0.67	0.63	-0.21
9,735.0	90.40	267.80	7,145.7	-202.7	-2,766.4	2,773.7	1.07	-1.05	-0.21
9,830.0	90.80	267.10	7,144.7	-206.9	-2,861.3	2,868.7	0.85	0.42	-0.74
9,925.0	90.70	266.40	7,143.5	-212.3	-2,956.1	2,963.6	0.74	-0.11	-0.74
9,957.0	90.50	266.60	7,143.2	-214.2	-2,988.1	2,995.6	0.88	-0.63	0.63
9,988.0	90.60	265.90	7,142.9	-216.3	-3,019.0	3,026.6	2.28	0.32	-2.26
10,020.0	90.10	266.60	7,142.7	-218.4	-3,050.9	3,058.6	2.69	-1.56	2.19
10,052.0	88.70	267.60	7,143.0	-220.0	-3,082.9	3,090.6	5.38	-4.38	3.13
10,083.0	88.50	267.60	7,143.8	-221.3	-3,113.9	3,121.6	0.65	-0.65	0.00
10,115.0	88.60	267.80	7,144.6	-222.6	-3,145.8	3,153.6	0.70	0.31	0.63
10,147.0	88.70	267.60	7,145.3	-223.8	-3,177.8	3,185.6	0.70	0.31	-0.63
10,210.0	88.80	267.50	7,146.7	-226.5	-3,240.7	3,248.6	0.22	0.16	-0.16
10,305.0	88.80	267.30	7,148.7	-230.8	-3,335.6	3,343.5	0.21	0.00	-0.21
10,368.0	88.80	266.80	7,150.0	-234.1	-3,398.5	3,406.5	0.79	0.00	-0.79
10,400.0	88.10	266.20	7,150.9	-236.0	-3,430.4	3,438.5	2.88	-2.19	-1.88
10,495.0	88.30	268.00	7,153.9	-240.8	-3,525.3	3,533.4	1.91	0.21	1.89
10,590.0	88.80	268.00	7,156.3	-244.2	-3,620.2	3,628.4	0.53	0.53	0.00
10,685.0	89.30	267.60	7,157.8	-247.8	-3,715.1	3,723.3	0.67	0.53	-0.42
10,780.0	88.90	266.80	7,159.3	-252.4	-3,810.0	3,818.3	0.94	-0.42	-0.84
10,874.0	89.30	265.90	7,160.8	-258.4	-3,903.7	3,912.3	1.05	0.43	-0.96
10,969.0	90.10	264.50	7,161.3	-266.4	-3,998.4	4,007.3	1.70	0.84	-1.47
11,064.0	90.90	264.10	7,160.5	-275.8	-4,092.9	4,102.2	0.94	0.84	-0.42
11,159.0	91.10	263.40	7,158.8	-286.2	-4,187.4	4,197.1	0.77	0.21	-0.74
11,254.0	91.40	263.30	7,156.7	-297.1	-4,281.7	4,291.9	0.33	0.32	-0.11
11,349.0	92.40	263.30	7,153.6	-308.2	-4,376.0	4,386.7	1.05	1.05	0.00
11,404.0	92.90	263.40	7,151.1	-314.6	-4,430.6	4,441.6	0.93	0.91	0.18
TD @ 11460' MD / 7148' TVD									
11,460.0	92.90	263.40	7,148.2	-321.0	-4,486.1	4,497.5	0.00	0.00	0.00

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
615.0	615.0	0.0	0.0	TIE IN @ 615' MD / 615' TVD
6,975.0	6,919.8	-143.1	-87.3	CROSSED HARD LINE @ 6975' MD / 6920' TVD
11,460.0	7,148.2	-321.0	-4,486.1	TD @ 11460' MD / 7148' TVD

Checked By: _____ Approved By: _____ Date: _____



Survey Certification Sheet

Noble Energy
Company

RM-12400
Job Number

6/19/2012
Date

Sec 25, T4N, R66W
Lease

Roy K25-63-1HN
Well Name

Weld, CO
County & State

Surveyed from a depth of: 615 feet to 11460 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: 2012.06.19 16:15:26 -05'00'

Larry Wright
MWD General Manager

Company Name: Noble Energy Inc.
Roy K25-63-1HN
Weld County, CO
Rig: H&P #323
Created By: Dina Chance
Date: 6/19/2012

Roy K25-63-1HN
Weld County, CO
Q120332 & RM-12400

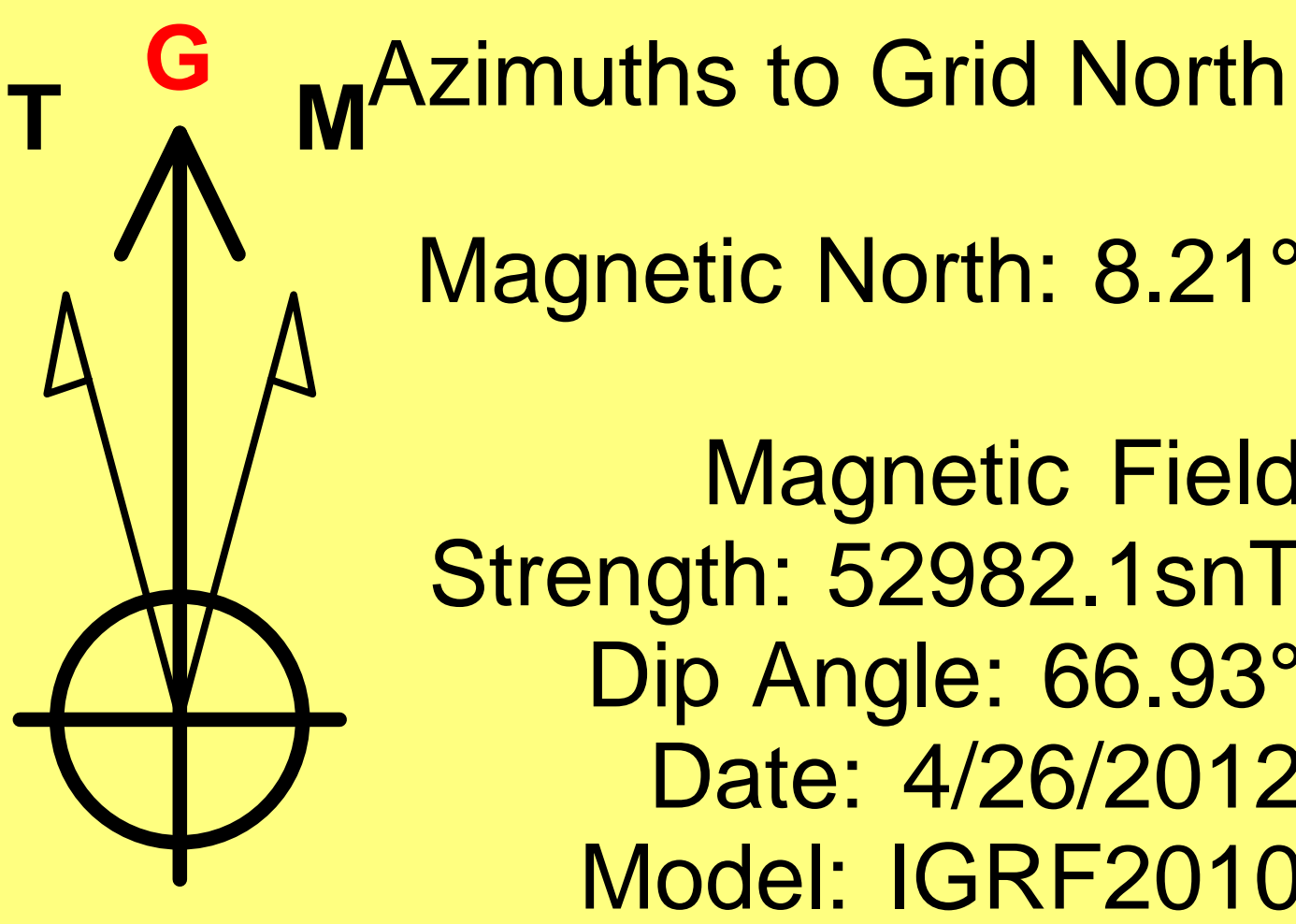


PROJECT DETAILS: Weld County, CO

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: Roy K25-63-1HN

+N/-S +E/-W Ground Level: 4803.0
0.0 0.0 Northing Easting Latitude Longitude
1345562.46 3218500.81 40° 16' 45.552 N 104° 43' 0.660 W

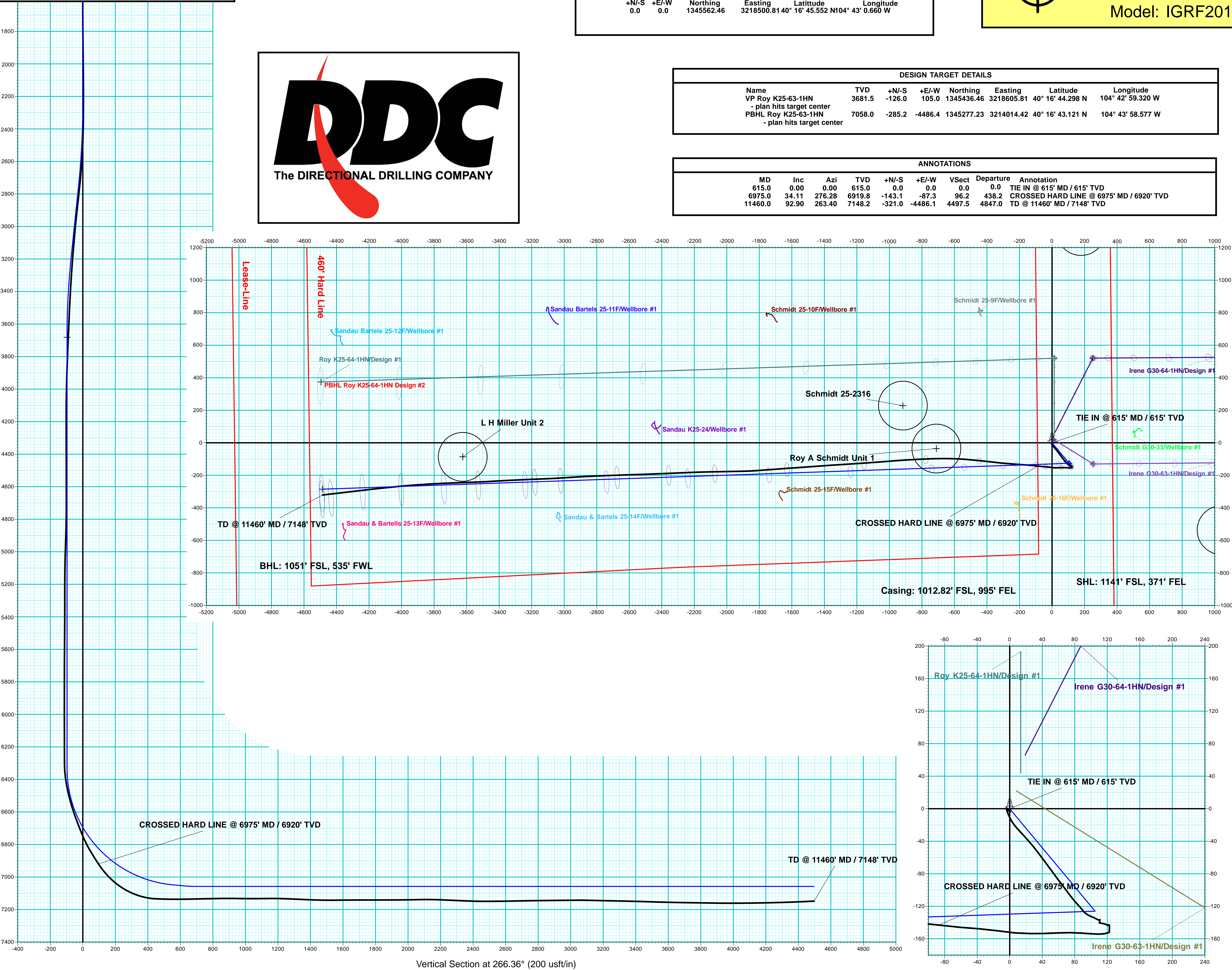


DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
VP Roy K25-63-1HN - plan hits target center	3681.5	-126.0	105.0	1345436.46	3218605.81	40° 16' 44.298 N	104° 42' 59.320 W
PBHL Roy K25-63-1HN - plan hits target center	7058.0	-285.2	-4486.4	1345277.23	3214014.42	40° 16' 43.121 N	104° 43' 58.577 W

ANNOTATIONS

MD	Inc	Azi	TVD	+N/-S	+E/-W	VSect	Departure	Annotation
615.0	0.00	0.00	615.0	0.0	0.0	0.0	0.0	TIE IN @ 615' MD / 615' TVD
6975.0	34.11	276.28	6919.8	-143.1	-87.3	96.2	438.2	CROSSED HARD LINE @ 6975' MD / 6920' TVD
11460.0	92.90	263.40	7148.2	-321.0	-4486.1	4497.5	4847.0	TD @ 11460' MD / 7148' TVD



Vertical Section at 266.36° (200 usft/in)

