



LEGEND

- Ritchey USX WW27-02D, Wellbore #1, Noble Ritchey USX WW27-02D Plan #2 (8-22-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
8776'MD & 8618'TVD @ 1186' VS
0.6 deg Inc 243.0 deg AZ

Project: SEC.27-T1N-R66W
Site: Ritchey USX WW27-02D Pad Sec.27-T1N-R66W
Well: Ritchey USX WW27-02D
Plan: Wellbore #1



Directional

**NOBLE ENERGY INC WELD
COUNTY CO**

SEC.27-T1N-R66W

Ritchey USX WW27-02D Pad Sec.27-T1N-R66W

Ritchey USX WW27-02D

Wellbore #1

Survey: Survey #1

Standard Survey Report

12 October, 2011



Company:	NOBLE ENERGY INC WELD COUNTY CO	Local Co-ordinate Reference:	Well Ritchey USX WW27-02D
Project:	SEC.27-T1N-R66W	TVD Reference:	WELL @ 5218.0ft (Original Well Elev)
Site:	Ritchey USX WW27-02D Pad Sec.27-T1N-R66W	MD Reference:	WELL @ 5218.0ft (Original Well Elev)
Well:	Ritchey USX WW27-02D	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	Landmark

Project	SEC.27-T1N-R66W, Weld County, Colorado		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		Using Well Reference Point
Map Zone:	Colorado Northern Zone		Using geodetic scale factor

Site Ritchey USX WW27-02D Pad Sec.27-T1N-R66W

Site Position:		Northing:	1,253,965.72 ft	Latitude:	40.028130
From:	Lat/Long	Easting:	3,208,085.43 ft	Longitude:	-104.756930
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.48 °

Well Ritchey USX WW27-02D

Well Position	+N/-S	0.0 ft	Northing:	1,253,965.71 ft	Latitude:	40.028130
	+E/-W	0.0 ft	Easting:	3,208,085.43 ft	Longitude:	-104.756930
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,205.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/20/2011	8.81	66.75	52,923

Design Wellbore #1

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.0

Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	263.06

Survey Program **Date** 10/12/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
287.0	8,776.0	Survey #1 (Wellbore #1)	MWD	MWD - Standard

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
287.0	0.70	230.80	287.0	-1.1	-1.4	1.5	0.24	0.24	0.00
391.0	2.00	257.10	391.0	-1.9	-3.6	3.8	1.35	1.25	25.29
518.0	4.70	259.30	517.7	-3.4	-10.9	11.2	2.13	2.13	1.73
646.0	6.90	263.10	645.1	-5.3	-23.7	24.1	1.74	1.72	2.97
774.0	9.10	263.40	771.8	-7.4	-41.4	42.0	1.72	1.72	0.23
902.0	11.40	264.40	897.8	-9.8	-64.0	64.7	1.80	1.80	0.78
1,030.0	13.60	263.30	1,022.7	-12.7	-91.6	92.4	1.73	1.72	-0.86
1,159.0	16.50	260.40	1,147.3	-17.6	-124.7	125.9	2.32	2.25	-2.25
1,287.0	17.90	260.40	1,269.6	-23.9	-162.0	163.7	1.09	1.09	0.00
1,421.0	17.80	263.10	1,397.1	-29.8	-202.7	204.8	0.62	-0.07	2.01
1,495.0	17.30	260.50	1,467.7	-33.0	-224.7	227.1	1.26	-0.68	-3.51

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 Sec.27-T1N-R66W
 Well: Ritchey USX WW27-02D
 Wellbore: Wellbore #1
 Design: Wellbore #1

Local Co-ordinate Reference: Well Ritchey USX WW27-02D
 TVD Reference: WELL @ 5218.0ft (Original Well Elev)
 MD Reference: WELL @ 5218.0ft (Original Well Elev)
 North Reference: True
 Survey Calculation Method: Minimum Curvature
 Database: Landmark

Survey

Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
1,623.0	16.60	259.80	1,590.1	-39.3	-261.5	264.3	0.57	-0.55	-0.55
1,752.0	17.00	261.90	1,713.6	-45.3	-298.3	301.6	0.56	0.31	1.63
1,880.0	17.20	262.80	1,835.9	-50.3	-335.6	339.2	0.26	0.16	0.70
2,009.0	18.20	263.60	1,958.8	-54.9	-374.5	378.4	0.80	0.78	0.62
2,137.0	18.80	263.80	2,080.2	-59.4	-414.9	419.1	0.47	0.47	0.16
2,265.0	17.20	262.10	2,202.0	-64.2	-454.2	458.6	1.32	-1.25	-1.33
2,394.0	17.40	260.40	2,325.1	-70.0	-492.1	496.9	0.42	0.16	-1.32
2,522.0	16.60	262.60	2,447.5	-75.6	-529.1	534.3	0.80	-0.63	1.72
2,651.0	16.70	264.90	2,571.1	-79.6	-565.8	571.3	0.52	0.08	1.78
2,779.0	16.00	260.50	2,693.9	-84.1	-601.5	607.3	1.11	-0.55	-3.44
2,907.0	15.50	261.70	2,817.1	-89.5	-635.9	642.0	0.47	-0.39	0.94
3,036.0	16.90	264.80	2,941.0	-93.7	-671.6	678.0	1.28	1.09	2.40
3,164.0	16.20	261.30	3,063.7	-98.1	-707.8	714.4	0.95	-0.55	-2.73
3,293.0	15.10	259.60	3,187.9	-103.8	-742.1	749.2	0.92	-0.85	-1.32
3,421.0	16.90	263.90	3,311.0	-108.8	-777.0	784.4	1.68	1.41	3.36
3,549.0	17.60	261.10	3,433.2	-113.8	-814.6	822.4	0.85	0.55	-2.19
3,678.0	16.50	259.30	3,556.5	-120.2	-851.9	860.2	0.95	-0.85	-1.40
3,806.0	16.80	261.10	3,679.2	-126.5	-888.0	896.8	0.47	0.23	1.41
3,935.0	16.60	262.50	3,802.7	-131.8	-924.7	933.8	0.35	-0.16	1.09
4,063.0	16.50	262.90	3,925.4	-136.4	-960.9	970.3	0.12	-0.08	0.31
4,191.0	15.80	264.50	4,048.4	-140.3	-996.3	1,005.9	0.65	-0.55	1.25
4,320.0	15.90	263.80	4,172.5	-143.9	-1,031.3	1,041.1	0.17	0.08	-0.54
4,448.0	12.70	264.40	4,296.5	-147.2	-1,062.7	1,072.7	2.50	-2.50	0.47
4,577.0	10.70	266.00	4,422.8	-149.4	-1,088.8	1,098.9	1.57	-1.55	1.24
4,705.0	8.50	261.00	4,549.0	-151.7	-1,110.0	1,120.2	1.84	-1.72	-3.91
4,833.0	5.90	263.50	4,676.0	-153.9	-1,125.9	1,136.2	2.05	-2.03	1.95
4,962.0	2.70	293.40	4,804.6	-153.5	-1,135.3	1,145.5	2.95	-2.48	23.18
5,090.0	1.60	356.70	4,932.6	-150.5	-1,138.1	1,148.0	1.91	-0.86	49.45
5,219.0	1.80	353.90	5,061.5	-146.7	-1,138.5	1,147.8	0.17	0.16	-2.17
5,347.0	0.40	351.80	5,189.5	-144.2	-1,138.7	1,147.8	1.09	-1.09	-1.64
5,475.0	0.30	326.60	5,317.5	-143.5	-1,139.0	1,148.0	0.14	-0.08	-19.69
5,557.5	0.30	318.48	5,399.9	-143.2	-1,139.2	1,148.2	0.05	0.00	-9.85
TARGET BHL 660'FNL, 1985'FEL									
5,604.0	0.30	313.90	5,446.5	-143.0	-1,139.4	1,148.3	0.05	0.00	-9.83
5,732.0	0.80	245.40	5,574.5	-143.1	-1,140.5	1,149.4	0.58	0.39	-53.52
5,861.0	0.60	240.00	5,703.5	-143.8	-1,141.9	1,150.9	0.16	-0.16	-4.19
5,989.0	0.70	251.50	5,831.4	-144.4	-1,143.2	1,152.3	0.13	0.08	8.98
6,117.0	0.70	285.50	5,959.4	-144.5	-1,144.7	1,153.8	0.32	0.00	26.56
6,246.0	0.80	276.30	6,088.4	-144.2	-1,146.3	1,155.4	0.12	0.08	-7.13
6,374.0	1.20	253.00	6,216.4	-144.4	-1,148.5	1,157.5	0.44	0.31	-18.20
6,503.0	0.60	272.70	6,345.4	-144.8	-1,150.5	1,159.5	0.52	-0.47	15.27
6,631.0	0.70	305.10	6,473.4	-144.3	-1,151.8	1,160.8	0.29	0.08	25.31
6,759.0	0.90	275.70	6,601.4	-143.8	-1,153.4	1,162.3	0.35	0.16	-22.97
6,888.0	0.90	279.20	6,730.4	-143.5	-1,155.4	1,164.3	0.04	0.00	2.71
7,016.0	0.90	280.00	6,858.3	-143.2	-1,157.4	1,166.2	0.01	0.00	0.63
7,145.0	1.00	281.70	6,987.3	-142.8	-1,159.5	1,168.3	0.08	0.08	1.32
7,273.0	1.10	290.20	7,115.3	-142.1	-1,161.8	1,170.4	0.14	0.08	6.64
7,401.0	1.10	284.20	7,243.3	-141.4	-1,164.1	1,172.7	0.09	0.00	-4.69
7,506.8	1.18	286.70	7,349.1	-140.8	-1,166.1	1,174.6	0.09	0.08	2.36
LEGAL BOX 400' X 400' 665'FNL & 1980'FWL									
7,506.9	1.18	286.70	7,349.2	-140.8	-1,166.1	1,174.6	0.00	0.00	0.00
TARGET CIRCLE 660'FNL & 1985'FEL									
7,530.0	1.20	287.20	7,372.2	-140.7	-1,166.6	1,175.1	0.09	0.08	2.17

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7,658.0	1.10	291.50	7,500.2	-139.8	-1,169.0	1,177.4	0.10	-0.08	3.36
7,787.0	0.70	282.30	7,629.2	-139.2	-1,170.9	1,179.2	0.33	-0.31	-7.13
7,915.0	0.40	266.90	7,757.2	-139.1	-1,172.2	1,180.4	0.26	-0.23	-12.03
8,043.0	0.20	240.00	7,885.2	-139.2	-1,172.8	1,181.0	0.19	-0.16	-21.02
8,172.0	0.20	200.80	8,014.2	-139.5	-1,173.1	1,181.3	0.10	0.00	-30.39
8,300.0	0.40	195.60	8,142.2	-140.2	-1,173.3	1,181.6	0.16	0.16	-4.06
8,429.0	0.60	226.30	8,271.2	-141.1	-1,173.9	1,182.3	0.25	0.16	23.80
8,557.0	0.60	232.30	8,399.2	-142.0	-1,174.9	1,183.4	0.05	0.00	4.69
8,726.0	0.70	243.20	8,568.2	-143.0	-1,176.5	1,185.2	0.09	0.06	6.45
8,776.0	0.60	243.00	8,618.2	-143.2	-1,177.0	1,185.7	0.20	-0.20	-0.40

Checked By: _____ Approved By: _____ Date: _____