



Project: SEC.27-T1N-R66W
Site: Ritchey USX WW27-19D Pad Sec.27-T1N-R66W
Well: Ritchey USX WW27-19D
Plan: Wellbore #1



Directional

NOBLE ENERGY INC WELD COUNTY CO

SEC.27-T1N-R66W

Ritchey USX WW27-19D Pad Sec.27-T1N-R66W

Ritchey USX WW27-19D

Wellbore #1

Survey: Survey #1

Standard Survey Report

20 October, 2011



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Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Ritchey USX WW27-19D
TVD Reference: WELL @ 5127.0ft (Original Well Elev)
MD Reference: WELL @ 5127.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
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 WW27-19D Pad Sec.27-T1N-R66W

Site Position:		Northing:	1,251,151.83 ft	Latitude:	40.020490
From:	Lat/Long	Easting:	3,204,383.95 ft	Longitude:	-104.770230
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.47 °

Well Ritchey USX WW27-19D

Well Position	+N/-S	0.0 ft	Northing:	1,251,151.82 ft	Latitude:	40.020490
	+E/-W	0.0 ft	Easting:	3,204,383.95 ft	Longitude:	-104.770230
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	5,114.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	7/9/2011	8.82	66.74	52,922

Design Wellbore #1

Audit Notes:

Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
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Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	6,000.0	0.0	0.0	15.02

Survey Program Date 10/20/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
342.0	8,656.0	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
342.0	0.40	178.20	342.0	-1.2	0.0	-1.1	0.12	0.12	0.00
470.0	1.70	43.00	470.0	-0.3	1.3	0.1	1.57	1.02	-105.63
598.0	4.40	32.70	597.8	5.3	5.3	6.5	2.14	2.11	-8.05
725.0	6.70	35.00	724.2	15.4	12.2	18.1	1.82	1.81	1.81
852.0	8.60	24.70	850.1	30.1	20.4	34.4	1.84	1.50	-8.11
980.0	10.90	18.80	976.2	50.3	28.3	55.9	1.96	1.80	-4.61
1,108.0	13.30	16.20	1,101.3	75.9	36.3	82.7	1.92	1.88	-2.03
1,236.0	15.90	13.80	1,225.2	107.1	44.6	115.0	2.09	2.03	-1.88
1,365.0	18.10	13.80	1,348.6	143.7	53.6	152.7	1.71	1.71	0.00
1,423.0	18.80	15.00	1,403.6	161.5	58.2	171.0	1.37	1.21	2.07
1,493.0	18.50	13.70	1,469.9	183.1	63.7	193.4	0.73	-0.43	-1.86

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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)
1,622.0	19.70	15.80	1,591.8	224.0	74.5	235.6	1.07	0.93	1.63
1,750.0	21.30	13.40	1,711.7	267.3	85.7	280.4	1.41	1.25	-1.88
1,878.0	23.60	15.20	1,830.0	314.7	97.8	329.3	1.88	1.80	1.41
2,007.0	25.10	15.20	1,947.5	366.0	111.8	382.5	1.16	1.16	0.00
2,135.0	25.10	14.10	2,063.4	418.5	125.5	436.8	0.36	0.00	-0.86
2,264.0	25.00	13.50	2,180.3	471.6	138.6	491.4	0.21	-0.08	-0.47
2,392.0	23.80	12.90	2,296.9	523.1	150.6	544.2	0.96	-0.94	-0.47
2,520.0	23.20	15.10	2,414.2	572.6	163.0	595.2	0.83	-0.47	1.72
2,649.0	23.80	15.70	2,532.5	622.2	176.6	646.7	0.50	0.47	0.47
2,777.0	24.50	14.10	2,649.3	672.8	190.1	699.0	0.75	0.55	-1.25
2,906.0	23.50	15.70	2,767.2	723.5	203.6	751.5	0.92	-0.78	1.24
3,034.0	25.80	14.00	2,883.5	775.1	217.2	804.9	1.88	1.80	-1.33
3,162.0	25.20	13.70	2,999.0	828.6	230.4	860.0	0.48	-0.47	-0.23
3,291.0	25.00	14.70	3,115.9	881.6	243.8	914.7	0.36	-0.16	0.78
3,419.0	24.70	16.60	3,232.0	933.4	258.3	968.5	0.67	-0.23	1.48
3,548.0	26.70	13.60	3,348.3	987.4	272.8	1,024.4	1.85	1.55	-2.33
3,676.0	26.50	14.20	3,462.7	1,043.1	286.6	1,081.7	0.26	-0.16	0.47
3,804.0	26.40	16.30	3,577.3	1,098.1	301.6	1,138.7	0.73	-0.08	1.64
3,933.0	26.10	14.10	3,693.0	1,153.1	316.6	1,195.8	0.79	-0.23	-1.71
4,061.0	25.30	14.00	3,808.3	1,207.0	330.0	1,251.3	0.63	-0.63	-0.08
4,190.0	23.50	15.60	3,925.8	1,258.5	343.6	1,304.5	1.49	-1.40	1.24
4,318.0	24.20	14.80	4,042.9	1,308.4	357.2	1,356.3	0.60	0.55	-0.63
4,446.0	25.40	14.20	4,159.1	1,360.4	370.6	1,410.0	0.96	0.94	-0.47
4,575.0	23.60	15.00	4,276.5	1,412.2	384.1	1,463.5	1.42	-1.40	0.62
4,703.0	25.00	16.70	4,393.1	1,462.8	398.5	1,516.1	1.22	1.09	1.33
4,832.0	27.60	15.60	4,508.8	1,517.7	414.4	1,573.3	2.05	2.02	-0.85
4,960.0	26.40	14.50	4,622.8	1,573.8	429.5	1,631.4	1.02	-0.94	-0.86
5,088.0	23.00	16.60	4,739.1	1,625.4	443.7	1,684.8	2.74	-2.66	1.64
5,217.0	21.40	16.70	4,858.5	1,672.1	457.7	1,733.6	1.24	-1.24	0.08
5,345.0	19.50	15.00	4,978.4	1,715.1	470.0	1,778.3	1.56	-1.48	-1.33
5,474.0	17.20	10.90	5,100.9	1,754.6	479.1	1,818.8	2.04	-1.78	-3.18
5,602.0	13.90	10.00	5,224.2	1,788.3	485.4	1,853.0	2.58	-2.58	-0.70
5,730.0	10.70	10.20	5,349.2	1,815.2	490.2	1,880.2	2.50	-2.50	0.16
5,859.0	6.90	12.20	5,476.7	1,834.6	493.9	1,899.9	2.95	-2.95	1.55
5,987.0	3.80	23.30	5,604.1	1,846.0	497.2	1,911.8	2.54	-2.42	8.67
6,116.0	0.40	74.40	5,733.0	1,850.0	499.3	1,916.2	2.76	-2.64	39.61
6,244.0	0.10	12.40	5,861.0	1,850.2	499.8	1,916.6	0.28	-0.23	-48.44
6,372.0	0.60	332.70	5,989.0	1,850.9	499.5	1,917.2	0.41	0.39	-31.02
6,382.9	0.60	331.42	5,999.9	1,851.1	499.5	1,917.2	0.12	-0.01	-11.68
TARGET BHL 1440°FNL, 1200°FNL									
6,501.0	0.60	317.50	6,118.0	1,852.0	498.8	1,918.0	0.12	0.00	-11.79
6,629.0	0.70	289.40	6,246.0	1,852.8	497.6	1,918.4	0.26	0.08	-21.95
6,758.0	1.10	247.20	6,375.0	1,852.6	495.7	1,917.7	0.58	0.31	-32.71
6,886.0	0.40	272.30	6,503.0	1,852.1	494.1	1,916.9	0.59	-0.55	19.61
7,014.0	0.40	12.60	6,631.0	1,852.6	493.8	1,917.2	0.48	0.00	78.36
7,143.0	0.70	12.90	6,760.0	1,853.8	494.0	1,918.5	0.23	0.23	0.23
7,271.0	0.60	18.80	6,887.9	1,855.2	494.4	1,919.9	0.09	-0.08	4.61
7,400.0	0.70	20.10	7,016.9	1,856.6	494.9	1,921.4	0.08	0.08	1.01
7,528.0	0.70	20.10	7,144.9	1,858.0	495.4	1,922.9	0.00	0.00	0.00
7,656.0	0.60	15.00	7,272.9	1,859.4	495.9	1,924.4	0.09	-0.08	-3.98
7,657.9	0.60	15.43	7,274.8	1,859.4	495.9	1,924.4	0.24	0.02	23.19
TARGET CIRCLE 1440°FNL & 1200°FNL									
7,659.6	0.60	15.84	7,276.5	1,859.4	495.9	1,924.4	0.24	0.02	23.16

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LEGAL BOX 800' X 800' 1327'FNL & 1323'FWL									
7,785.0	0.70	41.60	7,401.9	1,860.7	496.6	1,925.8	0.24	0.08	20.55
7,913.0	0.70	46.30	7,529.9	1,861.8	497.7	1,927.1	0.04	0.00	3.67
8,042.0	0.70	49.90	7,658.9	1,862.8	498.8	1,928.5	0.03	0.00	2.79
8,170.0	0.80	61.50	7,786.9	1,863.8	500.2	1,929.7	0.14	0.08	9.06
8,298.0	0.70	68.20	7,914.9	1,864.5	501.7	1,930.8	0.10	-0.08	5.23
8,606.0	0.70	60.50	8,222.8	1,866.1	505.1	1,933.3	0.03	0.00	-2.50
8,656.0	0.70	60.50	8,272.8	1,866.4	505.6	1,933.7	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____