

Well Name: **Howard USX A09-06D**

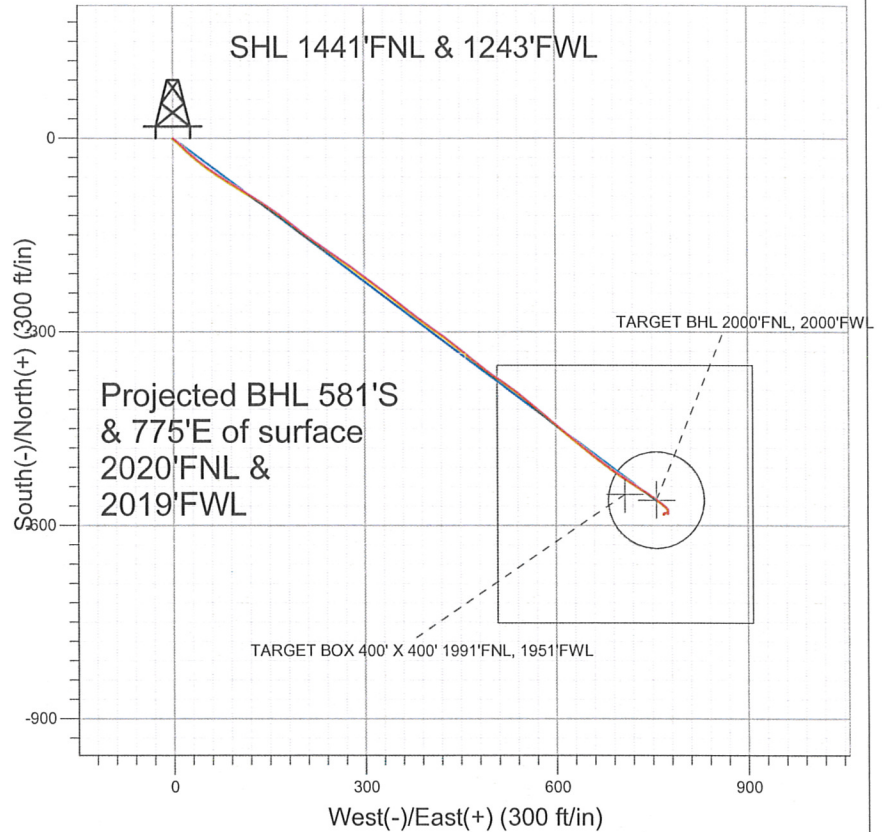
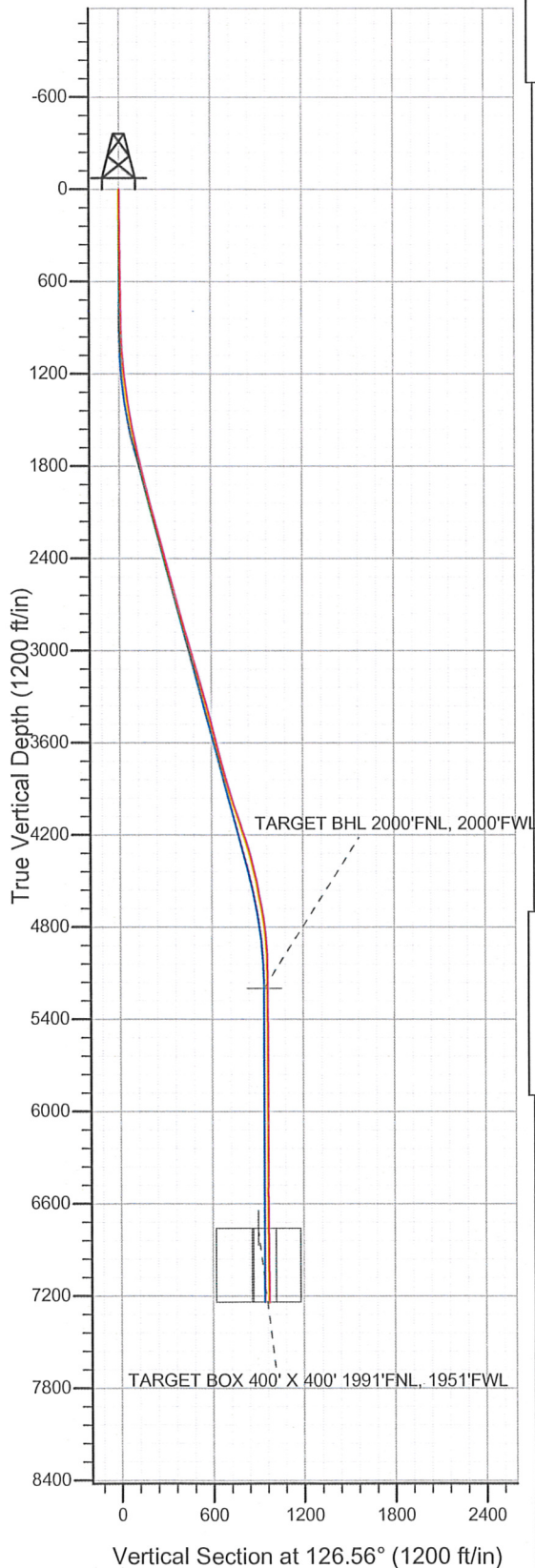
Surface Location: Howard USX A09-12D Pad Sec.9-T6N-R64W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

Ground Elevation: 4867.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1427837.14	3261423.76	40.504010	-104.559890	

Original Well Elev WELL @ 4880.0ft (Original Well Elev)

## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- △ Howard USX A09-06D, Wellbore #1, Noble Howard USX A09-06D Plan #1 (4-11-11) V0
- Wellbore #1
- Survey #1

## Final Survey Plot

Projected Final Survey -  
7365'MD & 7244'TVD @ 969'VS  
0.4 deg Inc 71.2 deg AZ

Project: SEC.9-T6N-R64W  
Site: Howard USX A09-12D Pad Sec.9-T6N-R64W  
Well: Howard USX A09-06D  
Plan: Wellbore #1



**Directional**

## **NOBLE ENERGY INC WELD COUNTY CO**

**SEC.9-T6N-R64W**

**Howard USX A09-12D Pad Sec.9-T6N-R64W**

**Howard USX A09-06D**

**Wellbore #1**

**Survey: Survey #1**

## **Standard Survey Report**

**01 July, 2011**



Company: NOBLE ENERGY INC WELD COUNTY CO  
 Project: SEC.9-T6N-R64W  
 Site: Howard USX A09-12D Pad Sec.9-T6N-R64W  
 Well: Howard USX A09-06D  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Howard USX A09-06D  
 TVD Reference: WELL @ 4880.0ft (Original Well Elev)  
 MD Reference: WELL @ 4880.0ft (Original Well Elev)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature  
 Database: Landmark

Project	SEC.9-T6N-R64W, 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 Howard USX A09-12D Pad Sec.9-T6N-R64W

Site Position:		Northing:	1,427,836.92 ft	Latitude:	40.504010
From:	Lat/Long	Easting:	3,261,401.52 ft	Longitude:	-104.559970
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.61 °

Well	Howard USX A09-06D					
Well Position	+N/-S	0.0 ft	Northing:	1,427,837.14 ft	Latitude:	40.504010
	+E/-W	0.0 ft	Easting:	3,261,423.76 ft	Longitude:	-104.559890
Position Uncertainty	0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,867.0 ft	

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	4/11/2011	8.79	67.18	53,226

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 (°)
	5,200.0	0.0	0.0	126.56

Survey Program Date 7/1/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
789.0	7,365.0	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
789.0	1.20	129.50	788.9	-5.3	6.4	8.3	0.15	0.15	0.00
871.0	1.20	130.30	870.9	-6.4	7.7	10.0	0.02	0.00	0.98
953.0	2.30	132.10	952.9	-8.0	9.6	12.5	1.34	1.34	2.20
1,034.0	3.40	137.70	1,033.8	-10.9	12.4	16.4	1.40	1.36	6.91
1,116.0	4.40	132.60	1,115.6	-14.8	16.3	21.9	1.29	1.22	-6.22
1,198.0	6.00	136.00	1,197.3	-20.0	21.6	29.3	1.99	1.95	4.15
1,279.0	7.60	129.60	1,277.7	-26.5	28.7	38.8	2.18	1.98	-7.90
1,361.0	9.00	127.30	1,358.8	-33.8	38.0	50.7	1.75	1.71	-2.80
1,443.0	9.90	128.90	1,439.7	-42.1	48.6	64.1	1.14	1.10	1.95
1,524.0	10.80	125.50	1,519.4	-50.9	60.2	78.7	1.34	1.11	-4.20
1,606.0	11.60	121.30	1,599.8	-59.7	73.5	94.6	1.39	0.98	-5.12
1,688.0	12.10	121.60	1,680.1	-68.4	87.8	111.3	0.61	0.61	0.37



**Company:** NOBLE ENERGY INC WELD COUNTY CO  
**Project:** SEC.9-T6N-R64W  
**Site:** Howard USX A09-12D Pad Sec.9-T6N-R64W  
**Well:** Howard USX A09-06D  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Howard USX A09-06D  
**TVD Reference:** WELL @ 4880.0ft (Original Well Elev)  
**MD Reference:** WELL @ 4880.0ft (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)
1,770.0	12.50	122.40	1,760.2	-77.7	102.6	128.7	0.53	0.49	0.98
1,851.0	13.30	120.30	1,839.2	-87.1	118.1	146.7	1.14	0.99	-2.59
1,933.0	13.60	122.10	1,918.9	-97.0	134.4	165.7	0.63	0.37	2.20
2,015.0	14.50	125.40	1,998.5	-108.1	150.9	185.6	1.47	1.10	4.02
2,096.0	15.40	126.20	2,076.7	-120.3	167.9	206.5	1.14	1.11	0.99
2,178.0	15.50	127.70	2,155.7	-133.4	185.3	228.3	0.50	0.12	1.83
2,260.0	15.30	126.40	2,234.8	-146.5	202.7	250.1	0.49	-0.24	-1.59
2,341.0	15.50	126.10	2,312.9	-159.3	220.1	271.6	0.27	0.25	-0.37
2,423.0	15.30	123.60	2,392.0	-171.7	237.9	293.4	0.85	-0.24	-3.05
2,505.0	14.90	124.90	2,471.1	-183.7	255.6	314.7	0.64	-0.49	1.59
2,586.0	14.70	125.20	2,549.4	-195.6	272.5	335.4	0.26	-0.25	0.37
2,668.0	14.80	125.00	2,628.7	-207.6	289.6	356.3	0.14	0.12	-0.24
2,750.0	15.90	126.30	2,707.8	-220.3	307.2	378.0	1.41	1.34	1.59
2,831.0	16.00	126.20	2,785.7	-233.4	325.2	400.2	0.13	0.12	-0.12
2,913.0	15.60	128.90	2,864.6	-247.0	342.9	422.6	1.02	-0.49	3.29
2,995.0	16.70	127.30	2,943.4	-261.1	360.8	445.4	1.45	1.34	-1.95
3,076.0	16.80	127.10	3,020.9	-275.2	379.4	468.7	0.14	0.12	-0.25
3,158.0	15.90	125.30	3,099.6	-288.8	398.1	491.8	1.26	-1.10	-2.20
3,240.0	15.70	125.40	3,178.5	-301.8	416.3	514.1	0.25	-0.24	0.12
3,321.0	16.60	126.70	3,256.3	-315.0	434.5	536.6	1.20	1.11	1.60
3,403.0	16.00	129.20	3,335.0	-329.2	452.6	559.6	1.13	-0.73	3.05
3,485.0	14.40	129.10	3,414.1	-342.7	469.3	581.1	1.95	-1.95	-0.12
3,566.0	14.10	127.80	3,492.6	-355.1	484.9	601.0	0.54	-0.37	-1.60
3,648.0	14.20	124.80	3,572.2	-367.0	501.1	621.1	0.90	0.12	-3.66
3,730.0	14.50	123.80	3,651.6	-378.4	517.9	641.4	0.47	0.37	-1.22
3,812.0	15.00	127.10	3,730.9	-390.6	534.8	662.2	1.19	0.61	4.02
3,893.0	15.90	130.10	3,809.0	-404.0	551.7	683.8	1.49	1.11	3.70
3,975.0	16.90	129.70	3,887.6	-418.9	569.5	706.9	1.23	1.22	-0.49
4,057.0	18.00	129.30	3,965.9	-434.5	588.4	731.5	1.35	1.34	-0.49
4,138.0	19.20	129.10	4,042.6	-450.8	608.5	757.3	1.48	1.48	-0.25
4,220.0	19.70	129.50	4,119.9	-468.1	629.6	784.6	0.63	0.61	0.49
4,302.0	18.60	128.50	4,197.4	-485.1	650.5	811.4	1.40	-1.34	-1.22
4,383.0	16.60	128.20	4,274.6	-500.3	669.7	835.9	2.47	-2.47	-0.37
4,465.0	14.90	125.20	4,353.5	-513.6	687.5	858.2	2.30	-2.07	-3.66
4,547.0	13.90	124.70	4,433.0	-525.3	704.2	878.5	1.23	-1.22	-0.61
4,628.0	11.40	123.00	4,512.0	-535.2	718.9	896.3	3.12	-3.09	-2.10
4,710.0	10.80	122.30	4,592.5	-543.7	732.2	912.0	0.75	-0.73	-0.85
4,792.0	10.30	123.10	4,673.1	-551.8	744.9	927.0	0.64	-0.61	0.98
4,873.0	8.10	125.60	4,753.0	-559.1	755.6	939.9	2.76	-2.72	3.09
4,955.0	6.20	129.60	4,834.4	-565.3	763.7	950.1	2.39	-2.32	4.88
5,037.0	4.00	130.50	4,916.0	-569.9	769.3	957.4	2.68	-2.68	1.10
5,118.0	1.80	131.00	4,996.9	-572.6	772.4	961.5	2.72	-2.72	0.62
5,200.0	1.80	148.30	5,078.9	-574.6	774.0	964.0	0.66	0.00	21.10
5,282.0	0.90	180.20	5,160.9	-576.3	774.7	965.5	1.39	-1.10	38.90
5,320.9	0.80	179.91	5,199.8	-576.9	774.7	965.9	0.25	-0.25	-0.75
TARGET BHL 2000'FNL, 2000'FWL									
5,363.0	0.70	179.50	5,241.9	-577.4	774.7	966.2	0.25	-0.25	-0.97
5,445.0	0.60	181.40	5,323.9	-578.4	774.7	966.8	0.12	-0.12	2.32
5,527.0	0.40	213.80	5,405.9	-579.0	774.5	967.0	0.41	-0.24	39.51
5,608.0	0.50	230.90	5,486.9	-579.5	774.1	967.0	0.21	0.12	21.11
5,690.0	0.70	255.60	5,568.9	-579.8	773.3	966.6	0.39	0.24	30.12
5,772.0	1.10	242.30	5,650.8	-580.3	772.1	965.9	0.55	0.49	-16.22
5,854.0	1.00	259.60	5,732.8	-580.8	770.7	965.1	0.40	-0.12	21.10
5,935.0	0.50	275.90	5,813.8	-580.9	769.7	964.3	0.67	-0.62	20.12

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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)
6,017.0	0.60	253.00	5,895.8	-581.0	768.9	963.7	0.29	0.12	-27.93
6,099.0	0.50	184.60	5,977.8	-581.5	768.5	963.6	0.76	-0.12	-83.41
6,180.0	0.50	196.10	6,058.8	-582.2	768.4	964.0	0.12	0.00	14.20
6,262.0	0.30	106.10	6,140.8	-582.6	768.5	964.3	0.71	-0.24	-109.76
6,344.0	0.30	352.80	6,222.8	-582.4	768.7	964.3	0.61	0.00	-138.17
6,425.0	0.50	52.80	6,303.8	-582.0	768.9	964.3	0.54	0.25	74.07
6,507.0	0.50	48.50	6,385.8	-581.5	769.5	964.5	0.05	0.00	-5.24
6,589.0	0.20	69.50	6,467.8	-581.3	769.9	964.6	0.39	-0.37	25.61
6,670.0	0.70	65.30	6,548.8	-581.0	770.4	964.9	0.62	0.62	-5.19
6,752.0	0.70	60.10	6,630.8	-580.5	771.3	965.4	0.08	0.00	-6.34
6,834.0	0.50	56.70	6,712.8	-580.1	772.1	965.7	0.25	-0.24	-4.15
6,880.8	0.55	67.08	6,759.5	-579.9	772.4	965.9	0.23	0.11	22.21
TARGET BOX 400' X 400' 1991'FNL, 1951'FWL									
6,881.1	0.55	67.08	6,759.9	-579.9	772.4	965.9	0.00	0.00	0.00
TARGET CIRCLE 2000'FNL, 2000'FWL									
6,915.0	0.60	73.40	6,793.8	-579.8	772.8	966.1	0.23	0.14	18.64
6,997.0	0.40	149.80	6,875.8	-579.9	773.3	966.6	0.78	-0.24	93.17
7,079.0	0.60	139.20	6,957.8	-580.5	773.7	967.3	0.27	0.24	-12.93
7,160.0	0.50	166.20	7,038.8	-581.1	774.1	968.0	0.34	-0.12	33.33
7,242.0	0.30	75.20	7,120.8	-581.4	774.4	968.4	0.72	-0.24	-110.98
7,315.0	0.40	70.30	7,193.8	-581.3	774.8	968.6	0.14	0.14	-6.71
7,365.0	0.40	71.20	7,243.8	-581.2	775.2	968.8	0.01	0.00	1.80

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_