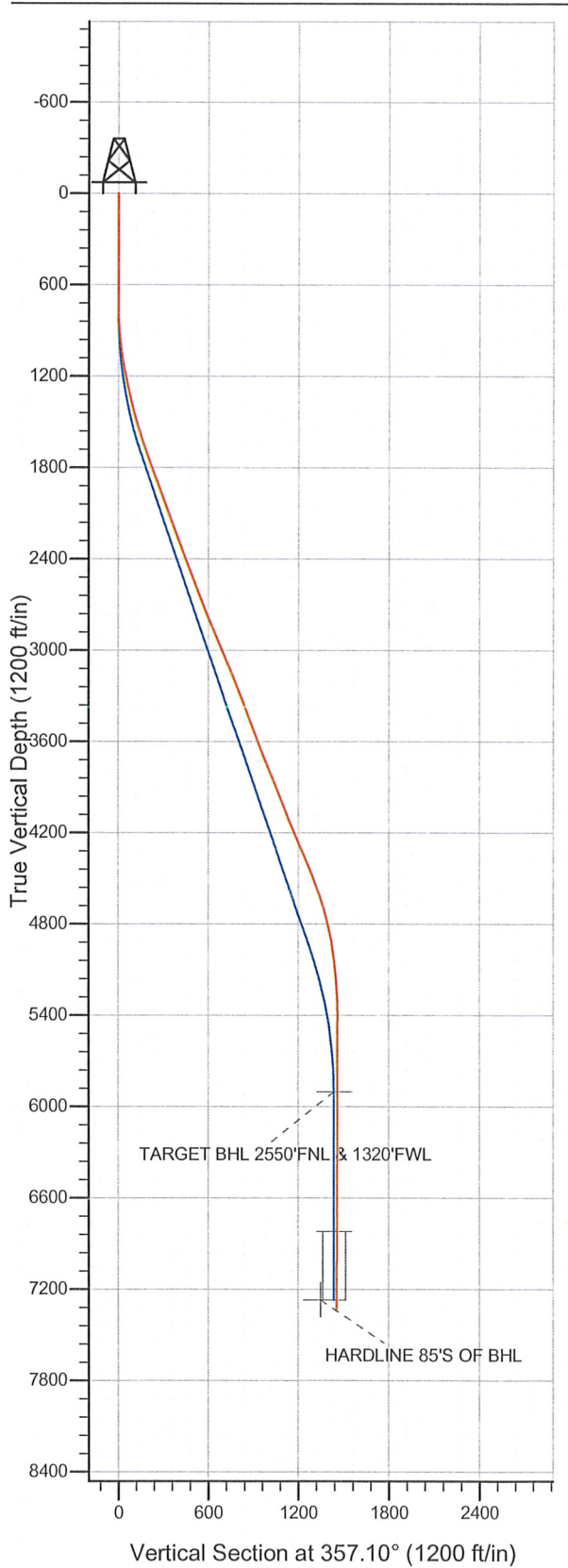
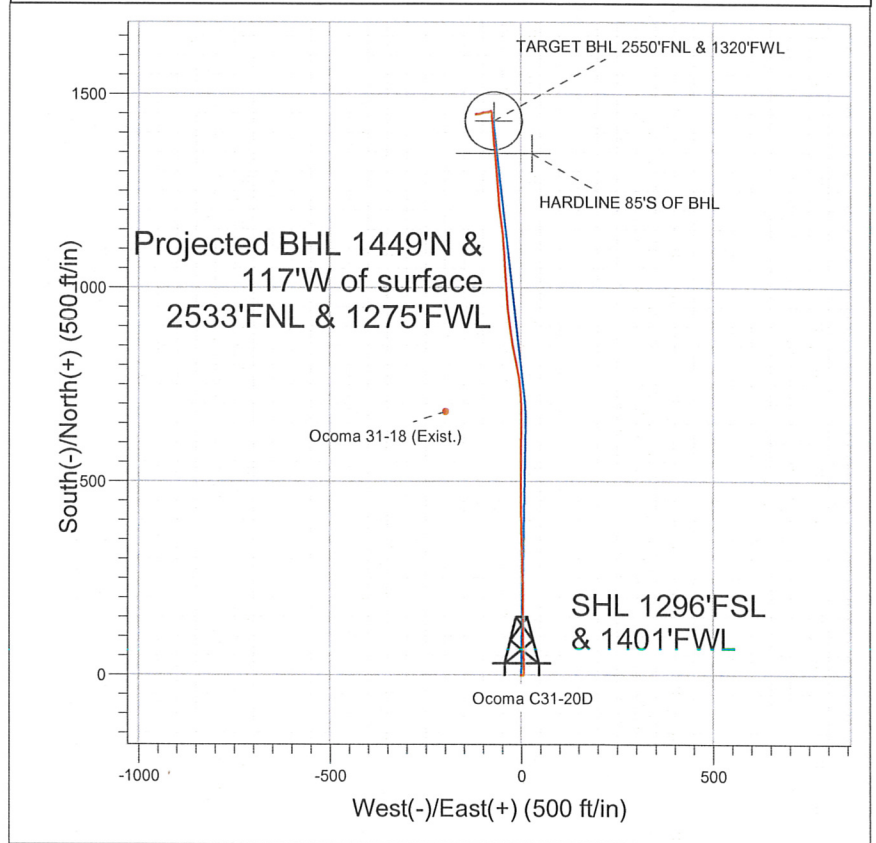


Surface Location: Ocoma C31-20D Pad Sec.31-T4N-R64W  
North American Datum 1983 US State Plane 1983 Colorado Northern Zone  
Ground Elevation: 4865.0  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1340699.33 3251879.31 40.265100 -104.597400  
Original Well Elev WELL @ 4878.0ft (Original Well Elev)



## NOBLE ENERGY INC WELD COUNTY CO



### LEGEND

- Ocoma C31-20D, Wellbore #1, Noble Ocoma C31-20D Plan #1 (8-26-11) V0
- Ocoma 31-18 (Exist.), Wellbore #1, Design #1 V0
- Wellbore #1

## Final Survey Plot

Projected Final Survey -  
7586'MD & 7329'TVD @ 1453'VS  
2.8 deg Inc 270.0 deg AZ

Project: SEC.31-T4N-R64W  
Site: Ocoma C31-20D Pad Sec.31-T4N-R64W  
Well: Ocoma C31-20D  
Plan: Wellbore #1



**Directional**

**NOBLE ENERGY INC WELD  
COUNTY CO**

**SEC.31-T4N-R64W**

**Ocoma C31-20D Pad Sec.31-T4N-R64W**

**Ocoma C31-20D**

**Wellbore #1**

**Design: Wellbore #1**

**Standard Survey Report**

**27 December, 2011**





**Company:** NOBLE ENERGY INC WELD COUNTY CO  
**Project:** SEC.31-T4N-R64W  
**Site:** Ocoma C31-20D Pad Sec.31-T4N-R64W  
**Well:** Ocoma C31-20D  
**Wellbore:** Wellbore #1  
**Design:** Wellbore #1

**Local Co-ordinate Reference:** Well Ocoma C31-20D  
**TVD Reference:** WELL @ 4878.0ft (Original Well Elev)  
**MD Reference:** WELL @ 4878.0ft (Original Well Elev)  
**North Reference:** True  
**Survey Calculation Method:** Minimum Curvature  
**Database:** Landmark

**Project** SEC.31-T4N-R64W, Weld County, CO

**Map System:** US State Plane 1983  
**Geo Datum:** North American Datum 1983  
**Map Zone:** Colorado Northern Zone  
**System Datum:** Mean Sea Level  
 Using Well Reference Point

**Site** Ocoma C31-20D Pad Sec.31-T4N-R64W

**Site Position:**  
**From:** Lat/Long  
**Position Uncertainty:** 0.0 ft  
**Northing:** 1,340,699.34 ft  
**Easting:** 3,251,879.31 ft  
**Slot Radius:** "  
**Latitude:** 40.265100  
**Longitude:** -104.597400  
**Grid Convergence:** 0.58 °

**Well** Ocoma C31-20D

**Well Position** +N/-S 0.0 ft **Northing:** 1,340,699.33 ft **Latitude:** 40.265100  
 +E/-W 0.0 ft **Easting:** 3,251,879.31 ft **Longitude:** -104.597400  
**Position Uncertainty** 0.0 ft **Wellhead Elevation:** ft **Ground Level:** 4,865.0 ft

**Wellbore** Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	11/23/2011	8.70	66.95	53,032

**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 0.0 357.10

**Survey Program** Date 12/27/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
725.0	7,586.0	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
725.0	0.90	96.30	725.0	-0.6	5.7	-0.9	0.12	0.12	0.00
854.0	3.00	7.90	853.9	2.6	7.1	2.2	2.41	1.63	-68.53
982.0	6.70	359.10	981.4	13.4	7.5	13.0	2.94	2.89	-6.88
1,110.0	9.70	358.90	1,108.1	31.6	7.1	31.2	2.34	2.34	-0.16
1,239.0	11.80	359.10	1,234.8	55.7	6.7	55.3	1.63	1.63	0.16
1,367.0	13.60	356.40	1,359.7	83.8	5.6	83.4	1.48	1.41	-2.11
1,496.0	16.00	0.00	1,484.4	116.7	4.6	116.3	1.99	1.86	2.79
1,624.0	18.60	2.10	1,606.6	154.8	5.4	154.3	2.09	2.03	1.64
1,752.0	19.80	358.50	1,727.5	196.9	5.6	196.3	1.32	0.94	-2.81
1,881.0	21.50	358.50	1,848.2	242.3	4.4	241.8	1.32	1.32	0.00
2,009.0	20.40	359.40	1,967.7	288.1	3.5	287.5	0.90	-0.86	0.70
2,138.0	19.50	357.80	2,089.0	332.1	2.5	331.5	0.82	-0.70	-1.24

Company: NOBLE ENERGY INC WELD COUNTY CO  
 Project: SEC.31-T4N-R64W  
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 Well: Ocoma C31-20D  
 Wellbore: Wellbore #1  
 Design: Wellbore #1

Local Co-ordinate Reference: Well Ocoma C31-20D  
 TVD Reference: WELL @ 4878.0ft (Original Well Elev)  
 MD Reference: WELL @ 4878.0ft (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)
2,266.0	20.80	358.00	2,209.2	376.1	0.8	375.6	1.02	1.02	0.16
2,394.0	21.40	0.80	2,328.6	422.2	0.4	421.7	0.92	0.47	2.19
2,523.0	20.80	358.90	2,448.9	468.6	0.3	468.0	0.71	-0.47	-1.47
2,651.0	21.20	0.30	2,568.4	514.5	0.0	513.9	0.50	0.31	1.09
2,780.0	21.30	0.10	2,688.7	561.3	0.1	560.5	0.10	0.08	-0.16
2,908.0	23.60	0.00	2,807.0	610.1	0.2	609.4	1.80	1.80	-0.08
3,036.0	23.40	1.20	2,924.3	661.2	0.7	660.3	0.41	-0.16	0.94
3,165.0	23.60	357.50	3,042.6	712.6	0.1	711.7	1.15	0.16	-2.87
3,293.0	21.50	350.60	3,160.9	761.3	-4.9	760.6	2.64	-1.64	-5.39
3,422.0	21.50	348.70	3,280.9	807.8	-13.3	807.5	0.54	0.00	-1.47
3,550.0	20.80	349.80	3,400.3	853.2	-22.0	853.2	0.63	-0.55	0.86
3,678.0	21.10	353.10	3,519.8	898.5	-28.8	898.8	0.95	0.23	2.58
3,807.0	20.90	353.80	3,640.2	944.4	-34.0	944.9	0.25	-0.16	0.54
3,935.0	22.20	355.70	3,759.3	991.2	-38.3	991.9	1.15	1.02	1.48
4,064.0	23.00	357.00	3,878.4	1,040.7	-41.5	1,041.4	0.73	0.62	1.01
4,192.0	22.40	357.00	3,996.5	1,090.0	-44.0	1,090.8	0.47	-0.47	0.00
4,320.0	20.60	353.40	4,115.6	1,136.7	-47.9	1,137.7	1.74	-1.41	-2.81
4,449.0	23.90	352.90	4,234.9	1,185.2	-53.7	1,186.4	2.56	2.56	-0.39
4,577.0	23.50	356.30	4,352.2	1,236.4	-58.6	1,237.8	1.11	-0.31	2.66
4,706.0	22.00	355.00	4,471.1	1,286.2	-62.4	1,287.7	1.23	-1.16	-1.01
4,834.0	20.00	355.20	4,590.6	1,331.9	-66.3	1,333.5	1.56	-1.56	0.16
4,962.0	14.90	353.30	4,712.7	1,370.0	-70.0	1,371.8	4.01	-3.98	-1.48
5,091.0	12.70	356.60	4,838.0	1,400.7	-72.8	1,402.6	1.81	-1.71	2.56
5,219.0	8.30	354.30	4,963.8	1,423.9	-74.6	1,425.9	3.45	-3.44	-1.80
5,348.0	5.90	354.20	5,091.8	1,439.8	-76.2	1,441.8	1.86	-1.86	-0.08
5,476.0	3.90	9.60	5,219.3	1,450.6	-76.1	1,452.6	1.86	-1.56	12.03
5,604.0	2.30	306.70	5,347.2	1,456.4	-77.4	1,458.5	2.74	-1.25	-49.14
5,733.0	2.10	222.00	5,476.1	1,456.2	-81.1	1,458.5	2.30	-0.16	-65.66
5,861.0	0.40	299.00	5,604.1	1,454.7	-83.1	1,457.1	1.60	-1.33	60.16
5,990.0	0.50	244.80	5,733.1	1,454.7	-84.0	1,457.1	0.33	0.08	-42.02
6,118.0	0.50	250.80	5,861.0	1,454.3	-85.0	1,456.7	0.04	0.00	4.69
6,156.9	0.44	262.22	5,899.9	1,454.2	-85.3	1,456.6	0.28	-0.15	29.38
TARGET BHL 2550'FNL & 1320'FWL									
6,246.0	0.40	296.80	5,989.0	1,454.3	-85.9	1,456.8	0.28	-0.05	38.80
6,375.0	0.60	281.90	6,118.0	1,454.6	-87.0	1,457.2	0.18	0.16	-11.55
6,503.0	0.50	247.50	6,246.0	1,454.6	-88.2	1,457.2	0.26	-0.08	-26.88
6,632.0	0.80	258.90	6,375.0	1,454.2	-89.6	1,456.8	0.25	0.23	8.84
6,760.0	0.90	255.70	6,503.0	1,453.7	-91.4	1,456.5	0.09	0.08	-2.50
6,888.0	1.30	271.40	6,631.0	1,453.5	-93.8	1,456.4	0.39	0.31	12.27
7,017.0	1.80	255.20	6,759.9	1,453.1	-97.3	1,456.1	0.51	0.39	-12.56
7,074.5	1.71	252.76	6,817.4	1,452.6	-98.9	1,455.7	0.21	-0.16	-4.24
TARGET CIRCLE 2550'FNL & 1320'FWL									
7,145.0	1.60	249.40	6,887.9	1,451.9	-100.9	1,455.2	0.21	-0.15	-4.77
7,274.0	1.80	248.20	7,016.8	1,450.5	-104.4	1,454.0	0.16	0.16	-0.93
7,450.0	2.60	261.90	7,192.7	1,448.9	-111.0	1,452.7	0.54	0.45	7.78
7,519.0	2.75	268.99	7,261.7	1,448.7	-114.2	1,452.6	0.53	0.22	10.27
HARDLINE 85'S OF BHL									
7,537.0	2.80	270.70	7,279.6	1,448.7	-115.0	1,452.6	0.53	0.26	9.52
7,586.0	2.80	270.00	7,328.5	1,448.7	-117.4	1,452.8	0.07	0.00	-1.43



**Company:** NOBLE ENERGY INC WELD COUNTY CO  
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Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_