

Well Name: **Howard A27-17D**

Surface Location: Howard A27-17D Pad Sec.27-T6N-R64W
North American Datum 1983 US State Plane 1983 Colorado Northern Zone

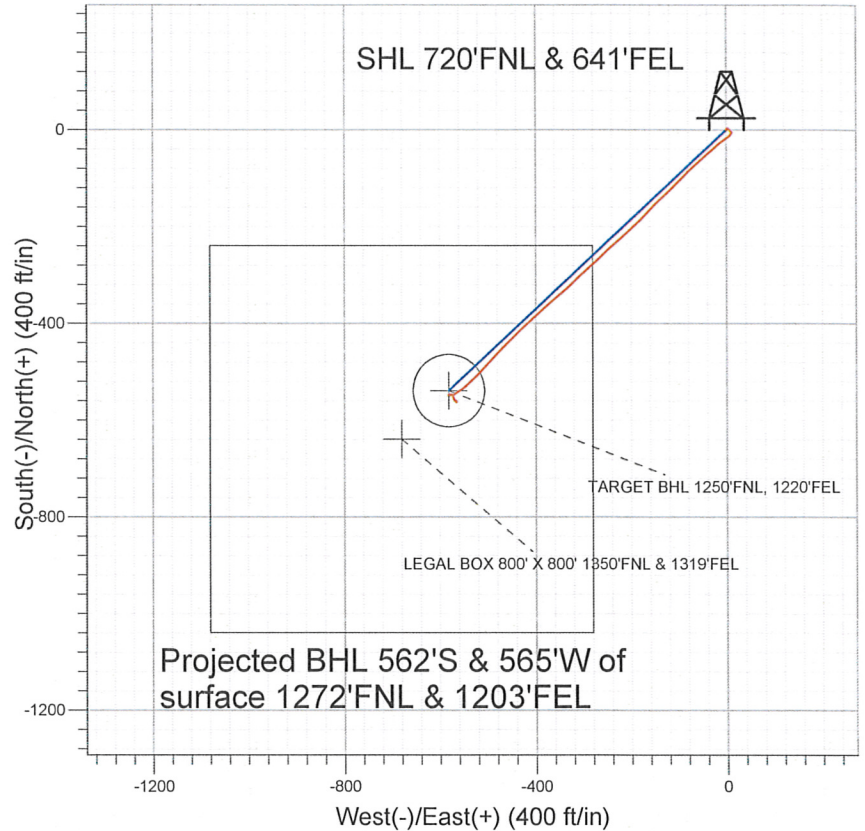
Ground Elevation: 4697.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1412840.90	3270156.22	40° 27' 45.324 N	104° 31' 44.688 W

Original Well Elev WELL @ 4710.0ft (Original Well Elev)

Slot

NOBLE ENERGY INC WELD COUNTY CO



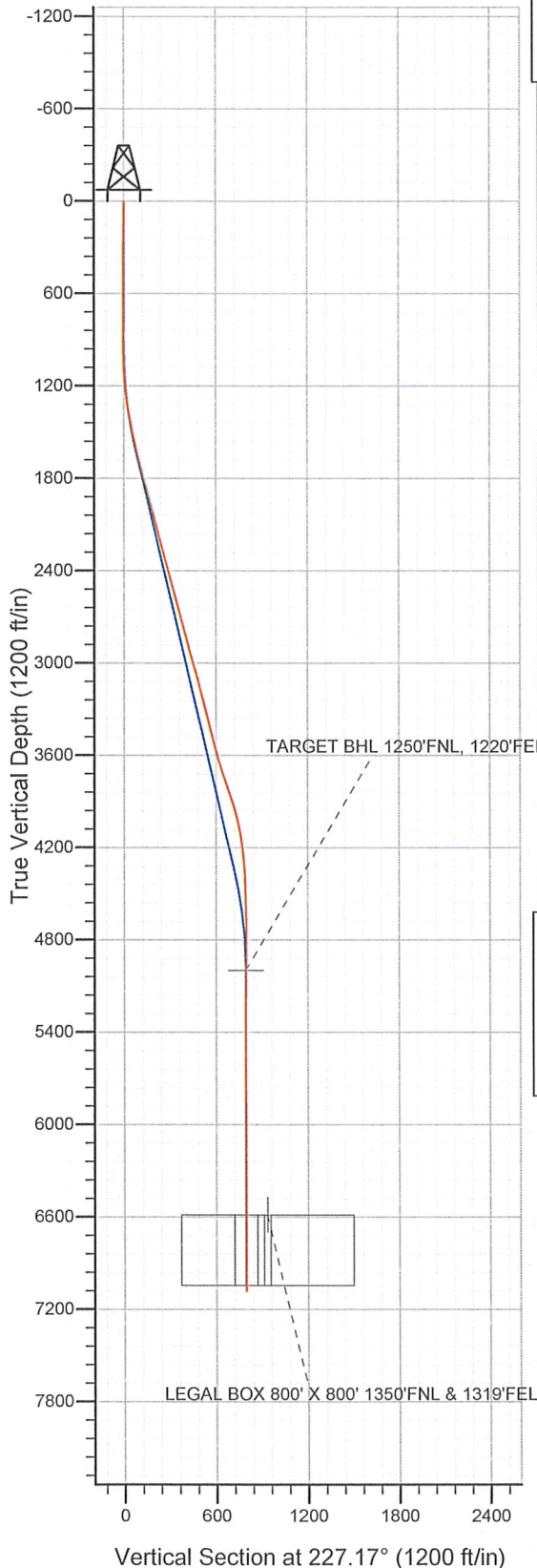
LEGEND

- Howard A27-17D, Wellbore #1, Noble Howard A27-17D Plan #2 (6-20-11) V0
- Wellbore #1
- Survey #1

Final Survey Plot

Projected Final Survey -
7179'MD & 7078'TVD @ 796'VS
0.5 deg Inc 180.5 deg AZ

Project: SEC.27-T6N-R64W
Site: Howard A27-17D Pad Sec.27-T6N-R64W
Well: Howard A27-17D
Plan: Wellbore #1



Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.27-T6N-R64W
Site: Howard A27-17D Pad Sec.27-T6N-R64W
Well: Howard A27-17D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Howard A27-17D
TVD Reference: WELL @ 4710.0ft (Original Well Elev)
MD Reference: WELL @ 4710.0ft (Original Well Elev)
North Reference: True
Survey Calculation Method: Minimum Curvature
Database: Landmark

Project	SEC.27-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 A27-17D Pad Sec.27-T6N-R64W

Site Position:
From: Lat/Long **Northing:** 1,412,840.91 ft **Latitude:** 40° 27' 45.324 N
Position Uncertainty: 0.0 ft **Easting:** 3,270,156.22 ft **Longitude:** 104° 31' 44.688 W
Slot Radius: " **Grid Convergence:** 0.63 °

Well Howard A27-17D
Well Position +N/-S 0.0 ft **Northing:** 1,412,840.90 ft **Latitude:** 40° 27' 45.324 N
 +E/-W 0.0 ft **Easting:** 3,270,156.22 ft **Longitude:** 104° 31' 44.688 W
Position Uncertainty 0.0 ft **Wellhead Elevation:** ft **Ground Level:** 4,697.0 ft

Wellbore Wellbore #1

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	6/20/2011	8.74	67.14	53,189

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	227.17

Survey Program Date 6/28/2011

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
270.0	7,179.0	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
270.0	1.20	23.80	270.0	2.6	1.1	-2.6	0.44	0.44	0.00
464.0	0.90	121.40	464.0	3.7	3.3	-4.9	0.82	-0.15	50.31
658.0	1.30	141.20	657.9	1.1	5.9	-5.1	0.28	0.21	10.21
859.0	1.60	134.70	858.9	-2.6	9.4	-5.1	0.17	0.15	-3.23
923.0	1.60	130.20	922.8	-3.8	10.7	-5.2	0.20	0.00	-7.03
1,017.0	2.10	212.80	1,016.8	-6.1	10.8	-3.7	2.63	0.53	87.87
1,110.0	3.30	212.80	1,109.7	-9.8	8.4	0.5	1.29	1.29	0.00
1,204.0	5.60	233.40	1,203.4	-14.8	3.2	7.7	2.94	2.45	21.91
1,298.0	8.00	236.10	1,296.7	-21.2	-5.9	18.7	2.58	2.55	2.87
1,391.0	10.40	229.20	1,388.5	-30.3	-17.6	33.5	2.84	2.58	-7.42
1,485.0	11.50	230.20	1,480.8	-41.8	-31.2	51.3	1.19	1.17	1.06
1,578.0	12.90	227.70	1,571.7	-54.7	-46.0	71.0	1.61	1.51	-2.69

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.27-T6N-R64W
Site: Howard A27-17D Pad Sec.27-T6N-R64W
Well: Howard A27-17D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Howard A27-17D
TVD Reference: WELL @ 4710.0ft (Original Well Elev)
MD Reference: WELL @ 4710.0ft (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)
1,672.0	13.80	227.50	1,663.2	-69.4	-62.1	92.7	0.96	0.96	-0.21
1,766.0	14.50	226.30	1,754.3	-85.1	-78.8	115.7	0.81	0.74	-1.28
1,859.0	15.50	224.00	1,844.2	-102.1	-95.9	139.7	1.25	1.08	-2.47
1,953.0	14.60	227.10	1,934.9	-119.2	-113.3	164.1	1.28	-0.96	3.30
2,046.0	15.00	226.30	2,024.9	-135.5	-130.6	187.9	0.48	0.43	-0.86
2,140.0	15.50	226.00	2,115.5	-152.6	-148.4	212.6	0.54	0.53	-0.32
2,233.0	15.40	222.60	2,205.2	-170.3	-165.7	237.3	0.98	-0.11	-3.66
2,327.0	14.80	223.80	2,295.9	-188.2	-182.5	261.7	0.72	-0.64	1.28
2,420.0	14.30	228.10	2,386.0	-204.4	-199.2	285.1	1.28	-0.54	4.62
2,514.0	15.20	229.10	2,476.9	-220.2	-217.2	309.0	0.99	0.96	1.06
2,608.0	14.70	228.20	2,567.7	-236.2	-235.4	333.2	0.59	-0.53	-0.96
2,701.0	15.10	226.80	2,657.6	-252.4	-253.0	357.2	0.58	0.43	-1.51
2,795.0	15.30	227.50	2,748.3	-269.2	-271.1	381.8	0.29	0.21	0.74
2,888.0	16.00	228.50	2,837.8	-285.9	-289.7	406.9	0.81	0.75	1.08
2,982.0	14.90	227.30	2,928.4	-302.7	-308.3	431.9	1.22	-1.17	-1.28
3,076.0	15.40	226.60	3,019.2	-319.5	-326.3	456.5	0.57	0.53	-0.74
3,169.0	16.20	230.80	3,108.6	-336.2	-345.3	481.8	1.50	0.86	4.52
3,263.0	14.50	228.40	3,199.3	-352.3	-364.3	506.6	1.93	-1.81	-2.55
3,356.0	13.90	227.80	3,289.4	-367.5	-381.2	529.4	0.66	-0.65	-0.65
3,450.0	14.10	226.80	3,380.7	-382.9	-398.0	552.2	0.33	0.21	-1.06
3,543.0	14.20	228.40	3,470.8	-398.3	-414.7	574.9	0.43	0.11	1.72
3,637.0	15.10	227.30	3,561.8	-414.2	-432.4	598.7	1.00	0.96	-1.17
3,730.0	18.00	224.00	3,650.9	-432.8	-451.3	625.2	3.28	3.12	-3.55
3,824.0	19.10	225.70	3,740.0	-454.0	-472.3	655.0	1.30	1.17	1.81
3,918.0	18.90	223.00	3,828.9	-475.9	-493.7	685.6	0.96	-0.21	-2.87
4,011.0	17.40	221.60	3,917.3	-497.3	-513.2	714.5	1.68	-1.61	-1.51
4,105.0	12.10	228.10	4,008.2	-514.4	-529.9	738.3	5.90	-5.64	6.91
4,199.0	10.50	225.70	4,100.3	-526.9	-543.4	756.7	1.77	-1.70	-2.55
4,292.0	8.20	237.90	4,192.1	-536.4	-555.1	771.7	3.25	-2.47	13.12
4,386.0	5.40	235.30	4,285.4	-542.5	-564.4	782.7	3.00	-2.98	-2.77
4,479.0	2.50	235.00	4,378.2	-546.1	-569.6	789.0	3.12	-3.12	-0.32
4,573.0	1.70	254.90	4,472.1	-547.7	-572.7	792.3	1.14	-0.85	21.17
4,666.0	1.70	269.40	4,565.1	-548.0	-575.4	794.5	0.46	0.00	15.59
4,760.0	1.80	268.00	4,659.0	-548.1	-578.3	796.7	0.12	0.11	-1.49
4,853.0	1.70	288.60	4,752.0	-547.7	-581.0	798.4	0.68	-0.11	22.15
4,947.0	0.80	86.20	4,846.0	-547.2	-581.7	798.6	2.62	-0.96	167.66
5,041.0	1.20	65.20	4,940.0	-546.8	-580.1	797.2	0.57	0.43	-22.34
5,101.0	1.37	82.00	5,000.0	-546.4	-578.9	796.0	0.68	0.28	27.99
TARGET BHL 1250'FNL, 1220'FEL									
5,134.0	1.50	89.30	5,033.0	-546.3	-578.0	795.3	0.68	0.40	22.14
5,228.0	1.00	84.40	5,126.9	-546.2	-576.0	793.8	0.54	-0.53	-5.21
5,321.0	0.70	120.30	5,219.9	-546.4	-574.7	793.0	0.64	-0.32	38.60
5,415.0	0.50	114.30	5,313.9	-546.9	-573.8	792.6	0.22	-0.21	-6.38
5,508.0	0.30	153.40	5,406.9	-547.3	-573.3	792.5	0.35	-0.22	42.04
5,602.0	1.30	167.10	5,500.9	-548.6	-573.0	793.1	1.08	1.06	14.57
5,696.0	1.60	163.30	5,594.9	-550.8	-572.4	794.3	0.33	0.32	-4.04
5,789.0	1.30	157.90	5,687.8	-553.1	-571.6	795.2	0.35	-0.32	-5.81
5,883.0	1.10	160.40	5,781.8	-554.9	-570.9	795.9	0.22	-0.21	2.66
5,976.0	0.90	138.70	5,874.8	-556.3	-570.1	796.3	0.46	-0.22	-23.33
6,070.0	1.00	149.30	5,968.8	-557.6	-569.2	796.5	0.21	0.11	11.28
6,163.0	0.60	114.50	6,061.8	-558.5	-568.4	796.5	0.66	-0.43	-37.42
6,257.0	0.40	111.00	6,155.8	-558.8	-567.6	796.1	0.22	-0.21	-3.72
6,351.0	0.50	147.80	6,249.8	-559.2	-567.1	796.1	0.32	0.11	39.15
6,444.0	0.40	106.60	6,342.8	-559.7	-566.6	796.0	0.36	-0.11	-44.30

Company: NOBLE ENERGY INC WELD COUNTY CO
Project: SEC.27-T6N-R64W
Site: Howard A27-17D Pad Sec.27-T6N-R64W
Well: Howard A27-17D
Wellbore: Wellbore #1
Design: Wellbore #1

Local Co-ordinate Reference: Well Howard A27-17D
TVD Reference: WELL @ 4710.0ft (Original Well Elev)
MD Reference: WELL @ 4710.0ft (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)
6,538.0	0.10	316.50	6,436.8	-559.7	-566.3	795.8	0.52	-0.32	-159.68
6,631.0	0.10	340.90	6,529.8	-559.6	-566.4	795.8	0.05	0.00	26.24
6,688.3	0.08	297.74	6,587.0	-559.5	-566.4	795.8	0.12	-0.03	-75.38
LEGAL BOX 800' X 800' 1350'FNL & 1319'FEL - TARGET CIRCLE 1250'FNL & 1220'FEL									
6,725.0	0.10	271.70	6,623.8	-559.5	-566.5	795.8	0.12	0.05	-70.87
6,818.0	0.40	126.80	6,716.8	-559.7	-566.3	795.8	0.52	0.32	-155.81
6,912.0	0.40	86.20	6,810.8	-559.9	-565.7	795.5	0.30	0.00	-43.19
7,006.0	0.50	143.60	6,904.8	-560.2	-565.2	795.3	0.47	0.11	61.06
7,133.0	0.50	180.50	7,031.8	-561.2	-564.8	795.7	0.25	0.00	29.06
7,179.0	0.50	180.50	7,077.8	-561.6	-564.8	796.0	0.00	0.00	0.00

Checked By: _____ Approved By: _____ Date: _____