

# ENSIGN

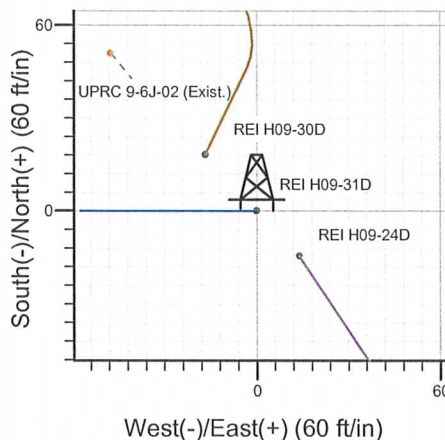
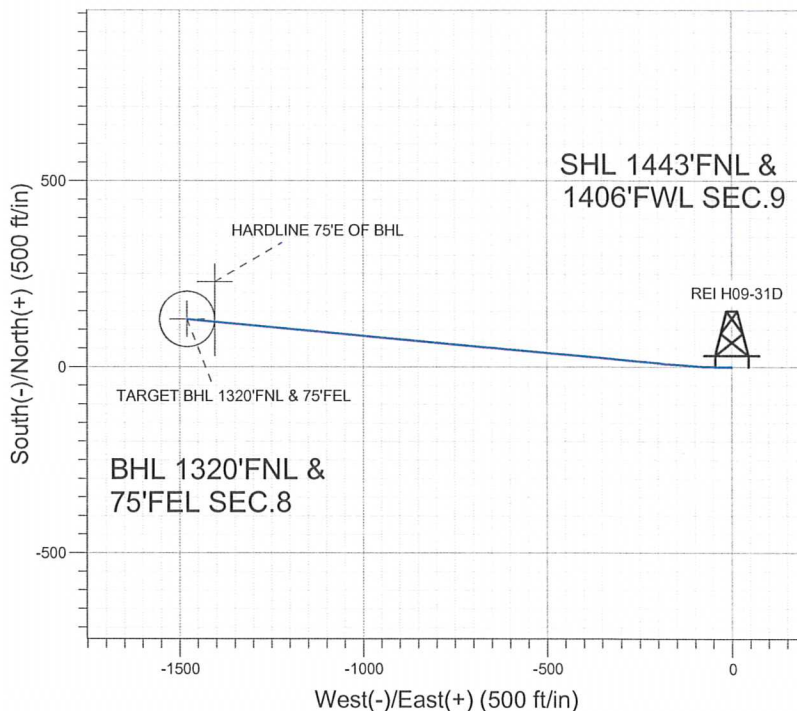
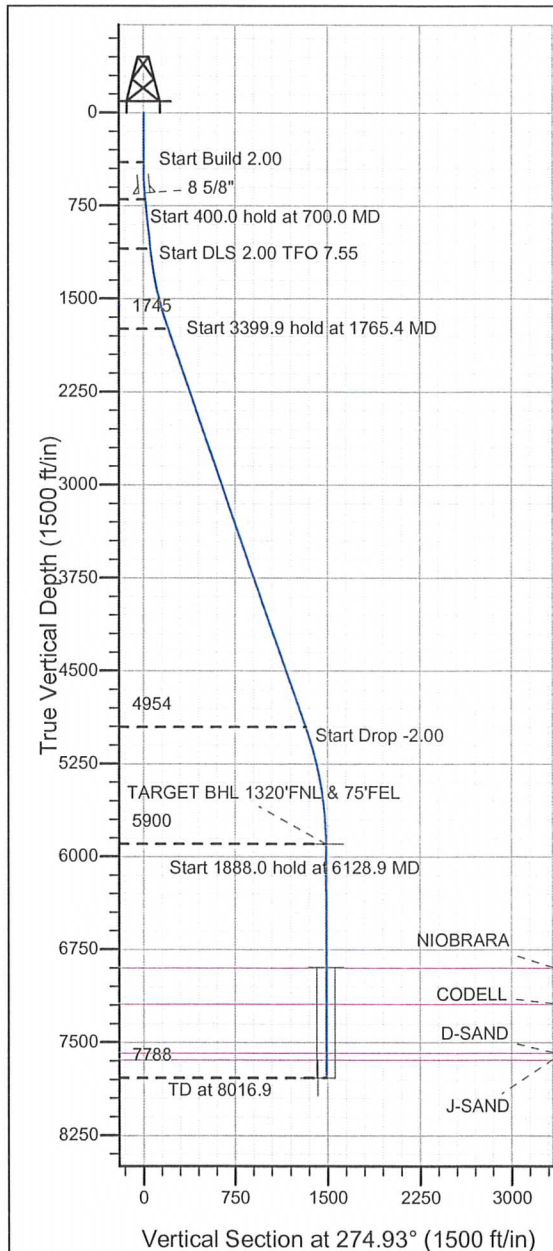
## Directional

Well Name: REI H09-31D

Surface Location: REI H09-31D Pad Sec.9-T3N-R65W  
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone  
Ground Elevation: 4830.0

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1332502.31	3230946.90	40.243160	-104.672680	
Original Well Elev WELL @ 4843.0ft (Original Well Elev)						

### NOBLE ENERGY INC WELD COUNTY CO



REI H09-31D Pad Sec.9-T3N-R65W  
REI H09-31D  
Noble REI H09-31D Plan #2 (1-4-12)  
13:31, January 04 2012



Azimuths to True North  
Magnetic North: 8.68°  
Magnetic Field  
Strength: 53023.7snT  
Dip Angle: 66.93°  
Date: 1/4/2012  
Model: IGRF200510

#### WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BHL 1320'FNL & 75'FEL	5900.0	127.6	-1479.6	40.243510	-104.677980	Point
TARGET CIRCLE 1320'FNL & 75'FEL	6897.0	127.6	-1479.6	40.243510	-104.677980	Circle (Radius: 75.0)
HARDLINE 75'E OF BHL	7788.0	227.6	-1404.6	40.243785	-104.677711	Polygon

#### SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	DLeg	TFace	VSec	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.0	
3	700.0	6.00	270.00	699.5	0.0	-15.7	2.00	270.00	15.6	
4	1100.0	6.00	270.00	1097.3	0.0	-57.5	0.00	0.00	57.3	
5	1765.4	19.27	275.25	1745.1	10.1	-202.3	2.00	7.55	202.4	
6	5165.3	19.27	275.25	4954.5	112.9	-1319.7	0.00	0.00	1324.5	
7	6128.9	0.00	0.00	5900.0	127.6	-1479.6	2.00	180.00	1485.1	TARGET BHL 1320'FNL & 75'FEL
8	8016.9	0.00	0.00	7788.0	127.6	-1479.6	0.00	0.00	1485.1	



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

**SEC.9-T3N-R65W**

**REI H09-31D Pad Sec.9-T3N-R65W**

**REI H09-31D**

**Wellbore #1**

**Plan: Noble REI H09-31D Plan #2 (1-4-12)**

## **Standard Planning Report**

**04 January, 2012**





Database:	Landmark	Local Co-ordinate Reference:	Well REI H09-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4843.0ft (Original Well Elev)
Project:	SEC.9-T3N-R65W	MD Reference:	WELL @ 4843.0ft (Original Well Elev)
Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Project	SEC.9-T3N-R65W, 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		REI H09-31D Pad Sec.9-T3N-R65W			
Site Position:		Northing:	1,332,502.33 ft	Latitude:	40.243160
From:	Lat/Long	Easting:	3,230,946.90 ft	Longitude:	-104.672680
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.53 °

Well	REI H09-31D					
Well Position	+N/-S	0.0 ft	Northing:	1,332,502.31 ft	Latitude:	40.243160
	+E/-W	0.0 ft	Easting:	3,230,946.90 ft	Longitude:	-104.672680
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,830.0 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	1/4/2012	8.68	66.93	53,024

Design	Noble REI H09-31D Plan #2 (1-4-12)			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	274.93

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
400.0	0.00	0.00	400.0	0.0	0.0	0.00	0.00	0.00	0.00	
700.0	6.00	270.00	699.5	0.0	-15.7	2.00	2.00	0.00	270.00	
1,100.0	6.00	270.00	1,097.3	0.0	-57.5	0.00	0.00	0.00	0.00	
1,765.4	19.27	275.25	1,745.1	10.1	-202.3	2.00	1.99	0.79	7.55	
5,165.3	19.27	275.25	4,954.5	112.9	-1,319.7	0.00	0.00	0.00	0.00	
6,128.9	0.00	0.00	5,900.0	127.6	-1,479.6	2.00	-2.00	0.00	180.00	TARGET BHL 132C
8,016.9	0.00	0.00	7,788.0	127.6	-1,479.6	0.00	0.00	0.00	0.00	

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Project:	SEC.9-T3N-R65W	MD Reference:	WELL @ 4843.0ft (Original Well Elev)
Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Planned 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
40.0	0.00	0.00	40.0	0.0	0.0	0.0	0.00	0.00	0.00
80.0	0.00	0.00	80.0	0.0	0.0	0.0	0.00	0.00	0.00
120.0	0.00	0.00	120.0	0.0	0.0	0.0	0.00	0.00	0.00
160.0	0.00	0.00	160.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
240.0	0.00	0.00	240.0	0.0	0.0	0.0	0.00	0.00	0.00
280.0	0.00	0.00	280.0	0.0	0.0	0.0	0.00	0.00	0.00
320.0	0.00	0.00	320.0	0.0	0.0	0.0	0.00	0.00	0.00
360.0	0.00	0.00	360.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
440.0	0.80	270.00	440.0	0.0	-0.3	0.3	2.00	2.00	0.00
480.0	1.60	270.00	480.0	0.0	-1.1	1.1	2.00	2.00	0.00
520.0	2.40	270.00	520.0	0.0	-2.5	2.5	2.00	2.00	0.00
560.0	3.20	270.00	559.9	0.0	-4.5	4.5	2.00	2.00	0.00
600.0	4.00	270.00	599.8	0.0	-7.0	7.0	2.00	2.00	0.00
640.0	4.80	270.00	639.7	0.0	-10.0	10.0	2.00	2.00	0.00
650.3	5.01	270.00	650.0	0.0	-10.9	10.9	2.00	2.00	0.00
8 5/8"									
680.0	5.60	270.00	679.6	0.0	-13.7	13.6	2.00	2.00	0.00
700.0	6.00	270.00	699.5	0.0	-15.7	15.6	2.00	2.00	0.00
720.0	6.00	270.00	719.3	0.0	-17.8	17.7	0.00	0.00	0.00
760.0	6.00	270.00	759.1	0.0	-22.0	21.9	0.00	0.00	0.00
800.0	6.00	270.00	798.9	0.0	-26.1	26.0	0.00	0.00	0.00
840.0	6.00	270.00	838.7	0.0	-30.3	30.2	0.00	0.00	0.00
880.0	6.00	270.00	878.5	0.0	-34.5	34.4	0.00	0.00	0.00
920.0	6.00	270.00	918.2	0.0	-38.7	38.5	0.00	0.00	0.00
960.0	6.00	270.00	958.0	0.0	-42.9	42.7	0.00	0.00	0.00
1,000.0	6.00	270.00	997.8	0.0	-47.1	46.9	0.00	0.00	0.00
1,040.0	6.00	270.00	1,037.6	0.0	-51.2	51.0	0.00	0.00	0.00
1,080.0	6.00	270.00	1,077.4	0.0	-55.4	55.2	0.00	0.00	0.00
1,100.0	6.00	270.00	1,097.3	0.0	-57.5	57.3	0.00	0.00	0.00
1,120.0	6.40	270.47	1,117.1	0.0	-59.7	59.4	2.00	1.98	2.36
1,160.0	7.19	271.26	1,156.9	0.1	-64.4	64.2	2.00	1.99	1.97
1,200.0	7.99	271.89	1,196.5	0.2	-69.7	69.4	2.00	1.99	1.58
1,240.0	8.78	272.41	1,236.1	0.4	-75.5	75.3	2.00	1.99	1.29
1,280.0	9.58	272.84	1,275.6	0.7	-81.9	81.6	2.00	1.99	1.08
1,320.0	10.38	273.21	1,315.0	1.1	-88.8	88.6	2.00	1.99	0.92
1,360.0	11.18	273.52	1,354.3	1.5	-96.3	96.0	2.00	1.99	0.79
1,400.0	11.97	273.79	1,393.4	2.1	-104.3	104.1	2.00	2.00	0.68
1,440.0	12.77	274.03	1,432.5	2.6	-112.8	112.6	2.00	2.00	0.60
1,480.0	13.57	274.24	1,471.5	3.3	-121.9	121.8	2.00	2.00	0.53
1,520.0	14.37	274.43	1,510.3	4.0	-131.5	131.4	2.00	2.00	0.47
1,560.0	15.17	274.60	1,549.0	4.8	-141.7	141.6	2.00	2.00	0.42
1,600.0	15.97	274.75	1,587.5	5.7	-152.4	152.3	2.00	2.00	0.38
1,640.0	16.77	274.89	1,625.9	6.7	-163.6	163.6	2.00	2.00	0.35
1,680.0	17.57	275.02	1,664.1	7.7	-175.4	175.4	2.00	2.00	0.32
1,720.0	18.36	275.13	1,702.1	8.8	-187.7	187.8	2.00	2.00	0.29
1,760.0	19.16	275.24	1,740.0	9.9	-200.5	200.6	2.00	2.00	0.27
1,765.4	19.27	275.25	1,745.1	10.1	-202.3	202.4	2.00	2.00	0.25
1,800.0	19.27	275.25	1,777.8	11.1	-213.7	213.8	0.00	0.00	0.00
1,840.0	19.27	275.25	1,815.5	12.4	-226.8	227.0	0.00	0.00	0.00
1,880.0	19.27	275.25	1,853.3	13.6	-239.9	240.2	0.00	0.00	0.00
1,920.0	19.27	275.25	1,891.0	14.8	-253.1	253.4	0.00	0.00	0.00



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Project:	SEC.9-T3N-R65W	MD Reference:	WELL @ 4843.0ft (Original Well Elev)
Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Planned 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)
1,960.0	19.27	275.25	1,928.8	16.0	-266.2	266.6	0.00	0.00	0.00
2,000.0	19.27	275.25	1,966.6	17.2	-279.4	279.8	0.00	0.00	0.00
2,040.0	19.27	275.25	2,004.3	18.4	-292.5	293.0	0.00	0.00	0.00
2,080.0	19.27	275.25	2,042.1	19.6	-305.7	306.2	0.00	0.00	0.00
2,120.0	19.27	275.25	2,079.8	20.8	-318.8	319.4	0.00	0.00	0.00
2,160.0	19.27	275.25	2,117.6	22.0	-332.0	332.6	0.00	0.00	0.00
2,200.0	19.27	275.25	2,155.4	23.2	-345.1	345.8	0.00	0.00	0.00
2,240.0	19.27	275.25	2,193.1	24.4	-358.3	359.0	0.00	0.00	0.00
2,280.0	19.27	275.25	2,230.9	25.7	-371.4	372.2	0.00	0.00	0.00
2,320.0	19.27	275.25	2,268.6	26.9	-384.6	385.4	0.00	0.00	0.00
2,360.0	19.27	275.25	2,306.4	28.1	-397.7	398.6	0.00	0.00	0.00
2,400.0	19.27	275.25	2,344.1	29.3	-410.9	411.8	0.00	0.00	0.00
2,440.0	19.27	275.25	2,381.9	30.5	-424.0	425.1	0.00	0.00	0.00
2,480.0	19.27	275.25	2,419.7	31.7	-437.1	438.3	0.00	0.00	0.00
2,520.0	19.27	275.25	2,457.4	32.9	-450.3	451.5	0.00	0.00	0.00
2,560.0	19.27	275.25	2,495.2	34.1	-463.4	464.7	0.00	0.00	0.00
2,600.0	19.27	275.25	2,532.9	35.3	-476.6	477.9	0.00	0.00	0.00
2,640.0	19.27	275.25	2,570.7	36.5	-489.7	491.1	0.00	0.00	0.00
2,680.0	19.27	275.25	2,608.5	37.7	-502.9	504.3	0.00	0.00	0.00
2,720.0	19.27	275.25	2,646.2	39.0	-516.0	517.5	0.00	0.00	0.00
2,760.0	19.27	275.25	2,684.0	40.2	-529.2	530.7	0.00	0.00	0.00
2,800.0	19.27	275.25	2,721.7	41.4	-542.3	543.9	0.00	0.00	0.00
2,840.0	19.27	275.25	2,759.5	42.6	-555.5	557.1	0.00	0.00	0.00
2,880.0	19.27	275.25	2,797.2	43.8	-568.6	570.3	0.00	0.00	0.00
2,920.0	19.27	275.25	2,835.0	45.0	-581.8	583.5	0.00	0.00	0.00
2,960.0	19.27	275.25	2,872.8	46.2	-594.9	596.7	0.00	0.00	0.00
3,000.0	19.27	275.25	2,910.5	47.4	-608.1	609.9	0.00	0.00	0.00
3,040.0	19.27	275.25	2,948.3	48.6	-621.2	623.1	0.00	0.00	0.00
3,080.0	19.27	275.25	2,986.0	49.8	-634.3	636.3	0.00	0.00	0.00
3,120.0	19.27	275.25	3,023.8	51.0	-647.5	649.5	0.00	0.00	0.00
3,160.0	19.27	275.25	3,061.6	52.3	-660.6	662.7	0.00	0.00	0.00
3,200.0	19.27	275.25	3,099.3	53.5	-673.8	675.9	0.00	0.00	0.00
3,240.0	19.27	275.25	3,137.1	54.7	-686.9	689.1	0.00	0.00	0.00
3,280.0	19.27	275.25	3,174.8	55.9	-700.1	702.3	0.00	0.00	0.00
3,320.0	19.27	275.25	3,212.6	57.1	-713.2	715.5	0.00	0.00	0.00
3,360.0	19.27	275.25	3,250.4	58.3	-726.4	728.7	0.00	0.00	0.00
3,400.0	19.27	275.25	3,288.1	59.5	-739.5	741.9	0.00	0.00	0.00
3,440.0	19.27	275.25	3,325.9	60.7	-752.7	755.1	0.00	0.00	0.00
3,480.0	19.27	275.25	3,363.6	61.9	-765.8	768.3	0.00	0.00	0.00
3,520.0	19.27	275.25	3,401.4	63.1	-779.0	781.5	0.00	0.00	0.00
3,560.0	19.27	275.25	3,439.1	64.3	-792.1	794.7	0.00	0.00	0.00
3,600.0	19.27	275.25	3,476.9	65.6	-805.3	807.9	0.00	0.00	0.00
3,640.0	19.27	275.25	3,514.7	66.8	-818.4	821.1	0.00	0.00	0.00
3,680.0	19.27	275.25	3,552.4	68.0	-831.6	834.3	0.00	0.00	0.00
3,720.0	19.27	275.25	3,590.2	69.2	-844.7	847.5	0.00	0.00	0.00
3,760.0	19.27	275.25	3,627.9	70.4	-857.8	860.7	0.00	0.00	0.00
3,800.0	19.27	275.25	3,665.7	71.6	-871.0	873.9	0.00	0.00	0.00
3,840.0	19.27	275.25	3,703.5	72.8	-884.1	887.1	0.00	0.00	0.00
3,880.0	19.27	275.25	3,741.2	74.0	-897.3	900.3	0.00	0.00	0.00
3,920.0	19.27	275.25	3,779.0	75.2	-910.4	913.5	0.00	0.00	0.00
3,960.0	19.27	275.25	3,816.7	76.4	-923.6	926.7	0.00	0.00	0.00
4,000.0	19.27	275.25	3,854.5	77.6	-936.7	939.9	0.00	0.00	0.00
4,040.0	19.27	275.25	3,892.2	78.9	-949.9	953.1	0.00	0.00	0.00
4,080.0	19.27	275.25	3,930.0	80.1	-963.0	966.3	0.00	0.00	0.00



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Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Planned 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)
4,120.0	19.27	275.25	3,967.8	81.3	-976.2	979.5	0.00	0.00	0.00
4,160.0	19.27	275.25	4,005.5	82.5	-989.3	992.7	0.00	0.00	0.00
4,200.0	19.27	275.25	4,043.3	83.7	-1,002.5	1,005.9	0.00	0.00	0.00
4,240.0	19.27	275.25	4,081.0	84.9	-1,015.6	1,019.1	0.00	0.00	0.00
4,280.0	19.27	275.25	4,118.8	86.1	-1,028.8	1,032.3	0.00	0.00	0.00
4,320.0	19.27	275.25	4,156.6	87.3	-1,041.9	1,045.5	0.00	0.00	0.00
4,360.0	19.27	275.25	4,194.3	88.5	-1,055.0	1,058.8	0.00	0.00	0.00
4,400.0	19.27	275.25	4,232.1	89.7	-1,068.2	1,072.0	0.00	0.00	0.00
4,440.0	19.27	275.25	4,269.8	90.9	-1,081.3	1,085.2	0.00	0.00	0.00
4,480.0	19.27	275.25	4,307.6	92.2	-1,094.5	1,098.4	0.00	0.00	0.00
4,520.0	19.27	275.25	4,345.3	93.4	-1,107.6	1,111.6	0.00	0.00	0.00
4,560.0	19.27	275.25	4,383.1	94.6	-1,120.8	1,124.8	0.00	0.00	0.00
4,600.0	19.27	275.25	4,420.9	95.8	-1,133.9	1,138.0	0.00	0.00	0.00
4,640.0	19.27	275.25	4,458.6	97.0	-1,147.1	1,151.2	0.00	0.00	0.00
4,680.0	19.27	275.25	4,496.4	98.2	-1,160.2	1,164.4	0.00	0.00	0.00
4,720.0	19.27	275.25	4,534.1	99.4	-1,173.4	1,177.6	0.00	0.00	0.00
4,760.0	19.27	275.25	4,571.9	100.6	-1,186.5	1,190.8	0.00	0.00	0.00
4,800.0	19.27	275.25	4,609.7	101.8	-1,199.7	1,204.0	0.00	0.00	0.00
4,840.0	19.27	275.25	4,647.4	103.0	-1,212.8	1,217.2	0.00	0.00	0.00
4,880.0	19.27	275.25	4,685.2	104.2	-1,226.0	1,230.4	0.00	0.00	0.00
4,920.0	19.27	275.25	4,722.9	105.5	-1,239.1	1,243.6	0.00	0.00	0.00
4,960.0	19.27	275.25	4,760.7	106.7	-1,252.2	1,256.8	0.00	0.00	0.00
5,000.0	19.27	275.25	4,798.4	107.9	-1,265.4	1,270.0	0.00	0.00	0.00
5,040.0	19.27	275.25	4,836.2	109.1	-1,278.5	1,283.2	0.00	0.00	0.00
5,080.0	19.27	275.25	4,874.0	110.3	-1,291.7	1,296.4	0.00	0.00	0.00
5,120.0	19.27	275.25	4,911.7	111.5	-1,304.8	1,309.6	0.00	0.00	0.00
5,160.0	19.27	275.25	4,949.5	112.7	-1,318.0	1,322.8	0.00	0.00	0.00
5,165.3	19.27	275.25	4,954.5	112.9	-1,319.7	1,324.5	0.00	0.00	0.00
5,200.0	18.58	275.25	4,987.3	113.9	-1,330.9	1,335.8	2.00	-2.00	0.00
5,240.0	17.78	275.25	5,025.3	115.0	-1,343.4	1,348.3	2.00	-2.00	0.00
5,280.0	16.98	275.25	5,063.5	116.1	-1,355.3	1,360.2	2.00	-2.00	0.00
5,320.0	16.18	275.25	5,101.8	117.2	-1,366.6	1,371.6	2.00	-2.00	0.00
5,360.0	15.38	275.25	5,140.3	118.2	-1,377.4	1,382.5	2.00	-2.00	0.00
5,400.0	14.58	275.25	5,179.0	119.1	-1,387.7	1,392.8	2.00	-2.00	0.00
5,440.0	13.78	275.25	5,217.7	120.0	-1,397.5	1,402.6	2.00	-2.00	0.00
5,480.0	12.98	275.25	5,256.7	120.9	-1,406.7	1,411.9	2.00	-2.00	0.00
5,520.0	12.18	275.25	5,295.7	121.7	-1,415.4	1,420.6	2.00	-2.00	0.00
5,560.0	11.38	275.25	5,334.8	122.4	-1,423.5	1,428.8	2.00	-2.00	0.00
5,600.0	10.58	275.25	5,374.1	123.1	-1,431.1	1,436.4	2.00	-2.00	0.00
5,640.0	9.78	275.25	5,413.5	123.8	-1,438.1	1,443.5	2.00	-2.00	0.00
5,680.0	8.98	275.25	5,453.0	124.4	-1,444.6	1,450.0	2.00	-2.00	0.00
5,720.0	8.18	275.25	5,492.5	124.9	-1,450.6	1,455.9	2.00	-2.00	0.00
5,760.0	7.38	275.25	5,532.1	125.4	-1,456.0	1,461.4	2.00	-2.00	0.00
5,800.0	6.58	275.25	5,571.8	125.8	-1,460.8	1,466.2	2.00	-2.00	0.00
5,840.0	5.78	275.25	5,611.6	126.2	-1,465.1	1,470.5	2.00	-2.00	0.00
5,880.0	4.98	275.25	5,651.4	126.6	-1,468.8	1,474.3	2.00	-2.00	0.00
5,920.0	4.18	275.25	5,691.3	126.9	-1,472.0	1,477.5	2.00	-2.00	0.00
5,960.0	3.38	275.25	5,731.2	127.1	-1,474.6	1,480.1	2.00	-2.00	0.00
6,000.0	2.58	275.25	5,771.2	127.3	-1,476.7	1,482.2	2.00	-2.00	0.00
6,040.0	1.78	275.25	5,811.1	127.4	-1,478.2	1,483.7	2.00	-2.00	0.00
6,080.0	0.98	275.25	5,851.1	127.5	-1,479.2	1,484.7	2.00	-2.00	0.00
6,120.0	0.18	275.25	5,891.1	127.6	-1,479.6	1,485.1	2.00	-2.00	0.00
6,128.9	0.00	0.00	5,900.0	127.6	-1,479.6	1,485.1	2.00	-2.00	0.00
TARGET BHL 1320°FNL & 75°FEL									



Database:	Landmark	Local Co-ordinate Reference:	Well REI H09-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4843.0ft (Original Well Elev)
Project:	SEC.9-T3N-R65W	MD Reference:	WELL @ 4843.0ft (Original Well Elev)
Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Planned 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)
6,160.0	0.00	0.00	5,931.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,200.0	0.00	0.00	5,971.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,240.0	0.00	0.00	6,011.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,280.0	0.00	0.00	6,051.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,320.0	0.00	0.00	6,091.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,360.0	0.00	0.00	6,131.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,171.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,440.0	0.00	0.00	6,211.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,480.0	0.00	0.00	6,251.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,520.0	0.00	0.00	6,291.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,560.0	0.00	0.00	6,331.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,371.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,640.0	0.00	0.00	6,411.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,680.0	0.00	0.00	6,451.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,720.0	0.00	0.00	6,491.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,760.0	0.00	0.00	6,531.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,571.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,840.0	0.00	0.00	6,611.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,880.0	0.00	0.00	6,651.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,920.0	0.00	0.00	6,691.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
6,960.0	0.00	0.00	6,731.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,771.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,040.0	0.00	0.00	6,811.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,080.0	0.00	0.00	6,851.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,120.0	0.00	0.00	6,891.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,125.9	0.00	0.00	6,897.0	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
<b>NIOBRARA - TARGET CIRCLE 1320'FNL &amp; 75'FEL</b>									
7,160.0	0.00	0.00	6,931.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,200.0	0.00	0.00	6,971.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,240.0	0.00	0.00	7,011.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,280.0	0.00	0.00	7,051.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,320.0	0.00	0.00	7,091.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,360.0	0.00	0.00	7,131.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,400.0	0.00	0.00	7,171.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,414.9	0.00	0.00	7,186.0	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
<b>CODELL</b>									
7,440.0	0.00	0.00	7,211.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,480.0	0.00	0.00	7,251.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,520.0	0.00	0.00	7,291.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,560.0	0.00	0.00	7,331.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,600.0	0.00	0.00	7,371.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,640.0	0.00	0.00	7,411.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,680.0	0.00	0.00	7,451.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,720.0	0.00	0.00	7,491.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,760.0	0.00	0.00	7,531.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,800.0	0.00	0.00	7,571.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,811.9	0.00	0.00	7,583.0	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
<b>D-SAND</b>									
7,840.0	0.00	0.00	7,611.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,866.9	0.00	0.00	7,638.0	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
<b>J-SAND</b>									
7,880.0	0.00	0.00	7,651.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
7,920.0	0.00	0.00	7,691.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00



Database:	Landmark	Local Co-ordinate Reference:	Well REI H09-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4843.0ft (Original Well Elev)
Project:	SEC.9-T3N-R65W	MD Reference:	WELL @ 4843.0ft (Original Well Elev)
Site:	REI H09-31D Pad Sec.9-T3N-R65W	North Reference:	True
Well:	REI H09-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Noble REI H09-31D Plan #2 (1-4-12)		

Planned 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)
7,960.0	0.00	0.00	7,731.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
8,000.0	0.00	0.00	7,771.1	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
8,016.9	0.00	0.00	7,788.0	127.6	-1,479.6	1,485.1	0.00	0.00	0.00
HARDLINE 75'E OF BHL									

Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (ft)	Easting (ft)	Latitude	Longitude
- hit/miss target									
- Shape									
TARGET CIRCLE 13'	0.00	0.00	6,897.0	127.6	-1,479.6	1,332,616.07	3,229,466.26	40.243510	-104.677980
- plan hits target center									
- Circle (radius 75.0)									
TARGET BHL 1320'F	0.00	0.00	5,900.0	127.6	-1,479.6	1,332,616.07	3,229,466.26	40.243510	-104.677980
- plan hits target center									
- Point									
HARDLINE 75'E OF E	0.00	0.00	7,788.0	227.6	-1,404.6	1,332,716.79	3,229,540.30	40.243785	-104.677711
- plan misses target center by 125.0ft at 8016.9ft MD (7788.0 TVD, 127.6 N, -1479.6 E)									
- Polygon									
Point 1			7,788.0	0.0	0.0	1,332,716.79	3,229,540.30		
Point 2			7,788.0	-200.0	0.0	1,332,516.81	3,229,542.17		
Point 3			7,788.0	0.0	0.0	1,332,716.79	3,229,540.30		

Casing Points					
Measured Depth (ft)	Vertical Depth (ft)	Name	Casing Diameter (")	Hole Diameter (")	
650.3	650.0	8 5/8"	8-5/8	12-1/4	

Formations						
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)	
7,125.9	6,897.0	NIOBRARA		0.00		
7,414.9	7,186.0	CODELL		0.00		
7,811.9	7,583.0	D-SAND		0.00		
7,866.9	7,638.0	J-SAND		0.00		