

**ENSIGN****Directional****Well Name: Boulder G22-31D**

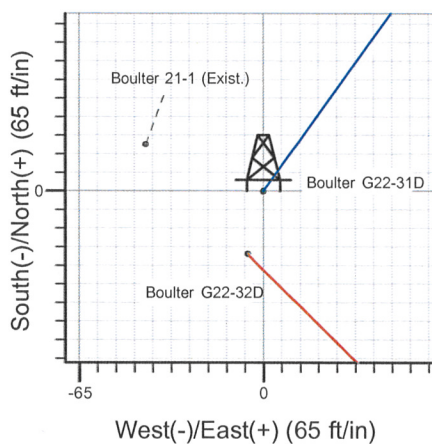
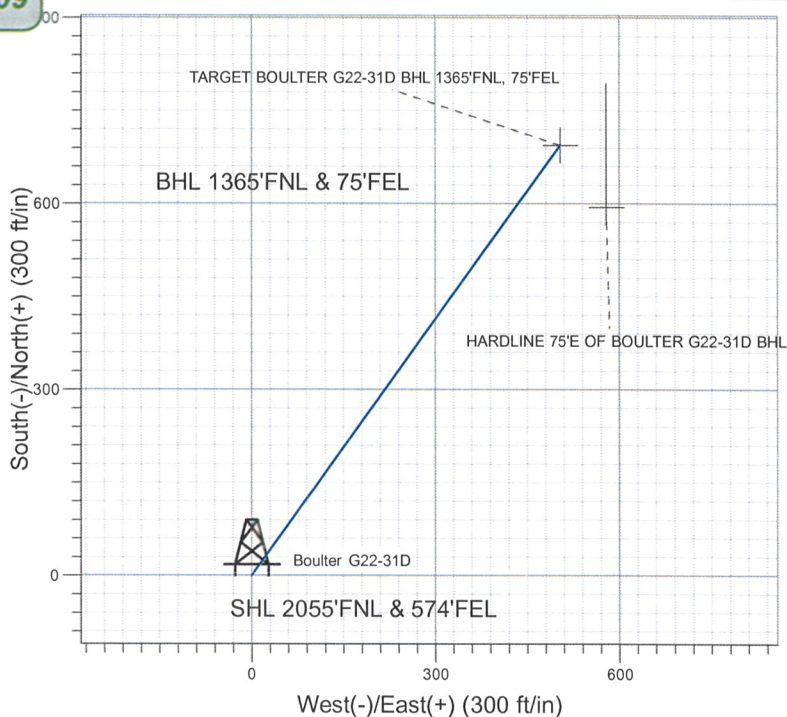
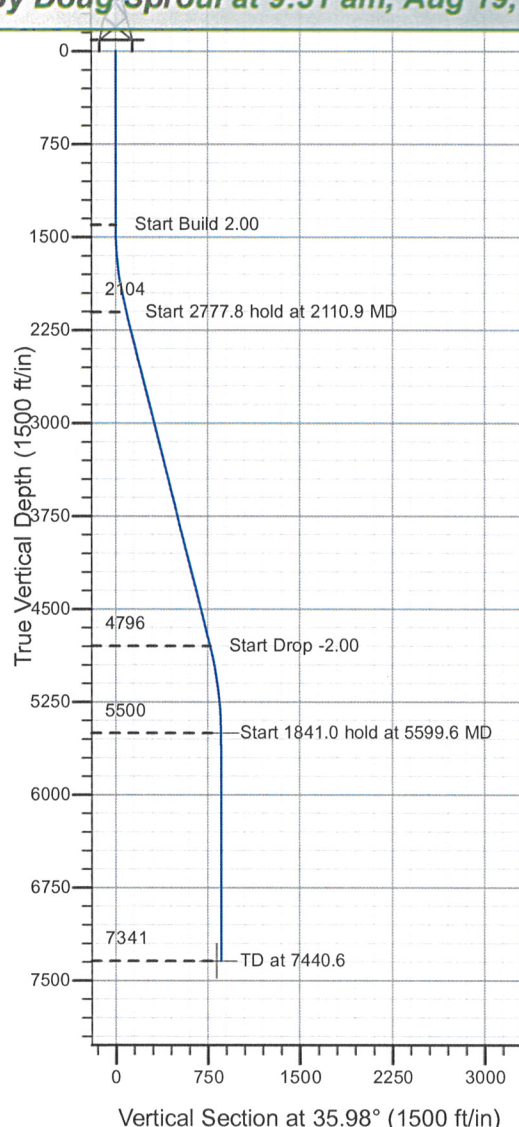
Surface Location: Boulder Pad Sec.21-T4N-R65W

North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

Ground Elevation: 4808.0

+N/-S+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.0	0.0	1353063.76	3234063.23	40° 17' 58.272 N	104° 39' 38.952 W

Original Well Elev WELL @ 4821.0ft (Original Well Elev)

**APPROVED***By Doug Sproul at 9:31 am, Aug 19, 2009***NOBLE ENERGY INC WELD COUNTY CO**

Boulder Pad Sec.21-T4N-R65W  
Boulder G22-31D  
Plan #3 (07-16-09)  
16:10, July 16 2009



Azimuths to True North  
Magnetic North: 9.04°

Magnetic Field  
Strength: 53322.8snT  
Dip Angle: 67.06°  
Date: 6/2/2009  
Model: IGRF200510

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

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
TARGET BOULTER G22-31D BHL 1365'FNL, 75'FEL	5500.0	694.2	503.9	40° 18' 5.131 N	104° 39' 32.448 W	Point
HARDLINE 75'E OF BOULTER G22-31D BHL	7341.0	594.2	578.9	40° 18' 4.144 N	104° 39' 31.480 W	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	1400.0	0.00	0.00	1400.0	0.0	0.0	0.00	0.00	0.0	
3	2110.9	14.22	35.98	2103.6	71.0	51.6	2.00	35.98	87.8	
4	4888.7	14.22	35.98	4796.4	623.2	452.3	0.00	0.00	770.0	
5	5599.6	0.00	0.00	5500.0	694.2	503.9	2.00	180.00	857.8	TARGET BOULTER G22-31D BHL 1365'FNL, 75'FEL
6	7440.6	0.00	0.00	7341.0	694.2	503.9	0.00	0.00	857.8	

<b>Database:</b>	EDM den0-adp01 Server Data	<b>Local Co-ordinate Reference:</b>	Well Boulter G22-31D
<b>Company:</b>	NOBLE ENERGY INC WELD COUNTY CO	<b>TVD Reference:</b>	WELL @ 4821.0ft (Original Well Elev)
<b>Project:</b>	SEC.21-T4N-R65W	<b>MD Reference:</b>	WELL @ 4821.0ft (Original Well Elev)
<b>Site:</b>	Boulter Pad Sec.21-T4N-R65W	<b>North Reference:</b>	True
<b>Well:</b>	Boulter G22-31D	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Boulter G22-31D		
<b>Design:</b>	Plan #3 (07-16-09)		

<b>Project</b>	SEC.21-T4N-R65W, Weld County, Colorado		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		Using Well Reference Point
<b>Map Zone:</b>	Colorado Northern Zone		Using geodetic scale factor

Site		Boulter Pad Sec.21-T4N-R65W			
Site Position:		Northing:	1,353,041.86 ft	Latitude:	40° 17' 58.056 N
From:	Lat/Long	Easting:	3,234,057.86 ft	Longitude:	104° 39' 39.024 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.54 °

Well		Boulter G22-31D				
Well Position	+N/-S	21.9 ft	Northing:	1,353,063.76 ft	Latitude:	40° 17' 58.272 N
	+E/-W	5.6 ft	Easting:	3,234,063.23 ft	Longitude:	104° 39' 38.952 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,808.0 ft

<b>Wellbore</b>	Boulter G22-31D				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	10/2/2008	9.13	67.09	53,392
	IGRF200510	6/2/2009	9.04	67.06	53,323

<b>Design</b>	Plan #3 (07-16-09)			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.0	0.0	0.0	35.98

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	
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,110.9	14.22	35.98	2,103.6	71.0	51.6	2.00	2.00	0.00	35.98	
4,888.7	14.22	35.98	4,796.4	623.2	452.3	0.00	0.00	0.00	0.00	
5,599.6	0.00	0.00	5,500.0	694.2	503.9	2.00	-2.00	0.00	180.00	TARGET BOULTEF
7,440.6	0.00	0.00	7,341.0	694.2	503.9	0.00	0.00	0.00	0.00	



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Project:	SEC.21-T4N-R65W	MD Reference:	WELL @ 4821.0ft (Original Well Elev)
Site:	Boulter Pad Sec.21-T4N-R65W	North Reference:	True
Well:	Boulter G22-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Boulter G22-31D		
Design:	Plan #3 (07-16-09)		

## 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	0.00	0.00	440.0	0.0	0.0	0.0	0.00	0.00	0.00
480.0	0.00	0.00	480.0	0.0	0.0	0.0	0.00	0.00	0.00
520.0	0.00	0.00	520.0	0.0	0.0	0.0	0.00	0.00	0.00
560.0	0.00	0.00	560.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
640.0	0.00	0.00	640.0	0.0	0.0	0.0	0.00	0.00	0.00
680.0	0.00	0.00	680.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.00	0.00	720.0	0.0	0.0	0.0	0.00	0.00	0.00
760.0	0.00	0.00	760.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
840.0	0.00	0.00	840.0	0.0	0.0	0.0	0.00	0.00	0.00
880.0	0.00	0.00	880.0	0.0	0.0	0.0	0.00	0.00	0.00
920.0	0.00	0.00	920.0	0.0	0.0	0.0	0.00	0.00	0.00
960.0	0.00	0.00	960.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,040.0	0.00	0.00	1,040.0	0.0	0.0	0.0	0.00	0.00	0.00
1,080.0	0.00	0.00	1,080.0	0.0	0.0	0.0	0.00	0.00	0.00
1,120.0	0.00	0.00	1,120.0	0.0	0.0	0.0	0.00	0.00	0.00
1,160.0	0.00	0.00	1,160.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,240.0	0.00	0.00	1,240.0	0.0	0.0	0.0	0.00	0.00	0.00
1,280.0	0.00	0.00	1,280.0	0.0	0.0	0.0	0.00	0.00	0.00
1,320.0	0.00	0.00	1,320.0	0.0	0.0	0.0	0.00	0.00	0.00
1,360.0	0.00	0.00	1,360.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,440.0	0.80	35.98	1,440.0	0.2	0.2	0.3	2.00	2.00	0.00
1,480.0	1.60	35.98	1,480.0	0.9	0.7	1.1	2.00	2.00	0.00
1,520.0	2.40	35.98	1,520.0	2.0	1.5	2.5	2.00	2.00	0.00
1,560.0	3.20	35.98	1,559.9	3.6	2.6	4.5	2.00	2.00	0.00
1,600.0	4.00	35.98	1,599.8	5.6	4.1	7.0	2.00	2.00	0.00
1,640.0	4.80	35.98	1,639.7	8.1	5.9	10.0	2.00	2.00	0.00
1,680.0	5.60	35.98	1,679.6	11.1	8.0	13.7	2.00	2.00	0.00
1,720.0	6.40	35.98	1,719.3	14.4	10.5	17.9	2.00	2.00	0.00
1,760.0	7.20	35.98	1,759.1	18.3	13.3	22.6	2.00	2.00	0.00
1,800.0	8.00	35.98	1,798.7	22.6	16.4	27.9	2.00	2.00	0.00
1,840.0	8.80	35.98	1,838.3	27.3	19.8	33.7	2.00	2.00	0.00
1,880.0	9.60	35.98	1,877.8	32.5	23.6	40.1	2.00	2.00	0.00
1,920.0	10.40	35.98	1,917.1	38.1	27.6	47.1	2.00	2.00	0.00
1,960.0	11.20	35.98	1,956.4	44.2	32.1	54.6	2.00	2.00	0.00
2,000.0	12.00	35.98	1,995.6	50.7	36.8	62.6	2.00	2.00	0.00
2,040.0	12.80	35.98	2,034.7	57.6	41.8	71.2	2.00	2.00	0.00
2,080.0	13.60	35.98	2,073.6	65.0	47.2	80.3	2.00	2.00	0.00
2,110.9	14.22	35.98	2,103.6	71.0	51.6	87.8	2.00	2.00	0.00

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Project:	SEC.21-T4N-R65W	MD Reference:	WELL @ 4821.0ft (Original Well Elev)
Site:	Boulter Pad Sec.21-T4N-R65W	North Reference:	True
Well:	Boulter G22-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Boulter G22-31D		
Design:	Plan #3 (07-16-09)		

## 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)
2,120.0	14.22	35.98	2,112.4	72.8	52.9	90.0	0.00	0.00	0.00
2,160.0	14.22	35.98	2,151.2	80.8	58.6	99.8	0.00	0.00	0.00
2,200.0	14.22	35.98	2,190.0	88.7	64.4	109.6	0.00	0.00	0.00
2,240.0	14.22	35.98	2,228.8	96.7	70.2	119.5	0.00	0.00	0.00
2,280.0	14.22	35.98	2,267.5	104.6	75.9	129.3	0.00	0.00	0.00
2,320.0	14.22	35.98	2,306.3	112.6	81.7	139.1	0.00	0.00	0.00
2,360.0	14.22	35.98	2,345.1	120.5	87.5	148.9	0.00	0.00	0.00
2,400.0	14.22	35.98	2,383.9	128.5	93.3	158.8	0.00	0.00	0.00
2,440.0	14.22	35.98	2,422.6	136.4	99.0	168.6	0.00	0.00	0.00
2,480.0	14.22	35.98	2,461.4	144.4	104.8	178.4	0.00	0.00	0.00
2,520.0	14.22	35.98	2,500.2	152.3	110.6	188.2	0.00	0.00	0.00
2,560.0	14.22	35.98	2,539.0	160.3	116.3	198.1	0.00	0.00	0.00
2,600.0	14.22	35.98	2,577.7	168.2	122.1	207.9	0.00	0.00	0.00
2,640.0	14.22	35.98	2,616.5	176.2	127.9	217.7	0.00	0.00	0.00
2,680.0	14.22	35.98	2,655.3	184.1	133.7	227.5	0.00	0.00	0.00
2,720.0	14.22	35.98	2,694.1	192.1	139.4	237.4	0.00	0.00	0.00
2,760.0	14.22	35.98	2,732.8	200.0	145.2	247.2	0.00	0.00	0.00
2,800.0	14.22	35.98	2,771.6	208.0	151.0	257.0	0.00	0.00	0.00
2,840.0	14.22	35.98	2,810.4	215.9	156.7	266.8	0.00	0.00	0.00
2,879.8	14.22	35.98	2,849.0	223.9	162.5	276.6	0.00	0.00	0.00
<b>PIERRE SILT</b>									
2,880.0	14.22	35.98	2,849.2	223.9	162.5	276.7	0.00	0.00	0.00
2,920.0	14.22	35.98	2,887.9	231.8	168.3	286.5	0.00	0.00	0.00
2,960.0	14.22	35.98	2,926.7	239.8	174.1	296.3	0.00	0.00	0.00
3,000.0	14.22	35.98	2,965.5	247.7	179.8	306.1	0.00	0.00	0.00
3,040.0	14.22	35.98	3,004.3	255.7	185.6	316.0	0.00	0.00	0.00
3,080.0	14.22	35.98	3,043.0	263.6	191.4	325.8	0.00	0.00	0.00
3,120.0	14.22	35.98	3,081.8	271.6	197.1	335.6	0.00	0.00	0.00
3,160.0	14.22	35.98	3,120.6	279.5	202.9	345.4	0.00	0.00	0.00
3,200.0	14.22	35.98	3,159.4	287.5	208.7	355.3	0.00	0.00	0.00
3,240.0	14.22	35.98	3,198.1	295.4	214.5	365.1	0.00	0.00	0.00
3,280.0	14.22	35.98	3,236.9	303.4	220.2	374.9	0.00	0.00	0.00
3,320.0	14.22	35.98	3,275.7	311.3	226.0	384.7	0.00	0.00	0.00
3,360.0	14.22	35.98	3,314.5	319.3	231.8	394.5	0.00	0.00	0.00
3,400.0	14.22	35.98	3,353.2	327.2	237.5	404.4	0.00	0.00	0.00
3,440.0	14.22	35.98	3,392.0	335.2	243.3	414.2	0.00	0.00	0.00
3,480.0	14.22	35.98	3,430.8	343.1	249.1	424.0	0.00	0.00	0.00
3,520.0	14.22	35.98	3,469.6	351.1	254.9	433.8	0.00	0.00	0.00
3,560.0	14.22	35.98	3,508.3	359.0	260.6	443.7	0.00	0.00	0.00
3,600.0	14.22	35.98	3,547.1	367.0	266.4	453.5	0.00	0.00	0.00
3,640.0	14.22	35.98	3,585.9	374.9	272.2	463.3	0.00	0.00	0.00
3,680.0	14.22	35.98	3,624.7	382.9	277.9	473.1	0.00	0.00	0.00
3,720.0	14.22	35.98	3,663.4	390.8	283.7	483.0	0.00	0.00	0.00
3,760.0	14.22	35.98	3,702.2	398.8	289.5	492.8	0.00	0.00	0.00
3,800.0	14.22	35.98	3,741.0	406.8	295.3	502.6	0.00	0.00	0.00
3,840.0	14.22	35.98	3,779.8	414.7	301.0	512.4	0.00	0.00	0.00
3,847.5	14.22	35.98	3,787.0	416.2	302.1	514.3	0.00	0.00	0.00
<b>PARKMAN</b>									
3,880.0	14.22	35.98	3,818.5	422.7	306.8	522.3	0.00	0.00	0.00
3,920.0	14.22	35.98	3,857.3	430.6	312.6	532.1	0.00	0.00	0.00
3,960.0	14.22	35.98	3,896.1	438.6	318.3	541.9	0.00	0.00	0.00
4,000.0	14.22	35.98	3,934.9	446.5	324.1	551.7	0.00	0.00	0.00
4,040.0	14.22	35.98	3,973.6	454.5	329.9	561.6	0.00	0.00	0.00



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Well:	Boulter G22-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Boulter G22-31D		
Design:	Plan #3 (07-16-09)		

## 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)
4,080.0	14.22	35.98	4,012.4	462.4	335.7	571.4	0.00	0.00	0.00
4,120.0	14.22	35.98	4,051.2	470.4	341.4	581.2	0.00	0.00	0.00
4,160.0	14.22	35.98	4,090.0	478.3	347.2	591.0	0.00	0.00	0.00
4,200.0	14.22	35.98	4,128.7	486.3	353.0	600.9	0.00	0.00	0.00
4,240.0	14.22	35.98	4,167.5	494.2	358.7	610.7	0.00	0.00	0.00
4,280.0	14.22	35.98	4,206.3	502.2	364.5	620.5	0.00	0.00	0.00
4,320.0	14.22	35.98	4,245.1	510.1	370.3	630.3	0.00	0.00	0.00
4,360.0	14.22	35.98	4,283.8	518.1	376.1	640.2	0.00	0.00	0.00
4,400.0	14.22	35.98	4,322.6	526.0	381.8	650.0	0.00	0.00	0.00
4,440.0	14.22	35.98	4,361.4	534.0	387.6	659.8	0.00	0.00	0.00
4,480.0	14.22	35.98	4,400.2	541.9	393.4	669.6	0.00	0.00	0.00
4,501.5	14.22	35.98	4,421.0	546.2	396.5	674.9	0.00	0.00	0.00
<b>SUSSEX</b>									
4,520.0	14.22	35.98	4,438.9	549.9	399.1	679.5	0.00	0.00	0.00
4,560.0	14.22	35.98	4,477.7	557.8	404.9	689.3	0.00	0.00	0.00
4,600.0	14.22	35.98	4,516.5	565.8	410.7	699.1	0.00	0.00	0.00
4,640.0	14.22	35.98	4,555.3	573.7	416.5	708.9	0.00	0.00	0.00
4,680.0	14.22	35.98	4,594.0	581.7	422.2	718.8	0.00	0.00	0.00
4,720.0	14.22	35.98	4,632.8	589.6	428.0	728.6	0.00	0.00	0.00
4,760.0	14.22	35.98	4,671.6	597.6	433.8	738.4	0.00	0.00	0.00
4,800.0	14.22	35.98	4,710.4	605.5	439.5	748.2	0.00	0.00	0.00
4,840.0	14.22	35.98	4,749.1	613.5	445.3	758.1	0.00	0.00	0.00
4,880.0	14.22	35.98	4,787.9	621.4	451.1	767.9	0.00	0.00	0.00
4,888.7	14.22	35.98	4,796.4	623.2	452.3	770.0	0.00	0.00	0.00
4,920.0	13.59	35.98	4,826.7	629.2	456.8	777.5	2.00	-2.00	0.00
4,960.0	12.79	35.98	4,865.7	636.6	462.1	786.7	2.00	-2.00	0.00
5,000.0	11.99	35.98	4,904.7	643.6	467.2	795.3	2.00	-2.00	0.00
5,040.0	11.19	35.98	4,943.9	650.1	471.9	803.3	2.00	-2.00	0.00
5,076.7	10.46	35.98	4,980.0	655.7	475.9	810.2	2.00	-2.00	0.00
<b>SHANNON</b>									
5,080.0	10.39	35.98	4,983.2	656.1	476.3	810.8	2.00	-2.00	0.00
5,120.0	9.59	35.98	5,022.6	661.8	480.4	817.7	2.00	-2.00	0.00
5,160.0	8.79	35.98	5,062.1	666.9	484.1	824.1	2.00	-2.00	0.00
5,200.0	7.99	35.98	5,101.7	671.6	487.6	830.0	2.00	-2.00	0.00
5,240.0	7.19	35.98	5,141.3	675.9	490.7	835.2	2.00	-2.00	0.00
5,280.0	6.39	35.98	5,181.0	679.8	493.4	840.0	2.00	-2.00	0.00
5,320.0	5.59	35.98	5,220.8	683.1	495.9	844.1	2.00	-2.00	0.00
5,360.0	4.79	35.98	5,260.6	686.1	498.0	847.8	2.00	-2.00	0.00
5,400.0	3.99	35.98	5,300.5	688.5	499.8	850.8	2.00	-2.00	0.00
5,440.0	3.19	35.98	5,340.4	690.6	501.3	853.3	2.00	-2.00	0.00
5,480.0	2.39	35.98	5,380.4	692.1	502.4	855.3	2.00	-2.00	0.00
5,520.0	1.59	35.98	5,420.4	693.3	503.2	856.7	2.00	-2.00	0.00
5,560.0	0.79	35.98	5,460.4	693.9	503.7	857.5	2.00	-2.00	0.00
5,599.6	0.00	0.00	5,500.0	694.2	503.9	857.8	2.00	-2.00	-90.76
<b>TARGET BOULTER G22-31D BHL 1365'FNL, 75'FEL</b>									
5,600.0	0.00	0.00	5,500.4	694.2	503.9	857.8	0.00	0.00	0.00
5,640.0	0.00	0.00	5,540.4	694.2	503.9	857.8	0.00	0.00	0.00
5,680.0	0.00	0.00	5,580.4	694.2	503.9	857.8	0.00	0.00	0.00
5,720.0	0.00	0.00	5,620.4	694.2	503.9	857.8	0.00	0.00	0.00
5,760.0	0.00	0.00	5,660.4	694.2	503.9	857.8	0.00	0.00	0.00
5,800.0	0.00	0.00	5,700.4	694.2	503.9	857.8	0.00	0.00	0.00
5,840.0	0.00	0.00	5,740.4	694.2	503.9	857.8	0.00	0.00	0.00
5,880.0	0.00	0.00	5,780.4	694.2	503.9	857.8	0.00	0.00	0.00



Database:	EDM den0-adp01 Server Data	Local Co-ordinate Reference:	Well Boulter G22-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4821.0ft (Original Well Elev)
Project:	SEC.21-T4N-R65W	MD Reference:	WELL @ 4821.0ft (Original Well Elev)
Site:	Boulter Pad Sec.21-T4N-R65W	North Reference:	True
Well:	Boulter G22-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Boulter G22-31D		
Design:	Plan #3 (07-16-09)		

## 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)
5,920.0	0.00	0.00	5,820.4	694.2	503.9	857.8	0.00	0.00	0.00
5,960.0	0.00	0.00	5,860.4	694.2	503.9	857.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,900.4	694.2	503.9	857.8	0.00	0.00	0.00
6,040.0	0.00	0.00	5,940.4	694.2	503.9	857.8	0.00	0.00	0.00
6,080.0	0.00	0.00	5,980.4	694.2	503.9	857.8	0.00	0.00	0.00
6,120.0	0.00	0.00	6,020.4	694.2	503.9	857.8	0.00	0.00	0.00
6,160.0	0.00	0.00	6,060.4	694.2	503.9	857.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,100.4	694.2	503.9	857.8	0.00	0.00	0.00
6,240.0	0.00	0.00	6,140.4	694.2	503.9	857.8	0.00	0.00	0.00
6,258.6	0.00	0.00	6,159.0	694.2	503.9	857.8	0.00	0.00	0.00
<b>TEEPEE BUTTES</b>									
6,280.0	0.00	0.00	6,180.4	694.2	503.9	857.8	0.00	0.00	0.00
6,320.0	0.00	0.00	6,220.4	694.2	503.9	857.8	0.00	0.00	0.00
6,360.0	0.00	0.00	6,260.4	694.2	503.9	857.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,300.4	694.2	503.9	857.8	0.00	0.00	0.00
6,440.0	0.00	0.00	6,340.4	694.2	503.9	857.8	0.00	0.00	0.00
6,480.0	0.00	0.00	6,380.4	694.2	503.9	857.8	0.00	0.00	0.00
6,520.0	0.00	0.00	6,420.4	694.2	503.9	857.8	0.00	0.00	0.00
6,560.0	0.00	0.00	6,460.4	694.2	503.9	857.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,500.4	694.2	503.9	857.8	0.00	0.00	0.00
6,640.0	0.00	0.00	6,540.4	694.2	503.9	857.8	0.00	0.00	0.00
6,680.0	0.00	0.00	6,580.4	694.2	503.9	857.8	0.00	0.00	0.00
6,720.0	0.00	0.00	6,620.4	694.2	503.9	857.8	0.00	0.00	0.00
6,760.0	0.00	0.00	6,660.4	694.2	503.9	857.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,700.4	694.2	503.9	857.8	0.00	0.00	0.00
6,840.0	0.00	0.00	6,740.4	694.2	503.9	857.8	0.00	0.00	0.00
6,880.0	0.00	0.00	6,780.4	694.2	503.9	857.8	0.00	0.00	0.00
6,920.0	0.00	0.00	6,820.4	694.2	503.9	857.8	0.00	0.00	0.00
6,960.0	0.00	0.00	6,860.4	694.2	503.9	857.8	0.00	0.00	0.00
6,988.6	0.00	0.00	6,889.0	694.2	503.9	857.8	0.00	0.00	0.00
<b>NIOBRARA</b>									
7,000.0	0.00	0.00	6,900.4	694.2	503.9	857.8	0.00	0.00	0.00
7,040.0	0.00	0.00	6,940.4	694.2	503.9	857.8	0.00	0.00	0.00
7,080.0	0.00	0.00	6,980.4	694.2	503.9	857.8	0.00	0.00	0.00
7,120.0	0.00	0.00	7,020.4	694.2	503.9	857.8	0.00	0.00	0.00
7,160.0	0.00	0.00	7,060.4	694.2	503.9	857.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,100.4	694.2	503.9	857.8	0.00	0.00	0.00
7,240.0	0.00	0.00	7,140.4	694.2	503.9	857.8	0.00	0.00	0.00
7,265.6	0.00	0.00	7,166.0	694.2	503.9	857.8	0.00	0.00	0.00
<b>FT HAYS</b>									
7,280.0	0.00	0.00	7,180.4	694.2	503.9	857.8	0.00	0.00	0.00
7,290.6	0.00	0.00	7,191.0	694.2	503.9	857.8	0.00	0.00	0.00
<b>CODELL</b>									
7,320.0	0.00	0.00	7,220.4	694.2	503.9	857.8	0.00	0.00	0.00
7,360.0	0.00	0.00	7,260.4	694.2	503.9	857.8	0.00	0.00	0.00
7,400.0	0.00	0.00	7,300.4	694.2	503.9	857.8	0.00	0.00	0.00
7,440.0	0.00	0.00	7,340.4	694.2	503.9	857.8	0.00	0.00	0.00
7,440.6	0.00	0.00	7,341.0	694.2	503.9	857.8	0.00	0.00	0.00
<b>HARDLINE 75°E OF BOULTER G22-31D BHL</b>									



Database:	EDM den0-adp01 Server Data	Local Co-ordinate Reference:	Well Boulter G22-31D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4821.0ft (Original Well Elev)
Project:	SEC.21-T4N-R65W	MD Reference:	WELL @ 4821.0ft (Original Well Elev)
Site:	Boulter Pad Sec.21-T4N-R65W	North Reference:	True
Well:	Boulter G22-31D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Boulter G22-31D		
Design:	Plan #3 (07-16-09)		

Targets									
Target Name	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- hit/miss target	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
- Shape									
HARDLINE 75'E OF E	0.00	0.00	7,341.0	594.2	578.9	1,353,663.39	3,234,636.46	40° 18' 4.144 N	104° 39' 31.480 W
- plan misses target center by 125.0ft at 7440.6ft MD (7341.0 TVD, 694.2 N, 503.9 E)									
- Polygon									
Point 1			7,341.0	0.0	0.0	1,353,663.39	3,234,636.46		
Point 2			7,341.0	200.0	0.0	1,353,863.37	3,234,634.57		
TARGET BOULTER C	0.00	0.00	5,500.0	694.2	503.9	1,353,762.64	3,234,560.52	40° 18' 5.131 N	104° 39' 32.448 W
- plan hits target center									
- Point									

Formations							
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)		
2,879.8	2,849.0	PIERRE SILT		0.00			
3,847.5	3,787.0	PARKMAN		0.00			
4,501.5	4,421.0	SUSSEX		0.00			
5,076.7	4,980.0	SHANNON		0.00			
6,258.6	6,159.0	TEEPEE BUTTES		0.00			
6,988.6	6,889.0	NIOBRARA		0.00			
7,265.6	7,166.0	FT HAYS		0.00			
7,290.6	7,191.0	CODELL		0.00			