

ENSIGN

Directional

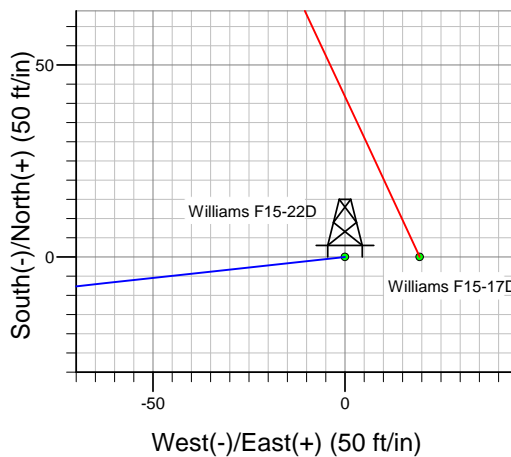
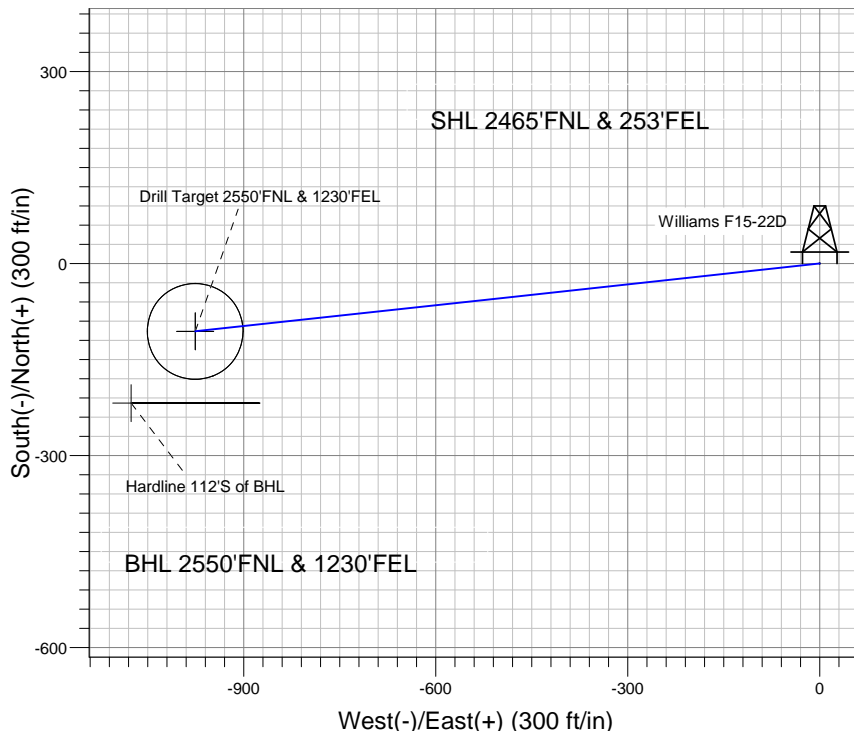
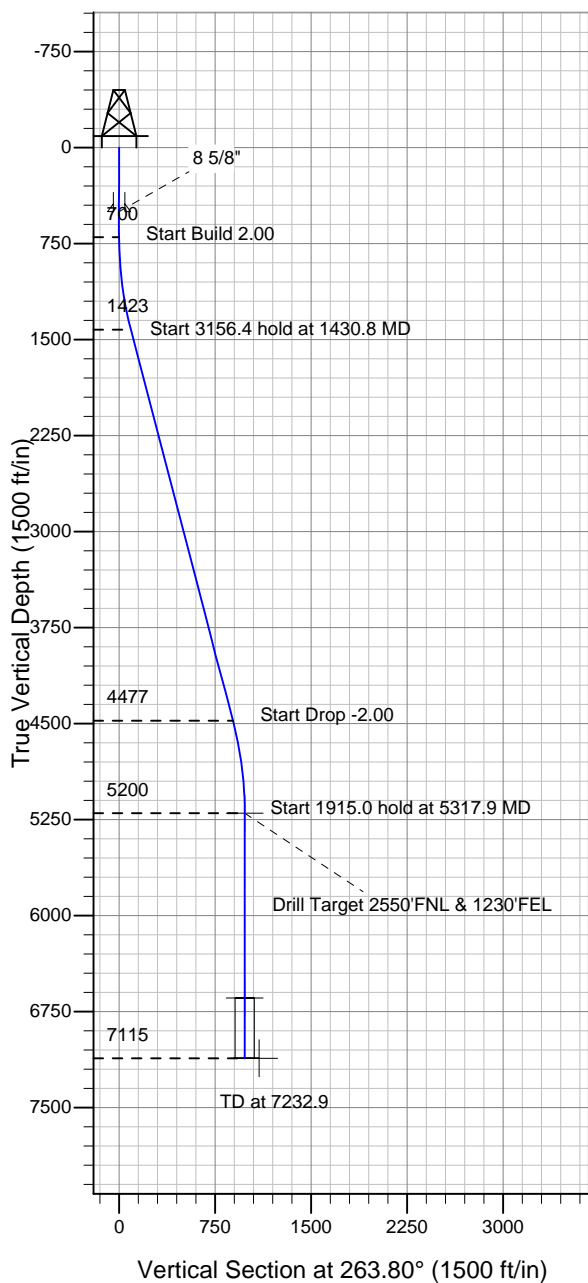
Well Name: Williams F15-22D

Surface Location: Williams Pad SEC.15-T5N-R65W
North American Datum 1983 , US State Plane 1983 , Colorado Northern Zone

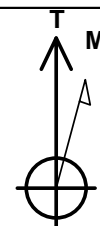
Ground Elevation: 4621.0

+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1389657.54 3239270.67 40° 23' 59.388 N 104° 38' 27.168 W
Original Well Elev WELL @ 4634.0ft (Original Well Elev)

NOBLE ENERGY INC WELD COUNTY CO



Williams Pad SEC.15-T5N-R65W
Williams F15-22D
Noble Williams F15-22D Plan #3 (2-07-11)
14:32, February 07 2011



Azimuths to True North
Magnetic North: 8.85°

Magnetic Field
Strength: 53183.5nT
Dip Angle: 67.08°
Date: 2/7/2011
Model: IGRF2010

WELLBORE TARGET DETAILS (LAT/LONG)

Name	TVD	+N/-S	+E/-W	Latitude	Longitude	Shape
Drill Target 2550'FNL & 1230'FEL	5200.0	-106.1	-976.1	40° 23' 58.339 N	104° 38' 39.784 W	Point
Target Circle 2550'FNL, 1230'FEL	6643.0	-106.1	-976.1	40° 23' 58.339 N	104° 38' 39.784 W	Circle (Radius: 75.0)
Hardline 112'S of BHL	7115.0	-218.1	-1076.1	40° 23' 57.232 N	104° 38' 41.077 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	700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.0	
3	1430.8	14.62	263.80	1422.9	-10.0	-92.2	2.00	263.80	92.7	
4	4587.2	14.62	263.80	4477.1	-96.1	-883.9	0.00	0.00	889.1	
5	5317.9	0.00	0.00	5200.0	-106.1	-976.1	2.00	180.00	981.8	Drill Target 2550'FNL & 1230'FEL
6	7232.9	0.00	0.00	7115.0	-106.1	-976.1	0.00	0.00	981.8	



NOBLE ENERGY INC WELD COUNTY CO

SEC.15-T5N-R65W

Williams Pad SEC.15-T5N-R65W

Williams F15-22D

Williams F15-22D

Plan: Noble Williams F15-22D Plan #3 (2-07-11)

Standard Planning Report

07 February, 2011



Database:	Landmark	Local Co-ordinate Reference:	Well Williams F15-22D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4634.0ft (Original Well Elev)
Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

Project	SEC.15-T5N-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		Williams Pad SEC.15-T5N-R65W			
Site Position:		Northing:	1,390,011.44 ft	Latitude:	40° 24' 2.916 N
From:	Lat/Long	Easting:	3,238,946.95 ft	Longitude:	104° 38' 31.308 W
Position Uncertainty:	0.0 ft	Slot Radius:	"	Grid Convergence:	0.55 °

Well	Williams F15-22D					
Well Position	+N-S	-357.0 ft	Northing:	1,389,657.54 ft	Latitude:	40° 23' 59.388 N
	+E-W	320.3 ft	Easting:	3,239,270.67 ft	Longitude:	104° 38' 27.168 W
Position Uncertainty		0.0 ft	Wellhead Elevation:	ft	Ground Level:	4,621.0 ft

Wellbore	Williams F15-22D				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	2/7/2011	8.85	67.08	53,183

Design	Noble Williams F15-22D Plan #3 (2-07-11)			
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	263.80

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	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,430.8	14.62	263.80	1,422.9	-10.0	-92.2	2.00	2.00	0.00	263.80	
4,587.2	14.62	263.80	4,477.1	-96.1	-883.9	0.00	0.00	0.00	0.00	
5,317.9	0.00	0.00	5,200.0	-106.1	-976.1	2.00	-2.00	0.00	180.00	Drill Target 2550'FN
7,232.9	0.00	0.00	7,115.0	-106.1	-976.1	0.00	0.00	0.00	0.00	

Database:	Landmark	Local Co-ordinate Reference:	Well Williams F15-22D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4634.0ft (Original Well Elev)
Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
8 5/8"									
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
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
720.0	0.40	263.80	720.0	0.0	-0.1	0.1	2.00	2.00	0.00
760.0	1.20	263.80	760.0	-0.1	-0.6	0.6	2.00	2.00	0.00
800.0	2.00	263.80	800.0	-0.2	-1.7	1.7	2.00	2.00	0.00
840.0	2.80	263.80	839.9	-0.4	-3.4	3.4	2.00	2.00	0.00
880.0	3.60	263.80	879.9	-0.6	-5.6	5.7	2.00	2.00	0.00
920.0	4.40	263.80	919.8	-0.9	-8.4	8.4	2.00	2.00	0.00
960.0	5.20	263.80	959.6	-1.3	-11.7	11.8	2.00	2.00	0.00
1,000.0	6.00	263.80	999.5	-1.7	-15.6	15.7	2.00	2.00	0.00
1,040.0	6.80	263.80	1,039.2	-2.2	-20.0	20.2	2.00	2.00	0.00
1,080.0	7.60	263.80	1,078.9	-2.7	-25.0	25.2	2.00	2.00	0.00
1,120.0	8.40	263.80	1,118.5	-3.3	-30.6	30.7	2.00	2.00	0.00
1,160.0	9.20	263.80	1,158.0	-4.0	-36.6	36.9	2.00	2.00	0.00
1,200.0	10.00	263.80	1,197.5	-4.7	-43.3	43.5	2.00	2.00	0.00
1,240.0	10.80	263.80	1,236.8	-5.5	-50.4	50.7	2.00	2.00	0.00
1,280.0	11.60	263.80	1,276.0	-6.3	-58.2	58.5	2.00	2.00	0.00
1,320.0	12.40	263.80	1,315.2	-7.2	-66.4	66.8	2.00	2.00	0.00
1,360.0	13.20	263.80	1,354.2	-8.2	-75.2	75.7	2.00	2.00	0.00
1,400.0	14.00	263.80	1,393.1	-9.2	-84.6	85.1	2.00	2.00	0.00
1,430.8	14.62	263.80	1,422.9	-10.0	-92.2	92.7	2.00	2.00	0.00
1,440.0	14.62	263.80	1,431.8	-10.3	-94.5	95.0	0.00	0.00	0.00
1,480.0	14.62	263.80	1,470.5	-11.4	-104.5	105.1	0.00	0.00	0.00
1,520.0	14.62	263.80	1,509.2	-12.4	-114.5	115.2	0.00	0.00	0.00
1,560.0	14.62	263.80	1,547.9	-13.5	-124.6	125.3	0.00	0.00	0.00
1,600.0	14.62	263.80	1,586.6	-14.6	-134.6	135.4	0.00	0.00	0.00
1,640.0	14.62	263.80	1,625.3	-15.7	-144.6	145.5	0.00	0.00	0.00
1,680.0	14.62	263.80	1,664.0	-16.8	-154.7	155.6	0.00	0.00	0.00
1,720.0	14.62	263.80	1,702.7	-17.9	-164.7	165.7	0.00	0.00	0.00
1,760.0	14.62	263.80	1,741.4	-19.0	-174.7	175.8	0.00	0.00	0.00
1,800.0	14.62	263.80	1,780.2	-20.1	-184.8	185.9	0.00	0.00	0.00
1,840.0	14.62	263.80	1,818.9	-21.2	-194.8	196.0	0.00	0.00	0.00
1,880.0	14.62	263.80	1,857.6	-22.3	-204.8	206.1	0.00	0.00	0.00
1,920.0	14.62	263.80	1,896.3	-23.4	-214.9	216.1	0.00	0.00	0.00
1,960.0	14.62	263.80	1,935.0	-24.4	-224.9	226.2	0.00	0.00	0.00

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Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

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)
2,000.0	14.62	263.80	1,973.7	-25.5	-234.9	236.3	0.00	0.00	0.00
2,040.0	14.62	263.80	2,012.4	-26.6	-245.0	246.4	0.00	0.00	0.00
2,080.0	14.62	263.80	2,051.1	-27.7	-255.0	256.5	0.00	0.00	0.00
2,120.0	14.62	263.80	2,089.8	-28.8	-265.0	266.6	0.00	0.00	0.00
2,160.0	14.62	263.80	2,128.5	-29.9	-275.1	276.7	0.00	0.00	0.00
2,200.0	14.62	263.80	2,167.2	-31.0	-285.1	286.8	0.00	0.00	0.00
2,240.0	14.62	263.80	2,205.9	-32.1	-295.2	296.9	0.00	0.00	0.00
2,280.0	14.62	263.80	2,244.6	-33.2	-305.2	307.0	0.00	0.00	0.00
2,320.0	14.62	263.80	2,283.3	-34.3	-315.2	317.1	0.00	0.00	0.00
2,360.0	14.62	263.80	2,322.0	-35.4	-325.3	327.2	0.00	0.00	0.00
2,400.0	14.62	263.80	2,360.7	-36.4	-335.3	337.3	0.00	0.00	0.00
2,440.0	14.62	263.80	2,399.4	-37.5	-345.3	347.4	0.00	0.00	0.00
2,480.0	14.62	263.80	2,438.2	-38.6	-355.4	357.4	0.00	0.00	0.00
2,520.0	14.62	263.80	2,476.9	-39.7	-365.4	367.5	0.00	0.00	0.00
2,560.0	14.62	263.80	2,515.6	-40.8	-375.4	377.6	0.00	0.00	0.00
2,600.0	14.62	263.80	2,554.3	-41.9	-385.5	387.7	0.00	0.00	0.00
2,640.0	14.62	263.80	2,593.0	-43.0	-395.5	397.8	0.00	0.00	0.00
2,644.2	14.62	263.80	2,597.0	-43.1	-396.5	398.9	0.00	0.00	0.00
Pierre Silt									
2,680.0	14.62	263.80	2,631.7	-44.1	-405.5	407.9	0.00	0.00	0.00
2,720.0	14.62	263.80	2,670.4	-45.2	-415.6	418.0	0.00	0.00	0.00
2,760.0	14.62	263.80	2,709.1	-46.3	-425.6	428.1	0.00	0.00	0.00
2,800.0	14.62	263.80	2,747.8	-47.3	-435.6	438.2	0.00	0.00	0.00
2,840.0	14.62	263.80	2,786.5	-48.4	-445.7	448.3	0.00	0.00	0.00
2,880.0	14.62	263.80	2,825.2	-49.5	-455.7	458.4	0.00	0.00	0.00
2,920.0	14.62	263.80	2,863.9	-50.6	-465.7	468.5	0.00	0.00	0.00
2,960.0	14.62	263.80	2,902.6	-51.7	-475.8	478.6	0.00	0.00	0.00
3,000.0	14.62	263.80	2,941.3	-52.8	-485.8	488.7	0.00	0.00	0.00
3,040.0	14.62	263.80	2,980.0	-53.9	-495.8	498.8	0.00	0.00	0.00
3,080.0	14.62	263.80	3,018.7	-55.0	-505.9	508.8	0.00	0.00	0.00
3,120.0	14.62	263.80	3,057.4	-56.1	-515.9	518.9	0.00	0.00	0.00
3,160.0	14.62	263.80	3,096.1	-57.2	-525.9	529.0	0.00	0.00	0.00
3,200.0	14.62	263.80	3,134.9	-58.3	-536.0	539.1	0.00	0.00	0.00
3,240.0	14.62	263.80	3,173.6	-59.3	-546.0	549.2	0.00	0.00	0.00
3,280.0	14.62	263.80	3,212.3	-60.4	-556.0	559.3	0.00	0.00	0.00
3,320.0	14.62	263.80	3,251.0	-61.5	-566.1	569.4	0.00	0.00	0.00
3,360.0	14.62	263.80	3,289.7	-62.6	-576.1	579.5	0.00	0.00	0.00
3,400.0	14.62	263.80	3,328.4	-63.7	-586.1	589.6	0.00	0.00	0.00
3,440.0	14.62	263.80	3,367.1	-64.8	-596.2	599.7	0.00	0.00	0.00
3,480.0	14.62	263.80	3,405.8	-65.9	-606.2	609.8	0.00	0.00	0.00
3,520.0	14.62	263.80	3,444.5	-67.0	-616.2	619.9	0.00	0.00	0.00
3,560.0	14.62	263.80	3,483.2	-68.1	-626.3	630.0	0.00	0.00	0.00
3,589.8	14.62	263.80	3,512.0	-68.9	-633.7	637.5	0.00	0.00	0.00
Parkman									
3,600.0	14.62	263.80	3,521.9	-69.2	-636.3	640.1	0.00	0.00	0.00
3,640.0	14.62	263.80	3,560.6	-70.3	-646.3	650.1	0.00	0.00	0.00
3,680.0	14.62	263.80	3,599.3	-71.3	-656.4	660.2	0.00	0.00	0.00
3,720.0	14.62	263.80	3,638.0	-72.4	-666.4	670.3	0.00	0.00	0.00
3,760.0	14.62	263.80	3,676.7	-73.5	-676.4	680.4	0.00	0.00	0.00
3,800.0	14.62	263.80	3,715.4	-74.6	-686.5	690.5	0.00	0.00	0.00
3,840.0	14.62	263.80	3,754.1	-75.7	-696.5	700.6	0.00	0.00	0.00
3,880.0	14.62	263.80	3,792.8	-76.8	-706.5	710.7	0.00	0.00	0.00
3,920.0	14.62	263.80	3,831.6	-77.9	-716.6	720.8	0.00	0.00	0.00
3,960.0	14.62	263.80	3,870.3	-79.0	-726.6	730.9	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Williams F15-22D
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Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

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)
4,000.0	14.62	263.80	3,909.0	-80.1	-736.6	741.0	0.00	0.00	0.00
4,040.0	14.62	263.80	3,947.7	-81.2	-746.7	751.1	0.00	0.00	0.00
4,080.0	14.62	263.80	3,986.4	-82.2	-756.7	761.2	0.00	0.00	0.00
4,120.0	14.62	263.80	4,025.1	-83.3	-766.7	771.3	0.00	0.00	0.00
4,160.0	14.62	263.80	4,063.8	-84.4	-776.8	781.4	0.00	0.00	0.00
4,200.0	14.62	263.80	4,102.5	-85.5	-786.8	791.4	0.00	0.00	0.00
4,240.0	14.62	263.80	4,141.2	-86.6	-796.8	801.5	0.00	0.00	0.00
4,280.0	14.62	263.80	4,179.9	-87.7	-806.9	811.6	0.00	0.00	0.00
4,320.0	14.62	263.80	4,218.6	-88.8	-816.9	821.7	0.00	0.00	0.00
4,356.6	14.62	263.80	4,254.0	-89.8	-826.1	831.0	0.00	0.00	0.00
Sussex									
4,360.0	14.62	263.80	4,257.3	-89.9	-827.0	831.8	0.00	0.00	0.00
4,400.0	14.62	263.80	4,296.0	-91.0	-837.0	841.9	0.00	0.00	0.00
4,440.0	14.62	263.80	4,334.7	-92.1	-847.0	852.0	0.00	0.00	0.00
4,480.0	14.62	263.80	4,373.4	-93.2	-857.1	862.1	0.00	0.00	0.00
4,520.0	14.62	263.80	4,412.1	-94.2	-867.1	872.2	0.00	0.00	0.00
4,560.0	14.62	263.80	4,450.8	-95.3	-877.1	882.3	0.00	0.00	0.00
4,587.2	14.62	263.80	4,477.1	-96.1	-883.9	889.1	0.00	0.00	0.00
4,600.0	14.36	263.80	4,489.6	-96.4	-887.1	892.4	2.00	-2.00	0.00
4,640.0	13.56	263.80	4,528.4	-97.5	-896.7	902.0	2.00	-2.00	0.00
4,680.0	12.76	263.80	4,567.3	-98.5	-905.8	911.1	2.00	-2.00	0.00
4,720.0	11.96	263.80	4,606.4	-99.4	-914.3	919.7	2.00	-2.00	0.00
4,760.0	11.16	263.80	4,645.6	-100.2	-922.2	927.7	2.00	-2.00	0.00
4,800.0	10.36	263.80	4,684.9	-101.0	-929.7	935.1	2.00	-2.00	0.00
4,840.0	9.56	263.80	4,724.3	-101.8	-936.5	942.1	2.00	-2.00	0.00
4,880.0	8.76	263.80	4,763.8	-102.5	-942.9	948.4	2.00	-2.00	0.00
4,920.0	7.96	263.80	4,803.3	-103.1	-948.7	954.2	2.00	-2.00	0.00
4,960.0	7.16	263.80	4,843.0	-103.7	-953.9	959.5	2.00	-2.00	0.00
5,000.0	6.36	263.80	4,882.7	-104.2	-958.6	964.2	2.00	-2.00	0.00
5,040.0	5.56	263.80	4,922.5	-104.6	-962.7	968.4	2.00	-2.00	0.00
5,060.6	5.15	263.80	4,943.0	-104.8	-964.6	970.3	2.00	-2.00	0.00
Shannon									
5,080.0	4.76	263.80	4,962.3	-105.0	-966.3	972.0	2.00	-2.00	0.00
5,120.0	3.96	263.80	5,002.2	-105.4	-969.3	975.0	2.00	-2.00	0.00
5,160.0	3.16	263.80	5,042.1	-105.6	-971.8	977.5	2.00	-2.00	0.00
5,200.0	2.36	263.80	5,082.1	-105.8	-973.7	979.4	2.00	-2.00	0.00
5,240.0	1.56	263.80	5,122.1	-106.0	-975.0	980.8	2.00	-2.00	0.00
5,280.0	0.76	263.80	5,162.1	-106.1	-975.8	981.6	2.00	-2.00	0.00
5,317.9	0.00	0.00	5,200.0	-106.1	-976.1	981.8	2.00	-2.00	0.00
Drill Target 2550'FNL & 1230'FEL									
5,320.0	0.00	0.00	5,202.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,360.0	0.00	0.00	5,242.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,400.0	0.00	0.00	5,282.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,440.0	0.00	0.00	5,322.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,480.0	0.00	0.00	5,362.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,520.0	0.00	0.00	5,402.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,560.0	0.00	0.00	5,442.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,600.0	0.00	0.00	5,482.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,640.0	0.00	0.00	5,522.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,680.0	0.00	0.00	5,562.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,720.0	0.00	0.00	5,602.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,760.0	0.00	0.00	5,642.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,800.0	0.00	0.00	5,682.1	-106.1	-976.1	981.8	0.00	0.00	0.00

Database:	Landmark	Local Co-ordinate Reference:	Well Williams F15-22D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4634.0ft (Original Well Elev)
Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

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)
5,840.0	0.00	0.00	5,722.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,880.0	0.00	0.00	5,762.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,920.0	0.00	0.00	5,802.1	-106.1	-976.1	981.8	0.00	0.00	0.00
5,960.0	0.00	0.00	5,842.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,000.0	0.00	0.00	5,882.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,040.0	0.00	0.00	5,922.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,080.0	0.00	0.00	5,962.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,120.0	0.00	0.00	6,002.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,160.0	0.00	0.00	6,042.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,200.0	0.00	0.00	6,082.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,240.0	0.00	0.00	6,122.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,280.0	0.00	0.00	6,162.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,320.0	0.00	0.00	6,202.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,360.0	0.00	0.00	6,242.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,400.0	0.00	0.00	6,282.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,440.0	0.00	0.00	6,322.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,480.0	0.00	0.00	6,362.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,520.0	0.00	0.00	6,402.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,560.0	0.00	0.00	6,442.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,600.0	0.00	0.00	6,482.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,640.0	0.00	0.00	6,522.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,680.0	0.00	0.00	6,562.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,720.0	0.00	0.00	6,602.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,760.0	0.00	0.00	6,642.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,760.9	0.00	0.00	6,643.0	-106.1	-976.1	981.8	0.00	0.00	0.00
Niobrara - Target Circle 2550'FNL, 1230'FEL									
6,800.0	0.00	0.00	6,682.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,840.0	0.00	0.00	6,722.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,880.0	0.00	0.00	6,762.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,920.0	0.00	0.00	6,802.1	-106.1	-976.1	981.8	0.00	0.00	0.00
6,960.0	0.00	0.00	6,842.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,882.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,040.0	0.00	0.00	6,922.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,058.9	0.00	0.00	6,941.0	-106.1	-976.1	981.8	0.00	0.00	0.00
Ft. Hays									
7,080.0	0.00	0.00	6,962.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,082.9	0.00	0.00	6,965.0	-106.1	-976.1	981.8	0.00	0.00	0.00
Codell									
7,120.0	0.00	0.00	7,002.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,160.0	0.00	0.00	7,042.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,200.0	0.00	0.00	7,082.1	-106.1	-976.1	981.8	0.00	0.00	0.00
7,232.9	0.00	0.00	7,115.0	-106.1	-976.1	981.8	0.00	0.00	0.00
Hardline 112'S of BHL									

Database:	Landmark	Local Co-ordinate Reference:	Well Williams F15-22D
Company:	NOBLE ENERGY INC WELD COUNTY CO	TVD Reference:	WELL @ 4634.0ft (Original Well Elev)
Project:	SEC.15-T5N-R65W	MD Reference:	WELL @ 4634.0ft (Original Well Elev)
Site:	Williams Pad SEC.15-T5N-R65W	North Reference:	True
Well:	Williams F15-22D	Survey Calculation Method:	Minimum Curvature
Wellbore:	Williams F15-22D		
Design:	Noble Williams F15-22D Plan #3 (2-07-11)		

Targets									
Target Name									
- hit/miss target	Dip Angle	Dip Dir.	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
- Shape	(°)	(°)	(ft)	(ft)	(ft)	(ft)	(ft)		
Drill Target 2550'FNL	0.00	0.00	5,200.0	-106.1	-976.1	1,389,542.00	3,238,295.70	40° 23' 58.339 N	104° 38' 39.784 W
- plan hits target center									
- Point									
Hardline 112'S of BHL	0.00	0.00	7,115.0	-218.1	-1,076.1	1,389,429.03	3,238,196.78	40° 23' 57.232 N	104° 38' 41.077 W
- plan misses target center by 150.2ft at 7232.9ft MD (7115.0 TVD, -106.1 N, -976.1 E)									
- Polygon									
Point 1			7,115.0	0.0	0.0	1,389,429.03	3,238,196.78		
Point 2			7,115.0	0.0	200.0	1,389,430.97	3,238,396.77		
Target Circle 2550'FN	0.00	0.00	6,643.0	-106.1	-976.1	1,389,541.99	3,238,295.69	40° 23' 58.339 N	104° 38' 39.784 W
- plan hits target center									
- Circle (radius 75.0)									

Casing Points					
	Measured Depth	Vertical Depth		Casing Diameter	Hole Diameter
	(ft)	(ft)	Name	(")	(")
	500.0	500.0	8 5/8"	8-5/8	12-1/4

Formations						
	Measured Depth	Vertical Depth			Dip	Dip Direction
	(ft)	(ft)	Name	Lithology	(°)	(°)
	2,644.2	2,597.0	Pierre Silt		0.00	
	3,589.8	3,512.0	Parkman		0.00	
	4,356.6	4,254.0	Sussex		0.00	
	5,060.6	4,943.0	Shannon		0.00	
	6,760.9	6,643.0	Niobrara		0.00	
	7,058.9	6,941.0	Ft. Hays		0.00	
	7,082.9	6,965.0	Codell		0.00	