

# **US ROCKIES WATTENBERG PLANNING**

**WELD-NAD83-UTMFT13N**

**1N-68W-03 MJOLNIR 13-3HZ PAD**

**MJOLNIR 3-5HZ**

## **Plan A**

### **Plan: Permit Rev-1**

SHL Lat/Long: 40.074378/-104.995072

Survey Program: MWD+IFR

## **Standard Planning Report**

**29 July, 2018**

Project: WELD-NAD83-UTMFT13N  
 Site: 1N-68W-03 MJOLNIR 13-3HZ PAD  
 Well: MJOLNIR 3-5HZ  
 Wellbore: Plan A  
 Design: Permit Rev-1

# US ROCKIES WATTENBERG PLANNING

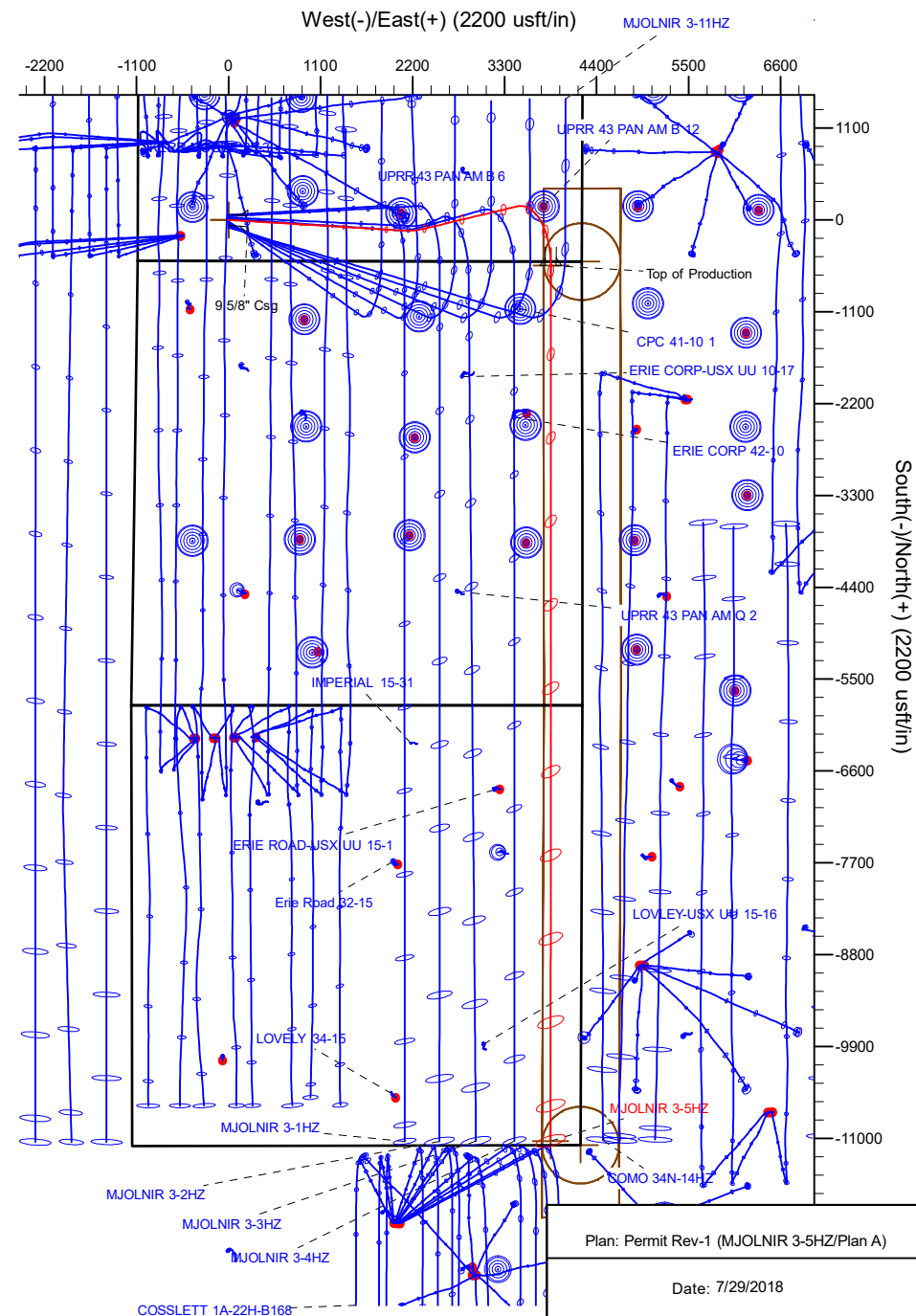
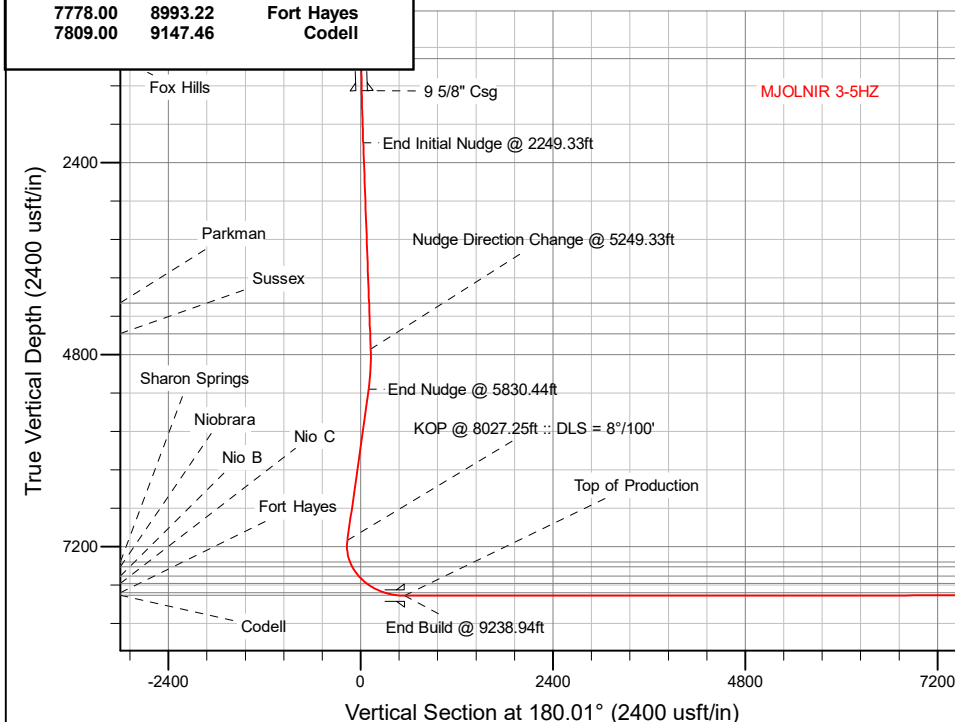
CASING DETAILS			WELL DETAILS: MJOLNIR 3-5HZ
TVD	MD	Size	
1500.00 7814.00	1526.50 9238.94	9-5/8 5-1/2	
			GL = 5047.00 RKB = 17' @ 5064.00usft (Drilling Rig)

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	
3	2249.33	30.74	93.50	2152.42	-32.76	535.69	1.50	93.50	32.67	
4	5249.33	30.74	93.50	4730.91	-126.38	2066.26	0.00	0.00	126.02	
5	5830.44	30.74	76.40	5231.33	-100.47	2359.41	1.50	-97.36	100.06	
6	8027.25	30.74	76.40	7119.48	163.57	3450.81	0.00	0.00	-164.17	
7	9238.94	90.03	180.01	7814.00	-547.84	3852.42	8.00	101.74	547.17	
8	19723.04	90.03	180.01	7808.00	-11031.94	3851.13	0.00	0.00	11031.26	MJOLNIR 3-5HZ_BHL

WELLBORE TARGET DETAILS (LAT/LONG)					
Name	TVD	+N-S	+E-W	Latitude	Longitude
MJOLNIR 3-5HZ_SHL	0.00	0.00	0.00	40.074378	-104.995072
MJOLNIR 3-5HZ_BHL	7808.00	-11031.94	3851.13	40.044082	-104.981312

FORMATION TOP DETAILS		
TVDPath	MDPath	Formation
1096.00	1104.43	Fox Hills
4155.00	4579.28	Parkman
4539.00	5026.05	Sussex
7393.00	8347.53	Sharon Springs
7454.00	8423.43	Niobrara
7569.00	8578.71	Nio B
7661.00	8724.37	Nio C
7778.00	8993.22	Fort Hayes
7809.00	9147.46	Codell

**SHL 492' FSL**  
**1086' FWL**  
**HEEL 50' FNL**  
**371' FEL**  
**TOE 51' FSL**  
**357' FEL**



Plan: Permit Rev-1 (MJOLNIR 3-5HZ/Plan A)

Date: 7/29/2018

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

<b>Project</b>	WELD-NAD83-UTMFT13N		
<b>Map System:</b>	Universal Transverse Mercator (US Survey Feet)	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Zone 13N (108 W to 102 W)		

Site		1N-68W-03 MJOLNIR 13-3HZ PAD			
Site Position:		Northing:	14,553,877.44 usft	Latitude:	40.074542
From:	Lat/Long	Easting:	1,641,795.53 usft	Longitude:	-104.995071
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.00 °

Well		MJOLNIR 3-5HZ				
Well Position	+N/-S	-59.72 usft	Northing:	14,553,817.72 usft	Latitude:	40.074378
	+E/-W	-0.28 usft	Easting:	1,641,795.26 usft	Longitude:	-104.995072
Position Uncertainty		3.28 usft	Wellhead Elevation:		Ground Level:	5,047.00 usft

<b>Wellbore</b>	Plan A				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	7/27/2018	8.19	66.53	52,070.17587113

<b>Design</b>	Permit Rev-1				
<b>Audit Notes:</b>					
<b>Version:</b>		<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.00
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.00	0.00	0.00	180.01	

<b>Plan Survey Tool Program</b>		<b>Date</b>	7/29/2018		
<b>Depth From (usft)</b>	<b>Depth To (usft)</b>	<b>Survey (Wellbore)</b>	<b>Tool Name</b>	<b>Remarks</b>	
1	0.00	1,500.00	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio	
2	1,500.00	19,723.04	Permit Rev-1 (Plan A)	APC_ISCWSA REV 2 MWD+II Fixed:v2:crustal field declinatio	

Corporate  
Planning Report

Database:	PLANNING	Local Co-ordinate Reference:	Well MJOLNIR 3-5HZ
Company:	US ROCKIES WATTENBERG PLANNING	TVD Reference:	RKB = 17' @ 5064.00usft (Drilling Rig)
Project:	WELD-NAD83-UTMFT13N	MD Reference:	RKB = 17' @ 5064.00usft (Drilling Rig)
Site:	1N-68W-03 MJOLNIR 13-3HZ PAD	North Reference:	True
Well:	MJOLNIR 3-5HZ	Survey Calculation Method:	Minimum Curvature
Wellbore:	Plan A		
Design:	Permit Rev-1		

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
2,249.33	30.74	93.50	2,152.42	-32.76	535.69	1.50	1.50	0.00	93.50	
5,249.33	30.74	93.50	4,730.91	-126.38	2,066.26	0.00	0.00	0.00	0.00	
5,830.44	30.74	76.40	5,231.33	-100.47	2,359.41	1.50	0.00	-2.94	-97.36	
8,027.25	30.74	76.40	7,119.48	163.57	3,450.81	0.00	0.00	0.00	0.00	
9,238.94	90.03	180.01	7,814.00	-547.84	3,852.42	8.00	4.89	8.55	101.74	
19,723.04	90.03	180.01	7,808.00	-11,031.94	3,851.13	0.00	0.00	0.00	0.00	MJOLNIR 3-5HZ_BHI

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
Begin Initial Nudge @ 200.00ft									
300.00	1.50	93.50	299.99	-0.08	1.31	0.08	1.50	1.50	0.00
400.00	3.00	93.50	399.91	-0.32	5.23	0.32	1.50	1.50	0.00
500.00	4.50	93.50	499.69	-0.72	11.75	0.72	1.50	1.50	0.00
600.00	6.00	93.50	599.27	-1.28	20.89	1.27	1.50	1.50	0.00
700.00	7.50	93.50	698.57	-1.99	32.62	1.99	1.50	1.50	0.00
800.00	9.00	93.50	797.54	-2.87	46.94	2.86	1.50	1.50	0.00
900.00	10.50	93.50	896.09	-3.90	63.84	3.89	1.50	1.50	0.00
1,000.00	12.00	93.50	994.16	-5.10	83.31	5.08	1.50	1.50	0.00
1,100.00	13.50	93.50	1,091.70	-6.44	105.34	6.42	1.50	1.50	0.00
1,104.43	13.57	93.50	1,096.00	-6.51	106.38	6.49	1.50	1.50	0.00
Fox Hills									
1,200.00	15.00	93.50	1,188.62	-7.95	129.91	7.92	1.50	1.50	0.00
1,300.00	16.50	93.50	1,284.86	-9.60	157.00	9.58	1.50	1.50	0.00
1,400.00	18.00	93.50	1,380.36	-11.41	186.60	11.38	1.50	1.50	0.00
1,500.00	19.50	93.50	1,475.05	-13.38	218.68	13.34	1.50	1.50	0.00
1,526.50	19.90	93.50	1,500.00	-13.92	227.60	13.88	1.50	1.50	0.00
9 5/8" Csg									
1,600.00	21.00	93.50	1,568.86	-15.49	253.23	15.44	1.50	1.50	0.00
1,700.00	22.50	93.50	1,661.74	-17.75	290.22	17.70	1.50	1.50	0.00
1,800.00	24.00	93.50	1,753.62	-20.16	329.62	20.10	1.50	1.50	0.00
1,900.00	25.50	93.50	1,844.43	-22.72	371.40	22.65	1.50	1.50	0.00
2,000.00	27.00	93.50	1,934.12	-25.42	415.55	25.34	1.50	1.50	0.00
2,100.00	28.50	93.50	2,022.61	-28.26	462.02	28.18	1.50	1.50	0.00
2,200.00	30.00	93.50	2,109.86	-31.24	510.79	31.15	1.50	1.50	0.00
2,249.33	30.74	93.50	2,152.42	-32.76	535.69	32.67	1.50	1.50	0.00
End Initial Nudge @ 2249.33ft									
2,300.00	30.74	93.50	2,195.97	-34.34	561.54	34.25	0.00	0.00	0.00
2,400.00	30.74	93.50	2,281.92	-37.47	612.55	37.36	0.00	0.00	0.00
2,500.00	30.74	93.50	2,367.87	-40.59	663.57	40.47	0.00	0.00	0.00
2,600.00	30.74	93.50	2,453.82	-43.71	714.59	43.58	0.00	0.00	0.00
2,700.00	30.74	93.50	2,539.77	-46.83	765.61	46.69	0.00	0.00	0.00
2,800.00	30.74	93.50	2,625.72	-49.95	816.63	49.80	0.00	0.00	0.00
2,900.00	30.74	93.50	2,711.67	-53.07	867.65	52.92	0.00	0.00	0.00
3,000.00	30.74	93.50	2,797.62	-56.19	918.67	56.03	0.00	0.00	0.00
3,100.00	30.74	93.50	2,883.57	-59.31	969.69	59.14	0.00	0.00	0.00
3,200.00	30.74	93.50	2,969.52	-62.43	1,020.71	62.25	0.00	0.00	0.00
3,300.00	30.74	93.50	3,055.47	-65.55	1,071.73	65.36	0.00	0.00	0.00
3,400.00	30.74	93.50	3,141.42	-68.67	1,122.74	68.47	0.00	0.00	0.00
3,500.00	30.74	93.50	3,227.37	-71.79	1,173.76	71.59	0.00	0.00	0.00
3,600.00	30.74	93.50	3,313.31	-74.91	1,224.78	74.70	0.00	0.00	0.00
3,700.00	30.74	93.50	3,399.26	-78.03	1,275.80	77.81	0.00	0.00	0.00
3,800.00	30.74	93.50	3,485.21	-81.15	1,326.82	80.92	0.00	0.00	0.00
3,900.00	30.74	93.50	3,571.16	-84.27	1,377.84	84.03	0.00	0.00	0.00
4,000.00	30.74	93.50	3,657.11	-87.39	1,428.86	87.14	0.00	0.00	0.00
4,100.00	30.74	93.50	3,743.06	-90.51	1,479.88	90.25	0.00	0.00	0.00
4,200.00	30.74	93.50	3,829.01	-93.63	1,530.90	93.37	0.00	0.00	0.00
4,300.00	30.74	93.50	3,914.96	-96.75	1,581.92	96.48	0.00	0.00	0.00
4,400.00	30.74	93.50	4,000.91	-99.87	1,632.93	99.59	0.00	0.00	0.00
4,500.00	30.74	93.50	4,086.86	-102.99	1,683.95	102.70	0.00	0.00	0.00
4,579.28	30.74	93.50	4,155.00	-105.47	1,724.40	105.17	0.00	0.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
<b>Parkman</b>									
4,600.00	30.74	93.50	4,172.81	-106.12	1,734.97	105.81	0.00	0.00	0.00
4,700.00	30.74	93.50	4,258.76	-109.24	1,785.99	108.92	0.00	0.00	0.00
4,800.00	30.74	93.50	4,344.71	-112.36	1,837.01	112.04	0.00	0.00	0.00
4,900.00	30.74	93.50	4,430.66	-115.48	1,888.03	115.15	0.00	0.00	0.00
5,000.00	30.74	93.50	4,516.61	-118.60	1,939.05	118.26	0.00	0.00	0.00
5,026.05	30.74	93.50	4,539.00	-119.41	1,952.34	119.07	0.00	0.00	0.00
<b>Sussex</b>									
5,100.00	30.74	93.50	4,602.56	-121.72	1,990.07	121.37	0.00	0.00	0.00
5,200.00	30.74	93.50	4,688.51	-124.84	2,041.09	124.48	0.00	0.00	0.00
5,249.33	30.74	93.50	4,730.91	-126.38	2,066.26	126.02	0.00	0.00	0.00
<b>Nudge Direction Change @ 5249.33ft</b>									
5,300.00	30.65	92.02	4,774.48	-127.62	2,092.09	127.26	1.50	-0.18	-2.92
5,400.00	30.52	89.08	4,860.57	-128.12	2,142.96	127.74	1.50	-0.13	-2.94
5,500.00	30.46	86.13	4,946.74	-126.00	2,193.64	125.62	1.50	-0.06	-2.95
5,600.00	30.47	83.17	5,032.94	-121.27	2,244.12	120.88	1.50	0.01	-2.96
5,700.00	30.54	80.22	5,119.10	-113.94	2,294.34	113.54	1.50	0.07	-2.95
5,800.00	30.68	77.29	5,205.16	-104.01	2,344.27	103.60	1.50	0.14	-2.93
5,830.44	30.74	76.40	5,231.33	-100.47	2,359.41	100.06	1.50	0.18	-2.92
<b>End Nudge @ 5830.44ft</b>									
5,900.00	30.74	76.40	5,291.12	-92.11	2,393.97	91.69	0.00	0.00	0.00
6,000.00	30.74	76.40	5,377.07	-80.09	2,443.65	79.67	0.00	0.00	0.00
6,100.00	30.74	76.40	5,463.02	-68.07	2,493.33	67.64	0.00	0.00	0.00
6,200.00	30.74	76.40	5,548.97	-56.05	2,543.01	55.61	0.00	0.00	0.00
6,300.00	30.74	76.40	5,634.92	-44.03	2,592.69	43.58	0.00	0.00	0.00
6,400.00	30.74	76.40	5,720.87	-32.02	2,642.37	31.55	0.00	0.00	0.00
6,500.00	30.74	76.40	5,806.82	-20.00	2,692.05	19.53	0.00	0.00	0.00
6,600.00	30.74	76.40	5,892.77	-7.98	2,741.73	7.50	0.00	0.00	0.00
6,700.00	30.74	76.40	5,978.72	4.04	2,791.42	-4.53	0.00	0.00	0.00
6,800.00	30.74	76.40	6,064.67	16.06	2,841.10	-16.56	0.00	0.00	0.00
6,900.00	30.74	76.40	6,150.62	28.08	2,890.78	-28.58	0.00	0.00	0.00
7,000.00	30.74	76.40	6,236.57	40.10	2,940.46	-40.61	0.00	0.00	0.00
7,100.00	30.74	76.40	6,322.52	52.12	2,990.14	-52.64	0.00	0.00	0.00
7,200.00	30.74	76.40	6,408.46	64.14	3,039.82	-64.67	0.00	0.00	0.00
7,300.00	30.74	76.40	6,494.41	76.16	3,089.50	-76.70	0.00	0.00	0.00
7,400.00	30.74	76.40	6,580.36	88.18	3,139.18	-88.72	0.00	0.00	0.00
7,500.00	30.74	76.40	6,666.31	100.19	3,188.86	-100.75	0.00	0.00	0.00
7,600.00	30.74	76.40	6,752.26	112.21	3,238.55	-112.78	0.00	0.00	0.00
7,700.00	30.74	76.40	6,838.21	124.23	3,288.23	-124.81	0.00	0.00	0.00
7,800.00	30.74	76.40	6,924.16	136.25	3,337.91	-136.83	0.00	0.00	0.00
7,900.00	30.74	76.40	7,010.11	148.27	3,387.59	-148.86	0.00	0.00	0.00
8,000.00	30.74	76.40	7,096.06	160.29	3,437.27	-160.89	0.00	0.00	0.00
8,027.25	30.74	76.40	7,119.48	163.57	3,450.81	-164.17	0.00	0.00	0.00
<b>KOP @ 8027.25ft :: DLS = 8°/100'</b>									
8,100.00	30.05	87.84	7,182.29	168.63	3,487.11	-169.24	8.00	-0.95	15.72
8,200.00	30.75	103.63	7,268.68	163.54	3,537.05	-164.16	8.00	0.70	15.79
8,300.00	33.22	118.02	7,353.62	144.62	3,586.16	-145.25	8.00	2.48	14.40
8,347.53	34.92	124.10	7,393.00	130.87	3,608.92	-131.50	8.00	3.58	12.78
<b>Sharon Springs</b>									
8,400.00	37.12	130.19	7,435.45	112.23	3,633.47	-112.86	8.00	4.19	11.60
8,423.43	38.19	132.70	7,454.00	102.75	3,644.19	-103.39	8.00	4.59	10.73
<b>Niobrara</b>									
8,500.00	42.04	140.11	7,512.58	67.00	3,678.06	-67.64	8.00	5.02	9.68

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,578.71	46.42	146.61	7,569.00	22.93	3,710.68	-23.58	8.00	5.56	8.26
<b>Nio B</b>									
8,600.00	47.66	148.20	7,583.51	9.80	3,719.07	-10.45	8.00	5.84	7.48
8,700.00	53.75	154.91	7,646.85	-58.24	3,755.70	57.58	8.00	6.09	6.71
8,724.37	55.29	156.38	7,661.00	-76.32	3,763.88	75.66	8.00	6.31	6.04
<b>Nio C</b>									
8,800.00	60.16	160.63	7,701.38	-135.80	3,787.24	135.13	8.00	6.45	5.61
8,900.00	66.79	165.64	7,746.04	-221.37	3,813.07	220.70	8.00	6.63	5.01
8,993.22	73.10	169.87	7,778.00	-306.89	3,831.57	306.22	8.00	6.77	4.54
<b>Fort Hayes</b>									
9,000.00	73.56	170.17	7,779.95	-313.29	3,832.69	312.62	8.00	6.82	4.36
9,100.00	80.42	174.39	7,802.45	-409.76	3,845.72	409.09	8.00	6.86	4.22
9,147.46	83.70	176.33	7,809.00	-456.60	3,849.52	455.93	8.00	6.90	4.08
<b>Codell</b>									
9,200.00	87.34	178.45	7,813.11	-508.92	3,851.90	508.25	8.00	6.92	4.03
9,238.94	90.03	180.01	7,814.00	-547.84	3,852.42	547.17	8.00	6.92	4.01
<b>End Build @ 9238.94ft - Top of Production</b>									
9,300.00	90.03	180.01	7,813.96	-608.90	3,852.42	608.23	0.00	0.00	0.00
9,400.00	90.03	180.01	7,813.91	-708.90	3,852.40	708.23	0.00	0.00	0.00
9,500.00	90.03	180.01	7,813.85	-808.90	3,852.39	808.23	0.00	0.00	0.00
9,600.00	90.03	180.01	7,813.79	-908.90	3,852.38	908.23	0.00	0.00	0.00
9,700.00	90.03	180.01	7,813.74	-1,008.90	3,852.37	1,008.23	0.00	0.00	0.00
9,800.00	90.03	180.01	7,813.68	-1,108.90	3,852.36	1,108.23	0.00	0.00	0.00
9,900.00	90.03	180.01	7,813.62	-1,208.90	3,852.34	1,208.23	0.00	0.00	0.00
10,000.00	90.03	180.01	7,813.56	-1,308.90	3,852.33	1,308.23	0.00	0.00	0.00
10,100.00	90.03	180.01	7,813.51	-1,408.90	3,852.32	1,408.23	0.00	0.00	0.00
10,200.00	90.03	180.01	7,813.45	-1,508.90	3,852.31	1,508.23	0.00	0.00	0.00
10,300.00	90.03	180.01	7,813.39	-1,608.90	3,852.29	1,608.23	0.00	0.00	0.00
10,400.00	90.03	180.01	7,813.34	-1,708.90	3,852.28	1,708.23	0.00	0.00	0.00
10,500.00	90.03	180.01	7,813.28	-1,808.90	3,852.27	1,808.23	0.00	0.00	0.00
10,600.00	90.03	180.01	7,813.22	-1,908.90	3,852.26	1,908.23	0.00	0.00	0.00
10,700.00	90.03	180.01	7,813.16	-2,008.90	3,852.24	2,008.23	0.00	0.00	0.00
10,800.00	90.03	180.01	7,813.11	-2,108.90	3,852.23	2,108.23	0.00	0.00	0.00
10,900.00	90.03	180.01	7,813.05	-2,208.90	3,852.22	2,208.23	0.00	0.00	0.00
11,000.00	90.03	180.01	7,812.99	-2,308.90	3,852.21	2,308.23	0.00	0.00	0.00
11,100.00	90.03	180.01	7,812.93	-2,408.90	3,852.19	2,408.23	0.00	0.00	0.00
11,200.00	90.03	180.01	7,812.88	-2,508.90	3,852.18	2,508.23	0.00	0.00	0.00
11,300.00	90.03	180.01	7,812.82	-2,608.90	3,852.17	2,608.23	0.00	0.00	0.00
11,400.00	90.03	180.01	7,812.76	-2,708.90	3,852.16	2,708.23	0.00	0.00	0.00
11,500.00	90.03	180.01	7,812.71	-2,808.90	3,852.15	2,808.23	0.00	0.00	0.00
11,600.00	90.03	180.01	7,812.65	-2,908.90	3,852.13	2,908.23	0.00	0.00	0.00
11,700.00	90.03	180.01	7,812.59	-3,008.90	3,852.12	3,008.23	0.00	0.00	0.00
11,800.00	90.03	180.01	7,812.53	-3,108.90	3,852.11	3,108.23	0.00	0.00	0.00
11,900.00	90.03	180.01	7,812.48	-3,208.90	3,852.10	3,208.23	0.00	0.00	0.00
12,000.00	90.03	180.01	7,812.42	-3,308.90	3,852.08	3,308.23	0.00	0.00	0.00
12,100.00	90.03	180.01	7,812.36	-3,408.90	3,852.07	3,408.23	0.00	0.00	0.00
12,200.00	90.03	180.01	7,812.31	-3,508.90	3,852.06	3,508.23	0.00	0.00	0.00
12,300.00	90.03	180.01	7,812.25	-3,608.90	3,852.05	3,608.23	0.00	0.00	0.00
12,400.00	90.03	180.01	7,812.19	-3,708.90	3,852.03	3,708.23	0.00	0.00	0.00
12,500.00	90.03	180.01	7,812.13	-3,808.90	3,852.02	3,808.23	0.00	0.00	0.00
12,600.00	90.03	180.01	7,812.08	-3,908.90	3,852.01	3,908.23	0.00	0.00	0.00
12,700.00	90.03	180.01	7,812.02	-4,008.90	3,852.00	4,008.23	0.00	0.00	0.00
12,800.00	90.03	180.01	7,811.96	-4,108.90	3,851.98	4,108.23	0.00	0.00	0.00
12,900.00	90.03	180.01	7,811.90	-4,208.90	3,851.97	4,208.23	0.00	0.00	0.00

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
13,000.00	90.03	180.01	7,811.85	-4,308.90	3,851.96	4,308.23	0.00	0.00	0.00
13,100.00	90.03	180.01	7,811.79	-4,408.90	3,851.95	4,408.23	0.00	0.00	0.00
13,200.00	90.03	180.01	7,811.73	-4,508.90	3,851.94	4,508.23	0.00	0.00	0.00
13,300.00	90.03	180.01	7,811.68	-4,608.90	3,851.92	4,608.23	0.00	0.00	0.00
13,400.00	90.03	180.01	7,811.62	-4,708.90	3,851.91	4,708.23	0.00	0.00	0.00
13,500.00	90.03	180.01	7,811.56	-4,808.90	3,851.90	4,808.23	0.00	0.00	0.00
13,600.00	90.03	180.01	7,811.50	-4,908.90	3,851.89	4,908.23	0.00	0.00	0.00
13,700.00	90.03	180.01	7,811.45	-5,008.90	3,851.87	5,008.23	0.00	0.00	0.00
13,800.00	90.03	180.01	7,811.39	-5,108.90	3,851.86	5,108.23	0.00	0.00	0.00
13,900.00	90.03	180.01	7,811.33	-5,208.90	3,851.85	5,208.23	0.00	0.00	0.00
14,000.00	90.03	180.01	7,811.28	-5,308.90	3,851.84	5,308.23	0.00	0.00	0.00
14,100.00	90.03	180.01	7,811.22	-5,408.90	3,851.82	5,408.23	0.00	0.00	0.00
14,200.00	90.03	180.01	7,811.16	-5,508.90	3,851.81	5,508.23	0.00	0.00	0.00
14,300.00	90.03	180.01	7,811.10	-5,608.90	3,851.80	5,608.23	0.00	0.00	0.00
14,400.00	90.03	180.01	7,811.05	-5,708.90	3,851.79	5,708.23	0.00	0.00	0.00
14,500.00	90.03	180.01	7,810.99	-5,808.90	3,851.78	5,808.23	0.00	0.00	0.00
14,600.00	90.03	180.01	7,810.93	-5,908.90	3,851.76	5,908.23	0.00	0.00	0.00
14,700.00	90.03	180.01	7,810.87	-6,008.90	3,851.75	6,008.23	0.00	0.00	0.00
14,800.00	90.03	180.01	7,810.82	-6,108.90	3,851.74	6,108.23	0.00	0.00	0.00
14,900.00	90.03	180.01	7,810.76	-6,208.90	3,851.73	6,208.23	0.00	0.00	0.00
15,000.00	90.03	180.01	7,810.70	-6,308.90	3,851.71	6,308.23	0.00	0.00	0.00
15,100.00	90.03	180.01	7,810.65	-6,408.90	3,851.70	6,408.23	0.00	0.00	0.00
15,200.00	90.03	180.01	7,810.59	-6,508.90	3,851.69	6,508.23	0.00	0.00	0.00
15,300.00	90.03	180.01	7,810.53	-6,608.90	3,851.68	6,608.23	0.00	0.00	0.00
15,400.00	90.03	180.01	7,810.47	-6,708.90	3,851.66	6,708.23	0.00	0.00	0.00
15,500.00	90.03	180.01	7,810.42	-6,808.90	3,851.65	6,808.23	0.00	0.00	0.00
15,600.00	90.03	180.01	7,810.36	-6,908.90	3,851.64	6,908.23	0.00	0.00	0.00
15,700.00	90.03	180.01	7,810.30	-7,008.90	3,851.63	7,008.23	0.00	0.00	0.00
15,800.00	90.03	180.01	7,810.25	-7,108.90	3,851.61	7,108.23	0.00	0.00	0.00
15,900.00	90.03	180.01	7,810.19	-7,208.90	3,851.60	7,208.23	0.00	0.00	0.00
16,000.00	90.03	180.01	7,810.13	-7,308.90	3,851.59	7,308.23	0.00	0.00	0.00
16,100.00	90.03	180.01	7,810.07	-7,408.90	3,851.58	7,408.23	0.00	0.00	0.00
16,200.00	90.03	180.01	7,810.02	-7,508.90	3,851.57	7,508.23	0.00	0.00	0.00
16,300.00	90.03	180.01	7,809.96	-7,608.90	3,851.55	7,608.23	0.00	0.00	0.00
16,400.00	90.03	180.01	7,809.90	-7,708.90	3,851.54	7,708.23	0.00	0.00	0.00
16,500.00	90.03	180.01	7,809.84	-7,808.90	3,851.53	7,808.23	0.00	0.00	0.00
16,600.00	90.03	180.01	7,809.79	-7,908.90	3,851.52	7,908.23	0.00	0.00	0.00
16,700.00	90.03	180.01	7,809.73	-8,008.90	3,851.50	8,008.23	0.00	0.00	0.00
16,800.00	90.03	180.01	7,809.67	-8,108.90	3,851.49	8,108.23	0.00	0.00	0.00
16,900.00	90.03	180.01	7,809.62	-8,208.90	3,851.48	8,208.23	0.00	0.00	0.00
17,000.00	90.03	180.01	7,809.56	-8,308.90	3,851.47	8,308.23	0.00	0.00	0.00
17,100.00	90.03	180.01	7,809.50	-8,408.90	3,851.45	8,408.23	0.00	0.00	0.00
17,200.00	90.03	180.01	7,809.44	-8,508.90	3,851.44	8,508.23	0.00	0.00	0.00
17,300.00	90.03	180.01	7,809.39	-8,608.90	3,851.43	8,608.23	0.00	0.00	0.00
17,400.00	90.03	180.01	7,809.33	-8,708.90	3,851.42	8,708.23	0.00	0.00	0.00
17,500.00	90.03	180.01	7,809.27	-8,808.90	3,851.40	8,808.23	0.00	0.00	0.00
17,600.00	90.03	180.01	7,809.22	-8,908.90	3,851.39	8,908.23	0.00	0.00	0.00
17,700.00	90.03	180.01	7,809.16	-9,008.90	3,851.38	9,008.23	0.00	0.00	0.00
17,800.00	90.03	180.01	7,809.10	-9,108.90	3,851.37	9,108.23	0.00	0.00	0.00
17,900.00	90.03	180.01	7,809.04	-9,208.90	3,851.36	9,208.23	0.00	0.00	0.00
18,000.00	90.03	180.01	7,808.99	-9,308.90	3,851.34	9,308.23	0.00	0.00	0.00
18,100.00	90.03	180.01	7,808.93	-9,408.90	3,851.33	9,408.23	0.00	0.00	0.00
18,200.00	90.03	180.01	7,808.87	-9,508.90	3,851.32	9,508.23	0.00	0.00	0.00
18,300.00	90.03	180.01	7,808.81	-9,608.90	3,851.31	9,608.23	0.00	0.00	0.00



# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
18,400.00	90.03	180.01	7,808.76	-9,708.90	3,851.29	9,708.23	0.00	0.00	0.00	
18,500.00	90.03	180.01	7,808.70	-9,808.90	3,851.28	9,808.23	0.00	0.00	0.00	
18,600.00	90.03	180.01	7,808.64	-9,908.90	3,851.27	9,908.23	0.00	0.00	0.00	
18,700.00	90.03	180.01	7,808.59	-10,008.90	3,851.26	10,008.23	0.00	0.00	0.00	
18,800.00	90.03	180.01	7,808.53	-10,108.90	3,851.24	10,108.23	0.00	0.00	0.00	
18,900.00	90.03	180.01	7,808.47	-10,208.90	3,851.23	10,208.23	0.00	0.00	0.00	
19,000.00	90.03	180.01	7,808.41	-10,308.90	3,851.22	10,308.23	0.00	0.00	0.00	
19,100.00	90.03	180.01	7,808.36	-10,408.90	3,851.21	10,408.23	0.00	0.00	0.00	
19,200.00	90.03	180.01	7,808.30	-10,508.90	3,851.19	10,508.23	0.00	0.00	0.00	
19,300.00	90.03	180.01	7,808.24	-10,608.90	3,851.18	10,608.23	0.00	0.00	0.00	
19,400.00	90.03	180.01	7,808.19	-10,708.90	3,851.17	10,708.23	0.00	0.00	0.00	
19,500.00	90.03	180.01	7,808.13	-10,808.90	3,851.16	10,808.23	0.00	0.00	0.00	
19,600.00	90.03	180.01	7,808.07	-10,908.90	3,851.15	10,908.23	0.00	0.00	0.00	
19,700.00	90.03	180.01	7,808.01	-11,008.90	3,851.13	11,008.23	0.00	0.00	0.00	
19,723.04	90.03	180.01	7,808.00	-11,031.94	3,851.13	11,031.26	0.00	0.00	0.00	
TD Well @ 19723.04ft										

Casing Points					
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")	
1,526.50	1,500.00	9 5/8" Csg	9-5/8	13-1/2	
9,238.94	7,814.00	Top of Production	5-1/2	7-7/8	

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
1,104.43	1,096.00	Fox Hills				
4,579.28	4,155.00	Parkman				
5,026.05	4,539.00	Sussex				
8,347.53	7,393.00	Sharon Springs				
8,423.43	7,454.00	Niobrara				
8,578.71	7,569.00	Nio B				
8,724.37	7,661.00	Nio C				
8,993.22	7,778.00	Fort Hayes				
9,147.46	7,809.00	Codell				

# Corporate Planning Report

<b>Database:</b>	PLANNING	<b>Local Co-ordinate Reference:</b>	Well MJOLNIR 3-5HZ
<b>Company:</b>	US ROCKIES WATTENBERG PLANNING	<b>TVD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Project:</b>	WELD-NAD83-UTMFT13N	<b>MD Reference:</b>	RKB = 17' @ 5064.00usft (Drilling Rig)
<b>Site:</b>	1N-68W-03 MJOLNIR 13-3HZ PAD	<b>North Reference:</b>	True
<b>Well:</b>	MJOLNIR 3-5HZ	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Plan A		
<b>Design:</b>	Permit Rev-1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.00	200.00	0.00	0.00	Begin Initial Nudge @ 200.00ft
2,249.33	2,152.42	-32.76	535.69	End Initial Nudge @ 2249.33ft
5,249.33	4,730.91	-126.38	2,066.26	Nudge Direction Change @ 5249.33ft
5,830.44	5,231.33	-100.47	2,359.41	End Nudge @ 5830.44ft
8,027.25	7,119.48	163.57	3,450.81	KOP @ 8027.25ft :: DLS = 8°/100'
9,238.94	7,814.00	-547.84	3,852.42	End Build @ 9238.94ft
19,723.04	7,808.00	-11,031.94	3,851.13	TD Well @ 19723.04ft