



# **Ursa Operating Company, LLC**

**Rockies Region**

**Frei A**

**Frei A2**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**06 August, 2013**



<b>Database:</b>	EDM 2003.21 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Frei A2
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	Frei A2 @ 5611.9ft (PAD EST KB)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A2 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Rockies Region		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	Frei A			
<b>Site Position:</b>		<b>Northing:</b>	1,626,942.75 ft	<b>Latitude:</b> 39° 32' 9.196 N
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,406,826.15 ft	<b>Longitude:</b> 107° 36' 12.020 W
<b>Position Uncertainty:</b>	0.0 ft	<b>Slot Radius:</b>	"	<b>Grid Convergence:</b> -1.33 °

<b>Well</b>	Frei A2, SHL LAT: 39.535853900 LONG: -107.603345500			
<b>Well Position</b>	<b>+N/-S</b>	-12.4 ft	<b>Northing:</b>	1,626,930.44 ft
	<b>+E/-W</b>	-1.9 ft	<b>Easting:</b>	2,406,824.00 ft
<b>Position Uncertainty</b>		0.0 ft	<b>Wellhead Elevation:</b>	5,611.9 ft
			<b>Ground Level:</b>	5,596.5 ft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF200510	8/6/2013	9.87	65.80	52,148

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD)</b>	<b>+N/-S (ft)</b>	<b>+E/-W (ft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	134.09

<b>Plan Sections</b>										
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	
300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,141.0	25.23	134.09	1,114.1	-126.8	130.9	3.00	3.00	0.00	134.09	
3,450.1	25.23	134.09	3,202.9	-811.6	837.8	0.00	0.00	0.00	0.00	
4,291.1	0.00	0.00	4,017.0	-938.3	968.6	3.00	-3.00	0.00	180.00	Frei A2 TGT
7,115.1	0.00	0.00	6,841.0	-938.3	968.6	0.00	0.00	0.00	0.00	

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<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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
100.0	0.00	0.00	100.0	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
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 3.00									
400.0	3.00	134.09	400.0	-1.8	1.9	2.6	3.00	3.00	0.00
500.0	6.00	134.09	499.6	-7.3	7.5	10.5	3.00	3.00	0.00
600.0	9.00	134.09	598.8	-16.4	16.9	23.5	3.00	3.00	0.00
700.0	12.00	134.09	697.1	-29.0	30.0	41.7	3.00	3.00	0.00
800.0	15.00	134.09	794.3	-45.3	46.7	65.1	3.00	3.00	0.00
900.0	18.00	134.09	890.2	-65.0	67.1	93.5	3.00	3.00	0.00
1,000.0	21.00	134.09	984.4	-88.3	91.1	126.9	3.00	3.00	0.00
1,100.0	24.00	134.09	1,076.8	-114.9	118.6	165.1	3.00	3.00	0.00
1,141.0	25.23	134.09	1,114.1	-126.8	130.9	182.2	3.00	3.00	0.00
Start 2309.1 hold at 1141.0 MD									
1,200.0	25.23	134.09	1,167.5	-144.3	148.9	207.3	0.00	0.00	0.00
1,300.0	25.23	134.09	1,257.9	-173.9	179.5	250.0	0.00	0.00	0.00
1,400.0	25.23	134.09	1,348.4	-203.6	210.2	292.6	0.00	0.00	0.00
1,500.0	25.23	134.09	1,438.8	-233.2	240.8	335.2	0.00	0.00	0.00
1,600.0	25.23	134.09	1,529.3	-262.9	271.4	377.8	0.00	0.00	0.00
1,700.0	25.23	134.09	1,619.8	-292.5	302.0	420.5	0.00	0.00	0.00
1,800.0	25.23	134.09	1,710.2	-322.2	332.6	463.1	0.00	0.00	0.00
1,900.0	25.23	134.09	1,800.7	-351.9	363.2	505.7	0.00	0.00	0.00
2,000.0	25.23	134.09	1,891.1	-381.5	393.8	548.3	0.00	0.00	0.00
2,100.0	25.23	134.09	1,981.6	-411.2	424.5	591.0	0.00	0.00	0.00
2,200.0	25.23	134.09	2,072.1	-440.8	455.1	633.6	0.00	0.00	0.00
2,300.0	25.23	134.09	2,162.5	-470.5	485.7	676.2	0.00	0.00	0.00
2,400.0	25.23	134.09	2,253.0	-500.1	516.3	718.8	0.00	0.00	0.00
2,500.0	25.23	134.09	2,343.4	-529.8	546.9	761.5	0.00	0.00	0.00
2,600.0	25.23	134.09	2,433.9	-559.5	577.5	804.1	0.00	0.00	0.00
2,700.0	25.23	134.09	2,524.4	-589.1	608.1	846.7	0.00	0.00	0.00
2,800.0	25.23	134.09	2,614.8	-618.8	638.8	889.3	0.00	0.00	0.00
2,900.0	25.23	134.09	2,705.3	-648.4	669.4	931.9	0.00	0.00	0.00
3,000.0	25.23	134.09	2,795.8	-678.1	700.0	974.6	0.00	0.00	0.00
3,068.7	25.23	134.09	2,857.9	-698.5	721.0	1,003.9	0.00	0.00	0.00
WF									
3,100.0	25.23	134.09	2,886.2	-707.7	730.6	1,017.2	0.00	0.00	0.00
3,200.0	25.23	134.09	2,976.7	-737.4	761.2	1,059.8	0.00	0.00	0.00
3,300.0	25.23	134.09	3,067.1	-767.1	791.8	1,102.4	0.00	0.00	0.00
3,400.0	25.23	134.09	3,157.6	-796.7	822.5	1,145.1	0.00	0.00	0.00
3,450.1	25.23	134.09	3,202.9	-811.6	837.8	1,166.4	0.00	0.00	0.00
Start Drop -3.00									
3,500.0	23.73	134.09	3,248.3	-826.0	852.6	1,187.1	3.00	-3.00	0.00
3,600.0	20.73	134.09	3,340.9	-852.3	879.8	1,224.9	3.00	-3.00	0.00
3,700.0	17.73	134.09	3,435.3	-875.2	903.5	1,257.9	3.00	-3.00	0.00
3,800.0	14.73	134.09	3,531.3	-894.6	923.5	1,285.8	3.00	-3.00	0.00
3,900.0	11.73	134.09	3,628.6	-910.6	940.0	1,308.7	3.00	-3.00	0.00
4,000.0	8.73	134.09	3,727.0	-922.9	952.7	1,326.5	3.00	-3.00	0.00
4,100.0	5.73	134.09	3,826.2	-931.7	961.8	1,339.1	3.00	-3.00	0.00
4,200.0	2.73	134.09	3,925.9	-936.8	967.1	1,346.4	3.00	-3.00	0.00
4,291.0	0.00	134.09	4,016.9	-938.3	968.6	1,348.6	3.00	-3.00	0.00
Top of Gas									
4,291.1	0.00	0.00	4,017.0	-938.3	968.6	1,348.6	3.00	-3.00	0.00

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A2 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

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)
Start 2824.0 hold at 4291.1 MD									
4,300.0	0.00	0.00	4,025.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,400.0	0.00	0.00	4,125.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,500.0	0.00	0.00	4,225.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,600.0	0.00	0.00	4,325.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,700.0	0.00	0.00	4,425.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,800.0	0.00	0.00	4,525.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
4,900.0	0.00	0.00	4,625.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,000.0	0.00	0.00	4,725.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,100.0	0.00	0.00	4,825.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,200.0	0.00	0.00	4,925.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,300.0	0.00	0.00	5,025.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,400.0	0.00	0.00	5,125.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,500.0	0.00	0.00	5,225.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,600.0	0.00	0.00	5,325.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,640.0	0.00	0.00	5,365.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
Cameo									
5,700.0	0.00	0.00	5,425.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,800.0	0.00	0.00	5,525.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
5,900.0	0.00	0.00	5,625.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,000.0	0.00	0.00	5,725.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,825.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,200.0	0.00	0.00	5,925.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,300.0	0.00	0.00	6,025.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,125.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,225.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,325.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,425.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,525.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
6,815.0	0.00	0.00	6,540.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
Rollins									
6,900.0	0.00	0.00	6,625.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,725.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,825.9	-938.3	968.6	1,348.6	0.00	0.00	0.00
7,115.1	0.00	0.00	6,841.0	-938.3	968.6	1,348.6	0.00	0.00	0.00
TD at 7115.1									

Formations					
Measured Depth (ft)	Vertical Depth (ft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,068.7	2,857.9	WF		0.00	
4,291.0	4,016.9	Top of Gas		0.00	
5,640.0	5,365.9	Cameo		0.00	
6,815.0	6,540.9	Rollins		0.00	

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<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Frei A2 @ 5611.9ft (PAD EST KB)
<b>Site:</b>	Frei A	<b>North Reference:</b>	True
<b>Well:</b>	Frei A2	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
300.0	300.0	0.0	0.0	Start Build 3.00
1,141.0	1,114.1	-126.8	130.9	Start 2309.1 hold at 1141.0 MD
3,450.1	3,202.9	-811.6	837.8	Start Drop -3.00
4,291.1	4,017.0	-938.3	968.6	Start 2824.0 hold at 4291.1 MD
7,115.1	6,841.0	-938.3	968.6	TD at 7115.1



Well Name: Frei A2  
Surface Location: Frei A  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5596.5  
+N/-S +E/-W Northing Easting Latitude Longitude Slot  
0.0 0.0 1626930.44 2406824.00 39° 32' 9.074 N 107° 36' 12.044 W  
PAD EST KB Frei A2 @ 5611.9ft (PAD EST KB)



Azimuths to True North  
Magnetic North: 9.87°  
Magnetic Field  
Strength: 52148.2snT  
Dip Angle: 65.80°  
Date: 8/6/2013  
Model: IGRF200510

Frei A  
Frei A2  
Design #1  
20:02, August 06 2013

#### WELLBORE TARGET DETAILS (MAP CO-ORDINATES AND LAT/LONG)

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Frei A2 TGT	4017.0	-938.3	968.6	1625969.93	2407770.67	39° 31' 59.800 N	107° 35' 59.680 W	Point

#### 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	300.0	0.00	0.00	300.0	0.0	0.0	0.00	0.00	0.0	
3	1141.0	25.23	134.09	1114.1	-126.8	130.9	3.00	134.09	182.2	
4	3450.1	25.23	134.09	3202.9	-811.6	837.8	0.00	0.00	1166.4	
5	4291.1	0.00	0.00	4017.0	-938.3	968.6	3.00	180.00	1348.6	Frei A2 TGT
6	7115.1	0.00	0.00	6841.0	-938.3	968.6	0.00	0.00	1348.6	

#### ANNOTATIONS

TVD	MD	Annotation
300.0	300.0	Start Build 3.00
1114.1	1141.0	Start 2309.1 hold at 1141.0 MD
3202.9	3450.1	Start Drop -3.00
4017.0	4291.1	Start 2824.0 hold at 4291.1 MD
6841.0	7115.1	TD at 7115.1

#### FORMATION TOP DETAILS

TVDP	PathMD	Path	Formation
2857.9	3068.7	WF	WF
4016.9	4291.0	Top of Gas	Top of Gas
5365.9	5640.0	Cameo	Cameo
6540.9	6815.0	Rollins	Rollins

