



# **Ursa Operating Company, LLC**

**Rockies Region**

**CSF E**

**CSF E 23C-09-07-91**

**Wellbore #1**

**Plan: Design #1**

## **Ursa Operating Company LLC Planning Report**

**04 December, 2014**



<b>Company:</b> Ursa Operating Company, LLC <b>Project:</b> Rockies Region <b>Site:</b> CSF E <b>Well:</b> CSF E 23C-09-07-91 <b>Wellbore:</b> Wellbore #1 <b>Design:</b> Design #1	<b>Local Co-ordinate Reference:</b> Well CSF E 23C-09-07-91 <b>TVD Reference:</b> CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB) <b>MD Reference:</b> CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB) <b>North Reference:</b> True <b>Survey Calculation Method:</b> Minimum Curvature <b>Database:</b> MasterDB
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<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> CSF E			
<b>Site Position:</b>	<b>Northing:</b>	1,600,196.55 usft	<b>Latitude:</b> 39° 27' 47.492 N
<b>From:</b> Lat/Long	<b>Easting:</b>	2,418,195.90 usft	<b>Longitude:</b> 107° 33' 39.189 W
<b>Position Uncertainty:</b> 0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.30 °

<b>Well</b> CSF E 23C-09-07-91, SHL LAT: 39.458604071 LONG: -107.558772361			
<b>Well Position</b>	<b>Northing:</b>	1,598,512.24 usft	<b>Latitude:</b> 39° 27' 30.975 N
<b>+N/-S</b> 0.0 usft	<b>Easting:</b>	2,418,754.54 usft	<b>Longitude:</b> 107° 33' 31.580 W
<b>+E/-W</b> 0.0 usft	<b>Wellhead Elevation:</b>	6,821.4 usft	<b>Ground Level:</b> 6,806.0 usft
<b>Position Uncertainty</b> 0.0 usft			

<b>Wellbore</b> Wellbore #1					
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2010	12/4/2014	9.70	65.69	51,928

<b>Design</b> Design #1				
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PROTOTYPE	<b>Tie On Depth:</b>	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	300.99

<b>Survey Tool Program</b> Date 12/4/2014				
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	7,499.9	Design #1 (Wellbore #1)	MWD	MWD - Standard

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23C-09-07-91
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23C-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

**Planned Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
0.0	0.00	0.00	0.0	-6,821.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
100.0	0.00	0.00	100.0	-6,721.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
200.0	0.00	0.00	200.0	-6,621.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
300.0	0.00	0.00	300.0	-6,521.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
400.0	0.00	0.00	400.0	-6,421.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
500.0	0.00	0.00	500.0	-6,321.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
600.0	0.00	0.00	600.0	-6,221.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
700.0	0.00	0.00	700.0	-6,121.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
800.0	0.00	0.00	800.0	-6,021.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
900.0	0.00	0.00	900.0	-5,921.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
1,000.0	0.00	0.00	1,000.0	-5,821.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
1,100.0	0.00	0.00	1,100.0	-5,721.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
<b>Surface Casing</b>										
1,200.0	0.00	0.00	1,200.0	-5,621.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
1,300.0	0.00	0.00	1,300.0	-5,521.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
1,350.0	0.00	0.00	1,350.0	-5,471.4	0.0	0.0	0.0	0.00	1,598,512.24	2,418,754.54
<b>Start Build 3.00</b>										
1,400.0	1.50	300.99	1,400.0	-5,421.4	0.3	-0.6	0.7	3.00	1,598,512.59	2,418,753.99
1,500.0	4.50	300.99	1,499.8	-5,321.6	3.0	-5.0	5.9	3.00	1,598,515.39	2,418,749.57
1,600.0	7.50	300.99	1,599.3	-5,222.1	8.4	-14.0	16.3	3.00	1,598,520.97	2,418,740.73
1,700.0	10.50	300.99	1,698.0	-5,123.4	16.5	-27.4	32.0	3.00	1,598,529.33	2,418,727.51
1,763.0	12.39	300.99	1,759.8	-5,061.6	22.9	-38.1	44.5	3.00	1,598,536.01	2,418,716.94
<b>Start 2766.8 hold at 1763.0 MD</b>										
1,800.0	12.39	300.99	1,795.9	-5,025.5	27.0	-44.9	52.4	0.00	1,598,540.25	2,418,710.23
1,900.0	12.39	300.99	1,893.6	-4,927.8	38.0	-63.3	73.9	0.00	1,598,551.71	2,418,692.09
2,000.0	12.39	300.99	1,991.3	-4,830.1	49.1	-81.7	95.3	0.00	1,598,563.17	2,418,673.95
2,100.0	12.39	300.99	2,088.9	-4,732.5	60.1	-100.1	116.8	0.00	1,598,574.64	2,418,655.81
2,200.0	12.39	300.99	2,186.6	-4,634.8	71.2	-118.5	138.3	0.00	1,598,586.10	2,418,637.67

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23C-09-07-91
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<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23C-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

### Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
2,300.0	12.39	300.99	2,284.3	-4,537.1	82.2	-136.9	159.7	0.00	1,598,597.57	2,418,619.54
2,400.0	12.39	300.99	2,382.0	-4,439.4	93.3	-155.3	181.2	0.00	1,598,609.03	2,418,601.40
2,500.0	12.39	300.99	2,479.6	-4,341.8	104.3	-173.7	202.6	0.00	1,598,620.49	2,418,583.26
2,600.0	12.39	300.99	2,577.3	-4,244.1	115.4	-192.1	224.1	0.00	1,598,631.96	2,418,565.12
2,700.0	12.39	300.99	2,675.0	-4,146.4	126.4	-210.5	245.5	0.00	1,598,643.42	2,418,546.98
2,800.0	12.39	300.99	2,772.6	-4,048.8	137.5	-228.9	267.0	0.00	1,598,654.89	2,418,528.84
2,900.0	12.39	300.99	2,870.3	-3,951.1	148.5	-247.3	288.5	0.00	1,598,666.35	2,418,510.70
3,000.0	12.39	300.99	2,968.0	-3,853.4	159.6	-265.7	309.9	0.00	1,598,677.81	2,418,492.56
3,100.0	12.39	300.99	3,065.6	-3,755.8	170.6	-284.1	331.4	0.00	1,598,689.28	2,418,474.42
3,157.1	12.39	300.99	3,121.4	-3,700.0	177.0	-294.6	343.6	0.00	1,598,695.82	2,418,464.07
<b>Williams Fork</b>										
3,200.0	12.39	300.99	3,163.3	-3,658.1	181.7	-302.5	352.8	0.00	1,598,700.74	2,418,456.28
3,300.0	12.39	300.99	3,261.0	-3,560.4	192.7	-320.8	374.3	0.00	1,598,712.21	2,418,438.15
3,400.0	12.39	300.99	3,358.7	-3,462.7	203.8	-339.2	395.7	0.00	1,598,723.67	2,418,420.01
3,500.0	12.39	300.99	3,456.3	-3,365.1	214.8	-357.6	417.2	0.00	1,598,735.13	2,418,401.87
3,600.0	12.39	300.99	3,554.0	-3,267.4	225.9	-376.0	438.7	0.00	1,598,746.60	2,418,383.73
3,700.0	12.39	300.99	3,651.7	-3,169.7	236.9	-394.4	460.1	0.00	1,598,758.06	2,418,365.59
3,800.0	12.39	300.99	3,749.3	-3,072.1	248.0	-412.8	481.6	0.00	1,598,769.53	2,418,347.45
3,900.0	12.39	300.99	3,847.0	-2,974.4	259.0	-431.2	503.0	0.00	1,598,780.99	2,418,329.31
4,000.0	12.39	300.99	3,944.7	-2,876.7	270.1	-449.6	524.5	0.00	1,598,792.45	2,418,311.17
4,100.0	12.39	300.99	4,042.4	-2,779.0	281.1	-468.0	546.0	0.00	1,598,803.92	2,418,293.03
4,200.0	12.39	300.99	4,140.0	-2,681.4	292.2	-486.4	567.4	0.00	1,598,815.38	2,418,274.89
4,300.0	12.39	300.99	4,237.7	-2,583.7	303.2	-504.8	588.9	0.00	1,598,826.85	2,418,256.76
4,400.0	12.39	300.99	4,335.4	-2,486.0	314.3	-523.2	610.3	0.00	1,598,838.31	2,418,238.62
4,500.0	12.39	300.99	4,433.0	-2,388.4	325.3	-541.6	631.8	0.00	1,598,849.77	2,418,220.48
4,529.8	12.39	300.99	4,462.2	-2,359.2	328.6	-547.1	638.2	0.00	1,598,853.19	2,418,215.06
<b>Start Drop -3.00</b>										

<b>Company:</b>	Ursa Operating Company, LLC	<b>Local Co-ordinate Reference:</b>	Well CSF E 23C-09-07-91
<b>Project:</b>	Rockies Region	<b>TVD Reference:</b>	CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Site:</b>	CSF E	<b>MD Reference:</b>	CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b>	CSF E 23C-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

**Planned Survey**

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
4,600.0	10.29	300.99	4,531.0	-2,290.4	335.7	-558.9	652.0	3.00	1,598,860.56	2,418,203.40
4,700.0	7.29	300.99	4,629.8	-2,191.6	343.6	-572.0	667.3	3.00	1,598,868.72	2,418,190.49
4,800.0	4.29	300.99	4,729.3	-2,092.1	348.8	-580.6	677.3	3.00	1,598,874.11	2,418,181.97
4,900.0	1.29	300.99	4,829.1	-1,992.3	351.3	-584.8	682.2	3.00	1,598,876.70	2,418,177.86
4,942.9	0.00	0.00	4,872.0	-1,949.4	351.6	-585.2	682.7	3.00	1,598,876.96	2,418,177.46
<b>Back to Vertical - Start 2557.0 hold at 4942.9 MD</b>										
4,943.3	0.00	0.00	4,872.4	-1,949.0	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
<b>Tof Of Gas</b>										
5,000.0	0.00	0.00	4,929.1	-1,892.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,100.0	0.00	0.00	5,029.1	-1,792.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,200.0	0.00	0.00	5,129.1	-1,692.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,300.0	0.00	0.00	5,229.1	-1,592.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,400.0	0.00	0.00	5,329.1	-1,492.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,500.0	0.00	0.00	5,429.1	-1,392.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,600.0	0.00	0.00	5,529.1	-1,292.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,700.0	0.00	0.00	5,629.1	-1,192.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,800.0	0.00	0.00	5,729.1	-1,092.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,900.0	0.00	0.00	5,829.1	-992.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
5,943.3	0.00	0.00	5,872.4	-949.0	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
<b>Cameo</b>										
6,000.0	0.00	0.00	5,929.1	-892.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,100.0	0.00	0.00	6,029.1	-792.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,200.0	0.00	0.00	6,129.1	-692.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,300.0	0.00	0.00	6,229.1	-592.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,400.0	0.00	0.00	6,329.1	-492.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,500.0	0.00	0.00	6,429.1	-392.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,600.0	0.00	0.00	6,529.1	-292.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,700.0	0.00	0.00	6,629.1	-192.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46

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<b>Site:</b> CSF E	<b>MD Reference:</b> CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)
<b>Well:</b> CSF E 23C-09-07-91	<b>North Reference:</b> True
<b>Wellbore:</b> Wellbore #1	<b>Survey Calculation Method:</b> Minimum Curvature
<b>Design:</b> Design #1	<b>Database:</b> MasterDB

Planned Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	TVDSS (usft)	N/S (usft)	E/W (usft)	V. Sec (usft)	DLeg (°/100usft)	Northing (usft)	Easting (usft)
6,800.0	0.00	0.00	6,729.1	-92.3	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
6,900.0	0.00	0.00	6,829.1	7.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,000.0	0.00	0.00	6,929.1	107.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,100.0	0.00	0.00	7,029.1	207.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,200.0	0.00	0.00	7,129.1	307.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,200.3	0.00	0.00	7,129.4	308.0	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
<b>Rollins</b>										
7,300.0	0.00	0.00	7,229.1	407.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,400.0	0.00	0.00	7,329.1	507.7	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
7,499.9	0.00	0.00	7,429.0	607.6	351.6	-585.2	682.7	0.00	1,598,876.96	2,418,177.46
<b>TD at 7499.9</b>										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,943.3	4,872.4	Tof Of Gas		0.00		
3,157.1	3,121.4	Williams Fork		0.00		
7,200.3	7,129.4	Rollins		0.00		
5,943.3	5,872.4	Cameo		0.00		

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<b>Well:</b>	CSF E 23C-09-07-91	<b>North Reference:</b>	True
<b>Wellbore:</b>	Wellbore #1	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Design:</b>	Design #1	<b>Database:</b>	MasterDB

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
1,100.0	1,100.0	0.0	0.0	Surface Casing	
1,350.0	1,350.0	0.0	0.0	Start Build 3.00	
1,763.0	1,759.8	22.9	-38.1	Start 2766.8 hold at 1763.0 MD	
4,529.8	4,462.2	328.6	-547.1	Start Drop -3.00	
4,942.9	4,872.0	351.6	-585.2	Back to Vertical	
4,942.9	4,872.0	351.6	-585.2	Start 2557.0 hold at 4942.9 MD	
7,499.9	7,429.0	351.6	-585.2	TD at 7499.9	

Checked By: \_\_\_\_\_ Approved By: \_\_\_\_\_ Date: \_\_\_\_\_



Well Name: CSF E 23C-09-07-91  
 Surface Location: CSF E  
 North American Datum 1983, US State Plane 1983, Colorado Central Zone  
 Ground Elevation: 6806.0  
 +N/-S +E/-W Northing Easting Latitude Longitude Slot  
 0.0 0.0 1598512.24 2418754.54 39° 27' 30.975 N 107° 33' 31.580 W  
 PAD Est KB CSF E 23C-09-07-91 @ 6821.4usft (PAD Est KB)



Azimuths to True North  
 Magnetic North: 9.70°  
 Magnetic Field  
 Strength: 51928.2snT  
 Dip Angle: 65.69°  
 Date: 12/4/2014  
 Model: IGRF2010

CSF E  
 CSF E 23C-09-07-91  
 Design #1  
 11:11, December 04 2014

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
23C-09-07-91 TGT	4872.0	351.6	-585.2	1598876.96	2418177.46	39° 27' 34.449 N	107° 33' 39.042 W	Rectangle (Sides: L40.0 W100.0)

ANNOTATIONS

TVD	MD	Annotation
1100.0	1100.0	Surface Casing
1350.0	1350.0	Start Build 3.00
1759.8	1763.0	Start 2766.8 hold at 1763.0 MD
4462.2	4529.8	Start Drop -3.00
4872.0	4942.9	Back to Vertical
4872.0	4942.9	Start 2557.0 hold at 4942.9 MD
7429.0	7499.9	TD at 7499.9

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	1350.0	0.00	0.00	1350.0	0.0	0.0	0.00	0.00	0.0	
3	1763.0	12.39	300.99	1759.8	22.9	-38.1	3.00	300.99	44.5	
4	4529.8	12.39	300.99	4462.2	328.6	-547.1	0.00	0.00	638.2	
5	4942.9	0.00	0.00	4872.0	351.6	-585.2	3.00	180.00	682.7	23C-09-07-91 TGT
6	7499.9	0.00	0.00	7429.0	351.6	-585.2	0.00	0.00	682.7	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3121.4	3157.1	Williams Fork	0.00	
4872.4	4943.3	Tof Of Gas	0.00	
5872.4	5943.3	Cameo	0.00	
7129.4	7200.3	Rollins	0.00	

