



Ursa Operating Company, LLC

Rockies Region

CSF E

CSF E 41B-16-07-91

Wellbore #1

Plan: Design #2

Ursa Operating Company LLC Planning Report

04 December, 2014



Company: Ursa Operating Company, LLC	Local Co-ordinate Reference: Well CSF E 41B-16-07-91
Project: Rockies Region	TVD Reference: CSF E 41B-16-07-91 @ 6821.4usft (PAD Est KB)
Site: CSF E	MD Reference: CSF E 41B-16-07-91 @ 6821.4usft (PAD Est KB)
Well: CSF E 41B-16-07-91	North Reference: True
Wellbore: Wellbore #1	Survey Calculation Method: Minimum Curvature
Design: Design #2	Database: MasterDB

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

Site	CSF E			
Site Position:	Northing:	1,600,196.55 usft	Latitude:	39° 27' 47.492 N
From: Lat/Long	Easting:	2,418,195.90 usft	Longitude:	107° 33' 39.189 W
Position Uncertainty: 0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.30 °

Well	CSF E 41B-16-07-91, SHL LAT: 39.458649549 LONG: -107.558706072					
Well Position	+N/-S	0.0 usft	Northing:	1,598,528.38 usft	Latitude:	39° 27' 31.138 N
	+E/-W	0.0 usft	Easting:	2,418,773.63 usft	Longitude:	107° 33' 31.342 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	6,821.4 usft	Ground Level:	6,806.0 usft

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

Design	Design #2			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	132.90

Survey Tool Program	Date 12/4/2014			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.0	8,114.9	Design #2 (Wellbore #1)	MWD	MWD - Standard

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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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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	1,598,528.38	2,418,773.63
100.0	0.00	0.00	100.0	-6,721.4	0.0	0.0	0.0	0.00	1,598,528.38	2,418,773.63
200.0	0.00	0.00	200.0	-6,621.4	0.0	0.0	0.0	0.00	1,598,528.38	2,418,773.63
300.0	0.00	0.00	300.0	-6,521.4	0.0	0.0	0.0	0.00	1,598,528.38	2,418,773.63
Start Build 3.50										
400.0	3.50	132.90	399.9	-6,421.5	-2.1	2.2	3.1	3.50	1,598,526.25	2,418,775.82
500.0	7.00	132.90	499.5	-6,321.9	-8.3	8.9	12.2	3.50	1,598,519.87	2,418,782.38
600.0	10.50	132.90	598.3	-6,223.1	-18.7	20.1	27.4	3.50	1,598,509.27	2,418,793.28
700.0	14.00	132.90	696.0	-6,125.4	-33.1	35.6	48.6	3.50	1,598,494.48	2,418,808.49
800.0	17.50	132.90	792.3	-6,029.1	-51.6	55.5	75.8	3.50	1,598,475.56	2,418,827.95
900.0	21.00	132.90	886.7	-5,934.7	-74.0	79.6	108.7	3.50	1,598,452.58	2,418,851.58
1,000.0	24.50	132.90	978.9	-5,842.5	-100.3	108.0	147.4	3.50	1,598,425.62	2,418,879.30
1,100.0	28.00	132.90	1,068.5	-5,752.9	-130.4	140.4	191.6	3.50	1,598,394.79	2,418,911.01
Surface Casing										
1,200.0	31.50	132.90	1,155.3	-5,666.1	-164.2	176.7	241.2	3.50	1,598,360.20	2,418,946.58
1,300.0	35.00	132.90	1,239.0	-5,582.4	-201.5	216.9	296.1	3.50	1,598,321.98	2,418,985.88
1,316.1	35.56	132.90	1,252.1	-5,569.3	-207.8	223.7	305.3	3.50	1,598,315.52	2,418,992.53
Start 3786.0 hold at 1316.1 MD										
1,400.0	35.56	132.90	1,320.4	-5,501.0	-241.1	259.4	354.1	0.00	1,598,281.48	2,419,027.53
1,500.0	35.56	132.90	1,401.7	-5,419.7	-280.7	302.0	412.3	0.00	1,598,240.94	2,419,069.22
1,600.0	35.56	132.90	1,483.0	-5,338.4	-320.3	344.6	470.5	0.00	1,598,200.39	2,419,110.92
1,700.0	35.56	132.90	1,564.4	-5,257.0	-359.8	387.2	528.6	0.00	1,598,159.85	2,419,152.61
1,800.0	35.56	132.90	1,645.7	-5,175.7	-399.4	429.8	586.8	0.00	1,598,119.30	2,419,194.31
1,900.0	35.56	132.90	1,727.1	-5,094.3	-439.0	472.4	644.9	0.00	1,598,078.76	2,419,236.00
2,000.0	35.56	132.90	1,808.4	-5,013.0	-478.6	515.0	703.1	0.00	1,598,038.21	2,419,277.70
2,100.0	35.56	132.90	1,889.8	-4,931.6	-518.2	557.6	761.3	0.00	1,597,997.67	2,419,319.39
2,200.0	35.56	132.90	1,971.1	-4,850.3	-557.8	600.3	819.4	0.00	1,597,957.12	2,419,361.09
2,300.0	35.56	132.90	2,052.5	-4,768.9	-597.4	642.9	877.6	0.00	1,597,916.58	2,419,402.78

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Well:	CSF E 41B-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	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)
2,400.0	35.56	132.90	2,133.8	-4,687.6	-637.0	685.5	935.7	0.00	1,597,876.03	2,419,444.48
2,500.0	35.56	132.90	2,215.2	-4,606.2	-676.6	728.1	993.9	0.00	1,597,835.49	2,419,486.17
2,600.0	35.56	132.90	2,296.5	-4,524.9	-716.2	770.7	1,052.0	0.00	1,597,794.94	2,419,527.87
2,700.0	35.56	132.90	2,377.9	-4,443.5	-755.7	813.3	1,110.2	0.00	1,597,754.40	2,419,569.56
2,800.0	35.56	132.90	2,459.2	-4,362.2	-795.3	855.9	1,168.4	0.00	1,597,713.85	2,419,611.26
2,900.0	35.56	132.90	2,540.6	-4,280.8	-834.9	898.5	1,226.5	0.00	1,597,673.31	2,419,652.95
3,000.0	35.56	132.90	2,621.9	-4,199.5	-874.5	941.1	1,284.7	0.00	1,597,632.76	2,419,694.65
3,100.0	35.56	132.90	2,703.3	-4,118.1	-914.1	983.7	1,342.8	0.00	1,597,592.22	2,419,736.34
3,200.0	35.56	132.90	2,784.6	-4,036.8	-953.7	1,026.3	1,401.0	0.00	1,597,551.67	2,419,778.04
3,300.0	35.56	132.90	2,866.0	-3,955.4	-993.3	1,068.9	1,459.2	0.00	1,597,511.13	2,419,819.73
3,400.0	35.56	132.90	2,947.3	-3,874.1	-1,032.9	1,111.5	1,517.3	0.00	1,597,470.58	2,419,861.43
3,432.1	35.56	132.90	2,973.4	-3,848.0	-1,045.6	1,125.1	1,536.0	0.00	1,597,457.59	2,419,874.79
Williams Fork										
3,500.0	35.56	132.90	3,028.7	-3,792.7	-1,072.5	1,154.1	1,575.5	0.00	1,597,430.04	2,419,903.12
3,600.0	35.56	132.90	3,110.0	-3,711.4	-1,112.1	1,196.7	1,633.6	0.00	1,597,389.49	2,419,944.82
3,700.0	35.56	132.90	3,191.4	-3,630.0	-1,151.6	1,239.3	1,691.8	0.00	1,597,348.95	2,419,986.51
3,800.0	35.56	132.90	3,272.7	-3,548.7	-1,191.2	1,281.9	1,749.9	0.00	1,597,308.40	2,420,028.21
3,900.0	35.56	132.90	3,354.1	-3,467.3	-1,230.8	1,324.5	1,808.1	0.00	1,597,267.86	2,420,069.91
4,000.0	35.56	132.90	3,435.4	-3,386.0	-1,270.4	1,367.1	1,866.3	0.00	1,597,227.31	2,420,111.60
4,100.0	35.56	132.90	3,516.8	-3,304.6	-1,310.0	1,409.7	1,924.4	0.00	1,597,186.77	2,420,153.30
4,200.0	35.56	132.90	3,598.1	-3,223.3	-1,349.6	1,452.3	1,982.6	0.00	1,597,146.22	2,420,194.99
4,300.0	35.56	132.90	3,679.5	-3,141.9	-1,389.2	1,494.9	2,040.7	0.00	1,597,105.68	2,420,236.69
4,400.0	35.56	132.90	3,760.8	-3,060.6	-1,428.8	1,537.5	2,098.9	0.00	1,597,065.13	2,420,278.38
4,500.0	35.56	132.90	3,842.2	-2,979.2	-1,468.4	1,580.1	2,157.1	0.00	1,597,024.58	2,420,320.08
4,600.0	35.56	132.90	3,923.5	-2,897.9	-1,508.0	1,622.7	2,215.2	0.00	1,596,984.04	2,420,361.77
4,700.0	35.56	132.90	4,004.9	-2,816.5	-1,547.5	1,665.3	2,273.4	0.00	1,596,943.49	2,420,403.47
4,800.0	35.56	132.90	4,086.2	-2,735.2	-1,587.1	1,707.9	2,331.5	0.00	1,596,902.95	2,420,445.16

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Well:	CSF E 41B-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	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)
4,900.0	35.56	132.90	4,167.6	-2,653.8	-1,626.7	1,750.5	2,389.7	0.00	1,596,862.40	2,420,486.86
5,000.0	35.56	132.90	4,248.9	-2,572.5	-1,666.3	1,793.1	2,447.8	0.00	1,596,821.86	2,420,528.55
5,102.1	35.56	132.90	4,331.9	-2,489.5	-1,706.7	1,836.6	2,507.2	0.00	1,596,780.48	2,420,571.11
Start Drop -3.50										
5,200.0	32.13	132.90	4,413.3	-2,408.1	-1,743.8	1,876.6	2,561.7	3.50	1,596,742.45	2,420,610.21
5,300.0	28.63	132.90	4,499.5	-2,321.9	-1,778.3	1,913.6	2,612.3	3.50	1,596,707.20	2,420,646.47
5,400.0	25.13	132.90	4,588.7	-2,232.7	-1,809.1	1,946.7	2,657.5	3.50	1,596,675.68	2,420,678.88
5,500.0	21.63	132.90	4,680.5	-2,140.9	-1,836.1	1,975.8	2,697.2	3.50	1,596,648.01	2,420,707.33
5,547.0	19.99	132.90	4,724.4	-2,097.0	-1,847.4	1,988.0	2,713.9	3.50	1,596,636.37	2,420,719.30
Top of Gas										
5,600.0	18.13	132.90	4,774.5	-2,046.9	-1,859.2	2,000.7	2,731.2	3.50	1,596,624.30	2,420,731.71
5,700.0	14.63	132.90	4,870.4	-1,951.0	-1,878.4	2,021.4	2,759.4	3.50	1,596,604.64	2,420,751.93
5,800.0	11.13	132.90	4,967.9	-1,853.5	-1,893.6	2,037.7	2,781.7	3.50	1,596,589.10	2,420,767.91
5,900.0	7.63	132.90	5,066.5	-1,754.9	-1,904.7	2,049.7	2,798.0	3.50	1,596,577.73	2,420,779.60
6,000.0	4.13	132.90	5,166.0	-1,655.4	-1,911.7	2,057.2	2,808.3	3.50	1,596,570.59	2,420,786.95
6,100.0	0.63	132.90	5,265.9	-1,555.5	-1,914.5	2,060.2	2,812.4	3.50	1,596,567.69	2,420,789.93
6,118.1	0.00	0.00	5,284.0	-1,537.4	-1,914.6	2,060.3	2,812.5	3.50	1,596,567.62	2,420,790.00
Start 1997.0 hold at 6118.1 MD - Back to Vertical										
6,200.0	0.00	0.00	5,365.9	-1,455.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,300.0	0.00	0.00	5,465.9	-1,355.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,400.0	0.00	0.00	5,565.9	-1,255.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,500.0	0.00	0.00	5,665.9	-1,155.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,558.5	0.00	0.00	5,724.4	-1,097.0	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
Cameo										
6,600.0	0.00	0.00	5,765.9	-1,055.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,700.0	0.00	0.00	5,865.9	-955.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,800.0	0.00	0.00	5,965.9	-855.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
6,900.0	0.00	0.00	6,065.9	-755.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00

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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)
7,000.0	0.00	0.00	6,165.9	-655.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,100.0	0.00	0.00	6,265.9	-555.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,200.0	0.00	0.00	6,365.9	-455.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,300.0	0.00	0.00	6,465.9	-355.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,400.0	0.00	0.00	6,565.9	-255.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,500.0	0.00	0.00	6,665.9	-155.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,600.0	0.00	0.00	6,765.9	-55.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,700.0	0.00	0.00	6,865.9	44.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,800.0	0.00	0.00	6,965.9	144.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
7,815.5	0.00	0.00	6,981.4	160.0	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
Rollins										
7,900.0	0.00	0.00	7,065.9	244.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
8,000.0	0.00	0.00	7,165.9	344.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
8,100.0	0.00	0.00	7,265.9	444.5	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
8,115.1	0.00	0.00	7,281.0	459.6	-1,914.6	2,060.3	2,812.5	0.00	1,596,567.62	2,420,790.00
TD at 8115.1										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
3,432.1	2,973.4	Williams Fork		0.00		
6,558.5	5,724.4	Cameo		0.00		
5,547.0	4,724.4	Top of Gas		0.00		
7,815.5	6,981.4	Rollins		0.00		

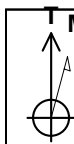
Company:	Ursa Operating Company, LLC	Local Co-ordinate Reference:	Well CSF E 41B-16-07-91
Project:	Rockies Region	TVD Reference:	CSF E 41B-16-07-91 @ 6821.4usft (PAD Est KB)
Site:	CSF E	MD Reference:	CSF E 41B-16-07-91 @ 6821.4usft (PAD Est KB)
Well:	CSF E 41B-16-07-91	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Design #2	Database:	MasterDB

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
300.0	300.0	0.0	0.0	Start Build 3.50
1,100.0	1,068.5	-130.4	140.4	Surface Casing
1,316.1	1,252.1	-207.8	223.7	Start 3786.0 hold at 1316.1 MD
5,102.1	4,331.9	-1,706.7	1,836.6	Start Drop -3.50
6,118.1	5,284.0	-1,914.6	2,060.3	Start 1997.0 hold at 6118.1 MD
6,118.1	5,284.0	-1,914.6	2,060.3	Back to Vertical
8,115.1	7,281.0	-1,914.6	2,060.3	TD at 8115.1

Checked By: _____ Approved By: _____ Date: _____



Well Name: CSF E 41B-16-07-91
 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 1598528.38 2418773.63 39° 27' 31.138 N 107° 33' 31.342 W
 PAD Est KB CSF E 41B-16-07-91 @ 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 41B-16-07-91
 Design #2
 12:44, December 04 2014

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
41B-16-07-91 TGT	4724.0	-1914.6	2060.3	1596567.62	2420790.00	39° 27' 12.214 N	107° 33' 5.075 W	Rectangle (Sides: L40.0 W100.0)

ANNOTATIONS

TVD	MD	Annotation
300.0	300.0	Start Build 3.50
1068.5	1100.0	Surface Casing
1252.1	1316.1	Start 3786.0 hold at 1316.1 MD
4331.9	5102.1	Start Drop -3.50
5284.0	6118.1	Start 1997.0 hold at 6118.1 MD
5284.0	6118.1	Back to Vertical
7281.0	8115.1	TD at 8115.1

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	Vsect	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	1316.1	35.56	132.90	1252.1	-207.8	223.7	3.50	132.90	305.3	
4	5102.1	35.56	132.90	4331.9	-1706.7	1836.6	0.00	0.00	2507.2	
5	6118.1	0.00	0.00	5284.0	-1914.6	2060.3	3.50	180.00	2812.5	
6	8115.1	0.00	0.00	7281.0	-1914.6	2060.3	0.00	0.00	2812.5	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2973.4	3432.1	Williams Fork	0.00	
4724.4	5547.0	Top of Gas	0.00	
5724.4	6558.5	Cameo	0.00	
6981.4	7815.5	Rollins	0.00	

