



# **Ursa Operating Company, LLC**

**Rockies Region**

**Hangs A**

**Hangs A 23D-09-06-92**

**Wellbore #1**

**Plan: Design #1**

## **Standard Planning Report**

**20 August, 2015**



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well Hangs A 23D-09-06-92
<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	Hangs A 23D-09-06-92 @ 5424.5usft (Capstar 321)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Hangs A 23D-09-06-92 @ 5424.5usft (Capstar 321)
<b>Site:</b>	Hangs A	<b>North Reference:</b>	True
<b>Well:</b>	Hangs A 23D-09-06-92	<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		

Site		Hangs A			
Site Position:		Northing:	1,627,718.49 usft	Latitude:	39° 32' 12.404 N
From:	Lat/Long	Easting:	2,387,658.46 usft	Longitude:	107° 40' 16.846 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.37 °

Well	Hangs A 23D-09-06-92, SHL: 39.536586134 -107.671341497					
Well Position	+N/-S	-70.3 usft	Northing:	1,627,648.22 usft	Latitude:	39° 32' 11.710 N
	+E/-W	1.3 usft	Easting:	2,387,658.05 usft	Longitude:	107° 40' 16.829 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,424.5 usft	Ground Level:	5,407.5 usft

<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>
	IGRF2010	8/17/2015	9.67	65.72	51,897

<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) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>	
	0.0	0.0	0.0	305.56	

<b>Plan Sections</b>										
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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,300.0	4.00	325.00	1,299.8	5.7	-4.0	2.00	2.00	0.00	325.00	
1,665.2	16.48	305.19	1,658.6	46.2	-53.8	3.50	3.42	-5.42	-25.74	
4,864.7	16.48	305.19	4,726.7	569.2	-795.4	0.00	0.00	0.00	0.00	
5,335.5	0.00	0.00	5,191.0	607.9	-850.4	3.50	-3.50	0.00	180.00	Hangs A 23D-09-06-9
8,152.5	0.00	0.00	8,008.0	607.9	-850.4	0.00	0.00	0.00	0.00	

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<b>Company:</b>	Ursa Operating Company, LLC	<b>TVD Reference:</b>	Hangs A 23D-09-06-92 @ 5424.5usft (Capstar 321)
<b>Project:</b>	Rockies Region	<b>MD Reference:</b>	Hangs A 23D-09-06-92 @ 5424.5usft (Capstar 321)
<b>Site:</b>	Hangs A	<b>North Reference:</b>	True
<b>Well:</b>	Hangs A 23D-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
0.1	0.00	0.00	0.1	0.0	0.0	0.0	0.00	0.00	0.00
<b>SHL: 39.536586134 -107.671341497</b>									
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
400.0	0.00	0.00	400.0	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
600.0	0.00	0.00	600.0	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
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Surface Casing</b>									
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>Start Build 2.00</b>									
1,200.0	2.00	325.00	1,200.0	1.4	-1.0	1.6	2.00	2.00	0.00
1,300.0	4.00	325.00	1,299.8	5.7	-4.0	6.6	2.00	2.00	0.00
<b>Start DLS 3.50 TFO -25.74</b>									
1,400.0	7.31	312.97	1,399.3	12.9	-10.7	16.2	3.50	3.31	-12.03
1,500.0	10.74	308.50	1,498.1	23.1	-22.6	31.8	3.50	3.43	-4.47
1,600.0	14.21	306.19	1,595.7	36.1	-39.8	53.4	3.50	3.46	-2.32
1,665.2	16.48	305.19	1,658.6	46.2	-53.8	70.7	3.50	3.48	-1.52
<b>Start 3199.5 hold at 1665.2 MD</b>									
1,700.0	16.48	305.19	1,692.0	51.9	-61.9	80.5	0.00	0.00	0.00
1,800.0	16.48	305.19	1,787.8	68.2	-85.1	108.9	0.00	0.00	0.00
1,900.0	16.48	305.19	1,883.7	84.5	-108.3	137.2	0.00	0.00	0.00
2,000.0	16.48	305.19	1,979.6	100.9	-131.4	165.6	0.00	0.00	0.00
2,100.0	16.48	305.19	2,075.5	117.2	-154.6	194.0	0.00	0.00	0.00
2,200.0	16.48	305.19	2,171.4	133.6	-177.8	222.3	0.00	0.00	0.00
2,300.0	16.48	305.19	2,267.3	149.9	-201.0	250.7	0.00	0.00	0.00
2,400.0	16.48	305.19	2,363.2	166.3	-224.1	279.0	0.00	0.00	0.00
2,500.0	16.48	305.19	2,459.1	182.6	-247.3	307.4	0.00	0.00	0.00
2,600.0	16.48	305.19	2,555.0	199.0	-270.5	335.8	0.00	0.00	0.00
2,700.0	16.48	305.19	2,650.9	215.3	-293.7	364.1	0.00	0.00	0.00
2,800.0	16.48	305.19	2,746.8	231.7	-316.9	392.5	0.00	0.00	0.00
2,900.0	16.48	305.19	2,842.7	248.0	-340.0	420.9	0.00	0.00	0.00
3,000.0	16.48	305.19	2,938.6	264.4	-363.2	449.2	0.00	0.00	0.00
3,100.0	16.48	305.19	3,034.5	280.7	-386.4	477.6	0.00	0.00	0.00
3,200.0	16.48	305.19	3,130.4	297.0	-409.6	505.9	0.00	0.00	0.00
3,300.0	16.48	305.19	3,226.3	313.4	-432.7	534.3	0.00	0.00	0.00
3,400.0	16.48	305.19	3,322.1	329.7	-455.9	562.7	0.00	0.00	0.00
3,500.0	16.48	305.19	3,418.0	346.1	-479.1	591.0	0.00	0.00	0.00
3,600.0	16.48	305.19	3,513.9	362.4	-502.3	619.4	0.00	0.00	0.00
3,700.0	16.48	305.19	3,609.8	378.8	-525.5	647.7	0.00	0.00	0.00
3,800.0	16.48	305.19	3,705.7	395.1	-548.6	676.1	0.00	0.00	0.00
3,900.0	16.48	305.19	3,801.6	411.5	-571.8	704.5	0.00	0.00	0.00
4,000.0	16.48	305.19	3,897.5	427.8	-595.0	732.8	0.00	0.00	0.00
4,001.0	16.48	305.19	3,898.5	428.0	-595.2	733.1	0.00	0.00	0.00
<b>Williams Fork</b>									
4,100.0	16.48	305.19	3,993.4	444.2	-618.2	761.2	0.00	0.00	0.00

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<b>Well:</b>	Hangs A 23D-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #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)
4,200.0	16.48	305.19	4,089.3	460.5	-641.4	789.6	0.00	0.00	0.00
4,300.0	16.48	305.19	4,185.2	476.8	-664.5	817.9	0.00	0.00	0.00
4,400.0	16.48	305.19	4,281.1	493.2	-687.7	846.3	0.00	0.00	0.00
4,500.0	16.48	305.19	4,377.0	509.5	-710.9	874.6	0.00	0.00	0.00
4,600.0	16.48	305.19	4,472.9	525.9	-734.1	903.0	0.00	0.00	0.00
4,700.0	16.48	305.19	4,568.8	542.2	-757.2	931.4	0.00	0.00	0.00
4,800.0	16.48	305.19	4,664.7	558.6	-780.4	959.7	0.00	0.00	0.00
4,864.7	16.48	305.19	4,726.7	569.2	-795.4	978.1	0.00	0.00	0.00
Start Drop -3.50									
4,900.0	15.24	305.19	4,760.7	574.7	-803.3	987.7	3.50	-3.50	0.00
5,000.0	11.74	305.19	4,857.9	588.2	-822.4	1,011.0	3.50	-3.50	0.00
5,100.0	8.24	305.19	4,956.4	598.2	-836.5	1,028.4	3.50	-3.50	0.00
5,200.0	4.74	305.19	5,055.7	604.7	-845.8	1,039.7	3.50	-3.50	0.00
5,300.0	1.24	305.19	5,155.5	607.7	-850.0	1,044.9	3.50	-3.50	0.00
5,335.0	0.02	305.19	5,190.5	607.9	-850.4	1,045.3	3.50	-3.50	0.00
Top of Gas									
5,335.5	0.00	0.00	5,191.0	607.9	-850.4	1,045.3	3.50	-3.50	0.00
Start 2817.0 hold at 5335.5 MD - Back to Vertical									
5,400.0	0.00	0.00	5,255.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
5,500.0	0.00	0.00	5,355.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
5,600.0	0.00	0.00	5,455.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
5,700.0	0.00	0.00	5,555.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
5,800.0	0.00	0.00	5,655.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
5,900.0	0.00	0.00	5,755.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,000.0	0.00	0.00	5,855.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,100.0	0.00	0.00	5,955.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,200.0	0.00	0.00	6,055.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,300.0	0.00	0.00	6,155.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,400.0	0.00	0.00	6,255.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,500.0	0.00	0.00	6,355.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,600.0	0.00	0.00	6,455.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,690.0	0.00	0.00	6,545.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
Cameo									
6,700.0	0.00	0.00	6,555.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,655.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
6,900.0	0.00	0.00	6,755.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,855.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,100.0	0.00	0.00	6,955.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,200.0	0.00	0.00	7,055.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,300.0	0.00	0.00	7,155.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,400.0	0.00	0.00	7,255.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,500.0	0.00	0.00	7,355.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,600.0	0.00	0.00	7,455.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,652.0	0.00	0.00	7,507.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
Rollins									
7,700.0	0.00	0.00	7,555.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,800.0	0.00	0.00	7,655.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
7,900.0	0.00	0.00	7,755.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
8,000.0	0.00	0.00	7,855.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
8,100.0	0.00	0.00	7,955.5	607.9	-850.4	1,045.3	0.00	0.00	0.00
8,152.0	0.00	0.00	8,007.5	607.9	-850.4	1,045.3	0.00	0.00	0.00

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<b>Well:</b>	Hangs A 23D-09-06-92	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #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)
TD	8,152.5	0.00	0.00	8,008.0	607.9	-850.4	1,045.3	0.00	0.00
TD at 8152.5 - BHL: 39.538255 -107.6743566									

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
Hangs A 23D-09-06-92 1	0.00	0.00	5,191.0	607.9	-850.4	1,628,276.27	2,386,822.47	39° 32' 17.718 N	107° 40' 27.684 W
- plan hits target center									
- Rectangle (sides W100.0 H40.0 D2,817.0)									

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
4,001.0	3,898.5	Williams Fork		0.00		
5,335.0	5,190.5	Top of Gas		0.00		
6,690.0	6,545.5	Cameo		0.00		
7,652.0	7,507.5	Rollins		0.00		
8,152.0	8,007.5	TD		0.00		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
0.1	0.1	0.0	0.0	SHL: 39.536586134 -107.671341497
1,000.0	1,000.0	0.0	0.0	Surface Casing
1,100.0	1,100.0	0.0	0.0	Start Build 2.00
1,300.0	1,299.8	5.7	-4.0	Start DLS 3.50 TFO -25.74
1,665.2	1,658.6	46.2	-53.8	Start 3199.5 hold at 1665.2 MD
4,864.7	4,726.7	569.2	-795.4	Start Drop -3.50
5,335.5	5,191.0	607.9	-850.4	Start 2817.0 hold at 5335.5 MD
5,335.5	5,191.0	607.9	-850.4	Back to Vertical
8,152.5	8,008.0	607.9	-850.4	TD at 8152.5
8,152.5	8,008.0	607.9	-850.4	BHL: 39.538255 -107.6743566



Well Name: Hangs A 23D-09-06-92  
Surface Location: Hangs A  
North American Datum 1983, US State Plane 1983, Colorado Central Zone  
Ground Elevation: 5407.5  
+N/-S +E/-W Northing Easting Latitude Longitude  
0.0 0.0 1627648.22 2387658.05 39° 32' 11.710 N 107° 40' 16.829 W  
Capstar 321 Hangs A 23D-09-06-92 @ 5424.5usft (Capstar 321)



Azimuths to True North  
Magnetic North: 9.67°  
Magnetic Field  
Strength: 51896.5snT  
Dip Angle: 65.72°  
Date: 8/17/2015  
Model: IGRF2010

Hangs A  
Hangs A 23D-09-06-92  
Design #1  
12:58, August 20 2015

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
Hangs A 23D-09-06-92 TGT	5191.0	607.9	-850.4	1628276.27	2386822.479	39° 32' 17.718 N	107° 40' 27.684 W	Rectangle (Sides: L40.0 W100.0)

#### 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	1100.0	0.00	0.00	1100.0	0.0	0.0	0.00	0.00	0.0	
3	1300.0	4.00	325.00	1299.8	5.7	-4.0	2.00	325.00	6.6	
4	1665.2	16.48	305.19	1658.6	46.2	-53.8	3.50	-25.74	70.7	
5	4864.7	16.48	305.19	4726.7	569.2	-795.4	0.00	0.00	978.1	
6	5335.5	0.00	0.00	5191.0	607.9	-850.4	3.50	180.00	1045.3	Hangs A 23D-09-06-92 TGT
7	8152.5	0.00	0.00	8008.0	607.9	-850.4	0.00	0.00	1045.3	

#### ANNOTATIONS

TVD	MD	Annotation
0.1	0.1	SHL: 39.536586134 -107.671341497
1000.0	1000.0	Surface Casing
1100.0	1100.0	Start Build 2.00
1299.8	1300.0	Start DLS 3.50 TFO -25.74
1658.6	1665.2	Start 3199.5 hold at 1665.2 MD
4726.7	4864.7	Start Drop -3.50
5191.0	5335.5	Start 2817.0 hold at 5335.5 MD
5191.0	5335.5	Back to Vertical
8008.0	8152.5	TD at 8152.5
8008.0	8152.5	BHL: 39.538255 -107.6743566

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
3898.5	4001.0	Williams Fork	0.00	
5190.5	5335.0	Top of Gas	0.00	
6545.5	6690.0	Cameo	0.00	
7507.5	7652.0	Rollins	0.00	
8007.5	8152.0	TD	0.00	

