



Ursa Operating Company, LLC

Rockies Region

Speakman A

BAT 24B-24-07-96

Wellbore #1

Plan: Design #1

Standard Planning Report

10 June, 2014



Database:	MasterDB	Local Co-ordinate Reference:	Well BAT 24B-24-07-96
Company:	Ursa Operating Company, LLC	TVD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Project:	Rockies Region	MD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Site:	Speakman A	North Reference:	True
Well:	BAT 24B-24-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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		Speakman A			
Site Position:		Northing:	1,588,429.06 usft	Latitude:	39° 25' 15.663 N
From:	Lat/Long	Easting:	2,276,734.73 usft	Longitude:	108° 3' 38.016 W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.61 °

Well	BAT 24B-24-07-96, SHL LAT: 39.420669507 LONG: -108.060146390					
Well Position	+N/-S	-126.8 usft	Northing:	1,588,299.04 usft	Latitude:	39° 25' 14.410 N
	+E/-W	116.9 usft	Easting:	2,276,847.98 usft	Longitude:	108° 3' 36.527 W
Position Uncertainty		0.0 usft	Wellhead Elevation:	5,197.9 usft	Ground Level:	5,182.5 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF200510	6/15/2013	10.08	65.63	52,046

Design	Design #1				
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	181.93	

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
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
754.3	19.40	181.93	743.8	-92.9	-3.1	3.50	3.50	0.00	181.93	
3,156.1	19.40	181.93	3,009.2	-890.3	-30.0	0.00	0.00	0.00	0.00	
3,710.4	0.00	0.00	3,553.0	-983.2	-33.1	3.50	-3.50	0.00	180.00	BAT 24B-24-07-96 TC
5,903.4	0.00	0.00	5,746.0	-983.2	-33.1	0.00	0.00	0.00	0.00	BAT 24B-24-07-96 BT

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Project:	Rockies Region	MD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Site:	Speakman A	North Reference:	True
Well:	BAT 24B-24-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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
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
Start Build 3.50									
300.0	3.50	181.93	299.9	-3.1	-0.1	3.1	3.50	3.50	0.00
400.0	7.00	181.93	399.5	-12.2	-0.4	12.2	3.50	3.50	0.00
500.0	10.50	181.93	498.3	-27.4	-0.9	27.4	3.50	3.50	0.00
600.0	14.00	181.93	596.0	-48.6	-1.6	48.6	3.50	3.50	0.00
700.0	17.50	181.93	692.3	-75.7	-2.6	75.8	3.50	3.50	0.00
754.3	19.40	181.93	743.8	-92.9	-3.1	93.0	3.50	3.50	0.00
Start 2401.8 hold at 754.3 MD									
800.0	19.40	181.93	786.9	-108.1	-3.6	108.1	0.00	0.00	0.00
900.0	19.40	181.93	881.2	-141.3	-4.8	141.3	0.00	0.00	0.00
1,000.0	19.40	181.93	975.5	-174.5	-5.9	174.6	0.00	0.00	0.00
1,100.0	19.40	181.93	1,069.8	-207.7	-7.0	207.8	0.00	0.00	0.00
1,200.0	19.40	181.93	1,164.2	-240.9	-8.1	241.0	0.00	0.00	0.00
1,300.0	19.40	181.93	1,258.5	-274.1	-9.2	274.2	0.00	0.00	0.00
1,400.0	19.40	181.93	1,352.8	-307.3	-10.3	307.4	0.00	0.00	0.00
1,500.0	19.40	181.93	1,447.1	-340.5	-11.5	340.6	0.00	0.00	0.00
1,600.0	19.40	181.93	1,541.4	-373.7	-12.6	373.9	0.00	0.00	0.00
1,700.0	19.40	181.93	1,635.8	-406.9	-13.7	407.1	0.00	0.00	0.00
1,800.0	19.40	181.93	1,730.1	-440.1	-14.8	440.3	0.00	0.00	0.00
1,900.0	19.40	181.93	1,824.4	-473.2	-15.9	473.5	0.00	0.00	0.00
2,000.0	19.40	181.93	1,918.7	-506.4	-17.1	506.7	0.00	0.00	0.00
Surface Casing									
2,100.0	19.40	181.93	2,013.1	-539.6	-18.2	540.0	0.00	0.00	0.00
2,200.0	19.40	181.93	2,107.4	-572.8	-19.3	573.2	0.00	0.00	0.00
2,300.0	19.40	181.93	2,201.7	-606.0	-20.4	606.4	0.00	0.00	0.00
2,400.0	19.40	181.93	2,296.0	-639.2	-21.5	639.6	0.00	0.00	0.00
2,500.0	19.40	181.93	2,390.3	-672.4	-22.6	672.8	0.00	0.00	0.00
2,600.0	19.40	181.93	2,484.7	-705.6	-23.8	706.0	0.00	0.00	0.00
2,665.0	19.40	181.93	2,546.0	-727.2	-24.5	727.6	0.00	0.00	0.00
WF									
2,700.0	19.40	181.93	2,579.0	-738.8	-24.9	739.3	0.00	0.00	0.00
2,800.0	19.40	181.93	2,673.3	-772.0	-26.0	772.5	0.00	0.00	0.00
2,900.0	19.40	181.93	2,767.6	-805.2	-27.1	805.7	0.00	0.00	0.00
3,000.0	19.40	181.93	2,862.0	-838.4	-28.2	838.9	0.00	0.00	0.00
3,100.0	19.40	181.93	2,956.3	-871.6	-29.4	872.1	0.00	0.00	0.00
3,156.1	19.40	181.93	3,009.2	-890.3	-30.0	890.8	0.00	0.00	0.00
Start Drop -3.50									
3,200.0	17.87	181.93	3,050.8	-904.3	-30.5	904.8	3.50	-3.50	0.00
3,300.0	14.37	181.93	3,146.8	-932.0	-31.4	932.5	3.50	-3.50	0.00
3,400.0	10.87	181.93	3,244.4	-953.8	-32.1	954.4	3.50	-3.50	0.00
3,500.0	7.37	181.93	3,343.1	-969.7	-32.7	970.2	3.50	-3.50	0.00
3,600.0	3.87	181.93	3,442.6	-979.4	-33.0	980.0	3.50	-3.50	0.00
3,700.0	0.37	181.93	3,542.6	-983.1	-33.1	983.7	3.50	-3.50	0.00
3,710.4	0.00	0.00	3,553.0	-983.2	-33.1	983.7	3.50	-3.50	0.00
Back to Vertical - Start 2193.0 hold at 3710.4 MD - Top of Gas - BAT 24B-24-07-96 TGT									
3,800.0	0.00	0.00	3,642.6	-983.2	-33.1	983.7	0.00	0.00	0.00
3,900.0	0.00	0.00	3,742.6	-983.2	-33.1	983.7	0.00	0.00	0.00
4,000.0	0.00	0.00	3,842.6	-983.2	-33.1	983.7	0.00	0.00	0.00

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Project:	Rockies Region	MD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Site:	Speakman A	North Reference:	True
Well:	BAT 24B-24-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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)	
4,100.0	0.00	0.00	3,942.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,200.0	0.00	0.00	4,042.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,300.0	0.00	0.00	4,142.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,400.0	0.00	0.00	4,242.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,500.0	0.00	0.00	4,342.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,600.0	0.00	0.00	4,442.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,700.0	0.00	0.00	4,542.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,800.0	0.00	0.00	4,642.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
4,900.0	0.00	0.00	4,742.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,000.0	0.00	0.00	4,842.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,082.4	0.00	0.00	4,925.0	-983.2	-33.1	983.7	0.00	0.00	0.00	
Cameo										
5,100.0	0.00	0.00	4,942.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,200.0	0.00	0.00	5,042.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,300.0	0.00	0.00	5,142.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,400.0	0.00	0.00	5,242.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,500.0	0.00	0.00	5,342.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,600.0	0.00	0.00	5,442.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,603.4	0.00	0.00	5,446.0	-983.2	-33.1	983.7	0.00	0.00	0.00	
Rollins										
5,700.0	0.00	0.00	5,542.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,800.0	0.00	0.00	5,642.6	-983.2	-33.1	983.7	0.00	0.00	0.00	
5,903.4	0.00	0.00	5,746.0	-983.2	-33.1	983.7	0.00	0.00	0.00	
TD at 5903.4 - BAT 24B-24-07-96 BHL										

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										
BAT 24B-24-07-96 TGT	0.00	0.00	3,553.0	-983.2	-33.1	1,587,317.20	2,276,787.17	39° 25' 4.693 N	108° 3' 36.949 W	
- plan hits target center										
- Rectangle (sides W100.0 H40.0 D2,193.0)										
BAT 24B-24-07-96 BHL	0.00	0.00	5,746.0	-983.2	-33.1	1,587,317.20	2,276,787.17	39° 25' 4.693 N	108° 3' 36.949 W	
- plan hits target center										
- Rectangle (sides W100.0 H40.0 D0.0)										

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
2,665.0	2,546.0	WF		0.00		
3,710.4	3,553.0	Top of Gas		0.00		
5,082.4	4,925.0	Cameo		0.00		
5,603.4	5,446.0	Rollins		0.00		

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Company:	Ursa Operating Company, LLC	TVD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Project:	Rockies Region	MD Reference:	BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)
Site:	Speakman A	North Reference:	True
Well:	BAT 24B-24-07-96	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	0.0	0.0	Start Build 3.50
754.3	743.8	-92.9	-3.1	Start 2401.8 hold at 754.3 MD
2,000.0	1,918.7	-506.4	-17.1	Surface Casing
3,156.1	3,009.2	-890.3	-30.0	Start Drop -3.50
3,710.4	3,553.0	-983.2	-33.1	Back to Vertical
3,710.4	3,553.0	-983.2	-33.1	Start 2193.0 hold at 3710.4 MD
5,903.4	5,746.0	-983.2	-33.1	TD at 5903.4



Well Name: BAT 24B-24-07-96
Surface Location: Speakman A
North American Datum 1983, US State Plane 1983, Colorado Central Zone
Ground Elevation: 5182.5
+N/-S +E/-W Northing Easting Latitude Longitude Slot
0.0 0.0 1588299.04 2276847.98 39° 25' 14.410 N 108° 3' 36.527 W
Original Well Elev BAT 24B-24-07-96 @ 5197.9usft (Original Well Elev)



Azimuths to True North
Magnetic North: 10.08°
Magnetic Field
Strength: 52046.1snT
Dip Angle: 65.63°
Date: 6/15/2013
Model: IGRF200510

Speakman A
BAT 24B-24-07-96
Design #1
17:08, June 10 2014

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

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Shape
BAT 24B-24-07-96 TGT	3553.0	-983.2	-33.1	1587317.21	2276787.17	39° 25' 4.693 N	108° 3' 36.949 W	Rectangle (Sides: L40.0 W100.0)
BAT 24B-24-07-96 BHL	5746.0	-983.2	-33.1	1587317.21	2276787.17	39° 25' 4.693 N	108° 3' 36.949 W	Rectangle (Sides: L40.0 W100.0)

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	200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	
3	754.3	19.40	181.93	743.8	-92.9	-3.1	3.50	181.93	93.0	
4	3156.1	19.40	181.93	3009.2	-890.3	-30.0	0.00	0.00	890.8	
5	3710.4	0.00	0.00	3553.0	-983.2	-33.1	3.50	180.00	983.7	BAT 24B-24-07-96 TGT
6	5903.4	0.00	0.00	5746.0	-983.2	-33.1	0.00	0.00	983.7	BAT 24B-24-07-96 BHL

ANNOTATIONS

TVD	MD	Annotation
200.0	200.0	Start Build 3.50
743.8	754.3	Start 2401.8 hold at 754.3 MD
1918.7	2000.0	Surface Casing
3009.2	3156.1	Start Drop -3.50
3553.0	3710.4	Back to Vertical
3553.0	3710.4	Start 2193.0 hold at 3710.4 MD
5746.0	5903.4	TD at 5903.4

FORMATION TOP DETAILS

TVDPath	MDPath	Formation	DipAngle	DipDir
2546.0	2665.0	WF	0.00	
3553.0	3710.4	Top of Gas	0.00	
4925.0	5082.4	Cameo	0.00	
5446.0	5603.4	Rollins	0.00	

