

**PROJECT DETAILS: Garfield County, CO**

Geodetic System: US State Plane 1983  
Datum: North American Datum 1983  
Ellipsoid: GRS 1960  
Zone: Colorado Central Zone  
System Datum: Mean Sea Level

**WELL DETAILS: CC 0697-03-09W**

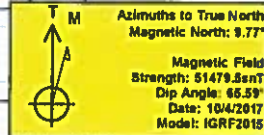
+N/-S 0.0 +E/-W 0.0 Northing 1639404.69 Easting 2233536.95 Elevation 8609.0 Latitude 39.557464 Longitude -108.218803

Project: Garfield County, CO  
Site: CC 604-41-32 Pad  
Well: CC 0697-03-09W  
Wellbore: Wellbore #1  
Design: Design #1  
Latitude: 39.557464  
Longitude: -108.218803  
Ground Level: 8609.0  
well @ 8633.0usft (24' RKB)



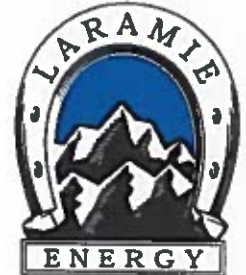
**REFERENCE INFORMATION**

Co-ordinate (NE) Reference: Well CC 0697-03-09W, True North  
Vertical (TVD) Reference: well @ 8633.0usft (24' RKB)  
Section (VS) Reference: Slat - (0.0N, 0.0E)  
Measured Depth Reference: well @ 8633.0usft (24' RKB)  
Calculation Method: Minimum Curvature



**FORMATION TOP DETAILS**

TVDPath	MDPath	Formation
4911.0	5155.3	Wasatch 'G' Sand
5511.0	5952.0	Ohio Creek
6761.0	7110.6	Williams Fork
7561.0	7932.3	TOG
9211.0	9582.3	Cameo
9441.0	9812.3	Base Cameo Coal
9461.0	9832.3	Rollins

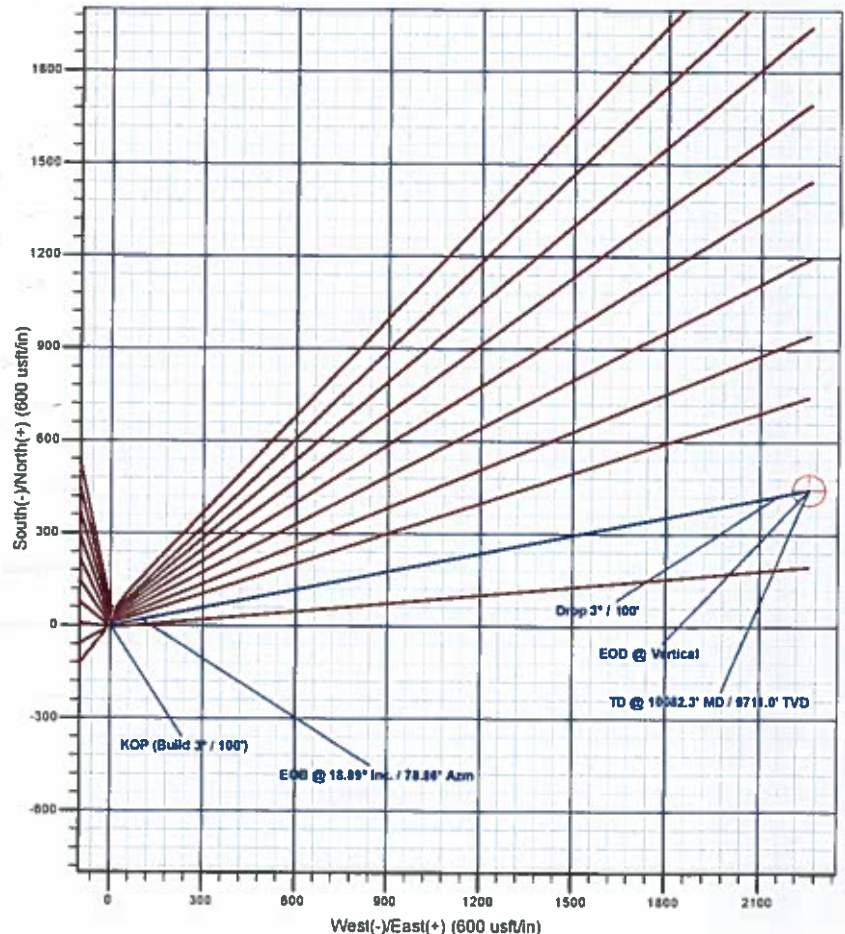
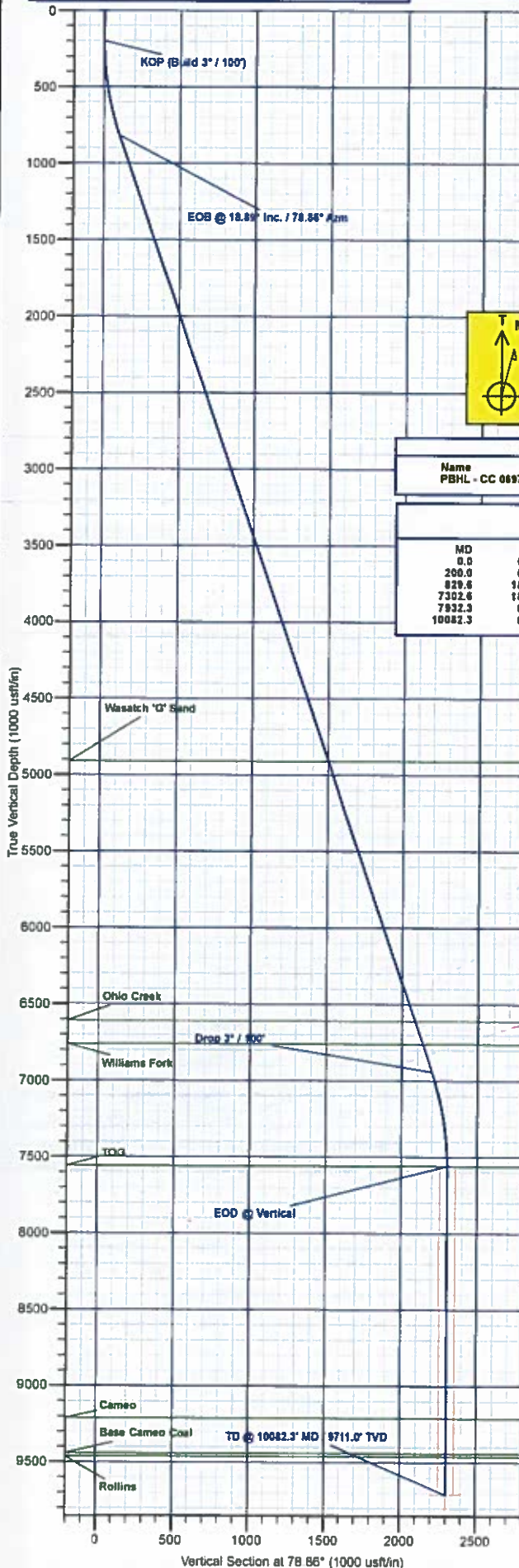


**DESIGN TARGET DETAILS**

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - CC 0697-03-09W	9711.0	444.5	2257.8	1639781.42	2235807.09	39.558684	-108.210795

**SECTION DETAILS**

MD	Inc	Azi	TVD	+N/-S	+E/-W	Diag	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3" / 100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 18.89° Inc. / 78.86° Azm
829.6	18.89	78.86	816.3	19.9	100.9	3.00	78.86	102.6	Drop 3" / 100'
7302.6	18.89	78.86	6942.7	424.6	2156.9	0.00	0.00	2199.3	Drop 3" / 100'
7932.3	0.00	0.00	7561.0	444.5	2257.8	3.00	180.00	2301.2	EOD @ Vertical
10082.3	0.00	0.00	9711.0	444.5	2257.8	0.00	0.00	2301.2	TD @ 10082.3' MD / 9711.0' TVD



Plan: Design #1 (CC 0697-03-09W/Wellbore #1)

Created By: Will Jircik

Date: 14:46, October 04 2017



# **Laramie Energy, LLC**

**Garfield County, CO**

**CC 604-41-32 Pad**

**CC 0697-03-09W**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**04 October, 2017**





# Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-03-09W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 8633.0usft (24' RKB)
Project:	Garfield County, CO	MD Reference:	well @ 8633.0usft (24' RKB)
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC 0697-03-09W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Garfield County, CO		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	Colorado Central Zone		

Site	CC 604-41-32 Pad			
Site Position:		Northing:	1,639,464.67 usft	Latitude: 39 557630
From:	Lat/Long	Easting:	2,233,548.14 usft	Longitude: -108 218770
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence: -1.71 *

Well	CC 0697-03-09W			
Well Position	+N/-S	-60.3 usft	Northing:	1,639,404.68 usft
	+E/-W	-9.4 usft	Easting:	2,233,536.95 usft
Position Uncertainty	0.0 usft	Wellhead Elevation:		Ground Level: 8,609.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/4/2017	9.77	85.59	51,479.46863685

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction
	(usft)	(usft)	(usft)	(°)
	0.0	0.0	0.0	78.86

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	
829.6	18.89	78.86	818.3	19.9	100.9	3.00	3.00	0.00	78.86	
7,302.6	18.89	78.86	6,942.7	424.6	2,156.9	0.00	0.00	0.00	0.00	
7,932.3	0.00	0.00	7,561.0	444.5	2,257.8	3.00	-3.00	0.00	180.00	
10,082.3	0.00	0.00	9,711.0	444.5	2,257.8	0.00	0.00	0.00	0.00	PBHL - CC 0697-03-C



# Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-09W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 8633.0usft (24' RKB)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	well @ 8633.0usft (24' RKB)
<b>Site:</b>	CC 604-41-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-09W	<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)	Buid 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
<b>KOP (Build 3° / 100')</b>									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	78.86	300.0	0.5	2.6	2.6	3.00	3.00	0.00
400.0	6.00	78.86	399.6	2.0	10.3	10.5	3.00	3.00	0.00
500.0	9.00	78.86	498.8	4.5	23.1	23.5	3.00	3.00	0.00
600.0	12.00	78.86	597.1	8.1	40.9	41.7	3.00	3.00	0.00
700.0	15.00	78.86	694.3	12.6	63.9	65.1	3.00	3.00	0.00
800.0	18.00	78.86	790.2	18.1	91.7	93.5	3.00	3.00	0.00
<b>EOB @ 18.89° Inc. / 78.86° Azm</b>									
829.6	18.89	78.86	818.3	19.9	100.9	102.8	3.00	3.00	0.00
900.0	18.89	78.86	884.9	24.3	123.3	125.6	0.00	0.00	0.00
1,000.0	18.89	78.86	979.5	30.5	155.0	158.0	0.00	0.00	0.00
1,100.0	18.89	78.86	1,074.1	36.8	186.8	190.4	0.00	0.00	0.00
1,200.0	18.89	78.86	1,168.7	43.0	218.6	222.7	0.00	0.00	0.00
1,300.0	18.89	78.86	1,263.3	49.3	250.3	255.1	0.00	0.00	0.00
1,400.0	18.89	78.86	1,357.9	55.5	282.1	287.5	0.00	0.00	0.00
1,500.0	18.89	78.86	1,452.6	61.8	313.8	319.9	0.00	0.00	0.00
1,600.0	18.89	78.86	1,547.2	68.0	345.6	352.2	0.00	0.00	0.00
1,700.0	18.89	78.86	1,641.8	74.3	377.4	384.6	0.00	0.00	0.00
1,800.0	18.89	78.86	1,736.4	80.5	409.1	417.0	0.00	0.00	0.00
1,900.0	18.89	78.86	1,831.0	86.8	440.9	449.4	0.00	0.00	0.00
2,000.0	18.89	78.86	1,925.6	93.0	472.7	481.7	0.00	0.00	0.00
2,100.0	18.89	78.86	2,020.2	99.3	504.4	514.1	0.00	0.00	0.00
2,200.0	18.89	78.86	2,114.9	105.6	536.2	546.5	0.00	0.00	0.00
2,300.0	18.89	78.86	2,209.5	111.8	567.9	578.8	0.00	0.00	0.00
2,400.0	18.89	78.86	2,304.1	118.1	599.7	611.2	0.00	0.00	0.00
2,500.0	18.89	78.86	2,398.7	124.3	631.5	643.8	0.00	0.00	0.00
<b>9 5/8"</b>									
2,524.0	18.89	78.86	2,421.4	125.8	639.1	651.4	0.00	0.00	0.00
2,600.0	18.89	78.86	2,493.3	130.6	663.2	676.0	0.00	0.00	0.00
2,700.0	18.89	78.86	2,587.9	136.8	695.0	708.3	0.00	0.00	0.00
2,800.0	18.89	78.86	2,682.6	143.1	726.8	740.7	0.00	0.00	0.00
2,900.0	18.89	78.86	2,777.2	149.3	758.5	773.1	0.00	0.00	0.00
3,000.0	18.89	78.86	2,871.8	155.6	790.3	805.5	0.00	0.00	0.00
3,100.0	18.89	78.86	2,966.4	161.8	822.1	837.8	0.00	0.00	0.00
3,200.0	18.89	78.86	3,061.0	168.1	853.8	870.2	0.00	0.00	0.00
3,300.0	18.89	78.86	3,155.6	174.3	885.6	902.6	0.00	0.00	0.00
3,400.0	18.89	78.86	3,250.2	180.6	917.3	934.9	0.00	0.00	0.00
3,500.0	18.89	78.86	3,344.9	186.8	949.1	967.3	0.00	0.00	0.00
3,600.0	18.89	78.86	3,439.5	193.1	980.9	999.7	0.00	0.00	0.00
3,700.0	18.89	78.86	3,534.1	199.4	1,012.6	1,032.1	0.00	0.00	0.00
3,800.0	18.89	78.86	3,628.7	205.6	1,044.4	1,064.4	0.00	0.00	0.00
3,900.0	18.89	78.86	3,723.3	211.9	1,076.2	1,096.8	0.00	0.00	0.00
4,000.0	18.89	78.86	3,817.9	218.1	1,107.9	1,129.2	0.00	0.00	0.00
4,100.0	18.89	78.86	3,912.5	224.4	1,139.7	1,161.6	0.00	0.00	0.00
4,200.0	18.89	78.86	4,007.2	230.6	1,171.4	1,193.9	0.00	0.00	0.00
4,300.0	18.89	78.86	4,101.8	236.9	1,203.2	1,226.3	0.00	0.00	0.00
4,400.0	18.89	78.86	4,196.4	243.1	1,235.0	1,258.7	0.00	0.00	0.00
4,500.0	18.89	78.86	4,291.0	249.4	1,266.7	1,291.0	0.00	0.00	0.00
4,600.0	18.89	78.86	4,385.6	255.6	1,298.5	1,323.4	0.00	0.00	0.00
4,700.0	18.89	78.86	4,480.2	261.9	1,330.3	1,355.8	0.00	0.00	0.00



## Well Planning Report



Database: EDM 5000.1 Single User Db  
 Company: Laramie Energy, LLC  
 Project: Garfield County, CO  
 Site: CC 804-41-32 Pad  
 Well: CC 0697-03-09W  
 Wellbore: Wellbore #1  
 Design: Design #1

Local Co-ordinate Reference: Well CC 0697-03-09W  
 TVD Reference: well @ 8633.0usft (24' RKB)  
 MD Reference: well @ 8633.0usft (24' RKB)  
 North Reference: True  
 Survey Calculation Method: Minimum Curvature

## 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)
4,800.0	18.89	78.86	4,574.9	268.1	1,362.0	1,388.2	0.00	0.00	0.00
4,900.0	18.89	78.86	4,669.5	274.4	1,393.8	1,420.5	0.00	0.00	0.00
5,000.0	18.89	78.86	4,764.1	280.6	1,425.6	1,452.9	0.00	0.00	0.00
5,100.0	18.89	78.86	4,858.7	286.9	1,457.3	1,485.3	0.00	0.00	0.00
<b>Wasatch 'G' Sand</b>									
5,155.3	18.89	78.86	4,911.0	290.3	1,474.9	1,503.2	0.00	0.00	0.00
5,200.0	18.89	78.86	4,953.3	293.1	1,489.1	1,517.7	0.00	0.00	0.00
5,300.0	18.89	78.86	5,047.9	299.4	1,520.8	1,550.0	0.00	0.00	0.00
5,400.0	18.89	78.86	5,142.5	305.7	1,552.6	1,582.4	0.00	0.00	0.00
5,500.0	18.89	78.86	5,237.2	311.9	1,584.4	1,614.8	0.00	0.00	0.00
5,600.0	18.89	78.86	5,331.8	318.2	1,616.1	1,647.1	0.00	0.00	0.00
5,700.0	18.89	78.86	5,426.4	324.4	1,647.8	1,679.5	0.00	0.00	0.00
5,800.0	18.89	78.86	5,521.0	330.7	1,679.7	1,711.9	0.00	0.00	0.00
5,900.0	18.89	78.86	5,615.6	336.9	1,711.4	1,744.3	0.00	0.00	0.00
6,000.0	18.89	78.86	5,710.2	343.2	1,743.2	1,776.6	0.00	0.00	0.00
6,100.0	18.89	78.86	5,804.8	349.4	1,774.9	1,809.0	0.00	0.00	0.00
6,200.0	18.89	78.86	5,899.5	355.7	1,806.7	1,841.4	0.00	0.00	0.00
6,300.0	18.89	78.86	5,994.1	361.9	1,838.5	1,873.8	0.00	0.00	0.00
6,400.0	18.89	78.86	6,088.7	368.2	1,870.2	1,906.1	0.00	0.00	0.00
6,500.0	18.89	78.86	6,183.3	374.4	1,902.0	1,938.5	0.00	0.00	0.00
6,600.0	18.89	78.86	6,277.9	380.7	1,933.8	1,970.9	0.00	0.00	0.00
6,700.0	18.89	78.86	6,372.5	386.9	1,965.5	2,003.2	0.00	0.00	0.00
6,800.0	18.89	78.86	6,467.2	393.2	1,997.3	2,035.6	0.00	0.00	0.00
6,900.0	18.89	78.86	6,561.8	399.4	2,029.0	2,068.0	0.00	0.00	0.00
<b>Ohio Creek</b>									
6,952.0	18.89	78.86	6,611.0	402.7	2,045.6	2,084.8	0.00	0.00	0.00
7,000.0	18.89	78.86	6,656.4	405.7	2,060.8	2,100.4	0.00	0.00	0.00
7,100.0	18.89	78.86	6,751.0	412.0	2,092.6	2,132.7	0.00	0.00	0.00
<b>Williams Fork</b>									
7,110.6	18.89	78.86	6,761.0	412.6	2,095.9	2,136.2	0.00	0.00	0.00
7,200.0	18.89	78.86	6,845.6	418.2	2,124.3	2,165.1	0.00	0.00	0.00
7,300.0	18.89	78.86	6,940.2	424.5	2,156.1	2,197.5	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
7,302.6	18.89	78.86	6,942.7	424.6	2,156.9	2,198.3	0.00	0.00	0.00
7,400.0	15.97	78.86	7,035.6	430.3	2,185.5	2,227.5	3.00	-3.00	0.00
7,500.0	12.97	78.86	7,132.4	435.1	2,210.1	2,252.5	3.00	-3.00	0.00
7,600.0	9.97	78.86	7,230.4	438.9	2,229.6	2,272.4	3.00	-3.00	0.00
7,700.0	6.97	78.86	7,329.3	441.8	2,244.0	2,287.1	3.00	-3.00	0.00
7,800.0	3.97	78.86	7,428.9	443.6	2,253.4	2,296.6	3.00	-3.00	0.00
7,900.0	0.97	78.86	7,528.7	444.4	2,257.6	2,300.9	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
7,932.3	0.00	0.00	7,561.0	444.5	2,257.8	2,301.2	3.00	-3.00	0.00
8,000.0	0.00	0.00	7,628.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,100.0	0.00	0.00	7,728.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,200.0	0.00	0.00	7,828.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,300.0	0.00	0.00	7,928.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,400.0	0.00	0.00	8,028.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,500.0	0.00	0.00	8,128.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,600.0	0.00	0.00	8,228.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,700.0	0.00	0.00	8,328.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,800.0	0.00	0.00	8,428.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
8,900.0	0.00	0.00	8,528.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,000.0	0.00	0.00	8,628.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,100.0	0.00	0.00	8,728.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00



## Well Planning Report



Database: EDM 5000.1 Single User Db  
 Company: Laramie Energy, LLC  
 Project: Garfield County, CO  
 Site: CC 604-41-32 Pad  
 Well: CC 0697-03-09W  
 Wellbore: Wellbore #1  
 Design: Design #1

Local Co-ordinate Reference:  
 TVD Reference:  
 MD Reference:  
 North Reference:  
 Survey Calculation Method:

Well CC 0697-03-09W  
 well @ 8633.0usft (24' RKB)  
 well @ 8633.0usft (24' RKB)  
 True  
 Minimum Curvature

## 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)
9,200.0	0.00	0.00	8,828.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,300.0	0.00	0.00	8,928.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,400.0	0.00	0.00	9,028.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,500.0	0.00	0.00	9,128.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
<b>Cameo</b>									
9,582.3	0.00	0.00	9,211.0	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,600.0	0.00	0.00	9,228.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,700.0	0.00	0.00	9,328.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,800.0	0.00	0.00	9,428.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
9,812.3	0.00	0.00	9,441.0	444.5	2,257.8	2,301.2	0.00	0.00	0.00
<b>Rollins</b>									
9,832.3	0.00	0.00	9,461.0	444.5	2,257.8	2,301.2	0.00	0.00	0.00
9,900.0	0.00	0.00	9,528.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
10,000.0	0.00	0.00	9,628.7	444.5	2,257.8	2,301.2	0.00	0.00	0.00
<b>TD @ 10082.3' MD / 9711.0' TVD</b>									
10,082.3	0.00	0.00	9,711.0	444.5	2,257.8	2,301.2	0.00	0.00	0.00

## Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PBHL - CC 0697-03-09V - plan hits target center - Circle (radius 50.0)	0.00	0.00	9,711.0	444.5	2,257.8	1,639,781.41	2,235,807.09	39 558684	-108 210795

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,524.0	2,421.4	9 5/8"	9-5/8	14-3/4

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
5,155.3	4,911.0	Wasatch 'G' Sand			
6,952.0	6,611.0	Ohio Creek			
7,110.6	6,761.0	Williams Fork			
7,932.3	7,561.0	TOG			
9,582.3	9,211.0	Cameo			
9,812.3	9,441.0	Base Cameo Coal			
9,832.3	9,461.0	Rollins			



## Well Planning Report



<b>Database:</b>	EDM 5000.1 Single User Db	<b>Local Co-ordinate Reference:</b>	Well CC 0697-03-09W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 8633.0usft (24' RKB)
<b>Project:</b>	Garfield County, CO	<b>MD Reference:</b>	well @ 8633.0usft (24' RKB)
<b>Site:</b>	CC 604-41-32 Pad	<b>North Reference:</b>	True
<b>Well:</b>	CC 0697-03-09W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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	KOP (Build 3" / 100')
829.6	818.3	19.9	100.9	EOB @ 18.89° Inc. / 78.86° Azm
7,302.6	6,942.7	424.6	2,156.9	Drop 3" / 100'
7,932.3	7,561.0	444.5	2,257.8	EOD @ Vertical
10,082.3	9,711.0	444.5	2,257.8	TD @ 10082.3' MD / 9711.0' TVD