



Project: Mesa County, CO  
 Site: Bruton 19-06 Pad  
 Well: Bruton 19-06W  
 Wellbore: Wellbore #1  
 Design: Design #2  
 Latitude: 39.262892  
 Longitude: -107.815064  
 Ground Level: 7262.0  
 well @ 7286.0usft (H&P #290)



PROJECT DETAILS: Mesa County, CO

Geodetic System: US State Plane 1983  
 Datum: North American Datum 1983  
 Ellipsoid: GRS 1980  
 Zone: Colorado Central Zone  
 System Datum: Mean Sea Level

REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well Bruton 19-06W, True North  
 Vertical (TVD) Reference: well @ 7286.0usft (H&P #290)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7286.0usft (H&P #290)  
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-06W

+N-S	+E-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1528993.70	2344595.14	39.262892	-107.815064

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

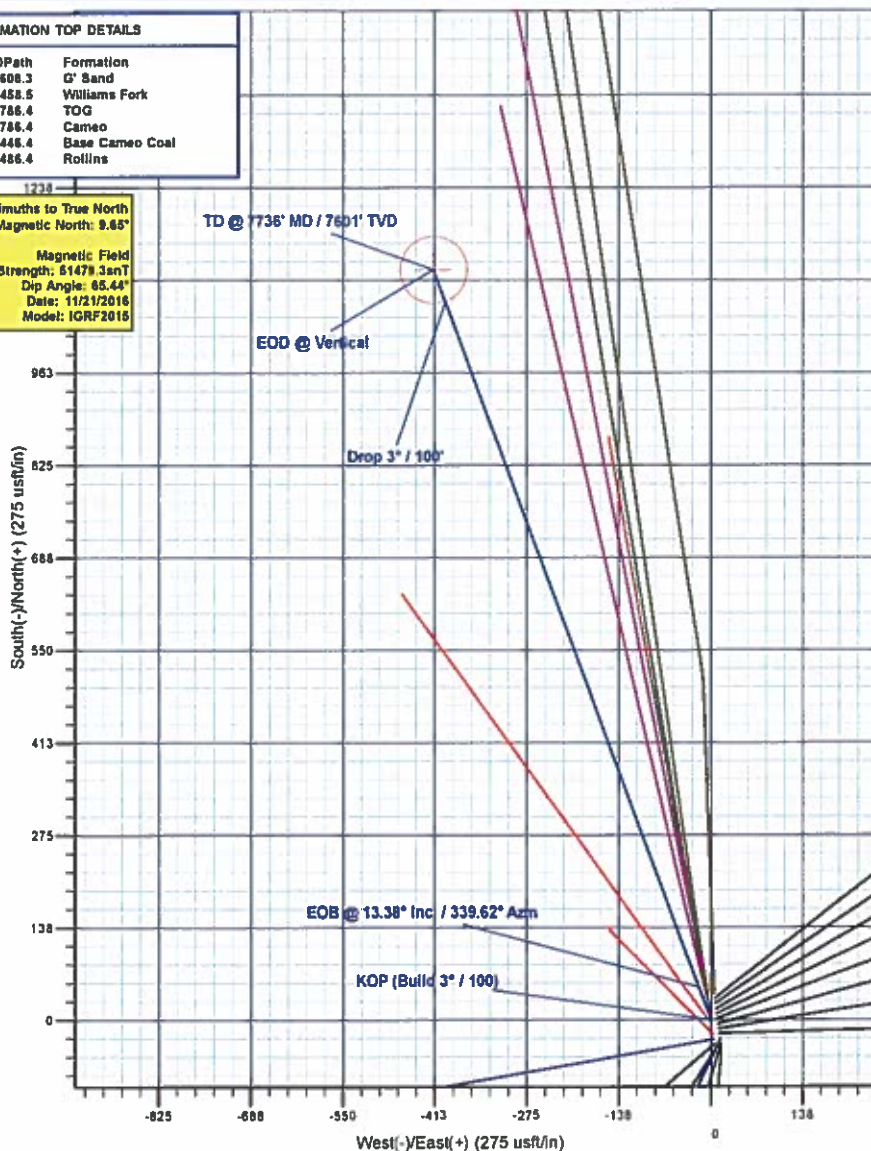
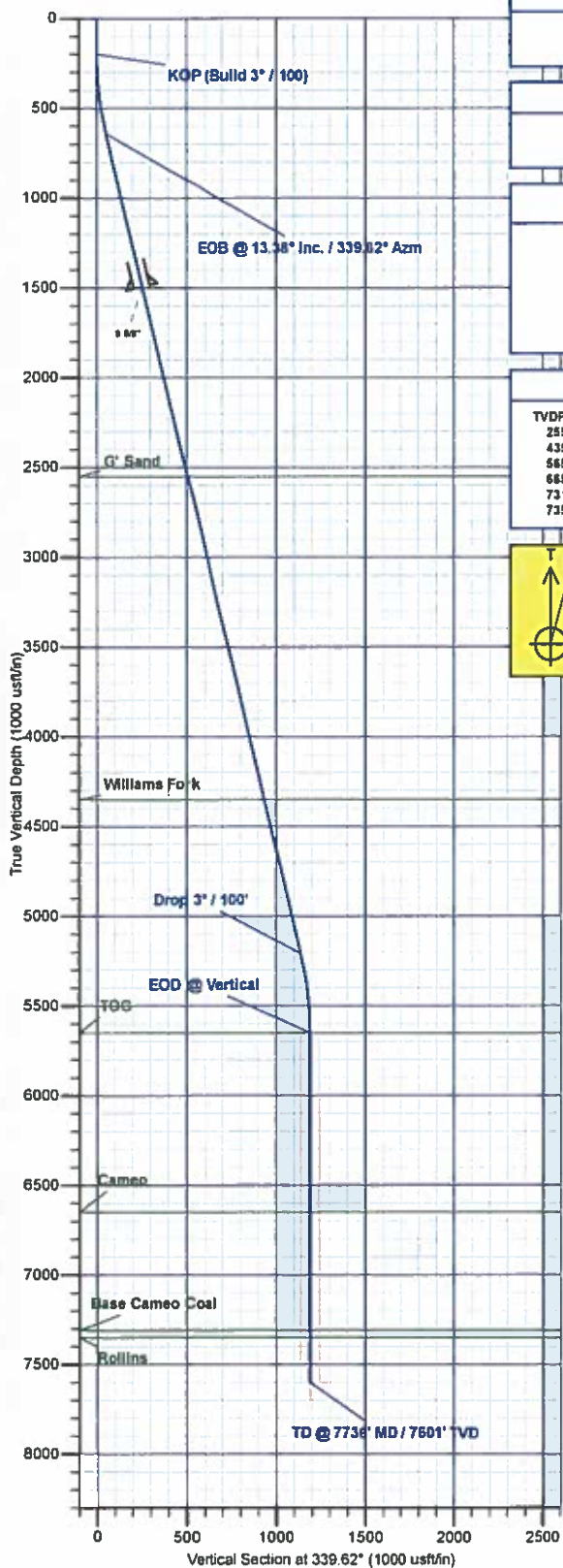
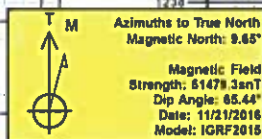
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-06W	7601.0	1115.2	-414.2	1530119.14	2344209.48	39.265954	-107.816527

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSeet	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100°)
645.9	13.38	339.62	641.8	48.6	-18.0	3.00	339.62	51.8	EOB @ 13.38° Inc. / 339.62° Azm
5340.6	13.38	339.62	5209.2	1066.7	-396.2	0.00	0.00	1137.9	Drop 3° / 100°
5786.4	0.00	0.00	5651.0	1115.2	-414.2	3.00	180.00	1189.7	EOD @ Vertical
7736.4	0.00	0.00	7601.0	1115.2	-414.2	0.00	0.00	1189.7	TD @ 7736° MD / 7601° TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2551.0	2606.3	G' Sand
4351.0	4458.5	Williams Fork
5651.0	5786.4	TOG
6651.0	6786.4	Cameo
7311.0	7446.4	Base Cameo Coal
7351.0	7486.4	Rollins



Plan: Design #2 (Bruton 19-06W/Wellbore #1)

Created By: Will Jircik Date: 11:54, March 01 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 19-06 Pad**

**Bruton 19-06W**

**Wellbore #1**

**Plan: Design #2**

## **QES Well Planning Report**

**01 March, 2017**





# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-06W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-06W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

<b>Project</b>	Mesa County, CO		
<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>	Bruton 19-06 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,528,940.55 usft	<b>Latitude:</b> 39.262756
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,344,737.10 usft	<b>Longitude:</b> -107.814558
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.46 "

<b>Well</b>	Bruton 19-06W			
<b>Well Position</b>	+N/-S	49.5 usft	<b>Northing:</b>	1,528,993.70 usft
	+E/-W	-143.3 usft	<b>Easting:</b>	2,344,595.14 usft
<b>Position Uncertainty</b>	0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft	<b>Ground Level:</b> 7,262.0 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>
	IGRF2015	11/21/2016	9.65	65.44	51,479

<b>Design</b>	Design #2			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<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	339.62

<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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
645.9	13.38	339.62	641.8	48.6	-18.0	3.00	3.00	0.00	339.62	
5,340.6	13.38	339.62	5,209.2	1,066.7	-396.2	0.00	0.00	0.00	0.00	
5,786.4	0.00	0.00	5,651.0	1,115.2	-414.2	3.00	-3.00	0.00	180.00	
7,736.4	0.00	0.00	7,601.0	1,115.2	-414.2	0.00	0.00	0.00	0.00	PBHL - Bruton 19-06W





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-06W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286.0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-06W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## 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
<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	339.62	300.0	2.5	-0.9	2.6	3.00	3.00	0.00
400.0	6.00	339.62	399.6	9.8	-3.6	10.5	3.00	3.00	0.00
500.0	9.00	339.62	498.8	22.0	-8.2	23.5	3.00	3.00	0.00
600.0	12.00	339.62	597.1	39.1	-14.5	41.7	3.00	3.00	0.00
<b>EOB @ 13.38° Inc. / 339.62° Azm</b>									
645.9	13.38	339.62	641.9	48.6	-18.0	51.8	3.00	3.00	0.00
700.0	13.38	339.62	694.5	60.3	-22.4	64.3	0.00	0.00	0.00
800.0	13.38	339.62	791.8	82.0	-30.5	87.5	0.00	0.00	0.00
900.0	13.38	339.62	889.1	103.7	-38.5	110.6	0.00	0.00	0.00
1,000.0	13.38	339.62	986.4	125.4	-46.6	133.7	0.00	0.00	0.00
1,100.0	13.38	339.62	1,083.6	147.1	-54.6	156.9	0.00	0.00	0.00
1,200.0	13.38	339.62	1,180.9	168.7	-62.7	180.0	0.00	0.00	0.00
1,300.0	13.38	339.62	1,278.2	190.4	-70.7	203.1	0.00	0.00	0.00
1,400.0	13.38	339.62	1,375.5	212.1	-78.8	226.3	0.00	0.00	0.00
1,500.0	13.38	339.62	1,472.8	233.8	-86.8	249.4	0.00	0.00	0.00
<b>8 5/8"</b>									
1,524.0	13.38	339.62	1,496.1	239.0	-88.8	255.0	0.00	0.00	0.00
1,600.0	13.38	339.62	1,570.1	255.5	-94.9	272.5	0.00	0.00	0.00
1,700.0	13.38	339.62	1,667.4	277.2	-102.9	295.7	0.00	0.00	0.00
1,800.0	13.38	339.62	1,764.7	298.9	-111.0	318.8	0.00	0.00	0.00
1,900.0	13.38	339.62	1,861.9	320.5	-119.1	341.9	0.00	0.00	0.00
2,000.0	13.38	339.62	1,959.2	342.2	-127.1	365.1	0.00	0.00	0.00
2,100.0	13.38	339.62	2,056.5	363.9	-135.2	388.2	0.00	0.00	0.00
2,200.0	13.38	339.62	2,153.8	385.6	-143.2	411.3	0.00	0.00	0.00
2,300.0	13.38	339.62	2,251.1	407.3	-151.3	434.5	0.00	0.00	0.00
2,400.0	13.38	339.62	2,348.4	429.0	-159.3	457.6	0.00	0.00	0.00
2,500.0	13.38	339.62	2,445.7	450.7	-167.4	480.7	0.00	0.00	0.00
2,600.0	13.38	339.62	2,543.0	472.3	-175.4	503.9	0.00	0.00	0.00
<b>G<sup>+</sup> Sand</b>									
2,608.3	13.38	339.62	2,551.0	474.1	-176.1	505.8	0.00	0.00	0.00
2,700.0	13.38	339.62	2,640.2	494.0	-183.5	527.0	0.00	0.00	0.00
2,800.0	13.38	339.62	2,737.5	515.7	-191.5	550.1	0.00	0.00	0.00
2,900.0	13.38	339.62	2,834.8	537.4	-199.6	573.3	0.00	0.00	0.00
3,000.0	13.38	339.62	2,932.1	559.1	-207.7	596.4	0.00	0.00	0.00
3,100.0	13.38	339.62	3,029.4	580.8	-215.7	619.5	0.00	0.00	0.00
3,200.0	13.38	339.62	3,126.7	602.5	-223.8	642.7	0.00	0.00	0.00
3,300.0	13.38	339.62	3,224.0	624.2	-231.8	665.8	0.00	0.00	0.00
3,400.0	13.38	339.62	3,321.3	645.8	-239.9	688.9	0.00	0.00	0.00
3,500.0	13.38	339.62	3,418.5	667.5	-247.9	712.1	0.00	0.00	0.00
3,600.0	13.38	339.62	3,515.8	689.2	-256.0	735.2	0.00	0.00	0.00
3,700.0	13.38	339.62	3,613.1	710.9	-264.0	758.3	0.00	0.00	0.00
3,800.0	13.38	339.62	3,710.4	732.6	-272.1	781.5	0.00	0.00	0.00
3,900.0	13.38	339.62	3,807.7	754.3	-280.1	804.6	0.00	0.00	0.00
4,000.0	13.38	339.62	3,905.0	776.0	-288.2	827.8	0.00	0.00	0.00
4,100.0	13.38	339.62	4,002.3	797.6	-296.2	850.9	0.00	0.00	0.00
4,200.0	13.38	339.62	4,099.5	819.3	-304.3	874.0	0.00	0.00	0.00
4,300.0	13.38	339.62	4,196.8	841.0	-312.4	897.2	0.00	0.00	0.00
4,400.0	13.38	339.62	4,294.1	862.7	-320.4	920.3	0.00	0.00	0.00
<b>Williams Fork</b>									
4,458.5	13.38	339.62	4,351.0	875.4	-325.1	933.8	0.00	0.00	0.00



## Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-06W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7286.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7286.0usft (H&P #290)
Site:	Bruton 19-06 Pad	North Reference:	True
Well:	Bruton 19-06W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

## 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)
4,500.0	13.38	339.62	4,391.4	884.4	-328.5	943.4	0.00	0.00	0.00
4,600.0	13.38	339.62	4,488.7	906.1	-336.5	966.6	0.00	0.00	0.00
4,700.0	13.38	339.62	4,586.0	927.8	-344.6	989.7	0.00	0.00	0.00
4,800.0	13.38	339.62	4,683.3	949.5	-352.6	1,012.8	0.00	0.00	0.00
4,900.0	13.38	339.62	4,780.6	971.1	-360.7	1,036.0	0.00	0.00	0.00
5,000.0	13.38	339.62	4,877.8	992.8	-368.7	1,059.1	0.00	0.00	0.00
5,100.0	13.38	339.62	4,975.1	1,014.5	-376.8	1,082.2	0.00	0.00	0.00
5,200.0	13.38	339.62	5,072.4	1,036.2	-384.8	1,105.4	0.00	0.00	0.00
5,300.0	13.38	339.62	5,169.7	1,057.9	-392.9	1,128.5	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,340.6	13.38	339.62	5,209.2	1,066.7	-396.2	1,137.9	0.00	0.00	0.00
5,400.0	11.59	339.62	5,267.2	1,078.7	-400.6	1,150.7	3.00	-3.00	0.00
5,500.0	8.59	339.62	5,365.6	1,095.2	-406.7	1,168.2	3.00	-3.00	0.00
5,600.0	5.59	339.62	5,464.9	1,106.7	-411.0	1,180.6	3.00	-3.00	0.00
5,700.0	2.59	339.62	5,564.6	1,113.4	-413.5	1,187.7	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
5,786.4	0.00	0.00	5,651.0	1,115.2	-414.2	1,189.7	3.00	-3.00	23.57
5,800.0	0.00	0.00	5,664.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
5,900.0	0.00	0.00	5,764.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,000.0	0.00	0.00	5,864.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,100.0	0.00	0.00	5,964.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,200.0	0.00	0.00	6,064.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,300.0	0.00	0.00	6,164.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,400.0	0.00	0.00	6,264.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,500.0	0.00	0.00	6,364.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,600.0	0.00	0.00	6,464.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,700.0	0.00	0.00	6,564.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
<b>Cameo</b>									
6,786.4	0.00	0.00	6,651.0	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,800.0	0.00	0.00	6,664.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
6,900.0	0.00	0.00	6,764.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,000.0	0.00	0.00	6,864.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,100.0	0.00	0.00	6,964.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,200.0	0.00	0.00	7,064.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,300.0	0.00	0.00	7,164.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,400.0	0.00	0.00	7,264.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,446.4	0.00	0.00	7,311.0	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
<b>Rollins</b>									
7,486.4	0.00	0.00	7,351.0	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,500.0	0.00	0.00	7,364.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,464.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,564.6	1,115.2	-414.2	1,189.7	0.00	0.00	0.00
<b>TD @ 7736' MD / 7601' TVD</b>									
7,736.4	0.00	0.00	7,601.0	1,115.2	-414.2	1,189.7	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-06W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7286 0usft (H&P #290)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7286 0usft (H&P #290)
<b>Site:</b>	Bruton 19-06 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-06W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## 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 - Bruton 19-06W - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,601.0	1,115.2	-414.2	1,530,119.14	2,344,209.49	39 265954	-107.816527

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,496.1	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,608.3	2,551.0	G' Sand			
4,458.5	4,351.0	Williams Fork			
5,786.4	5,651.0	TOG			
6,786.4	6,651.0	Cameo			
7,446.4	7,311.0	Base Cameo Coal			
7,486.4	7,351.0	Rollins			

## 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)
645.9	641.9	48.6	-18.0	EOB @ 13.38° Inc. / 339.62° Azm
5,340.6	5,209.2	1,066.7	-396.2	Drop 3" / 100'
5,786.4	5,651.0	1,115.2	-414.2	EOD @ Vertical
7,736.4	7,601.0	1,115.2	-414.2	TD @ 7736' MD / 7601' TVD