



Project: Mesa County, CO  
 Site: Bruton 19-06 Pad  
 Well: Bruton 19-03E  
 Wellbore: Wellbore #1  
 Design: Design #2  
 Latitude: 39.262978  
 Longitude: -107.815044  
 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 19-03E, 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 19-03E

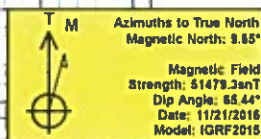
+N-S	+E-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1529024.79	2344601.47	39.262978	-107.815044

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-03E	7636.0	1810.0	2328.7	1530774.86	2346975.58	39.267847	-107.806819

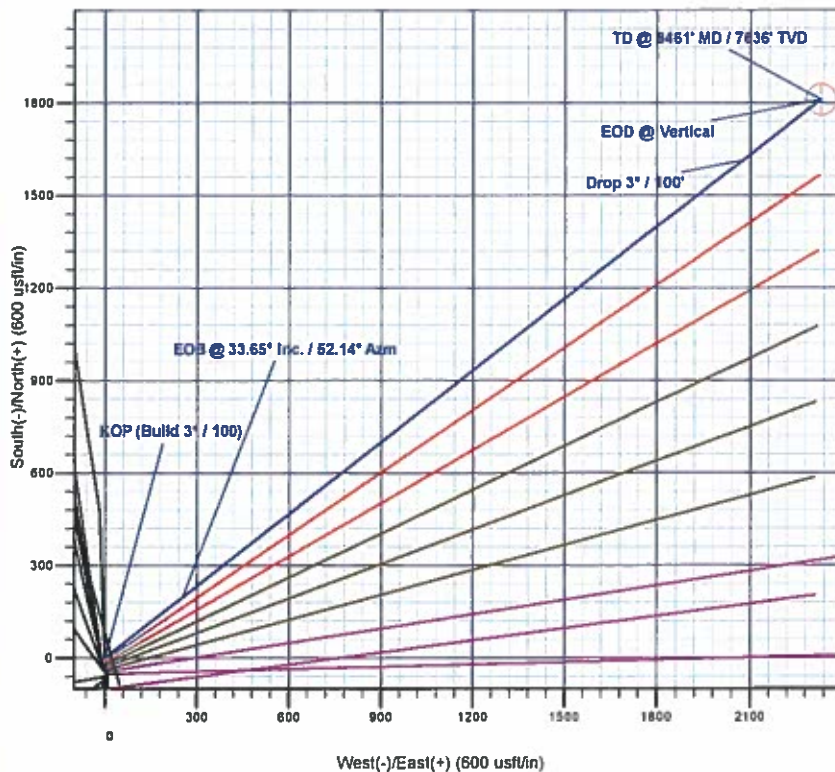
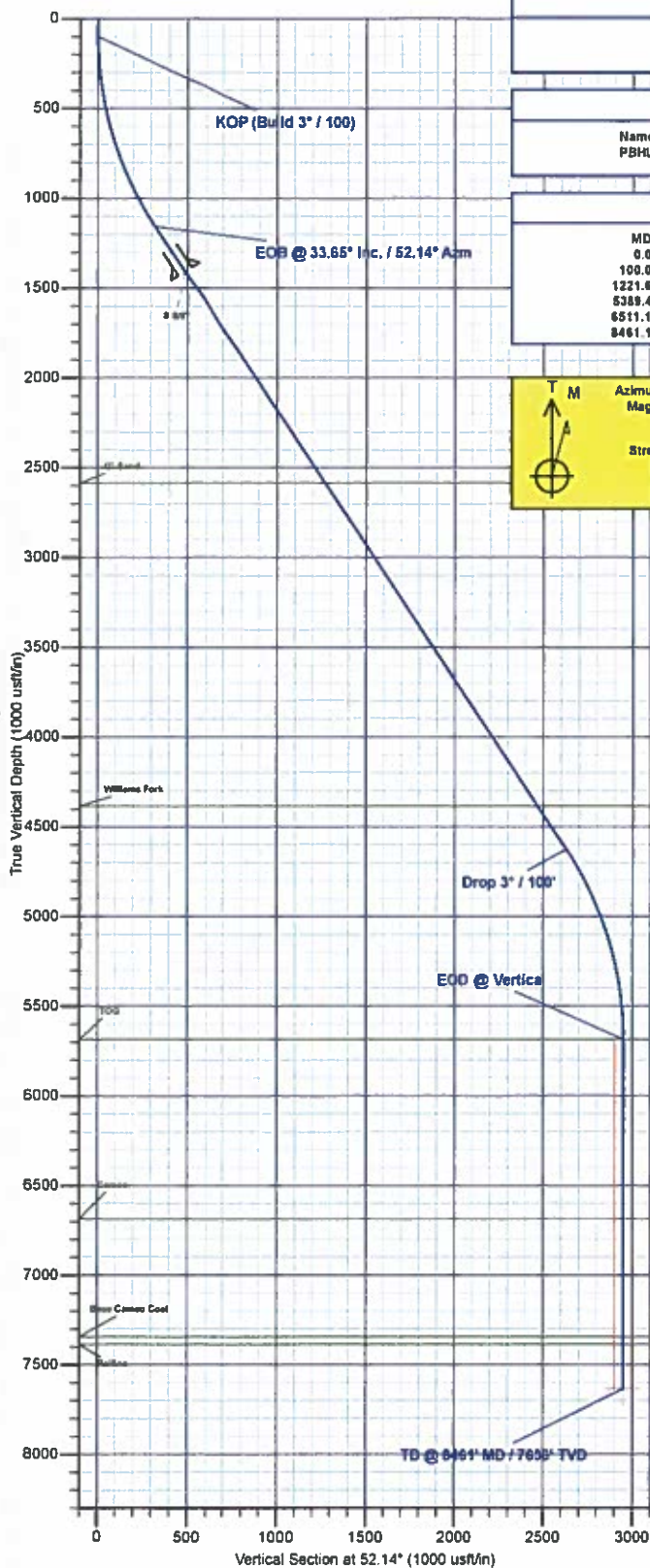
SECTION DETAILS

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	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3" / 100)
1221.6	33.65	52.14	1158.3	196.4	252.7	3.00	52.14	320.0	EOB @ 33.65° Inc. / 52.14° Azm
5389.4	33.65	52.14	4627.7	1613.6	2076.1	0.00	0.00	2629.4	Drop 3" / 100'
6511.1	0.00	0.00	5686.0	1810.0	2328.7	3.00	180.00	2948.4	EOD @ Vertical
8461.1	0.00	0.00	7636.0	1810.0	2328.7	0.00	0.00	2948.4	TD @ 8461' MD / 7636' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2586.0	2936.8	G' Sand
4386.0	5099.1	Williams Fork
5686.0	6511.1	TOG
6686.0	7511.1	Cameo
7346.0	8171.1	Base Cameo Coal
7386.0	8211.1	Rollins



Plan: Design #2 (Bruton 19-03E/Wellbore #1)

Created By: Will Jircik Date: 9:14, March 01 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 19-06 Pad**

**Bruton 19-03E**

**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 19-03E
<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 19-03E	<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 19-03E				
<b>Well Position</b>	+N/-S	80.8 usft	<b>Northing:</b>	1,529,024.80 usft	<b>Latitude:</b> 39.262978
	+E/-W	-137.7 usft	<b>Easting:</b>	2,344,601.48 usft	<b>Longitude:</b> -107.815045
<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	52.14

<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	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,221.6	33.65	52.14	1,158.3	196.4	252.7	3.00	3.00	0.00	52.14	
5,389.4	33.65	52.14	4,627.7	1,613.6	2,076.1	0.00	0.00	0.00	0.00	
6,511.1	0.00	0.00	5,686.0	1,810.0	2,328.7	3.00	-3.00	0.00	180.00	
8,461.1	0.00	0.00	7,636.0	1,810.0	2,328.7	0.00	0.00	0.00	0.00	PBHL - Bruton 19-03E





## Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-03E
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 19-03E	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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
<b>KOP (Build 3° / 100)</b>									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	3.00	52.14	200.0	1.6	2.1	2.6	3.00	3.00	0.00
300.0	6.00	52.14	299.6	6.4	8.3	10.5	3.00	3.00	0.00
400.0	9.00	52.14	398.8	14.4	18.6	23.5	3.00	3.00	0.00
500.0	12.00	52.14	497.1	25.6	33.0	41.7	3.00	3.00	0.00
600.0	15.00	52.14	594.3	39.9	51.4	65.1	3.00	3.00	0.00
700.0	18.00	52.14	690.2	57.4	73.8	93.5	3.00	3.00	0.00
800.0	21.00	52.14	784.4	77.8	100.2	126.9	3.00	3.00	0.00
900.0	24.00	52.14	876.8	101.3	130.4	165.1	3.00	3.00	0.00
1,000.0	27.00	52.14	967.1	127.7	164.4	208.2	3.00	3.00	0.00
1,100.0	30.00	52.14	1,054.9	157.0	202.0	255.9	3.00	3.00	0.00
1,200.0	33.00	52.14	1,140.2	189.1	243.3	308.1	3.00	3.00	0.00
<b>EOB @ 33.65° Inc. / 52.14° Azm</b>									
1,221.6	33.65	52.14	1,158.2	196.4	252.6	320.0	3.00	3.00	0.00
1,300.0	33.65	52.14	1,223.5	223.0	286.9	363.4	0.00	0.00	0.00
1,400.0	33.65	52.14	1,306.7	257.0	330.7	418.8	0.00	0.00	0.00
1,500.0	33.65	52.14	1,390.0	291.0	374.4	474.2	0.00	0.00	0.00
<b>8 5/8"</b>									
1,524.0	33.65	52.14	1,410.0	299.2	384.9	487.5	0.00	0.00	0.00
1,600.0	33.65	52.14	1,473.2	325.0	418.2	529.7	0.00	0.00	0.00
1,700.0	33.65	52.14	1,556.5	359.0	461.9	585.1	0.00	0.00	0.00
1,800.0	33.65	52.14	1,639.7	393.0	505.7	640.5	0.00	0.00	0.00
1,900.0	33.65	52.14	1,723.0	427.1	549.4	695.9	0.00	0.00	0.00
2,000.0	33.65	52.14	1,806.2	461.1	593.2	751.3	0.00	0.00	0.00
2,100.0	33.65	52.14	1,889.5	495.1	636.9	806.7	0.00	0.00	0.00
2,200.0	33.65	52.14	1,972.7	529.1	680.7	862.1	0.00	0.00	0.00
2,300.0	33.65	52.14	2,055.9	563.1	724.4	917.5	0.00	0.00	0.00
2,400.0	33.65	52.14	2,139.2	597.1	768.2	972.9	0.00	0.00	0.00
2,500.0	33.65	52.14	2,222.4	631.1	811.9	1,028.4	0.00	0.00	0.00
2,600.0	33.65	52.14	2,305.7	665.1	855.7	1,083.8	0.00	0.00	0.00
2,700.0	33.65	52.14	2,388.9	699.1	899.4	1,139.2	0.00	0.00	0.00
2,800.0	33.65	52.14	2,472.2	733.1	943.2	1,194.6	0.00	0.00	0.00
2,900.0	33.65	52.14	2,555.4	767.1	986.9	1,250.0	0.00	0.00	0.00
<b>G' Sand</b>									
2,936.8	33.65	52.14	2,586.0	779.6	1,003.0	1,270.4	0.00	0.00	0.00
3,000.0	33.65	52.14	2,638.7	801.1	1,030.7	1,305.4	0.00	0.00	0.00
3,100.0	33.65	52.14	2,721.9	835.1	1,074.4	1,360.8	0.00	0.00	0.00
3,200.0	33.65	52.14	2,805.1	869.1	1,118.2	1,416.2	0.00	0.00	0.00
3,300.0	33.65	52.14	2,888.4	903.1	1,161.9	1,471.6	0.00	0.00	0.00
3,400.0	33.65	52.14	2,971.6	937.1	1,205.7	1,527.1	0.00	0.00	0.00
3,500.0	33.65	52.14	3,054.9	971.1	1,249.4	1,582.5	0.00	0.00	0.00
3,600.0	33.65	52.14	3,138.1	1,005.1	1,293.2	1,637.9	0.00	0.00	0.00
3,700.0	33.65	52.14	3,221.4	1,039.1	1,336.9	1,693.3	0.00	0.00	0.00
3,800.0	33.65	52.14	3,304.6	1,073.1	1,380.7	1,748.7	0.00	0.00	0.00
3,900.0	33.65	52.14	3,387.9	1,107.1	1,424.4	1,804.1	0.00	0.00	0.00
4,000.0	33.65	52.14	3,471.1	1,141.1	1,468.2	1,859.5	0.00	0.00	0.00
4,100.0	33.65	52.14	3,554.3	1,175.1	1,511.9	1,914.9	0.00	0.00	0.00
4,200.0	33.65	52.14	3,637.6	1,209.2	1,555.7	1,970.3	0.00	0.00	0.00
4,300.0	33.65	52.14	3,720.8	1,243.2	1,599.4	2,025.8	0.00	0.00	0.00
4,400.0	33.65	52.14	3,804.1	1,277.2	1,643.2	2,081.2	0.00	0.00	0.00
4,500.0	33.65	52.14	3,887.3	1,311.2	1,686.9	2,136.6	0.00	0.00	0.00
4,600.0	33.65	52.14	3,970.6	1,345.2	1,730.7	2,192.0	0.00	0.00	0.00



# Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-03E
<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 19-03E	<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)
4,700.0	33.65	52.14	4,053.8	1,379.2	1,774.4	2,247.4	0.00	0.00	0.00
4,800.0	33.65	52.14	4,137.1	1,413.2	1,818.2	2,302.8	0.00	0.00	0.00
4,900.0	33.65	52.14	4,220.3	1,447.2	1,861.9	2,358.2	0.00	0.00	0.00
5,000.0	33.65	52.14	4,303.5	1,481.2	1,905.7	2,413.6	0.00	0.00	0.00
<b>Williams Fork</b>									
5,099.1	33.65	52.14	4,386.0	1,514.9	1,949.0	2,468.5	0.00	0.00	0.00
5,100.0	33.65	52.14	4,386.8	1,515.2	1,949.4	2,469.0	0.00	0.00	0.00
5,200.0	33.65	52.14	4,470.0	1,549.2	1,993.2	2,524.4	0.00	0.00	0.00
5,300.0	33.65	52.14	4,553.3	1,583.2	2,036.9	2,579.9	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,389.4	33.65	52.14	4,627.7	1,613.6	2,076.1	2,629.4	0.00	0.00	0.00
5,400.0	33.33	52.14	4,636.5	1,617.2	2,080.7	2,635.2	2.99	-2.99	0.00
5,500.0	30.33	52.14	4,721.5	1,649.6	2,122.3	2,688.0	3.00	-3.00	0.00
5,600.0	27.33	52.14	4,809.1	1,679.1	2,160.4	2,736.2	3.00	-3.00	0.00
5,700.0	24.33	52.14	4,899.1	1,705.9	2,194.8	2,779.8	3.00	-3.00	0.00
5,800.0	21.33	52.14	4,991.2	1,729.7	2,225.4	2,818.6	3.00	-3.00	0.00
5,900.0	18.33	52.14	5,085.3	1,750.5	2,252.2	2,852.5	3.00	-3.00	0.00
6,000.0	15.33	52.14	5,181.0	1,768.3	2,275.1	2,881.5	3.00	-3.00	0.00
6,100.0	12.33	52.14	5,278.1	1,782.9	2,293.9	2,905.4	3.00	-3.00	0.00
6,200.0	9.33	52.14	5,376.3	1,794.5	2,308.8	2,924.1	3.00	-3.00	0.00
6,300.0	6.33	52.14	5,475.3	1,802.8	2,319.5	2,937.8	3.00	-3.00	0.00
6,400.0	3.33	52.14	5,575.0	1,808.0	2,326.2	2,946.2	3.00	-3.00	0.00
6,500.0	0.33	52.14	5,674.9	1,810.0	2,328.7	2,949.4	3.00	-3.00	0.00
<b>EOD @ Vertical - TOG</b>									
6,511.1	0.00	0.00	5,686.0	1,810.0	2,328.7	2,949.4	3.00	-3.00	0.00
6,600.0	0.00	0.00	5,774.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
6,700.0	0.00	0.00	5,874.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
6,800.0	0.00	0.00	5,974.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,074.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,174.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,274.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,200.0	0.00	0.00	6,374.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,300.0	0.00	0.00	6,474.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,400.0	0.00	0.00	6,574.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,500.0	0.00	0.00	6,674.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
<b>Cameo</b>									
7,511.1	0.00	0.00	6,686.0	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,600.0	0.00	0.00	6,774.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,700.0	0.00	0.00	6,874.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,800.0	0.00	0.00	6,974.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,074.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
8,000.0	0.00	0.00	7,174.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
8,100.0	0.00	0.00	7,274.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
8,171.1	0.00	0.00	7,346.0	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
8,200.0	0.00	0.00	7,374.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
<b>Rollins</b>									
8,211.1	0.00	0.00	7,386.0	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
8,300.0	0.00	0.00	7,474.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
8,400.0	0.00	0.00	7,574.9	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00
<b>TD @ 8461' MD / 7636' TVD</b>									
8,461.1	0.00	0.00	7,636.0	1,810.0	2,328.7	2,949.4	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-03E
<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 19-03E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #2		

## Design Targets

## Target Name

- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- Shape									
PBHL - Bruton 19-03E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,636.0	1,810.0	2,328.7	1,530,774.87	2,346,975.58	39.267947	-107.806819

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,410.0	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,936.8	2,586.0	G' Sand			
5,099.1	4,386.0	Williams Fork			
6,511.1	5,686.0	TOG			
7,511.1	6,686.0	Cameo			
8,171.1	7,346.0	Base Cameo Coal			
8,211.1	7,386.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.0	100.0	0.0	0.0	KOP (Build 3" / 100)
1,221.6	1,158.2	196.4	252.6	EOB @ 33.65° Inc. / 52.14° Azm
5,389.4	4,627.7	1,613.6	2,076.1	Drop 3" / 100'
6,511.1	5,686.0	1,810.0	2,328.7	EOD @ Vertical
8,461.1	7,636.0	1,810.0	2,328.7	TD @ 8461' MD / 7636' TVD