



Project: Mesa County, CO  
 Site: Bruton 30-01 Pad  
 Well: Bruton 19-16E  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.255308  
 Longitude: -107.806267  
 Ground Level: 7425.0  
 well @ 7455.0usft (H&P #522)



#### 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 19-16E, True North  
 Vertical (TVD) Reference: well @ 7455.0usft (H&P #522)  
 Section (VS) Reference: Slot @ 0.0N, 0.0E  
 Measured Depth Reference: well @ 7455.0usft (H&P #522)  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: Bruton 19-16E

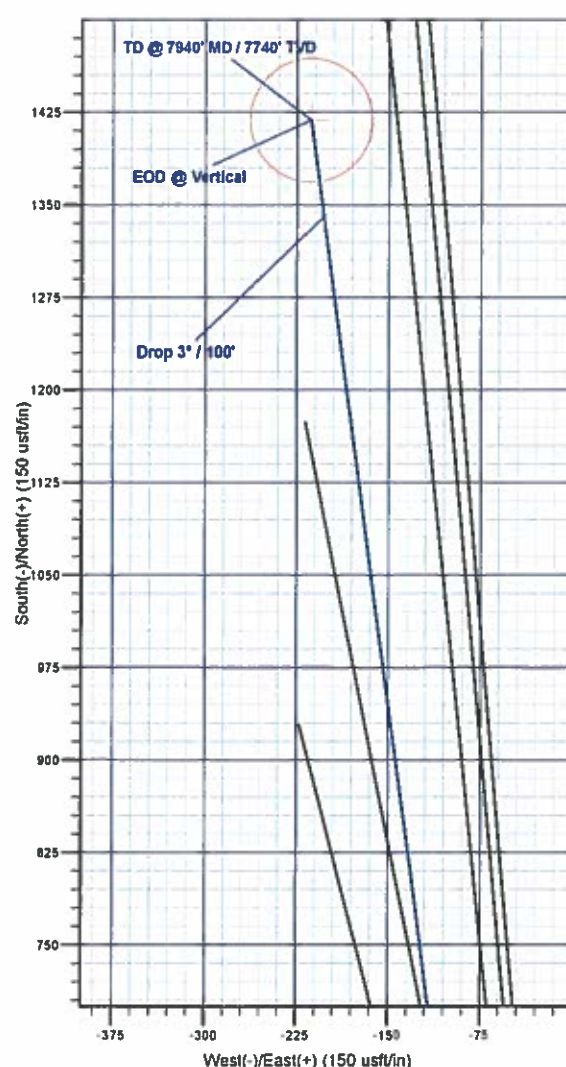
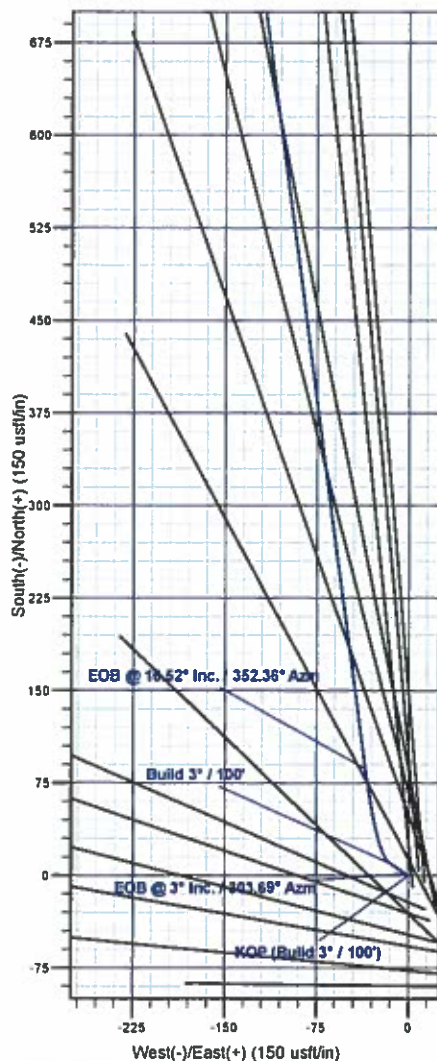
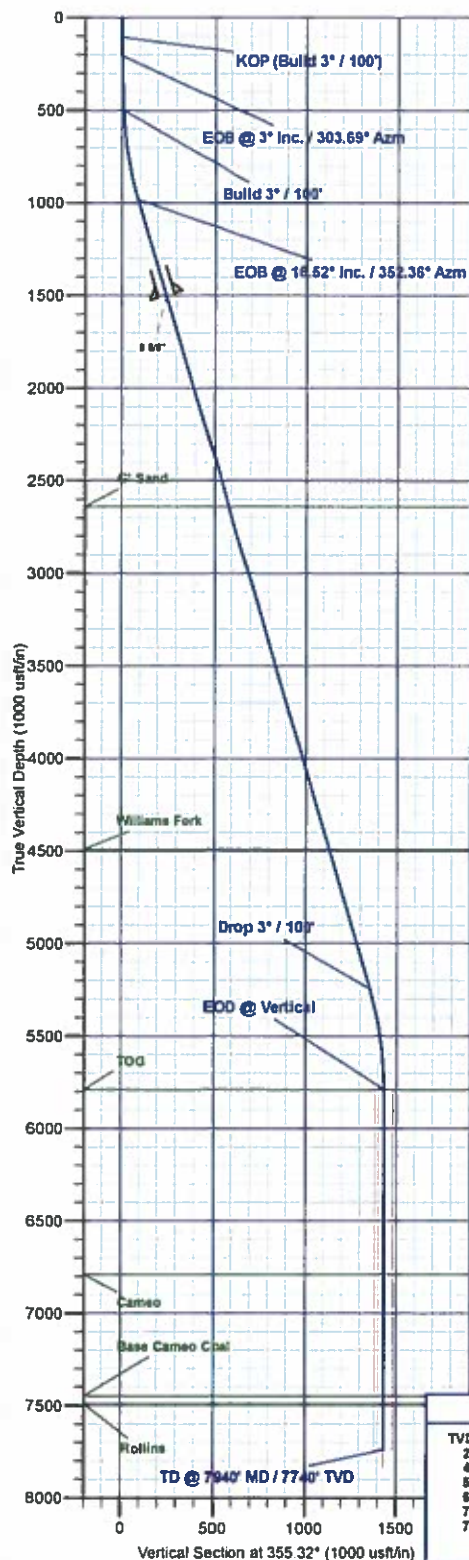
+N-S	+E-W	Northing	Ground Level: Easting	7425.0 Latitude	Longitude
0.0	0.0	1526169.13	2347015.06	39.255308	-107.806267

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
BRUTON 19-16E	7740.0	1418.5	-213.6	1527592.62	2346837.54	39.259203	-107.807021

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dieg	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°)
106.0	0.00	0.00	106.0	0.0	0.0	0.00	0.00	0.0	EOB @ 3° Inc. / 303.69° Azm
206.0	3.00	303.69	206.0	1.8	-2.2	3.00	303.69	1.6	Build 3° / 100°
500.4	3.00	303.69	500.0	10.0	-15.0	0.00	0.00	11.2	EOB @ 16.52° Inc. / 352.36° Azm
890.8	16.52	352.36	982.5	86.6	-35.0	3.00	87.25	89.2	Drop 3° / 100°
5438.8	16.52	352.36	5248.9	1340.4	-203.1	0.00	0.00	1352.5	EOD @ Vertical
5989.5	0.00	0.00	5790.0	1418.5	-213.6	3.00	180.00	1431.2	TD @ 7940' MD / 7740' TVD
7939.5	0.00	0.00	7740.0	1418.5	-213.6	0.00	0.00	1431.2	



#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2640.0	2719.6	G' Sand
4490.0	4649.3	Williams Fork
5790.0	5989.5	TOG
6790.0	6989.5	Cameo
7450.0	7649.5	Base Cameo Coal
7490.0	7689.5	Rollins

Plan: Design #1 (Bruton 19-16E/Wellbore #1)

Created By: Will Jircik Date: 17:22, January 10 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Bruton 30-01 Pad**

**Bruton 19-16E**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**10 January, 2017**





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-16E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-16E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<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 30-01 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,526,078.02 usft	<b>Latitude:</b> 39.255061
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,347,056.81 usft	<b>Longitude:</b> -107.806111
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16"	<b>Grid Convergence:</b> -1.45°

<b>Well</b>	Bruton 19-16E			
<b>Well Position</b>	+N/-S	90.0 usft	<b>Northing:</b>	1,526,169.14 usft
	+E/-W	-44.0 usft	<b>Easting:</b>	2,347,015.06 usft
<b>Position Uncertainty</b>	0.0 usft		<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,425.0 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	1/5/2017	9.63	65.43	51,461

<b>Design</b>	Design #1			
<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	355.32

<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	
106.0	0.00	0.00	106.0	0.0	0.0	0.00	0.00	0.00	0.00	
206.0	3.00	303.69	206.0	1.5	-2.2	3.00	3.00	-56.31	303.69	
500.4	3.00	303.69	500.0	10.0	-15.0	0.00	0.00	0.00	0.00	
990.8	16.52	352.36	982.5	86.6	-35.0	3.00	2.76	9.93	57.25	
5,438.8	16.52	352.36	5,246.9	1,340.4	-203.1	0.00	0.00	0.00	0.00	
5,989.5	0.00	0.00	5,790.0	1,418.5	-213.6	3.00	-3.00	0.00	180.00	
7,939.5	0.00	0.00	7,740.0	1,418.5	-213.6	0.00	0.00	0.00	0.00	BRUTON 19-16E





# Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-16E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-16E	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
KOP (Build 3° / 100')									
106.0	0.00	0.00	106.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	2.82	303.69	200.0	1.3	-1.9	1.4	3.00	3.00	0.00
EOB @ 3° Inc. / 303.69° Azm									
206.0	3.00	303.69	206.0	1.5	-2.2	1.6	3.00	3.00	0.00
300.0	3.00	303.69	299.8	4.2	-6.3	4.7	0.00	0.00	0.00
400.0	3.00	303.69	399.7	7.1	-10.6	7.9	0.00	0.00	0.00
500.0	3.00	303.69	499.6	10.0	-15.0	11.2	0.00	0.00	0.00
Build 3° / 100'									
500.4	3.00	303.69	500.0	10.0	-15.0	11.2	0.00	0.00	0.00
600.0	5.25	332.28	599.3	15.5	-19.3	17.0	3.00	2.26	28.72
700.0	8.02	342.67	698.6	26.2	-23.5	28.0	3.00	2.76	10.39
800.0	10.90	347.68	797.3	42.1	-27.6	44.2	3.00	2.89	5.01
900.0	13.84	350.60	894.9	63.1	-31.6	65.5	3.00	2.94	2.92
EOB @ 16.62° Inc. / 352.36° Azm									
990.8	16.52	352.36	982.5	86.6	-35.0	89.2	3.00	2.96	1.94
1,000.0	16.52	352.36	991.4	89.2	-35.4	91.8	0.00	0.00	0.00
1,100.0	16.52	352.36	1,087.2	117.4	-39.2	120.2	0.00	0.00	0.00
1,200.0	16.52	352.36	1,183.1	145.6	-43.0	148.6	0.00	0.00	0.00
1,300.0	16.52	352.36	1,279.0	173.8	-46.7	177.0	0.00	0.00	0.00
1,400.0	16.52	352.36	1,374.8	202.0	-50.5	205.4	0.00	0.00	0.00
1,500.0	16.52	352.36	1,470.7	230.2	-54.3	233.8	0.00	0.00	0.00
8 5/8"									
1,530.0	16.52	352.36	1,499.5	238.6	-55.4	242.4	0.00	0.00	0.00
1,600.0	16.52	352.36	1,566.6	258.4	-58.1	262.2	0.00	0.00	0.00
1,700.0	16.52	352.36	1,662.5	286.5	-61.8	290.6	0.00	0.00	0.00
1,800.0	16.52	352.36	1,758.3	314.7	-65.6	319.0	0.00	0.00	0.00
1,900.0	16.52	352.36	1,854.2	342.9	-69.4	347.4	0.00	0.00	0.00
2,000.0	16.52	352.36	1,950.1	371.1	-73.2	375.8	0.00	0.00	0.00
2,100.0	16.52	352.36	2,045.9	399.3	-77.0	404.2	0.00	0.00	0.00
2,200.0	16.52	352.36	2,141.8	427.5	-80.7	432.6	0.00	0.00	0.00
2,300.0	16.52	352.36	2,237.7	455.7	-84.5	461.0	0.00	0.00	0.00
2,400.0	16.52	352.36	2,333.6	483.8	-88.3	489.4	0.00	0.00	0.00
2,500.0	16.52	352.36	2,429.4	512.0	-92.1	517.8	0.00	0.00	0.00
2,600.0	16.52	352.36	2,525.3	540.2	-95.9	546.2	0.00	0.00	0.00
2,700.0	16.52	352.36	2,621.2	568.4	-99.6	574.6	0.00	0.00	0.00
G' Sand									
2,719.6	16.52	352.36	2,640.0	573.9	-100.4	580.2	0.00	0.00	0.00
2,800.0	16.52	352.36	2,717.0	596.6	-103.4	603.0	0.00	0.00	0.00
2,900.0	16.52	352.36	2,812.9	624.8	-107.2	631.4	0.00	0.00	0.00
3,000.0	16.52	352.36	2,908.8	653.0	-111.0	659.8	0.00	0.00	0.00
3,100.0	16.52	352.36	3,004.7	681.2	-114.7	688.2	0.00	0.00	0.00
3,200.0	16.52	352.36	3,100.5	709.3	-118.5	716.6	0.00	0.00	0.00
3,300.0	16.52	352.36	3,196.4	737.5	-122.3	745.0	0.00	0.00	0.00
3,400.0	16.52	352.36	3,292.3	765.7	-126.1	773.4	0.00	0.00	0.00
3,500.0	16.52	352.36	3,388.1	793.9	-129.9	801.8	0.00	0.00	0.00
3,600.0	16.52	352.36	3,484.0	822.1	-133.6	830.2	0.00	0.00	0.00
3,700.0	16.52	352.36	3,579.9	850.3	-137.4	858.6	0.00	0.00	0.00
3,800.0	16.52	352.36	3,675.8	878.5	-141.2	887.0	0.00	0.00	0.00
3,900.0	16.52	352.36	3,771.6	906.6	-145.0	915.4	0.00	0.00	0.00
4,000.0	16.52	352.36	3,867.5	934.8	-148.7	943.8	0.00	0.00	0.00



## Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-16E
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7455 0usft (H&P #522)
Project:	Mesa County, CO	MD Reference:	well @ 7455 0usft (H&P #522)
Site:	Bruton 30-01 Pad	North Reference:	True
Well:	Bruton 19-16E	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	16.52	352.36	3,963.4	963.0	-152.5	972.2	0.00	0.00	0.00
4,200.0	16.52	352.36	4,059.2	991.2	-158.3	1,000.6	0.00	0.00	0.00
4,300.0	16.52	352.36	4,155.1	1,019.4	-160.1	1,029.0	0.00	0.00	0.00
4,400.0	16.52	352.36	4,251.0	1,047.6	-163.9	1,057.4	0.00	0.00	0.00
4,500.0	16.52	352.36	4,346.9	1,075.8	-167.6	1,085.8	0.00	0.00	0.00
4,600.0	16.52	352.36	4,442.7	1,103.9	-171.4	1,114.2	0.00	0.00	0.00
Williams Fork									
4,649.3	16.52	352.36	4,490.0	1,117.8	-173.3	1,128.3	0.00	0.00	0.00
4,700.0	16.52	352.36	4,538.6	1,132.1	-175.2	1,142.6	0.00	0.00	0.00
4,800.0	16.52	352.36	4,634.5	1,160.3	-179.0	1,171.0	0.00	0.00	0.00
4,900.0	16.52	352.36	4,730.3	1,188.5	-182.8	1,199.4	0.00	0.00	0.00
5,000.0	16.52	352.36	4,826.2	1,216.7	-186.5	1,227.8	0.00	0.00	0.00
5,100.0	16.52	352.36	4,922.1	1,244.9	-190.3	1,256.2	0.00	0.00	0.00
5,200.0	16.52	352.36	5,017.9	1,273.1	-194.1	1,284.6	0.00	0.00	0.00
5,300.0	16.52	352.36	5,113.8	1,301.2	-197.9	1,313.0	0.00	0.00	0.00
5,400.0	16.52	352.36	5,209.7	1,329.4	-201.6	1,341.4	0.00	0.00	0.00
Drop 3° / 100'									
5,438.8	16.52	352.36	5,246.9	1,340.4	-203.1	1,352.5	0.00	0.00	0.00
5,500.0	14.89	352.36	5,305.8	1,356.7	-205.3	1,368.9	3.00	-3.00	0.00
5,600.0	11.69	352.36	5,403.2	1,379.3	-208.3	1,391.7	3.00	-3.00	0.00
5,700.0	8.89	352.36	5,501.6	1,396.8	-210.7	1,409.3	3.00	-3.00	0.00
5,800.0	5.69	352.36	5,600.8	1,409.2	-212.3	1,421.8	3.00	-3.00	0.00
5,900.0	2.69	352.36	5,700.5	1,416.4	-213.3	1,429.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,989.5	0.00	0.00	5,790.0	1,418.5	-213.6	1,431.2	3.00	-3.00	0.00
6,000.0	0.00	0.00	5,800.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,100.0	0.00	0.00	5,900.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,200.0	0.00	0.00	6,000.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,300.0	0.00	0.00	6,100.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,400.0	0.00	0.00	6,200.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,500.0	0.00	0.00	6,300.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,600.0	0.00	0.00	6,400.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,700.0	0.00	0.00	6,500.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,800.0	0.00	0.00	6,600.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
6,900.0	0.00	0.00	6,700.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
Cameo									
6,989.5	0.00	0.00	6,790.0	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,000.0	0.00	0.00	6,800.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,100.0	0.00	0.00	6,900.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,200.0	0.00	0.00	7,000.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,300.0	0.00	0.00	7,100.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,400.0	0.00	0.00	7,200.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,500.0	0.00	0.00	7,300.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,600.0	0.00	0.00	7,400.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
Base Cameo Coal									
7,649.5	0.00	0.00	7,450.0	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
Rollins									
7,689.5	0.00	0.00	7,490.0	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,700.0	0.00	0.00	7,500.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,800.0	0.00	0.00	7,600.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
7,900.0	0.00	0.00	7,700.5	1,418.5	-213.6	1,431.2	0.00	0.00	0.00
TD @ 7940' MD / 7740' TVD									
7,939.5	0.00	0.00	7,740.0	1,418.5	-213.6	1,431.2	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Bruton 19-16E
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7455.0usft (H&P #522)
<b>Site:</b>	Bruton 30-01 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Bruton 19-16E	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## 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
BRUTON 19-16E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,740.0	1,418.5	-213.6	1,527,592.62	2,346,837.55	39.259203	-107.807021

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,499.5	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,719.6	2,640.0	G <sup>+</sup> Sand			
4,649.3	4,490.0	Williams Fork			
5,989.5	5,790.0	TOG			
6,989.5	6,790.0	Cameo			
7,649.5	7,450.0	Base Cameo Coal			
7,689.5	7,490.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
106.0	106.0	0.0	0.0	KOP (Build 3" / 100')
206.0	206.0	1.5	-2.2	EOB @ 3" Inc. / 303.69° Azm
500.4	500.0	10.0	-15.0	Build 3" / 100'
990.8	982.5	86.6	-35.0	EOB @ 16.52" Inc. / 352.36° Azm
5,438.8	5,246.9	1,340.4	-203.1	Drop 3" / 100'
5,989.5	5,790.0	1,418.5	-213.6	EOD @ Vertical
7,939.5	7,740.0	1,418.5	-213.6	TD @ 7940' MD / 7740' TVD