



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-16W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248131
 Longitude: -107.808903
 Ground Level: 7643.0
 well @ 7665.0usft (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 30-16W, True North
 Vertical (TVD) Reference: well @ 7665.0usft (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7665.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-16W

Ground Level: 7643.0
 +N/-S 0.0 +E/-W 0.0 Northing 1523574.84 Easting 2346202.35 Latitude 39.248131 Longitude -107.808903

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-16W	7707.0	-1226.2	-2105.9	1522402.53	2344065.93	39.244764	-107.816338

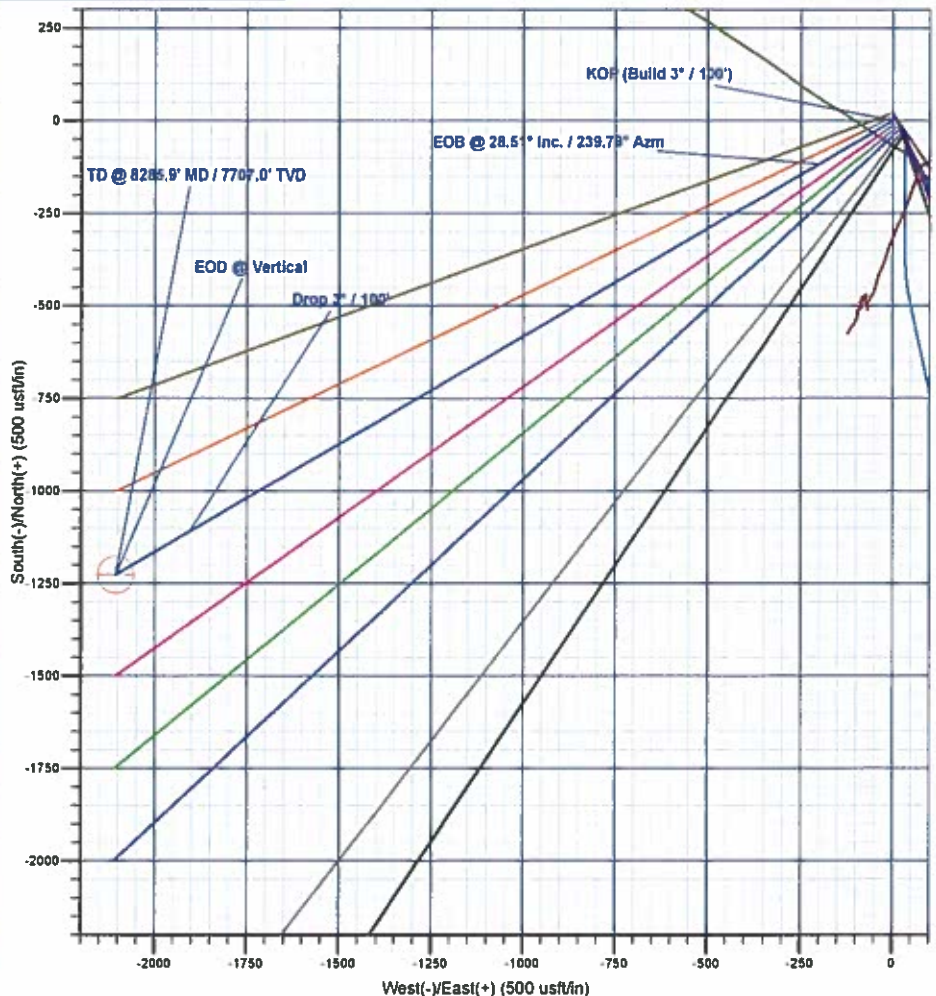
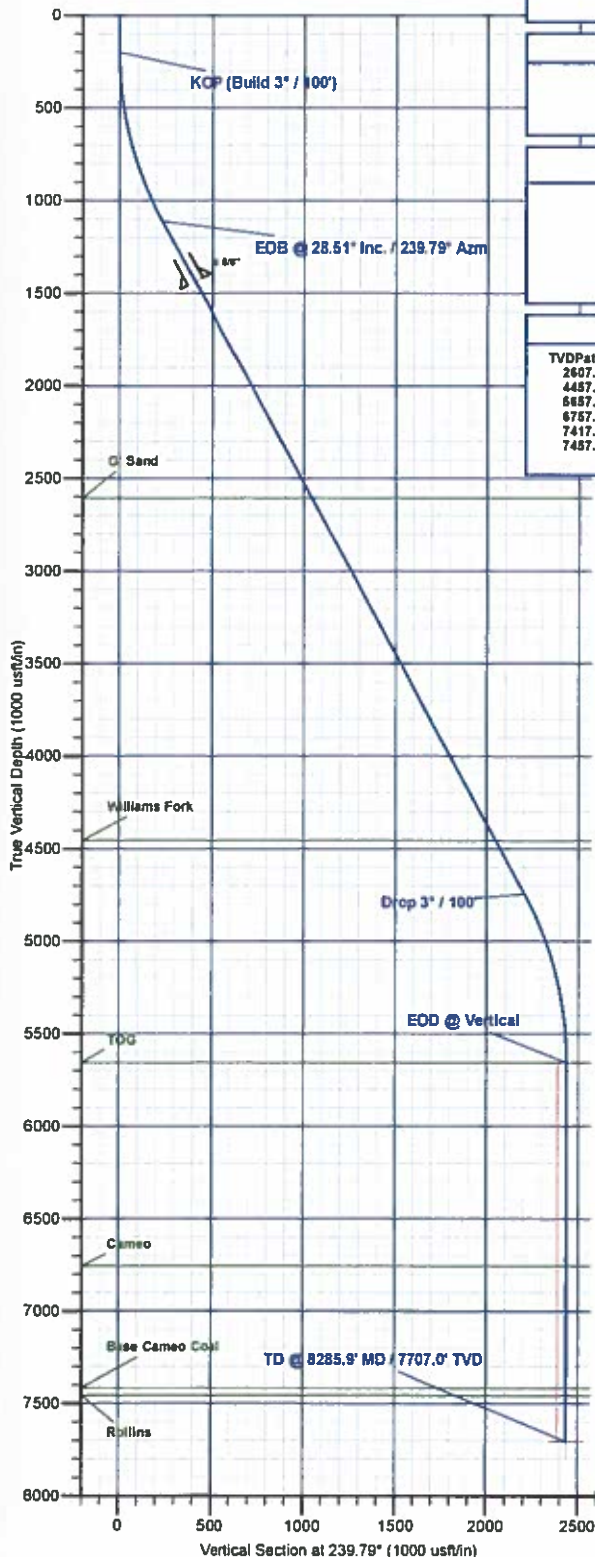
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Slag	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')
1150.3	28.51	239.79	1111.6	-116.5	-200.1	3.00	239.79	231.6	EOB @ 28.51° Inc. / 239.79° Azm
5285.6	28.51	239.79	4748.4	-1109.7	-1905.8	0.00	0.00	2205.3	Drop 3" / 100'
6235.9	0.00	0.00	5657.0	-1226.2	-2105.9	3.00	180.00	2436.9	EOD @ Vertical
8285.9	0.00	0.00	7707.0	-1226.2	-2105.9	0.00	0.00	2436.9	TD @ 8285.9' MD / 7707.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2607.0	2852.1	G' Sand
4457.0	4957.4	Williams Fork
5657.0	6235.9	TOG
6757.0	7335.9	Cameo
7417.0	7895.9	Base Cameo Coal
7457.0	8035.9	Rollins

Azimuths to True North
 Magnetic North: 9.55°
 Magnetic Field
 Strength: 51397.6snT
 Dip Angle: 65.42°
 Date: 7/14/2017
 Model: IGRF2015



Plan: Design #1 (Bruton 30-16W/Wellbore #1)

Created By: Will Jirclik Date: 19:41, July 14 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-16W

Wellbore #1

Plan: Design #1

QES Well Planning Report

14 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665 0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-16W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Mesa 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	Bruton 30-10 Pad			
Site Position:		Northing:	1,523,424.58 usft	Latitude: 39.247725
From:	Map	Easting:	2,346,291.81 usft	Longitude: -107.808574
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16"	Grid Convergence: -1.46°

Well	Bruton 30-16W			
Well Position	+N/-S	147.9 usft	Northing:	1,523,574.84 usft
	+E/-W	-93.3 usft	Easting:	2,346,202.35 usft
Position Uncertainty	0.0 usft		Wellhead Elevation:	0.0 usft
			Ground Level:	7,643.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/14/2017	9.58	65.42	51,398

Design	Design #1			
Audit Notes:				
Version:	Phase:	PLAN	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	239.79

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	
1,150.3	28.51	239.79	1,111.6	-116.5	-200.1	3.00	3.00	0.00	239.79	
5,285.6	28.51	239.79	4,745.4	-1,109.7	-1,905.8	0.00	0.00	0.00	0.00	
6,235.9	0.00	0.00	5,657.0	-1,226.2	-2,105.9	3.00	-3.00	0.00	180.00	
8,285.9	0.00	0.00	7,707.0	-1,226.2	-2,105.9	0.00	0.00	0.00	0.00	PBHL - Bruton 30-16W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-16W	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')									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	239.79	300.0	-1.3	-2.3	2.6	3.00	3.00	0.00
400.0	6.00	239.79	399.6	-5.3	-9.0	10.5	3.00	3.00	0.00
500.0	9.00	239.79	498.8	-11.8	-20.3	23.5	3.00	3.00	0.00
600.0	12.00	239.79	597.1	-21.0	-36.1	41.7	3.00	3.00	0.00
700.0	15.00	239.79	694.3	-32.7	-56.2	65.1	3.00	3.00	0.00
800.0	18.00	239.79	790.2	-47.0	-80.8	93.5	3.00	3.00	0.00
900.0	21.00	239.79	884.4	-63.8	-109.6	126.9	3.00	3.00	0.00
1,000.0	24.00	239.79	976.8	-83.1	-142.7	165.1	3.00	3.00	0.00
1,100.0	27.00	239.79	1,067.1	-104.7	-179.9	208.2	3.00	3.00	0.00
EOB @ 28.51° Inc. / 239.79° Azm									
1,150.3	28.51	239.79	1,111.6	-116.5	-200.1	231.6	3.00	3.00	0.00
1,200.0	28.51	239.79	1,155.2	-128.5	-220.6	255.3	0.00	0.00	0.00
1,300.0	28.51	239.79	1,243.1	-152.5	-261.9	303.0	0.00	0.00	0.00
1,400.0	28.51	239.79	1,331.0	-176.5	-303.1	350.8	0.00	0.00	0.00
1,500.0	28.51	239.79	1,418.9	-200.5	-344.4	398.5	0.00	0.00	0.00
8 5/8"									
1,522.0	28.51	239.79	1,438.2	-205.8	-353.4	409.0	0.00	0.00	0.00
1,600.0	28.51	239.79	1,506.7	-224.5	-385.6	446.2	0.00	0.00	0.00
1,700.0	28.51	239.79	1,594.6	-248.6	-426.9	494.0	0.00	0.00	0.00
1,800.0	28.51	239.79	1,682.5	-272.6	-468.1	541.7	0.00	0.00	0.00
1,900.0	28.51	239.79	1,770.4	-296.6	-509.4	589.4	0.00	0.00	0.00
2,000.0	28.51	239.79	1,858.2	-320.6	-550.6	637.1	0.00	0.00	0.00
2,100.0	28.51	239.79	1,946.1	-344.6	-591.9	684.9	0.00	0.00	0.00
2,200.0	28.51	239.79	2,034.0	-368.6	-633.1	732.6	0.00	0.00	0.00
2,300.0	28.51	239.79	2,121.9	-392.7	-674.3	780.3	0.00	0.00	0.00
2,400.0	28.51	239.79	2,209.7	-416.7	-715.6	828.1	0.00	0.00	0.00
2,500.0	28.51	239.79	2,297.6	-440.7	-756.8	875.8	0.00	0.00	0.00
2,600.0	28.51	239.79	2,385.5	-464.7	-798.1	923.5	0.00	0.00	0.00
2,700.0	28.51	239.79	2,473.4	-488.7	-839.3	971.2	0.00	0.00	0.00
2,800.0	28.51	239.79	2,561.2	-512.7	-880.6	1,019.0	0.00	0.00	0.00
G' Sand									
2,852.1	28.51	239.79	2,607.0	-525.2	-902.1	1,043.8	0.00	0.00	0.00
2,900.0	28.51	239.79	2,649.1	-536.8	-921.8	1,066.7	0.00	0.00	0.00
3,000.0	28.51	239.79	2,737.0	-560.8	-963.1	1,114.4	0.00	0.00	0.00
3,100.0	28.51	239.79	2,824.9	-584.8	-1,004.3	1,162.2	0.00	0.00	0.00
3,200.0	28.51	239.79	2,912.7	-608.8	-1,045.6	1,209.9	0.00	0.00	0.00
3,300.0	28.51	239.79	3,000.6	-632.8	-1,086.8	1,257.6	0.00	0.00	0.00
3,400.0	28.51	239.79	3,088.5	-656.8	-1,128.1	1,305.4	0.00	0.00	0.00
3,500.0	28.51	239.79	3,176.4	-680.9	-1,169.3	1,353.1	0.00	0.00	0.00
3,600.0	28.51	239.79	3,264.2	-704.9	-1,210.6	1,400.8	0.00	0.00	0.00
3,700.0	28.51	239.79	3,352.1	-728.9	-1,251.8	1,448.5	0.00	0.00	0.00
3,800.0	28.51	239.79	3,440.0	-752.9	-1,293.0	1,496.3	0.00	0.00	0.00
3,900.0	28.51	239.79	3,527.9	-776.9	-1,334.3	1,544.0	0.00	0.00	0.00
4,000.0	28.51	239.79	3,615.7	-800.9	-1,375.5	1,591.7	0.00	0.00	0.00
4,100.0	28.51	239.79	3,703.6	-825.0	-1,416.8	1,639.5	0.00	0.00	0.00
4,200.0	28.51	239.79	3,791.5	-849.0	-1,458.0	1,687.2	0.00	0.00	0.00
4,300.0	28.51	239.79	3,879.3	-873.0	-1,499.3	1,734.9	0.00	0.00	0.00
4,400.0	28.51	239.79	3,967.2	-897.0	-1,540.5	1,782.6	0.00	0.00	0.00
4,500.0	28.51	239.79	4,055.1	-921.0	-1,581.8	1,830.4	0.00	0.00	0.00
4,600.0	28.51	239.79	4,143.0	-945.0	-1,623.0	1,878.1	0.00	0.00	0.00



Well Planning Report



Database:	EDMS002	Local Co-ordinate Reference:	Well Bruton 30-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-16W	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)	Bulld Rate (°/100usft)	Turn Rate (°/100usft)
4,700.0	28.51	239.79	4,230.8	-969.1	-1,664.3	1,925.8	0.00	0.00	0.00
4,800.0	28.51	239.79	4,318.7	-993.1	-1,705.5	1,973.6	0.00	0.00	0.00
4,900.0	28.51	239.79	4,406.6	-1,017.1	-1,746.8	2,021.3	0.00	0.00	0.00
Williams Fork									
4,957.4	28.51	239.79	4,457.0	-1,030.9	-1,770.4	2,048.7	0.00	0.00	0.00
5,000.0	28.51	239.79	4,494.5	-1,041.1	-1,788.0	2,069.0	0.00	0.00	0.00
5,100.0	28.51	239.79	4,582.3	-1,065.1	-1,829.3	2,116.8	0.00	0.00	0.00
5,200.0	28.51	239.79	4,670.2	-1,089.1	-1,870.5	2,164.5	0.00	0.00	0.00
Drop 3° / 100'									
5,285.6	28.51	239.79	4,745.4	-1,109.7	-1,905.8	2,205.3	0.00	0.00	0.00
5,300.0	28.08	239.79	4,758.1	-1,113.1	-1,911.7	2,212.2	3.00	-3.00	0.00
5,400.0	25.08	239.79	4,847.5	-1,135.6	-1,950.4	2,256.9	3.00	-3.00	0.00
5,500.0	22.08	239.79	4,939.2	-1,155.8	-1,984.9	2,296.9	3.00	-3.00	0.00
5,600.0	19.08	239.79	5,032.8	-1,173.4	-2,015.3	2,332.0	3.00	-3.00	0.00
5,700.0	16.08	239.79	5,128.1	-1,188.6	-2,041.4	2,362.2	3.00	-3.00	0.00
5,800.0	13.08	239.79	5,224.9	-1,201.3	-2,063.1	2,387.4	3.00	-3.00	0.00
5,900.0	10.08	239.79	5,322.8	-1,211.4	-2,080.5	2,407.5	3.00	-3.00	0.00
6,000.0	7.08	239.79	5,421.7	-1,218.9	-2,093.4	2,422.4	3.00	-3.00	0.00
6,100.0	4.08	239.79	5,521.2	-1,223.8	-2,101.8	2,432.1	3.00	-3.00	0.00
6,200.0	1.08	239.79	5,621.1	-1,226.1	-2,105.6	2,436.6	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,235.9	0.00	0.00	5,657.0	-1,226.2	-2,105.9	2,436.9	3.00	-3.00	334.94
6,300.0	0.00	0.00	5,721.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,400.0	0.00	0.00	5,821.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,500.0	0.00	0.00	5,921.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,600.0	0.00	0.00	6,021.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,700.0	0.00	0.00	6,121.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,800.0	0.00	0.00	6,221.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
6,900.0	0.00	0.00	6,321.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,000.0	0.00	0.00	6,421.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,100.0	0.00	0.00	6,521.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,200.0	0.00	0.00	6,621.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,300.0	0.00	0.00	6,721.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
Cameo									
7,335.9	0.00	0.00	6,757.0	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,400.0	0.00	0.00	6,821.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,500.0	0.00	0.00	6,921.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,600.0	0.00	0.00	7,021.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,700.0	0.00	0.00	7,121.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,800.0	0.00	0.00	7,221.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
7,900.0	0.00	0.00	7,321.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
Base Cameo Coal									
7,995.9	0.00	0.00	7,417.0	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
8,000.0	0.00	0.00	7,421.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
Rollins									
8,035.9	0.00	0.00	7,457.0	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
8,100.0	0.00	0.00	7,521.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
8,200.0	0.00	0.00	7,621.1	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00
TD @ 8285.9' MD / 7707.0' TVD									
8,285.9	0.00	0.00	7,707.0	-1,226.2	-2,105.9	2,436.9	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-16W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7665.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7665.0usft (H&P #290)
Site:	Bruton 30-10 Pad	North Reference:	True
Well:	Bruton 30-16W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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 30-16W	0.00	0.00	7,707.0	-1,226.2	-2,105.9	1,522,402.53	2,344,065.94	39.244764	-107.818339
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,438.2	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,852.1	2,607.0	G' Sand			
4,957.4	4,457.0	Williams Fork			
6,235.9	5,657.0	TOG			
7,335.9	6,757.0	Cameo			
7,995.9	7,417.0	Base Cameo Coal			
8,035.9	7,457.0	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')
1,150.3	1,111.6	-116.5	-200.1	EOB @ 28.51° Inc. / 239.79° Azm
5,285.6	4,745.4	-1,109.7	-1,905.8	Drop 3" / 100'
6,235.9	5,657.0	-1,226.2	-2,105.9	EOD @ Vertical
8,285.9	7,707.0	-1,226.2	-2,105.9	TD @ 8285.9' MD / 7707.0' TVD