



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton Federal 30-20W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248036
 Longitude: -107.808831
 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 Federal 30-20W, 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 Federal 30-20W

Ground Level: 7643.0
 +N-S +E-W Northing Easting Latitude Longitude
 0.0 0.0 1523539.73 2346221.85 39.248036 -107.808831

DESIGN TARGET DETAILS

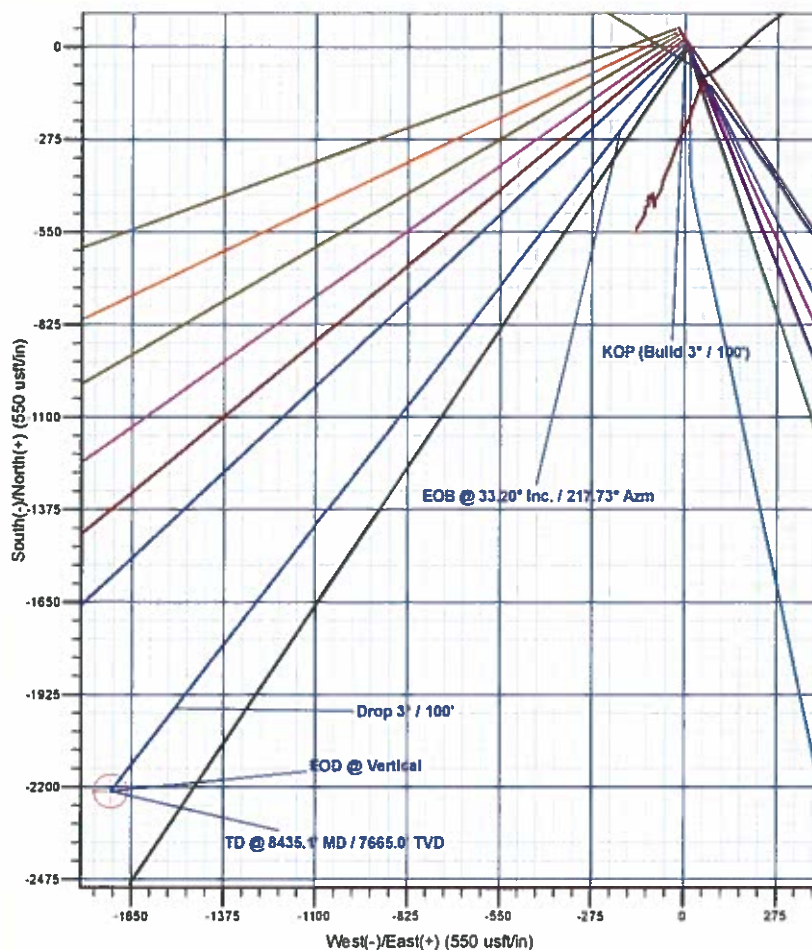
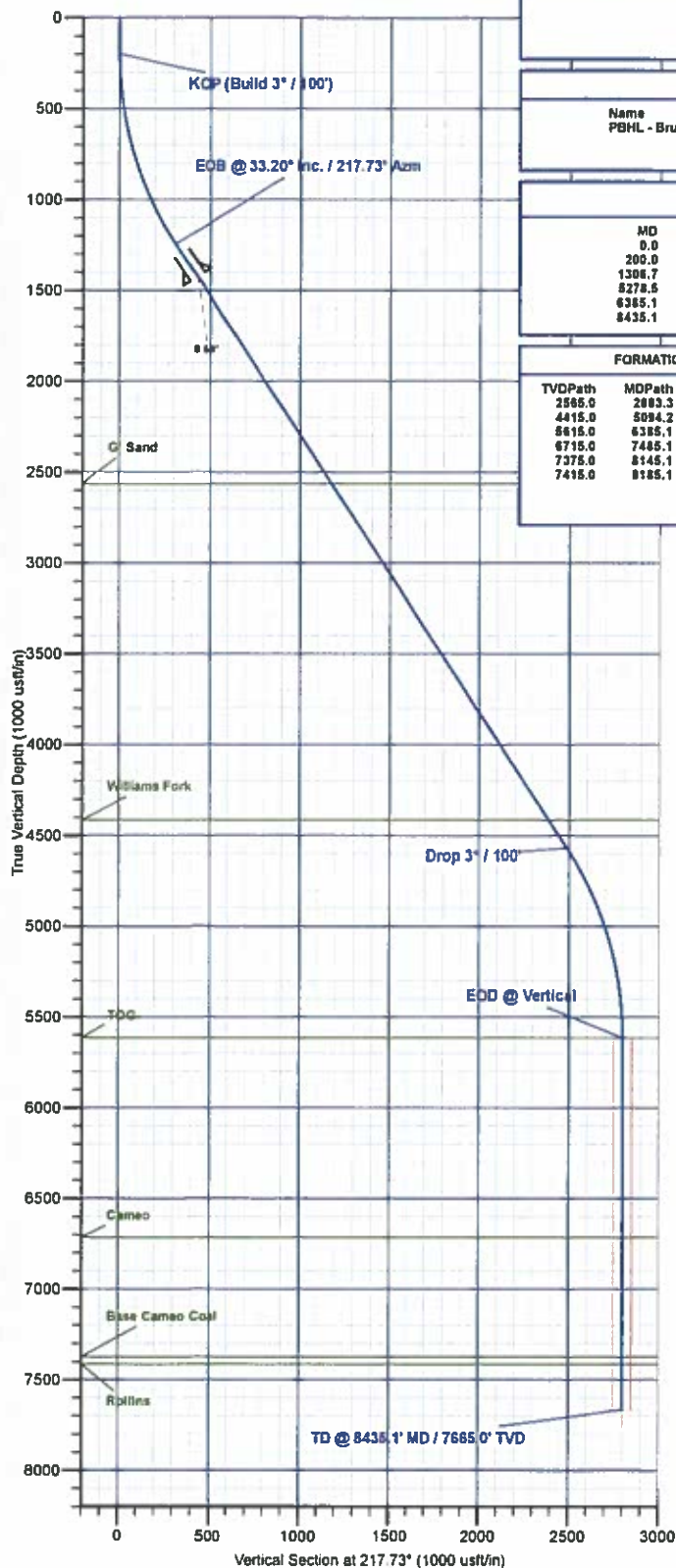
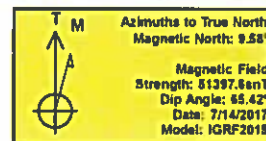
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton Federal 30-20W	7665.0	-2213.3	-1712.3	1521370.68	2344453.82	39.241959	-107.814877

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 @ 33.20° Inc. / 217.73° Azm
1308.7	33.20	217.73	1245.8	-246.6	-190.8	3.00	217.73	311.0	Drop 3° / 100'
8278.6	0.00	0.00	4589.2	-1986.7	-1521.5	0.00	0.00	2486.6	EOB @ Vertical
8385.1	0.00	0.00	8415.0	-2213.3	-1712.3	3.00	180.00	2796.3	TD @ 8435.1' MD / 7665.0' TVD
8435.1	0.00	0.00	7665.0	-2213.3	-1712.3	0.00	0.00	2796.3	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2585.0	2883.3	G' Sand
4415.0	5094.2	Williams Fork
6615.0	6385.1	TOG
6715.0	7485.1	Cameo
7375.0	8145.1	Base Cameo Coal
7415.0	8185.1	Rollins



Plan: Design #1 (Bruton Federal 30-20W/Wellbore #1)

Created By: Will Jircik Date: 7:29, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton Federal 30-20W

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-20W
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 Federal 30-20W	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 Federal 30-20W			
Well Position	+N/-S	113.3 usft	Northing:	1,523,539.73 usft
	+E/-W	-72.9 usft	Easting:	2,346,221.85 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	217.73

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	
1,306.7	33.20	217.73	1,245.8	-246.6	-190.8	3.00	3.00	0.00	217.73	
5,278.5	33.20	217.73	4,569.2	-1,966.7	-1,521.6	0.00	0.00	0.00	0.00	
6,385.1	0.00	0.00	5,615.0	-2,213.3	-1,712.3	3.00	-3.00	0.00	180.00	
8,435.1	0.00	0.00	7,665.0	-2,213.3	-1,712.3	0.00	0.00	0.00	0.00	PBHL - Bruton Feder



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-20W
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 Federal 30-20W	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	217.73	300.0	-2.1	-1.6	2.6	3.00	3.00	0.00
400.0	6.00	217.73	399.6	-8.3	-6.4	10.5	3.00	3.00	0.00
500.0	9.00	217.73	498.8	-18.6	-14.4	23.5	3.00	3.00	0.00
600.0	12.00	217.73	597.1	-33.0	-25.5	41.7	3.00	3.00	0.00
700.0	15.00	217.73	694.3	-51.5	-39.8	65.1	3.00	3.00	0.00
800.0	18.00	217.73	790.2	-73.9	-57.2	93.5	3.00	3.00	0.00
900.0	21.00	217.73	884.4	-100.3	-77.6	126.9	3.00	3.00	0.00
1,000.0	24.00	217.73	976.8	-130.6	-101.0	165.1	3.00	3.00	0.00
1,100.0	27.00	217.73	1,067.1	-164.6	-127.4	208.2	3.00	3.00	0.00
1,200.0	30.00	217.73	1,154.9	-202.4	-156.6	255.9	3.00	3.00	0.00
1,300.0	33.00	217.73	1,240.2	-243.7	-188.5	308.1	3.00	3.00	0.00
EOB @ 33.20° Inc. / 217.73° Azm									
1,306.7	33.20	217.73	1,245.8	-246.6	-190.8	311.8	3.00	3.00	0.00
1,400.0	33.20	217.73	1,323.9	-287.0	-222.0	362.9	0.00	0.00	0.00
1,500.0	33.20	217.73	1,407.5	-330.3	-255.5	417.6	0.00	0.00	0.00
8 5/8"									
1,522.0	33.20	217.73	1,426.0	-339.8	-262.9	429.7	0.00	0.00	0.00
1,600.0	33.20	217.73	1,491.2	-373.6	-289.1	472.4	0.00	0.00	0.00
1,700.0	33.20	217.73	1,574.9	-416.9	-322.6	527.1	0.00	0.00	0.00
1,800.0	33.20	217.73	1,658.6	-460.2	-356.1	581.9	0.00	0.00	0.00
1,900.0	33.20	217.73	1,742.2	-503.5	-389.6	636.6	0.00	0.00	0.00
2,000.0	33.20	217.73	1,825.9	-546.8	-423.1	691.4	0.00	0.00	0.00
2,100.0	33.20	217.73	1,909.6	-590.2	-456.6	746.2	0.00	0.00	0.00
2,200.0	33.20	217.73	1,993.3	-633.5	-490.1	800.9	0.00	0.00	0.00
2,300.0	33.20	217.73	2,077.0	-676.8	-523.6	855.7	0.00	0.00	0.00
2,400.0	33.20	217.73	2,160.6	-720.1	-557.1	910.4	0.00	0.00	0.00
2,500.0	33.20	217.73	2,244.3	-763.4	-590.6	965.2	0.00	0.00	0.00
2,600.0	33.20	217.73	2,328.0	-806.7	-624.1	1,019.9	0.00	0.00	0.00
2,700.0	33.20	217.73	2,411.7	-850.0	-657.6	1,074.7	0.00	0.00	0.00
2,800.0	33.20	217.73	2,495.3	-893.3	-691.1	1,129.5	0.00	0.00	0.00
G' Sand									
2,883.3	33.20	217.73	2,565.0	-929.4	-719.0	1,175.0	0.00	0.00	0.00
2,900.0	33.20	217.73	2,579.0	-936.6	-724.6	1,184.2	0.00	0.00	0.00
3,000.0	33.20	217.73	2,662.7	-979.9	-758.1	1,239.0	0.00	0.00	0.00
3,100.0	33.20	217.73	2,746.4	-1,023.2	-791.6	1,293.7	0.00	0.00	0.00
3,200.0	33.20	217.73	2,830.0	-1,066.5	-825.2	1,348.5	0.00	0.00	0.00
3,300.0	33.20	217.73	2,913.7	-1,109.9	-858.7	1,403.2	0.00	0.00	0.00
3,400.0	33.20	217.73	2,997.4	-1,153.2	-892.2	1,458.0	0.00	0.00	0.00
3,500.0	33.20	217.73	3,081.1	-1,196.5	-925.7	1,512.8	0.00	0.00	0.00
3,600.0	33.20	217.73	3,164.7	-1,239.8	-959.2	1,567.5	0.00	0.00	0.00
3,700.0	33.20	217.73	3,248.4	-1,283.1	-992.7	1,622.3	0.00	0.00	0.00
3,800.0	33.20	217.73	3,332.1	-1,326.4	-1,026.2	1,677.0	0.00	0.00	0.00
3,900.0	33.20	217.73	3,415.8	-1,369.7	-1,059.7	1,731.8	0.00	0.00	0.00
4,000.0	33.20	217.73	3,499.4	-1,413.0	-1,093.2	1,786.5	0.00	0.00	0.00
4,100.0	33.20	217.73	3,583.1	-1,456.3	-1,126.7	1,841.3	0.00	0.00	0.00
4,200.0	33.20	217.73	3,666.8	-1,499.6	-1,160.2	1,896.0	0.00	0.00	0.00
4,300.0	33.20	217.73	3,750.5	-1,542.9	-1,193.7	1,950.8	0.00	0.00	0.00
4,400.0	33.20	217.73	3,834.2	-1,586.2	-1,227.2	2,005.6	0.00	0.00	0.00
4,500.0	33.20	217.73	3,917.8	-1,629.6	-1,260.7	2,060.3	0.00	0.00	0.00
4,600.0	33.20	217.73	4,001.5	-1,672.9	-1,294.2	2,115.1	0.00	0.00	0.00



Well Planning Report



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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 Federal 30-20W	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)
4,700.0	33.20	217.73	4,085.2	-1,716.2	-1,327.7	2,169.8	0.00	0.00	0.00
4,800.0	33.20	217.73	4,168.9	-1,759.5	-1,361.3	2,224.6	0.00	0.00	0.00
4,900.0	33.20	217.73	4,252.5	-1,802.8	-1,394.8	2,279.3	0.00	0.00	0.00
5,000.0	33.20	217.73	4,336.2	-1,846.1	-1,428.3	2,334.1	0.00	0.00	0.00
Williams Fork									
5,094.2	33.20	217.73	4,415.0	-1,886.9	-1,459.8	2,385.7	0.00	0.00	0.00
5,100.0	33.20	217.73	4,419.9	-1,889.4	-1,461.8	2,388.9	0.00	0.00	0.00
5,200.0	33.20	217.73	4,503.6	-1,932.7	-1,495.3	2,443.6	0.00	0.00	0.00
Drop 3° / 100'									
5,278.5	33.20	217.73	4,569.2	-1,966.7	-1,521.6	2,486.6	0.00	0.00	0.00
5,300.0	32.55	217.73	4,587.3	-1,975.9	-1,528.7	2,498.3	3.00	-3.00	0.00
5,400.0	29.55	217.73	4,673.0	-2,016.7	-1,560.3	2,549.8	3.00	-3.00	0.00
5,500.0	26.55	217.73	4,761.2	-2,053.9	-1,589.1	2,596.9	3.00	-3.00	0.00
5,600.0	23.55	217.73	4,851.8	-2,087.4	-1,615.0	2,639.2	3.00	-3.00	0.00
5,700.0	20.55	217.73	4,944.5	-2,117.1	-1,637.9	2,676.8	3.00	-3.00	0.00
5,800.0	17.55	217.73	5,039.0	-2,142.9	-1,657.9	2,709.4	3.00	-3.00	0.00
5,900.0	14.55	217.73	5,135.1	-2,164.8	-1,674.8	2,737.1	3.00	-3.00	0.00
6,000.0	11.55	217.73	5,232.5	-2,182.7	-1,688.7	2,759.6	3.00	-3.00	0.00
6,100.0	8.55	217.73	5,330.9	-2,196.5	-1,699.3	2,777.1	3.00	-3.00	0.00
6,200.0	5.55	217.73	5,430.1	-2,206.2	-1,706.9	2,789.4	3.00	-3.00	0.00
6,300.0	2.55	217.73	5,529.9	-2,211.8	-1,711.2	2,796.4	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,385.1	0.00	0.00	5,615.0	-2,213.3	-1,712.3	2,798.3	3.00	-3.00	167.10
6,400.0	0.00	0.00	5,629.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
6,500.0	0.00	0.00	5,729.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
6,600.0	0.00	0.00	5,829.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
6,700.0	0.00	0.00	5,929.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
6,800.0	0.00	0.00	6,029.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
6,900.0	0.00	0.00	6,129.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,000.0	0.00	0.00	6,229.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,100.0	0.00	0.00	6,329.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,200.0	0.00	0.00	6,429.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,300.0	0.00	0.00	6,529.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,400.0	0.00	0.00	6,629.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
Cameo									
7,485.1	0.00	0.00	6,715.0	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,500.0	0.00	0.00	6,729.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,600.0	0.00	0.00	6,829.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,700.0	0.00	0.00	6,929.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,800.0	0.00	0.00	7,029.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
7,900.0	0.00	0.00	7,129.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
8,000.0	0.00	0.00	7,229.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
8,100.0	0.00	0.00	7,329.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
Base Cameo Coal									
8,145.1	0.00	0.00	7,375.0	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
Rollins									
8,185.1	0.00	0.00	7,415.0	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
8,200.0	0.00	0.00	7,429.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
8,300.0	0.00	0.00	7,529.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
8,400.0	0.00	0.00	7,629.9	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00
TD @ 8435.1' MD / 7665.0' TVD									
8,435.1	0.00	0.00	7,665.0	-2,213.3	-1,712.3	2,798.3	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton Federal 30-20W
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 Federal 30-20W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Design Targets

Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL - Bruton Federal 3	0.00	0.00	7,665.0	-2,213.3	-1,712.3	1,521,370.68	2,344,453.82	39.241959	-107.814877
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,426.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,883.3	2,565.0	G' Sand			
5,094.2	4,415.0	Williams Fork			
6,385.1	5,615.0	TOG			
7,485.1	6,715.0	Cameo			
8,145.1	7,375.0	Base Cameo Coal			
8,185.1	7,415.0	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')
1,306.7	1,245.8	-246.6	-190.8	EOB @ 33.20° Inc. / 217.73° Azm
5,278.5	4,569.2	-1,966.7	-1,521.6	Drop 3" / 100'
6,385.1	5,615.0	-2,213.3	-1,712.3	EOD @ Vertical
8,435.1	7,665.0	-2,213.3	-1,712.3	TD @ 8435.1' MD / 7665.0' TVD