



Project: Mesa County, CO
 Site: Bruton 19-06 Pad
 Well: Bruton 19-01W
 Wellbore: Wellbore #1
 Design: Design #2
 Latitude: 39.262997
 Longitude: -107.815047
 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 19-01W, 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 19-01W

+N-S	+E-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1529031.89	2344600.87	39.262997	-107.815047

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

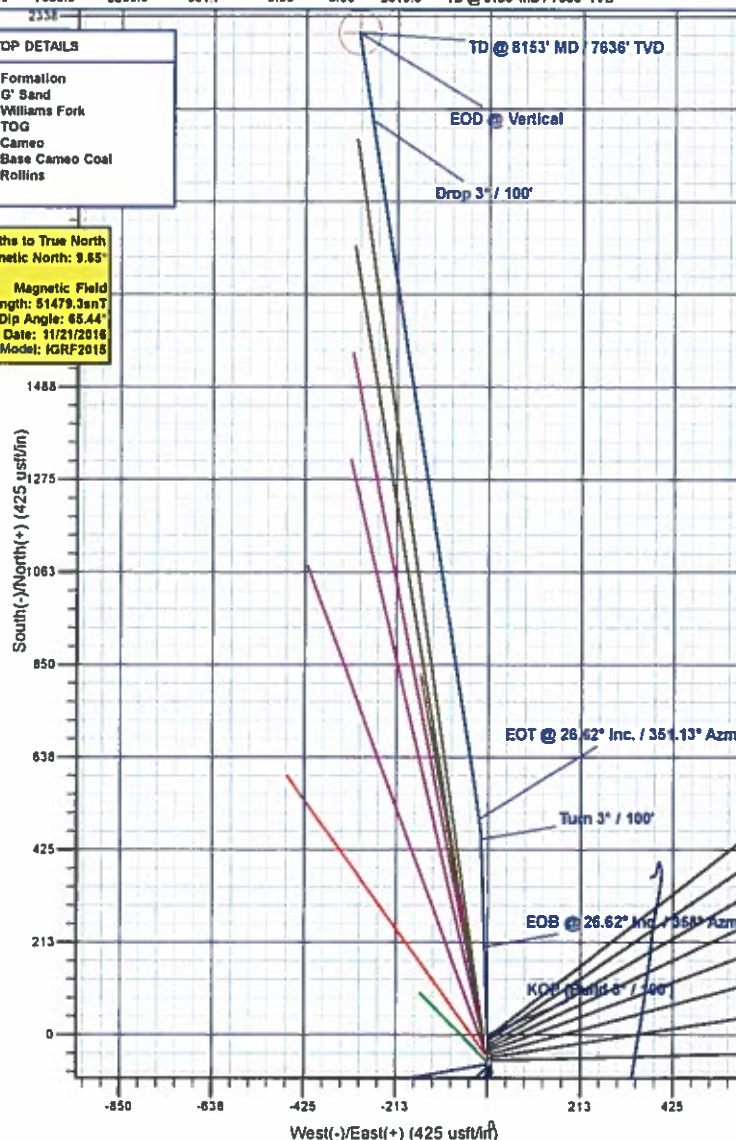
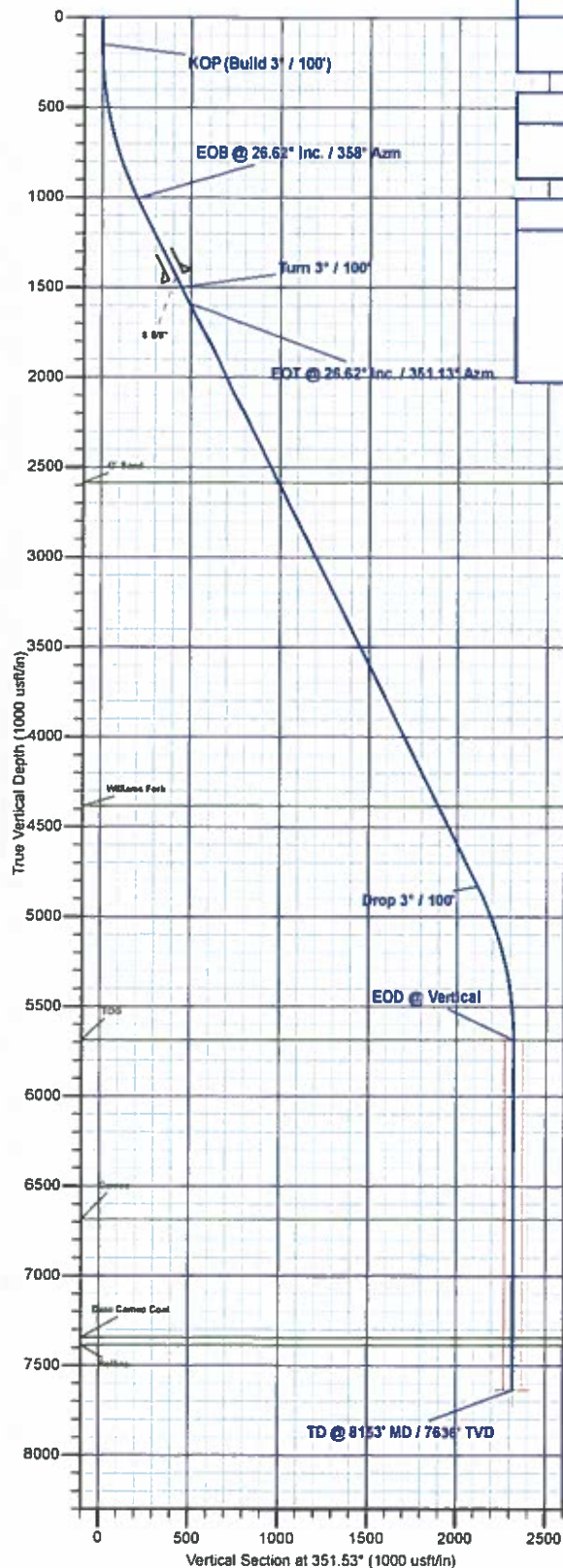
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-01W	7636.0	2299.6	-301.7	1531338.44	2344357.83	39.269311	-107.816113

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSeet	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3" / 100')
1037.3	26.62	358.00	1005.8	202.3	-7.1	3.00	358.00	201.2	EOB @ 26.62° Inc. / 358° Azm
1590.2	26.62	358.00	1500.0	449.9	-15.7	3.00	0.00	447.3	Turn 3" / 100'
1892.6	26.62	351.13	1591.8	495.8	-20.1	3.00	-83.00	493.2	EOT @ 26.62° Inc. / 351.13° Azm
5315.3	26.62	351.13	4830.1	2089.5	-270.5	0.00	0.00	2116.5	Drop 3" / 100'
6202.7	0.00	0.00	5686.0	2299.6	-301.7	3.00	180.00	2319.0	EOD @ Vertical
8152.7	0.00	0.00	7636.0	2299.6	-301.7	0.00	0.00	2319.0	TD @ 8153' MD / 7636' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2588.0	2805.0	G' Sand
4366.0	4818.5	Williams Fork
5686.0	6202.7	TOG
6686.0	7202.7	Cameo
7346.0	7662.7	Base Cameo Coal
7396.0	7902.7	Rollins



Plan: Design #2 (Bruton 19-01W/Wellbore #1)

Created By: Will Jircik Date: 8:51, March 01 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-01W

Wellbore #1

Plan: Design #2

QES Well Planning Report

01 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-01W
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 19-01W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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

Well	Bruton 19-01W					
Well Position	+N/-S	87.8 usft	Northing:	1,529,031.89 usft	Latitude:	39.262897
	+E/-W	-138.5 usft	Easting:	2,344,600.87 usft	Longitude:	-107.815047
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,262.0 usft

Wellbore		Wellbore #1			
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/21/2016	9.85	65.44	51,479

Design	Design #2			
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	351.53

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	
150.0	0.00	0.00	150.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,037.3	26.62	358.00	1,005.8	202.3	-7.1	3.00	3.00	0.00	358.00	
1,590.2	26.62	358.00	1,500.0	449.9	-15.7	0.00	0.00	0.00	0.00	
1,692.8	26.62	351.13	1,591.8	495.6	-20.1	3.00	0.00	-6.70	-93.00	
5,315.3	26.62	351.13	4,830.1	2,099.5	-270.5	0.00	0.00	0.00	0.00	
6,202.7	0.00	0.00	5,686.0	2,299.6	-301.7	3.00	-3.00	0.00	180.00	
8,152.7	0.00	0.00	7,636.0	2,299.6	-301.7	0.00	0.00	0.00	0.00	PBHL - Bruton 19-01W



Well Planning Report



Database:	EDMS002	Local Co-ordinate Reference:	Well Bruton 19-01W
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 19-01W	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
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
150.0	0.00	0.00	150.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	1.50	358.00	200.0	0.7	0.0	0.7	3.00	3.00	0.00
300.0	4.50	358.00	299.8	5.9	-0.2	5.8	3.00	3.00	0.00
400.0	7.50	358.00	399.3	16.3	-0.6	16.2	3.00	3.00	0.00
500.0	10.50	358.00	498.0	32.0	-1.1	31.8	3.00	3.00	0.00
600.0	13.50	358.00	595.8	52.7	-1.8	52.4	3.00	3.00	0.00
700.0	16.50	358.00	692.4	78.6	-2.7	78.1	3.00	3.00	0.00
800.0	19.50	358.00	787.5	109.5	-3.8	108.8	3.00	3.00	0.00
900.0	22.50	358.00	880.9	145.3	-5.1	144.5	3.00	3.00	0.00
1,000.0	25.50	358.00	972.2	185.9	-6.5	184.9	3.00	3.00	0.00
EOB @ 26.62° Inc. / 358° Azm									
1,037.3	26.62	358.00	1,005.8	202.3	-7.1	201.2	3.00	3.00	0.00
1,100.0	26.62	358.00	1,061.8	230.4	-8.0	229.1	0.00	0.00	0.00
1,200.0	26.62	358.00	1,151.2	275.2	-9.6	273.6	0.00	0.00	0.00
1,300.0	26.62	358.00	1,240.6	319.9	-11.2	318.1	0.00	0.00	0.00
1,400.0	26.62	358.00	1,330.0	364.7	-12.7	362.6	0.00	0.00	0.00
1,500.0	26.62	358.00	1,419.4	409.5	-14.3	407.1	0.00	0.00	0.00
8 5/8"									
1,524.0	26.62	358.00	1,440.8	420.3	-14.7	417.8	0.00	0.00	0.00
Turn 3° / 100'									
1,590.2	26.62	358.00	1,500.0	449.9	-15.7	447.3	0.00	0.00	0.00
1,600.0	26.61	357.34	1,508.8	454.3	-15.9	451.7	3.00	-0.14	-6.69
EOT @ 26.62° Inc. / 351.13° Azm									
1,692.8	26.62	351.13	1,591.8	495.6	-20.1	493.2	3.00	0.02	-6.70
1,700.0	26.62	351.13	1,598.2	498.8	-20.6	496.4	0.00	0.00	0.00
1,800.0	26.62	351.13	1,687.6	543.1	-27.5	541.2	0.00	0.00	0.00
1,900.0	26.62	351.13	1,777.0	587.3	-34.4	586.0	0.00	0.00	0.00
2,000.0	26.62	351.13	1,866.4	631.6	-41.3	630.8	0.00	0.00	0.00
2,100.0	26.62	351.13	1,955.8	675.9	-48.2	675.6	0.00	0.00	0.00
2,200.0	26.62	351.13	2,045.2	720.2	-55.1	720.4	0.00	0.00	0.00
2,300.0	26.62	351.13	2,134.6	764.4	-62.0	765.2	0.00	0.00	0.00
2,400.0	26.62	351.13	2,224.0	808.7	-69.0	810.1	0.00	0.00	0.00
2,500.0	26.62	351.13	2,313.4	853.0	-75.9	854.9	0.00	0.00	0.00
2,600.0	26.62	351.13	2,402.8	897.3	-82.8	899.7	0.00	0.00	0.00
2,700.0	26.62	351.13	2,492.2	941.6	-89.7	944.5	0.00	0.00	0.00
2,800.0	26.62	351.13	2,581.6	985.8	-96.6	989.3	0.00	0.00	0.00
G' Sand									
2,805.0	26.62	351.13	2,586.0	988.0	-96.9	991.5	0.00	0.00	0.00
2,900.0	26.62	351.13	2,671.0	1,030.1	-103.5	1,034.1	0.00	0.00	0.00
3,000.0	26.62	351.13	2,760.4	1,074.4	-110.4	1,078.9	0.00	0.00	0.00
3,100.0	26.62	351.13	2,849.7	1,118.7	-117.3	1,123.7	0.00	0.00	0.00
3,200.0	26.62	351.13	2,939.1	1,162.9	-124.3	1,168.6	0.00	0.00	0.00
3,300.0	26.62	351.13	3,028.5	1,207.2	-131.2	1,213.4	0.00	0.00	0.00
3,400.0	26.62	351.13	3,117.9	1,251.5	-138.1	1,258.2	0.00	0.00	0.00
3,500.0	26.62	351.13	3,207.3	1,295.8	-145.0	1,303.0	0.00	0.00	0.00
3,600.0	26.62	351.13	3,296.7	1,340.0	-151.9	1,347.8	0.00	0.00	0.00
3,700.0	26.62	351.13	3,386.1	1,384.3	-158.8	1,392.6	0.00	0.00	0.00
3,800.0	26.62	351.13	3,475.5	1,428.6	-165.7	1,437.4	0.00	0.00	0.00
3,900.0	26.62	351.13	3,564.9	1,472.9	-172.6	1,482.2	0.00	0.00	0.00
4,000.0	26.62	351.13	3,654.3	1,517.2	-179.6	1,527.1	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-01W
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 19-01W	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)
4,100.0	26.62	351.13	3,743.7	1,561.4	-186.5	1,571.9	0.00	0.00	0.00
4,200.0	26.62	351.13	3,833.1	1,605.7	-193.4	1,616.7	0.00	0.00	0.00
4,300.0	26.62	351.13	3,922.5	1,650.0	-200.3	1,661.5	0.00	0.00	0.00
4,400.0	26.62	351.13	4,011.9	1,694.3	-207.2	1,706.3	0.00	0.00	0.00
4,500.0	26.62	351.13	4,101.3	1,738.5	-214.1	1,751.1	0.00	0.00	0.00
4,600.0	26.62	351.13	4,190.7	1,782.8	-221.0	1,795.9	0.00	0.00	0.00
4,700.0	26.62	351.13	4,280.1	1,827.1	-228.0	1,840.7	0.00	0.00	0.00
4,800.0	26.62	351.13	4,369.5	1,871.4	-234.9	1,885.6	0.00	0.00	0.00
Williams Fork									
4,818.5	26.62	351.13	4,386.0	1,879.6	-236.1	1,893.8	0.00	0.00	0.00
4,900.0	26.62	351.13	4,458.9	1,915.7	-241.8	1,930.4	0.00	0.00	0.00
5,000.0	26.62	351.13	4,548.3	1,959.9	-248.7	1,975.2	0.00	0.00	0.00
5,100.0	26.62	351.13	4,637.7	2,004.2	-255.6	2,020.0	0.00	0.00	0.00
5,200.0	26.62	351.13	4,727.1	2,048.5	-262.5	2,064.8	0.00	0.00	0.00
5,300.0	26.62	351.13	4,816.5	2,092.8	-269.4	2,109.6	0.00	0.00	0.00
Drop 3" / 100'									
5,315.3	26.62	351.13	4,830.1	2,099.5	-270.5	2,116.5	0.00	0.00	0.00
5,400.0	24.08	351.13	4,906.7	2,135.4	-276.1	2,152.7	3.00	-3.00	0.00
5,500.0	21.08	351.13	4,999.0	2,173.3	-282.0	2,191.1	3.00	-3.00	0.00
5,600.0	18.08	351.13	5,093.2	2,206.4	-287.2	2,224.6	3.00	-3.00	0.00
5,700.0	15.08	351.13	5,189.0	2,234.6	-291.6	2,253.2	3.00	-3.00	0.00
5,800.0	12.08	351.13	5,286.2	2,257.8	-295.2	2,276.7	3.00	-3.00	0.00
5,900.0	9.08	351.13	5,384.5	2,275.9	-298.0	2,295.0	3.00	-3.00	0.00
6,000.0	6.08	351.13	5,483.6	2,289.0	-300.1	2,308.2	3.00	-3.00	0.00
6,100.0	3.08	351.13	5,583.3	2,296.9	-301.3	2,316.2	3.00	-3.00	0.00
6,200.0	0.08	351.13	5,683.3	2,299.6	-301.7	2,319.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,202.7	0.00	0.00	5,686.0	2,299.6	-301.7	2,319.0	3.00	-3.00	0.00
6,300.0	0.00	0.00	5,783.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,400.0	0.00	0.00	5,883.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,500.0	0.00	0.00	5,983.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,083.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,183.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,283.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,383.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,483.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,100.0	0.00	0.00	6,583.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,683.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
Cameo									
7,202.7	0.00	0.00	6,686.0	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,300.0	0.00	0.00	6,783.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,400.0	0.00	0.00	6,883.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,500.0	0.00	0.00	6,983.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,083.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,183.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,283.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
Base Cameo Coal									
7,862.7	0.00	0.00	7,346.0	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,383.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
Rollins									
7,902.7	0.00	0.00	7,386.0	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
8,000.0	0.00	0.00	7,483.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00
8,100.0	0.00	0.00	7,583.3	2,299.6	-301.7	2,319.0	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-01W
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 19-01W	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)
TD @ 8153' MD / 7636' TVD									
8,152.7	0.00	0.00	7,636.0	2,299.6	-301.7	2,319.0	0.00	0.00	0.00

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 19-01W	0.00	0.00	7,636.0	2,299.6	-301.7	1,531,338.44	2,344,357.83	39.269311	-107.816113
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,440.8	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,805.0	2,586.0	G' Sand			
4,818.5	4,386.0	Williams Fork			
6,202.7	5,686.0	TOG			
7,202.7	6,686.0	Cameo			
7,862.7	7,346.0	Base Cameo Coal			
7,902.7	7,386.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
150.0	150.0	0.0	0.0	KOP (Build 3° / 100')
1,037.3	1,005.8	202.3	-7.1	EOB @ 26.62° Inc. / 358° Azm
1,590.2	1,500.0	449.9	-15.7	Turn 3° / 100'
1,692.8	1,591.8	495.6	-20.1	EOT @ 26.62° Inc. / 351.13° Azm
5,315.3	4,830.1	2,099.5	-270.5	Drop 3° / 100'
6,202.7	5,686.0	2,299.6	-301.7	EOD @ Vertical
8,152.7	7,636.0	2,299.6	-301.7	TD @ 8153' MD / 7636' TVD