



Project: Mesa County, CO
 Site: Bruton 19-06 Pad
 Well: Bruton 19-05W
 Wellbore: Wellbore #1
 Design: Design #2
 Latitude: 39.262933
 Longitude: -107.815072
 Ground Level: 7262.0
 well @ 7286.0ust (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 19-05W, True North
 Vertical (TVD) Reference: well @ 7286.0ust (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7286.0ust (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-05W

+N-S	+E-W	Northing	Ground Level: Easting	Latitude	Longitude
0.0	0.0	1529008.69	2344593.26	39.262933	-107.815072

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

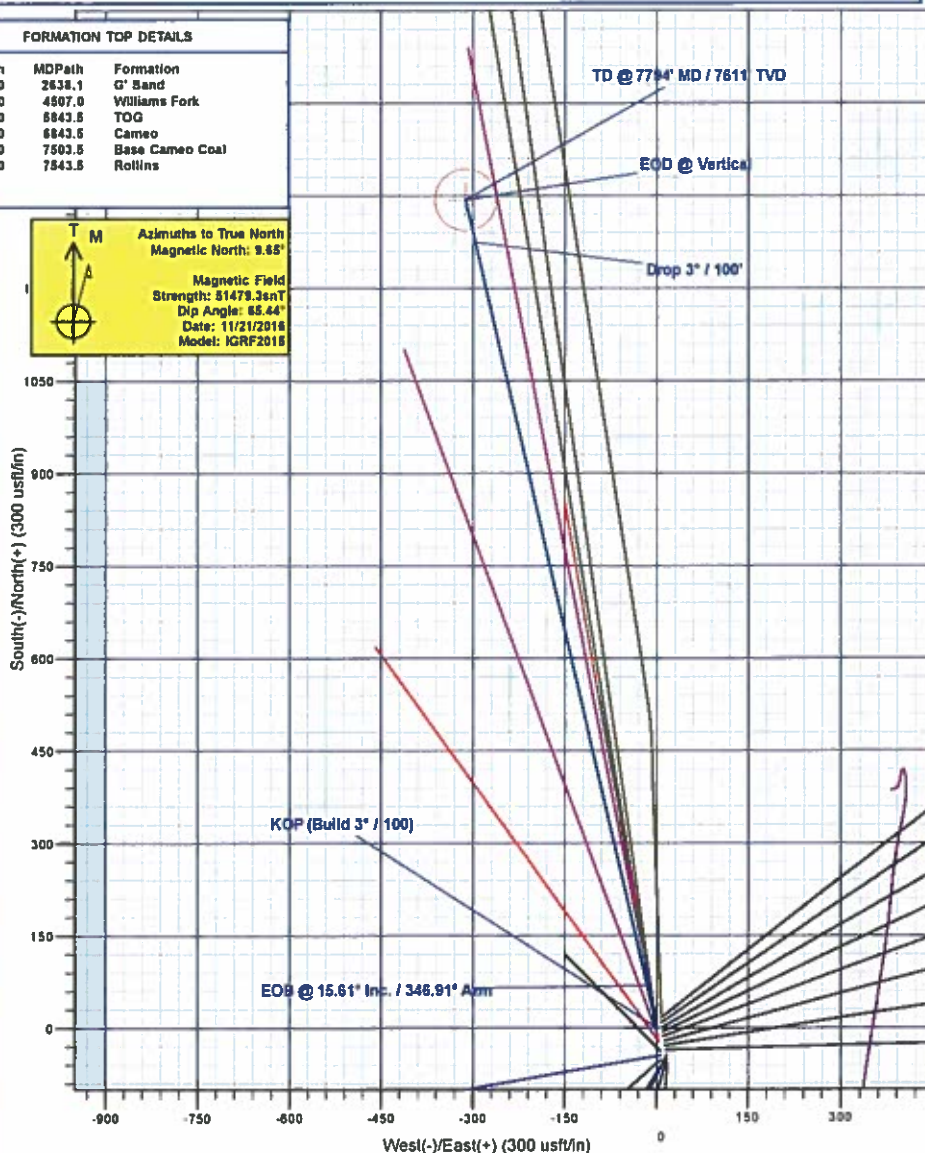
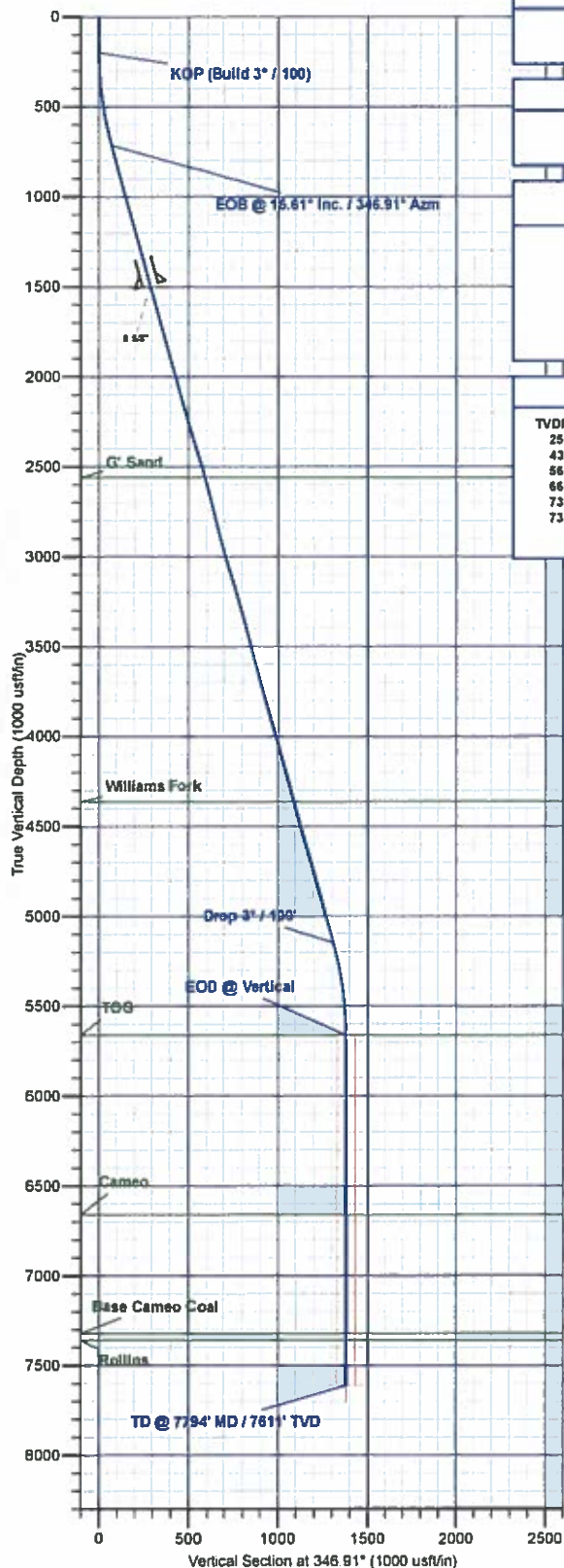
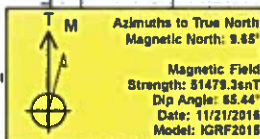
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-05W	7611.0	1343.2	-312.3	1530359.45	2344315.30	39.266621	-107.816175

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diep	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 @ 15.61" Inc. / 346.91" Azm
720.2	15.61	346.91	713.8	66.6	-16.9	3.00	346.91	70.4	Drop 3" / 100'
5323.3	15.61	346.91	5147.2	1274.7	-296.3	0.00	0.00	1304.7	EOD @ Vertical
5843.5	0.00	0.00	5843.5	1343.2	-312.3	3.00	185.00	1379.1	TD @ 7794' MD / 7611' TVD
7793.5	0.00	0.00	7611.0	1343.2	-312.3	0.00	0.00	1379.1	

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2561.0	2638.1	G' Sand
4361.0	4507.0	Williams Fork
5661.0	5843.5	TOG
6661.0	6843.5	Cameo
7321.0	7503.5	Base Cameo Coal
7361.0	7843.5	Rollins



Plan: Design #2 (Bruton 19-05W/Wellbore #1)

Created By: Will Jircik Date: 11:17, March 01 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-05W

Wellbore #1

Plan: Design #2

QES Well Planning Report

01 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05W
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 19-05W	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 19-05W			
Well Position	+N/-S	64.5 usft	Northing:	1,529,008.69 usft
	+E/-W	-145.5 usft	Easting:	2,344,593.26 usft
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	9.65	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	346.91

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	
720.2	15.61	346.91	713.8	68.6	-15.9	3.00	3.00	0.00	346.91	
5,323.3	15.61	346.91	5,147.2	1,274.7	-296.3	0.00	0.00	0.00	0.00	
5,843.5	0.00	0.00	5,661.0	1,343.2	-312.3	3.00	-3.00	0.00	180.00	
7,793.5	0.00	0.00	7,611.0	1,343.2	-312.3	0.00	0.00	0.00	0.00	PBHL - Bruton 19-05W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05W
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 19-05W	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)									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	346.91	300.0	2.5	-0.6	2.6	3.00	3.00	0.00
400.0	6.00	346.91	399.6	10.2	-2.4	10.5	3.00	3.00	0.00
500.0	9.00	346.91	498.8	22.9	-5.3	23.5	3.00	3.00	0.00
600.0	12.00	346.91	597.1	40.7	-9.5	41.7	3.00	3.00	0.00
700.0	15.00	346.91	694.3	63.4	-14.7	65.1	3.00	3.00	0.00
EOB @ 15.61° Inc. / 346.91° Azm									
720.2	15.61	346.91	713.8	68.6	-15.9	70.4	3.00	3.00	0.00
800.0	15.61	346.91	790.7	89.5	-20.8	91.9	0.00	0.00	0.00
900.0	15.61	346.91	887.0	115.7	-26.8	118.8	0.00	0.00	0.00
1,000.0	15.61	346.91	983.3	141.9	-33.0	145.7	0.00	0.00	0.00
1,100.0	15.61	346.91	1,079.6	168.1	-39.1	172.6	0.00	0.00	0.00
1,200.0	15.61	346.91	1,175.9	194.3	-45.2	199.5	0.00	0.00	0.00
1,300.0	15.61	346.91	1,272.2	220.5	-51.3	226.4	0.00	0.00	0.00
1,400.0	15.61	346.91	1,368.5	246.7	-57.4	253.3	0.00	0.00	0.00
1,500.0	15.61	346.91	1,464.8	272.9	-63.4	280.2	0.00	0.00	0.00
8 5/8"									
1,524.0	15.61	346.91	1,488.0	279.2	-64.9	286.6	0.00	0.00	0.00
1,600.0	15.61	346.91	1,561.2	299.1	-69.5	307.1	0.00	0.00	0.00
1,700.0	15.61	346.91	1,657.5	325.3	-75.6	334.0	0.00	0.00	0.00
1,800.0	15.61	346.91	1,753.8	351.5	-81.7	360.9	0.00	0.00	0.00
1,900.0	15.61	346.91	1,850.1	377.7	-87.8	387.8	0.00	0.00	0.00
2,000.0	15.61	346.91	1,946.4	403.9	-93.9	414.7	0.00	0.00	0.00
2,100.0	15.61	346.91	2,042.7	430.1	-100.0	441.6	0.00	0.00	0.00
2,200.0	15.61	346.91	2,139.0	456.3	-106.1	468.5	0.00	0.00	0.00
2,300.0	15.61	346.91	2,235.4	482.5	-112.2	495.4	0.00	0.00	0.00
2,400.0	15.61	346.91	2,331.7	508.7	-118.3	522.3	0.00	0.00	0.00
2,500.0	15.61	346.91	2,428.0	534.9	-124.4	549.2	0.00	0.00	0.00
2,600.0	15.61	346.91	2,524.3	561.1	-130.5	576.1	0.00	0.00	0.00
G' Sand									
2,638.1	15.61	346.91	2,561.0	571.1	-132.8	586.3	0.00	0.00	0.00
2,700.0	15.61	346.91	2,620.6	587.3	-136.5	603.0	0.00	0.00	0.00
2,800.0	15.61	346.91	2,716.9	613.5	-142.6	629.9	0.00	0.00	0.00
2,900.0	15.61	346.91	2,813.2	639.7	-148.7	656.8	0.00	0.00	0.00
3,000.0	15.61	346.91	2,909.6	665.9	-154.8	683.7	0.00	0.00	0.00
3,100.0	15.61	346.91	3,005.9	692.1	-160.9	710.6	0.00	0.00	0.00
3,200.0	15.61	346.91	3,102.2	718.3	-167.0	737.5	0.00	0.00	0.00
3,300.0	15.61	346.91	3,198.5	744.5	-173.1	764.4	0.00	0.00	0.00
3,400.0	15.61	346.91	3,294.8	770.7	-179.2	791.3	0.00	0.00	0.00
3,500.0	15.61	346.91	3,391.1	796.9	-185.3	818.2	0.00	0.00	0.00
3,600.0	15.61	346.91	3,487.4	823.1	-191.4	845.1	0.00	0.00	0.00
3,700.0	15.61	346.91	3,583.8	849.3	-197.5	872.0	0.00	0.00	0.00
3,800.0	15.61	346.91	3,680.1	875.5	-203.5	898.9	0.00	0.00	0.00
3,900.0	15.61	346.91	3,776.4	901.7	-209.6	925.8	0.00	0.00	0.00
4,000.0	15.61	346.91	3,872.7	927.9	-215.7	952.7	0.00	0.00	0.00
4,100.0	15.61	346.91	3,969.0	954.1	-221.8	979.6	0.00	0.00	0.00
4,200.0	15.61	346.91	4,065.3	980.3	-227.9	1,006.5	0.00	0.00	0.00
4,300.0	15.61	346.91	4,161.6	1,006.5	-234.0	1,033.4	0.00	0.00	0.00
4,400.0	15.61	346.91	4,258.0	1,032.7	-240.1	1,060.3	0.00	0.00	0.00
4,500.0	15.61	346.91	4,354.3	1,059.0	-246.2	1,087.2	0.00	0.00	0.00
Williams Fork									



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05W
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 19-05W	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)
4,507.0	15.61	346.91	4,361.0	1,060.8	-246.6	1,089.1	0.00	0.00	0.00
4,600.0	15.61	346.91	4,450.6	1,085.2	-252.3	1,114.1	0.00	0.00	0.00
4,700.0	15.61	346.91	4,546.9	1,111.4	-258.4	1,141.0	0.00	0.00	0.00
4,800.0	15.61	346.91	4,643.2	1,137.6	-264.5	1,167.9	0.00	0.00	0.00
4,900.0	15.61	346.91	4,739.5	1,163.8	-270.6	1,194.8	0.00	0.00	0.00
5,000.0	15.61	346.91	4,835.8	1,190.0	-276.6	1,221.7	0.00	0.00	0.00
5,100.0	15.61	346.91	4,932.1	1,216.2	-282.7	1,248.6	0.00	0.00	0.00
5,200.0	15.61	346.91	5,028.5	1,242.4	-288.8	1,275.5	0.00	0.00	0.00
5,300.0	15.61	346.91	5,124.8	1,268.6	-294.9	1,302.4	0.00	0.00	0.00
Drop 3° / 100'									
5,323.3	15.61	346.91	5,147.2	1,274.7	-296.3	1,308.7	0.00	0.00	0.00
5,400.0	13.30	346.91	5,221.5	1,293.3	-300.7	1,327.8	3.00	-3.00	0.00
5,500.0	10.30	346.91	5,319.4	1,313.2	-305.3	1,348.3	3.00	-3.00	0.00
5,600.0	7.30	346.91	5,418.2	1,328.1	-308.8	1,363.6	3.00	-3.00	0.00
5,700.0	4.30	346.91	5,517.6	1,338.0	-311.1	1,373.7	3.00	-3.00	0.00
5,800.0	1.30	346.91	5,617.5	1,342.8	-312.2	1,378.6	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,843.5	0.00	0.00	5,661.0	1,343.2	-312.3	1,379.1	3.00	-3.00	0.00
5,900.0	0.00	0.00	5,717.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,000.0	0.00	0.00	5,817.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,100.0	0.00	0.00	5,917.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,200.0	0.00	0.00	6,017.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,300.0	0.00	0.00	6,117.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,400.0	0.00	0.00	6,217.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,500.0	0.00	0.00	6,317.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,600.0	0.00	0.00	6,417.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,700.0	0.00	0.00	6,517.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,800.0	0.00	0.00	6,617.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
Cameo									
6,843.5	0.00	0.00	6,661.0	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
6,900.0	0.00	0.00	6,717.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,000.0	0.00	0.00	6,817.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,100.0	0.00	0.00	6,917.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,200.0	0.00	0.00	7,017.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,300.0	0.00	0.00	7,117.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,400.0	0.00	0.00	7,217.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,500.0	0.00	0.00	7,317.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
Base Cameo Coal									
7,503.5	0.00	0.00	7,321.0	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
Rollins									
7,543.5	0.00	0.00	7,361.0	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,600.0	0.00	0.00	7,417.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
7,700.0	0.00	0.00	7,517.5	1,343.2	-312.3	1,379.1	0.00	0.00	0.00
TD @ 7794' MD / 7611' TVD									
7,793.5	0.00	0.00	7,611.0	1,343.2	-312.3	1,379.1	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05W
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 19-05W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	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 19-05W	0.00	0.00	7,611.0	1,343.2	-312.3	1,530,359.46	2,344,315.31	39.266621	-107.816175
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,488.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,638.1	2,561.0	G' Sand			
4,507.0	4,361.0	Williams Fork			
5,843.5	5,661.0	TOG			
6,843.5	6,661.0	Cameo			
7,503.5	7,321.0	Base Cameo Coal			
7,543.5	7,381.0	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)
720.2	713.8	68.6	-15.9	EOB @ 15.61° Inc. / 346.91° Azm
5,323.3	5,147.2	1,274.7	-296.3	Drop 3" / 100'
5,843.5	5,661.0	1,343.2	-312.3	EOD @ Vertical
7,793.5	7,611.0	1,343.2	-312.3	TD @ 7794' MD / 7611' TVD