



Project: Mesa County, CO
 Site: Bruton 19-06 Pad
 Well: Bruton 19-05E
 Wellbore: Wellbore #1
 Design: Design #2
 Latitude: 39.262936
 Longitude: -107.815036
 Ground Level: 7262.0
 well @ 7286.0ustf (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 19-05E, True North
 Vertical (TVD) Reference: well @ 7286.0ustf (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7286.0ustf (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-05E

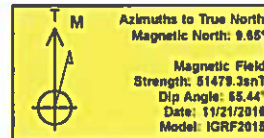
+N-S	+E-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1529009.52	2344603.48	39.262936	-107.815036

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

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-05E	7629.0	1335.3	2317.6	1530285.37	2346954.37	39.266602	-107.806880

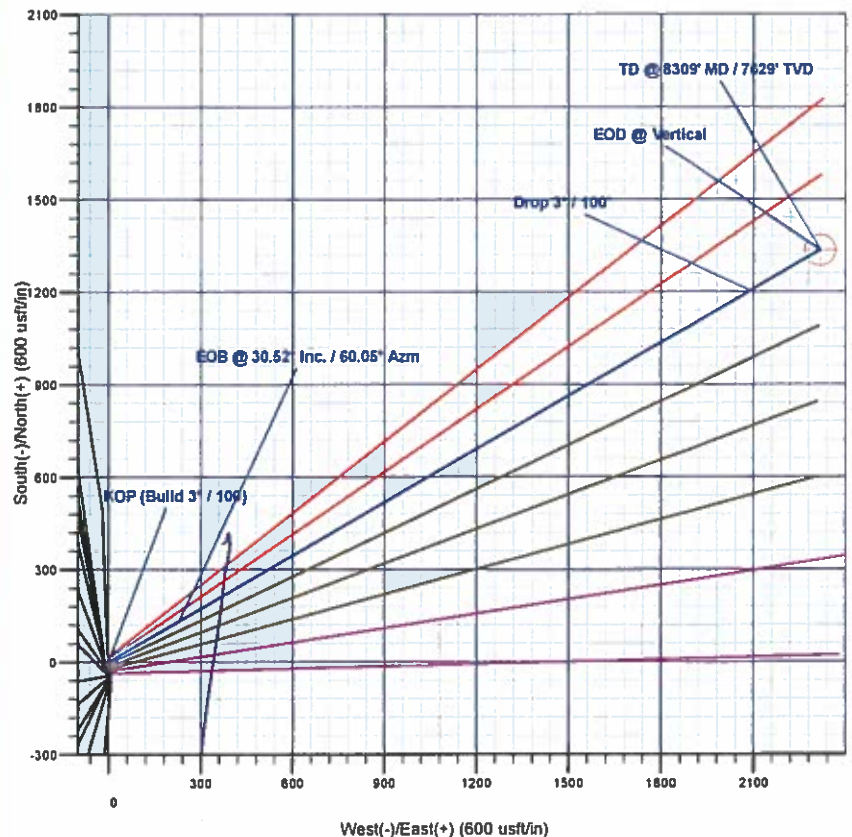
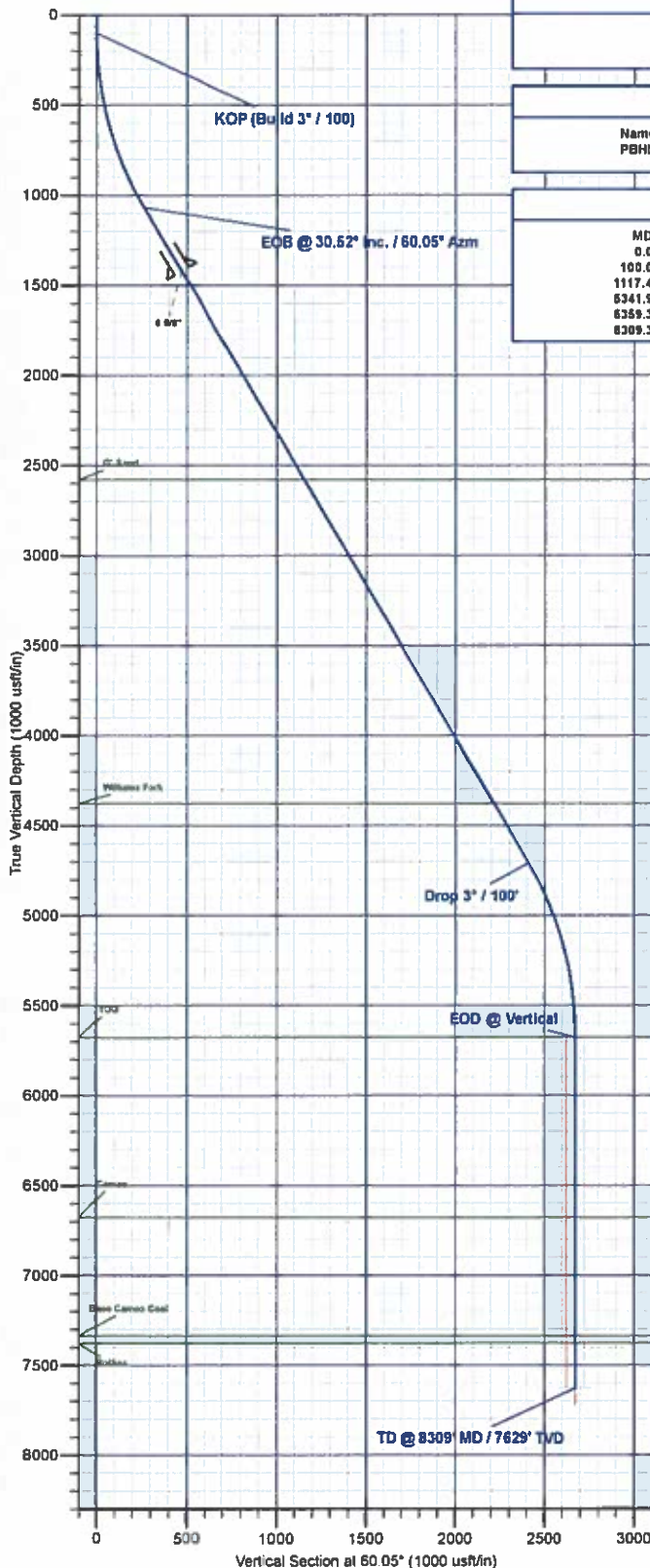
SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Diag	TFace	VSecl	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.0	EOB @ 30.52° Inc. / 60.05° Azm
1117.4	30.52	60.05	1070.0	132.1	229.3	1.00	60.05	264.6	EOB @ 30.52° Inc. / 60.05° Azm
6341.9	30.52	60.05	4709.0	1203.2	2088.3	0.00	0.00	2410.1	Drop 3' / 100'
6359.3	0.00	0.00	5679.0	1335.3	2317.6	3.00	180.00	2674.8	EOD @ Vertical
8309.3	0.00	0.00	7629.0	1335.3	2317.6	0.00	0.00	2674.8	TD @ 8309' MD / 7629' TVD



FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2579.0	2869.2	G' Sand
4379.0	4958.7	Williams Fork
5679.0	6359.3	TOG
6679.0	7359.3	Cameo
7339.0	8019.3	Base Cameo Coal
7379.0	8059.3	Rollins



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

Created By: Will Jircik Date: 11:06, March 01 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-05E

Wellbore #1

Plan: Design #2

QES Well Planning Report

01 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05E
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 19-05E	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:	La/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 19-05E					
Well Position	+N/-S	65.6 usft	Northing:	1,529,009.52 usft	Latitude:	39.262936
	+E/-W	-135.3 usft	Easting:	2,344,603.48 usft	Longitude:	-107.815036
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	60.05

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	
100.0	0.00	0.00	100.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,117.4	30.52	60.05	1,070.0	132.1	229.3	3.00	3.00	0.00	60.05	
5,341.9	30.52	60.05	4,709.0	1,203.2	2,088.3	0.00	0.00	0.00	0.00	
6,359.3	0.00	0.00	5,679.0	1,335.3	2,317.6	3.00	-3.00	0.00	180.00	
8,309.3	0.00	0.00	7,629.0	1,335.3	2,317.6	0.00	0.00	0.00	0.00	PBHL - Bruton 19-05E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05E
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 19-05E	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
KOP (Build 3° / 100)									
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	3.00	60.05	200.0	1.3	2.3	2.6	3.00	3.00	0.00
300.0	6.00	60.05	299.6	5.2	9.1	10.5	3.00	3.00	0.00
400.0	9.00	60.05	398.8	11.7	20.4	23.5	3.00	3.00	0.00
500.0	12.00	60.05	497.1	20.8	36.2	41.7	3.00	3.00	0.00
600.0	15.00	60.05	594.3	32.5	56.4	65.1	3.00	3.00	0.00
700.0	18.00	60.05	690.2	46.7	81.0	93.5	3.00	3.00	0.00
800.0	21.00	60.05	784.4	63.3	109.9	126.9	3.00	3.00	0.00
900.0	24.00	60.05	876.8	82.4	143.1	165.1	3.00	3.00	0.00
1,000.0	27.00	60.05	967.1	103.9	180.4	208.2	3.00	3.00	0.00
1,100.0	30.00	60.05	1,054.9	127.7	221.7	255.9	3.00	3.00	0.00
EOB @ 30.52° Inc. / 60.05° Azm									
1,117.4	30.52	60.05	1,070.0	132.1	229.3	264.6	3.00	3.00	0.00
1,200.0	30.52	60.05	1,141.1	153.1	285.7	306.6	0.00	0.00	0.00
1,300.0	30.52	60.05	1,227.3	178.4	309.7	357.4	0.00	0.00	0.00
1,400.0	30.52	60.05	1,313.4	203.8	353.7	408.2	0.00	0.00	0.00
1,500.0	30.52	60.05	1,399.5	229.1	397.7	459.0	0.00	0.00	0.00
8 5/8"									
1,524.0	30.52	60.05	1,420.2	235.2	408.2	471.1	0.00	0.00	0.00
1,600.0	30.52	60.05	1,485.7	254.5	441.7	509.7	0.00	0.00	0.00
1,700.0	30.52	60.05	1,571.8	279.8	485.7	560.5	0.00	0.00	0.00
1,800.0	30.52	60.05	1,658.0	305.2	529.7	611.3	0.00	0.00	0.00
1,900.0	30.52	60.05	1,744.1	330.5	573.7	662.1	0.00	0.00	0.00
2,000.0	30.52	60.05	1,830.3	355.9	617.7	712.9	0.00	0.00	0.00
2,100.0	30.52	60.05	1,916.4	381.3	661.7	763.7	0.00	0.00	0.00
2,200.0	30.52	60.05	2,002.5	406.6	705.7	814.5	0.00	0.00	0.00
2,300.0	30.52	60.05	2,088.7	432.0	749.7	865.3	0.00	0.00	0.00
2,400.0	30.52	60.05	2,174.8	457.3	793.7	916.0	0.00	0.00	0.00
2,500.0	30.52	60.05	2,261.0	482.7	837.7	966.8	0.00	0.00	0.00
2,600.0	30.52	60.05	2,347.1	508.0	881.7	1,017.6	0.00	0.00	0.00
2,700.0	30.52	60.05	2,433.3	533.4	925.7	1,068.4	0.00	0.00	0.00
2,800.0	30.52	60.05	2,519.4	558.7	969.7	1,119.2	0.00	0.00	0.00
G' Sand									
2,869.2	30.52	60.05	2,579.0	576.3	1,000.2	1,154.3	0.00	0.00	0.00
2,900.0	30.52	60.05	2,605.5	584.1	1,013.8	1,170.0	0.00	0.00	0.00
3,000.0	30.52	60.05	2,691.7	609.4	1,057.8	1,220.8	0.00	0.00	0.00
3,100.0	30.52	60.05	2,777.8	634.8	1,101.8	1,271.6	0.00	0.00	0.00
3,200.0	30.52	60.05	2,864.0	660.2	1,145.8	1,322.3	0.00	0.00	0.00
3,300.0	30.52	60.05	2,950.1	685.5	1,189.8	1,373.1	0.00	0.00	0.00
3,400.0	30.52	60.05	3,036.3	710.9	1,233.8	1,423.9	0.00	0.00	0.00
3,500.0	30.52	60.05	3,122.4	736.2	1,277.8	1,474.7	0.00	0.00	0.00
3,600.0	30.52	60.05	3,208.5	761.6	1,321.8	1,525.5	0.00	0.00	0.00
3,700.0	30.52	60.05	3,294.7	786.9	1,365.8	1,576.3	0.00	0.00	0.00
3,800.0	30.52	60.05	3,380.8	812.3	1,409.8	1,627.1	0.00	0.00	0.00
3,900.0	30.52	60.05	3,467.0	837.6	1,453.8	1,677.9	0.00	0.00	0.00
4,000.0	30.52	60.05	3,553.1	863.0	1,497.8	1,728.6	0.00	0.00	0.00
4,100.0	30.52	60.05	3,639.3	888.3	1,541.8	1,779.4	0.00	0.00	0.00
4,200.0	30.52	60.05	3,725.4	913.7	1,585.8	1,830.2	0.00	0.00	0.00
4,300.0	30.52	60.05	3,811.5	939.1	1,629.8	1,881.0	0.00	0.00	0.00
4,400.0	30.52	60.05	3,897.7	964.4	1,673.8	1,931.8	0.00	0.00	0.00
4,500.0	30.52	60.05	3,983.8	989.8	1,717.8	1,982.6	0.00	0.00	0.00
4,600.0	30.52	60.05	4,070.0	1,015.1	1,761.9	2,033.4	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05E
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 19-05E	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)
4,700.0	30.52	60.05	4,156.1	1,040.5	1,805.9	2,084.2	0.00	0.00	0.00
4,800.0	30.52	60.05	4,242.3	1,065.8	1,849.9	2,134.9	0.00	0.00	0.00
4,900.0	30.52	60.05	4,328.4	1,091.2	1,893.9	2,185.7	0.00	0.00	0.00
Williams Fork									
4,958.7	30.52	60.05	4,379.0	1,106.1	1,919.7	2,215.6	0.00	0.00	0.00
5,000.0	30.52	60.05	4,414.5	1,116.5	1,937.9	2,236.5	0.00	0.00	0.00
5,100.0	30.52	60.05	4,500.7	1,141.9	1,981.9	2,287.3	0.00	0.00	0.00
5,200.0	30.52	60.05	4,586.8	1,167.2	2,025.9	2,338.1	0.00	0.00	0.00
5,300.0	30.52	60.05	4,673.0	1,192.6	2,069.9	2,388.9	0.00	0.00	0.00
Drop 3° / 100'									
5,341.9	30.52	60.05	4,709.1	1,203.2	2,088.3	2,410.2	0.00	0.00	0.00
5,400.0	28.78	60.05	4,759.6	1,217.6	2,113.2	2,438.9	3.00	-3.00	0.00
5,500.0	25.78	60.05	4,848.4	1,240.5	2,152.9	2,484.7	3.00	-3.00	0.00
5,600.0	22.78	60.05	4,939.6	1,261.0	2,188.6	2,525.8	3.00	-3.00	0.00
5,700.0	19.78	60.05	5,032.7	1,279.1	2,220.0	2,562.1	3.00	-3.00	0.00
5,800.0	16.78	60.05	5,127.7	1,294.7	2,247.2	2,593.5	3.00	-3.00	0.00
5,900.0	13.78	60.05	5,224.1	1,307.9	2,270.0	2,619.8	3.00	-3.00	0.00
6,000.0	10.78	60.05	5,321.8	1,318.5	2,288.4	2,641.1	3.00	-3.00	0.00
6,100.0	7.78	60.05	5,420.5	1,326.6	2,302.4	2,657.2	3.00	-3.00	0.00
6,200.0	4.78	60.05	5,519.9	1,332.0	2,311.9	2,668.2	3.00	-3.00	0.00
6,300.0	1.78	60.05	5,619.7	1,334.9	2,316.8	2,673.9	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,359.3	0.00	0.00	5,679.0	1,335.3	2,317.6	2,674.8	3.00	-3.00	-101.32
6,400.0	0.00	0.00	5,719.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
6,500.0	0.00	0.00	5,819.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
6,600.0	0.00	0.00	5,919.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
6,700.0	0.00	0.00	6,019.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
6,800.0	0.00	0.00	6,119.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
6,900.0	0.00	0.00	6,219.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,000.0	0.00	0.00	6,319.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,100.0	0.00	0.00	6,419.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,200.0	0.00	0.00	6,519.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,300.0	0.00	0.00	6,619.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
Cameo									
7,359.3	0.00	0.00	6,679.0	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,400.0	0.00	0.00	6,719.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,500.0	0.00	0.00	6,819.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,600.0	0.00	0.00	6,919.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,700.0	0.00	0.00	7,019.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,800.0	0.00	0.00	7,119.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
7,900.0	0.00	0.00	7,219.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
8,000.0	0.00	0.00	7,319.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
Base Cameo Coal									
8,019.3	0.00	0.00	7,339.0	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
Rollins									
8,059.3	0.00	0.00	7,379.0	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
8,100.0	0.00	0.00	7,419.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
8,200.0	0.00	0.00	7,519.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
8,300.0	0.00	0.00	7,619.7	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00
TD @ 8309' MD / 7629' TVD - TD									
8,309.3	0.00	0.00	7,629.0	1,335.3	2,317.6	2,674.8	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-05E
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 19-05E	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #2		

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
PBHL - Bruton 19-05E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,629.0	1,335.3	2,317.6	1,530,285.37	2,346,954.37	39.266602	-107.806850

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,420.2	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,869.2	2,579.0	G' Sand			
4,958.7	4,379.0	Williams Fork			
6,359.3	5,679.0	TOG			
7,359.3	6,679.0	Cameo			
8,019.3	7,339.0	Base Cameo Coal			
8,059.3	7,379.0	Rollins			
8,309.3	7,629.0	TD			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
100.0	100.0	0.0	0.0	KOP (Build 3" / 100)
1,117.4	1,070.0	132.1	229.3	EOB @ 30.52° Inc. / 60.05° Azm
5,341.9	4,709.1	1,203.2	2,088.3	Drop 3" / 100'
6,359.3	5,679.0	1,335.3	2,317.6	EOD @ Vertical
8,309.3	7,629.0	1,335.3	2,317.6	TD @ 8309' MD / 7629' TVD