



Project: Mesa County, CO
 Site: Bruton 30-10 Pad
 Well: Bruton 30-21E
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.248050
 Longitude: -107.808800
 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 30-21E, True North
 Vertical (TVD) Reference: well @ 7665.0usft (H&P #290)
 Section (VS) Reference: Shot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7665.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-21E

Ground Level: 7643.0
 +N-S +E-W Northing Easting Latitude Longitude
 0.0 0.0 1523544.60 2346230.76 39.248050 -107.808800

DESIGN TARGET DETAILS

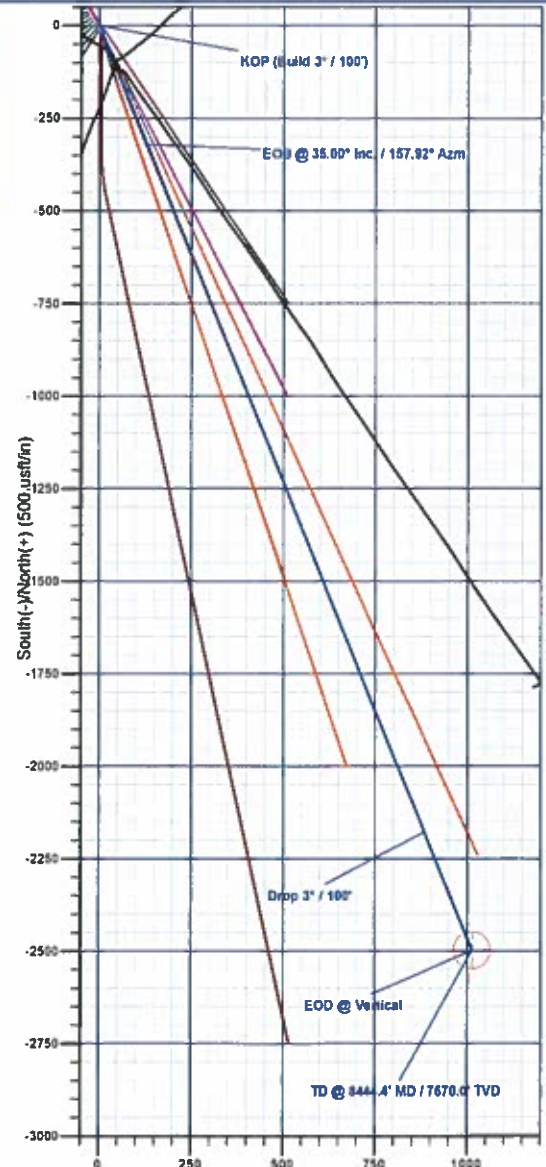
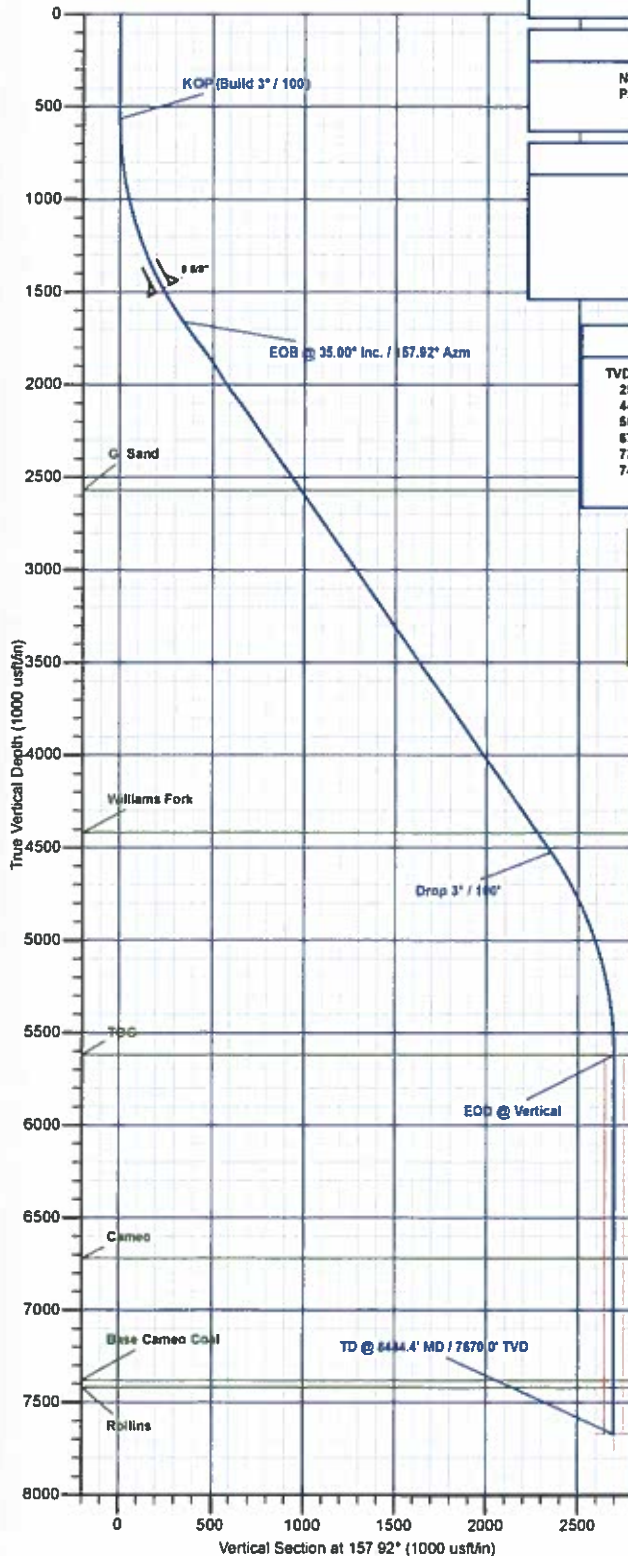
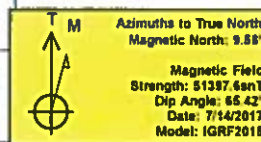
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-21E	7670.0	-2497.8	1013.1	1521021.90	2347180.04	39.241192	-107.805223

SECTION DETAILS

MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
566.0	0.00	0.00	566.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100°)
1732.6	35.00	157.92	1661.4	-320.0	129.8	3.00	157.92	345.4	EOB @ 35.00° Inc. / 157.92° Azm
5227.6	35.00	157.92	4524.6	-2177.7	883.3	0.00	0.00	2350.0	Drop 3° / 100°
6384.4	0.00	0.00	5620.0	-2497.8	1013.1	3.00	180.00	2695.4	EOD @ Vertical
8444.4	0.00	0.00	7670.0	-2497.8	1013.1	0.00	0.00	2695.4	TD @ 8444.4' MD / 7670.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2570.0	2841.8	G' Sand
4420.0	5100.2	Williams Fork
5620.0	6394.4	TOG
6720.0	7494.4	Cameo
7380.0	8154.4	Base Cameo Coal
7420.0	8194.4	Rollins



Plan: Design #1 (Bruton 30-21E/Wellbore #1)

Created By: Will Jircik Date: 12:38, July 17 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-10 Pad

Bruton 30-21E

Wellbore #1

Plan: Design #1

QES Well Planning Report

17 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-21E
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 30-21E	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 30-21E			
Well Position	+N/-S	118.4 usft	Northing:	1,523,544.61 usft
	+E/-W	-64.1 usft	Easting:	2,346,230.76 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	157.92

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	
566.0	0.00	0.00	566.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,732.6	35.00	157.92	1,681.4	-320.0	129.8	3.00	3.00	0.00	157.92	
5,227.8	35.00	157.92	4,524.6	-2,177.7	883.3	0.00	0.00	0.00	0.00	
6,394.4	0.00	0.00	5,620.0	-2,497.8	1,013.1	3.00	-3.00	0.00	180.00	
8,444.4	0.00	0.00	7,670.0	-2,497.8	1,013.1	0.00	0.00	0.00	0.00	PBHL - Bruton 30-21E



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-21E
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 30-21E	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
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP (Build 3° / 100')									
566.0	0.00	0.00	566.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	1.02	157.92	600.0	-0.3	0.1	0.3	3.00	3.00	0.00
700.0	4.02	157.92	699.9	-4.4	1.8	4.7	3.00	3.00	0.00
800.0	7.02	157.92	799.4	-13.3	5.4	14.3	3.00	3.00	0.00
900.0	10.02	157.92	898.3	-27.0	10.9	29.1	3.00	3.00	0.00
1,000.0	13.02	157.92	996.3	-45.5	18.5	49.1	3.00	3.00	0.00
1,100.0	16.02	157.92	1,093.1	-68.7	27.9	74.2	3.00	3.00	0.00
1,200.0	19.02	157.92	1,188.4	-96.6	39.2	104.3	3.00	3.00	0.00
1,300.0	22.02	157.92	1,282.1	-129.1	52.4	139.3	3.00	3.00	0.00
1,400.0	25.02	157.92	1,373.7	-166.1	67.4	179.2	3.00	3.00	0.00
1,500.0	28.02	157.92	1,463.2	-207.5	84.1	223.9	3.00	3.00	0.00
8 5/8"									
1,522.0	28.68	157.92	1,482.6	-217.1	88.1	234.3	3.00	3.00	0.00
1,600.0	31.02	157.92	1,550.2	-253.1	102.7	273.1	3.00	3.00	0.00
1,700.0	34.02	157.92	1,634.5	-302.9	122.9	326.9	3.00	3.00	0.00
EOB @ 35.00° Inc. / 157.92° Azm									
1,732.6	35.00	157.92	1,661.4	-320.0	129.8	345.4	3.00	3.00	0.00
1,800.0	35.00	157.92	1,716.6	-355.9	144.3	384.0	0.00	0.00	0.00
1,900.0	35.00	157.92	1,798.5	-409.0	165.9	441.4	0.00	0.00	0.00
2,000.0	35.00	157.92	1,880.4	-462.2	187.4	498.7	0.00	0.00	0.00
2,100.0	35.00	157.92	1,962.4	-515.3	209.0	556.1	0.00	0.00	0.00
2,200.0	35.00	157.92	2,044.3	-568.5	230.6	613.4	0.00	0.00	0.00
2,300.0	35.00	157.92	2,126.2	-621.6	252.1	670.8	0.00	0.00	0.00
2,400.0	35.00	157.92	2,208.1	-674.8	273.7	728.1	0.00	0.00	0.00
2,500.0	35.00	157.92	2,290.0	-727.9	295.2	785.5	0.00	0.00	0.00
2,600.0	35.00	157.92	2,371.9	-781.1	316.8	842.9	0.00	0.00	0.00
2,700.0	35.00	157.92	2,453.9	-834.2	338.3	900.2	0.00	0.00	0.00
2,800.0	35.00	157.92	2,535.8	-887.3	359.9	957.6	0.00	0.00	0.00
G' Sand									
2,841.8	35.00	157.92	2,570.0	-909.6	368.9	981.5	0.00	0.00	0.00
2,900.0	35.00	157.92	2,617.7	-940.5	381.5	1,014.9	0.00	0.00	0.00
3,000.0	35.00	157.92	2,699.6	-993.6	403.0	1,072.3	0.00	0.00	0.00
3,100.0	35.00	157.92	2,781.5	-1,046.8	424.6	1,129.6	0.00	0.00	0.00
3,200.0	35.00	157.92	2,863.4	-1,099.9	446.1	1,187.0	0.00	0.00	0.00
3,300.0	35.00	157.92	2,945.4	-1,153.1	467.7	1,244.3	0.00	0.00	0.00
3,400.0	35.00	157.92	3,027.3	-1,206.2	489.2	1,301.7	0.00	0.00	0.00
3,500.0	35.00	157.92	3,109.2	-1,259.4	510.8	1,359.0	0.00	0.00	0.00
3,600.0	35.00	157.92	3,191.1	-1,312.5	532.4	1,416.4	0.00	0.00	0.00
3,700.0	35.00	157.92	3,273.0	-1,365.7	553.9	1,473.8	0.00	0.00	0.00
3,800.0	35.00	157.92	3,355.0	-1,418.8	575.5	1,531.1	0.00	0.00	0.00
3,900.0	35.00	157.92	3,436.9	-1,472.0	597.0	1,588.5	0.00	0.00	0.00
4,000.0	35.00	157.92	3,518.8	-1,525.1	618.6	1,645.8	0.00	0.00	0.00
4,100.0	35.00	157.92	3,600.7	-1,578.3	640.1	1,703.2	0.00	0.00	0.00
4,200.0	35.00	157.92	3,682.6	-1,631.4	661.7	1,760.5	0.00	0.00	0.00
4,300.0	35.00	157.92	3,764.5	-1,684.6	683.3	1,817.9	0.00	0.00	0.00
4,400.0	35.00	157.92	3,846.5	-1,737.7	704.8	1,875.2	0.00	0.00	0.00
4,500.0	35.00	157.92	3,928.4	-1,790.9	726.4	1,932.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-21E
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 30-21E	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)
4,600.0	35.00	157.92	4,010.3	-1,844.0	747.9	1,989.9	0.00	0.00	0.00
4,700.0	35.00	157.92	4,092.2	-1,897.2	769.5	2,047.3	0.00	0.00	0.00
4,800.0	35.00	157.92	4,174.1	-1,950.3	791.0	2,104.7	0.00	0.00	0.00
4,900.0	35.00	157.92	4,256.0	-2,003.5	812.6	2,162.0	0.00	0.00	0.00
5,000.0	35.00	157.92	4,338.0	-2,056.6	834.2	2,219.4	0.00	0.00	0.00
5,100.0	35.00	157.92	4,419.9	-2,109.8	855.7	2,276.7	0.00	0.00	0.00
Williams Fork									
5,100.2	35.00	157.92	4,420.0	-2,109.9	855.8	2,276.8	0.00	0.00	0.00
5,200.0	35.00	157.92	4,501.8	-2,162.9	877.3	2,334.1	0.00	0.00	0.00
Drop 3° / 100'									
5,227.8	35.00	157.92	4,524.6	-2,177.7	883.3	2,350.0	0.00	0.00	0.00
5,300.0	32.83	157.92	4,584.5	-2,215.0	898.4	2,390.3	3.00	-3.00	0.00
5,400.0	29.83	157.92	4,669.9	-2,263.2	918.0	2,442.3	3.00	-3.00	0.00
5,500.0	26.83	157.92	4,757.9	-2,307.2	935.8	2,489.8	3.00	-3.00	0.00
5,600.0	23.83	157.92	4,848.3	-2,348.8	951.9	2,532.5	3.00	-3.00	0.00
5,700.0	20.83	157.92	4,940.8	-2,382.1	966.2	2,570.5	3.00	-3.00	0.00
5,800.0	17.83	157.92	5,035.1	-2,412.7	978.6	2,603.6	3.00	-3.00	0.00
5,900.0	14.83	157.92	5,131.1	-2,438.8	989.2	2,631.8	3.00	-3.00	0.00
6,000.0	11.83	157.92	5,228.4	-2,460.2	997.8	2,654.8	3.00	-3.00	0.00
6,100.0	8.83	157.92	5,326.7	-2,476.8	1,004.6	2,672.7	3.00	-3.00	0.00
6,200.0	5.83	157.92	5,425.9	-2,488.6	1,009.4	2,685.5	3.00	-3.00	0.00
6,300.0	2.83	157.92	5,525.6	-2,495.6	1,012.2	2,693.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,394.4	0.00	0.00	5,620.0	-2,497.8	1,013.1	2,695.4	3.00	-3.00	0.00
6,400.0	0.00	0.00	5,625.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
6,500.0	0.00	0.00	5,725.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
6,600.0	0.00	0.00	5,825.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
6,700.0	0.00	0.00	5,925.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
6,800.0	0.00	0.00	6,025.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
6,900.0	0.00	0.00	6,125.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,000.0	0.00	0.00	6,225.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,100.0	0.00	0.00	6,325.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,200.0	0.00	0.00	6,425.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,300.0	0.00	0.00	6,525.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,400.0	0.00	0.00	6,625.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
Cameo									
7,494.4	0.00	0.00	6,720.0	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,500.0	0.00	0.00	6,725.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,600.0	0.00	0.00	6,825.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,700.0	0.00	0.00	6,925.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,800.0	0.00	0.00	7,025.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
7,900.0	0.00	0.00	7,125.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
8,000.0	0.00	0.00	7,225.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
8,100.0	0.00	0.00	7,325.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
Base Cameo Coal									
8,154.4	0.00	0.00	7,380.0	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
Rollins									
8,194.4	0.00	0.00	7,420.0	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
8,200.0	0.00	0.00	7,425.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
8,300.0	0.00	0.00	7,525.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
8,400.0	0.00	0.00	7,625.6	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00
TD @ 8444.4' MD / 7670.0' TVD									
8,444.4	0.00	0.00	7,670.0	-2,497.8	1,013.1	2,695.4	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-21E
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 30-21E	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)
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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 30-21E - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,670.0	-2,497.8	1,013.1	1,521,021.90	2,347,180.05	39.241192	-107.805223

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,482.6	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,841.8	2,570.0	G' Sand			
5,100.2	4,420.0	Williams Fork			
6,394.4	5,620.0	TOG			
7,494.4	6,720.0	Cameo			
8,154.4	7,380.0	Base Cameo Coal			
8,194.4	7,420.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
566.0	566.0	0.0	0.0	KOP (Build 3" / 100')
1,732.6	1,661.4	-320.0	129.8	EOB @ 35.00° Inc. / 157.92° Azm
5,227.8	4,524.6	-2,177.7	883.3	Drop 3" / 100'
6,394.4	5,620.0	-2,497.8	1,013.1	EOD @ Vertical
8,444.4	7,670.0	-2,497.8	1,013.1	TD @ 8444.4' MD / 7670.0' TVD