



Project: Mesa County, CO
 Site: Bruton 19-06 Pad
 Well: Bruton 19-03W
 Wellbore: Wellbore #1
 Design: Design #2
 Latitude: 39.262975
 Longitude: -107.815081
 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 19-03W, True North
 Vertical (TVD) Reference: well @ 7286.0usft (H&P #290)
 Section (V/S) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7286.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 19-03W

+N/-S	+E/-W	Northing	Ground Level: Easting	7262.0 Latitude	Longitude
0.0	0.0	1529024.04	2344891.23	39.262975	-107.815081

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

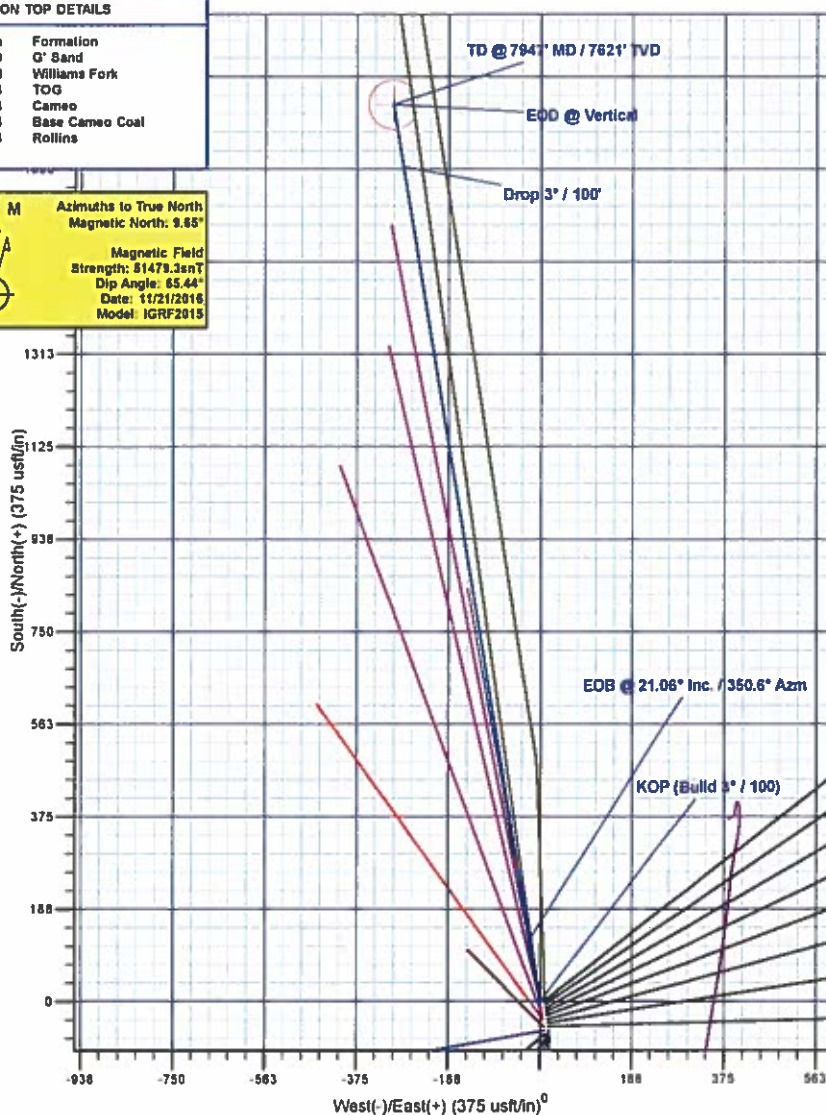
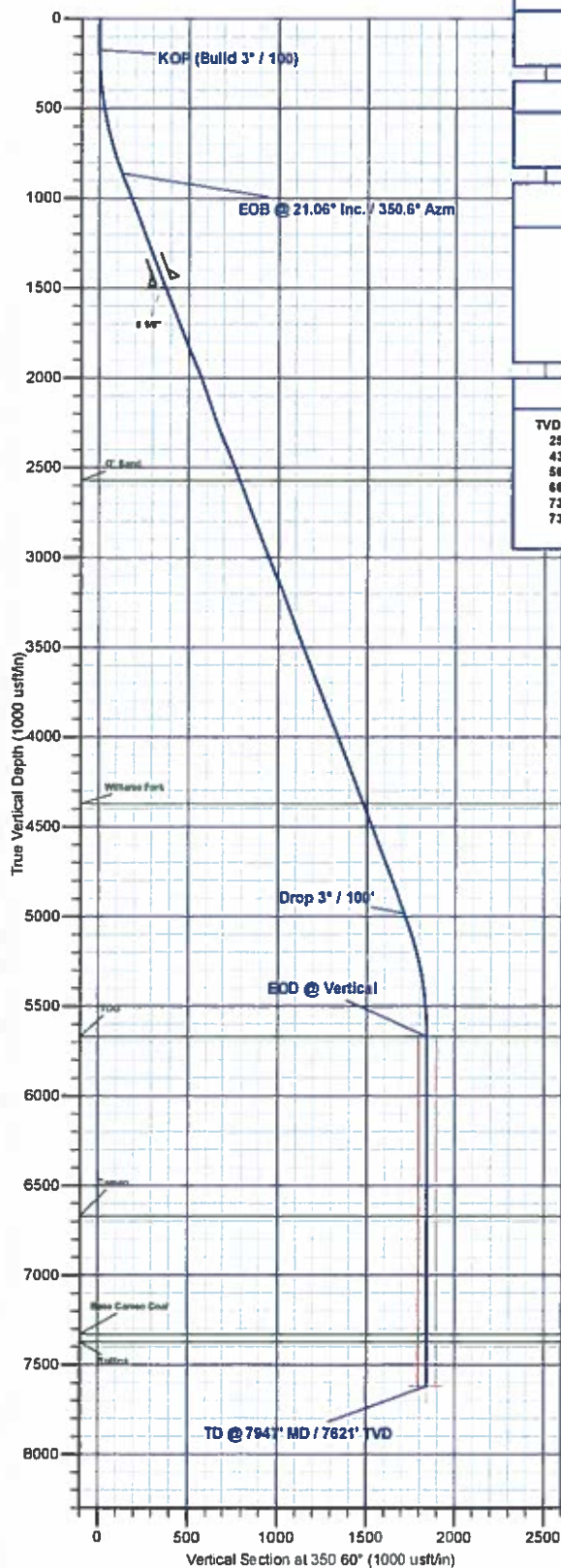
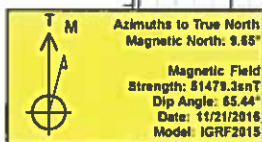
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 19-03W	7621.0	1817.8	-301.1	1530848.94	2344338.57	39.267966	-107.815144

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	V/Sect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
175.0	0.00	0.00	175.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3° / 100)
876.9	21.06	350.60	861.2	125.8	-20.8	3.00	350.60	127.5	EOB @ 21.06° Inc. / 350.6° Azm
6295.6	21.06	350.60	4984.8	1692.0	-280.2	0.00	0.00	1715.1	Drop 3° / 100'
6997.4	0.00	0.00	5671.0	1817.8	-301.1	3.00	180.00	1842.6	EOD @ Vertical
7947.4	0.00	0.00	7621.0	1817.8	-301.1	0.00	0.00	1842.6	TD @ 7947' MD / 7621' TVD

FORMATION TOP DETAILS

TVDPth	MDPath	Formation
2571.0	2709.0	G' Sand
4371.0	4637.8	Williams Fork
5671.0	5997.4	TOG
6671.0	6997.4	Cameo
7331.0	7657.4	Base Cameo Coal
7371.0	7697.4	Rollins



Plan: Design #2 (Bruton 19-03W/Wellbore #1)

Created By: Will Jircik Date: 9:56, March 01 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-03W

Wellbore #1

Plan: Design #2

QES Well Planning Report

01 March, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-03W
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 19-03W	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 19-03W			
Well Position	+N/-S	79.8 usft	Northing:	1,529,024.04 usft
	+E/-W	-148.0 usft	Easting:	2,344,591.23 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	350.60

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	
175.0	0.00	0.00	175.0	0.0	0.0	0.00	0.00	0.00	0.00	
876.9	21.06	350.60	861.2	125.8	-20.8	3.00	3.00	0.00	350.60	
5,295.6	21.06	350.60	4,984.8	1,692.0	-280.2	0.00	0.00	0.00	0.00	
5,997.4	0.00	0.00	5,671.0	1,817.8	-301.1	3.00	-3.00	0.00	180.00	
7,947.4	0.00	0.00	7,621.0	1,817.8	-301.1	0.00	0.00	0.00	0.00	PBHL - Bruton 19-03W



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-03W
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 19-03W	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)									
175.0	0.00	0.00	175.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.75	350.60	200.0	0.2	0.0	0.2	3.00	3.00	0.00
300.0	3.75	350.60	299.9	4.0	-0.7	4.1	3.00	3.00	0.00
400.0	6.75	350.60	399.5	13.1	-2.2	13.2	3.00	3.00	0.00
500.0	9.75	350.60	498.4	27.2	-4.5	27.6	3.00	3.00	0.00
600.0	12.75	350.60	596.5	46.5	-7.7	47.1	3.00	3.00	0.00
700.0	15.75	350.60	693.4	70.7	-11.7	71.7	3.00	3.00	0.00
800.0	18.75	350.60	788.9	100.0	-16.6	101.4	3.00	3.00	0.00
EOB @ 21.06° Inc. / 350.6° Azm									
876.9	21.06	350.60	861.2	125.8	-20.8	127.5	3.00	3.00	0.00
900.0	21.06	350.60	882.8	134.0	-22.2	135.8	0.00	0.00	0.00
1,000.0	21.06	350.60	976.1	169.5	-28.1	171.8	0.00	0.00	0.00
1,100.0	21.06	350.60	1,069.4	204.9	-33.9	207.7	0.00	0.00	0.00
1,200.0	21.06	350.60	1,162.7	240.3	-39.8	243.6	0.00	0.00	0.00
1,300.0	21.06	350.60	1,256.1	275.8	-45.7	279.5	0.00	0.00	0.00
1,400.0	21.06	350.60	1,349.4	311.2	-51.5	315.5	0.00	0.00	0.00
1,500.0	21.06	350.60	1,442.7	346.7	-57.4	351.4	0.00	0.00	0.00
8 5/8"									
1,524.0	21.06	350.60	1,465.1	355.2	-58.8	360.0	0.00	0.00	0.00
1,600.0	21.06	350.60	1,536.0	382.1	-63.3	387.3	0.00	0.00	0.00
1,700.0	21.06	350.60	1,629.3	417.6	-69.2	423.3	0.00	0.00	0.00
1,800.0	21.06	350.60	1,722.7	453.0	-75.0	459.2	0.00	0.00	0.00
1,900.0	21.06	350.60	1,816.0	488.5	-80.9	495.1	0.00	0.00	0.00
2,000.0	21.06	350.60	1,909.3	523.9	-86.8	531.0	0.00	0.00	0.00
2,100.0	21.06	350.60	2,002.6	559.3	-92.6	567.0	0.00	0.00	0.00
2,200.0	21.06	350.60	2,096.0	594.8	-98.5	602.9	0.00	0.00	0.00
2,300.0	21.06	350.60	2,189.3	630.2	-104.4	638.8	0.00	0.00	0.00
2,400.0	21.06	350.60	2,282.6	665.7	-110.3	674.8	0.00	0.00	0.00
2,500.0	21.06	350.60	2,375.9	701.1	-116.1	710.7	0.00	0.00	0.00
2,600.0	21.06	350.60	2,469.3	736.6	-122.0	746.6	0.00	0.00	0.00
2,700.0	21.06	350.60	2,562.6	772.0	-127.9	782.5	0.00	0.00	0.00
G' Sand									
2,709.0	21.06	350.60	2,571.0	775.2	-128.4	785.8	0.00	0.00	0.00
2,800.0	21.06	350.60	2,655.9	807.5	-133.7	818.5	0.00	0.00	0.00
2,900.0	21.06	350.60	2,749.2	842.9	-139.6	854.4	0.00	0.00	0.00
3,000.0	21.06	350.60	2,842.5	878.4	-145.5	890.3	0.00	0.00	0.00
3,100.0	21.06	350.60	2,935.9	913.8	-151.3	926.2	0.00	0.00	0.00
3,200.0	21.06	350.60	3,029.2	949.2	-157.2	962.2	0.00	0.00	0.00
3,300.0	21.06	350.60	3,122.5	984.7	-163.1	998.1	0.00	0.00	0.00
3,400.0	21.06	350.60	3,215.8	1,020.1	-169.0	1,034.0	0.00	0.00	0.00
3,500.0	21.06	350.60	3,309.2	1,055.6	-174.8	1,070.0	0.00	0.00	0.00
3,600.0	21.06	350.60	3,402.5	1,091.0	-180.7	1,105.9	0.00	0.00	0.00
3,700.0	21.06	350.60	3,495.8	1,126.5	-186.6	1,141.8	0.00	0.00	0.00
3,800.0	21.06	350.60	3,589.1	1,161.9	-192.4	1,177.7	0.00	0.00	0.00
3,900.0	21.06	350.60	3,682.5	1,197.4	-198.3	1,213.7	0.00	0.00	0.00
4,000.0	21.06	350.60	3,775.8	1,232.8	-204.2	1,249.6	0.00	0.00	0.00
4,100.0	21.06	350.60	3,869.1	1,268.3	-210.1	1,285.5	0.00	0.00	0.00
4,200.0	21.06	350.60	3,962.4	1,303.7	-215.9	1,321.5	0.00	0.00	0.00
4,300.0	21.06	350.60	4,055.7	1,339.1	-221.8	1,357.4	0.00	0.00	0.00
4,400.0	21.06	350.60	4,149.1	1,374.6	-227.7	1,393.3	0.00	0.00	0.00
4,500.0	21.06	350.60	4,242.4	1,410.0	-233.5	1,429.2	0.00	0.00	0.00



Well Planning Report



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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 19-03W	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)
4,600.0	21.06	350.60	4,335.7	1,445.5	-239.4	1,465.2	0.00	0.00	0.00
Williams Fork									
4,637.8	21.06	350.60	4,371.0	1,458.9	-241.6	1,478.8	0.00	0.00	0.00
4,700.0	21.06	350.60	4,429.0	1,480.9	-245.3	1,501.1	0.00	0.00	0.00
4,800.0	21.06	350.60	4,522.4	1,516.4	-251.1	1,537.0	0.00	0.00	0.00
4,900.0	21.06	350.60	4,615.7	1,551.8	-257.0	1,573.0	0.00	0.00	0.00
5,000.0	21.06	350.60	4,709.0	1,587.3	-262.9	1,608.9	0.00	0.00	0.00
5,100.0	21.06	350.60	4,802.3	1,622.7	-268.8	1,644.8	0.00	0.00	0.00
5,200.0	21.06	350.60	4,895.7	1,658.1	-274.6	1,680.7	0.00	0.00	0.00
Drop 3" / 100'									
5,295.6	21.06	350.60	4,984.9	1,692.0	-280.2	1,715.1	0.00	0.00	0.00
5,300.0	20.92	350.60	4,989.0	1,693.6	-280.5	1,716.7	3.03	-3.03	0.00
5,400.0	17.92	350.60	5,083.3	1,726.4	-285.9	1,749.9	3.00	-3.00	0.00
5,500.0	14.92	350.60	5,179.2	1,754.3	-290.6	1,778.2	3.00	-3.00	0.00
5,600.0	11.92	350.60	5,276.4	1,777.2	-294.3	1,801.4	3.00	-3.00	0.00
5,700.0	8.92	350.60	5,374.8	1,795.0	-297.3	1,819.5	3.00	-3.00	0.00
5,800.0	5.92	350.60	5,473.9	1,807.8	-299.4	1,832.4	3.00	-3.00	0.00
5,900.0	2.92	350.60	5,573.6	1,815.4	-300.7	1,840.1	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,997.4	0.00	0.00	5,671.0	1,817.8	-301.1	1,842.6	3.00	-3.00	0.00
6,000.0	0.00	0.00	5,673.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,100.0	0.00	0.00	5,773.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,200.0	0.00	0.00	5,873.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,300.0	0.00	0.00	5,973.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,400.0	0.00	0.00	6,073.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,500.0	0.00	0.00	6,173.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,600.0	0.00	0.00	6,273.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,700.0	0.00	0.00	6,373.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,800.0	0.00	0.00	6,473.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
6,900.0	0.00	0.00	6,573.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
Cameo									
6,997.4	0.00	0.00	6,671.0	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,000.0	0.00	0.00	6,673.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,100.0	0.00	0.00	6,773.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,200.0	0.00	0.00	6,873.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,300.0	0.00	0.00	6,973.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,400.0	0.00	0.00	7,073.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,500.0	0.00	0.00	7,173.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,600.0	0.00	0.00	7,273.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
Base Cameo Coal									
7,657.4	0.00	0.00	7,331.0	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
Rollins									
7,697.4	0.00	0.00	7,371.0	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,700.0	0.00	0.00	7,373.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,800.0	0.00	0.00	7,473.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
7,900.0	0.00	0.00	7,573.6	1,817.8	-301.1	1,842.6	0.00	0.00	0.00
TD @ 7947' MD / 7621' TVD									
7,947.4	0.00	0.00	7,621.0	1,817.8	-301.1	1,842.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 19-03W
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 19-03W	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 19-03W - plan hits target center - Circle (radius 50.0)	0.00	0.00	7,621.0	1,817.8	-301.1	1,530,848.95	2,344,336.57	39.267966	-107.816144

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,524.0	1,465.1	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,709.0	2,571.0	G' Sand			
4,637.8	4,371.0	Williams Fork			
5,997.4	5,671.0	TOG			
6,997.4	6,671.0	Cameo			
7,657.4	7,331.0	Base Cameo Coal			
7,697.4	7,371.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
175.0	175.0	0.0	0.0	KOP (Build 3" / 100)
876.9	861.2	125.8	-20.8	EOB @ 21.06° Inc. / 350.6° Azm
5,295.6	4,984.9	1,692.0	-280.2	Drop 3" / 100'
5,997.4	5,671.0	1,817.8	-301.1	EOD @ Vertical
7,947.4	7,621.0	1,817.8	-301.1	TD @ 7947' MD / 7621' TVD