



Project: Mesa County, CO
 Site: Bruton 30-03 Pad
 Well: Bruton 30-11W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.252572
 Longitude: -107.814333
 Ground Level: 7512.0
 well @ 7534.0usft (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 30-11W, True North
 Vertical (TVD) Reference: well @ 7534.0usft (H&P #290)
 Section (VS) Reference: Slot - (0.0N, 0.0E)
 Measured Depth Reference: well @ 7534.0usft (H&P #290)
 Calculation Method: Minimum Curvature

WELL DETAILS: Bruton 30-11W

+N-S	+E-W	Northing	Easting	Latitude	Longitude
0.0	0.0	1525230.92	2344706.30	39.252572	-107.814333

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - Bruton 30-11W	7636.0	-1616.7	-563.9	1523628.81	2344111.37	39.248133	-107.816289

SECTION DETAILS

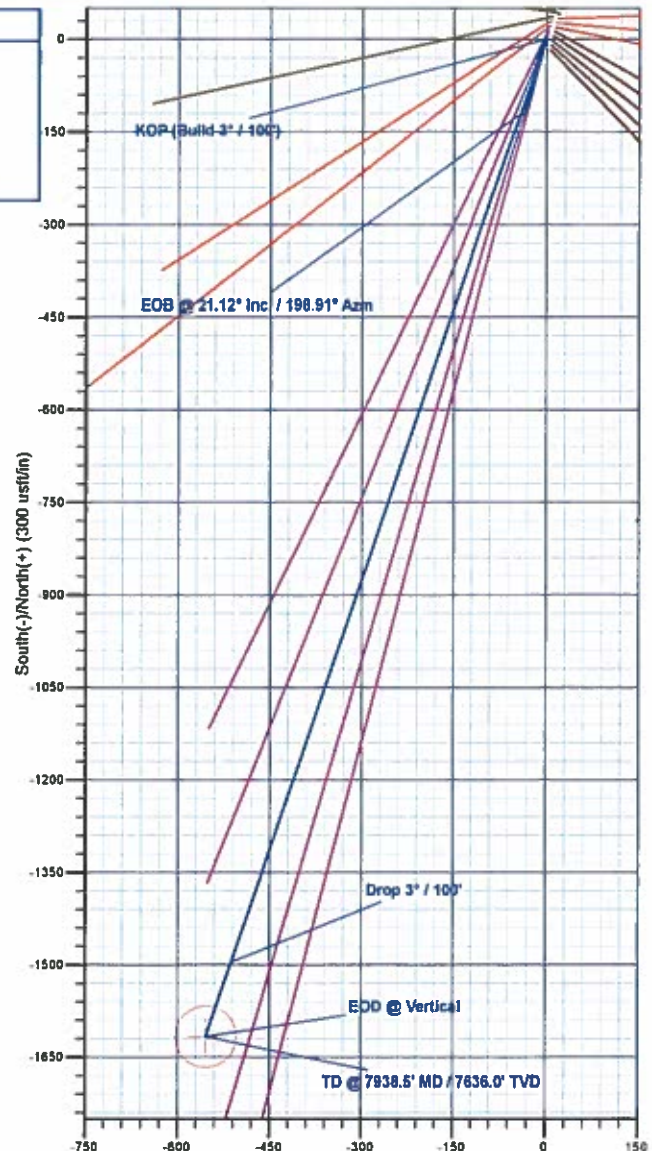
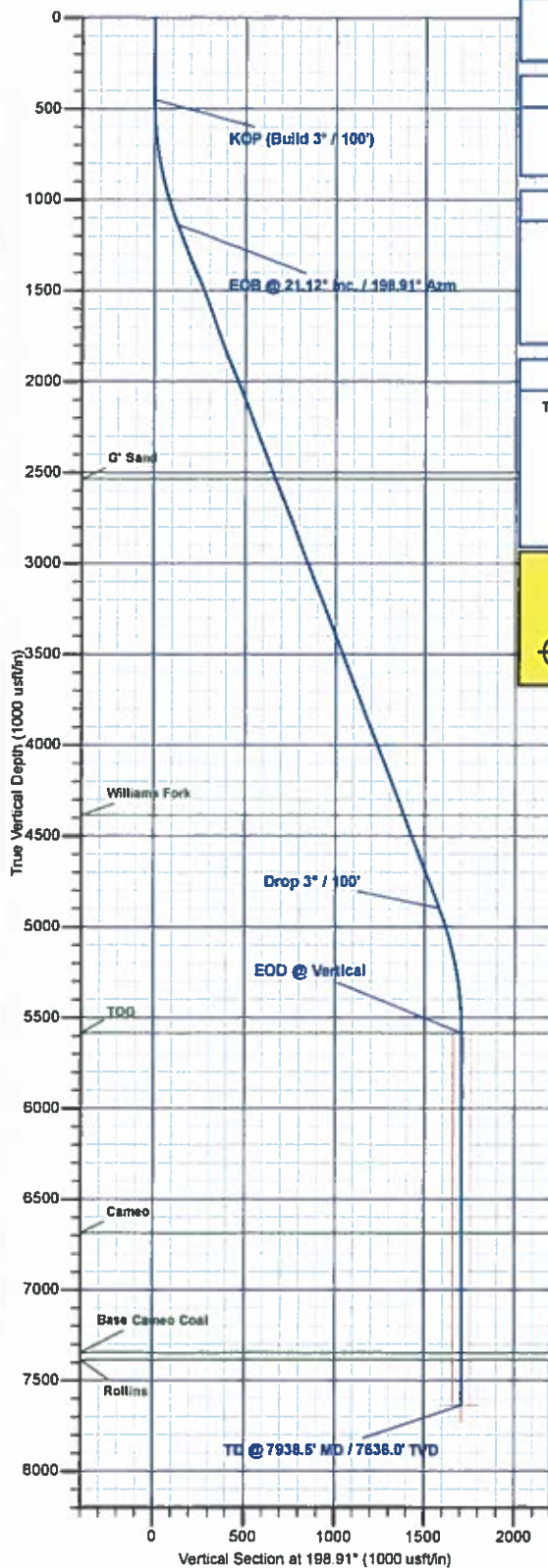
MD	Inc	Azi	TVD	+N-S	+E-W	Dleg	TFace	VFace	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
450.0	0.00	0.00	450.0	0.0	0.0	0.00	0.00	0.0	EOB @ 21.12° Inc / 198.91° Azm
1154.1	21.12	198.91	1139.2	-121.4	-41.6	3.00	198.91	128.3	EOB @ 21.12° Inc / 198.91° Azm
5184.4	21.12	198.91	4897.8	-1496.3	-512.3	0.00	0.00	1580.7	Drop 3' / 100'
5588.5	0.00	0.00	5588.0	-1616.7	-563.9	3.00	180.00	1709.0	EOD @ Vertical
7938.5	0.00	0.00	7636.0	-1616.7	-563.9	0.00	0.00	1709.0	TD @ 7938.5' MD / 7636.0' TVD

FORMATION TOP DETAILS

TVDPth	MDPath	Formation
2536.0	2652.5	G' Sand
4398.0	4635.8	Williams Fork
5588.0	5588.5	TOG
6986.0	6988.5	Cameo
7346.0	7648.5	Base Cameo Coal
7388.0	7688.5	Rollins



Azimuths to True North
 Magnetic North: 9.50°
 Magnetic Field
 Strength: 51419.8nT
 Dip Angle: 65.42°
 Date: 5/11/2017
 Model: IGRF2015



Plan: Design #1 (Bruton 30-11W/Wellbore #1)

Created By: Will Jircik Date: 12:54, May 15 2017



Laramie Energy, LLC

Mesa County, CO

Bruton 30-03 Pad

Bruton 30-11W

Wellbore #1

Plan: Design #1

QES Well Planning Report

15 May, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-11W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534 0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-11W	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 30-03 Pad			
Site Position:		Northing:	1,525,281.27 usft	Latitude:	39.252711
From:	Lat/Long	Easting:	2,344,720.08 usft	Longitude:	-107.814289
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46

Well	Bruton 30-11W					
Well Position	+N/-S	-50.7 usft	Northing:	1,525,230.92 usft	Latitude:	39.252572
	+E/-W	-12.5 usft	Easting:	2,344,706.30 usft	Longitude:	-107.814333
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,512.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	5/11/2017	9.60	65.42	51,420

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	198.91

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	
450.0	0.00	0.00	450.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,154.1	21.12	198.91	1,138.2	-121.4	-41.6	3.00	3.00	0.00	198.91	
5,184.4	21.12	198.91	4,897.8	-1,495.3	-512.3	0.00	0.00	0.00	0.00	
5,888.5	0.00	0.00	5,586.0	-1,616.7	-553.9	3.00	-3.00	0.00	180.00	
7,938.5	0.00	0.00	7,636.0	-1,616.7	-553.9	0.00	0.00	0.00	0.00	PBHL - Bruton 30-11V



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-11W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-11W	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
KOP (Build 3° / 100')									
450.0	0.00	0.00	450.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	1.50	198.91	500.0	-0.6	-0.2	0.7	3.00	3.00	0.00
600.0	4.50	198.91	599.8	-5.6	-1.9	5.9	3.00	3.00	0.00
700.0	7.50	198.91	699.3	-15.5	-5.3	16.3	3.00	3.00	0.00
800.0	10.50	198.91	798.0	-30.3	-10.4	32.0	3.00	3.00	0.00
900.0	13.50	198.91	895.8	-49.9	-17.1	52.8	3.00	3.00	0.00
1,000.0	16.50	198.91	992.4	-74.4	-25.5	78.6	3.00	3.00	0.00
1,100.0	19.50	198.91	1,087.5	-103.6	-35.5	109.5	3.00	3.00	0.00
EOB @ 21.12° Inc. / 198.91° Azm									
1,154.1	21.12	198.91	1,138.2	-121.4	-41.6	128.3	3.00	3.00	0.00
1,200.0	21.12	198.91	1,181.1	-137.0	-47.0	144.9	0.00	0.00	0.00
1,300.0	21.12	198.91	1,274.4	-171.1	-58.6	180.9	0.00	0.00	0.00
1,400.0	21.12	198.91	1,367.6	-205.2	-70.3	216.9	0.00	0.00	0.00
1,500.0	21.12	198.91	1,460.9	-239.3	-82.0	253.0	0.00	0.00	0.00
8 5/8"									
1,522.0	21.12	198.91	1,481.4	-246.8	-84.6	260.9	0.00	0.00	0.00
1,600.0	21.12	198.91	1,554.2	-273.4	-93.7	289.0	0.00	0.00	0.00
1,700.0	21.12	198.91	1,647.5	-307.5	-105.4	325.0	0.00	0.00	0.00
1,800.0	21.12	198.91	1,740.8	-341.6	-117.0	361.1	0.00	0.00	0.00
1,900.0	21.12	198.91	1,834.0	-375.7	-128.7	397.1	0.00	0.00	0.00
2,000.0	21.12	198.91	1,927.3	-409.8	-140.4	433.2	0.00	0.00	0.00
2,100.0	21.12	198.91	2,020.6	-443.9	-152.1	469.2	0.00	0.00	0.00
2,200.0	21.12	198.91	2,113.9	-478.0	-163.8	505.2	0.00	0.00	0.00
2,300.0	21.12	198.91	2,207.2	-512.0	-175.4	541.3	0.00	0.00	0.00
2,400.0	21.12	198.91	2,300.5	-546.1	-187.1	577.3	0.00	0.00	0.00
2,500.0	21.12	198.91	2,393.7	-580.2	-198.8	613.3	0.00	0.00	0.00
2,600.0	21.12	198.91	2,487.0	-614.3	-210.5	649.4	0.00	0.00	0.00
G' Sand									
2,652.5	21.12	198.91	2,536.0	-632.2	-216.6	668.3	0.00	0.00	0.00
2,700.0	21.12	198.91	2,580.3	-648.4	-222.2	685.4	0.00	0.00	0.00
2,800.0	21.12	198.91	2,673.6	-682.5	-233.8	721.4	0.00	0.00	0.00
2,900.0	21.12	198.91	2,766.9	-716.6	-245.5	757.5	0.00	0.00	0.00
3,000.0	21.12	198.91	2,860.1	-750.7	-257.2	793.5	0.00	0.00	0.00
3,100.0	21.12	198.91	2,953.4	-784.8	-268.9	829.6	0.00	0.00	0.00
3,200.0	21.12	198.91	3,046.7	-818.9	-280.6	865.6	0.00	0.00	0.00
3,300.0	21.12	198.91	3,140.0	-852.9	-292.2	901.6	0.00	0.00	0.00
3,400.0	21.12	198.91	3,233.3	-887.0	-303.9	937.7	0.00	0.00	0.00
3,500.0	21.12	198.91	3,326.5	-921.1	-315.6	973.7	0.00	0.00	0.00
3,600.0	21.12	198.91	3,419.8	-955.2	-327.3	1,009.7	0.00	0.00	0.00
3,700.0	21.12	198.91	3,513.1	-989.3	-339.0	1,045.8	0.00	0.00	0.00
3,800.0	21.12	198.91	3,606.4	-1,023.4	-350.6	1,081.8	0.00	0.00	0.00
3,900.0	21.12	198.91	3,699.7	-1,057.5	-362.3	1,117.8	0.00	0.00	0.00
4,000.0	21.12	198.91	3,793.0	-1,091.6	-374.0	1,153.9	0.00	0.00	0.00
4,100.0	21.12	198.91	3,886.2	-1,125.7	-385.7	1,189.9	0.00	0.00	0.00
4,200.0	21.12	198.91	3,979.5	-1,159.8	-397.4	1,225.9	0.00	0.00	0.00
4,300.0	21.12	198.91	4,072.8	-1,193.9	-409.0	1,262.0	0.00	0.00	0.00
4,400.0	21.12	198.91	4,166.1	-1,227.9	-420.7	1,298.0	0.00	0.00	0.00
4,500.0	21.12	198.91	4,259.4	-1,262.0	-432.4	1,334.1	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-11W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534 0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534 0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-11W	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	21.12	198.91	4,352.6	-1,296.1	-444.1	1,370.1	0.00	0.00	0.00
Williams Fork									
4,635.8	21.12	198.91	4,386.0	-1,308.3	-448.3	1,383.0	0.00	0.00	0.00
4,700.0	21.12	198.91	4,445.9	-1,330.2	-455.8	1,406.1	0.00	0.00	0.00
4,800.0	21.12	198.91	4,539.2	-1,364.3	-467.4	1,442.2	0.00	0.00	0.00
4,900.0	21.12	198.91	4,632.5	-1,398.4	-479.1	1,478.2	0.00	0.00	0.00
5,000.0	21.12	198.91	4,725.8	-1,432.5	-490.8	1,514.2	0.00	0.00	0.00
5,100.0	21.12	198.91	4,819.0	-1,466.6	-502.5	1,550.3	0.00	0.00	0.00
Drop 3" / 100'									
5,184.4	21.12	198.91	4,897.8	-1,495.3	-512.3	1,580.7	0.00	0.00	0.00
5,200.0	20.65	198.91	4,912.3	-1,500.6	-514.1	1,586.2	3.00	-3.00	0.00
5,300.0	17.65	198.91	5,006.8	-1,531.7	-524.8	1,619.1	3.00	-3.00	0.00
5,400.0	14.65	198.91	5,102.8	-1,558.0	-533.8	1,646.9	3.00	-3.00	0.00
5,500.0	11.65	198.91	5,200.2	-1,579.5	-541.2	1,669.6	3.00	-3.00	0.00
5,600.0	8.65	198.91	5,298.6	-1,596.2	-546.9	1,687.3	3.00	-3.00	0.00
5,700.0	5.65	198.91	5,397.8	-1,607.9	-550.9	1,699.7	3.00	-3.00	0.00
5,800.0	2.65	198.91	5,497.6	-1,614.8	-553.3	1,707.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
5,888.5	0.00	0.00	5,586.0	-1,616.7	-553.9	1,709.0	3.00	-3.00	182.09
5,900.0	0.00	0.00	5,597.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,000.0	0.00	0.00	5,697.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,100.0	0.00	0.00	5,797.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,200.0	0.00	0.00	5,897.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,300.0	0.00	0.00	5,997.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,097.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,197.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,297.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,397.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,497.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,597.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
Cameo									
6,988.5	0.00	0.00	6,686.0	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,000.0	0.00	0.00	6,697.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,100.0	0.00	0.00	6,797.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,200.0	0.00	0.00	6,897.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,300.0	0.00	0.00	6,997.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,097.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,197.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,297.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
Base Cameo Coal									
7,648.5	0.00	0.00	7,346.0	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
Rollins									
7,688.5	0.00	0.00	7,386.0	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,397.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,497.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,597.5	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00
TD @ 7938.5' MD / 7636.0' TVD									
7,938.5	0.00	0.00	7,636.0	-1,616.7	-553.9	1,709.0	0.00	0.00	0.00



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Bruton 30-11W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7534.0usft (H&P #290)
Project:	Mesa County, CO	MD Reference:	well @ 7534.0usft (H&P #290)
Site:	Bruton 30-03 Pad	North Reference:	True
Well:	Bruton 30-11W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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 30-11W	0.00	0.00	7,636.0	-1,616.7	-553.9	1,523,628.82	2,344,111.37	39.248133	-107.816289
- plan hits target center									
- Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,522.0	1,481.4	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,652.5	2,536.0	G' Sand			
4,635.8	4,386.0	Williams Fork			
5,888.5	5,586.0	TOG			
6,988.5	6,686.0	Cameo			
7,648.5	7,346.0	Base Cameo Coal			
7,688.5	7,386.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
450.0	450.0	0.0	0.0	KOP (Build 3" / 100')
1,154.1	1,138.2	-121.4	-41.6	EOB @ 21.12° Inc. / 198.91° Azm
5,184.4	4,897.8	-1,495.3	-512.3	Drop 3" / 100'
5,888.5	5,586.0	-1,616.7	-553.9	EOD @ Vertical
7,938.5	7,636.0	-1,616.7	-553.9	TD @ 7938.5' MD / 7636.0' TVD