



Project: Mesa County, CO  
 Site: Nichols 24-07 Pad  
 Well: Nichols 0994-24-12W  
 Wellbore: Wellbore #1  
 Design: Design #1  
 Latitude: 39.263347  
 Longitude: -107.830867  
 Ground Level: 7212.0  
 well @ 7242.0ustf (H&P #522)



#### 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 Nichols 0994-24-12W, True North  
 Vertical (TVD) Reference: well @ 7242.0ustf (H&P #522)  
 Section (VS) Reference: Slot - (0.0N, 0.0E)  
 Measured Depth Reference: well @ 7242.0ustf (H&P #522)  
 Calculation Method: Minimum Curvature

#### WELL DETAILS: Nichols 0994-24-12W

+N/-S	+E/-W	North	Ground Level:	7212.0	Latitude	Longitude
0.0	0.0	1529273.76	Easting	2340126.47	39.263347	-107.830867

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

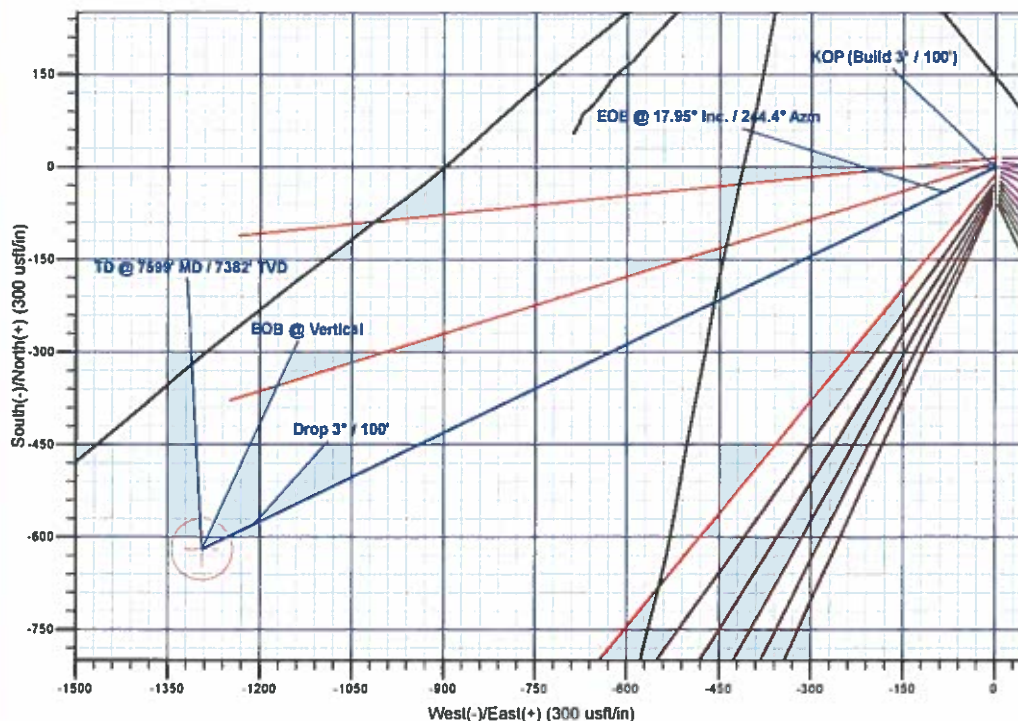
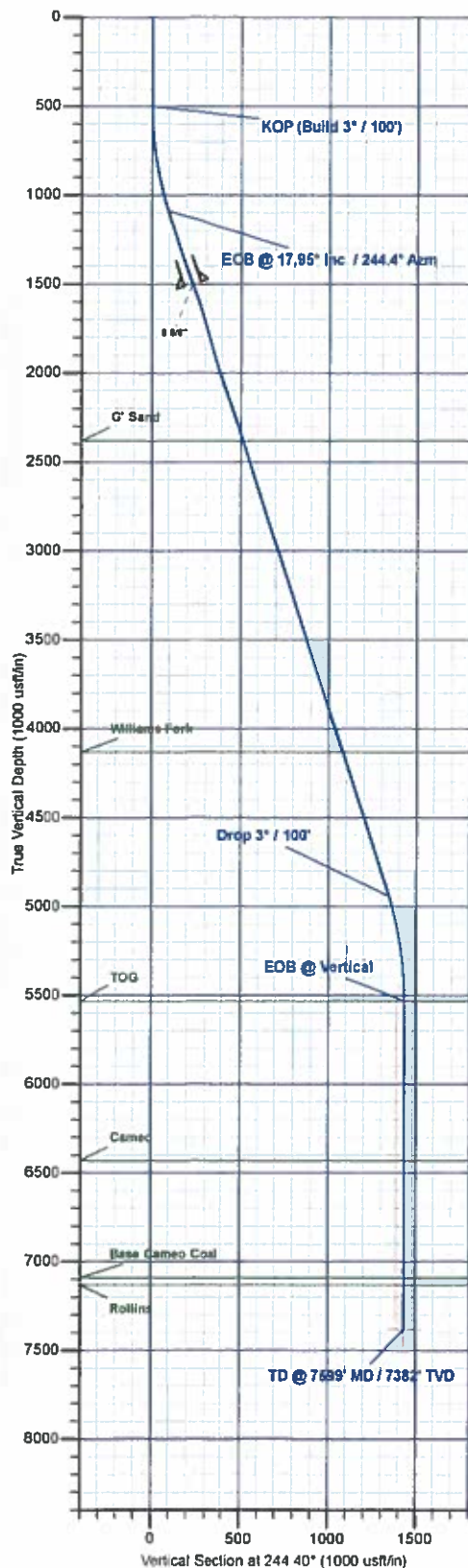
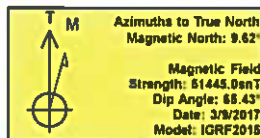
Name	TVD	+N/-S	+E/-W	North	Easting	Latitude	Longitude
PBHL - Nichols 0994-24-12W	7382.0	-619.9	-1293.7	1528687.30	2338617.33	39.261645	-107.835436

#### SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSec	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.0	EOB @ 17.95° Inc. / 244.4° Azm
1098.2	17.95	244.40	1088.5	-40.2	-83.8	3.00	244.40	82.9	Drop 3' / 100'
5150.4	17.95	244.40	4943.5	-579.7	-1209.9	0.00	0.00	1341.6	EOB @ Vertical
5748.6	0.00	0.00	5632.0	-619.9	-1293.7	3.00	180.00	1434.5	TD @ 7599' MD / 7382' TVD
7599.6	0.00	0.00	7382.0	-619.9	-1293.7	0.00	0.00	1434.5	

#### FORMATION TOP DETAILS

TVDPath	MDPath	Formation
2382.0	2457.9	G' Sand
4132.0	4297.4	Williams Fork
5532.0	5748.6	TOG
6432.0	6648.6	Cameo
7092.0	7308.6	Base Cameo Coal
7132.0	7348.6	Rollins



Plan: Design #1 (Nichols 0994-24-12W/Wellbore #1)

Created By: Will Jircik Date: 17:01, March 10 2017



# **Laramie Energy, LLC**

**Mesa County, CO**

**Nichols 24-07 Pad**

**Nichols 0994-24-12W**

**Wellbore #1**

**Plan: Design #1**

## **QES Well Planning Report**

**10 March, 2017**





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

<b>Project</b>	Mesa County, CO		
<b>Map System:</b>	US State Plane 1983	<b>System Datum:</b>	Mean Sea Level
<b>Geo Datum:</b>	North American Datum 1983		
<b>Map Zone:</b>	Colorado Central Zone		

<b>Site</b>	Nichols 24-07 Pad			
<b>Site Position:</b>		<b>Northing:</b>	1,529,213.07 usft	<b>Latitude:</b> 39.263181
<b>From:</b>	Lat/Long	<b>Easting:</b>	2,340,128.94 usft	<b>Longitude:</b> -107.830853
<b>Position Uncertainty:</b>	0.0 usft	<b>Slot Radius:</b>	13-3/16 "	<b>Grid Convergence:</b> -1.47 "

<b>Well</b>	Nichols 0994-24-12W			
<b>Well Position</b>	+N/-S	60.6 usft	<b>Northing:</b>	1,529,273.77 usft
	+E/-W	-4.0 usft	<b>Easting:</b>	2,340,126.47 usft
<b>Position Uncertainty</b>		0.0 usft	<b>Wellhead Elevation:</b>	0.0 usft
			<b>Ground Level:</b>	7,212.0 usft

<b>Wellbore</b>	Wellbore #1				
<b>Magnetics</b>	<b>Model Name</b>	<b>Sample Date</b>	<b>Declination (°)</b>	<b>Dip Angle (°)</b>	<b>Field Strength (nT)</b>
	IGRF2015	3/9/2017	9.63	65.43	51,445

<b>Design</b>	Design #1			
<b>Audit Notes:</b>				
<b>Version:</b>	<b>Phase:</b>	PLAN	<b>Tie On Depth:</b>	0.0
<b>Vertical Section:</b>	<b>Depth From (TVD) (usft)</b>	<b>+N/-S (usft)</b>	<b>+E/-W (usft)</b>	<b>Direction (°)</b>
	0.0	0.0	0.0	244.40

<b>Plan Sections</b>										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Bulld 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	
500.0	0.00	0.00	500.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,098.2	17.95	244.40	1,088.5	-40.2	-83.8	3.00	3.00	0.00	244.40	
5,150.4	17.95	244.40	4,943.5	-579.7	-1,209.9	0.00	0.00	0.00	0.00	
5,748.6	0.00	0.00	5,532.0	-619.9	-1,293.7	3.00	-3.00	0.00	180.00	
7,598.6	0.00	0.00	7,382.0	-619.9	-1,293.7	0.00	0.00	0.00	0.00	PBHL - Nichols 0994-





## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242.0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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
<b>KOP (Build 3° / 100')</b>									
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	3.00	244.40	600.0	-1.1	-2.4	2.6	3.00	3.00	0.00
700.0	6.00	244.40	699.6	-4.5	-9.4	10.5	3.00	3.00	0.00
800.0	9.00	244.40	798.8	-10.2	-21.2	23.5	3.00	3.00	0.00
900.0	12.00	244.40	897.1	-18.0	-37.6	41.7	3.00	3.00	0.00
1,000.0	15.00	244.40	994.3	-28.1	-58.7	65.1	3.00	3.00	0.00
<b>EOB @ 17.95° Inc. / 244.4° Azm</b>									
1,098.2	17.95	244.40	1,088.5	-40.2	-83.8	92.9	3.00	3.00	0.00
1,100.0	17.95	244.40	1,090.2	-40.4	-84.3	93.5	0.00	0.00	0.00
1,200.0	17.95	244.40	1,185.3	-53.7	-112.1	124.3	0.00	0.00	0.00
1,300.0	17.95	244.40	1,280.4	-67.0	-139.9	155.1	0.00	0.00	0.00
1,400.0	17.95	244.40	1,375.6	-80.3	-167.7	185.9	0.00	0.00	0.00
1,500.0	17.95	244.40	1,470.7	-93.7	-195.5	216.7	0.00	0.00	0.00
<b>8 5/8"</b>									
1,530.0	17.95	244.40	1,499.3	-97.6	-203.8	226.0	0.00	0.00	0.00
1,600.0	17.95	244.40	1,565.8	-107.0	-223.2	247.5	0.00	0.00	0.00
1,700.0	17.95	244.40	1,661.0	-120.3	-251.0	278.4	0.00	0.00	0.00
1,800.0	17.95	244.40	1,756.1	-133.6	-278.8	309.2	0.00	0.00	0.00
1,900.0	17.95	244.40	1,851.3	-146.9	-306.6	340.0	0.00	0.00	0.00
2,000.0	17.95	244.40	1,946.4	-160.2	-334.4	370.8	0.00	0.00	0.00
2,100.0	17.95	244.40	2,041.5	-173.5	-362.2	401.6	0.00	0.00	0.00
2,200.0	17.95	244.40	2,136.7	-186.9	-390.0	432.4	0.00	0.00	0.00
2,300.0	17.95	244.40	2,231.8	-200.2	-417.8	463.2	0.00	0.00	0.00
2,400.0	17.95	244.40	2,326.9	-213.5	-445.6	494.1	0.00	0.00	0.00
<b>G' Sand</b>									
2,457.9	17.95	244.40	2,382.0	-221.2	-461.6	511.9	0.00	0.00	0.00
2,500.0	17.95	244.40	2,422.1	-226.8	-473.3	524.9	0.00	0.00	0.00
2,600.0	17.95	244.40	2,517.2	-240.1	-501.1	555.7	0.00	0.00	0.00
2,700.0	17.95	244.40	2,612.3	-253.4	-528.9	586.5	0.00	0.00	0.00
2,800.0	17.95	244.40	2,707.5	-266.7	-556.7	617.3	0.00	0.00	0.00
2,900.0	17.95	244.40	2,802.6	-280.1	-584.5	648.1	0.00	0.00	0.00
3,000.0	17.95	244.40	2,897.7	-293.4	-612.3	678.9	0.00	0.00	0.00
3,100.0	17.95	244.40	2,992.9	-306.7	-640.1	709.8	0.00	0.00	0.00
3,200.0	17.95	244.40	3,088.0	-320.0	-667.9	740.6	0.00	0.00	0.00
3,300.0	17.95	244.40	3,183.1	-333.3	-695.7	771.4	0.00	0.00	0.00
3,400.0	17.95	244.40	3,278.3	-346.6	-723.4	802.2	0.00	0.00	0.00
3,500.0	17.95	244.40	3,373.4	-359.9	-751.2	833.0	0.00	0.00	0.00
3,600.0	17.95	244.40	3,468.5	-373.3	-779.0	863.8	0.00	0.00	0.00
3,700.0	17.95	244.40	3,563.7	-386.6	-806.8	894.6	0.00	0.00	0.00
3,800.0	17.95	244.40	3,658.8	-399.9	-834.6	925.5	0.00	0.00	0.00
3,900.0	17.95	244.40	3,753.9	-413.2	-862.4	956.3	0.00	0.00	0.00
4,000.0	17.95	244.40	3,849.1	-426.5	-890.2	987.1	0.00	0.00	0.00
4,100.0	17.95	244.40	3,944.2	-439.8	-918.0	1,017.9	0.00	0.00	0.00
4,200.0	17.95	244.40	4,039.3	-453.2	-945.8	1,048.7	0.00	0.00	0.00
<b>Williams Fork</b>									
4,297.4	17.95	244.40	4,132.0	-466.1	-972.8	1,078.7	0.00	0.00	0.00
4,300.0	17.95	244.40	4,134.5	-466.5	-973.5	1,079.5	0.00	0.00	0.00
4,400.0	17.95	244.40	4,229.6	-479.8	-1,001.3	1,110.3	0.00	0.00	0.00



## Well Planning Report



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<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	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)
4,500.0	17.95	244.40	4,324.7	-493.1	-1,029.1	1,141.2	0.00	0.00	0.00
4,600.0	17.95	244.40	4,419.9	-506.4	-1,056.9	1,172.0	0.00	0.00	0.00
4,700.0	17.95	244.40	4,515.0	-519.7	-1,084.7	1,202.8	0.00	0.00	0.00
4,800.0	17.95	244.40	4,610.1	-533.0	-1,112.5	1,233.6	0.00	0.00	0.00
4,900.0	17.95	244.40	4,705.3	-546.4	-1,140.3	1,264.4	0.00	0.00	0.00
5,000.0	17.95	244.40	4,800.4	-559.7	-1,168.1	1,295.2	0.00	0.00	0.00
5,100.0	17.95	244.40	4,895.5	-573.0	-1,195.9	1,326.0	0.00	0.00	0.00
<b>Drop 3° / 100'</b>									
5,150.4	17.95	244.40	4,943.5	-579.7	-1,209.9	1,341.6	0.00	0.00	0.00
5,200.0	16.46	244.40	4,990.9	-566.0	-1,223.1	1,356.2	3.00	-3.00	0.00
5,300.0	13.46	244.40	5,087.5	-597.2	-1,246.4	1,382.0	3.00	-3.00	0.00
5,400.0	10.46	244.40	5,185.3	-606.1	-1,265.0	1,402.8	3.00	-3.00	0.00
5,500.0	7.46	244.40	5,284.1	-612.9	-1,279.1	1,418.3	3.00	-3.00	0.00
5,600.0	4.46	244.40	5,383.5	-617.4	-1,288.5	1,428.7	3.00	-3.00	0.00
5,700.0	1.46	244.40	5,483.4	-619.6	-1,293.1	1,433.9	3.00	-3.00	0.00
<b>EOB @ Vertical - TOG</b>									
5,748.6	0.00	0.00	5,532.0	-619.9	-1,293.7	1,434.5	3.00	-3.00	0.00
5,800.0	0.00	0.00	5,583.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,683.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,783.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,100.0	0.00	0.00	5,883.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,200.0	0.00	0.00	5,983.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,083.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,183.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,283.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,383.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
<b>Cameo</b>									
6,648.6	0.00	0.00	6,432.0	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,483.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,583.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,683.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,783.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,883.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,200.0	0.00	0.00	6,983.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,300.0	0.00	0.00	7,083.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
<b>Base Cameo Coal</b>									
7,308.6	0.00	0.00	7,092.0	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
<b>Rollins</b>									
7,348.6	0.00	0.00	7,132.0	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,183.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,283.4	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00
<b>TD @ 7599' MD / 7382' TVD</b>									
7,598.6	0.00	0.00	7,382.0	-619.9	-1,293.7	1,434.5	0.00	0.00	0.00



## Well Planning Report



<b>Database:</b>	EDM5002	<b>Local Co-ordinate Reference:</b>	Well Nichols 0994-24-12W
<b>Company:</b>	Laramie Energy, LLC	<b>TVD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Project:</b>	Mesa County, CO	<b>MD Reference:</b>	well @ 7242 0usft (H&P #522)
<b>Site:</b>	Nichols 24-07 Pad	<b>North Reference:</b>	True
<b>Well:</b>	Nichols 0994-24-12W	<b>Survey Calculation Method:</b>	Minimum Curvature
<b>Wellbore:</b>	Wellbore #1		
<b>Design:</b>	Design #1		

## 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 - Nichols 0994-24	0.00	0.00	7,382.0	-619.9	-1,293.7	1,528,687.30	2,338,817.33	39.261645	-107.835436
- plan hits target center									
- Point									

## Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,499.3	8 5/8"	8-5/8	11

## Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
2,457.9	2,382.0	G' Sand			
4,297.4	4,132.0	Williams Fork			
5,748.6	5,532.0	TOG			
6,648.6	6,432.0	Cameo			
7,308.6	7,092.0	Base Cameo Coal			
7,348.6	7,132.0	Rollins			

## Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
500.0	500.0	0.0	0.0	KOP (Build 3" / 100')
1,098.2	1,088.5	-40.2	-83.8	EOB @ 17.95° Inc. / 244.4° Azm
5,150.4	4,943.5	-578.7	-1,209.9	Drop 3" / 100'
5,748.6	5,532.0	-619.9	-1,293.7	EOB @ Vertical
7,598.6	7,382.0	-619.9	-1,293.7	TD @ 7599' MD / 7382' TVD