



Project: Mesa County, CO
 Site: Curry 0992-19-15 Pad
 Well: Curry Federal SCU 0992-19-10W
 Wellbore: Wellbore #1
 Design: Design #1
 Latitude: 39.266545
 Longitude: -107.707502
 Ground Level: 7780.0
 well @ 7791.0usft (11' RKB)



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 Curry Federal SCU 0992-19-10W, True North
 Vertical (TVD) Reference: well @ 7791.0usft (11' RKB)
 Section (VS) Reference: Slot - (0.8N, 0.6E)
 Measured Depth Reference: well @ 7791.0usft (11' RKB)
 Calculation Method: Minimum Curvature

WELL DETAILS: Curry Federal SCU 0992-19-10W

+N/-S	+E/-W	Northing	Ground Level: Easting	7780.0 Latitude	Longitude
0.0	0.0	1528545.82	2375072.81	39.266545	-107.707502

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

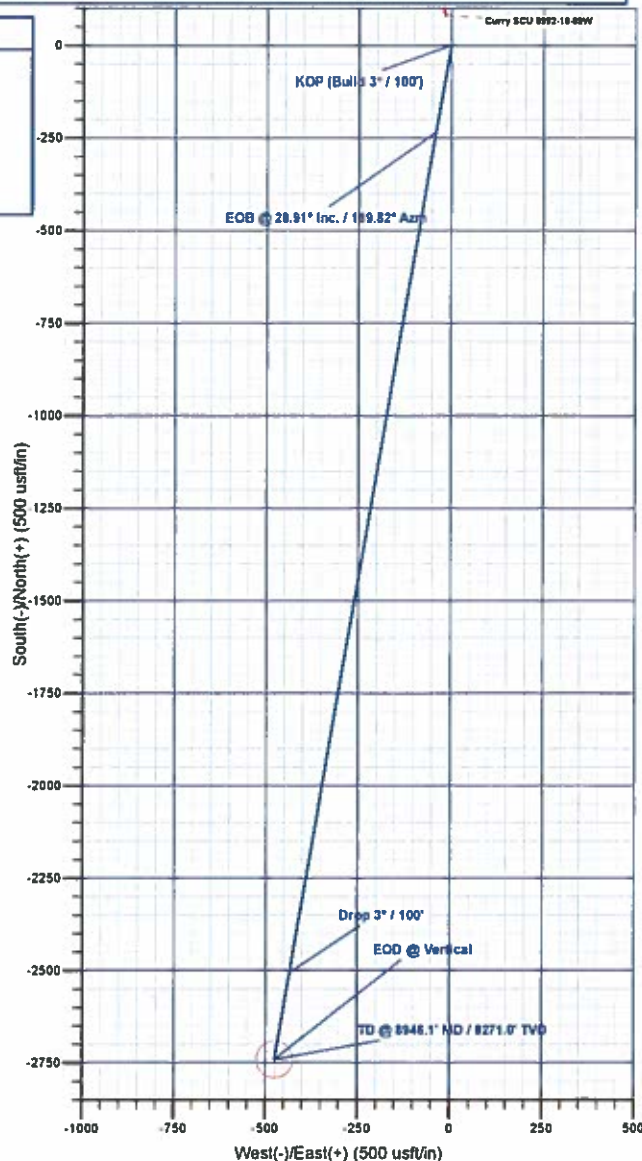
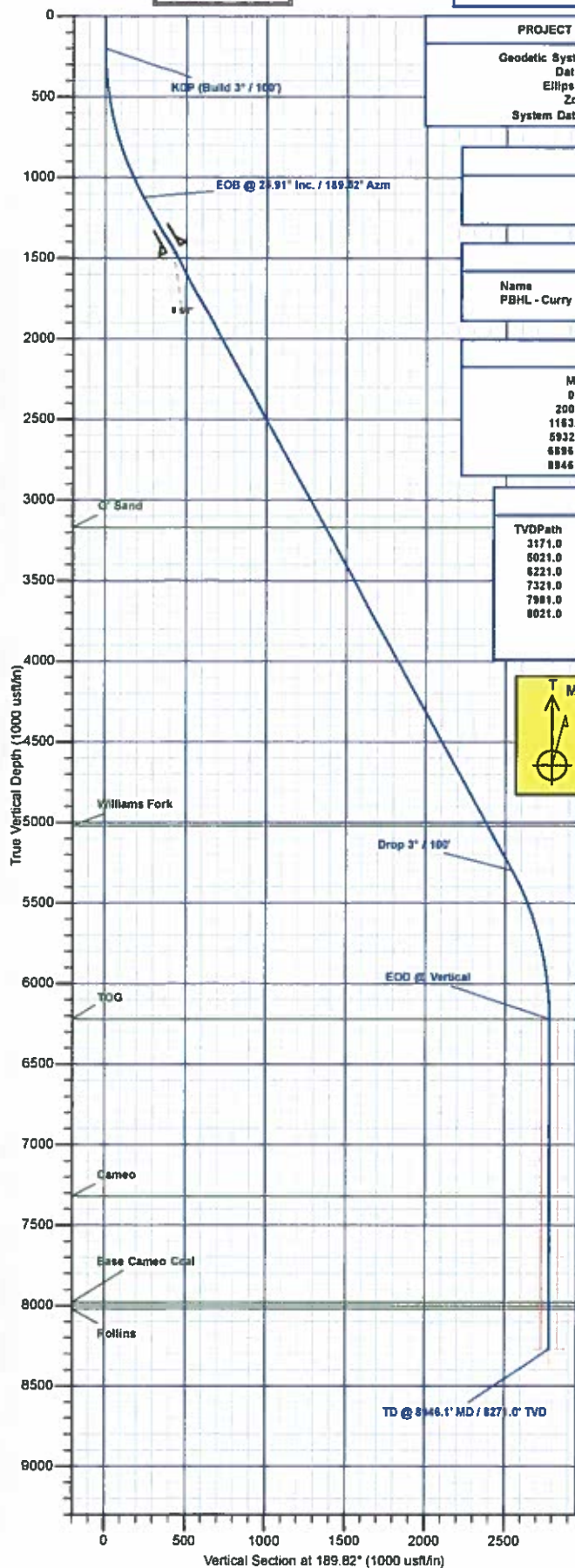
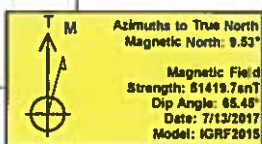
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - Curry Federal SCU 0992-19-10W	8271.0	-2740.7	-474.3	1526837.43	2374531.88	39.259020	-107.709177

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	KOP (Build 3' / 100')
1183.7	28.91	189.82	1123.3	-234.5	-40.6	3.00	189.82	238.0	EOB @ 28.91° Inc. / 189.82° Azm
5932.4	28.91	189.82	5297.7	-2506.2	-433.7	0.00	0.00	2543.4	Drop 3' / 100'
6896.1	0.00	0.00	6221.0	-2740.7	-474.3	3.00	180.00	2781.5	EOD @ Vertical
8946.1	0.00	0.00	8271.0	-2740.7	-474.3	0.00	0.00	2781.5	TD @ 8946.1' MD / 8271.0' TVD

FORMATION TOP DETAILS

TVDPath	MDPath	Formation
3171.0	3502.9	G' Sand
5021.0	5816.3	Williams Fork
6221.0	6896.1	TOG
7321.0	7996.1	Cameo
7981.0	8556.1	Base Cameo Coal
8021.0	8696.1	Rollins



Plan: Design #1 (Curry Federal SCU 0992-19-10W/Wellbore #1)

Created By: Will Jirclik Date: 11:09, July 13 2017



Laramie Energy, LLC

Mesa County, CO

Curry 0992-18-15 Pad

Curry Federal SCU 0992-19-10W

Wellbore #1

Plan: Design #1

QES Well Planning Report

13 July, 2017





Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Curry Federal SCU 0992-19-10W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7791.0usft (11' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 7791.0usft (11' RKB)
Site:	Curry 0992-18-15 Pad	North Reference:	True
Well:	Curry Federal SCU 0992-19-10W	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		Curry 0992-18-15 Pad			
Site Position:		Northing:	1,529,647.78 usft	Latitude:	39.266769
From:	Lat/Long	Easting:	2,375,058.74 usft	Longitude:	-107.707558
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.39 °

Well	Curry Federal SCU 0992-19-10W					
Well Position	+N/-S	-81.6 usft	Northing:	1,529,565.82 usft	Latitude:	39.266545
	+E/-W	15.9 usft	Easting:	2,375,072.61 usft	Longitude:	-107.707502
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,780.0 usft

Wellbore	Wellbore #1
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	7/13/2017	9.53	65.45	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	189.82

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	
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,163.7	28.91	189.82	1,123.3	-234.5	-40.6	3.00	3.00	0.00	189.82	
5,932.4	28.91	189.82	5,297.7	-2,506.2	-433.7	0.00	0.00	0.00	0.00	
6,896.1	0.00	0.00	6,221.0	-2,740.7	-474.3	3.00	-3.00	0.00	180.00	
8,946.1	0.00	0.00	8,271.0	-2,740.7	-474.3	0.00	0.00	0.00	0.00	PBHL - Curry Federal



Well Planning Report



Database:	EDM5002	Local Co-ordinate Reference:	Well Curry Federal SCU 0992-19-10W
Company:	Laramie Energy, LLC	TVD Reference:	well @ 7791.0usft (11' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 7791.0usft (11' RKB)
Site:	Curry 0992-18-15 Pad	North Reference:	True
Well:	Curry Federal SCU 0992-19-10W	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
KOP (Build 3° / 100')									
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	3.00	189.82	300.0	-2.6	-0.4	2.6	3.00	3.00	0.00
400.0	6.00	189.82	399.6	-10.3	-1.8	10.5	3.00	3.00	0.00
500.0	9.00	189.82	498.8	-23.2	-4.0	23.5	3.00	3.00	0.00
600.0	12.00	189.82	597.1	-41.1	-7.1	41.7	3.00	3.00	0.00
700.0	15.00	189.82	694.3	-64.1	-11.1	65.1	3.00	3.00	0.00
800.0	18.00	189.82	790.2	-92.1	-15.9	93.5	3.00	3.00	0.00
900.0	21.00	189.82	884.4	-125.0	-21.6	126.9	3.00	3.00	0.00
1,000.0	24.00	189.82	976.8	-162.7	-28.2	165.1	3.00	3.00	0.00
1,100.0	27.00	189.82	1,067.1	-205.1	-35.5	208.2	3.00	3.00	0.00
EOB @ 28.91° Inc. / 189.82° Azm									
1,163.7	28.91	189.82	1,123.3	-234.5	-40.6	238.0	3.00	3.00	0.00
1,200.0	28.91	189.82	1,155.1	-251.8	-43.6	255.6	0.00	0.00	0.00
1,300.0	28.91	189.82	1,242.6	-299.5	-51.8	303.9	0.00	0.00	0.00
1,400.0	28.91	189.82	1,330.2	-347.1	-60.1	352.3	0.00	0.00	0.00
1,500.0	28.91	189.82	1,417.7	-394.7	-68.3	400.6	0.00	0.00	0.00
8 5/8"									
1,530.0	28.91	189.82	1,444.0	-409.0	-70.8	415.1	0.00	0.00	0.00
1,600.0	28.91	189.82	1,505.2	-442.4	-76.6	449.0	0.00	0.00	0.00
1,700.0	28.91	189.82	1,592.8	-490.0	-84.8	497.3	0.00	0.00	0.00
1,800.0	28.91	189.82	1,680.3	-537.7	-93.0	545.6	0.00	0.00	0.00
1,900.0	28.91	189.82	1,767.9	-585.3	-101.3	594.0	0.00	0.00	0.00
2,000.0	28.91	189.82	1,855.4	-632.9	-109.5	642.3	0.00	0.00	0.00
2,100.0	28.91	189.82	1,942.9	-680.6	-117.8	690.7	0.00	0.00	0.00
2,200.0	28.91	189.82	2,030.5	-728.2	-126.0	739.0	0.00	0.00	0.00
2,300.0	28.91	189.82	2,118.0	-775.8	-134.3	787.4	0.00	0.00	0.00
2,400.0	28.91	189.82	2,205.5	-823.5	-142.5	835.7	0.00	0.00	0.00
2,500.0	28.91	189.82	2,293.1	-871.1	-150.7	884.1	0.00	0.00	0.00
2,600.0	28.91	189.82	2,380.6	-918.7	-159.0	932.4	0.00	0.00	0.00
2,700.0	28.91	189.82	2,468.2	-966.4	-167.2	980.7	0.00	0.00	0.00
2,800.0	28.91	189.82	2,555.7	-1,014.0	-175.5	1,029.1	0.00	0.00	0.00
2,900.0	28.91	189.82	2,643.2	-1,061.7	-183.7	1,077.4	0.00	0.00	0.00
3,000.0	28.91	189.82	2,730.8	-1,109.3	-192.0	1,125.8	0.00	0.00	0.00
3,100.0	28.91	189.82	2,818.3	-1,156.9	-200.2	1,174.1	0.00	0.00	0.00
3,200.0	28.91	189.82	2,905.8	-1,204.6	-208.4	1,222.5	0.00	0.00	0.00
3,300.0	28.91	189.82	2,993.4	-1,252.2	-216.7	1,270.8	0.00	0.00	0.00
3,400.0	28.91	189.82	3,080.9	-1,299.8	-224.9	1,319.2	0.00	0.00	0.00
3,500.0	28.91	189.82	3,168.5	-1,347.5	-233.2	1,367.5	0.00	0.00	0.00
G' Sand									
3,502.9	28.91	189.82	3,171.0	-1,348.9	-233.4	1,368.9	0.00	0.00	0.00
3,600.0	28.91	189.82	3,256.0	-1,395.1	-241.4	1,415.9	0.00	0.00	0.00
3,700.0	28.91	189.82	3,343.5	-1,442.8	-249.7	1,464.2	0.00	0.00	0.00
3,800.0	28.91	189.82	3,431.1	-1,490.4	-257.9	1,512.5	0.00	0.00	0.00
3,900.0	28.91	189.82	3,518.6	-1,538.0	-266.2	1,560.9	0.00	0.00	0.00
4,000.0	28.91	189.82	3,606.1	-1,585.7	-274.4	1,609.2	0.00	0.00	0.00
4,100.0	28.91	189.82	3,693.7	-1,633.3	-282.6	1,657.6	0.00	0.00	0.00
4,200.0	28.91	189.82	3,781.2	-1,680.9	-290.9	1,705.9	0.00	0.00	0.00
4,300.0	28.91	189.82	3,868.8	-1,728.6	-299.1	1,754.3	0.00	0.00	0.00
4,400.0	28.91	189.82	3,956.3	-1,776.2	-307.4	1,802.6	0.00	0.00	0.00
4,500.0	28.91	189.82	4,043.8	-1,823.9	-315.6	1,851.0	0.00	0.00	0.00
4,600.0	28.91	189.82	4,131.4	-1,871.5	-323.9	1,899.3	0.00	0.00	0.00



Well Planning Report



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Project:	Mesa County, CO	MD Reference:	well @ 7791.0usft (11' RKB)
Site:	Curry 0992-18-15 Pad	North Reference:	True
Well:	Curry Federal SCU 0992-19-10W	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)
4,700.0	28.91	189.82	4,218.9	-1,919.1	-332.1	1,947.6	0.00	0.00	0.00
4,800.0	28.91	189.82	4,306.4	-1,966.8	-340.3	1,996.0	0.00	0.00	0.00
4,900.0	28.91	189.82	4,394.0	-2,014.4	-348.6	2,044.3	0.00	0.00	0.00
5,000.0	28.91	189.82	4,481.5	-2,062.0	-356.8	2,092.7	0.00	0.00	0.00
5,100.0	28.91	189.82	4,569.0	-2,109.7	-365.1	2,141.0	0.00	0.00	0.00
5,200.0	28.91	189.82	4,656.6	-2,157.3	-373.3	2,189.4	0.00	0.00	0.00
5,300.0	28.91	189.82	4,744.1	-2,204.9	-381.6	2,237.7	0.00	0.00	0.00
5,400.0	28.91	189.82	4,831.7	-2,252.6	-389.8	2,286.1	0.00	0.00	0.00
5,500.0	28.91	189.82	4,919.2	-2,300.2	-398.0	2,334.4	0.00	0.00	0.00
5,600.0	28.91	189.82	5,006.7	-2,347.9	-406.3	2,382.8	0.00	0.00	0.00
Williams Fork									
5,616.3	28.91	189.82	5,021.0	-2,355.6	-407.6	2,390.6	0.00	0.00	0.00
5,700.0	28.91	189.82	5,094.3	-2,395.5	-414.5	2,431.1	0.00	0.00	0.00
5,800.0	28.91	189.82	5,181.8	-2,443.1	-422.8	2,479.4	0.00	0.00	0.00
5,900.0	28.91	189.82	5,269.3	-2,490.8	-431.0	2,527.8	0.00	0.00	0.00
Drop 3° / 100'									
5,932.4	28.91	189.82	5,297.7	-2,506.2	-433.7	2,543.4	0.00	0.00	0.00
6,000.0	26.88	189.82	5,357.4	-2,537.4	-439.1	2,575.1	3.00	-3.00	0.00
6,100.0	23.88	189.82	5,447.8	-2,579.6	-446.4	2,617.9	3.00	-3.00	0.00
6,200.0	20.88	189.82	5,540.2	-2,617.1	-452.9	2,656.0	3.00	-3.00	0.00
6,300.0	17.88	189.82	5,634.6	-2,649.8	-458.5	2,689.2	3.00	-3.00	0.00
6,400.0	14.88	189.82	5,730.5	-2,677.6	-463.4	2,717.4	3.00	-3.00	0.00
6,500.0	11.88	189.82	5,827.8	-2,700.4	-467.3	2,740.5	3.00	-3.00	0.00
6,600.0	8.88	189.82	5,926.1	-2,718.2	-470.4	2,758.6	3.00	-3.00	0.00
6,700.0	5.88	189.82	6,025.3	-2,730.8	-472.6	2,771.4	3.00	-3.00	0.00
6,800.0	2.88	189.82	6,125.0	-2,738.3	-473.9	2,779.0	3.00	-3.00	0.00
EOD @ Vertical - TOG									
6,896.1	0.00	0.00	6,221.0	-2,740.7	-474.3	2,781.5	3.00	-3.00	0.00
6,900.0	0.00	0.00	6,224.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,324.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,100.0	0.00	0.00	6,424.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,200.0	0.00	0.00	6,524.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,300.0	0.00	0.00	6,624.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,400.0	0.00	0.00	6,724.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,500.0	0.00	0.00	6,824.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,600.0	0.00	0.00	6,924.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,024.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,124.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,224.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
Cameo									
7,996.1	0.00	0.00	7,321.0	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,324.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,100.0	0.00	0.00	7,424.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,200.0	0.00	0.00	7,524.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,300.0	0.00	0.00	7,624.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,400.0	0.00	0.00	7,724.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,500.0	0.00	0.00	7,824.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,600.0	0.00	0.00	7,924.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
Base Cameo Coal									
8,656.1	0.00	0.00	7,981.0	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
Rollins									
8,696.1	0.00	0.00	8,021.0	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,700.0	0.00	0.00	8,024.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00



Well Planning Report



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Company:	Laramie Energy, LLC	TVD Reference:	well @ 7791.0usft (11' RKB)
Project:	Mesa County, CO	MD Reference:	well @ 7791.0usft (11' RKB)
Site:	Curry 0992-18-15 Pad	North Reference:	True
Well:	Curry Federal SCU 0992-19-10W	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)
8,800.0	0.00	0.00	8,124.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
8,900.0	0.00	0.00	8,224.9	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00
TD @ 8946.1' MD / 8271.0' TVD - PBHL - Curry Federal SCU 0992-19-10W									
8,946.1	0.00	0.00	8,271.0	-2,740.7	-474.3	2,781.5	0.00	0.00	0.00

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 - Curry Federal SCU 0992-19-10W	0.00	0.00	8,271.0	-2,740.7	-474.3	1,526,837.43	2,374,531.88	39.259020	-107.709177
- plan hits target center									
- Circle (radius 50.0)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,530.0	1,444.0	8 5/8"	8-5/8	11

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
3,502.9	3,171.0	G ⁺ Sand			
5,616.3	5,021.0	Williams Fork			
6,896.1	6,221.0	TOG			
7,996.1	7,321.0	Cameo			
8,656.1	7,981.0	Base Cameo Coal			
8,696.1	8,021.0	Rollins			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	0.0	0.0	KOP (Build 3" / 100')
1,163.7	1,123.3	-234.5	-40.6	EOB @ 28.91° Inc. / 189.82° Azm
5,932.4	5,297.7	-2,506.2	-433.7	Drop 3" / 100'
6,896.1	6,221.0	-2,740.7	-474.3	EOD @ Vertical
8,946.1	8,271.0	-2,740.7	-474.3	TD @ 8946.1' MD / 8271.0' TVD