

PROJECT DETAILS: Garfield 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

WELL DETAILS: CC Federal 0697-03-03W

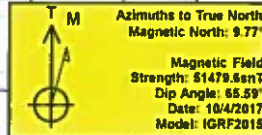
+N/-S 0.0 +E/-W 0.0 Northing 1639468.13 Easting 2233660.01 Ground Level: 8609.0 Latitude 39.557640 Longitude -108.218728

Project: Garfield County, CO
Site: CC 604-41-32 Pad
Well: CC Federal 0697-03-03W
Wellbore: Wellbore #1
Design: Design #3
Latitude: 39.557640
Longitude: -108.218728
Ground Level: 8609.0
Well @ 8639.0usft (RKB 30')



REFERENCE INFORMATION

Co-ordinate (N/E) Reference: Well CC Federal 0697-03-03W, True North
Vertical (TVD) Reference: Well @ 8639.0usft (RKB 30')
Section (VS) Reference: Slot @ (0.0N, 0.0E)
Measured Depth Reference: Well @ 8639.0usft (RKB 30')
Calculation Method: Minimum Curvature



FORMATION TOP DETAILS

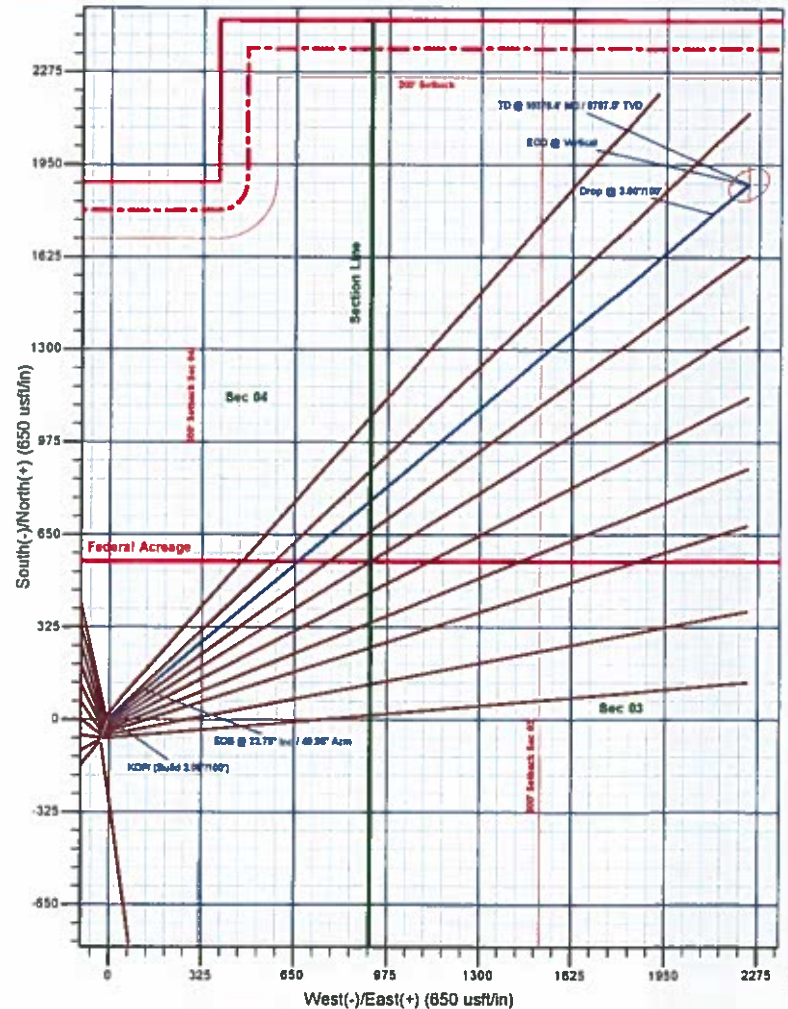
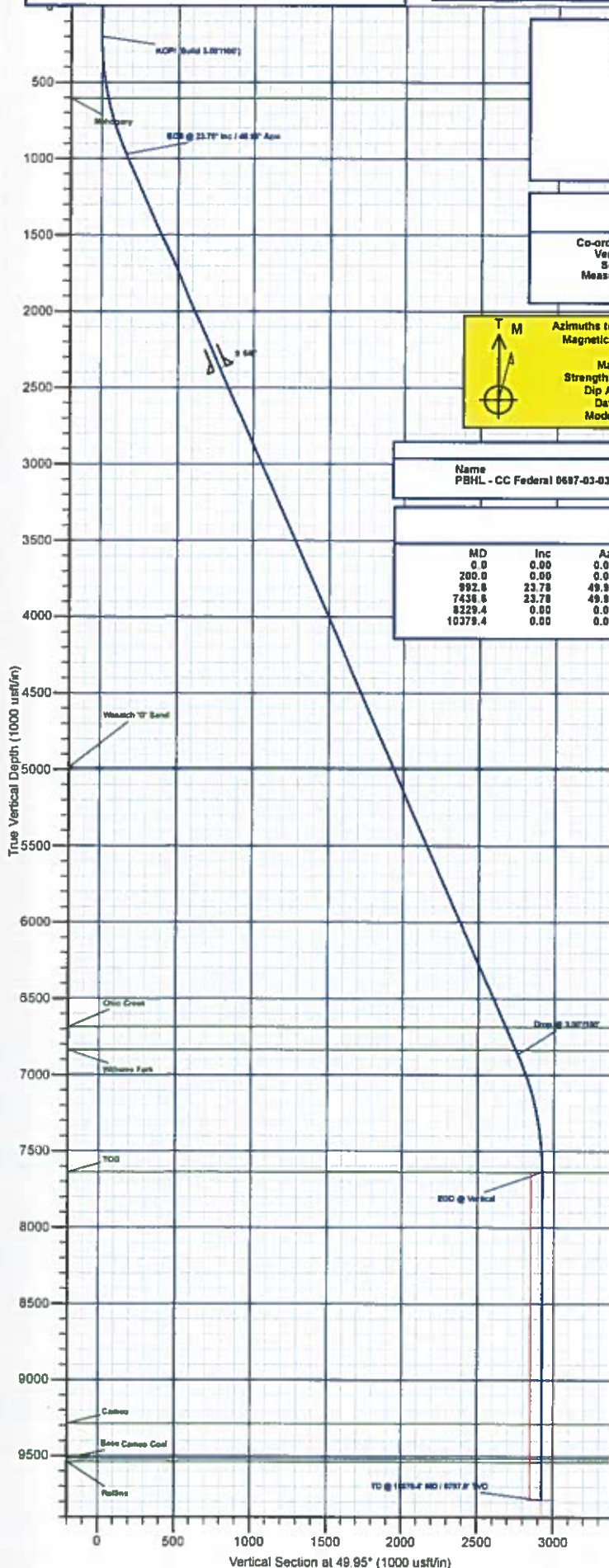
TVDPath	MDPath	Formation
406.0	609.1	Mahogany
4987.0	6382.4	Wasatch 'G' Sand
6687.0	7240.1	Ohio Creek
6837.0	7404.1	Williams Fork
7837.0	8229.4	TOG
8287.0	8678.4	Cameo
9117.0	10109.4	Base Cameo Coal
9537.9	10129.4	Rollins

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
PBHL - CC Federal 0697-03-03W	9787.0	1680.7	2237.7	1641281.05	2235652.90	39.562803	-108.210791

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Ddeg	TFace	VSect	Annotation
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	KOP/ (Build 3.00°/100')
200.0	0.00	0.00	200.0	0.0	0.0	0.00	0.00	0.0	EOB @ 23.75° Inc / 49.95° Azm
992.0	23.78	49.95	970.2	104.4	124.2	3.00	49.95	162.2	Drop @ 3.00°/100'
7436.6	23.78	49.95	6866.8	1776.4	2113.5	0.00	0.00	2760.9	EOD @ Vertical
8229.4	0.00	0.00	7837.0	1880.7	2237.7	3.00	180.00	2923.1	TD @ 10379.4' MD / 9787.0' TVD
10379.4	0.00	0.00	9787.0	1880.7	2237.7	0.00	0.00	2923.1	



Plan: Design #3 (CC Federal 0697-03-03W/Wellbore #1)

Created By: Will Jircik Date: 16:08, February 04 2019



Laramie Energy, LLC

Garfield County, CO

CC 604-41-32 Pad

CC Federal 0697-03-03W

Wellbore #1

Plan: Design #3

QES Well Planning Report

04 February, 2019





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-03W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639.0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-03W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

Project	Garfield 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		CC 604-41-32 Pad			
Site Position:		Northing:	1,639,464.67 usft	Latitude:	39.557630
From:	Lat/Long	Easting:	2,233,548.14 usft	Longitude:	-108.218770
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.71

Well	CC Federal 0697-03-03W					
Well Position	+N/-S	3.8 usft	Northing:	1,639,468.12 usft	Latitude:	39.557640
	+E/-W	11.8 usft	Easting:	2,233,560.01 usft	Longitude:	-108.218728
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	8,609.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/4/2017	9.77	65.59	51,479.57280347

Design	Design #3			
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	49.95

Plan Sections										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Buidl 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	
992.8	23.78	49.95	970.2	104.4	124.2	3.00	3.00	0.00	49.95	
7,436.6	23.78	49.95	6,866.8	1,776.4	2,113.5	0.00	0.00	0.00	0.00	
8,229.4	0.00	0.00	7,637.0	1,880.7	2,237.7	3.00	-3.00	0.00	180.00	
10,379.4	0.00	0.00	9,787.0	1,880.7	2,237.7	0.00	0.00	0.00	0.00	PBHL - CC Federal 01



Well Planning Report



Database: EDM 5000.1 Single User Db
 Company: Laramie Energy, LLC
 Project: Garfield County, CO
 Sits: CC 604-41-32 Pad
 Well: CC Federal 0697-03-03W
 Wellbore: Wellbore #1
 Design: Design #3

Local Co-ordinate Reference:

TVD Reference:
 MD Reference:
 North Reference:
 Survey Calculation Method:

Well CC Federal 0697-03-03W

Well @ 8639.0usft (RKB 30')

Well @ 8639.0usft (RKB 30')

True

Minimum Curvature

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 3.00°/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	49.95	300.0	1.7	2.0	2.6	3.00	3.00	0.00
400.0	6.00	49.95	399.6	6.7	8.0	10.5	3.00	3.00	0.00
500.0	9.00	49.95	498.8	15.1	18.0	23.5	3.00	3.00	0.00
600.0	12.00	49.95	597.1	26.9	31.9	41.7	3.00	3.00	0.00
Mahogany									
609.1	12.27	49.95	606.0	28.1	33.4	43.7	3.00	3.00	0.00
700.0	15.00	49.95	694.3	41.9	49.8	65.1	3.00	3.00	0.00
800.0	18.00	49.95	790.2	60.1	71.6	93.5	3.00	3.00	0.00
900.0	21.00	49.95	884.4	81.6	97.1	126.9	3.00	3.00	0.00
EOB @ 23.78° Inc / 49.95° Azm									
992.8	23.78	49.95	970.2	104.4	124.2	162.2	3.00	3.00	0.00
1,000.0	23.78	49.95	976.8	106.2	126.4	165.1	0.00	0.00	0.00
1,100.0	23.78	49.95	1,068.3	132.2	157.3	205.4	0.00	0.00	0.00
1,200.0	23.78	49.95	1,159.8	158.1	188.1	245.8	0.00	0.00	0.00
1,300.0	23.78	49.95	1,251.3	184.1	219.0	286.1	0.00	0.00	0.00
1,400.0	23.78	49.95	1,342.8	210.0	249.8	326.4	0.00	0.00	0.00
1,500.0	23.78	49.95	1,434.4	236.0	280.8	366.7	0.00	0.00	0.00
1,600.0	23.78	49.95	1,525.9	261.9	311.6	407.1	0.00	0.00	0.00
1,700.0	23.78	49.95	1,617.4	287.9	342.5	447.4	0.00	0.00	0.00
1,800.0	23.78	49.95	1,708.9	313.8	373.4	487.7	0.00	0.00	0.00
1,900.0	23.78	49.95	1,800.4	339.8	404.2	528.1	0.00	0.00	0.00
2,000.0	23.78	49.95	1,891.9	365.7	435.1	568.4	0.00	0.00	0.00
2,100.0	23.78	49.95	1,983.4	391.7	466.0	608.7	0.00	0.00	0.00
2,200.0	23.78	49.95	2,074.9	417.6	496.9	649.0	0.00	0.00	0.00
2,300.0	23.78	49.95	2,166.4	443.5	527.7	689.4	0.00	0.00	0.00
2,400.0	23.78	49.95	2,257.9	469.5	558.6	729.7	0.00	0.00	0.00
2,500.0	23.78	49.95	2,349.4	495.4	589.5	770.0	0.00	0.00	0.00
2,600.0	23.78	49.95	2,440.9	521.4	620.4	810.4	0.00	0.00	0.00
2,700.0	23.78	49.95	2,532.4	547.3	651.2	850.7	0.00	0.00	0.00
2,800.0	23.78	49.95	2,623.9	573.3	682.1	891.0	0.00	0.00	0.00
2,900.0	23.78	49.95	2,715.5	599.2	713.0	931.3	0.00	0.00	0.00
3,000.0	23.78	49.95	2,807.0	625.2	743.8	971.7	0.00	0.00	0.00
3,100.0	23.78	49.95	2,898.5	651.1	774.7	1,012.0	0.00	0.00	0.00
3,200.0	23.78	49.95	2,990.0	677.1	805.6	1,052.3	0.00	0.00	0.00
3,300.0	23.78	49.95	3,081.5	703.0	836.5	1,092.7	0.00	0.00	0.00
3,400.0	23.78	49.95	3,173.0	729.0	867.3	1,133.0	0.00	0.00	0.00
3,500.0	23.78	49.95	3,264.5	754.9	898.2	1,173.3	0.00	0.00	0.00
3,600.0	23.78	49.95	3,356.0	780.9	929.1	1,213.6	0.00	0.00	0.00
3,700.0	23.78	49.95	3,447.5	806.8	960.0	1,254.0	0.00	0.00	0.00
3,800.0	23.78	49.95	3,539.0	832.8	990.8	1,294.3	0.00	0.00	0.00
3,900.0	23.78	49.95	3,630.5	858.7	1,021.7	1,334.6	0.00	0.00	0.00
4,000.0	23.78	49.95	3,722.0	884.7	1,052.6	1,375.0	0.00	0.00	0.00
4,100.0	23.78	49.95	3,813.5	910.6	1,083.4	1,415.3	0.00	0.00	0.00
4,200.0	23.78	49.95	3,905.1	936.5	1,114.3	1,455.6	0.00	0.00	0.00
4,300.0	23.78	49.95	3,996.6	962.5	1,145.2	1,495.9	0.00	0.00	0.00
4,400.0	23.78	49.95	4,088.1	988.4	1,176.1	1,536.3	0.00	0.00	0.00
4,500.0	23.78	49.95	4,179.6	1,014.4	1,206.9	1,576.6	0.00	0.00	0.00
4,600.0	23.78	49.95	4,271.1	1,040.3	1,237.8	1,616.9	0.00	0.00	0.00
4,700.0	23.78	49.95	4,362.6	1,066.3	1,268.7	1,657.3	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-03W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639.0usft (RKB 30')
Sits:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-03W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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)
4,800.0	23.78	49.95	4,454.1	1,092.2	1,299.5	1,897.8	0.00	0.00	0.00
4,900.0	23.78	49.95	4,545.6	1,118.2	1,330.4	1,737.9	0.00	0.00	0.00
5,000.0	23.78	49.95	4,637.1	1,144.1	1,361.3	1,778.2	0.00	0.00	0.00
5,100.0	23.78	49.95	4,728.6	1,170.1	1,392.2	1,818.6	0.00	0.00	0.00
5,200.0	23.78	49.95	4,820.1	1,196.0	1,423.0	1,858.9	0.00	0.00	0.00
5,300.0	23.78	49.95	4,911.6	1,222.0	1,453.9	1,899.2	0.00	0.00	0.00
Wasatch 'G' Sand									
5,382.4	23.78	49.95	4,987.0	1,243.3	1,479.3	1,932.4	0.00	0.00	0.00
5,400.0	23.78	49.95	5,003.1	1,247.9	1,484.8	1,939.6	0.00	0.00	0.00
5,500.0	23.78	49.95	5,094.7	1,273.9	1,515.7	1,979.9	0.00	0.00	0.00
5,600.0	23.78	49.95	5,186.2	1,299.8	1,546.5	2,020.2	0.00	0.00	0.00
5,700.0	23.78	49.95	5,277.7	1,325.8	1,577.4	2,060.5	0.00	0.00	0.00
5,800.0	23.78	49.95	5,369.2	1,351.7	1,608.3	2,100.9	0.00	0.00	0.00
5,900.0	23.78	49.95	5,460.7	1,377.7	1,639.1	2,141.2	0.00	0.00	0.00
6,000.0	23.78	49.95	5,552.2	1,403.6	1,670.0	2,181.5	0.00	0.00	0.00
6,100.0	23.78	49.95	5,643.7	1,429.6	1,700.9	2,221.9	0.00	0.00	0.00
6,200.0	23.78	49.95	5,735.2	1,455.5	1,731.8	2,262.2	0.00	0.00	0.00
6,300.0	23.78	49.95	5,826.7	1,481.4	1,762.6	2,302.5	0.00	0.00	0.00
6,400.0	23.78	49.95	5,918.2	1,507.4	1,793.5	2,342.8	0.00	0.00	0.00
6,500.0	23.78	49.95	6,009.7	1,533.3	1,824.4	2,383.2	0.00	0.00	0.00
6,600.0	23.78	49.95	6,101.2	1,559.3	1,855.3	2,423.5	0.00	0.00	0.00
6,700.0	23.78	49.95	6,192.7	1,585.2	1,886.1	2,463.8	0.00	0.00	0.00
6,800.0	23.78	49.95	6,284.2	1,611.2	1,917.0	2,504.2	0.00	0.00	0.00
6,900.0	23.78	49.95	6,375.8	1,637.1	1,947.9	2,544.5	0.00	0.00	0.00
7,000.0	23.78	49.95	6,467.3	1,663.1	1,978.7	2,584.8	0.00	0.00	0.00
7,100.0	23.78	49.95	6,558.8	1,689.0	2,009.6	2,625.1	0.00	0.00	0.00
7,200.0	23.78	49.95	6,650.3	1,715.0	2,040.5	2,665.5	0.00	0.00	0.00
Ohio Creek									
7,240.1	23.78	49.95	6,687.0	1,725.4	2,052.9	2,681.7	0.00	0.00	0.00
7,300.0	23.78	49.95	6,741.8	1,740.9	2,071.4	2,705.8	0.00	0.00	0.00
7,400.0	23.78	49.95	6,833.3	1,766.9	2,102.2	2,746.1	0.00	0.00	0.00
Williams Fork									
7,404.1	23.78	49.95	6,837.0	1,767.9	2,103.5	2,747.8	0.00	0.00	0.00
Drop @ 3.00°/100'									
7,436.6	23.78	49.95	6,866.8	1,776.4	2,113.5	2,760.9	0.00	0.00	0.00
7,500.0	21.88	49.95	6,925.2	1,792.2	2,132.4	2,785.5	3.00	-3.00	0.00
7,600.0	18.88	49.95	7,018.9	1,814.6	2,159.0	2,820.3	3.00	-3.00	0.00
7,700.0	15.88	49.95	7,114.4	1,833.8	2,181.9	2,850.2	3.00	-3.00	0.00
7,800.0	12.88	49.95	7,211.2	1,849.8	2,200.9	2,875.0	3.00	-3.00	0.00
7,900.0	9.88	49.95	7,309.2	1,862.5	2,216.0	2,894.7	3.00	-3.00	0.00
8,000.0	6.88	49.95	7,408.2	1,871.9	2,227.2	2,909.3	3.00	-3.00	0.00
8,100.0	3.88	49.95	7,507.7	1,877.9	2,234.3	2,918.7	3.00	-3.00	0.00
8,200.0	0.88	49.95	7,607.6	1,880.6	2,237.5	2,922.9	3.00	-3.00	0.00
EOD @ Vertical - TOG									
8,229.4	0.00	0.00	7,637.0	1,880.7	2,237.7	2,923.1	3.00	-3.00	0.00
8,300.0	0.00	0.00	7,707.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,400.0	0.00	0.00	7,807.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,500.0	0.00	0.00	7,907.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,600.0	0.00	0.00	8,007.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,107.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,800.0	0.00	0.00	8,207.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
8,900.0	0.00	0.00	8,307.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,000.0	0.00	0.00	8,407.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,100.0	0.00	0.00	8,507.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00



Well Planning Report



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Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639.0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639.0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
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Wellbore:	Wellbore #1		
Design:	Design #3		

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)
9,200.0	0.00	0.00	8,607.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,300.0	0.00	0.00	8,707.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,400.0	0.00	0.00	8,807.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,500.0	0.00	0.00	8,907.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,600.0	0.00	0.00	9,007.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,700.0	0.00	0.00	9,107.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,800.0	0.00	0.00	9,207.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
Cameo									
9,879.4	0.00	0.00	9,287.0	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
9,900.0	0.00	0.00	9,307.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
10,000.0	0.00	0.00	9,407.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
10,100.0	0.00	0.00	9,507.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
Base Cameo Coal									
10,109.4	0.00	0.00	9,517.0	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
Rollins									
10,129.4	0.00	0.00	9,537.0	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
10,200.0	0.00	0.00	9,607.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
10,300.0	0.00	0.00	9,707.6	1,880.7	2,237.7	2,923.1	0.00	0.00	0.00
TD @ 10379.4' MD / 9787.0' TVD									
10,379.4	0.00	0.00	9,787.0	1,880.7	2,237.7	2,923.1	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 - CC Federal 069;	0.00	0.00	9,787.0	1,880.7	2,237.7	1,641,281.04	2,235,852.98	39.562803	-108.210791
- plan hits target center									
- Ellipse (radii L50.0 W75.0 on 150.00 azi)									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,530.0	2,376.9	9 5/8"	9-5/8	14-3/4

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
609.1	606.0	Mahogany			
5,382.4	4,987.0	Wasatch 'G' Sand			
7,240.1	6,687.0	Ohio Creek			
7,404.1	6,837.0	Williams Fork			
8,229.4	7,637.0	TOG			
9,879.4	9,287.0	Cameo			
10,109.4	9,517.0	Base Cameo Coal			
10,129.4	9,537.0	Rollins			



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-03W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639 0usft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639 0usft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-03W	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #3		

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 00"/100')
892.8	870.2	104.4	124.2	EOB @ 23.78" Inc / 49.95" Azm
7,436.6	6,866.8	1,776.4	2,113.5	Drop @ 3 00"/100'
8,229.4	7,637.0	1,880.7	2,237.7	EOD @ Vertical
10,379.4	9,787.0	1,880.7	2,237.7	TD @ 10379.4' MD / 9787.0' TVD