

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 0697-03-07W
 +N-S: 0.0 +E-W: 0.0 Northing: 1639430.63 Ground Level: 8609.0 Easting: 2233546.47 Latitude: 39.557538 Longitude: -108.216772

Project: Garfield County, CO
 Site: CC 604-41-32 Pad
 Well: CC Federal 0697-03-07W
 Wellbore: Wellbore #1
 Design: Design #3
 Latitude: 39.557536
 Longitude: -108.218772
 Ground Level: 8609.0
 Well @ 8639.0usft (RKB 30')



REFERENCE INFORMATION
 Co-ordinate (N/E) Reference: Well CC Federal 0697-03-07W, True North
 Vertical (TVD) Reference: Well @ 8639.0usft (RKB 30')
 Section (VS) Reference: S101 - (0.0N, 0.0E)
 Measured Depth Reference: Well @ 8639.0usft (RKB 30')
 Calculation Method: Minimum Curvature

Azimuths to True North
 Magnetic North: 9.77°
 Magnetic Field
 Strength: 51479.85nT
 Dip Angle: 65.53°
 Date: 10/4/2017
 Mode: IGRF2015

FORMATION TOP DETAILS

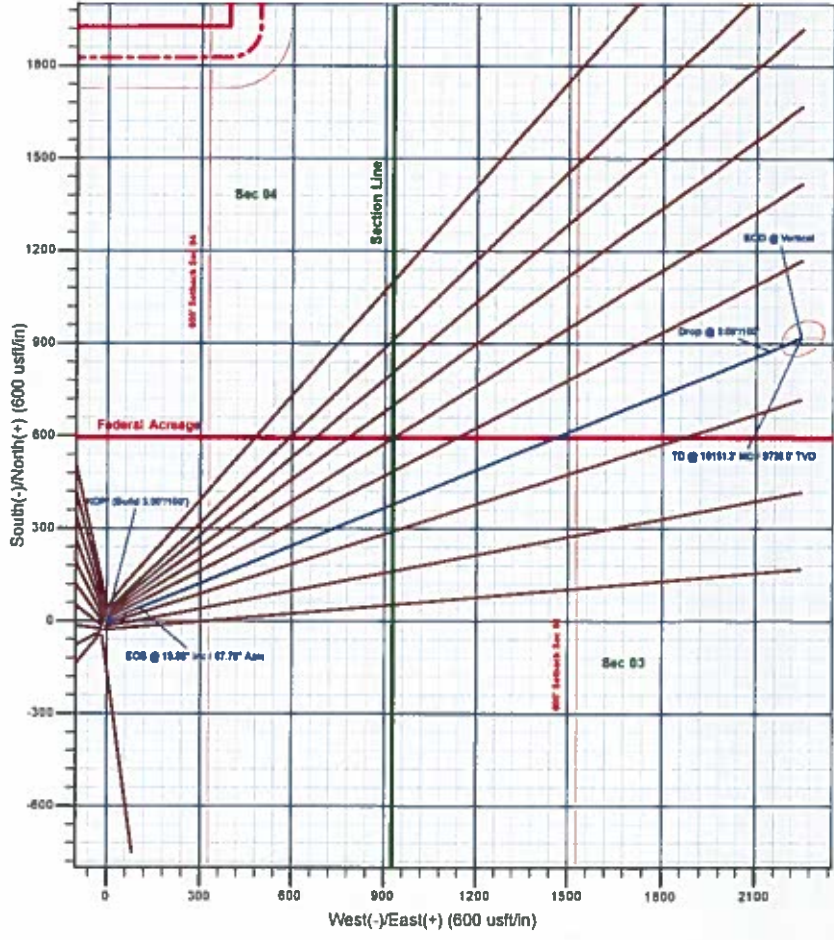
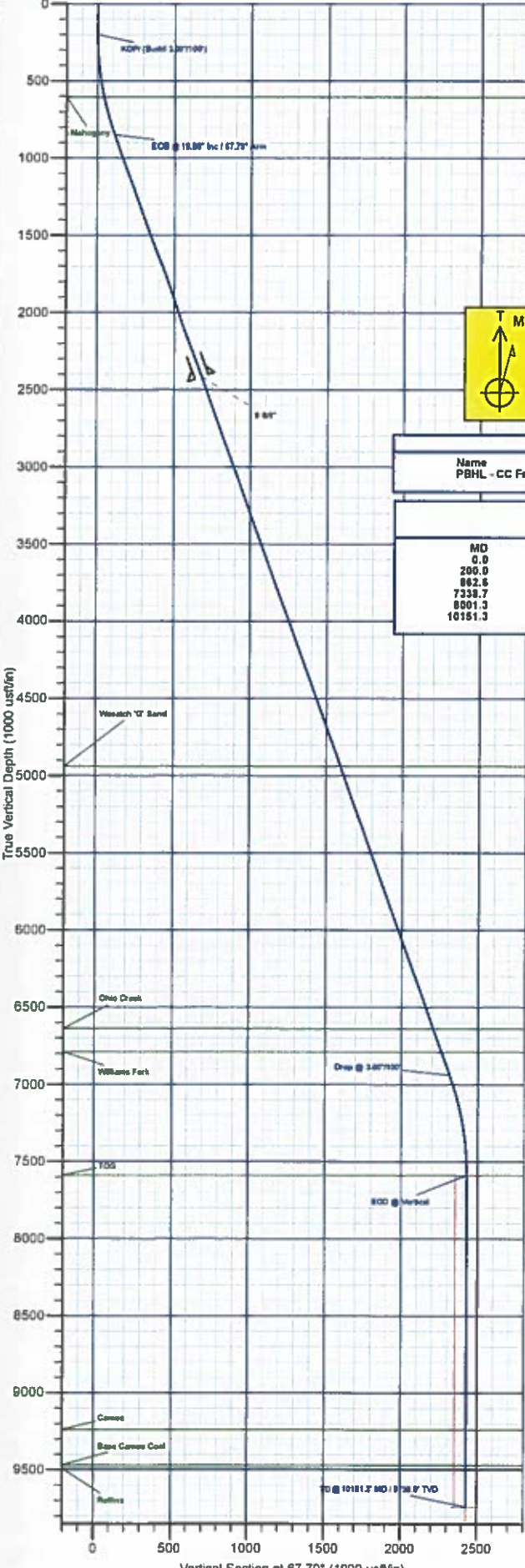
TVDPath	MDPath	Formation
606.0	609.1	Mahogany
4939.0	5211.3	Wasatch 'G' Sand
6639.0	7019.0	Ohio Creek
6789.0	7178.5	Williams Fork
7589.0	8001.3	TOG
8239.0	8651.3	Cameo
8469.0	8881.3	Base Cameo Coal
8489.0	8901.3	Rollins

DESIGN TARGET DETAILS

Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude
PBHL - CC Federal 0697-03-07W	9739.0	918.4	2249.3	1640281.30	2235922.29	39.56057	-108.210794

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 3.00°/100')
862.6	19.88	67.79	849.4	43.0	105.4	3.00	67.79	113.8	EOB @ 19.88° Inc / 67.79° Azm
7338.7	19.88	67.79	6938.5	475.4	2144.0	3.00	0.00	2315.8	Drop @ 3.00°/100'
8901.3	0.00	0.00	7589.0	918.4	2249.3	3.00	180.00	3429.6	EOB @ Vertical
10151.3	0.00	0.00	9739.0	918.4	2249.3	0.00	0.00	2429.6	TD @ 10151.3' MD / 9739.0' TVD



Plan: Design #3 (CC Federal 0697-03-07W/Wellbore #1)
 Created By: Will Jircik Date: 15:23, February 04 2019



Laramie Energy, LLC

Garfield County, CO

CC 604-41-32 Pad

CC Federal 0697-03-07W

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 0697-03-07W
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 0697-03-07W	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 0697-03-07W					
Well Position	+N/-S	-34.1 usft	Northing:	1,639,430.63 usft	Latitude:	39.557536
	+E/-W	-0.6 usft	Easting:	2,233,546.47 usft	Longitude:	-108.218772
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	8.609.0 usft

Wellbore	Wellbore #1				
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Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	10/4/2017	9.77	65.59	51,479.51129509

Design	Design #3				
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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	67.79	

Plan Sections										
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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	
862.6	19.88	67.79	849.4	43.0	105.4	3.00	3.00	0.00	67.79	
7,338.7	19.88	67.79	6,939.6	875.4	2,144.0	0.00	0.00	0.00	0.00	
8,001.3	0.00	0.00	7,589.0	918.4	2,249.3	3.00	-3.00	0.00	180.00	
10,151.3	0.00	0.00	9,739.0	918.4	2,249.3	0.00	0.00	0.00	0.00	PBHL - CC Federal 01



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-07W
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 0697-03-07W	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)
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	67.79	300.0	1.0	2.4	2.6	3.00	3.00	0.00
400.0	6.00	67.79	399.6	4.0	9.7	10.5	3.00	3.00	0.00
500.0	9.00	67.79	498.8	8.9	21.8	23.5	3.00	3.00	0.00
600.0	12.00	67.79	597.1	15.8	38.6	41.7	3.00	3.00	0.00
Mahogany									
609.1	12.27	67.79	606.0	16.5	40.4	43.7	3.00	3.00	0.00
700.0	15.00	67.79	694.3	24.6	60.2	65.1	3.00	3.00	0.00
800.0	18.00	67.79	790.2	35.3	86.5	93.5	3.00	3.00	0.00
EOB @ 19.88° Inc / 67.79° Azm									
862.6	19.88	67.79	849.4	43.0	105.4	113.8	3.00	3.00	0.00
900.0	19.88	67.79	884.6	47.8	117.1	126.5	0.00	0.00	0.00
1,000.0	19.88	67.79	978.6	60.7	148.6	160.5	0.00	0.00	0.00
1,100.0	19.88	67.79	1,072.6	73.5	180.1	194.5	0.00	0.00	0.00
1,200.0	19.88	67.79	1,166.7	86.4	211.6	228.5	0.00	0.00	0.00
1,300.0	19.88	67.79	1,260.7	99.2	243.0	262.5	0.00	0.00	0.00
1,400.0	19.88	67.79	1,354.8	112.1	274.5	296.5	0.00	0.00	0.00
1,500.0	19.88	67.79	1,448.8	124.9	306.0	330.5	0.00	0.00	0.00
1,600.0	19.88	67.79	1,542.9	137.8	337.5	364.5	0.00	0.00	0.00
1,700.0	19.88	67.79	1,636.9	150.6	369.0	398.5	0.00	0.00	0.00
1,800.0	19.88	67.79	1,730.9	163.5	400.4	432.5	0.00	0.00	0.00
1,900.0	19.88	67.79	1,825.0	176.3	431.9	466.5	0.00	0.00	0.00
2,000.0	19.88	67.79	1,919.0	189.2	463.4	500.5	0.00	0.00	0.00
2,100.0	19.88	67.79	2,013.1	202.1	494.9	534.5	0.00	0.00	0.00
2,200.0	19.88	67.79	2,107.1	214.9	526.4	568.5	0.00	0.00	0.00
2,300.0	19.88	67.79	2,201.1	227.8	557.8	602.5	0.00	0.00	0.00
2,400.0	19.88	67.79	2,295.2	240.6	589.3	636.5	0.00	0.00	0.00
2,500.0	19.88	67.79	2,389.2	253.5	620.8	670.5	0.00	0.00	0.00
2,600.0	19.88	67.79	2,483.3	266.3	652.3	704.5	0.00	0.00	0.00
2,700.0	19.88	67.79	2,577.3	279.2	683.8	738.6	0.00	0.00	0.00
2,800.0	19.88	67.79	2,671.4	292.0	715.2	772.6	0.00	0.00	0.00
2,900.0	19.88	67.79	2,765.4	304.9	746.7	806.6	0.00	0.00	0.00
3,000.0	19.88	67.79	2,859.4	317.7	778.2	840.6	0.00	0.00	0.00
3,100.0	19.88	67.79	2,953.5	330.6	809.7	874.6	0.00	0.00	0.00
3,200.0	19.88	67.79	3,047.5	343.4	841.2	908.6	0.00	0.00	0.00
3,300.0	19.88	67.79	3,141.6	356.3	872.6	942.6	0.00	0.00	0.00
3,400.0	19.88	67.79	3,235.6	369.1	904.1	976.6	0.00	0.00	0.00
3,500.0	19.88	67.79	3,329.6	382.0	935.6	1,010.6	0.00	0.00	0.00
3,600.0	19.88	67.79	3,423.7	394.8	967.1	1,044.6	0.00	0.00	0.00
3,700.0	19.88	67.79	3,517.7	407.7	998.6	1,078.6	0.00	0.00	0.00
3,800.0	19.88	67.79	3,611.8	420.5	1,030.0	1,112.6	0.00	0.00	0.00
3,900.0	19.88	67.79	3,705.8	433.4	1,061.5	1,146.6	0.00	0.00	0.00
4,000.0	19.88	67.79	3,799.9	446.3	1,093.0	1,180.6	0.00	0.00	0.00
4,100.0	19.88	67.79	3,893.9	459.1	1,124.5	1,214.6	0.00	0.00	0.00
4,200.0	19.88	67.79	3,987.9	472.0	1,155.9	1,248.6	0.00	0.00	0.00
4,300.0	19.88	67.79	4,082.0	484.8	1,187.4	1,282.6	0.00	0.00	0.00
4,400.0	19.88	67.79	4,176.0	497.7	1,218.9	1,316.6	0.00	0.00	0.00
4,500.0	19.88	67.79	4,270.1	510.5	1,250.4	1,350.6	0.00	0.00	0.00
4,600.0	19.88	67.79	4,364.1	523.4	1,281.9	1,384.6	0.00	0.00	0.00
4,700.0	19.88	67.79	4,458.1	536.2	1,313.3	1,418.6	0.00	0.00	0.00



Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-07W
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 0697-03-07W	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	19.88	67.79	4,552.2	549.1	1,344.8	1,452.6	0.00	0.00	0.00	
4,900.0	19.88	67.79	4,646.2	581.9	1,376.3	1,488.6	0.00	0.00	0.00	
5,000.0	19.88	67.79	4,740.3	574.8	1,407.8	1,520.6	0.00	0.00	0.00	
5,100.0	19.88	67.79	4,834.3	587.6	1,439.3	1,554.6	0.00	0.00	0.00	
5,200.0	19.88	67.79	4,928.4	600.5	1,470.7	1,588.6	0.00	0.00	0.00	
Wasatch 'G' Sand										
5,211.3	19.88	67.79	4,939.0	601.9	1,474.3	1,592.5	0.00	0.00	0.00	
5,300.0	19.88	67.79	5,022.4	613.3	1,502.2	1,622.6	0.00	0.00	0.00	
5,400.0	19.88	67.79	5,116.4	626.2	1,533.7	1,658.6	0.00	0.00	0.00	
5,500.0	19.88	67.79	5,210.5	639.0	1,565.2	1,690.6	0.00	0.00	0.00	
5,600.0	19.88	67.79	5,304.5	651.9	1,596.7	1,724.6	0.00	0.00	0.00	
5,700.0	19.88	67.79	5,398.6	664.8	1,628.1	1,758.6	0.00	0.00	0.00	
5,800.0	19.88	67.79	5,492.6	677.6	1,659.6	1,792.6	0.00	0.00	0.00	
5,900.0	19.88	67.79	5,586.6	690.5	1,691.1	1,826.6	0.00	0.00	0.00	
6,000.0	19.88	67.79	5,680.7	703.3	1,722.6	1,860.6	0.00	0.00	0.00	
6,100.0	19.88	67.79	5,774.7	716.2	1,754.1	1,894.6	0.00	0.00	0.00	
6,200.0	19.88	67.79	5,868.8	729.0	1,785.5	1,928.6	0.00	0.00	0.00	
6,300.0	19.88	67.79	5,962.8	741.9	1,817.0	1,962.6	0.00	0.00	0.00	
6,400.0	19.88	67.79	6,056.9	754.7	1,848.5	1,996.6	0.00	0.00	0.00	
6,500.0	19.88	67.79	6,150.9	767.6	1,880.0	2,030.6	0.00	0.00	0.00	
6,600.0	19.88	67.79	6,244.9	780.4	1,911.5	2,064.6	0.00	0.00	0.00	
6,700.0	19.88	67.79	6,339.0	793.3	1,942.9	2,098.6	0.00	0.00	0.00	
6,800.0	19.88	67.79	6,433.0	806.1	1,974.4	2,132.6	0.00	0.00	0.00	
6,900.0	19.88	67.79	6,527.1	819.0	2,005.9	2,166.6	0.00	0.00	0.00	
7,000.0	19.88	67.79	6,621.1	831.8	2,037.4	2,200.7	0.00	0.00	0.00	
Ohio Creek										
7,019.0	19.88	67.79	6,639.0	834.3	2,043.4	2,207.1	0.00	0.00	0.00	
7,100.0	19.88	67.79	6,715.1	844.7	2,068.9	2,234.7	0.00	0.00	0.00	
Williams Fork										
7,178.5	19.88	67.79	6,789.0	854.8	2,093.6	2,261.4	0.00	0.00	0.00	
7,200.0	19.88	67.79	6,809.2	857.5	2,100.3	2,268.7	0.00	0.00	0.00	
7,300.0	19.88	67.79	6,903.2	870.4	2,131.8	2,302.7	0.00	0.00	0.00	
Drop @ 3.00°/100'										
7,338.7	19.88	67.79	6,939.6	875.4	2,144.0	2,315.8	0.00	0.00	0.00	
7,400.0	18.04	67.79	6,997.6	882.9	2,162.4	2,335.7	3.00	-3.00	0.00	
7,500.0	15.04	67.79	7,093.4	893.7	2,188.8	2,364.2	3.00	-3.00	0.00	
7,600.0	12.04	67.79	7,190.7	902.5	2,210.5	2,387.6	3.00	-3.00	0.00	
7,700.0	9.04	67.79	7,289.0	909.4	2,227.4	2,405.9	3.00	-3.00	0.00	
7,800.0	6.04	67.79	7,388.1	914.4	2,239.5	2,419.0	3.00	-3.00	0.00	
7,900.0	3.04	67.79	7,487.8	917.4	2,246.9	2,426.9	3.00	-3.00	0.00	
8,000.0	0.04	67.79	7,587.7	918.4	2,249.3	2,429.6	3.00	-3.00	0.00	
EOD @ Vertical - TOG										
8,001.3	0.00	0.00	7,589.0	918.4	2,249.3	2,429.6	3.00	-3.00	0.00	
8,100.0	0.00	0.00	7,687.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,200.0	0.00	0.00	7,787.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,300.0	0.00	0.00	7,887.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,400.0	0.00	0.00	7,987.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,500.0	0.00	0.00	8,087.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,600.0	0.00	0.00	8,187.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,700.0	0.00	0.00	8,287.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,800.0	0.00	0.00	8,387.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
8,900.0	0.00	0.00	8,487.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,000.0	0.00	0.00	8,587.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,100.0	0.00	0.00	8,687.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-07W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8639 Ousft (RKB 30')
Project:	Garfield County, CO	MD Reference:	Well @ 8639 Ousft (RKB 30')
Site:	CC 604-41-32 Pad	North Reference:	True
Well:	CC Federal 0697-03-07W	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)	
9,200.0	0.00	0.00	8,787.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,300.0	0.00	0.00	8,887.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,400.0	0.00	0.00	8,987.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,500.0	0.00	0.00	9,087.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,600.0	0.00	0.00	9,187.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
Cameo										
9,651.3	0.00	0.00	9,239.0	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,700.0	0.00	0.00	9,287.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,800.0	0.00	0.00	9,387.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
Base Cameo Coal										
9,881.3	0.00	0.00	9,469.0	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
9,900.0	0.00	0.00	9,487.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
Rollins										
9,901.3	0.00	0.00	9,489.0	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
10,000.0	0.00	0.00	9,587.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
10,100.0	0.00	0.00	9,687.7	918.4	2,249.3	2,429.6	0.00	0.00	0.00	
TD @ 10151.3' MD / 9739.0' TVD										
10,151.3	0.00	0.00	9,739.0	918.4	2,249.3	2,429.6	0.00	0.00	0.00	

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N-S (usft)	+E-W (usft)	Northing (usft)	Eastng (usft)	Latitude	Longitude	
PBHL - CC Federal 069; - hit/miss target - Shape	0.00	0.00	9,739.0	918.4	2,249.3	1,640,281.29	2,235,822.29	39 560057	-108.210794	
- 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	2,417.4	9 5/8"	9-5/8	14-3/4		

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
609.1	608.0	Mahogany				
5,211.3	4,939.0	Wasatch 'G' Sand				
7,019.0	6,639.0	Ohio Creek				
7,178.5	6,789.0	Williams Fork				
8,001.3	7,589.0	TOG				
9,651.3	9,239.0	Cameo				
9,881.3	9,469.0	Base Cameo Coal				
9,901.3	9,489.0	Rollins				



Well Planning Report



Database:	EDM 5000 1 Single User Db	Local Co-ordinate Reference:	Well CC Federal 0697-03-07W
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 0697-03-07W	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')
862.6	849.4	43.0	105.4	EOB @ 19.88° Inc / 67.79° Azm
7,338.7	6,939.6	875.4	2,144.0	Drop @ 3 00"/100'
8,001.3	7,589.0	918.4	2,249.3	EOD @ Vertical
10,151.3	9,739.0	918.4	2,249.3	TD @ 10151.3' MD / 9739.0' TVD