



Laramie Energy, LLC

Garfield County, CO

CC 603-23-32 Pad

CC 0697-03-25W

B-7

Plan: Permit #1

QES Well Planning Report

13 May, 2018





Well Planning Report



Database:	EDM 5000.1 Single User Db	Local Co-ordinate Reference:	Well CC 0697-03-25W
Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8637.0usft (H&P 290)
Project:	Garfield County, CO	MD Reference:	Well @ 8637.0usft (H&P 290)
Site:	CC 603-23-32 Pad	North Reference:	True
Well:	CC 0697-03-25W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
Design:	Permit #1		

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 603-23-32 Pad			
Site Position:		Northing:	1,636,139.15 usft	Latitude:	39.548692
From:	Lat/Long	Easting:	2,235,843.66 usft	Longitude:	-108.210280
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.71 °

Well	CC 0697-03-25W					
Well Position	+N/-S	26.6 usft	Northing:	1,636,164.83 usft	Latitude:	39.548765
	+E/-W	29.9 usft	Easting:	2,235,874.33 usft	Longitude:	-108.210174
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	8,613.0 usft

Wellbore	B-7				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	3/24/2018	9.72	65.58	51,423.76593848

Design	Permit #1				
Audit Notes:					
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.0	
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	112.91	

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	
700.0	0.00	0.00	700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,032.9	9.99	112.91	1,031.2	-11.3	26.6	3.00	3.00	0.00	112.91	
3,677.6	9.99	112.91	3,635.8	-189.8	449.1	0.00	0.00	0.00	0.00	
4,010.4	0.00	0.00	3,967.0	-201.1	475.7	3.00	-3.00	0.00	180.00	
9,760.4	0.00	0.00	9,717.0	-201.1	475.7	0.00	0.00	0.00	0.00	PBHL - CC 0697-03-2



Well Planning Report



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Project:	Garfield County, CO	MD Reference:	Well @ 8637.0usft (H&P 290)
Site:	CC 603-23-32 Pad	North Reference:	True
Well:	CC 0697-03-25W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
Design:	Permit #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
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
Mahogany									
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP/ (Build 3.00°/100')									
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	3.00	112.91	800.0	-1.0	2.4	2.6	3.00	3.00	0.00
900.0	6.00	112.91	899.6	-4.1	9.6	10.5	3.00	3.00	0.00
1,000.0	9.00	112.91	998.8	-9.2	21.7	23.5	3.00	3.00	0.00
EOB @ 9.99° Inc / 112.91° Azm									
1,032.9	9.99	112.91	1,031.2	-11.3	26.6	28.9	3.00	3.00	0.00
1,100.0	9.99	112.91	1,097.3	-15.8	37.4	40.6	0.00	0.00	0.00
1,200.0	9.99	112.91	1,195.8	-22.5	53.3	57.9	0.00	0.00	0.00
1,300.0	9.99	112.91	1,294.3	-29.3	69.3	75.3	0.00	0.00	0.00
1,400.0	9.99	112.91	1,392.8	-36.0	85.3	92.6	0.00	0.00	0.00
1,500.0	9.99	112.91	1,491.2	-42.8	101.3	109.9	0.00	0.00	0.00
1,600.0	9.99	112.91	1,589.7	-49.5	117.2	127.3	0.00	0.00	0.00
1,700.0	9.99	112.91	1,688.2	-56.3	133.2	144.6	0.00	0.00	0.00
1,800.0	9.99	112.91	1,786.7	-63.0	149.2	162.0	0.00	0.00	0.00
1,900.0	9.99	112.91	1,885.2	-69.8	165.2	179.3	0.00	0.00	0.00
2,000.0	9.99	112.91	1,983.7	-76.5	181.1	196.6	0.00	0.00	0.00
2,100.0	9.99	112.91	2,082.2	-83.3	197.1	214.0	0.00	0.00	0.00
2,200.0	9.99	112.91	2,180.6	-90.0	213.1	231.3	0.00	0.00	0.00
2,300.0	9.99	112.91	2,279.1	-96.8	229.0	248.7	0.00	0.00	0.00
2,400.0	9.99	112.91	2,377.6	-103.5	245.0	266.0	0.00	0.00	0.00
2,500.0	9.99	112.91	2,476.1	-110.3	261.0	283.3	0.00	0.00	0.00
8 5/8"									
2,524.0	9.99	112.91	2,499.7	-111.9	264.8	287.5	0.00	0.00	0.00
2,600.0	9.99	112.91	2,574.6	-117.0	277.0	300.7	0.00	0.00	0.00
2,700.0	9.99	112.91	2,673.1	-123.8	292.9	318.0	0.00	0.00	0.00
2,800.0	9.99	112.91	2,771.5	-130.5	308.9	335.4	0.00	0.00	0.00
2,900.0	9.99	112.91	2,870.0	-137.3	324.9	352.7	0.00	0.00	0.00
3,000.0	9.99	112.91	2,968.5	-144.0	340.8	370.0	0.00	0.00	0.00
3,100.0	9.99	112.91	3,067.0	-150.8	356.8	387.4	0.00	0.00	0.00
3,200.0	9.99	112.91	3,165.5	-157.6	372.8	404.7	0.00	0.00	0.00
3,300.0	9.99	112.91	3,264.0	-164.3	388.8	422.1	0.00	0.00	0.00
3,400.0	9.99	112.91	3,362.5	-171.1	404.7	439.4	0.00	0.00	0.00
3,500.0	9.99	112.91	3,460.9	-177.8	420.7	456.7	0.00	0.00	0.00
3,600.0	9.99	112.91	3,559.4	-184.6	436.7	474.1	0.00	0.00	0.00
Drop @ 3.00°/100'									
3,677.6	9.99	112.91	3,635.8	-189.8	449.1	487.5	0.00	0.00	0.00
3,700.0	9.31	112.91	3,657.9	-191.3	452.5	491.3	3.00	-3.00	0.00
3,800.0	6.31	112.91	3,757.0	-196.5	465.1	504.9	3.00	-3.00	0.00
3,900.0	3.31	112.91	3,856.6	-199.8	472.8	513.3	3.00	-3.00	0.00
4,000.0	0.31	112.91	3,956.6	-201.0	475.7	516.4	3.00	-3.00	0.00
EOD @ Vertical									
4,010.4	0.00	0.00	3,967.0	-201.1	475.7	516.5	3.00	-3.00	0.00
4,100.0	0.00	0.00	4,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,200.0	0.00	0.00	4,156.6	-201.1	475.7	516.5	0.00	0.00	0.00



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Well:	CC 0697-03-25W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
Design:	Permit #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)
4,300.0	0.00	0.00	4,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,400.0	0.00	0.00	4,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,500.0	0.00	0.00	4,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,600.0	0.00	0.00	4,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,700.0	0.00	0.00	4,656.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,800.0	0.00	0.00	4,756.6	-201.1	475.7	516.5	0.00	0.00	0.00
4,900.0	0.00	0.00	4,856.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,000.0	0.00	0.00	4,956.6	-201.1	475.7	516.5	0.00	0.00	0.00
Wasatch 'G' Sand									
5,010.4	0.00	0.00	4,967.0	-201.1	475.7	516.5	0.00	0.00	0.00
5,100.0	0.00	0.00	5,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,200.0	0.00	0.00	5,156.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,300.0	0.00	0.00	5,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,400.0	0.00	0.00	5,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,500.0	0.00	0.00	5,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,600.0	0.00	0.00	5,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,700.0	0.00	0.00	5,656.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,800.0	0.00	0.00	5,756.6	-201.1	475.7	516.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,856.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,956.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,100.0	0.00	0.00	6,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,156.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,656.6	-201.1	475.7	516.5	0.00	0.00	0.00
Ohio Creek									
6,710.4	0.00	0.00	6,667.0	-201.1	475.7	516.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,756.6	-201.1	475.7	516.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,856.6	-201.1	475.7	516.5	0.00	0.00	0.00
Williams Fork									
6,910.4	0.00	0.00	6,867.0	-201.1	475.7	516.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,956.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,100.0	0.00	0.00	7,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,200.0	0.00	0.00	7,156.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,300.0	0.00	0.00	7,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
TOG									
7,510.4	0.00	0.00	7,467.0	-201.1	475.7	516.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,656.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,756.6	-201.1	475.7	516.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,856.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,956.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,100.0	0.00	0.00	8,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,200.0	0.00	0.00	8,156.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,300.0	0.00	0.00	8,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,400.0	0.00	0.00	8,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,500.0	0.00	0.00	8,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,600.0	0.00	0.00	8,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,700.0	0.00	0.00	8,656.6	-201.1	475.7	516.5	0.00	0.00	0.00



Well Planning Report



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Project:	Garfield County, CO	MD Reference:	Well @ 8637.0usft (H&P 290)
Site:	CC 603-23-32 Pad	North Reference:	True
Well:	CC 0697-03-25W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
Design:	Permit #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	8,756.6	-201.1	475.7	516.5	0.00	0.00	0.00
8,900.0	0.00	0.00	8,856.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,000.0	0.00	0.00	8,956.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,100.0	0.00	0.00	9,056.6	-201.1	475.7	516.5	0.00	0.00	0.00
Cameo									
9,110.4	0.00	0.00	9,067.0	-201.1	475.7	516.5	0.00	0.00	0.00
9,200.0	0.00	0.00	9,156.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,300.0	0.00	0.00	9,256.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,400.0	0.00	0.00	9,356.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,500.0	0.00	0.00	9,456.6	-201.1	475.7	516.5	0.00	0.00	0.00
Base Cameo Coal									
9,500.4	0.00	0.00	9,457.0	-201.1	475.7	516.5	0.00	0.00	0.00
Rollins									
9,510.4	0.00	0.00	9,467.0	-201.1	475.7	516.5	0.00	0.00	0.00
9,600.0	0.00	0.00	9,556.6	-201.1	475.7	516.5	0.00	0.00	0.00
9,700.0	0.00	0.00	9,656.6	-201.1	475.7	516.5	0.00	0.00	0.00
TD @ 9760.4' MD / 9717.0' TVD									
9,760.4	0.00	0.00	9,717.0	-201.1	475.7	516.5	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 - CC 0697-03-25V	0.00	0.00	9,717.0	-201.1	475.7	1,635,949.68	2,236,343.84	39.548213	-108.208487
- plan hits target center									
- Circle (radius 50.0)									

Casing Points				
Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
2,524.0	2,499.7	8 5/8"	8-5/8	11

Formations						
Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)	
600.0	600.0	Mahogany				
5,010.4	4,967.0	Wasatch 'G' Sand				
6,710.4	6,667.0	Ohio Creek				
6,910.4	6,867.0	Williams Fork				
7,510.4	7,467.0	TOG				
9,110.4	9,067.0	Cameo				
9,500.4	9,457.0	Base Cameo Coal				
9,510.4	9,467.0	Rollins				



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Company:	Laramie Energy, LLC	TVD Reference:	Well @ 8637.0usft (H&P 290)
Project:	Garfield County, CO	MD Reference:	Well @ 8637.0usft (H&P 290)
Site:	CC 603-23-32 Pad	North Reference:	True
Well:	CC 0697-03-25W	Survey Calculation Method:	Minimum Curvature
Wellbore:	B-7		
Design:	Permit #1		

Plan Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
700.0	700.0	0.0	0.0	KOP/ (Build 3.00°/100')
1,032.9	1,031.2	-11.3	26.6	EOB @ 9.99° Inc / 112.91° Azm
3,677.6	3,635.8	-189.8	449.1	Drop @ 3.00°/100'
4,010.4	3,967.0	-201.1	475.7	EOD @ Vertical
9,760.4	9,717.0	-201.1	475.7	TD @ 9760.4' MD / 9717.0' TVD