



Laramie Energy, LLC

Mesa County, CO

Bruton 19-06 Pad

Bruton 19-06W

Wellbore #1

Design: Wellbore #1

QES Survey Report

02 October, 2017





Survey Report



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Bruton 19-06W
Project:	Mesa County, CO	TVD Reference:	well @ 7286.0usft (H&P #290)
Site:	Bruton 19-06 Pad	MD Reference:	well @ 7286.0usft (H&P #290)
Well:	Bruton 19-06W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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		Bruton 19-06 Pad			
Site Position:		Northing:	1,528,940.55 usft	Latitude:	39.262756
From:	Lat/Long	Easting:	2,344,737.10 usft	Longitude:	-107.814558
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.46 °

Well	Bruton 19-06W					
Well Position	+N/-S	0.0 usft	Northing:	1,528,993.70 usft	Latitude:	39.262892
	+E/-W	0.0 usft	Easting:	2,344,595.14 usft	Longitude:	-107.815064
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,262.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/18/2017	9.56	65.42	51,387.72173397

Design	Wellbore #1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.0
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)	
	0.0	0.0	0.0	339.62	

Survey Program	Date	10/2/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
203.0	7,743.0	MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

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
First MWD Survey @ 203.0' MD / 203.0' TVD									
203.0	1.70	304.00	203.0	1.7	-2.5	2.4	0.84	0.84	0.00
294.0	1.80	349.60	293.9	3.8	-3.9	5.0	1.49	0.11	50.11
385.0	2.90	344.70	384.9	7.5	-4.7	8.7	1.23	1.21	-5.38
475.0	5.30	340.00	474.6	13.6	-6.8	15.1	2.69	2.67	-5.22
566.0	8.40	339.30	565.0	23.7	-10.5	25.9	3.41	3.41	-0.77
657.0	11.20	337.90	654.6	38.2	-16.2	41.4	3.09	3.08	-1.54
748.0	13.70	342.50	743.5	56.6	-22.8	61.0	2.95	2.75	5.05
839.0	13.60	348.60	831.9	77.4	-28.1	82.3	1.59	-0.11	6.70
929.0	13.50	339.50	919.4	97.6	-33.9	103.3	2.37	-0.11	-10.11



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Design:	Wellbore #1	Database:	EDM 5000.1 Single User Db

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)
1,024.0	15.20	338.50	1,011.4	119.6	-42.4	126.8	1.81	1.79	-1.05
1,118.0	15.30	337.80	1,102.1	142.5	-51.6	151.6	0.22	0.11	-0.74
1,213.0	15.60	337.10	1,193.7	165.9	-61.3	176.9	0.37	0.32	-0.74
1,308.0	15.00	341.50	1,285.3	189.3	-70.1	201.9	1.38	-0.63	4.63
1,403.0	15.20	343.30	1,377.1	212.9	-77.6	226.6	0.54	0.21	1.89
1,498.0	15.50	339.40	1,468.7	236.7	-85.7	251.7	1.13	0.32	-4.11
1,592.0	15.00	339.30	1,559.4	259.9	-94.4	276.5	0.53	-0.53	-0.11
1,686.0	14.50	337.80	1,650.3	282.1	-103.1	300.4	0.67	-0.53	-1.60
1,781.0	13.70	336.70	1,742.4	303.5	-112.1	323.5	0.89	-0.84	-1.16
1,875.0	12.70	344.80	1,833.9	323.7	-119.2	344.9	2.23	-1.06	8.62
1,970.0	14.40	350.50	1,926.3	345.4	-123.9	366.9	2.27	1.79	6.00
2,064.0	16.20	349.90	2,016.9	369.8	-128.1	391.3	1.92	1.91	-0.64
2,159.0	17.10	344.30	2,108.0	396.3	-134.2	418.3	1.94	0.95	-5.89
2,254.0	16.10	338.50	2,199.0	422.0	-142.8	445.4	2.04	-1.05	-6.11
2,348.0	15.10	339.40	2,289.6	445.6	-151.9	470.6	1.09	-1.06	0.96
2,443.0	14.50	339.70	2,381.4	468.4	-160.4	494.9	0.64	-0.63	0.32
2,537.0	13.40	339.20	2,472.6	489.6	-168.3	517.6	1.18	-1.17	-0.53
2,632.0	12.90	337.90	2,565.1	509.7	-176.2	539.2	0.61	-0.53	-1.37
2,726.0	13.10	339.90	2,656.7	529.4	-183.8	560.3	0.52	0.21	2.13
2,821.0	13.90	340.00	2,749.1	550.3	-191.4	582.5	0.84	0.84	0.11
2,915.0	13.10	339.70	2,840.5	570.9	-199.0	604.4	0.85	-0.85	-0.32
3,010.0	12.70	339.30	2,933.1	590.7	-206.4	625.6	0.43	-0.42	-0.42
3,105.0	11.90	339.30	3,025.9	609.7	-213.6	645.9	0.84	-0.84	0.00
3,199.0	13.70	338.80	3,117.6	629.1	-221.0	666.7	1.92	1.91	-0.53
3,294.0	12.70	336.80	3,210.1	649.2	-229.2	688.4	1.16	-1.05	-2.11
3,389.0	11.90	336.90	3,302.9	667.8	-237.2	708.6	0.84	-0.84	0.11
3,483.0	11.40	336.30	3,395.0	685.2	-244.7	727.6	0.55	-0.53	-0.64
3,578.0	13.00	338.10	3,487.8	703.7	-252.5	747.6	1.73	1.68	1.89
3,672.0	12.30	337.00	3,579.5	722.8	-260.3	768.2	0.79	-0.74	-1.17
3,767.0	14.20	337.80	3,672.0	742.9	-268.7	789.9	2.01	2.00	0.84
3,861.0	13.50	335.60	3,763.3	763.5	-277.6	812.4	0.93	-0.74	-2.34
3,956.0	12.50	336.20	3,855.8	783.0	-286.3	833.7	1.06	-1.05	0.63
4,050.0	12.80	339.50	3,947.5	802.1	-294.1	854.3	0.83	0.32	3.51
4,145.0	14.90	340.40	4,039.8	823.5	-301.8	877.0	2.22	2.21	0.95
4,240.0	14.40	338.90	4,131.7	846.0	-310.2	901.1	0.66	-0.53	-1.58
4,334.0	13.60	338.10	4,222.9	867.2	-318.5	923.8	0.88	-0.85	-0.85
4,429.0	11.80	338.00	4,315.6	886.5	-326.3	944.7	1.89	-1.89	-0.11
4,524.0	13.20	340.30	4,408.3	905.7	-333.6	965.2	1.56	1.47	2.42
4,618.0	15.80	342.70	4,499.3	928.1	-341.0	988.7	2.84	2.77	2.55
4,713.0	14.60	342.50	4,591.0	951.8	-348.5	1,013.6	1.26	-1.26	-0.21
4,808.0	12.60	340.00	4,683.3	973.0	-355.6	1,035.9	2.19	-2.11	-2.63
4,902.0	14.10	340.00	4,774.8	993.4	-363.1	1,057.6	1.60	1.60	0.00
4,997.0	12.80	338.50	4,867.2	1,014.1	-370.9	1,079.7	1.42	-1.37	-1.58



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Survey										
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5,092.0	11.50	337.70	4,960.0	1,032.6	-378.3	1,099.7	1.38	-1.37	-0.84	
5,186.0	10.50	336.60	5,052.3	1,049.1	-385.3	1,117.6	1.09	-1.06	-1.17	
5,281.0	9.20	341.20	5,145.9	1,064.3	-391.2	1,133.9	1.60	-1.37	4.84	
5,375.0	8.30	338.70	5,238.8	1,077.7	-396.1	1,148.2	1.04	-0.96	-2.66	
5,470.0	7.40	337.10	5,332.9	1,089.7	-400.9	1,161.1	0.97	-0.95	-1.68	
5,564.0	7.50	349.40	5,426.1	1,101.3	-404.4	1,173.2	1.70	0.11	13.09	
5,659.0	6.80	347.50	5,520.4	1,112.9	-406.8	1,184.9	0.78	-0.74	-2.00	
5,753.0	5.90	344.70	5,613.8	1,123.0	-409.2	1,195.2	1.01	-0.96	-2.98	
5,848.0	4.30	354.70	5,708.4	1,131.3	-410.9	1,203.5	1.92	-1.68	10.53	
5,942.0	3.80	345.30	5,802.2	1,137.8	-412.0	1,210.1	0.88	-0.53	-10.00	
6,037.0	3.40	338.50	5,897.0	1,143.5	-413.8	1,216.0	0.62	-0.42	-7.16	
6,131.0	2.20	24.00	5,990.9	1,147.7	-414.1	1,220.1	2.59	-1.28	48.40	
6,226.0	1.80	30.00	6,085.9	1,150.7	-412.6	1,222.3	0.47	-0.42	6.32	
6,321.0	1.10	34.60	6,180.8	1,152.7	-411.4	1,223.8	0.75	-0.74	4.84	
6,415.0	0.50	183.90	6,274.8	1,153.0	-410.9	1,224.0	1.65	-0.64	158.83	
6,510.0	0.40	180.20	6,369.8	1,152.3	-410.9	1,223.3	0.11	-0.11	-3.89	
6,605.0	0.40	243.20	6,464.8	1,151.8	-411.2	1,222.9	0.44	0.00	66.32	
6,699.0	0.50	223.10	6,558.8	1,151.4	-411.8	1,222.7	0.20	0.11	-21.38	
6,794.0	0.40	260.20	6,653.8	1,151.0	-412.4	1,222.6	0.32	-0.11	39.05	
6,888.0	0.60	236.10	6,747.8	1,150.7	-413.1	1,222.5	0.30	0.21	-25.64	
6,983.0	1.10	229.10	6,842.8	1,149.8	-414.2	1,222.1	0.54	0.53	-7.37	
7,077.0	1.60	218.50	6,936.8	1,148.2	-415.7	1,221.1	0.59	0.53	-11.28	
7,172.0	2.50	209.40	7,031.7	1,145.3	-417.6	1,219.1	1.00	0.95	-9.58	
7,266.0	2.80	221.40	7,125.6	1,141.8	-420.1	1,216.7	0.67	0.32	12.77	
7,361.0	3.00	235.60	7,220.5	1,138.7	-423.7	1,215.0	0.78	0.21	14.95	
7,456.0	3.50	244.90	7,315.3	1,136.1	-428.3	1,214.1	0.76	0.53	9.79	
7,550.0	3.30	243.80	7,409.2	1,133.6	-433.4	1,213.6	0.22	-0.21	-1.17	
7,645.0	3.20	235.40	7,504.0	1,130.9	-438.0	1,212.7	0.51	-0.11	-8.84	
7,687.0	2.90	236.60	7,546.0	1,129.7	-439.9	1,212.1	0.73	-0.71	2.86	
Projection to TD @ 7743.0' MD / 7601.9' TVD										
7,743.0	2.90	236.60	7,601.9	1,128.1	-442.2	1,211.5	0.00	0.00	0.00	

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
203.0	203.0	1.7	-2.5	First MWD Survey @ 203.0' MD / 203.0' TVD	
7,743.0	7,601.9	1,128.1	-442.2	Projection to TD @ 7743.0' MD / 7601.9' TVD	