



Laramie Energy, LLC

**Mesa County, CO
Nichols 24-07 Pad
Nichols 0994-24-11W**

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

16 March, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-11W
Project:	Mesa County, CO	TVD Reference:	well @ 7236.0usft (H&P #290)
Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-11W	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		Nichols 24-07 Pad						
Site Position:		Northing:	1,529,213.07	usft	Latitude:	39.263181		
From:	Lat/Long	Easting:	2,340,128.94	usft	Longitude:	-107.830853		
Position Uncertainty:	0.0	usft	Slot Radius:	13-3/16	"	Grid Convergence:	-1.47	°

Well	Nichols 0994-24-11W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,281.75 usft	Latitude:	39.263369
	+E/-W	0.0 usft	Easting:	2,340,127.53 usft	Longitude:	-107.830864
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,212.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	User Defined	2/13/2018	9.45	65.40	51,323.70000000

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	252.82	

Survey Program	Date	3/16/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
200.0	7,522.0	QES MWD Surveys (Wellbore #1)	MWD default	MWD - Standard	

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	1,529,281.75	2,340,127.53	39.263369	-107.830864
200.0	1.60	331.20	200.0	2.4	-1.3	1,529,284.23	2,340,126.25	39.263376	-107.830869
First MWD Survey @ 200.0' MD / 200.0' TVD									
290.0	1.60	317.20	289.9	4.5	-2.8	1,529,286.29	2,340,124.84	39.263381	-107.830874
380.0	2.20	316.30	379.9	6.6	-4.9	1,529,288.51	2,340,122.85	39.263387	-107.830881
470.0	2.90	304.20	469.8	9.2	-7.9	1,529,291.12	2,340,119.84	39.263394	-107.830892
560.0	4.50	289.20	559.6	11.6	-13.1	1,529,293.69	2,340,114.69	39.263401	-107.830911
650.0	6.50	278.70	649.2	13.5	-21.5	1,529,295.84	2,340,106.37	39.263406	-107.830940
740.0	8.10	260.20	738.5	13.2	-32.8	1,529,295.82	2,340,095.08	39.263405	-107.830980
834.0	10.10	252.60	831.3	9.6	-47.2	1,529,292.60	2,340,080.60	39.263396	-107.831031
929.0	11.00	250.70	924.7	4.2	-63.7	1,529,287.53	2,340,063.96	39.263380	-107.831089
1,023.0	13.10	252.40	1,016.6	-2.0	-82.3	1,529,281.83	2,340,045.19	39.263363	-107.831155



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Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
1,118.0	14.90	248.10	1,108.8	-9.8	-103.9	1,529,274.57	2,340,023.40	39.263342	-107.831231
1,212.0	16.60	248.90	1,199.3	-19.2	-127.7	1,529,265.84	2,339,999.42	39.263316	-107.831315
1,307.0	17.71	250.62	1,290.0	-28.9	-153.9	1,529,256.84	2,339,972.89	39.263290	-107.831408
1,402.0	17.49	247.37	1,380.6	-39.2	-180.8	1,529,247.24	2,339,945.83	39.263262	-107.831503
1,495.0	17.49	248.25	1,469.3	-49.7	-206.6	1,529,237.36	2,339,919.68	39.263233	-107.831594
1,587.0	16.90	244.90	1,557.2	-60.5	-231.6	1,529,227.20	2,339,894.47	39.263203	-107.831682
1,682.0	16.60	251.60	1,648.1	-70.6	-257.0	1,529,217.72	2,339,868.83	39.263175	-107.831772
1,776.0	18.20	256.30	1,737.8	-78.4	-284.0	1,529,210.70	2,339,841.63	39.263154	-107.831867
1,871.0	17.00	254.60	1,828.4	-85.6	-311.8	1,529,204.21	2,339,813.66	39.263134	-107.831965
1,965.0	15.70	253.30	1,918.6	-92.9	-337.2	1,529,197.56	2,339,788.05	39.263114	-107.832055
2,059.0	17.10	259.80	2,008.8	-99.0	-363.0	1,529,192.12	2,339,762.11	39.263097	-107.832146
2,154.0	15.60	258.50	2,099.9	-104.0	-389.3	1,529,187.78	2,339,735.73	39.263084	-107.832239
2,249.0	14.80	256.90	2,191.6	-109.3	-413.6	1,529,183.10	2,339,711.26	39.263069	-107.832325
2,343.0	14.10	256.10	2,282.6	-114.8	-436.4	1,529,178.22	2,339,688.32	39.263054	-107.832406
2,438.0	13.30	255.30	2,374.9	-120.3	-458.2	1,529,173.23	2,339,666.38	39.263039	-107.832483
2,532.0	13.70	256.20	2,466.3	-125.7	-479.5	1,529,168.38	2,339,644.98	39.263024	-107.832558
2,627.0	15.40	257.80	2,558.3	-131.1	-502.7	1,529,163.63	2,339,621.60	39.263009	-107.832640
2,721.0	16.80	251.80	2,648.6	-137.9	-527.8	1,529,157.39	2,339,596.32	39.262990	-107.832729
2,816.0	15.80	251.60	2,739.8	-146.3	-553.2	1,529,149.67	2,339,570.80	39.262967	-107.832818
2,910.0	14.70	251.60	2,830.5	-154.1	-576.6	1,529,142.47	2,339,547.15	39.262946	-107.832901
3,005.0	16.40	251.30	2,922.0	-162.2	-600.8	1,529,134.99	2,339,522.80	39.262924	-107.832986
3,099.0	15.60	252.30	3,012.3	-170.3	-625.4	1,529,127.53	2,339,497.99	39.262901	-107.833073
3,194.0	17.60	253.20	3,103.4	-178.4	-651.3	1,529,120.16	2,339,471.88	39.262879	-107.833165
3,288.0	16.50	251.70	3,193.3	-186.7	-677.6	1,529,112.54	2,339,445.39	39.262857	-107.833257
3,383.0	18.30	253.30	3,283.9	-195.2	-704.7	1,529,104.71	2,339,418.09	39.262833	-107.833353
3,477.0	17.30	253.00	3,373.4	-203.5	-732.2	1,529,097.09	2,339,390.38	39.262810	-107.833450
3,572.0	16.30	252.20	3,464.3	-211.7	-758.4	1,529,089.56	2,339,363.97	39.262788	-107.833543
3,667.0	15.60	251.30	3,555.7	-219.9	-783.2	1,529,082.03	2,339,338.98	39.262765	-107.833630
3,762.0	17.30	252.30	3,646.8	-228.3	-808.7	1,529,074.30	2,339,313.22	39.262742	-107.833721
3,856.0	15.90	252.60	3,736.9	-236.4	-834.3	1,529,066.86	2,339,287.41	39.262720	-107.833811
3,951.0	16.80	251.20	3,828.0	-244.7	-859.7	1,529,059.19	2,339,261.79	39.262697	-107.833901
4,046.0	18.20	250.70	3,918.6	-254.0	-886.7	1,529,050.56	2,339,234.56	39.262672	-107.833996
4,140.0	18.10	250.60	4,008.0	-263.7	-914.4	1,529,041.57	2,339,206.70	39.262645	-107.834094
4,235.0	16.60	251.20	4,098.6	-273.0	-941.1	1,529,032.99	2,339,179.70	39.262619	-107.834188
4,329.0	18.10	252.70	4,188.4	-281.7	-967.8	1,529,025.00	2,339,152.83	39.262596	-107.834282
4,424.0	16.70	252.30	4,279.0	-290.2	-994.9	1,529,017.16	2,339,125.53	39.262572	-107.834378
4,519.0	17.50	251.60	4,369.8	-298.9	-1,021.4	1,529,009.19	2,339,098.76	39.262548	-107.834472
4,613.0	15.80	249.70	4,459.9	-307.8	-1,046.9	1,529,000.94	2,339,073.12	39.262524	-107.834562
4,707.0	16.20	250.10	4,550.2	-316.7	-1,071.2	1,528,992.67	2,339,048.57	39.262500	-107.834648
4,802.0	14.50	249.90	4,641.8	-325.3	-1,094.8	1,528,984.68	2,339,024.72	39.262476	-107.834731
4,896.0	13.10	248.80	4,733.1	-333.2	-1,115.8	1,528,977.32	2,339,003.55	39.262454	-107.834805
4,991.0	12.00	247.80	4,825.8	-340.8	-1,135.0	1,528,970.19	2,338,984.17	39.262433	-107.834873
5,086.0	10.50	247.70	4,919.0	-347.8	-1,152.1	1,528,963.62	2,338,966.85	39.262414	-107.834933
5,180.0	9.70	247.10	5,011.6	-354.1	-1,167.4	1,528,957.68	2,338,951.47	39.262397	-107.834987
5,275.0	9.10	243.20	5,105.3	-360.6	-1,181.4	1,528,951.54	2,338,937.23	39.262379	-107.835037
5,369.0	7.50	244.90	5,198.3	-366.6	-1,193.6	1,528,945.90	2,338,924.89	39.262362	-107.835080
5,464.0	5.10	254.80	5,292.7	-370.3	-1,203.3	1,528,942.41	2,338,915.11	39.262352	-107.835114
5,559.0	3.00	250.30	5,387.5	-372.3	-1,209.7	1,528,940.63	2,338,908.64	39.262347	-107.835137
5,653.0	1.30	254.50	5,481.4	-373.4	-1,213.1	1,528,939.60	2,338,905.27	39.262344	-107.835149
5,748.0	0.18	4.88	5,576.4	-373.5	-1,214.1	1,528,939.49	2,338,904.24	39.262343	-107.835152
5,842.0	0.79	224.17	5,670.4	-373.8	-1,214.5	1,528,939.18	2,338,903.79	39.262343	-107.835154
5,937.0	0.97	223.20	5,765.4	-374.9	-1,215.6	1,528,938.15	2,338,902.76	39.262340	-107.835157
6,032.0	1.45	242.10	5,860.4	-376.1	-1,217.2	1,528,937.05	2,338,901.12	39.262336	-107.835163
6,127.0	1.67	225.66	5,955.3	-377.6	-1,219.2	1,528,935.57	2,338,899.03	39.262332	-107.835170
6,221.0	1.71	224.69	6,049.3	-379.5	-1,221.2	1,528,933.67	2,338,897.01	39.262327	-107.835177



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-11W
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Site:	Nichols 24-07 Pad	MD Reference:	well @ 7236.0usft (H&P #290)
Well:	Nichols 0994-24-11W	North Reference:	True
Wellbore:	Wellbore #1	Survey Calculation Method:	Minimum Curvature
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)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
6,316.0	1.76	223.29	6,144.2	-381.6	-1,223.2	1,528,931.65	2,338,894.96	39.262321	-107.835184
6,411.0	1.89	238.05	6,239.2	-383.5	-1,225.5	1,528,929.82	2,338,892.59	39.262316	-107.835193
6,506.0	2.11	229.18	6,334.1	-385.5	-1,228.2	1,528,927.91	2,338,889.88	39.262311	-107.835202
6,600.0	2.33	223.29	6,428.1	-388.0	-1,230.8	1,528,925.46	2,338,887.20	39.262304	-107.835211
6,695.0	2.29	225.57	6,523.0	-390.7	-1,233.5	1,528,922.80	2,338,884.45	39.262296	-107.835221
6,789.0	2.37	236.82	6,616.9	-393.1	-1,236.4	1,528,920.49	2,338,881.42	39.262290	-107.835231
6,884.0	2.42	249.13	6,711.8	-394.9	-1,239.9	1,528,918.80	2,338,877.86	39.262285	-107.835244
6,979.0	2.11	246.49	6,806.8	-396.3	-1,243.4	1,528,917.47	2,338,874.35	39.262281	-107.835256
7,073.0	2.07	272.77	6,900.7	-396.9	-1,246.7	1,528,916.95	2,338,871.05	39.262279	-107.835267
7,168.0	3.30	282.09	6,995.6	-396.3	-1,251.1	1,528,917.72	2,338,866.68	39.262281	-107.835283
7,263.0	3.60	277.25	7,090.4	-395.3	-1,256.7	1,528,918.81	2,338,861.08	39.262284	-107.835303
7,357.0	3.69	273.91	7,184.2	-394.7	-1,262.7	1,528,919.54	2,338,855.15	39.262285	-107.835324
7,451.0	3.47	270.40	7,278.0	-394.5	-1,268.5	1,528,919.92	2,338,849.29	39.262286	-107.835345
7,467.0	3.56	270.40	7,294.0	-394.5	-1,269.5	1,528,919.95	2,338,848.31	39.262286	-107.835348
7,522.0	3.56	270.40	7,348.9	-394.5	-1,272.9	1,528,920.06	2,338,844.90	39.262286	-107.835360
Projection to TD @ 7522.0' MD / 7348.9' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
200.0	200.0	2.4	-1.3	First MWD Survey @ 200.0' MD / 200.0' TVD
7,522.0	7,348.9	-394.5	-1,272.9	Projection to TD @ 7522.0' MD / 7348.9' TVD