



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-21W

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

28 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-21W
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 0994-24-21W	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 0994-24-21W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,214.20 usft	Latitude:	39.263183
	+E/-W	0.0 usft	Easting:	2,340,118.75 usft	Longitude:	-107.830889
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	5/10/2018	9.43	65.40	51,296.50000000

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	200.57	

Survey Program	Date	5/28/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
293.0	8,078.0	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	1,529,214.20	2,340,118.75	39.263183	-107.830889
293.0	9.80	195.40	291.6	-24.1	-6.6	1,529,190.28	2,340,111.49	39.263117	-107.830913
First MWD Survey @ 293.0' MD / 291.6' TVD									
383.0	12.00	197.00	379.9	-40.4	-11.4	1,529,174.07	2,340,106.30	39.263072	-107.830929
473.0	14.10	198.60	467.6	-59.8	-17.6	1,529,154.90	2,340,099.58	39.263019	-107.830951
563.0	17.00	199.30	554.3	-82.6	-25.5	1,529,132.29	2,340,091.15	39.262956	-107.830979
658.0	19.30	198.80	644.6	-110.6	-35.1	1,529,104.58	2,340,080.78	39.262879	-107.831013
753.0	19.80	197.20	734.1	-140.8	-45.0	1,529,074.61	2,340,070.19	39.262796	-107.831048
847.0	20.20	198.30	822.4	-171.4	-54.8	1,529,044.25	2,340,059.61	39.262712	-107.831083
942.0	20.60	197.40	911.5	-202.9	-64.9	1,529,013.00	2,340,048.65	39.262626	-107.831118
1,037.0	22.90	198.00	999.7	-236.5	-75.6	1,528,979.76	2,340,037.09	39.262534	-107.831156
1,131.0	24.79	201.12	1,085.7	-272.2	-88.4	1,528,944.31	2,340,023.42	39.262436	-107.831201



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-21W
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 0994-24-21W	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
1,226.0	25.36	202.09	1,171.7	-309.7	-103.2	1,528,907.28	2,340,007.64	39.262333	-107.831254
1,320.0	25.88	202.17	1,256.5	-347.3	-118.5	1,528,870.03	2,339,991.36	39.262229	-107.831308
1,415.0	26.50	202.09	1,341.7	-386.2	-134.3	1,528,831.61	2,339,974.58	39.262123	-107.831364
1,513.0	26.81	202.70	1,429.3	-426.8	-151.1	1,528,791.40	2,339,956.79	39.262011	-107.831423
1,624.0	26.60	202.50	1,528.5	-472.9	-170.2	1,528,745.86	2,339,936.44	39.261885	-107.831490
1,718.0	26.00	201.70	1,612.7	-511.4	-185.9	1,528,707.69	2,339,919.79	39.261779	-107.831546
1,813.0	25.20	201.80	1,698.4	-549.6	-201.1	1,528,669.96	2,339,903.60	39.261674	-107.831599
1,907.0	24.30	201.30	1,783.8	-586.2	-215.6	1,528,633.75	2,339,888.21	39.261574	-107.831651
2,002.0	25.90	201.60	1,869.8	-623.7	-230.3	1,528,596.63	2,339,872.52	39.261471	-107.831703
2,096.0	24.90	200.50	1,954.7	-661.3	-244.8	1,528,559.39	2,339,857.07	39.261367	-107.831754
2,191.0	26.40	199.10	2,040.4	-700.0	-258.7	1,528,521.07	2,339,842.16	39.261261	-107.831803
2,285.0	25.40	197.60	2,124.9	-739.0	-271.6	1,528,482.45	2,339,828.23	39.261154	-107.831849
2,380.0	23.90	197.50	2,211.3	-776.7	-283.6	1,528,444.99	2,339,815.32	39.261050	-107.831891
2,474.0	25.00	197.70	2,296.8	-813.8	-295.4	1,528,408.22	2,339,802.61	39.260949	-107.831932
2,569.0	26.20	199.40	2,382.5	-852.7	-308.4	1,528,369.66	2,339,788.54	39.260842	-107.831978
2,663.0	24.90	198.60	2,467.3	-891.1	-321.6	1,528,331.68	2,339,774.36	39.260737	-107.832025
2,758.0	26.90	198.90	2,552.8	-930.3	-335.0	1,528,292.75	2,339,760.02	39.260629	-107.832072
2,852.0	29.50	199.70	2,635.6	-972.3	-349.7	1,528,251.22	2,339,744.25	39.260514	-107.832124
2,947.0	31.40	200.40	2,717.5	-1,017.5	-366.2	1,528,206.44	2,339,726.58	39.260389	-107.832182
3,042.0	33.60	199.40	2,797.6	-1,065.5	-383.5	1,528,158.91	2,339,708.00	39.260258	-107.832244
3,136.0	36.80	199.70	2,874.4	-1,116.5	-401.7	1,528,108.34	2,339,688.56	39.260117	-107.832308
3,231.0	39.80	199.40	2,949.0	-1,172.0	-421.4	1,528,053.38	2,339,667.45	39.259965	-107.832377
3,326.0	40.50	201.70	3,021.6	-1,229.4	-442.9	1,527,996.61	2,339,644.48	39.259808	-107.832453
3,421.0	39.70	200.60	3,094.2	-1,286.4	-465.0	1,527,940.12	2,339,620.94	39.259651	-107.832531
3,515.0	41.00	201.50	3,165.9	-1,343.2	-486.8	1,527,883.91	2,339,597.62	39.259495	-107.832608
3,610.0	40.20	201.60	3,238.0	-1,400.7	-509.5	1,527,827.01	2,339,573.45	39.259337	-107.832689
3,704.0	39.50	202.30	3,310.2	-1,456.6	-532.0	1,527,771.74	2,339,549.51	39.259184	-107.832768
3,799.0	40.30	201.10	3,383.1	-1,513.2	-554.6	1,527,715.72	2,339,525.54	39.259028	-107.832848
3,893.0	39.60	201.20	3,455.1	-1,569.5	-576.3	1,527,660.00	2,339,502.32	39.258874	-107.832925
3,988.0	41.30	200.30	3,527.4	-1,627.1	-598.2	1,527,602.94	2,339,479.03	39.258716	-107.833002
4,082.0	40.50	199.40	3,598.5	-1,685.0	-619.1	1,527,545.61	2,339,456.65	39.258557	-107.833076
4,177.0	39.20	199.70	3,671.4	-1,742.4	-639.4	1,527,488.79	2,339,434.81	39.258399	-107.833147
4,271.0	40.80	198.20	3,743.4	-1,799.5	-659.1	1,527,432.17	2,339,413.75	39.258242	-107.833217
4,366.0	40.00	198.20	3,815.7	-1,858.0	-678.3	1,527,374.19	2,339,393.02	39.258082	-107.833285
4,461.0	38.40	198.70	3,889.4	-1,915.0	-697.3	1,527,317.74	2,339,372.57	39.257925	-107.833352
4,555.0	40.40	198.70	3,962.0	-1,971.5	-716.4	1,527,261.74	2,339,352.00	39.257770	-107.833419
4,650.0	38.80	199.10	4,035.2	-2,028.8	-736.0	1,527,204.97	2,339,330.92	39.257613	-107.833488
4,744.0	38.50	201.50	4,108.6	-2,083.8	-756.4	1,527,150.45	2,339,309.16	39.257462	-107.833560
4,839.0	38.10	199.80	4,183.2	-2,138.9	-777.1	1,527,095.91	2,339,286.98	39.257310	-107.833634
4,934.0	36.50	201.10	4,258.7	-2,192.9	-797.2	1,527,042.51	2,339,265.51	39.257162	-107.833705
5,028.0	35.20	201.30	4,334.9	-2,244.2	-817.2	1,526,991.71	2,339,244.29	39.257021	-107.833775
5,123.0	32.20	200.90	4,413.9	-2,293.4	-836.1	1,526,943.04	2,339,224.05	39.256886	-107.833842
5,217.0	30.70	199.70	4,494.1	-2,339.3	-853.2	1,526,897.50	2,339,205.86	39.256760	-107.833902
5,312.0	29.40	200.00	4,576.4	-2,384.1	-869.3	1,526,853.19	2,339,188.56	39.256637	-107.833959
5,407.0	27.20	201.00	4,660.0	-2,426.3	-885.1	1,526,811.42	2,339,171.73	39.256521	-107.834015
5,502.0	24.60	199.70	4,745.5	-2,465.2	-899.5	1,526,772.91	2,339,156.28	39.256415	-107.834066
5,596.0	22.40	204.00	4,831.7	-2,500.0	-913.4	1,526,738.49	2,339,141.51	39.256319	-107.834115
5,691.0	19.60	203.80	4,920.3	-2,531.1	-927.2	1,526,707.73	2,339,126.92	39.256234	-107.834164
5,786.0	16.60	204.50	5,010.6	-2,558.0	-939.3	1,526,681.12	2,339,114.18	39.256160	-107.834206
5,880.0	15.60	203.40	5,100.9	-2,581.8	-949.8	1,526,657.58	2,339,102.98	39.256094	-107.834244
5,975.0	14.90	203.40	5,192.6	-2,604.8	-959.8	1,526,634.91	2,339,092.47	39.256031	-107.834279
6,070.0	11.60	204.40	5,285.1	-2,624.7	-968.6	1,526,615.23	2,339,083.17	39.255977	-107.834310
6,164.0	9.50	208.20	5,377.5	-2,640.1	-976.1	1,526,599.98	2,339,075.20	39.255934	-107.834336
6,259.0	6.40	204.00	5,471.5	-2,651.9	-982.0	1,526,588.39	2,339,069.04	39.255902	-107.834357
6,354.0	2.90	209.20	5,566.2	-2,658.8	-985.3	1,526,581.54	2,339,065.54	39.255883	-107.834369



Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-21W
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 0994-24-21W	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
6,448.0	0.70	220.80	5,660.2	-2,661.3	-986.9	1,526,579.07	2,339,063.94	39.255876	-107.834374
6,543.0	0.90	253.20	5,755.2	-2,662.0	-987.9	1,526,578.44	2,339,062.83	39.255874	-107.834378
6,637.0	1.10	263.90	5,849.1	-2,662.3	-989.6	1,526,578.17	2,339,061.22	39.255873	-107.834384
6,732.0	1.10	259.70	5,944.1	-2,662.5	-991.4	1,526,577.96	2,339,059.41	39.255873	-107.834390
6,826.0	0.40	249.90	6,038.1	-2,662.8	-992.6	1,526,577.71	2,339,058.21	39.255872	-107.834394
6,921.0	0.57	270.99	6,133.1	-2,662.9	-993.3	1,526,577.63	2,339,057.42	39.255872	-107.834397
7,016.0	1.05	263.35	6,228.1	-2,663.0	-994.7	1,526,577.57	2,339,056.08	39.255871	-107.834402
7,110.0	1.05	273.15	6,322.1	-2,663.1	-996.4	1,526,577.56	2,339,054.36	39.255871	-107.834408
7,205.0	0.88	260.88	6,417.1	-2,663.1	-998.0	1,526,577.54	2,339,052.77	39.255871	-107.834414
7,299.0	0.83	213.25	6,511.1	-2,663.8	-999.1	1,526,576.88	2,339,051.67	39.255869	-107.834417
7,394.0	1.58	214.13	6,606.0	-2,665.5	-1,000.2	1,526,575.25	2,339,050.52	39.255865	-107.834421
7,489.0	1.49	232.06	6,701.0	-2,667.3	-1,001.9	1,526,573.45	2,339,048.76	39.255860	-107.834427
7,583.0	2.11	217.20	6,795.0	-2,669.5	-1,003.9	1,526,571.37	2,339,046.70	39.255854	-107.834434
7,678.0	2.72	246.38	6,889.9	-2,671.8	-1,007.0	1,526,569.16	2,339,043.52	39.255847	-107.834445
7,773.0	3.52	246.82	6,984.7	-2,673.8	-1,011.8	1,526,567.23	2,339,038.72	39.255842	-107.834462
7,867.0	3.78	255.00	7,078.5	-2,675.7	-1,017.4	1,526,565.44	2,339,033.02	39.255836	-107.834482
7,962.0	3.69	256.23	7,173.3	-2,677.3	-1,023.4	1,526,564.05	2,339,026.99	39.255832	-107.834503
8,018.0	4.17	262.03	7,229.2	-2,678.0	-1,027.2	1,526,563.44	2,339,023.21	39.255830	-107.834517
8,078.0	4.17	262.03	7,289.1	-2,678.6	-1,031.5	1,526,562.94	2,339,018.87	39.255829	-107.834532

Projection to TD @ 8078.0' MD / 7289.1' TVD

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
293.0	291.6	-24.1	-6.6	First MWD Survey @ 293.0' MD / 291.6' TVD
8,078.0	7,289.1	-2,678.6	-1,031.5	Projection to TD @ 8078.0' MD / 7289.1' TVD

Checked By: _____ Approved By: _____ Date: _____