



Laramie Energy, LLC

Mesa County, CO

Nichols 24-06A

Nichols 0994-24-09E

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

24 November, 2017





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-09E
Project:	Mesa County, CO	TVD Reference:	well @ 7161.0usft (H&P #290)
Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-09E	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 24-06A			
Site Position:		Northing:	1,529,702.08 usft	Latitude:	39.264528
From:	Lat/Long	Easting:	2,340,203.74 usft	Longitude:	-107.830633
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	-1.47 °

Well	Nichols 0994-24-09E					
Well Position	+N/-S	0.0 usft	Northing:	1,529,702.06 usft	Latitude:	39.264528
	+E/-W	0.0 usft	Easting:	2,340,203.74 usft	Longitude:	-107.830633
Position Uncertainty		0.0 usft	Wellhead Elevation:	0.0 usft	Ground Level:	7,137.0 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	11/14/2017	9.55	65.42	51,370.27085398

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	95.82	

Survey Program	Date	11/24/2017			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
111.0	7,629.0	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	1,529,702.06	2,340,203.74	39.264528	-107.830633
111.0	1.60	212.50	111.0	-1.3	-0.8	1,529,700.78	2,340,202.87	39.264524	-107.830636
First MWD Survey @ 111.0' MD / 111.0' TVD									
202.0	1.90	211.60	201.9	-3.7	-2.3	1,529,698.46	2,340,201.34	39.264518	-107.830641
292.0	2.00	204.10	291.9	-6.4	-3.7	1,529,695.79	2,340,199.85	39.264511	-107.830646
383.0	2.20	204.80	382.8	-9.4	-5.1	1,529,692.80	2,340,198.39	39.264502	-107.830651
473.0	1.90	208.70	472.8	-12.3	-6.6	1,529,689.96	2,340,196.88	39.264494	-107.830656
565.0	2.20	209.90	564.7	-15.1	-8.2	1,529,687.13	2,340,195.19	39.264486	-107.830662
655.0	0.90	183.80	654.7	-17.4	-9.1	1,529,684.95	2,340,194.23	39.264480	-107.830665
745.0	0.30	81.40	744.7	-18.0	-8.9	1,529,684.28	2,340,194.39	39.264479	-107.830665
836.0	2.20	87.40	835.6	-17.9	-6.9	1,529,684.34	2,340,196.38	39.264479	-107.830658
927.0	4.40	88.70	926.5	-17.7	-1.7	1,529,684.36	2,340,201.62	39.264479	-107.830639



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Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-09E	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
1,022.0	7.20	93.70	1,021.0	-18.0	7.9	1,529,683.82	2,340,211.19	39.264478	-107.830605
1,116.0	9.40	93.10	1,114.0	-18.8	21.5	1,529,682.67	2,340,224.71	39.264476	-107.830557
1,211.0	11.60	94.70	1,207.4	-20.0	38.7	1,529,681.03	2,340,241.94	39.264473	-107.830496
1,305.0	16.50	96.30	1,298.6	-22.3	61.4	1,529,678.21	2,340,264.58	39.264467	-107.830416
1,400.0	19.10	94.20	1,389.0	-24.9	90.3	1,529,674.85	2,340,293.42	39.264460	-107.830314
1,494.0	19.40	93.10	1,477.8	-26.9	121.3	1,529,672.08	2,340,324.28	39.264454	-107.830205
1,587.0	19.60	92.50	1,565.4	-28.4	152.3	1,529,669.77	2,340,355.24	39.264450	-107.830095
1,682.0	19.00	94.60	1,655.1	-30.3	183.6	1,529,667.04	2,340,386.51	39.264445	-107.829985
1,777.0	18.60	93.50	1,745.0	-32.5	214.2	1,529,664.09	2,340,416.99	39.264439	-107.829877
1,871.0	17.70	93.90	1,834.3	-34.4	243.4	1,529,661.45	2,340,446.15	39.264434	-107.829774
1,966.0	20.00	92.20	1,924.2	-36.0	274.0	1,529,659.06	2,340,476.74	39.264429	-107.829665
2,060.0	19.20	94.20	2,012.8	-37.7	305.5	1,529,656.50	2,340,508.17	39.264424	-107.829554
2,155.0	18.30	94.00	2,102.8	-39.9	336.0	1,529,653.54	2,340,538.56	39.264418	-107.829447
2,249.0	16.90	93.70	2,192.4	-41.8	364.3	1,529,650.90	2,340,566.86	39.264413	-107.829347
2,343.0	20.20	91.60	2,281.5	-43.2	394.2	1,529,648.80	2,340,596.68	39.264410	-107.829241
2,438.0	19.30	91.90	2,370.9	-44.1	426.3	1,529,647.00	2,340,628.73	39.264407	-107.829128
2,533.0	18.90	89.50	2,460.6	-44.5	457.3	1,529,645.82	2,340,659.79	39.264406	-107.829018
2,627.0	19.60	95.90	2,549.4	-46.0	488.3	1,529,643.53	2,340,690.65	39.264402	-107.828909
2,722.0	19.70	96.40	2,638.9	-49.4	520.0	1,529,639.30	2,340,722.31	39.264392	-107.828797
2,816.0	19.30	95.50	2,727.5	-52.7	551.2	1,529,635.24	2,340,753.43	39.264383	-107.828686
2,911.0	18.70	95.40	2,817.3	-55.6	582.0	1,529,631.52	2,340,784.13	39.264375	-107.828578
3,006.0	18.20	95.50	2,907.4	-58.5	611.9	1,529,627.90	2,340,813.98	39.264367	-107.828472
3,101.0	18.00	93.70	2,997.7	-60.9	641.4	1,529,624.77	2,340,843.32	39.264361	-107.828368
3,195.0	17.50	93.90	3,087.2	-62.8	669.9	1,529,622.14	2,340,871.86	39.264356	-107.828267
3,290.0	17.10	94.80	3,177.9	-64.9	698.1	1,529,619.28	2,340,899.96	39.264350	-107.828168
3,385.0	16.80	95.40	3,268.8	-67.4	725.7	1,529,616.11	2,340,927.48	39.264343	-107.828070
3,479.0	17.80	95.30	3,358.6	-70.0	753.5	1,529,612.79	2,340,955.23	39.264336	-107.827972
3,574.0	17.80	93.60	3,449.0	-72.2	782.5	1,529,609.80	2,340,984.12	39.264330	-107.827870
3,668.0	18.20	99.60	3,538.4	-75.6	811.3	1,529,605.71	2,341,012.84	39.264321	-107.827768
3,763.0	17.80	100.30	3,628.8	-80.6	840.2	1,529,599.90	2,341,041.61	39.264307	-107.827666
3,858.0	16.70	96.30	3,719.5	-84.7	868.1	1,529,595.09	2,341,069.35	39.264295	-107.827567
3,952.0	17.60	93.20	3,809.3	-87.0	895.7	1,529,592.11	2,341,096.90	39.264289	-107.827470
4,047.0	19.40	89.30	3,899.4	-87.6	925.8	1,529,590.73	2,341,126.99	39.264287	-107.827363
4,141.0	19.20	91.30	3,988.1	-87.8	956.9	1,529,589.77	2,341,158.04	39.264287	-107.827254
4,236.0	19.10	90.10	4,077.9	-88.2	988.0	1,529,588.59	2,341,189.18	39.264286	-107.827144
4,330.0	19.20	94.50	4,166.7	-89.4	1,018.8	1,529,586.56	2,341,219.93	39.264283	-107.827035
4,425.0	18.10	94.10	4,256.7	-91.7	1,049.1	1,529,583.50	2,341,250.16	39.264276	-107.826928
4,520.0	17.10	95.40	4,347.2	-94.0	1,077.7	1,529,580.40	2,341,278.71	39.264270	-107.826827
4,615.0	15.70	94.30	4,438.4	-96.3	1,104.5	1,529,577.44	2,341,305.37	39.264264	-107.826732
4,709.0	15.70	94.70	4,528.9	-98.3	1,129.8	1,529,574.79	2,341,330.67	39.264258	-107.826643
4,803.0	15.30	95.60	4,619.4	-100.6	1,154.8	1,529,571.90	2,341,355.62	39.264252	-107.826554
4,898.0	13.80	93.10	4,711.4	-102.4	1,178.6	1,529,569.45	2,341,379.35	39.264247	-107.826470
4,992.0	14.00	96.60	4,802.6	-104.3	1,201.1	1,529,566.96	2,341,401.79	39.264242	-107.826391
5,087.0	12.70	95.80	4,895.1	-106.7	1,222.9	1,529,564.03	2,341,423.52	39.264235	-107.826314
5,182.0	12.50	97.10	4,987.8	-109.0	1,243.5	1,529,561.17	2,341,444.05	39.264229	-107.826241
5,276.0	10.80	101.40	5,079.8	-112.0	1,262.2	1,529,557.70	2,341,462.70	39.264220	-107.826175
5,371.0	9.90	100.50	5,173.3	-115.3	1,279.0	1,529,554.02	2,341,479.36	39.264211	-107.826116
5,465.0	8.90	101.30	5,266.0	-118.2	1,294.1	1,529,550.74	2,341,494.36	39.264204	-107.826063
5,559.0	8.20	99.90	5,359.0	-120.7	1,307.8	1,529,547.81	2,341,508.02	39.264196	-107.826014
5,654.0	7.10	103.70	5,453.1	-123.3	1,320.2	1,529,544.94	2,341,520.33	39.264189	-107.825970
5,748.0	6.00	97.80	5,546.5	-125.3	1,330.7	1,529,542.62	2,341,530.79	39.264184	-107.825933
5,843.0	4.50	101.70	5,641.1	-126.8	1,339.3	1,529,540.98	2,341,539.32	39.264180	-107.825903
5,937.0	3.30	101.30	5,734.9	-128.1	1,345.5	1,529,539.54	2,341,545.55	39.264176	-107.825881
6,032.0	2.80	93.50	5,829.8	-128.7	1,350.5	1,529,538.73	2,341,550.53	39.264175	-107.825863
6,126.0	2.10	75.80	5,923.7	-128.4	1,354.5	1,529,538.91	2,341,554.49	39.264175	-107.825849



Survey Report - Geographic



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Project:	Mesa County, CO	TVD Reference:	well @ 7161.0usft (H&P #290)
Site:	Nichols 24-06A	MD Reference:	well @ 7161.0usft (H&P #290)
Well:	Nichols 0994-24-09E	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
6,221.0	0.90	46.50	6,018.7	-127.5	1,356.7	1,529,539.80	2,341,556.74	39.264178	-107.825841
6,316.0	0.50	301.10	6,113.7	-126.8	1,356.9	1,529,540.52	2,341,556.95	39.264180	-107.825841
6,410.0	0.40	291.80	6,207.7	-126.4	1,356.3	1,529,540.87	2,341,556.30	39.264181	-107.825843
6,505.0	0.60	229.80	6,302.6	-126.6	1,355.6	1,529,540.69	2,341,555.61	39.264180	-107.825845
6,600.0	0.70	239.90	6,397.6	-127.3	1,354.7	1,529,540.10	2,341,554.71	39.264179	-107.825849
6,694.0	0.30	266.00	6,491.6	-127.6	1,353.9	1,529,539.81	2,341,553.96	39.264178	-107.825851
6,788.0	0.50	298.50	6,585.6	-127.4	1,353.3	1,529,540.01	2,341,553.36	39.264178	-107.825853
6,883.0	1.00	295.50	6,680.6	-126.8	1,352.2	1,529,540.59	2,341,552.26	39.264180	-107.825857
6,978.0	1.20	300.00	6,775.6	-126.0	1,350.6	1,529,541.49	2,341,550.68	39.264182	-107.825863
7,072.0	0.80	288.20	6,869.6	-125.3	1,349.1	1,529,542.22	2,341,549.22	39.264184	-107.825868
7,167.0	1.40	281.00	6,964.6	-124.8	1,347.4	1,529,542.69	2,341,547.46	39.264185	-107.825874
7,261.0	2.30	263.60	7,058.5	-124.8	1,344.4	1,529,542.78	2,341,544.46	39.264185	-107.825885
7,356.0	2.60	253.50	7,153.4	-125.7	1,340.4	1,529,542.06	2,341,540.48	39.264183	-107.825899
7,451.0	2.40	258.50	7,248.4	-126.7	1,336.4	1,529,541.15	2,341,536.44	39.264180	-107.825913
7,546.0	2.50	256.80	7,343.3	-127.5	1,332.4	1,529,540.38	2,341,532.45	39.264178	-107.825927
7,629.0	2.50	256.80	7,426.2	-128.4	1,328.9	1,529,539.65	2,341,528.91	39.264176	-107.825940
Projection to TD @ 7629.0' MD / 7426.2' TVD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
111.0	111.0	-1.3	-0.8	First MWD Survey @ 111.0' MD / 111.0' TVD	
7,629.0	7,426.2	-128.4	1,328.9	Projection to TD @ 7629.0' MD / 7426.2' TVD	