



Laramie Energy, LLC

Mesa County, CO

Nichols 24-07 Pad

Nichols 0994-24-20W

Wellbore #1

Design: Wellbore #1

Survey Report - Geographic

15 May, 2018





Survey Report - Geographic



Company:	Laramie Energy, LLC	Local Co-ordinate Reference:	Well Nichols 0994-24-20W
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 0994-24-20W	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 0994-24-20W					
Well Position	+N/-S	0.0 usft	Northing:	1,529,221.47 usft	Latitude:	39.263203
	+E/-W	0.0 usft	Easting:	2,340,119.75 usft	Longitude:	-107.830886
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	206.76	

Survey Program	Date	5/15/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
293.0	8,015.0	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	1,529,221.47	2,340,119.75	39.263203	-107.830886
293.0	1.60	190.10	293.0	-4.0	-0.7	1,529,217.46	2,340,118.93	39.263192	-107.830889
First MWD Survey @ 293.0' MD / 293.0' TVD									
382.0	3.20	205.90	381.9	-7.5	-2.0	1,529,214.04	2,340,117.54	39.263182	-107.830893
473.0	5.70	215.40	472.6	-13.5	-5.7	1,529,208.16	2,340,113.66	39.263166	-107.830907
563.0	9.80	208.90	561.8	-23.8	-12.0	1,529,197.98	2,340,107.10	39.263138	-107.830929
658.0	13.30	204.50	654.8	-40.8	-20.5	1,529,181.17	2,340,098.23	39.263091	-107.830959
752.0	17.00	202.70	745.5	-63.4	-30.3	1,529,158.91	2,340,087.86	39.263029	-107.830993
847.0	21.20	203.70	835.3	-91.9	-42.5	1,529,130.68	2,340,074.86	39.262951	-107.831037
942.0	24.60	203.00	922.8	-125.9	-57.2	1,529,097.12	2,340,059.36	39.262857	-107.831088
1,036.0	25.40	203.10	1,008.0	-162.4	-72.7	1,529,060.98	2,340,042.88	39.262757	-107.831143
1,131.0	25.90	203.50	1,093.6	-200.2	-89.0	1,529,023.64	2,340,025.65	39.262653	-107.831201



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Well:	Nichols 0994-24-20W	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
1,225.0	25.90	202.70	1,178.2	-237.9	-105.1	1,528,986.30	2,340,008.57	39.262550	-107.831257
1,320.0	26.20	202.60	1,263.5	-276.4	-121.2	1,528,948.22	2,339,991.52	39.262444	-107.831314
1,414.0	26.30	201.60	1,347.8	-315.0	-136.8	1,528,910.12	2,339,974.90	39.262338	-107.831369
1,482.0	26.54	203.15	1,408.7	-342.9	-148.3	1,528,882.45	2,339,962.67	39.262261	-107.831410
1,623.0	26.50	204.20	1,534.9	-400.6	-173.6	1,528,825.46	2,339,935.92	39.262103	-107.831499
1,717.0	26.10	202.70	1,619.2	-438.8	-190.2	1,528,787.69	2,339,918.37	39.261998	-107.831558
1,812.0	25.20	206.80	1,704.8	-476.1	-207.4	1,528,750.81	2,339,900.23	39.261896	-107.831619
1,906.0	24.60	205.70	1,790.1	-511.6	-224.9	1,528,715.78	2,339,881.82	39.261798	-107.831681
2,001.0	23.90	206.10	1,876.7	-546.7	-241.9	1,528,681.13	2,339,863.88	39.261702	-107.831741
2,095.0	24.90	206.80	1,962.3	-581.5	-259.2	1,528,646.82	2,339,845.70	39.261606	-107.831802
2,190.0	24.10	206.50	2,048.7	-616.7	-276.9	1,528,612.07	2,339,827.13	39.261510	-107.831864
2,284.0	26.50	205.40	2,133.7	-652.8	-294.5	1,528,576.41	2,339,808.64	39.261411	-107.831926
2,379.0	25.80	204.40	2,219.0	-690.8	-312.1	1,528,538.90	2,339,790.04	39.261306	-107.831989
2,473.0	24.60	203.90	2,304.1	-727.3	-328.5	1,528,502.82	2,339,772.74	39.261206	-107.832046
2,568.0	26.20	205.50	2,389.9	-764.3	-345.5	1,528,466.26	2,339,754.75	39.261104	-107.832107
2,662.0	27.30	205.60	2,473.8	-802.5	-363.8	1,528,428.57	2,339,735.53	39.261000	-107.832171
2,757.0	29.10	206.30	2,557.5	-842.9	-383.4	1,528,388.72	2,339,714.85	39.260889	-107.832240
2,851.0	30.40	207.80	2,639.1	-884.4	-404.6	1,528,347.75	2,339,692.57	39.260775	-107.832315
2,946.0	33.00	208.90	2,720.0	-928.3	-428.3	1,528,304.45	2,339,667.73	39.260654	-107.832399
3,041.0	34.20	208.90	2,799.1	-974.3	-453.7	1,528,259.10	2,339,641.15	39.260528	-107.832489
3,136.0	36.70	206.60	2,876.5	-1,023.1	-479.4	1,528,211.00	2,339,614.29	39.260394	-107.832579
3,230.0	37.70	208.40	2,951.3	-1,073.5	-505.6	1,528,161.29	2,339,586.76	39.260256	-107.832672
3,324.0	39.60	208.60	3,024.8	-1,125.1	-533.6	1,528,110.44	2,339,557.43	39.260114	-107.832771
3,420.0	38.80	207.20	3,099.1	-1,178.7	-562.0	1,528,057.57	2,339,527.67	39.259967	-107.832871
3,514.0	38.50	206.80	3,172.6	-1,231.0	-588.7	1,528,005.96	2,339,499.68	39.259823	-107.832965
3,609.0	39.40	208.00	3,246.4	-1,284.0	-616.2	1,527,953.67	2,339,470.85	39.259678	-107.833062
3,703.0	39.10	207.00	3,319.2	-1,336.8	-643.6	1,527,901.64	2,339,442.04	39.259533	-107.833159
3,798.0	40.70	207.90	3,392.1	-1,390.9	-671.7	1,527,848.30	2,339,412.56	39.259384	-107.833259
3,893.0	40.60	207.20	3,464.2	-1,445.7	-700.4	1,527,794.19	2,339,382.54	39.259234	-107.833360
3,987.0	40.10	205.40	3,535.8	-1,500.3	-727.3	1,527,740.35	2,339,354.18	39.259084	-107.833455
4,081.0	41.00	207.50	3,607.3	-1,555.0	-754.5	1,527,686.36	2,339,325.56	39.258934	-107.833551
4,176.0	40.40	207.50	3,679.3	-1,609.9	-783.1	1,527,632.16	2,339,295.56	39.258783	-107.833652
4,270.0	39.80	206.10	3,751.2	-1,664.0	-810.5	1,527,578.84	2,339,266.88	39.258634	-107.833749
4,365.0	40.00	209.40	3,824.1	-1,717.9	-838.8	1,527,525.68	2,339,237.14	39.258486	-107.833849
4,460.0	39.60	208.80	3,897.1	-1,771.0	-868.4	1,527,473.32	2,339,206.21	39.258340	-107.833953
4,554.0	38.90	208.00	3,969.9	-1,823.3	-896.7	1,527,421.75	2,339,176.59	39.258197	-107.834053
4,649.0	39.10	211.20	4,043.7	-1,875.3	-926.2	1,527,370.56	2,339,145.74	39.258054	-107.834157
4,743.0	37.30	210.00	4,117.6	-1,925.3	-955.8	1,527,321.31	2,339,114.87	39.257917	-107.834262
4,838.0	35.70	209.20	4,193.9	-1,974.4	-983.7	1,527,272.91	2,339,085.70	39.257782	-107.834360
4,933.0	34.00	208.60	4,271.9	-2,022.0	-1,010.0	1,527,226.08	2,339,058.25	39.257651	-107.834453
5,027.0	31.10	209.30	4,351.1	-2,066.2	-1,034.4	1,527,182.47	2,339,032.65	39.257530	-107.834539
5,122.0	28.90	208.10	4,433.4	-2,107.9	-1,057.3	1,527,141.41	2,339,008.77	39.257416	-107.834620
5,216.0	27.20	208.20	4,516.3	-2,146.8	-1,078.1	1,527,102.99	2,338,986.92	39.257309	-107.834694
5,311.0	24.30	206.80	4,601.9	-2,183.4	-1,097.2	1,527,066.90	2,338,966.91	39.257208	-107.834761
5,406.0	22.70	206.30	4,689.0	-2,217.3	-1,114.1	1,527,033.46	2,338,949.11	39.257115	-107.834821
5,501.0	21.80	205.80	4,776.9	-2,249.6	-1,129.9	1,527,001.56	2,338,932.49	39.257026	-107.834877
5,595.0	18.80	205.30	4,865.1	-2,279.0	-1,144.0	1,526,972.52	2,338,917.67	39.256946	-107.834926
5,690.0	17.30	208.80	4,955.4	-2,305.3	-1,157.3	1,526,946.65	2,338,903.65	39.256874	-107.834974
5,785.0	13.60	206.80	5,047.0	-2,327.6	-1,169.2	1,526,924.61	2,338,891.24	39.256812	-107.835015
5,880.0	13.30	205.60	5,139.4	-2,347.4	-1,178.9	1,526,905.04	2,338,880.97	39.256758	-107.835050
5,974.0	9.20	208.70	5,231.5	-2,363.8	-1,187.2	1,526,888.91	2,338,872.27	39.256713	-107.835079
6,069.0	6.40	208.10	5,325.6	-2,375.1	-1,193.4	1,526,877.73	2,338,865.84	39.256682	-107.835101
6,163.0	4.60	199.50	5,419.2	-2,383.3	-1,197.1	1,526,869.66	2,338,861.91	39.256659	-107.835114
6,258.0	3.10	220.10	5,514.0	-2,388.9	-1,200.0	1,526,864.18	2,338,858.84	39.256644	-107.835124
6,353.0	0.30	185.10	5,608.9	-2,391.1	-1,201.7	1,526,862.01	2,338,857.11	39.256638	-107.835130



Survey Report - Geographic



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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 0994-24-20W	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
6,447.0	0.31	214.49	5,702.9	-2,391.5	-1,201.9	1,526,861.56	2,338,856.93	39.256637	-107.835131
6,542.0	0.92	224.07	5,797.9	-2,392.3	-1,202.5	1,526,860.82	2,338,856.23	39.256635	-107.835133
6,637.0	1.23	224.51	5,892.9	-2,393.6	-1,203.8	1,526,859.57	2,338,854.96	39.256631	-107.835138
6,731.0	1.27	229.17	5,986.9	-2,395.0	-1,205.3	1,526,858.21	2,338,853.43	39.256627	-107.835143
6,825.0	1.67	239.63	6,080.9	-2,396.3	-1,207.3	1,526,856.89	2,338,851.42	39.256624	-107.835150
6,920.0	2.11	230.57	6,175.8	-2,398.1	-1,209.8	1,526,855.14	2,338,848.83	39.256619	-107.835159
7,015.0	2.50	227.06	6,270.7	-2,400.7	-1,212.7	1,526,852.70	2,338,845.90	39.256612	-107.835169
7,109.0	1.63	206.58	6,364.7	-2,403.3	-1,214.8	1,526,850.16	2,338,843.73	39.256605	-107.835176
7,204.0	1.76	214.84	6,459.6	-2,405.7	-1,216.2	1,526,847.79	2,338,842.23	39.256598	-107.835181
7,298.0	2.11	230.31	6,553.6	-2,408.0	-1,218.4	1,526,845.56	2,338,840.02	39.256592	-107.835189
7,393.0	2.29	223.89	6,648.5	-2,410.4	-1,221.0	1,526,843.14	2,338,837.30	39.256585	-107.835198
7,488.0	2.29	224.60	6,743.4	-2,413.2	-1,223.7	1,526,840.49	2,338,834.58	39.256577	-107.835208
7,583.0	1.93	231.63	6,838.4	-2,415.5	-1,226.3	1,526,838.21	2,338,831.93	39.256571	-107.835217
7,677.0	1.80	235.85	6,932.3	-2,417.3	-1,228.7	1,526,836.47	2,338,829.42	39.256566	-107.835226
7,772.0	1.71	239.98	7,027.3	-2,418.9	-1,231.2	1,526,834.98	2,338,826.92	39.256562	-107.835234
7,866.0	1.58	243.58	7,121.2	-2,420.1	-1,233.6	1,526,833.77	2,338,824.52	39.256558	-107.835243
7,956.0	1.80	237.43	7,211.2	-2,421.5	-1,235.9	1,526,832.51	2,338,822.18	39.256555	-107.835251
8,015.0	1.80	237.43	7,270.2	-2,422.5	-1,237.4	1,526,831.56	2,338,820.59	39.256552	-107.835256
Projection to TD @ 8015.0' MD / 7270.2' TVD									

Design Annotations				
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
293.0	293.0	-4.0	-0.7	First MWD Survey @ 293.0' MD / 293.0' TVD
8,015.0	7,270.2	-2,422.5	-1,237.4	Projection to TD @ 8015.0' MD / 7270.2' TVD

Checked By: _____	Approved By: _____	Date: _____
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