



Final MWD Survey Certification

Lea County, New Mexico

Client: Devon Energy

Well Name: Jayhawk 7 FED 13H

Total Job No: 2019-360-X20

API No: 30-025-45551

Start Date: 05/29/2019

End Date: 06/13/2019

Measured Start Depth: 930 feet

Measured End Depth: 17454 feet

Vertical Section from well center at TD: 4730.19 feet

HOBBS OCD

FEB 19 2020

RECEIVED

I, Dean Williamson, certify that; I am employed by Total Directional Services, LLC and we conducted or supervised the taking of these open hole MWD surveys at the request of this client. This data is true, correct, complete and within the limitations of the tool as set forth by Total Directional Services, LLC. I am authorized and qualified to make this report and have reviewed this report and find that it conforms to the principals and procedures as set forth by Total Directional Services, LLC.

Date: 06/13/2019

Signed: *Dean Williamson*

DIRECTIONAL SURVEY REPORT

Company name: Devon Energy

Start date: 05/29/2019

Well name: Jayhawk 7 Fed 13H

End date: 06/13/2019

Field: Rattle Snake DBBU

Proposed direction: 179.92

Rig: Nabors X20

Declination: 6.27

API/UWI: 30-025-45551

North Reference: Grid

State/Province: New Mexico

Latitude/Longitude: 32.063737 / -103.511030

County/Parish: Lea

KB: 3371.6

Location Lea County

SVY	Depth	Inc	Azm	CL	TVD	VS	NS	EW	DLS
Tiein	0.00	0.00	0.00		0.00	0.00	0.00	0.00	0.00
1	181.00	0.30	224.20	181.00	181.00	0.34	-0.34	-0.33	0.17
2	233.00	0.10	196.20	52.00	233.00	0.48	-0.48	-0.44	0.42
3	328.00	0.40	166.10	95.00	328.00	0.88	-0.88	-0.38	0.33
4	423.00	0.40	172.30	95.00	423.00	1.53	-1.53	-0.26	0.05
5	517.00	0.50	177.30	94.00	516.99	2.27	-2.27	-0.19	0.11
6	612.00	0.60	171.50	95.00	611.99	3.17	-3.17	-0.10	0.12
7	707.00	0.70	163.50	95.00	706.98	4.22	-4.22	0.14	0.14
8	768.00	0.90	162.90	61.00	767.98	5.04	-5.04	0.38	0.33
9	848.00	1.00	163.60	80.00	847.97	6.31	-6.31	0.77	0.13
10	980.00	0.70	182.40	132.00	979.95	8.22	-8.22	1.06	0.31
11	1075.00	0.90	192.00	95.00	1074.94	9.53	-9.53	0.88	0.25
12	1169.00	0.90	184.60	94.00	1168.93	10.99	-10.99	0.67	0.12
13	1264.00	0.60	36.70	95.00	1263.93	11.33	-11.33	0.90	1.52
14	1358.00	1.20	32.30	94.00	1357.91	10.11	-10.10	1.72	0.64
15	1454.00	1.10	44.80	96.00	1453.90	8.60	-8.60	2.91	0.28
16	1548.00	1.10	41.40	94.00	1547.88	7.29	-7.28	4.14	0.07
17	1643.00	1.10	38.70	95.00	1642.86	5.90	-5.89	5.31	0.05

18	1738.00	1.00	37.30	95.00	1737.84	4.53	-4.52	6.39	0.11
19	1832.00	1.10	38.30	94.00	1831.83	3.17	-3.16	7.44	0.11
20	1927.00	1.20	39.50	95.00	1926.81	1.68	-1.67	8.64	0.11
21	2022.00	0.90	323.70	95.00	2021.80	0.32	-0.30	8.83	1.38
22	2116.00	1.10	296.80	94.00	2115.78	-0.69	0.70	7.59	0.54
23	2211.00	0.90	299.60	95.00	2210.77	-1.47	1.48	6.13	0.22
24	2305.00	0.80	308.70	94.00	2304.76	-2.25	2.25	4.97	0.18
25	2400.00	0.70	316.40	95.00	2399.75	-3.08	3.09	4.06	0.15
26	2495.00	0.70	307.60	95.00	2494.74	-3.86	3.86	3.20	0.11
27	2590.00	0.40	309.20	95.00	2589.74	-4.42	4.43	2.48	0.32
28	2685.00	0.20	5.00	95.00	2684.74	-4.80	4.80	2.24	0.35
29	2780.00	0.30	41.80	95.00	2779.74	-5.15	5.15	2.42	0.19
30	2874.00	0.40	85.80	94.00	2873.74	-5.35	5.36	2.91	0.30
31	2969.00	0.80	103.30	95.00	2968.73	-5.22	5.23	3.88	0.46
32	3064.00	1.10	100.10	95.00	3063.72	-4.91	4.92	5.43	0.32
33	3158.00	1.50	93.90	94.00	3157.69	-4.67	4.68	7.54	0.45
34	3253.00	1.50	61.30	95.00	3252.66	-5.17	5.19	9.87	0.89
35	3347.00	1.50	32.80	94.00	3346.63	-6.80	6.81	11.62	0.79
36	3442.00	2.20	345.40	95.00	3441.59	-9.61	9.62	11.83	1.70
37	3537.00	3.50	320.90	95.00	3536.47	-13.62	13.64	9.55	1.85
38	3632.00	4.40	318.50	95.00	3631.24	-18.61	18.62	5.30	0.96
39	3727.00	5.10	314.40	95.00	3725.92	-24.30	24.30	-0.13	0.82
40	3822.00	6.30	302.50	95.00	3820.45	-30.07	30.06	-7.54	1.77
41	3917.00	7.30	292.90	95.00	3914.78	-35.23	35.21	-17.50	1.59
42	4012.00	6.80	291.20	95.00	4009.06	-39.63	39.59	-28.30	0.57
43	4107.00	7.10	289.90	95.00	4103.37	-43.68	43.62	-39.07	0.36
44	4201.00	8.20	291.00	94.00	4196.53	-48.07	48.00	-50.79	1.18
45	4296.00	9.40	288.50	95.00	4290.41	-52.98	52.89	-64.47	1.33
46	4390.00	10.00	277.50	94.00	4383.07	-56.50	56.39	-79.84	2.07
47	4485.00	9.40	277.50	95.00	4476.71	-58.62	58.48	-95.71	0.63

48	4580.00	8.50	280.40	95.00	4570.56	-60.92	60.76	-110.31	1.06
49	4674.00	7.40	280.80	94.00	4663.65	-63.32	63.15	-123.09	1.17
50	4769.00	6.60	281.40	95.00	4757.94	-65.56	65.38	-134.45	0.85
51	4863.00	6.40	284.00	94.00	4851.34	-67.91	67.71	-144.83	0.38
52	4958.00	7.80	284.20	95.00	4945.61	-70.79	70.57	-156.22	1.47
53	5052.00	9.20	282.30	94.00	5038.57	-73.98	73.74	-169.74	1.52
54	5147.00	8.90	282.50	95.00	5132.39	-77.20	76.95	-184.34	0.32
55	5241.00	8.00	282.70	94.00	5225.37	-80.24	79.96	-197.82	0.96
56	5336.00	7.40	281.80	95.00	5319.51	-82.96	82.66	-210.26	0.64
57	5431.00	8.40	283.10	95.00	5413.61	-85.80	85.49	-223.00	1.07
58	5525.00	9.40	283.20	94.00	5506.48	-89.13	88.80	-237.17	1.06
59	5620.00	9.40	283.60	95.00	5600.20	-92.74	92.39	-252.26	0.07
60	5715.00	9.40	282.90	95.00	5693.92	-96.32	95.95	-267.36	0.12
61	5809.00	9.10	283.30	94.00	5786.70	-99.77	99.37	-282.08	0.33
62	5904.00	8.90	282.30	95.00	5880.53	-103.08	102.67	-296.57	0.27
63	5999.00	9.00	281.20	95.00	5974.38	-106.11	105.67	-311.04	0.21
64	6093.00	9.10	280.00	94.00	6067.21	-108.85	108.39	-325.57	0.23
65	6188.00	8.00	282.40	95.00	6161.15	-111.59	111.12	-339.43	1.22
66	6283.00	7.60	280.80	95.00	6255.27	-114.21	113.71	-352.05	0.48
67	6378.00	7.40	279.80	95.00	6349.46	-116.44	115.93	-364.25	0.25
68	6473.00	7.30	279.00	95.00	6443.68	-118.44	117.92	-376.24	0.15
69	6568.00	7.20	278.50	95.00	6537.92	-120.28	119.74	-388.09	0.12
70	6663.00	6.70	281.50	95.00	6632.22	-122.29	121.73	-399.41	0.65
71	6757.00	6.20	285.00	94.00	6725.62	-124.71	124.13	-409.69	0.68
72	6852.00	6.20	284.20	95.00	6820.07	-127.31	126.72	-419.62	0.09
73	6946.00	6.20	284.40	94.00	6913.52	-129.83	129.23	-429.45	0.02
74	7041.00	6.20	284.40	95.00	7007.96	-132.39	131.78	-439.39	0.00
75	7136.00	6.10	284.30	95.00	7102.42	-134.93	134.30	-449.25	0.11
76	7231.00	5.90	282.70	95.00	7196.90	-137.26	136.62	-458.91	0.27
77	7325.00	6.60	284.10	94.00	7290.34	-139.66	139.00	-468.86	0.76

78	7420.00	6.60	285.10	95.00	7384.71	-142.42	141.75	-479.42	0.12
79	7514.00	6.40	283.60	94.00	7478.10	-145.08	144.39	-489.73	0.28
80	7609.00	5.80	282.60	95.00	7572.56	-147.38	146.68	-499.56	0.64
81	7704.00	5.80	282.70	95.00	7667.08	-149.50	148.79	-508.93	0.01
82	7799.00	6.90	293.20	95.00	7761.50	-152.81	152.09	-518.86	1.68
83	7893.00	7.30	293.90	94.00	7854.78	-157.47	156.73	-529.51	0.44
84	7988.00	7.00	292.50	95.00	7949.04	-162.15	161.39	-540.37	0.37
85	8083.00	6.50	291.00	95.00	8043.38	-166.31	165.54	-550.74	0.56
86	8178.00	6.80	290.60	95.00	8137.74	-170.23	169.44	-561.03	0.32
87	8272.00	7.10	292.00	94.00	8231.05	-174.38	173.58	-571.62	0.37
88	8367.00	7.10	291.50	95.00	8325.32	-178.74	177.93	-582.53	0.07
89	8462.00	6.70	290.50	95.00	8419.63	-182.85	182.02	-593.18	0.44
90	8557.00	6.40	289.60	95.00	8514.01	-186.58	185.74	-603.36	0.33
91	8652.00	6.80	290.00	95.00	8608.38	-190.29	189.44	-613.63	0.42
92	8746.00	6.40	290.00	94.00	8701.76	-194.00	193.13	-623.79	0.43
93	8841.00	6.90	287.90	95.00	8796.12	-197.58	196.70	-634.19	0.59
94	8935.00	6.90	285.60	94.00	8889.44	-200.85	199.95	-645.00	0.29
95	9030.00	6.60	285.10	95.00	8983.78	-203.82	202.91	-655.77	0.32
96	9124.00	7.20	284.50	94.00	9077.10	-206.72	205.79	-666.69	0.64
97	9219.00	7.20	283.00	95.00	9171.35	-209.57	208.62	-678.25	0.20
98	9314.00	6.80	283.20	95.00	9265.64	-212.21	211.24	-689.53	0.42
99	9409.00	6.90	286.30	95.00	9359.96	-215.11	214.13	-700.48	0.40
100	9504.00	7.50	288.80	95.00	9454.21	-218.72	217.73	-711.83	0.71
101	9599.00	6.30	288.00	95.00	9548.52	-222.35	221.34	-722.66	1.27
102	9694.00	5.40	287.40	95.00	9643.03	-225.31	224.29	-731.88	0.95
103	9789.00	6.20	295.90	95.00	9737.54	-228.90	227.86	-740.76	1.23
104	9884.00	7.20	294.50	95.00	9831.89	-233.62	232.57	-750.79	1.07
105	9979.00	8.60	288.80	95.00	9925.99	-238.40	237.33	-762.94	1.69
106	10074.00	7.30	284.10	95.00	10020.08	-242.17	241.09	-775.51	1.53
107	10169.00	5.90	281.30	95.00	10114.45	-244.62	243.52	-786.16	1.51

108	10264.00	6.90	291.30	95.00	10208.86	-247.66	246.55	-796.26	1.57
109	10359.00	7.30	293.90	95.00	10303.13	-252.19	251.07	-807.10	0.54
110	10454.00	6.00	289.00	95.00	10397.49	-256.27	255.13	-817.31	1.49
111	10549.00	5.50	289.00	95.00	10492.01	-259.38	258.23	-826.31	0.53
112	10644.00	4.20	290.60	95.00	10586.67	-262.10	260.93	-833.87	1.38
113	10740.00	3.20	291.40	96.00	10682.46	-264.32	263.15	-839.66	1.04
114	10834.00	3.60	280.90	94.00	10776.30	-265.84	264.66	-845.00	0.79
115	10929.00	3.00	278.20	95.00	10871.14	-266.77	265.58	-850.39	0.65
116	11023.00	2.50	280.60	94.00	10965.03	-267.50	266.31	-854.84	0.55
117	11117.00	2.30	273.20	94.00	11058.95	-267.99	266.79	-858.73	0.39
118	11212.00	2.10	268.50	95.00	11153.88	-268.06	266.85	-862.38	0.28
119	11307.00	2.20	260.80	95.00	11248.81	-267.72	266.52	-865.92	0.32
120	11402.00	2.20	256.50	95.00	11343.74	-267.01	265.80	-869.49	0.17
121	11497.00	2.50	257.50	95.00	11438.66	-266.14	264.92	-873.29	0.32
122	11591.00	2.30	244.70	94.00	11532.58	-264.90	263.67	-876.99	0.61
123	11686.00	2.50	243.90	95.00	11627.50	-263.18	261.95	-880.58	0.21
124	11781.00	1.80	244.50	95.00	11722.43	-261.63	260.39	-883.78	0.74
125	11875.00	2.20	239.20	94.00	11816.37	-260.07	258.84	-886.67	0.47
126	11970.00	2.20	227.30	95.00	11911.31	-257.91	256.66	-889.57	0.48
127	12064.00	2.40	220.20	94.00	12005.23	-255.18	253.94	-892.17	0.37
128	12112.00	2.20	214.70	48.00	12053.19	-253.66	252.41	-893.34	0.62
129	12176.00	2.10	207.30	64.00	12117.15	-251.61	250.36	-894.58	0.46
130	12271.00	11.70	192.30	95.00	12211.35	-240.63	239.38	-897.44	10.20
131	12366.00	21.30	185.90	95.00	12302.34	-214.00	212.74	-901.27	10.27
132	12461.00	35.90	187.90	95.00	12385.52	-169.01	167.74	-906.90	15.40
133	12556.00	45.60	185.00	95.00	12457.41	-107.47	106.19	-913.71	10.40
134	12650.00	50.00	184.60	94.00	12520.54	-38.10	36.82	-919.52	4.69
135	12745.00	59.50	187.50	95.00	12575.31	38.92	-40.22	-927.80	10.30
136	12840.00	71.60	187.20	95.00	12614.56	124.52	-125.83	-938.84	12.74
137	12935.00	78.60	185.30	95.00	12638.98	215.70	-217.03	-948.80	7.62

138	13029.00	83.90	183.10	94.00	12653.27	308.31	-309.65	-955.59	6.09
139	13124.00	88.20	182.70	95.00	12659.81	402.94	-404.28	-960.38	4.55
140	13219.00	90.00	183.50	95.00	12661.31	497.77	-499.12	-965.52	2.07
141	13313.00	90.00	183.50	94.00	12661.31	591.59	-592.95	-971.26	0.00
142	13410.00	90.60	183.10	97.00	12660.80	688.42	-689.79	-976.84	0.74
143	13505.00	88.20	182.10	95.00	12661.79	783.30	-784.67	-981.15	2.74
144	13599.00	87.70	182.40	94.00	12665.16	877.17	-878.54	-984.84	0.62
145	13693.00	87.60	182.40	94.00	12669.01	971.00	-972.38	-988.77	0.11
146	13788.00	88.00	181.40	95.00	12672.66	1065.87	-1067.26	-991.92	1.13
147	13883.00	88.90	179.70	95.00	12675.23	1160.83	-1162.21	-992.83	2.02
148	13978.00	87.60	178.80	95.00	12678.13	1255.77	-1257.16	-991.59	1.66
149	14072.00	91.30	179.60	94.00	12679.03	1349.74	-1351.13	-990.27	4.03
150	14166.00	90.60	179.10	94.00	12677.47	1443.72	-1445.11	-989.21	0.92
151	14260.00	91.00	179.90	94.00	12676.16	1537.71	-1539.09	-988.39	0.95
152	14355.00	91.20	181.40	95.00	12674.34	1632.68	-1634.07	-989.47	1.59
153	14449.00	89.40	180.60	94.00	12673.84	1726.66	-1728.05	-991.11	2.10
154	14543.00	92.00	184.10	94.00	12672.70	1820.55	-1821.94	-994.96	4.64
155	14631.00	89.70	181.60	88.00	12671.39	1908.41	-1909.81	-999.33	3.86
156	14726.00	90.50	180.20	95.00	12671.22	2003.39	-2004.79	-1000.82	1.70
157	14820.00	90.90	178.40	94.00	12670.08	2097.38	-2098.77	-999.68	1.96
158	14915.00	90.90	178.20	95.00	12668.58	2192.33	-2193.72	-996.86	0.21
159	15010.00	90.90	177.60	95.00	12667.09	2287.25	-2288.64	-993.38	0.63
160	15104.00	90.30	178.00	94.00	12666.11	2381.18	-2382.57	-989.77	0.77
161	15198.00	90.00	178.60	94.00	12665.86	2475.15	-2476.53	-986.98	0.71
162	15293.00	91.10	180.90	95.00	12664.95	2570.13	-2571.51	-986.57	2.68
163	15387.00	89.10	180.30	94.00	12664.78	2664.12	-2665.50	-987.55	2.22
164	15481.00	88.00	180.30	94.00	12667.16	2758.09	-2759.47	-988.04	1.17
165	15576.00	88.20	179.40	95.00	12670.31	2853.03	-2854.42	-987.79	0.97
166	15671.00	90.30	178.50	95.00	12671.56	2948.01	-2949.39	-986.05	2.40
167	15766.00	89.60	178.60	95.00	12671.64	3042.98	-3044.35	-983.65	0.74

168	15860.00	91.40	177.60	94.00	12670.82	3136.92	-3138.29	-980.53	2.19
169	15955.00	90.90	177.70	95.00	12668.91	3231.83	-3233.20	-976.64	0.54
170	16050.00	90.20	178.10	95.00	12668.00	3326.76	-3328.13	-973.16	0.85
171	16144.00	90.20	178.60	94.00	12667.67	3420.73	-3422.09	-970.45	0.53
172	16239.00	89.00	178.10	95.00	12668.34	3515.69	-3517.04	-967.71	1.37
173	16333.00	91.60	177.90	94.00	12667.84	3609.63	-3610.98	-964.43	2.77
174	16428.00	91.30	177.80	95.00	12665.44	3704.53	-3705.88	-960.87	0.33
175	16522.00	91.50	180.30	94.00	12663.14	3798.49	-3799.83	-959.31	2.67
176	16617.00	89.00	180.70	95.00	12662.73	3893.47	-3894.82	-960.14	2.67
177	16711.00	91.60	180.00	94.00	12662.24	3987.46	-3988.81	-960.72	2.86
178	16806.00	91.20	180.20	95.00	12659.91	4082.43	-4083.78	-960.88	0.47
179	16900.00	89.10	179.10	94.00	12659.67	4176.42	-4177.77	-960.31	2.52
180	16994.00	89.90	179.10	94.00	12660.49	4270.41	-4271.75	-958.83	0.85
181	17089.00	92.30	178.90	95.00	12658.67	4365.37	-4366.71	-957.17	2.54
182	17184.00	89.40	177.60	95.00	12657.26	4460.31	-4461.65	-954.27	3.35
183	17278.00	90.10	177.70	94.00	12657.67	4554.23	-4555.57	-950.42	0.75
184	17373.00	90.60	180.70	95.00	12657.09	4649.21	-4650.54	-949.09	3.20
185	17403.00	90.60	181.10	30.00	12656.77	4679.21	-4680.54	-949.56	1.33
PTB	17454.00	90.60	181.10	51.00	12656.24	4730.19	-4731.53	-950.54	0.00