



MWD SURVEY CERTIFICATION
Legacy Directional Drilling, LLC.

State Of New Mexico

County Of Eddy

NM OIL CONSERVATION
ARTESIA DISTRICT
MAR 20 2018
RECEIVED
HOBBS OCD
MAR 07 2018
RECEIVED

I, Mark L. Miller certify that; I am employed by Legacy Directional Drilling, LLC.;
that I did on the day(s) of July 11, 2017 through July 26, 2017 conduct
or supervise the taking of a MWD survey from a depth of 880 feet to a depth of
15,058 feet; that the data is true, correct, complete and within the limitations of the
tool set forth by Legacy Directional Drilling, LLC.; that I am authorized and qualified to make this report;
that this survey was conducted at the request of Devon Energy Production Company for the
Cotton Draw Unit 512H Well, A.P.I. No. 30-015-44198 in
Paduca/Bone Spring Field and that I have reviewed this report and find that
it conforms to the principles and procedures set forth by Legacy Directional Drilling, LLC.

Surveyor's Signature

MLWD Technical Director
Title



760 W. CONSERVATION
ARTESIA DISTRICT
MAR 20 2018

Directional Survey Report

HOBBS OCD
MAR 07 2018
RECEIVED

Company Name: Devon Energy Production Company

State/Prov: New Mexico

Survey Company: Legacy Directional

Proposed Azimuth: 0

Well Name: Cotton Draw Unit 512H

RECEIVED

County: Eddy

Job Number: LF170032

Declination: 6.7

Field: Paduca / Bone Spring

Location: Bone Spring

Latitude: 32.18172

North Reference: Grid

Rig ID: ICD 217

API/UWI: 30-015-44198

Longitude: -103.729221

KB: 3537.90

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
Tiein	738.20	0.80	172.75	738.14	-6.91	3.38	-6.91	0	0	7.69	153.93	0
1	880	0.35	210.48	879.93	-8.27	3.29	-8.27	0.40	141.80	8.89	158.32	0
2	1065	0.93	175.01	1,064.92	-10.25	3.13	-10.25	0.37	185	10.72	163.02	0
3	1158	0.77	183.63	1,157.91	-11.62	3.16	-11.62	0.22	93	12.04	164.81	0
4	1251	0.67	182.96	1,250.90	-12.79	3.09	-12.79	0.11	93	13.16	166.43	0
5	1343	0.52	189.39	1,342.90	-13.74	2.99	-13.74	0.18	92	14.06	167.72	0
6	1436	0.37	193.33	1,435.90	-14.45	2.85	-14.45	0.16	93	14.73	168.83	0
7	1528	0.69	238.48	1,527.89	-15.03	2.31	-15.03	0.55	92	15.20	171.25	0
8	1620	1.57	251.46	1,619.87	-15.72	0.65	-15.72	0.99	92	15.73	177.65	0
9	1713	2.27	250.99	1,712.82	-16.72	-2.30	-16.72	0.75	93	16.88	187.84	0
10	1807	3.08	251.28	1,806.72	-18.14	-6.46	-18.14	0.86	94	19.25	199.59	0
11	1902	3.88	250.51	1,901.54	-20.03	-11.90	-20.03	0.84	95	23.30	210.72	0
12	1997	4.72	247.05	1,996.27	-22.63	-18.53	-22.63	0.93	95	29.25	219.32	0
13	2092	5.62	243.26	2,090.89	-26.24	-26.29	-26.24	1.01	95	37.14	225.05	0
14	2187	5.78	243.90	2,185.42	-30.44	-34.74	-30.44	0.18	95	46.19	228.77	0
15	2282	5.63	242.96	2,279.95	-34.66	-43.18	-34.66	0.19	95	55.37	231.24	0
16	2377	5.48	242.66	2,374.50	-38.87	-51.36	-38.87	0.16	95	64.41	232.88	0
17	2471	5.34	242.63	2,468.08	-42.94	-59.23	-42.94	0.15	94	73.16	234.06	0
18	2567	5.54	238.62	2,563.65	-47.41	-67.16	-47.41	0.45	96	82.20	234.78	0
19	2661	5.43	236.64	2,657.22	-52.21	-74.75	-52.21	0.23	94	91.18	235.06	0
20	2756	5.16	235.52	2,751.81	-57.10	-82.02	-57.10	0.30	95	99.94	235.15	0
21	2851	5.53	236.93	2,846.40	-62.02	-89.38	-62.02	0.41	95	108.79	235.24	0
22	2946	5.27	238.07	2,940.98	-66.83	-96.92	-66.83	0.30	95	117.72	235.41	0
23	3041	5.67	241.92	3,035.55	-71.34	-104.76	-71.34	0.57	95	126.75	235.75	0
24	3136	5.61	245.62	3,130.09	-75.47	-113.13	-75.47	0.39	95	135.99	236.29	0
25	3231	5.39	246.44	3,224.65	-79.17	-121.45	-79.17	0.25	95	144.97	236.90	0
26	3326	5.80	253.32	3,319.20	-82.33	-130.14	-82.33	0.83	95	153.99	237.68	0
27	3420	6.44	240.59	3,412.67	-86.28	-139.28	-86.28	1.59	94	163.84	238.22	0
28	3515	6.19	241.13	3,507.09	-91.37	-148.41	-91.37	0.27	95	174.28	238.38	0
29	3610	5.99	243.58	3,601.55	-96.05	-157.33	-96.05	0.35	95	184.33	238.60	0
30	3705	5.82	239.93	3,696.05	-100.67	-165.94	-100.67	0.43	95	194.09	238.76	0
31	3800	5.62	226.16	3,790.58	-106.30	-173.46	-106.30	1.46	95	203.44	238.50	0
32	3894	5.32	213.50	3,884.16	-113.13	-179.19	-113.13	1.32	94	211.91	237.73	0
33	3989	6.80	216.97	3,978.62	-121.29	-185.00	-121.29	1.60	95	221.22	236.75	0

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
34	4084	6.71	222.23	4,072.96	-129.90	-192.11	-129.90	0.66	95	231.91	235.94	0
35	4179	6.88	226.68	4,167.30	-137.91	-199.98	-137.91	0.58	95	242.93	235.41	0
36	4274	7.09	232.12	4,261.59	-145.41	-208.75	-145.41	0.73	95	254.41	235.14	0
37	4336	6.35	237.63	4,323.17	-149.60	-214.67	-149.60	1.58	62	261.65	235.13	0
38	4408	5.78	244.61	4,394.77	-153.28	-221.31	-153.28	1.29	72	269.21	235.29	0
39	4473	5.06	252.38	4,459.47	-155.55	-227.00	-155.55	1.58	65	275.18	235.58	0
40	4566	4.89	266.85	4,552.13	-157.01	-234.86	-157.01	1.36	93	282.51	236.24	0
41	4661	5.68	267.49	4,646.72	-157.44	-243.60	-157.44	0.83	95	290.05	237.13	0
42	4756	8.29	261.71	4,741.01	-158.64	-255.08	-158.64	2.84	95	300.38	238.12	0
43	4850	9.62	259.56	4,833.86	-161.04	-269.51	-161.04	1.46	94	313.96	239.14	0
44	4945	11.04	251.20	4,927.33	-165.41	-285.93	-165.41	2.17	95	330.32	239.95	0
45	5040	14.02	239.66	5,020.07	-174.15	-304.48	-174.15	4.08	95	350.76	240.23	0
46	5141	10.16	221.11	5,118.85	-187.06	-320.91	-187.06	5.38	101	371.44	239.76	0
47	5235	8.71	219.79	5,211.57	-198.77	-330.91	-198.77	1.56	94	386.02	239.01	0
48	5330	7.06	221.12	5,305.67	-208.70	-339.36	-208.70	1.75	95	398.39	238.41	0
49	5425	7.32	227.57	5,399.93	-217.18	-347.66	-217.18	0.89	95	409.92	238.01	0
50	5520	6.92	226.91	5,494.19	-225.17	-356.31	-225.17	0.43	95	421.49	237.71	0
51	5615	6.56	226.55	5,588.54	-232.81	-364.43	-232.81	0.38	95	432.45	237.43	0
52	5710	5.90	224.74	5,682.97	-240.01	-371.80	-240.01	0.72	95	442.54	237.16	0
53	5805	5.35	222.73	5,777.52	-246.74	-378.25	-246.74	0.61	95	451.61	236.88	0
54	5900	4.38	215.78	5,872.17	-252.93	-383.37	-252.93	1.19	95	459.29	236.58	0
55	5996	2.93	224.08	5,967.98	-257.67	-387.22	-257.67	1.60	96	465.12	236.36	0
56	6090	2.03	220.18	6,061.89	-260.67	-389.97	-260.67	0.97	94	469.06	236.24	0
57	6185	1.17	209.29	6,156.85	-262.80	-391.53	-262.80	0.96	95	471.55	236.13	0
58	6280	0.25	264.44	6,251.84	-263.66	-392.21	-263.66	1.10	95	472.60	236.09	0
59	6375	0.48	247.95	6,346.84	-263.83	-392.78	-263.83	0.26	95	473.17	236.11	0
60	6470	0.57	226.43	6,441.84	-264.31	-393.50	-264.31	0.23	95	474.02	236.11	0
61	6564	0.49	211.17	6,535.83	-264.97	-394.04	-264.97	0.17	94	474.85	236.08	0
62	6659	0.53	222.27	6,630.83	-265.65	-394.55	-265.65	0.11	95	475.64	236.05	0
63	6753	0.54	205.59	6,724.82	-266.37	-395.03	-266.37	0.17	94	476.45	236.01	0
64	6848	0.56	178.90	6,819.82	-267.24	-395.22	-267.24	0.27	95	477.09	235.93	0
65	6942	0.66	197.42	6,913.82	-268.21	-395.37	-268.21	0.23	94	477.76	235.85	0
66	7037	0.92	201.05	7,008.81	-269.45	-395.81	-269.45	0.28	95	478.82	235.75	0
67	7132	1	193.02	7,103.79	-270.97	-396.27	-270.97	0.16	95	480.05	235.64	0
68	7227	0.37	62.27	7,198.79	-271.63	-396.18	-271.63	1.34	95	480.36	235.56	0
69	7322	0.20	91.14	7,293.79	-271.49	-395.75	-271.49	0.23	95	479.92	235.55	0
70	7417	0.15	98.95	7,388.79	-271.51	-395.46	-271.51	0.06	95	479.69	235.53	0
71	7512	0.18	129.70	7,483.79	-271.63	-395.22	-271.63	0.10	95	479.56	235.50	0
72	7607	0.17	83.11	7,578.79	-271.71	-394.96	-271.71	0.15	95	479.40	235.47	0
73	7702	0.14	173.95	7,673.79	-271.81	-394.81	-271.81	0.23	95	479.33	235.45	0
74	7796	0.66	320.41	7,767.78	-271.50	-395.15	-271.50	0.83	94	479.43	235.51	0
75	7890	0.48	301.77	7,861.78	-270.88	-395.83	-270.88	0.27	94	479.64	235.61	0
76	7984	0.55	278.22	7,955.78	-270.61	-396.61	-270.61	0.24	94	480.13	235.69	0
77	8078	0.52	30	8,049.77	-270.17	-396.84	-270.17	0.94	94	480.08	235.75	0
78	8173	0.28	341.13	8,144.77	-269.58	-396.70	-269.58	0.42	95	479.63	235.80	0

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
79	8268	0.23	273.24	8,239.77	-269.35	-396.96	-269.35	0.30	95	479.72	235.84	0
80	8362	0.53	246.26	8,333.77	-269.51	-397.55	-269.51	0.36	94	480.30	235.87	0
81	8457	0.65	248.23	8,428.76	-269.89	-398.45	-269.89	0.13	95	481.25	235.89	0
82	8552	0.84	242.80	8,523.76	-270.41	-399.57	-270.41	0.21	95	482.47	235.91	0
83	8647	0.82	244.44	8,618.75	-271.02	-400.81	-271.02	0.03	95	483.84	235.93	0
84	8742	0.83	174.31	8,713.74	-272.00	-401.35	-272.00	1.00	95	484.84	235.87	0
85	8837	0.87	142.74	8,808.73	-273.26	-400.85	-273.26	0.49	95	485.13	235.72	0
86	8932	1.27	120.10	8,903.71	-274.36	-399.50	-274.36	0.60	95	484.64	235.52	0
87	9027	0.59	196.95	8,998.70	-275.35	-398.73	-275.35	1.34	95	484.57	235.37	0
88	9122	1.33	222.01	9,093.69	-276.64	-399.61	-276.64	0.88	95	486.02	235.31	0
89	9217	1.48	239.14	9,188.66	-278.09	-401.40	-278.09	0.47	95	488.32	235.29	0
90	9312	1.36	258.16	9,283.63	-278.95	-403.56	-278.95	0.51	95	490.58	235.35	0
91	9407	1.01	314.39	9,378.61	-278.60	-405.26	-278.60	1.22	95	491.78	235.49	0
92	9501	0.62	258.66	9,472.60	-278.12	-406.35	-278.12	0.89	94	492.41	235.61	0
93	9596	0.69	228.26	9,567.60	-278.60	-407.28	-278.60	0.37	95	493.45	235.63	0
94	9625	0.74	233.63	9,596.60	-278.83	-407.56	-278.83	0.29	29	493.81	235.62	0
95	9688	1.19	356.64	9,659.59	-278.41	-407.93	-278.41	2.71	63	493.88	235.69	0
96	9737	6.62	19.47	9,708.46	-275.24	-407.02	-275.24	11.31	49	491.34	235.93	0
97	9783	13.44	20.82	9,753.73	-267.73	-404.23	-267.73	14.83	46	484.85	236.48	0
98	9829	21.60	18.15	9,797.56	-254.67	-399.68	-254.67	17.82	46	473.92	237.50	0
99	9878	28.26	13.53	9,841.98	-234.80	-394.15	-234.80	14.15	49	458.79	239.22	0
100	9926	30.45	9.44	9,883.81	-211.75	-389.50	-211.75	6.18	48	443.34	241.47	0
101	9973	33.71	5.02	9,923.64	-187.00	-386.40	-187.00	8.54	47	429.27	244.18	0
102	10020	38.89	4.43	9,961.50	-159.27	-384.12	-159.27	11.05	47	415.83	247.48	0
103	10067	42.24	6.27	9,997.20	-128.85	-381.26	-128.85	7.57	47	402.44	251.33	0
104	10115	47.08	6.30	10,031.34	-95.33	-377.56	-95.33	10.08	48	389.41	255.83	0
105	10163	53.47	3.27	10,062.00	-58.56	-374.53	-58.56	14.17	48	379.08	261.11	0
106	10210	60.52	1.73	10,087.59	-19.21	-372.83	-19.21	15.25	47	373.33	267.05	0
107	10257	66.23	1.16	10,108.64	22.78	-371.78	22.78	12.20	47	372.48	273.51	0
108	10304	69.41	0.77	10,126.38	66.29	-371.05	66.29	6.81	47	376.92	280.13	0
109	10353	72.59	358.73	10,142.34	112.61	-371.26	112.61	7.59	49	387.96	286.87	0
110	10400	75.62	357.69	10,155.21	157.78	-372.67	157.78	6.79	47	404.70	292.95	0
111	10447	80	356.81	10,165.13	203.66	-374.88	203.66	9.50	47	426.63	298.51	0
112	10471	81.99	357.53	10,168.88	227.33	-376.05	227.33	8.81	24	439.42	301.15	0
113	10565	85.32	358.41	10,179.27	320.68	-379.36	320.68	3.66	94	496.74	310.21	0
114	10660	86.78	358.55	10,185.82	415.42	-381.87	415.42	1.54	95	564.27	317.41	0
115	10706	87.68	358.32	10,188.04	461.35	-383.12	461.35	2.02	46	599.69	320.29	0
116	10755	89.33	357.63	10,189.32	510.30	-384.86	510.30	3.65	49	639.16	322.98	0
117	10850	90.81	357.45	10,189.20	605.21	-388.93	605.21	1.57	95	719.41	327.27	0
118	10945	90.34	357.06	10,188.25	700.10	-393.48	700.10	0.64	95	803.10	330.66	0
119	11039	90.95	356.90	10,187.19	793.96	-398.43	793.96	0.67	94	888.33	333.35	0
120	11134	89.38	358	10,186.92	888.86	-402.66	888.86	2.02	95	975.81	335.63	0
121	11229	89.66	358.57	10,187.71	983.82	-405.50	983.82	0.67	95	1,064.11	337.60	0
122	11324	88.07	358.03	10,189.59	1,078.75	-408.32	1,078.75	1.77	95	1,153.44	339.27	0
123	11419	88.37	358.71	10,192.54	1,173.67	-411.02	1,173.67	0.78	95	1,243.56	340.70	0

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
124	11514	89.69	359.87	10,194.15	1,268.64	-412.20	1,268.64	1.85	95	1,333.93	342.00	0
125	11608	90.98	1.28	10,193.60	1,362.63	-411.26	1,362.63	2.03	94	1,423.34	343.21	0
126	11702	91.40	1.63	10,191.65	1,456.58	-408.87	1,456.58	0.58	94	1,512.88	344.32	0
127	11796	92.04	2.46	10,188.83	1,550.48	-405.52	1,550.48	1.11	94	1,602.63	345.34	0
128	11891	90.50	0.72	10,186.72	1,645.41	-402.88	1,645.41	2.45	95	1,694.02	346.24	0
129	11986	90.53	0.83	10,185.87	1,740.40	-401.60	1,740.40	0.12	95	1,786.13	347.01	0
130	12081	90.45	0.73	10,185.06	1,835.39	-400.30	1,835.39	0.13	95	1,878.53	347.70	0
131	12176	90.53	1.35	10,184.24	1,930.37	-398.58	1,930.37	0.66	95	1,971.09	348.33	0
132	12271	91.12	2.48	10,182.88	2,025.30	-395.41	2,025.30	1.34	95	2,063.54	348.95	0
133	12366	89.10	359.99	10,182.69	2,120.27	-393.36	2,120.27	3.37	95	2,156.45	349.49	0
134	12461	90.64	1	10,182.91	2,215.26	-392.54	2,215.26	1.94	95	2,249.77	349.95	0
135	12556	91.60	0.57	10,181.05	2,310.23	-391.24	2,310.23	1.11	95	2,343.12	350.39	0
136	12651	91.37	1.21	10,178.59	2,405.19	-389.76	2,405.19	0.72	95	2,436.56	350.80	0
137	12746	91.01	1.22	10,176.62	2,500.14	-387.75	2,500.14	0.38	95	2,530.03	351.18	0
138	12841	89.69	0.78	10,176.04	2,595.13	-386.09	2,595.13	1.46	95	2,623.69	351.54	0
139	12937	88.96	1.43	10,177.17	2,691.10	-384.24	2,691.10	1.02	96	2,718.39	351.87	0
140	13031	88.23	1.72	10,179.47	2,785.04	-381.66	2,785.04	0.84	94	2,811.07	352.20	0
141	13126	88.15	2.10	10,182.47	2,879.94	-378.49	2,879.94	0.41	95	2,904.70	352.51	0
142	13221	87.76	1.45	10,185.86	2,974.83	-375.55	2,974.83	0.80	95	2,998.44	352.80	0
143	13316	88.49	1.26	10,188.97	3,069.75	-373.30	3,069.75	0.79	95	3,092.37	353.07	0
144	13410	90.64	1.01	10,189.69	3,163.72	-371.44	3,163.72	2.30	94	3,185.45	353.30	0
145	13506	89.58	0.06	10,189.50	3,259.72	-370.55	3,259.72	1.48	96	3,280.71	353.51	0
146	13601	88.96	0.57	10,190.71	3,354.71	-370.02	3,354.71	0.85	95	3,375.05	353.71	0
147	13695	89.30	0.95	10,192.14	3,448.69	-368.78	3,448.69	0.54	94	3,468.35	353.90	0
148	13790	89.86	1.21	10,192.84	3,543.67	-366.99	3,543.67	0.65	95	3,562.62	354.09	0
149	13885	89.92	2.23	10,193.02	3,638.62	-364.14	3,638.62	1.08	95	3,656.80	354.29	0
150	13980	89.75	1.40	10,193.29	3,733.57	-361.13	3,733.57	0.89	95	3,751.00	354.48	0
151	14075	89.05	359.93	10,194.29	3,828.56	-360.02	3,828.56	1.71	95	3,845.45	354.63	0
152	14170	89.05	358.54	10,195.86	3,923.54	-361.29	3,923.54	1.46	95	3,940.14	354.74	0
153	14264	88.35	358.15	10,197.99	4,017.47	-364.01	4,017.47	0.85	94	4,033.93	354.82	0
154	14359	90.39	357.90	10,199.04	4,112.40	-367.28	4,112.40	2.16	95	4,128.77	354.90	0
155	14454	90.90	357.82	10,197.97	4,207.33	-370.83	4,207.33	0.54	95	4,223.64	354.96	0
156	14548	90.36	358.83	10,196.94	4,301.28	-373.57	4,301.28	1.22	94	4,317.48	355.04	0
157	14643	90.70	359.32	10,196.06	4,396.27	-375.11	4,396.27	0.63	95	4,412.24	355.12	0
158	14738	89.16	358.91	10,196.17	4,491.25	-376.58	4,491.25	1.68	95	4,507.01	355.21	0
159	14833	89.50	359.28	10,197.28	4,586.23	-378.08	4,586.23	0.53	95	4,601.79	355.29	0
160	14928	90.22	359.68	10,197.52	4,681.23	-378.94	4,681.23	0.87	95	4,696.54	355.37	0
161	14998	90.78	359.48	10,196.91	4,751.23	-379.45	4,751.23	0.85	70	4,766.35	355.43	0
PTB	15058	90.78	359.48	10,196.09	4,811.22	-380.00	4,811.22	1e-06	60	4,826.20	355.48	0