



MWD SURVEY CERTIFICATION
Legacy Directional Drilling, LLC.

HOBBS OCD
FEB 20 2018
RECEIVED

State Of New Mexico

County Of Eddy

I, Mark L. Miller certify that; I am employed by Legacy Directional Drilling, LLC.;
that I did on the day(s) of September 27, 2017 through October 11, 2017 conduct
or supervise the taking of a MWD survey from a depth of 883 feet to a depth of
15,488 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 Co. for the
Cotton Draw Unit 291H Well, A.P.I. No. 30-015-44106 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

NM OIL CONSERVATION
ARTESIA DISTRICT
FEB 28 2018
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Directional Survey Report

Company Name: DEVON ENERGY
Well Name: COTTON DRAW UNIT 291H
Field: PADUCA / BONE SPRING
Rig ID: ICD 217

State/Prov: NM
County: EDDY
Location: SEC 25 T24S R31E
API/UWI: 30015441060000

Survey Company: LEGACY DIRECTIONAL
Job Number: LF170041
Latitude: 32.181721
Longitude: -103.728931

Proposed Azimuth: 0
Declination: 6.67
North Reference: Grid
KB: 3535.6

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
Tiein	0	0	0	0	0	0	0	0	0	0	90	0
1	26	0	0	26	0	0	0	0	26	0	90	0
2	135	0.30	24.73	135.00	0.26	0.12	0.26	0.28	109	0.29	24.73	0
3	230	0.50	241.73	230.00	0.29	-0.14	0.29	0.80	95	0.32	333.87	0
4	323	0.40	197.73	323.00	-0.21	-0.60	-0.21	0.38	93	0.63	250.42	0
5	417	0.80	221.73	416.99	-1.01	-1.13	-1.01	0.49	94	1.52	228.19	0
6	512	0.60	183.73	511.98	-2.01	-1.61	-2.01	0.52	95	2.57	218.72	0
7	575	0.60	185.73	574.98	-2.66	-1.66	-2.66	0	63	3.14	211.98	0
8	606	0.40	190.73	605.98	-2.93	-1.70	-2.93	0.66	31	3.39	210.10	0
9	637	0.60	162.73	636.98	-3.19	-1.67	-3.19	1.00	31	3.60	207.63	0
10	669	0.40	179.73	668.98	-3.46	-1.62	-3.46	0.77	32	3.82	205.07	0
11	700	0.50	208.73	699.98	-3.69	-1.69	-3.69	0.79	31	4.06	204.54	0
12	883	0.54	145.90	882.97	-5.11	-1.59	-5.11	0.30	183	5.35	197.25	77
13	976	0.54	128.83	975.97	-5.74	-1.00	-5.74	0	93	5.83	189.86	77.70
14	1068	0.45	136.33	1,067.96	-6.28	-0.41	-6.28	0.12	92	6.29	183.75	84
15	1162	0.24	163.31	1,161.96	-6.73	-0.10	-6.73	0.28	94	6.73	180.85	85
16	1253	0.36	239.78	1,252.96	-7.06	-0.29	-7.06	0.42	91	7.06	182.37	-9999
17	1346	0.40	266	1,345.96	-7.23	-0.87	-7.23	0.19	93	7.28	186.85	-9999
18	1440	0.38	296.42	1,439.96	-7.11	-1.48	-7.11	0.22	94	7.26	191.72	-9999
19	1533	0.42	130.21	1,532.95	-7.20	-1.49	-7.20	0.85	93	7.35	191.71	-9999
20	1627	1.21	116.75	1,626.94	-7.86	-0.34	-7.86	0.86	94	7.87	182.49	106
21	1721	1.99	116.79	1,720.91	-9.05	2.00	-9.05	0.83	94	9.27	167.52	106.30
22	1816	2.47	121.14	1,815.84	-10.85	5.23	-10.85	0.54	95	12.04	154.28	-9999
23	1911	3.09	117.34	1,910.72	-13.08	9.25	-13.08	0.68	95	16.02	144.73	-9999
24	2007	3.81	115.80	2,006.55	-15.66	14.42	-15.66	0.76	96	21.29	137.35	113.40
25	2102	4.78	116.59	2,101.28	-18.81	20.80	-18.81	1.02	95	28.04	132.11	120.60
26	2197	5.32	115.70	2,195.91	-22.49	28.31	-22.49	0.57	95	36.16	128.46	113.40
27	2292	5.61	112.62	2,290.48	-26.18	36.57	-26.18	0.43	95	44.97	125.60	120.60
28	2387	6.31	108.44	2,384.97	-29.62	45.81	-29.62	0.87	95	54.55	122.89	120.60
29	2482	6.33	108.31	2,479.39	-32.92	55.73	-32.92	0.03	95	64.73	120.57	120.60
30	2577	6.83	105.42	2,573.76	-36.06	66.15	-36.06	0.63	95	75.34	118.60	127.70
31	2672	6.80	107.11	2,668.09	-39.22	76.97	-39.22	0.21	95	86.39	117.00	120.60
32	2768	6.88	107.15	2,763.41	-42.59	87.89	-42.59	0.08	96	97.67	115.85	127.70
33	2863	7.11	105.72	2,857.70	-45.86	98.99	-45.86	0.30	95	109.10	114.86	120.60

Swy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
34	2958	6.59	108.41	2,952.02	-49.17	109.82	-49.17	0.64	95	120.33	114.12	127.70
35	3053	6.33	106.16	3,046.42	-52.35	120.03	-52.35	0.38	95	130.95	113.57	127.70
36	3148	6.60	102.32	3,140.82	-54.98	130.39	-54.98	0.54	95	141.51	112.86	113.40
37	3243	6.73	100.84	3,235.17	-57.19	141.19	-57.19	0.23	95	152.33	112.05	120.60
38	3338	7.31	95.79	3,329.46	-58.84	152.67	-58.84	0.89	95	163.62	111.08	120.60
39	3433	6.60	100.92	3,423.76	-60.49	164.05	-60.49	0.99	95	174.84	110.24	127.70
40	3527	6.12	108.40	3,517.19	-63.09	174.10	-63.09	1.02	94	185.18	109.92	127.70
41	3623	5.68	110.13	3,612.68	-66.34	183.42	-66.34	0.49	96	195.05	109.89	127.70
42	3718	5.48	108.73	3,707.23	-69.42	192.13	-69.42	0.25	95	204.29	109.87	127.70
43	3813	6.68	107	3,801.69	-72.49	201.71	-72.49	1.28	95	214.34	109.77	127.70
44	3908	8.12	108.64	3,895.90	-76.25	213.35	-76.25	1.53	95	226.57	109.67	127.70
45	4003	7.15	105.84	3,990.06	-80.01	225.40	-80.01	1.09	95	239.18	109.54	127.70
46	4098	6.74	101.19	4,084.36	-82.70	236.55	-82.70	0.73	95	250.60	109.27	127.70
47	4193	7.61	95.92	4,178.61	-84.43	248.28	-84.43	1.15	95	262.24	108.78	127.70
48	4288	7.21	102.74	4,272.82	-86.40	260.35	-86.40	1.02	95	274.31	108.36	127.70
49	4385	6.40	105.06	4,369.14	-89.15	271.51	-89.15	0.88	97	285.77	108.18	99.10
50	4480	6.63	103.10	4,463.53	-91.76	281.96	-91.76	0.34	95	296.52	108.03	106.30
51	4574	7.27	110.28	4,556.84	-95.06	292.83	-95.06	1.15	94	307.87	107.98	106.30
52	4669	7.80	110.99	4,651.02	-99.45	304.49	-99.45	0.57	95	320.32	108.09	106.30
53	4764	6.98	105.01	4,745.23	-103.25	316.08	-103.25	1.18	95	332.52	108.09	113.40
54	4859	6.99	105.20	4,839.52	-106.26	327.23	-106.26	0.03	95	344.06	107.99	113.40
55	4954	7.22	104.51	4,933.79	-109.27	338.59	-109.27	0.26	95	355.79	107.89	113.40
56	5048	6.89	103.59	5,027.08	-112.08	349.79	-112.08	0.37	94	367.31	107.77	113.40
57	5143	6.99	104.28	5,121.38	-114.84	360.93	-114.84	0.14	95	378.76	107.65	113.40
58	5238	7.27	106.97	5,215.65	-118.02	372.28	-118.02	0.46	95	390.54	107.59	113.40
59	5333	7.41	107.13	5,309.87	-121.58	383.89	-121.58	0.15	95	402.68	107.57	113.40
60	5428	6.72	105.58	5,404.15	-124.88	395.10	-124.88	0.75	95	414.36	107.54	120.60
61	5523	6.10	103.39	5,498.56	-127.54	405.36	-127.54	0.70	95	424.95	107.47	120.60
62	5618	6.63	107.44	5,592.97	-130.35	415.50	-130.35	0.73	95	435.47	107.42	120.60
63	5714	6.42	107.43	5,688.35	-133.62	425.91	-133.62	0.22	96	446.38	107.42	120.60
64	5809	6.37	106.30	5,782.76	-136.69	436.04	-136.69	0.14	95	456.96	107.41	120.60
65	5904	6.35	105.97	5,877.17	-139.62	446.14	-139.62	0.04	95	467.48	107.38	120.60
66	5999	6.28	105.20	5,971.60	-142.43	456.21	-142.43	0.12	95	477.92	107.34	120.60
67	6094	7.28	111.08	6,065.93	-145.95	466.84	-145.95	1.28	95	489.12	107.36	120.60
68	6190	6.87	113.12	6,161.20	-150.39	477.80	-150.39	0.50	96	500.91	107.47	127.70
69	6285	7.21	104.20	6,255.49	-154.09	488.80	-154.09	1.20	95	512.51	107.50	127.70
70	6380	7.15	104.59	6,349.74	-157.04	500.30	-157.04	0.08	95	524.37	107.43	127.70
71	6475	6.71	106.94	6,444.05	-160.15	511.33	-160.15	0.55	95	535.83	107.39	127.70
72	6570	6.55	108.94	6,538.41	-163.52	521.77	-163.52	0.30	95	546.79	107.40	127.70
73	6665	6.56	109.07	6,632.79	-167.05	532.02	-167.05	0.02	95	557.63	107.43	127.70
74	6761	5.90	109.47	6,728.22	-170.49	541.86	-170.49	0.69	96	568.05	107.47	127.70
75	6856	6.24	105.10	6,822.69	-173.46	551.44	-173.46	0.60	95	578.08	107.46	127.70
76	6951	5.77	103.60	6,917.17	-175.93	561.07	-175.93	0.52	95	588.01	107.41	127.70
77	7046	5.85	99.03	7,011.68	-177.81	570.49	-177.81	0.49	95	597.56	107.31	127.70
78	7141	7.46	104.75	7,106.04	-180.14	581.24	-180.14	1.83	95	608.52	107.22	127.70

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
79	7236	7.29	105.73	7,200.26	-183.35	593.01	-183.35	0.22	95	620.70	107.18	127.70
80	7331	7.04	107.88	7,294.51	-186.77	604.35	-186.77	0.39	95	632.55	107.17	127.70
81	7426	6.66	110.38	7,388.84	-190.48	615.05	-190.48	0.51	95	643.87	107.21	127.70
82	7521	6.35	112.56	7,483.22	-194.41	625.07	-194.41	0.42	95	654.60	107.28	134.90
83	7616	5.66	109.24	7,577.70	-197.97	634.34	-197.97	0.81	95	664.52	107.33	134.90
84	7711	5.66	111.78	7,672.24	-201.25	643.12	-201.25	0	95	673.87	107.38	134.90
85	7806	4.88	109.88	7,766.84	-204.36	651.27	-204.36	0.84	95	682.58	107.42	134.90
86	7900	3.92	107.49	7,860.56	-206.69	658.09	-206.69	1.04	94	689.79	107.44	127.70
87	7995	3.44	112.78	7,955.36	-208.77	663.82	-208.77	0.62	95	695.87	107.46	127.70
88	8090	2.96	111.43	8,050.21	-210.77	668.73	-210.77	0.51	95	701.16	107.49	127.70
89	8185	2.73	92.72	8,145.10	-211.77	673.27	-211.77	1.00	95	705.79	107.46	120.60
90	8280	1.97	88.14	8,240.02	-211.83	677.16	-211.83	0.82	95	709.52	107.37	113.40
91	8375	0.84	90.64	8,334.99	-211.78	679.49	-211.78	1.19	95	711.73	107.31	113.40
92	8470	0.26	119.11	8,429.98	-211.89	680.38	-211.89	0.66	95	712.61	107.30	106.30
93	8564	0.42	177.53	8,523.98	-212.34	680.58	-212.34	0.38	94	712.93	107.33	113.40
94	8659	0.40	178.91	8,618.98	-213.02	680.60	-213.02	0.02	95	713.16	107.38	113.40
95	8753	0.17	18.13	8,712.98	-213.22	680.65	-213.22	0.60	94	713.26	107.39	120.60
96	8849	1.18	197.33	8,808.97	-214.02	680.40	-214.02	1.41	96	713.27	107.46	120.60
97	8944	1.76	191.99	8,903.94	-216.38	679.80	-216.38	0.63	95	713.41	107.66	120.60
98	9039	0.18	185.46	8,998.93	-217.96	679.49	-217.96	1.66	95	713.59	107.78	127.70
99	9134	0.56	118.43	9,093.92	-218.33	679.88	-218.33	0.54	95	714.08	107.80	127.70
100	9229	0.28	4.38	9,188.92	-218.32	680.31	-218.32	0.76	95	714.48	107.79	127.70
101	9324	1.46	313.88	9,283.91	-217.25	679.45	-217.25	1.37	95	713.34	107.73	134.90
102	9420	0.74	240.61	9,379.90	-216.71	678.03	-216.71	1.49	96	711.82	107.72	134.90
103	9514	0.76	231.58	9,473.89	-217.39	677.01	-217.39	0.13	94	711.06	107.80	134.90
104	9609	0.91	245.93	9,568.88	-218.09	675.83	-218.09	0.27	95	710.15	107.88	134.90
105	9704	1.04	234.31	9,663.86	-218.90	674.44	-218.90	0.25	95	709.08	107.98	134.90
106	9799	0.98	188.58	9,758.85	-220.21	673.62	-220.21	0.83	95	708.70	108.10	120.60
107	9894	1.12	174.01	9,853.83	-221.93	673.59	-221.93	0.32	95	709.21	108.24	127.70
108	9989	0.55	269.26	9,948.83	-222.86	673.24	-222.86	1.36	95	709.16	108.32	127.70
109	10043	0.39	259.05	10,002.83	-222.90	672.80	-222.90	0.33	54	708.76	108.33	120.60
110	10088	0.23	225.13	10,047.82	-222.99	672.58	-222.99	0.53	45	708.59	108.34	120.60
111	10183	7.76	29.58	10,142.54	-217.54	675.62	-217.54	8.40	95	709.78	107.85	120.60
112	10278	15.24	18.13	10,235.58	-200.07	682.68	-200.07	8.19	95	711.39	106.33	127.70
113	10310	17.62	16.15	10,266.27	-191.42	685.34	-191.42	7.64	32	711.57	105.61	127.70
114	10355	22	11.51	10,308.60	-176.61	688.91	-176.61	10.33	45	711.19	104.38	127.70
115	10387	25.74	10	10,337.86	-163.89	691.32	-163.89	11.84	32	710.48	103.34	127.70
116	10418	30.09	9.48	10,365.25	-149.59	693.77	-149.59	14.05	31	709.71	102.17	127.70
117	10450	34.74	7.79	10,392.25	-132.63	696.33	-132.63	14.80	32	708.85	100.78	127.70
118	10481	39.16	5.48	10,417.02	-114.13	698.46	-114.13	14.94	31	707.72	99.28	127.70
119	10513	42.89	2.10	10,441.16	-93.18	699.82	-93.18	13.56	32	706.00	97.58	127.70
120	10545	46.89	359.55	10,463.83	-70.61	700.13	-70.61	13.70	32	703.68	95.76	127.70
121	10577	52.07	359.93	10,484.61	-46.29	700.02	-46.29	16.21	32	701.55	93.78	134.90
122	10608	56.98	359.98	10,502.60	-21.05	700.00	-21.05	15.84	31	700.32	91.72	134.90
123	10639	61.94	358.67	10,518.35	5.64	699.68	5.64	16.41	31	699.71	89.54	134.90

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
124	10671	67.63	357.55	10,531.97	34.56	698.72	34.56	18.06	32	699.58	87.17	134.90
125	10703	74.04	357.01	10,542.47	64.74	697.29	64.74	20.09	32	700.28	84.70	134.90
126	10735	78.37	357.75	10,550.10	95.77	695.87	95.77	13.72	32	702.43	82.16	134.90
127	10766	80.40	358.18	10,555.81	126.22	694.79	126.22	6.69	31	706.16	79.70	134.90 •
128	10798	83.37	358.15	10,560.33	157.88	693.77	157.88	9.28	32	711.51	77.18	134.90
129	10829	84.64	358.18	10,563.57	188.69	692.78	188.69	4.10	31	718.02	74.76	134.90
130	10867	86.10	358.77	10,566.63	226.56	691.78	226.56	4.14	38	727.93	71.87	134.90
131	10914	87.59	358.79	10,569.22	273.47	690.78	273.47	3.17	47	742.94	68.40	134.90
132	10962	89.16	358.59	10,570.58	321.44	689.68	321.44	3.30	48	760.91	65.01	134.90
133	11057	90.59	358.79	10,570.79	416.41	687.51	416.41	1.52	95	803.78	58.80	127.70
134	11152	91.49	359.18	10,569.07	511.38	685.83	511.38	1.03	95	855.49	53.29	138
135	11247	90.62	359.23	10,567.32	606.35	684.51	606.35	0.92	95	914.45	48.46	-9999
136	11342	89.16	359.59	10,567.50	701.35	683.53	701.35	1.58	95	979.34	44.26	134.90
137	11436	85.88	0.35	10,571.57	795.24	683.48	795.24	3.58	94	1,048.60	40.68	142
138	11531	87.78	0.35	10,576.82	890.09	684.06	890.09	2	95	1,122.59	37.54	142
139	11626	89.19	1.19	10,579.33	985.05	685.34	985.05	1.73	95	1,200.00	34.83	142
140	11721	90.25	1.95	10,579.79	1,080.01	687.94	1,080.01	1.37	95	1,280.50	32.50	134.90
141	11816	89.61	1.22	10,579.91	1,174.97	690.57	1,174.97	1.02	95	1,362.88	30.44	134.90
142	11911	88.99	359.89	10,581.07	1,269.96	691.49	1,269.96	1.54	95	1,446.01	28.57	142
143	12006	87.73	359.45	10,583.79	1,364.91	690.94	1,364.91	1.40	95	1,529.83	26.85	134.90
144	12100	88.29	359.80	10,587.05	1,458.86	690.32	1,458.86	0.70	94	1,613.94	25.32	134.90
145	12195	87.59	0.17	10,590.47	1,553.79	690.30	1,553.79	0.83	95	1,700.23	23.95	134.90
146	12289	88.43	1.51	10,593.73	1,647.72	691.68	1,647.72	1.68	94	1,787.01	22.77	134.90
147	12384	87.48	1.63	10,597.12	1,742.63	694.28	1,742.63	1.01	95	1,875.84	21.72	134.90
148	12479	86.77	0.40	10,601.89	1,837.49	695.96	1,837.49	1.49	95	1,964.87	20.74	142
149	12574	88.37	0.52	10,605.92	1,932.40	696.72	1,932.40	1.69	95	2,054.16	19.83	142
150	12669	89.13	0.92	10,607.99	2,027.37	697.91	2,027.37	0.90	95	2,144.13	19.00	142
151	12764	88.77	0.17	10,609.73	2,122.35	698.82	2,122.35	0.88	95	2,234.43	18.22	142
152	12859	89.47	0.44	10,611.19	2,217.33	699.32	2,217.33	0.79	95	2,325.00	17.50	134.90
153	12954	89.24	0.20	10,612.26	2,312.33	699.85	2,312.33	0.35	95	2,415.91	16.84	134.90
154	13049	87.98	358.89	10,614.56	2,407.29	699.10	2,407.29	1.91	95	2,506.75	16.19	142
155	13144	89.64	359.50	10,616.54	2,502.26	697.77	2,502.26	1.86	95	2,597.72	15.58	142
156	13238	88.74	359.34	10,617.86	2,596.24	696.81	2,596.24	0.97	94	2,688.13	15.02	145
157	13333	89.05	359.56	10,619.70	2,691.22	695.90	2,691.22	0.40	95	2,779.74	14.50	142
158	13428	89.24	0.13	10,621.11	2,786.21	695.65	2,786.21	0.63	95	2,871.74	14.02	153
159	13523	90.87	1.64	10,621.02	2,881.19	697.11	2,881.19	2.34	95	2,964.33	13.60	149.10
160	13618	91.65	2.87	10,618.93	2,976.09	700.85	2,976.09	1.53	95	3,057.50	13.25	149.10
161	13713	89.78	1.81	10,617.75	3,071.00	704.73	3,071.00	2.26	95	3,150.82	12.92	149.10
162	13808	89.52	2.33	10,618.33	3,165.93	708.16	3,165.93	0.61	95	3,244.17	12.61	149.10
163	13903	88.26	1.18	10,620.17	3,260.87	711.07	3,260.87	1.80	95	3,337.50	12.30	149.10
164	13998	87.70	359.65	10,623.52	3,355.80	711.76	3,355.80	1.71	95	3,430.45	11.97	149.10
165	14093	90.28	0.01	10,625.19	3,450.78	711.47	3,450.78	2.74	95	3,523.36	11.65	156.30
166	14188	88.23	359.28	10,626.43	3,545.77	710.89	3,545.77	2.29	95	3,616.33	11.34	156.30
167	14283	88.18	358.40	10,629.40	3,640.70	708.96	3,640.70	0.93	95	3,709.09	11.02	156.30
168	14378	88.18	358.79	10,632.42	3,735.62	706.64	3,735.62	0	95	3,801.87	10.71	156.30

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
169	14474	88.99	358.22	10,634.79	3,831.58	704.97	3,831.58	0.96	96	3,895.89	10.43	156.30
170	14569	88.91	358.49	10,636.53	3,926.54	703.07	3,926.54	0.77	95	3,988.99	10.15	156.30
171	14664	90.28	359.63	10,637.20	4,021.52	701.51	4,021.52	1.88	95	4,082.25	9.90	156.30 -
172	14759	92.13	0.56	10,635.21	4,116.50	701.67	4,116.50	2.18	95	4,175.87	9.67	156.30 -
173	14854	93.90	0.34	10,630.21	4,211.36	702.42	4,211.36	1.88	95	4,269.53	9.47	156.30
174	14949	90.62	358.10	10,626.46	4,306.26	701.12	4,306.26	4.18	95	4,362.96	9.25	156.30
175	15044	91.32	358.29	10,624.85	4,401.19	698.13	4,401.19	0.76	95	4,456.22	9.01	156.30
176	15139	92.66	358.64	10,621.56	4,496.10	695.59	4,496.10	1.46	95	4,549.59	8.79	163.40
177	15234	92.50	358.07	10,617.28	4,590.96	692.86	4,590.96	0.62	95	4,642.95	8.58	163.40
178	15329	92.10	358.08	10,613.47	4,685.83	689.67	4,685.83	0.42	95	4,736.32	8.37	163.40
179	15424	92.13	358.06	10,609.96	4,780.72	688.48	4,780.72	0.04	95	4,829.75	8.17	163.40
180	15430	92.16	358.07	10,609.74	4,786.71	686.27	4,786.71	0.53	6	4,835.65	8.16	163.40
PTB	15488	92.16	358.07	10,607.55	4,844.63	684.32	4,844.63	0	58	4,892.73	8.04	0