



Directional Survey Report

HOBBS OCD

JAN 22 2019

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Company Name: Riley Permian Operating Co., LLC

Well Name: J Treehorn 21-16 State Com #4H

Field: Milnesand (San Andres)

Rig ID: Norton #2

State/Prov: New Mexico

County: Roosevelt

Location: 12MI WSW of Milnesand, NM

API/UWI: 30-041-20983

Survey Company: LEGACY DIRECTIONAL DRILLING, L.P. Proposed Depth: 359.39

Job Number: MD181079

Latitude: 33.6036475

Longitude: 103.3415558

Declination: 6.26

North Reference: Grid

KB: 4311

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
TieIn	2274	0.64	135.78	2,273.96	-8.37	5.01	-8.42	0	0	9.75	149.10	0
1	2299	0.88	113.05	2,298.96	-8.55	5.28	-8.60	1.52	25	10.05	148.27	72
2	2488	1.41	122.63	2,487.92	-10.37	8.58	-10.46	0.30	189	13.46	140.40	79
3	2675	1.45	120.25	2,674.86	-12.80	12.56	-12.93	0.04	187	17.93	135.54	84
4	2858	1.36	108.04	2,857.81	-14.64	16.62	-14.81	0.17	183	22.15	131.37	91
5	3046	1.45	97.93	3,045.75	-15.66	21.10	-15.88	0.14	188	26.28	126.58	97
6	3233	1.41	114.89	3,232.69	-16.95	25.53	-17.22	0.23	187	30.65	123.58	100
7	3422	1.58	109	3,421.63	-18.78	30.10	-19.10	0.12	189	35.48	121.96	104
8	3611	1.63	102.76	3,610.55	-20.22	35.19	-20.60	0.10	189	40.59	119.88	109
9	3798	0.97	182.39	3,797.52	-22.39	37.72	-22.79	0.93	187	43.86	120.69	115
10	3893	0.62	250.16	3,892.51	-23.37	37.20	-23.76	0.98	95	43.93	122.14	115
11	3925	1.14	338.40	3,924.51	-23.13	36.92	-23.52	4.00	32	43.57	122.07	115
12	3956	2.46	354.04	3,955.49	-22.18	36.74	-22.57	4.50	31	42.92	121.12	115
13	3988	4.31	0.55	3,987.43	-20.30	36.68	-20.69	5.90	32	41.92	118.96	115
14	4019	6.68	1.69	4,018.29	-17.33	36.74	-17.72	7.65	31	40.63	115.25	115
15	4050	8.92	359.93	4,049.00	-13.12	36.79	-13.51	7.27	31	39.06	109.63	115
16	4082	11.38	359.58	4,080.50	-7.48	36.77	-7.88	7.69	32	37.52	101.51	106
17	4114	15.12	359.40	4,111.64	-0.15	36.70	-0.54	11.69	32	36.70	90.24	108
18	4146	18.77	358	4,142.25	9.17	36.48	8.78	11.48	32	37.61	75.89	109
19	4177	22.68	356.15	4,171.24	20.12	35.90	19.74	12.79	31	41.16	60.73	109
20	4208	26.99	355.63	4,199.36	33.10	34.96	32.73	13.92	31	48.15	46.56	109
21	4240	31.25	355.36	4,227.31	48.63	33.74	48.26	13.32	32	59.18	34.75	109
22	4272	35.69	356.06	4,254.00	66.22	32.42	65.87	13.93	32	73.73	26.09	109
23	4303	40.79	357.30	4,278.34	85.37	31.33	85.03	16.64	31	90.93	20.15	102
24	4335	44.70	357.91	4,301.83	107.06	30.42	106.73	12.29	32	111.30	15.86	104
25	4366	45.76	357.73	4,323.67	129.06	29.59	128.73	3.44	31	132.40	12.91	106
26	4398	45.71	357.38	4,346.00	151.95	28.61	151.64	0.80	32	154.62	10.66	108
27	4430	45.32	357.12	4,368.42	174.76	27.51	174.45	1.35	32	176.91	8.95	109
28	4461	45.14	356.86	4,390.26	196.73	26.36	196.44	0.83	31	198.49	7.63	108
29	4492	44.53	356.50	4,412.24	218.55	25.09	218.27	2.13	31	219.99	6.55	109
30	4523	44.13	356.06	4,434.41	240.17	23.69	239.90	1.63	31	241.33	5.63	111
31	4555	46.37	356.77	4,456.94	262.85	22.27	262.60	7.18	32	263.79	4.84	111
32	4587	51.12	357.38	4,478.04	286.87	21.05	286.63	14.91	32	287.64	4.20	111
33	4618	55.30	356.77	4,496.60	311.66	19.78	311.43	13.58	31	312.28	3.63	111

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
34	4650	58.77	356.77	4,514.01	338.46	18.26	338.24	10.84	32	338.95	3.09	113
35	4682	62.81	357.82	4,529.62	366.35	16.95	366.15	12.95	32	366.74	2.65	113
36	4713	67.16	358.61	4,542.73	394.42	16.08	394.23	14.22	31	394.75	2.33	113
37	4744	71.12	358.88	4,553.76	423.38	15.45	423.19	12.80	31	423.66	2.09	113
38	4774	74.24	359.49	4,562.69	452.01	15.04	451.83	10.58	30	452.26	1.91	113
39	4805	77.05	359.93	4,570.38	482.04	14.89	481.85	9.17	31	482.27	1.77	115
40	4837	80.97	359.49	4,576.48	513.45	14.73	513.26	12.32	32	513.66	1.64	115
41	4868	84.04	358.79	4,580.52	544.17	14.27	543.99	10.15	31	544.36	1.50	115
42	4900	86.86	357.21	4,583.06	576.05	13.15	575.88	10.09	32	576.20	1.31	115
43	4932	88.26	355.89	4,584.42	607.96	11.23	607.81	6.01	32	608.06	1.06	115
44	4952	88.62	355.36	4,584.97	627.90	9.70	627.76	3.20	20	627.97	0.89	106
45	5046	89.63	355.01	4,586.40	721.55	1.81	721.49	1.14	94	721.55	0.14	108
46	5141	91.38	354.83	4,585.56	816.17	-6.60	816.19	1.85	95	816.20	359.54	111
47	5235	91.08	356.15	4,583.55	909.86	-13.99	909.95	1.44	94	909.96	359.12	115
48	5330	90.42	357.82	4,582.30	1,004.71	-18.98	1,004.86	1.89	95	1,004.89	358.92	115
49	5424	90.33	359.93	4,581.69	1,098.69	-20.83	1,098.85	2.25	94	1,098.88	358.91	117
50	5518	92	359.76	4,579.78	1,192.66	-21.08	1,192.82	1.79	94	1,192.85	358.99	120
51	5613	92.44	1.07	4,576.10	1,287.59	-20.40	1,287.73	1.45	95	1,287.75	359.09	109
52	5708	89.58	2.13	4,574.42	1,382.52	-17.74	1,382.64	3.21	95	1,382.64	359.26	117
53	5803	89.49	2.30	4,575.19	1,477.45	-14.07	1,477.52	0.20	95	1,477.52	359.45	120
54	5898	89.76	3.01	4,575.81	1,572.35	-9.67	1,572.36	0.80	95	1,572.38	359.65	122
55	5993	90.07	0.72	4,575.96	1,667.29	-6.58	1,667.26	2.43	95	1,667.30	359.77	124
56	6088	90.95	358.97	4,575.11	1,762.28	-6.84	1,762.25	2.06	95	1,762.29	359.78	124
57	6183	93.32	358.53	4,571.57	1,857.18	-8.91	1,857.17	2.54	95	1,857.21	359.73	124
58	6277	92.66	357.73	4,566.67	1,951.01	-11.97	1,951.02	1.10	94	1,951.04	359.65	133
59	6372	93.19	357.56	4,561.82	2,045.80	-15.87	2,045.85	0.59	95	2,045.86	359.56	126
60	6466	92.26	357.65	4,557.35	2,139.61	-19.79	2,139.70	0.99	94	2,139.70	359.47	122
61	6560	89.63	357.91	4,555.80	2,233.52	-23.43	2,233.64	2.81	94	2,233.64	359.40	124
62	6654	90.86	358.26	4,555.40	2,327.46	-26.57	2,327.62	1.36	94	2,327.62	359.35	124
63	6749	91.65	358.70	4,553.32	2,422.41	-29.09	2,422.58	0.95	95	2,422.58	359.31	126
64	6843	92.18	359.05	4,550.18	2,516.34	-30.94	2,516.52	0.68	94	2,516.53	359.30	122
65	6937	92.92	359.05	4,546.00	2,610.23	-32.49	2,610.43	0.79	94	2,610.43	359.29	126
66	7033	93.19	358.88	4,540.88	2,706.08	-34.23	2,706.29	0.33	96	2,706.29	359.28	124
67	7126	93.58	358.88	4,535.39	2,798.90	-36.04	2,799.12	0.42	93	2,799.13	359.26	126
68	7220	94.20	358.97	4,529.01	2,892.66	-37.80	2,892.90	0.67	94	2,892.91	359.25	127
69	7315	91.30	0.55	4,524.45	2,987.54	-38.20	2,987.78	3.48	95	2,987.78	359.27	127
70	7411	89.32	1.16	4,523.93	3,083.52	-36.76	3,083.74	2.16	96	3,083.74	359.32	127
71	7505	90.11	0.63	4,524.40	3,177.51	-35.30	3,177.71	1.01	94	3,177.71	359.36	127
72	7600	88.70	0.72	4,525.39	3,272.50	-34.18	3,272.67	1.49	95	3,272.67	359.40	127
73	7695	89.27	1.78	4,527.07	3,367.46	-32.10	3,367.61	1.27	95	3,367.61	359.45	126
74	7790	87.56	0.72	4,529.70	3,462.39	-30.03	3,462.52	2.12	95	3,462.52	359.50	127
75	7885	87.56	0.46	4,533.74	3,557.30	-29.06	3,557.41	0.27	95	3,557.42	359.53	129
76	7979	87.65	0.37	4,537.67	3,651.22	-28.37	3,651.31	0.14	94	3,651.33	359.55	129
77	8073	89.93	359.84	4,539.66	3,745.19	-28.20	3,745.28	2.49	94	3,745.30	359.57	127
78	8168	90.81	0.02	4,539.04	3,840.19	-28.32	3,840.27	0.95	95	3,840.29	359.58	129

Svy	Depth	Inc	Azm	TVD	NS	EW	VS	DLS	CL	CD	CA	Temp
79	8263	91.03	359.84	4,537.52	3,935.17	-28.43	3,935.25	0.30	95	3,935.28	359.59	129
80	8358	91.91	0.02	4,535.08	4,030.14	-28.55	4,030.22	0.95	95	4,030.24	359.59	129
81	8452	91.82	359.93	4,532.02	4,124.09	-28.59	4,124.16	0.14	94	4,124.19	359.60	129
82	8547	92.26	0.02	4,528.64	4,219.03	-28.63	4,219.10	0.47	95	4,219.13	359.61	129
83	8642	90.95	359.05	4,525.98	4,313.99	-29.40	4,314.06	1.72	95	4,314.09	359.61	122
84	8736	91.96	359.05	4,523.59	4,407.94	-30.96	4,408.02	1.07	94	4,408.05	359.60	124
85	8831	90.15	358.97	4,521.84	4,502.91	-32.60	4,503.00	1.91	95	4,503.03	359.59	126
86	8925	89.45	358	4,522.17	4,596.87	-35.09	4,596.99	1.27	94	4,597.01	359.56	127
87	9021	89.71	357.91	4,522.87	4,692.81	-38.51	4,692.95	0.29	96	4,692.97	359.53	129
88	9115	91.08	357.30	4,522.23	4,786.72	-42.44	4,786.90	1.60	94	4,786.91	359.49	129
89	9210	90.42	357.47	4,520.98	4,881.61	-46.78	4,881.84	0.72	95	4,881.84	359.45	131
90	9305	88.09	358.44	4,522.22	4,976.54	-50.17	4,976.79	2.66	95	4,976.79	359.42	131
91	9400	89.05	358.61	4,524.59	5,071.48	-52.61	5,071.75	1.03	95	5,071.75	359.41	131
92	9493	90.02	358.35	4,525.34	5,164.44	-55.08	5,164.73	1.08	93	5,164.73	359.39	129
93	9588	91.43	358.26	4,524.14	5,259.39	-57.89	5,259.71	1.49	95	5,259.71	359.37	131
94	9683	90.33	358.97	4,522.68	5,354.35	-60.18	5,354.68	1.38	95	5,354.69	359.36	131
95	9777	91.12	358.61	4,521.49	5,448.32	-62.17	5,448.67	0.92	94	5,448.67	359.35	131
96	9873	92.26	358.26	4,518.66	5,544.24	-64.79	5,544.61	1.24	96	5,544.62	359.33	131
97	9968	90.95	358.35	4,516.00	5,639.16	-67.60	5,639.56	1.38	95	5,639.56	359.31	131
98	10063	89.01	358.35	4,516.03	5,734.11	-70.33	5,734.54	2.04	95	5,734.54	359.30	129
99	10157	90.20	358.79	4,516.68	5,828.08	-72.68	5,828.52	1.35	94	5,828.53	359.29	131
100	10252	91.69	359.23	4,515.12	5,923.05	-74.32	5,923.51	1.64	95	5,923.52	359.28	131
101	10347	90.64	359.67	4,513.18	6,018.02	-75.23	6,018.48	1.20	95	6,018.49	359.28	131
102	10442	91.82	359.67	4,511.14	6,113.00	-75.78	6,113.46	1.24	95	6,113.47	359.29	133
103	10536	90.51	0.11	4,509.23	6,206.98	-75.96	6,207.43	1.47	94	6,207.44	359.30	131
104	10631	88.70	359.14	4,509.89	6,301.97	-76.58	6,302.43	2.16	95	6,302.43	359.30	133
105	10726	90.20	359.23	4,510.80	6,396.95	-77.93	6,397.42	1.58	95	6,397.43	359.30	133
106	10822	89.01	359.76	4,511.46	6,492.94	-78.78	6,493.41	1.36	96	6,493.42	359.30	133
107	10917	89.89	359.58	4,512.37	6,587.94	-79.32	6,588.41	0.95	95	6,588.41	359.31	126
108	11012	91.08	359.67	4,511.57	6,682.93	-79.95	6,683.40	1.26	95	6,683.41	359.31	129
109	11107	92.35	359.84	4,508.73	6,777.88	-80.35	6,778.36	1.35	95	6,778.36	359.32	129
110	11202	90.33	359.32	4,506.51	6,872.85	-81.05	6,873.32	2.20	95	6,873.33	359.32	129
111	11297	90.73	359.23	4,505.63	6,967.84	-82.25	6,968.32	0.43	95	6,968.32	359.32	131
112	11392	92.13	359.14	4,503.26	7,062.80	-83.60	7,063.29	1.48	95	7,063.29	359.32	131
113	11487	91.25	358.44	4,500.45	7,157.73	-85.61	7,158.24	1.18	95	7,158.24	359.31	133
114	11582	90.59	359.23	4,498.93	7,252.70	-87.54	7,253.22	1.08	95	7,253.23	359.31	133
115	11676	88.92	0.72	4,499.33	7,346.69	-87.58	7,347.21	2.38	94	7,347.21	359.32	133
116	11769	89.93	0.90	4,500.26	7,439.68	-86.26	7,440.17	1.10	93	7,440.18	359.34	135
117	11864	89.14	1.51	4,501.03	7,534.65	-84.27	7,535.12	1.05	95	7,535.12	359.36	135
118	11957	90.02	1.07	4,501.72	7,627.62	-82.17	7,628.07	1.06	93	7,628.07	359.38	135
119	12052	88.66	0.55	4,502.81	7,722.61	-80.83	7,723.03	1.53	95	7,723.03	359.40	135
120	12144	89.45	0.46	4,504.33	7,814.59	-80.02	7,815.00	0.86	92	7,815.00	359.41	135
121	12238	90.55	0.11	4,504.33	7,908.59	-79.55	7,908.99	1.23	94	7,908.99	359.42	135
122	12332	91.47	359.76	4,502.67	8,002.57	-79.66	8,002.97	1.05	94	8,002.97	359.43	135
123	12426	92.66	359.58	4,499.28	8,096.51	-80.20	8,096.90	1.28	94	8,096.90	359.43	135

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124	12521	91.21	359.67	4,496.08	8,191.45	-80.82	8,191.84	1.53	95	8,191.85	359.43	133
125	12616	91.91	359.67	4,493.49	8,286.41	-81.37	8,286.81	0.74	95	8,286.81	359.44	135
126	12711	90.20	358.17	4,491.74	8,381.37	-83.16	8,381.78	2.39	95	8,381.78	359.43	133
127	12806	88.57	357.47	4,492.76	8,476.29	-86.77	8,476.74	1.87	95	8,476.74	359.41	133
128	12871	88.97	357.47	4,494.16	8,541.21	-89.64	8,541.69	0.62	65	8,541.69	359.40	135
PTB	12928	88.97	357.47	4,495.18	8,598.15	-92.16	8,598.64	0	57	8,598.64	359.39	0