



NM OIL CONSERVATION

ARTESIA DISTRICT

APR 18 2017

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State of New Mexico
County of Eddy

I, Donnie Leone, certify that; I am employed by Accel Directional; that I did on the day(s) of April 8, 2017 through April 14, 2017 conduct or supervise the taking of MWD survey(s) from a depth of 430' feet to a depth of 5252' feet; that the data is true, correct, complete and within the limitations of the tool set forth by Accel Directional; that I am authorized and qualified to make this report; that this report was conducted at the request of Lime Rock Resources for the Mann 3, Well No. Fed 5, API No. 30-015-43755 in Eddy County, New Mexico; and that I have reviewed this report and find that it conforms to the principles and procedures as set forth by Accel Directional.

Donnie Leone

Donnie Leone
MWD Technician

Donnie Leone



SURVEY CALCULATION PROGRAM

Minimum Curvature

File:

OPERATOR: Limerock Resources										Target Information					VS Referenced to Offset from Surface			
WELL: Mann 3 Fed. No. 5										TARGET KBTVD:		2618.64 <th colspan="2">NORTH/SOUTH:</th> <td colspan="2">12.75</td>			NORTH/SOUTH:		12.75	
LOCATION: Eddy County										TARGET INCL:		13.05 <th colspan="2">EAST/WEST:</th> <td colspan="2">-489.73</td>			EAST/WEST:		-489.73	
RIG: United 33										TARGET AZM:		271.49 <th colspan="4">(Enter 0° N and 0° E for Surface)</th>			(Enter 0° N and 0° E for Surface)			
JOB NUMBER: TX-17016																		
SURVEY COMPANY					DIRECTIONAL COMPANY					PROPOSED DIRECTION:		271.49 <th colspan="2">Dec / Total Corr.(+/-):</th> <td colspan="2">7.35</td>		Dec / Total Corr.(+/-):		7.35		
Accel Directional					Accel Directional					COMMENTS:								
Directional Drillers					COORDINATORS					API # 30-015-43755								
Allen Hightower					Chris Shipp													
Limerock Resources					Mann 3 Fed. No. 5										Target Calculations			
SVY	MD	INC	TRUE AZM	TEMP °F	API Gamma	Course Length	TVD	N-S	E-W	Surface Vert Sect	CLOSURE DIST	DIR	DLS/ 100'	BUR/ 100'	TVD AT 0' V. SEC.	ABOVE (+) BELOW (-)	RIGHT(+) LEFT(-)	
TIE IN	0	0.0	0.0			N/A	0.00	0.00	0.00		0.00	0.00	N/A	N/A				
1	430	0.3	352.7			430	430.00	1.12	-0.14	0.17	1.13	352.70	0.07	0.07	429.26	2189.38	1.10	
2	460	0.2	19.8			30	460.00	1.24	-0.14	0.17	1.25	353.79	0.51	-0.33	459.27	2159.37	1.23	
3	491	0.2	214.0			31	491.00	1.25	-0.15	0.18	1.26	353.28	1.28	0.00	490.22	2128.42	1.23	
4	521	1.1	247.6			30	521.00	1.10	-0.44	0.47	1.18	338.02	3.13	3.00	518.96	2099.68	1.07	
5	552	2.5	257.4			31	551.98	0.84	-1.38	1.40	1.61	301.24	4.61	4.52	545.94	2072.70	0.79	
6	584	3.8	262.3			32	583.93	0.54	-3.11	3.12	3.16	279.88	4.15	4.06	570.46	2048.18	0.45	
7	616	5.1	264.0			32	615.83	0.25	-5.58	5.58	5.58	272.57	4.08	4.06	591.76	2026.88	0.09	
8	648	6.3	269.0			32	647.67	0.07	-8.75	8.74	8.75	270.47	4.05	3.75	609.95	2008.69	-0.17	
9	680	7.3	274.4			32	679.45	0.20	-12.53	12.53	12.53	270.90	3.71	3.13	625.40	1993.24	-0.14	
10	712	8.3	276.3			32	711.15	0.61	-16.85	16.86	16.86	272.06	3.23	3.13	638.41	1980.23	0.16	
11	744	9.0	277.8			32	742.79	1.20	-21.63	21.65	21.66	273.17	2.30	2.19	649.38	1969.26	0.63	
12	776	9.7	273.7			32	774.36	1.71	-26.80	26.83	26.85	273.66	3.02	2.19	658.60	1960.04	1.00	
13	808	10.3	273.5			32	805.88	2.06	-32.34	32.39	32.41	273.65	1.88	1.88	666.16	1952.48	1.21	
14	839	11.6	273.3			31	836.31	2.41	-38.22	38.27	38.30	273.61	4.20	4.19	671.20	1947.44	1.40	
15	871	12.4	272.5			32	867.61	2.75	-44.86	44.92	44.95	273.50	2.55	2.50	673.81	1944.83	1.57	
16	903	12.6	272.1			32	898.85	3.02	-51.79	51.85	51.87	273.34	0.68	0.62	675.17	1943.47	1.66	
17	935	12.4	272.0			32	930.10	3.27	-58.71	58.77	58.80	273.19	0.63	-0.62	676.54	1942.10	1.73	
18	967	12.0	272.3			32	961.37	3.52	-65.46	65.53	65.56	273.08	1.27	-1.25	678.64	1940.00	1.81	
19	999	11.6	272.2			32	992.70	3.78	-72.00	72.08	72.10	273.01	1.25	-1.25	681.73	1936.91	1.90	
20	1,031	11.2	270.8			32	1024.07	3.95	-78.33	78.40	78.43	272.89	1.52	-1.25	685.82	1932.82	1.90	
21	1,063	11.8	268.9			32	1055.42	3.93	-84.70	84.78	84.80	272.66	2.22	1.88	689.67	1928.97	1.71	
22	1,095	11.4	266.5			32	1086.77	3.67	-91.13	91.20	91.21	272.31	1.96	-1.25	693.32	1925.32	1.29	
23	1,128	11.0	266.3			33	1119.14	3.27	-97.53	97.58	97.58	271.92	1.22	-1.21	698.14	1920.50	0.72	
24	1,159	10.9	265.7			31	1149.58	2.86	-103.40	103.44	103.44	271.58	0.49	-0.32	703.29	1915.35	0.16	
25	1,191	11.7	264.3			32	1180.96	2.31	-109.65	109.67	109.67	271.21	2.64	2.50	707.80	1910.84	-0.55	
26	1,256	13.2	265.2			65	1244.43	1.04	-123.60	123.59	123.61	270.48	2.33	2.31	711.23	1907.41	-2.19	
27	1,350	14.1	275.6			94	1335.78	1.25	-145.70	145.68	145.70	270.49	2.78	0.96	707.27	1911.37	-2.55	
28	1,446	14.0	274.4			96	1428.91	3.29	-168.91	168.94	168.95	271.11	0.32	-0.10	700.05	1918.59	-1.12	
29	1,542	13.1	270.7			96	1522.24	4.31	-191.37	191.42	191.42	271.29	1.30	-0.94	696.41	1922.23	-0.68	
30	1,638	13.0	268.6			96	1615.76	4.18	-213.04	213.08	213.08	271.12	0.50	-0.10	696.47	1922.17	-1.37	
31	1,734	13.0	268.1			96	1709.30	3.56	-234.63	234.64	234.66	270.87	0.12	0.00	696.98	1921.66	-2.56	
32	1,830	13.6	271.8			96	1802.73	3.55	-256.70	256.71	256.73	270.79	1.08	0.63	695.21	1923.43	-3.13	
33	1,926	13.6	271.2			96	1896.04	4.14	-279.27	279.28	279.30	270.85	0.15	0.00	691.13	1927.51	-3.13	
34	2,023	13.5	272.3			97	1990.34	4.84	-301.98	302.01	302.02	270.92	0.28	-0.10	687.39	1931.25	-3.03	
35	2,118	13.3	272.0			95	2082.75	5.66	-323.98	324.02	324.03	271.00	0.22	-0.21	684.82	1933.82	-2.77	
36	2,214	13.4	272.3			96	2176.16	6.50	-346.14	346.19	346.20	271.08	0.13	0.10	682.60	1936.04	-2.52	
37	2,310	13.3	273.0			96	2269.56	7.52	-368.28	368.35	368.35	271.17	0.20	-0.10	680.40	1938.24	-2.07	
38	2,406	13.3	272.8			96	2362.99	8.64	-390.33	390.43	390.43	271.27	0.05	0.00	678.57	1940.07	-1.53	
39	2,503	13.1	272.2			97	2457.42	9.61	-412.46	412.57	412.57	271.33	0.25	-0.21	677.46	1941.18	-1.13	
40	2,599	13.0	273.6			96	2550.95	10.70	-434.11	434.24	434.24	271.41	0.35	-0.10	677.50	1941.14	-0.60	
41	2,694	9.9	275.6			95	2644.04	12.17	-452.91	453.07	453.07	271.54	3.29	-3.26	689.37	1929.27	0.38	
42	2,790	6.9	288.4			96	2739.01	14.80	-466.60	466.82	466.83	271.82	3.66	-3.13	725.00	1893.64	2.65	
43	2,887	3.6	287.1			97	2835.59	17.53	-475.04	475.33	475.36	272.11	3.40	-3.40	784.87	1833.77	5.16	
44	2,983	0.6	265.7			96	2931.52	18.38	-478.42	478.74	478.77	272.20	3.18	-3.13	866.11	1752.53	5.92	
45	3,085	0.4	279.9			102	3033.51	18.40	-479.30	479.62	479.66	272.20	0.23	-0.20	964.29	1654.35	5.92	
46	3,180	1.1	219.6			95	3128.50	17.75	-480.21	480.51	480.54	272.12	1.02	0.74	1055.44	1563.20	5.25	
47	3,276	1.3	213.6			96	3224.48	16.14	-481.40	481.66	481.67	271.92	0.25	0.21	1146.47	1472.17	3.60	
48	3,371	1.2	214.2			95	3319.46	14.42	-482.56	482.77	482.77	271.71	0.11	-0.11	1236.65	1381.99	1.85	
49	3,467	0.4	230.2			96	3415.45	13.37	-483.38	483.56	483.56	271.58	0.86	-0.83	1329.21	1289.43	0.79	
50	3,563	0.3	353.4			96	3511.45	13.41	-483.67	483.85	483.85	271.59	0.64	-0.10	1423.97	1194.67	0.81	
51	3,658	0.4	344.5			95	3606.45	13.97	-483.78	483.98	483.98	271.65	0.12	0.11	1518.40	1100.24	1.38	
52	3,754	0.5	342.4			96	3702.45	14.70	-484.00	484.22	484.22	271.74	0.11	0.10	1613.39	1005.25	2.09	
53	3,850	0.6	332.9			96	3798.44	15.54	-484.35	484.60	484.60	271.84	0.14	0.10	1707.75	910.89	2.93	
54	3,947	1.3	232.6			97	3895.43	15.33	-485.46	485.69	485.70	271.81	1.57	0.72	1800.00	818.64	2.69	
55	4,042	1.4	246.1			95	3990.41	14.20	-487.38	487.58	487.58	271.67	0.35	0.11	1886.83	731.81	1.51	
56	4,138	1.3	262.8			96	4086.38	13.59	-489.53	489.72	489.72	271.59	0.42	-0.10	1973.59	645.05	0.84	



SURVEY CALCULATION PROGRAM

Minimum Curvature

File:

OPERATOR: Limerock Resources										Target Information					VS Referenced to Offset from Surface			
WELL: Mann 3 Fed. No. 5										TARGET KBTVD:		2618.64			NORTH/SOUTH:		12.75	
LOCATION: Eddy County										TARGET INCL:		13.05			EAST/WEST:		-489.73	
RIG: United 33										TARGET AZM:		271.49			(Enter 0° N and 0° E for Surface)			
JOB NUMBER: TX-17016																		
SURVEY COMPANY							DIRECTIONAL COMPANY			PROPOSED DIRECTION:		271.49		Dec / Total Corr.(+/-):			7.35	
Accel Directional							Accel Directional			COMMENTS:								
Directional Drillers							COORDINATORS			API # 30-015-43755								
Allen Hightower							Chris Shipp											
Limerock Resources							Mann 3 Fed. No. 5								Target Calculations			
		TRUE	TEMP	API	Course				Surface	CLOSURE		DLS/	BUR/	TVD AT 0'	ABOVE (+)	RIGHT(+)		
SVY	MD	INC	AZM	°F	Gamma	Length	TVD	N-S	E-W	Vert Sect	DIST	DIR	100	100'	V. SEC.	BELOW (-)	LEFT(-)	
57	4,234	1.1	275.9			96	4182.36	13.55	-491.53	491.71	491.71	271.58	0.35	-0.21	2060.96	557.68	0.75	
58	4,330	1.1	279.4			96	4278.34	13.79	-493.35	493.54	493.55	271.60	0.07	0.00	2149.04	469.60	0.95	
59	4,425	0.2	268.1			95	4373.33	13.94	-494.42	494.61	494.61	271.61	0.95	-0.95	2239.42	379.22	1.06	
60	4,522	0.3	58.3			97	4470.33	14.06	-494.37	494.57	494.57	271.63	0.50	0.10	2336.61	282.03	1.19	
61	4,617	0.4	46.8			95	4565.33	14.42	-493.92	494.13	494.13	271.67	0.13	0.11	2433.53	185.11	1.56	
62	4,713	0.6	29.4			96	4661.33	15.09	-493.43	493.65	493.66	271.75	0.26	0.21	2531.56	87.08	2.24	
63	4,809	1.2	9.3			96	4757.32	16.52	-493.02	493.28	493.29	271.92	0.70	0.63	2629.16	-10.52	3.68	
64	4,905	1.6	15.4			96	4853.29	18.80	-492.50	492.82	492.86	272.19	0.44	0.42	2727.11	-108.47	5.98	
65	5,001	0.9	25.8			96	4949.26	20.77	-491.82	492.19	492.25	272.42	0.76	-0.73	2825.81	-207.17	7.97	
66	5,097	0.8	19.0			96	5045.25	22.09	-491.27	491.68	491.77	272.57	0.15	-0.10	2924.01	-305.37	9.29	
67	5,193	0.7	61.0			96	5141.25	23.00	-490.54	490.97	491.08	272.69	0.57	-0.10	3023.05	-404.41	10.23	
PTB	5,252	0.7	61.0			59	5200.24	23.35	-489.91	490.35	490.46	272.73	0.00	0.00	3084.73	-466.09	10.60	