

MWD SURVEYS

Customer: TAPROCK OPERATI
Well: COSMO K 113H
Field/Block: WOLFCAMP
Co./Parish: LEA COUNTY
State: NEW MEXICO

PGS Job #: LNM5182818
MWD Operator: MIKE BOSCH
Directional Driller: JOHN PENNY
Date of First Survey: July 28, 2018
Date of Last Survey: August 19, 2018



PROFESSIONAL
DIRECTIONAL LTD
EXPERIENCE ENHANCES PERFORMANCE

Total Correction: 6.19 0 0

Vertical Section Plane: 358.47

Nominal Dip Angle: 59.85

Magnetic Field Strength: 47961

MD	INC	AZM	T.V.D	V. SECT	+N / -S	+E / -W	DIST	ANGLE	DLS	TEMP(F°)	SHK/VIB	DATE	TIME	FLOW	
1	151	0.5	103.1	151.00	-0.17	-0.15	0.64	0.66	103.10	0.33	90 °F	Green	07/28/18	18:59	577 (gpm)
2	241	0.4	33.3	241.00	-0.01	0.02	1.20	1.20	88.84	0.58	90 °F	Green	07/28/18	19:56	577 (gpm)
3	331	0.4	89.1	330.99	0.25	0.29	1.68	1.71	80.17	0.42	90 °F	Green	07/28/18	21:02	577 (gpm)
4	420	0.7	61.0	419.99	0.49	0.56	2.47	2.53	77.22	0.44	91 °F	Green	07/28/18	21:45	577 (gpm)
5	510	1.0	55.8	509.98	1.17	1.27	3.60	3.82	70.59	0.34	93 °F	Green	07/29/18	01:16	765 (gpm)
6	600	0.6	48.4	599.97	1.90	2.02	4.60	5.03	66.27	0.46	93 °F	Green	07/29/18	05:31	765 (gpm)
7	691	1.3	97.2	690.96	2.05	2.21	5.98	6.38	69.73	1.11	97 °F	Green	07/29/18	06:25	765 (gpm)
8	781	1.5	71.2	780.93	2.24	2.46	8.11	8.48	73.12	0.73	100 °F	Green	07/29/18	07:25	765 (gpm)
9	873	1.5	61.6	872.90	3.15	3.42	10.31	10.86	71.64	0.27	100 °F	Green	07/29/18	08:18	765 (gpm)
10	962	1.1	108.4	961.88	3.38	3.71	12.14	12.70	73.03	1.23	100 °F	Green	07/29/18	09:23	765 (gpm)
11	1,082	1.4	111.9	1081.85	2.41	2.80	14.60	14.86	79.16	0.26	100 °F	Green	08/01/18	20:27	765 (gpm)
12	1,176	2.1	149.1	1175.81	0.45	0.89	16.55	16.57	86.92	1.38	100 °F	Green	08/01/18	21:25	765 (gpm)
13	1,271	3.3	158.2	1270.70	-3.63	-3.14	18.46	18.72	99.66	1.34	100 °F	Green	08/01/18	22:26	765 (gpm)
14	1,365	3.9	169.3	1364.52	-9.33	-8.80	20.06	21.90	113.68	0.98	104 °F	Green	08/01/18	23:15	765 (gpm)
15	1,459	3.9	172.6	1458.30	-15.66	-15.11	21.06	25.92	125.65	0.24	104 °F	Green	08/01/18	23:42	765 (gpm)
16	1,553	3.6	175.9	1552.10	-21.79	-21.22	21.68	30.34	134.38	0.39	109 °F	Green	08/02/18	00:27	765 (gpm)
17	1,648	3.3	178.0	1646.93	-27.51	-26.93	21.99	34.77	140.76	0.34	111 °F	Green	08/02/18	00:52	765 (gpm)
18	1,742	2.8	194.2	1740.80	-32.42	-31.86	21.52	38.45	145.96	1.05	91 °F	Green	08/02/18	12:00	650 (gpm)
19	1,931	3.0	198.7	1929.55	-41.51	-41.02	18.81	45.12	155.37	0.16	91 °F	Green	08/02/18	13:02	650 (gpm)
20	2,025	2.8	190.6	2023.43	-46.06	-45.60	17.59	48.88	158.90	0.48	99 °F	Green	08/02/18	13:30	650 (gpm)
21	2,120	3.3	196.0	2118.30	-50.93	-50.51	16.41	53.11	162.00	0.61	100 °F	Green	08/02/18	14:09	650 (gpm)
22	2,214	4.1	203.2	2212.10	-56.57	-56.20	14.34	58.01	165.68	0.98	104 °F	Green	08/02/18	14:57	650 (gpm)
23	2,308	4.4	202.4	2305.85	-62.91	-62.63	11.65	63.70	169.47	0.33	108 °F	Green	08/02/18	15:35	650 (gpm)
24	2,403	4.8	213.7	2400.54	-69.49	-69.30	8.05	69.77	173.37	1.04	108 °F	Green	08/02/18	16:53	650 (gpm)
25	2,497	4.8	218.8	2494.21	-75.70	-75.64	3.41	75.72	177.42	0.45	109 °F	Green	08/02/18	17:29	650 (gpm)
26	2,592	4.7	217.9	2588.89	-81.74	-81.81	-1.48	81.82	181.03	0.13	109 °F	Green	08/02/18	17:59	690 (gpm)
27	2,686	4.3	218.5	2682.60	-87.41	-87.60	-6.04	87.81	183.94	0.43	113 °F	Green	08/02/18	18:39	690 (gpm)

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28	2,781	4.0	216.7	2777.35	-92.74	-93.05	-10.23	93.61	186.28	0.34	115 °F	Green	08/02/18	19:23	690 (gpm)
29	2,875	3.9	218.0	2871.12	-97.78	-98.20	-14.16	99.21	188.21	0.14	115 °F	Green	08/02/18	20:02	690 (gpm)
30	2,969	3.9	219.8	2964.91	-102.65	-103.17	-18.17	104.76	189.99	0.13	117 °F	Green	08/02/18	20:32	690 (gpm)
31	3,064	3.7	225.8	3059.70	-107.15	-107.79	-22.44	110.10	191.76	0.47	117 °F	Green	08/02/18	21:09	690 (gpm)
32	3,158	3.3	216.8	3153.52	-111.33	-112.07	-26.23	115.10	193.18	0.72	118 °F	Green	08/02/18	22:27	690 (gpm)
33	3,253	3.3	212.9	3248.36	-115.73	-116.56	-29.36	120.20	194.14	0.24	118 °F	Green	08/02/18	23:32	690 (gpm)
34	3,347	3.5	216.7	3342.20	-120.22	-121.13	-32.54	125.42	195.04	0.32	120 °F	Green	08/03/18	00:31	690 (gpm)
35	3,441	3.3	211.9	3436.03	-124.73	-125.73	-35.69	130.69	195.85	0.37	120 °F	Green	08/03/18	01:45	690 (gpm)
36	3,536	3.3	215.9	3530.88	-129.18	-130.26	-38.74	135.90	196.56	0.24	120 °F	Green	08/03/18	02:49	690 (gpm)
37	3,630	3.2	217.9	3624.73	-133.36	-134.52	-41.93	140.91	197.31	0.16	120 °F	Green	08/03/18	04:19	690 (gpm)
38	3,725	3.0	192.2	3719.59	-137.82	-139.05	-44.09	145.87	197.59	1.47	120 °F	Green	08/03/18	05:29	690 (gpm)
39	3,819	3.5	175.7	3813.44	-143.08	-144.31	-44.39	150.99	197.10	1.12	118 °F	Green	08/03/18	06:32	690 (gpm)
40	3,913	4.3	183.0	3907.22	-149.45	-150.69	-44.36	157.09	196.40	1.00	118 °F	Green	08/03/18	07:51	690 (gpm)
41	4,008	4.4	181.2	4001.95	-156.64	-157.89	-44.62	164.08	195.78	0.18	118 °F	Green	08/03/18	08:30	690 (gpm)
42	4,102	3.6	196.4	4095.72	-163.05	-164.33	-45.53	170.52	195.49	1.41	120 °F	Green	08/03/18	10:25	690 (gpm)
43	4,196	3.8	208.0	4189.53	-168.57	-169.91	-47.83	176.51	195.72	0.82	120 °F	Green	08/03/18	11:30	690 (gpm)
44	4,290	3.6	204.7	4283.33	-173.93	-175.34	-50.52	182.48	196.07	0.31	120 °F	Green	08/03/18	12:34	690 (gpm)
45	4,385	4.1	220.6	4378.12	-179.12	-180.63	-53.98	188.52	196.64	1.24	117 °F	Green	08/03/18	13:10	690 (gpm)
46	4,479	4.9	238.8	4471.83	-183.60	-185.26	-59.60	194.61	197.83	1.73	117 °F	Green	08/03/18	13:45	690 (gpm)
47	4,574	4.3	252.7	4566.53	-186.58	-188.42	-66.47	199.80	199.43	1.33	118 °F	Green	08/03/18	15:02	690 (gpm)
48	4,668	2.0	249.5	4660.38	-188.07	-190.05	-71.37	203.01	200.58	2.45	117 °F	Green	08/03/18	15:56	690 (gpm)
49	4,762	1.2	162.7	4754.36	-189.55	-191.56	-72.62	204.86	200.76	2.42	117 °F	Green	08/03/18	16:45	690 (gpm)
50	4,857	2.5	138.8	4849.31	-192.10	-194.07	-70.96	206.63	200.08	1.56	118 °F	Green	08/03/18	17:33	690 (gpm)
51	4,951	2.6	136.1	4943.21	-195.26	-197.15	-68.13	208.59	199.06	0.17	118 °F	Green	08/03/18	18:34	690 (gpm)
52	4,993	2.5	137.5	4985.17	-196.65	-198.51	-66.85	209.46	198.61	0.28	118 °F	Green	08/03/18	19:03	690 (gpm)
53	5,093	2.2	140.0	5085.09	-199.80	-201.59	-64.14	211.55	197.65	0.32	104 °F	Green	08/05/18	21:21	595 (gpm)
54	5,188	2.3	168.6	5180.02	-203.11	-204.85	-62.59	214.20	196.99	1.17	111 °F	Green	08/05/18	23:04	595 (gpm)

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55	5,282	2.3	193.6	5273.94	-206.79	-208.54	-62.66	217.75	196.73	1.06	113 °F	Green	08/06/18	00:26	595 (gpm)
56	5,377	2.4	211.8	5368.86	-210.29	-212.08	-64.16	221.57	196.83	0.79	113 °F	Green	08/06/18	01:22	595 (gpm)
57	5,471	2.3	216.8	5462.79	-213.41	-215.26	-66.33	225.25	197.13	0.24	115 °F	Green	08/06/18	01:47	595 (gpm)
58	5,565	2.9	216.7	5556.69	-216.76	-218.68	-68.88	229.27	197.48	0.64	115 °F	Green	08/06/18	02:36	595 (gpm)
59	5,660	3.0	217.2	5651.56	-220.59	-222.59	-71.82	233.89	197.88	0.11	115 °F	Green	08/06/18	03:05	595 (gpm)
60	5,754	3.0	218.7	5745.43	-224.39	-226.46	-74.84	238.51	198.29	0.08	115 °F	Green	08/06/18	03:31	595 (gpm)
61	5,848	3.5	210.7	5839.28	-228.69	-230.85	-77.85	243.62	198.63	0.72	115 °F	Green	08/06/18	04:21	595 (gpm)
62	5,943	3.4	210.3	5934.11	-233.54	-235.78	-80.75	249.22	198.90	0.11	117 °F	Green	08/06/18	04:46	595 (gpm)
63	6,037	3.4	208.6	6027.95	-238.32	-240.63	-83.49	254.70	199.13	0.11	117 °F	Green	08/06/18	05:16	595 (gpm)
64	6,132	3.3	206.0	6122.78	-243.18	-245.56	-86.04	260.20	199.31	0.19	117 °F	Green	08/06/18	05:47	595 (gpm)
65	6,321	2.6	210.9	6311.53	-251.62	-254.13	-90.62	269.80	199.63	0.39	118 °F	Green	08/06/18	06:36	595 (gpm)
66	6,415	2.6	212.5	6405.44	-255.19	-257.76	-92.86	273.97	199.81	0.08	118 °F	Green	08/06/18	07:01	595 (gpm)
67	6,510	2.5	210.9	6500.34	-258.72	-261.35	-95.08	278.11	199.99	0.13	118 °F	Green	08/06/18	07:25	595 (gpm)
68	6,605	2.4	208.6	6595.25	-262.19	-264.88	-97.10	282.11	200.13	0.15	118 °F	Green	08/06/18	07:57	595 (gpm)
69	6,699	2.5	211.0	6689.17	-265.62	-268.36	-99.10	286.07	200.27	0.15	117 °F	Green	08/06/18	08:20	595 (gpm)
70	6,793	2.3	211.9	6783.09	-268.92	-271.72	-101.15	289.94	200.42	0.22	117 °F	Green	08/06/18	08:44	595 (gpm)
71	6,887	2.5	204.4	6877.00	-272.34	-275.19	-102.99	293.83	200.52	0.40	117 °F	Green	08/06/18	09:06	595 (gpm)
72	6,982	1.6	192.2	6971.94	-275.49	-278.37	-104.13	297.21	200.51	1.05	118 °F	Green	08/06/18	09:50	595 (gpm)
73	7,076	1.5	191.3	7065.91	-277.97	-280.86	-104.65	299.72	200.44	0.11	118 °F	Green	08/06/18	10:29	595 (gpm)
74	7,170	1.6	194.0	7159.87	-280.43	-283.34	-105.21	302.24	200.37	0.13	118 °F	Green	08/06/18	11:13	595 (gpm)
75	7,264	1.6	190.3	7253.84	-282.98	-285.91	-105.76	304.84	200.30	0.11	120 °F	Green	08/06/18	11:54	595 (gpm)
76	7,358	0.9	156.5	7347.81	-284.95	-287.87	-105.70	306.67	200.16	1.05	120 °F	Green	08/06/18	12:51	595 (gpm)
77	7,453	1.1	150.5	7442.80	-286.45	-289.35	-104.95	307.80	199.94	0.24	120 °F	Green	08/06/18	13:22	595 (gpm)
78	7,547	1.2	154.4	7536.78	-288.14	-291.02	-104.08	309.08	199.68	0.14	120 °F	Green	08/06/18	13:56	595 (gpm)
79	7,641	1.3	145.6	7630.76	-289.94	-292.79	-103.06	310.40	199.39	0.23	120 °F	Green	08/06/18	14:25	595 (gpm)
80	7,735	1.3	150.6	7724.74	-291.77	-294.60	-101.93	311.74	199.09	0.12	122 °F	Green	08/06/18	14:56	595 (gpm)
81	7,829	1.3	140.7	7818.71	-293.56	-296.36	-100.73	313.01	198.77	0.24	122 °F	Green	08/06/18	15:26	595 (gpm)

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82	7,923	1.3	137.2	7912.69	-295.20	-297.96	-99.33	314.08	198.44	0.08	124 °F	Green	08/06/18	15:55	595 (gpm)
83	8,018	1.2	136.4	8007.66	-296.75	-299.47	-97.91	315.07	198.11	0.11	124 °F	Green	08/06/18	16:25	595 (gpm)
84	8,112	1.0	127.2	8101.65	-298.00	-300.68	-96.58	315.81	197.81	0.28	126 °F	Green	08/06/18	16:56	595 (gpm)
85	8,207	1.0	97.1	8196.63	-298.64	-301.29	-95.10	315.94	197.52	0.55	126 °F	Green	08/06/18	17:45	595 (gpm)
86	8,302	1.1	76.4	8291.62	-298.57	-301.17	-93.39	315.32	197.23	0.41	126 °F	Green	08/06/18	18:23	595 (gpm)
87	8,396	1.3	69.0	8385.60	-298.03	-300.58	-91.52	314.20	196.93	0.27	127 °F	Green	08/06/18	19:03	595 (gpm)
	8,491	1.6	55.4	8480.57	-296.95	-299.44	-89.42	312.51	196.63	0.48	127 °F	Green	08/06/18	19:38	595 (gpm)
89	8,586	1.7	41.9	8575.53	-295.20	-297.64	-87.39	310.20	196.36	0.42	127 °F	Green	08/06/18	20:14	595 (gpm)
	8,680	1.3	59.1	8669.50	-293.66	-296.05	-85.54	308.16	196.12	0.64	129 °F	Green	08/06/18	20:48	595 (gpm)
91	8,775	1.3	66.3	8764.47	-292.73	-295.07	-83.63	306.69	195.82	0.17	129 °F	Green	08/06/18	21:34	595 (gpm)
92	8,869	1.5	77.4	8858.44	-292.09	-294.37	-81.45	305.43	195.47	0.36	129 °F	Green	08/06/18	22:24	595 (gpm)
93	8,964	1.5	83.1	8953.41	-291.73	-293.95	-79.00	304.38	195.04	0.16	129 °F	Green	08/06/18	23:19	595 (gpm)
94	9,059	1.5	93.0	9048.38	-291.72	-293.86	-76.53	303.67	194.60	0.27	127 °F	Green	08/07/18	00:39	450 (gpm)
95	9,153	1.4	96.7	9142.35	-291.98	-294.06	-74.16	303.27	194.15	0.15	127 °F	Green	08/07/18	01:49	422 (gpm)
96	9,248	1.3	94.2	9237.32	-292.25	-294.28	-71.93	302.94	193.74	0.12	126 °F	Green	08/07/18	03:36	450 (gpm)
97	9,342	0.8	67.2	9331.31	-292.12	-294.10	-70.26	302.38	193.44	0.73	126 °F	Green	08/07/18	05:48	502 (gpm)
	9,437	1.0	41.1	9426.29	-291.27	-293.22	-69.11	301.25	193.26	0.47	126 °F	Green	08/07/18	06:57	448 (gpm)
99	9,531	0.9	44.5	9520.28	-290.15	-292.07	-68.05	299.90	193.12	0.12	126 °F	Green	08/07/18	08:27	448 (gpm)
100	9,626	0.7	44.8	9615.27	-289.24	-291.13	-67.12	298.77	192.98	0.21	126 °F	Green	08/07/18	09:39	448 (gpm)
101	9,721	0.6	43.3	9710.27	-288.48	-290.36	-66.37	297.85	192.88	0.11	126 °F	Green	08/07/18	11:03	448 (gpm)
102	9,815	0.5	29.7	9804.26	-287.78	-289.64	-65.83	297.03	192.80	0.17	126 °F	Green	08/07/18	15:21	448 (gpm)
103	9,916	0.9	347.4	9905.26	-286.63	-288.49	-65.78	295.89	192.85	0.62	122 °F	Green	08/08/18	16:25	550 (gpm)
104	9,961	5.2	342.4	9950.18	-284.32	-286.20	-66.48	293.81	193.08	9.56	122 °F	Green	08/08/18	17:46	550 (gpm)
105	10,011	11.6	350.7	9999.62	-277.15	-279.07	-67.97	287.23	193.69	12.99	124 °F	Green	08/08/18	19:39	550 (gpm)
106	10,056	17.5	351.3	10043.16	-265.95	-267.91	-69.73	276.83	194.59	13.12	126 °F	Green	08/08/18	21:52	550 (gpm)
107	10,106	22.9	351.1	10090.07	-248.83	-250.85	-72.37	261.08	196.09	10.80	127 °F	Green	08/08/18	23:48	550 (gpm)
108	10,153	25.1	354.0	10133.00	-229.82	-231.90	-74.83	243.67	197.88	5.31	127 °F	Green	08/09/18	01:40	550 (gpm)

MWD SURVEYS

Customer: TAPROCK OPERATI
Well: COSMO K 113H
Field/Block: WOLFCAMP
Co./Parish: LEA COUNTY
State: NEW MEXICO

PGS Job #: LNM5182818
MWD Operator: MIKE BOSTIC
Directional Driller: JOHN PENNY
Date of First Survey: July 28, 2018
Date of Last Survey: August 19, 2018



Total Correction: 6.19 0 0

Vertical Section Plane: 358.47

Nominal Dip Angle: 59.85

Magnetic Field Strength: 47961

MD	INC	AZM	T.V.D	V. SECT	+N / -S	+E / -W	DIST	ANGLE	DLS	TEMP(F°)	SHK/VIB	DATE	TIME	FLOW	
109	10,201	27.1	356.6	10176.11	-208.74	-210.86	-76.54	224.32	199.95	4.80	126 °F	Green	08/09/18	05:43	550 (gpm)
110	10,247	29.5	356.9	10216.60	-186.94	-189.09	-77.78	204.46	202.36	5.23	127 °F	Green	08/10/18	01:15	550 (gpm)
111	10,295	35.4	358.4	10257.09	-161.20	-163.36	-78.81	181.38	205.75	12.40	127 °F	Green	08/10/18	03:31	550 (gpm)
112	10,342	42.3	359.1	10293.67	-131.74	-133.91	-79.44	155.70	210.68	14.71	126 °F	Green	08/10/18	05:53	550 (gpm)
113	10,390	45.8	358.1	10328.17	-98.37	-100.55	-80.26	128.65	218.60	7.43	126 °F	Green	08/10/18	08:34	550 (gpm)
114	10,436	48.5	356.9	10359.45	-64.66	-66.86	-81.74	105.60	230.72	6.17	108 °F	Green	08/10/18	16:56	450 (gpm)
115	10,483	50.8	357.4	10389.88	-28.85	-31.09	-83.52	89.12	249.58	4.96	102 °F	Green	08/10/18	20:45	450 (gpm)
116	10,530	55.1	358.3	10418.19	8.65	6.39	-84.92	85.16	274.30	9.28	99 °F	Green	08/11/18	00:21	450 (gpm)
117	10,578	61.0	359.4	10443.58	49.36	47.09	-85.72	97.80	298.78	12.44	129 °F	Green	08/11/18	22:46	465 (gpm)
118	10,625	66.3	0.5	10464.43	91.45	89.19	-85.75	123.72	316.13	11.47	129 °F	Green	08/12/18	03:08	601 (gpm)
119	10,673	71.4	1.2	10481.75	136.16	133.93	-85.08	158.67	327.57	10.71	129 °F	Green	08/12/18	06:33	601 (gpm)
120	10,719	78.7	1.3	10493.61	180.52	178.34	-84.11	197.18	334.75	15.87	131 °F	Green	08/12/18	11:13	601 (gpm)
121	10,765	84.7	0.7	10500.24	225.97	223.83	-83.32	238.83	339.58	13.11	131 °F	Green	08/13/18	10:10	601 (gpm)
122	10,859	87.3	0.3	10506.80	319.68	317.59	-82.50	328.13	345.44	2.80	131 °F	Green	08/13/18	11:40	601 (gpm)
123	10,954	87.7	0.1	10510.94	414.54	412.50	-82.17	420.60	348.73	0.47	136 °F	Green	08/13/18	12:22	601 (gpm)
124	11,048	87.6	359.8	10514.80	508.43	506.42	-82.25	513.05	350.77	0.34	136 °F	Green	08/13/18	13:03	601 (gpm)
125	11,143	88.1	359.9	10518.36	603.34	601.35	-82.50	606.98	352.19	0.54	140 °F	Green	08/13/18	13:43	601 (gpm)
126	11,237	88.6	0.5	10521.07	697.25	695.31	-82.17	700.15	353.26	0.83	144 °F	Green	08/13/18	14:21	601 (gpm)
127	11,332	89.0	0.6	10523.06	792.17	790.28	-81.26	794.45	354.13	0.43	144 °F	Green	08/13/18	15:05	601 (gpm)
128	11,427	88.6	359.8	10525.05	887.11	885.26	-80.93	888.95	354.78	0.94	144 °F	Green	08/13/18	15:45	601 (gpm)
129	11,521	88.0	359.4	10527.84	981.05	979.22	-81.58	982.61	355.24	0.77	145 °F	Green	08/13/18	16:26	601 (gpm)
130	11,615	89.0	358.7	10530.30	1,075.01	1,073.17	-83.14	1,076.38	355.57	1.30	147 °F	Green	08/13/18	17:39	601 (gpm)
131	11,709	90.9	359.0	10530.38	1,169.00	1,167.15	-85.03	1,170.24	355.83	2.05	145 °F	Green	08/13/18	18:44	601 (gpm)
132	11,804	91.6	358.6	10528.31	1,263.97	1,262.10	-87.02	1,265.10	356.06	0.85	149 °F	Green	08/13/18	19:38	601 (gpm)
133	11,898	91.7	358.6	10525.60	1,357.94	1,356.03	-89.31	1,358.97	356.23	0.11	151 °F	Green	08/13/18	20:32	601 (gpm)
134	11,992	92.5	358.1	10522.16	1,451.87	1,449.93	-92.02	1,452.85	356.37	1.00	151 °F	Green	08/13/18	21:19	601 (gpm)
135	12,087	92.9	357.9	10517.68	1,546.76	1,544.77	-95.33	1,547.71	356.47	0.47	153 °F	Green	08/13/18	22:09	601 (gpm)

MWD SURVEYS

Customer: TAPROCK OPERATI
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State: NEW MEXICO

PGS Job #: LNM5182818
MWD Operator: MIKE BOSTIC
Directional Driller: JOHN PENNY
Date of First Survey: July 28, 2018
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Total Correction: 6.19 0 0

Vertical Section Plane: 358.47

Nominal Dip Angle: 59.85

Magnetic Field Strength: 47961

MD	INC	AZM	T.V.D	V. SECT	+N / -S	+E / -W	DIST	ANGLE	DLS	TEMP(F°)	SHK/VIB	DATE	TIME	FLOW	
136	12,182	94.0	357.1	10511.96	1,641.57	1,639.50	-99.47	1,642.52	356.53	1.43	153 °F	Green	08/13/18	23:01	601 (gpm)
137	12,276	92.4	355.8	10506.72	1,735.36	1,733.17	-105.28	1,736.37	356.52	2.19	153 °F	Green	08/14/18	00:58	601 (gpm)
138	12,370	91.0	356.2	10503.93	1,829.23	1,826.90	-111.83	1,830.32	356.50	1.55	153 °F	Green	08/14/18	02:30	601 (gpm)
139	12,464	92.0	355.7	10501.47	1,923.11	1,920.63	-118.47	1,924.28	356.47	1.19	153 °F	Green	08/14/18	03:21	601 (gpm)
140	12,559	92.8	355.6	10497.49	2,017.91	2,015.27	-125.67	2,019.19	356.43	0.85	153 °F	Green	08/14/18	04:12	601 (gpm)
141	12,653	92.4	356.2	10493.22	2,111.72	2,108.93	-132.38	2,113.09	356.41	0.77	153 °F	Green	08/14/18	05:21	601 (gpm)
142	12,748	92.9	355.6	10488.83	2,206.52	2,203.59	-139.17	2,207.98	356.39	0.82	153 °F	Green	08/14/18	06:10	601 (gpm)
143	12,842	92.5	355.0	10484.40	2,300.27	2,297.17	-146.86	2,301.86	356.34	0.77	158 °F	Green	08/14/18	07:02	601 (gpm)
144	12,937	93.4	355.2	10479.52	2,394.98	2,391.70	-154.96	2,396.71	356.29	0.97	158 °F	Green	08/14/18	07:54	601 (gpm)
145	13,032	94.3	355.3	10473.14	2,489.62	2,486.15	-162.81	2,491.48	356.25	0.95	158 °F	Green	08/14/18	08:47	601 (gpm)
146	13,127	92.2	356.1	10467.75	2,584.35	2,580.73	-169.92	2,586.32	356.23	2.36	158 °F	Green	08/14/18	10:45	601 (gpm)
147	13,222	92.0	356.6	10464.27	2,679.22	2,675.47	-175.97	2,681.25	356.24	0.57	158 °F	Green	08/14/18	11:37	601 (gpm)
148	13,316	92.7	358.0	10460.42	2,773.11	2,769.29	-180.39	2,775.15	356.27	1.66	158 °F	Green	08/14/18	13:19	601 (gpm)
149	13,411	93.4	359.7	10455.36	2,867.97	2,864.13	-182.29	2,869.92	356.36	1.93	158 °F	Green	08/14/18	14:01	601 (gpm)
150	13,505	92.3	0.3	10450.69	2,961.82	2,958.01	-182.29	2,963.62	356.47	1.33	160 °F	Green	08/14/18	16:09	601 (gpm)
151	13,600	88.8	359.9	10449.77	3,056.76	3,052.99	-182.13	3,058.42	356.59	3.71	160 °F	Green	08/14/18	18:55	601 (gpm)
152	13,694	88.0	0.0	10452.40	3,150.70	3,146.95	-182.21	3,152.22	356.69	0.86	160 °F	Green	08/14/18	19:40	601 (gpm)
153	13,789	88.6	0.2	10455.22	3,245.62	3,241.91	-182.05	3,247.02	356.79	0.67	162 °F	Green	08/14/18	20:43	601 (gpm)
154	13,883	88.6	0.5	10457.51	3,339.54	3,335.88	-181.47	3,340.81	356.89	0.32	162 °F	Green	08/14/18	21:42	601 (gpm)
155	13,978	89.6	0.9	10459.01	3,434.45	3,430.86	-180.31	3,435.60	356.99	1.13	162 °F	Green	08/14/18	23:17	601 (gpm)
156	14,073	90.2	0.9	10459.17	3,529.37	3,525.85	-178.82	3,530.38	357.10	0.63	162 °F	Green	08/15/18	00:27	601 (gpm)
157	14,167	90.2	0.9	10458.84	3,623.28	3,619.84	-177.34	3,624.18	357.20	0.00	163 °F	Green	08/15/18	01:31	601 (gpm)
158	14,262	89.3	1.0	10459.26	3,718.19	3,714.82	-175.77	3,718.98	357.29	0.95	163 °F	Green	08/15/18	02:26	601 (gpm)
159	14,356	89.9	0.7	10459.92	3,812.11	3,808.81	-174.37	3,812.80	357.38	0.71	165 °F	Green	08/15/18	03:25	601 (gpm)
160	14,450	90.3	0.9	10459.75	3,906.03	3,902.80	-173.06	3,906.63	357.46	0.48	165 °F	Green	08/15/18	04:25	601 (gpm)
161	14,545	90.7	1.0	10458.92	4,000.93	3,997.78	-171.48	4,001.46	357.54	0.43	165 °F	Green	08/15/18	06:20	601 (gpm)
162	14,640	91.3	1.3	10457.26	4,095.82	4,092.75	-169.58	4,096.26	357.63	0.71	165 °F	Green	08/15/18	07:24	601 (gpm)

MWD SURVEYS

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Total Correction: 6.19 0 0

Vertical Section Plane: 358.47

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	MD	INC	AZM	T.V.D	V. SECT	+N / -S	+E / -W	DIST	ANGLE	DLS	TEMP(F°)	SHK/VIB	DATE	TIME	FLOW	
	163	14,734	92.0	1.5	10454.56	4,189.65	4,186.68	-167.28	4,190.02	357.71	0.77	167 °F	Green	08/15/18	08:26	601 (gpm)
	164	14,829	92.9	1.7	10450.50	4,284.42	4,281.55	-164.63	4,284.72	357.80	0.97	167 °F	Green	08/15/18	09:47	601 (gpm)
	165	14,923	93.2	1.4	10445.49	4,378.15	4,375.39	-162.09	4,378.39	357.88	0.45	167 °F	Green	08/15/18	11:52	601 (gpm)
	166	15,018	92.9	1.2	10440.44	4,472.90	4,470.23	-159.94	4,473.09	357.95	0.38	167 °F	Green	08/15/18	15:35	601 (gpm)
	167	15,113	93.1	0.5	10435.47	4,567.69	4,565.09	-158.53	4,567.84	358.01	0.77	154 °F	Green	08/18/18	02:16	601 (gpm)
	168	15,207	91.7	1.0	10431.53	4,661.53	4,658.99	-157.30	4,661.65	358.07	1.58	154 °F	Green	08/18/18	05:05	601 (gpm)
	169	15,302	90.2	1.2	10429.96	4,756.42	4,753.96	-155.48	4,756.50	358.13	1.59	154 °F	Green	08/18/18	06:48	601 (gpm)
	170	15,396	87.9	1.3	10431.52	4,850.29	4,847.92	-153.43	4,850.35	358.19	2.45	156 °F	Green	08/18/18	08:40	601 (gpm)
	171	15,491	87.3	2.2	10435.49	4,945.05	4,942.79	-150.53	4,945.08	358.26	1.14	156 °F	Green	08/18/18	09:37	601 (gpm)
	172	15,586	87.1	2.6	10440.13	5,039.71	5,037.59	-146.56	5,039.72	358.33	0.47	160 °F	Green	08/18/18	10:30	601 (gpm)
	173	15,680	87.1	1.3	10444.89	5,133.41	5,131.42	-143.36	5,133.42	358.40	1.38	162 °F	Green	08/18/18	12:25	601 (gpm)
	174	15,775	86.9	0.3	10449.86	5,228.20	5,226.28	-142.04	5,228.20	358.44	1.07	162 °F	Green	08/18/18	15:02	601 (gpm)
	175	15,869	88.1	359.7	10453.96	5,322.08	5,320.18	-142.04	5,322.08	358.47	1.43	160 °F	Green	08/18/18	17:31	601 (gpm)
	176	15,964	89.5	359.8	10455.95	5,417.03	5,415.16	-142.45	5,417.03	358.49	1.48	160 °F	Green	08/18/18	18:32	601 (gpm)
	177	16,059	89.1	359.6	10457.11	5,512.00	5,510.15	-142.95	5,512.00	358.51	0.47	163 °F	Green	08/18/18	19:31	601 (gpm)
	178	16,153	88.7	359.8	10458.92	5,605.96	5,604.13	-143.44	5,605.97	358.53	0.48	163 °F	Green	08/18/18	20:39	601 (gpm)
	179	16,247	89.2	359.8	10460.64	5,699.92	5,698.12	-143.77	5,699.93	358.55	0.53	165 °F	Green	08/19/18	00:54	601 (gpm)
	180	16,342	91.0	359.7	10460.47	5,794.89	5,793.11	-144.19	5,794.90	358.57	1.90	165 °F	Green	08/19/18	03:29	601 (gpm)
	181	16,437	91.6	359.9	10458.32	5,889.84	5,888.08	-144.52	5,889.86	358.59	0.67	165 °F	Green	08/19/18	04:25	601 (gpm)
	182	16,531	91.9	0.1	10455.45	5,983.77	5,982.04	-144.52	5,983.79	358.62	0.38	165 °F	Green	08/19/18	05:26	601 (gpm)
	183	16,626	92.8	0.0	10451.55	6,078.65	6,076.96	-144.44	6,078.68	358.64	0.95	167 °F	Green	08/19/18	06:30	601 (gpm)
	184	16,720	93.4	0.1	10446.47	6,172.48	6,170.82	-144.35	6,172.51	358.66	0.65	167 °F	Green	08/19/18	07:48	601 (gpm)
	185	16,746	93.4	0.2	10444.93	6,198.42	6,196.78	-144.29	6,198.46	358.67	0.38	169 °F	Green	08/19/18	08:13	601 (gpm)
	PTB	16,802	93.4	0.2	10441.61	6,254.30	6,252.68	-144.09	6,254.34	358.68	0.00	169 °F	Green	08/19/18	08:13	601 (gpm)