

30-015-45037

MWD SURVEYS	Customer:	Marathon Oil	ProDirectional Job #:	LNM1389518
	Well:	Fiddle Fee 24-28-23 WD 7H	MWD Operator:	Mike Remore
	Field/Block:	Carlsbad	Directional Driller:	Mark Waddle
	County:	Eddy	Date of First Survey:	July 31, 2018
	State:	New Mexico	Date of Last Survey:	October 9, 2018

PRODIRECTIONAL

Total Correction: 7.04 East Grid

Vertical Section Plane:			90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:			0.480					
Svy #	Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
Survey's are tied into:				Surface				Date Received:		N/A					
Company:				NA											

0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					
1	167	0.60	258.00	167.00	-0.85	-0.18	-0.86	0.87	258.00	0.36	93 °F		07/31/18	3:03	630 (gpm)
2	229	0.70	279.00	228.99	-1.54	-0.19	-1.55	1.56	263.00	0.41	93 °F		07/31/18	3:36	830 (gpm)
3	323	0.80	312.70	322.99	-2.60	0.34	-2.60	2.62	277.56	0.47	95 °F		07/31/18	4:02	806 (gpm)
4	416	0.90	320.60	415.98	-3.56	1.35	-3.54	3.79	290.88	0.17	97 °F		07/31/18	4:26	801 (gpm)
5	504	0.80	352.70	503.97	-4.09	2.49	-4.05	4.76	301.59	0.55	99 °F		07/31/18	4:48	795 (gpm)
6	608	1.20	10.60	607.95	-4.00	4.28	-3.95	5.82	317.35	0.48	91 °F		08/02/18	5:45	820 (gpm)
7	701	1.80	19.90	700.92	-3.36	6.61	-3.27	7.38	333.70	0.69	95 °F		08/02/18	6:22	825 (gpm)
8	794	2.60	0.60	793.85	-2.89	10.10	-2.75	10.46	344.76	1.16	99 °F		08/02/18	6:48	825 (gpm)
9	887	2.70	358.10	886.75	-3.00	14.40	-2.80	14.67	348.99	0.16	102 °F		08/02/18	7:11	866 (gpm)
10	978	2.50	353.50	977.66	-3.35	18.51	-3.10	18.77	350.50	0.32	106 °F		08/02/18	7:37	866 (gpm)
11	1,069	2.60	356.90	1068.57	-3.74	22.54	-3.43	22.80	351.34	0.20	109 °F		08/02/18	8:13	866 (gpm)
12	1,159	2.90	352.80	1158.46	-4.20	26.84	-3.83	27.11	351.88	0.40	111 °F		08/02/18	9:00	866 (gpm)
13	1,248	4.50	350.80	1247.27	-5.12	32.52	-4.67	32.85	351.83	1.80	115 °F		08/02/18	9:33	866 (gpm)
14	1,338	5.10	352.20	1336.96	-6.33	39.97	-5.78	40.38	351.78	0.68	120 °F		08/02/18	10:15	866 (gpm)
15	1,428	6.40	355.80	1426.50	-7.36	48.93	-6.69	49.39	352.22	1.50	124 °F		08/02/18	10:47	866 (gpm)
16	1,518	6.00	356.30	1515.98	-8.17	58.63	-7.36	59.09	352.85	0.45	126 °F		08/02/18	11:19	866 (gpm)
17	1,607	5.50	356.00	1604.53	-8.89	67.53	-7.96	68.00	353.28	0.56	129 °F		08/02/18	11:50	866 (gpm)
18	1,697	5.40	353.50	1694.12	-9.78	76.04	-8.74	76.54	353.45	0.29	131 °F		08/02/18	12:36	866 (gpm)
19	1,786	8.30	356.90	1782.48	-10.75	86.62	-9.56	87.14	353.70	3.29	135 °F		08/02/18	13:16	866 (gpm)
20	1,876	9.90	1.30	1871.34	-11.12	100.84	-9.73	101.31	354.49	1.94	135 °F		08/02/18	13:47	866 (gpm)
21	1,965	9.40	3.50	1959.08	-10.71	115.74	-9.12	116.10	355.50	0.70	136 °F		08/02/18	14:19	866 (gpm)
22	2,055	8.80	7.20	2047.95	-9.59	129.91	-7.80	130.14	356.56	0.93	129 °F		08/02/18	15:07	866 (gpm)
23	2,144	8.00	7.70	2136.00	-8.09	142.80	-6.12	142.93	357.55	0.90	133 °F		08/02/18	15:41	866 (gpm)
24	2,234	9.90	9.90	2224.90	-6.11	156.63	-3.95	156.68	358.55	2.14	135 °F		08/02/18	16:03	866 (gpm)

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	Field/Block:	Carlsbad	Directional Driller:	Mark Waddle
	County:	Eddy	Date of First Survey:	July 31, 2018
	State:	New Mexico	Date of Last Survey:	October 9, 2018

PRODIRECTIONAL

Total Correction: 7.04 East Grid

Vertical Section Plane:			90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:			0.480					
Svy #	Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
25	2,323	9.50	15.60	2312.63	-3.02	171.24	-0.66	171.24	359.78	1.17	136 °F		08/02/18	16:24	866 (gpm)
26	2,413	9.10	20.40	2401.44	1.27	185.07	3.82	185.10	1.18	0.97	129 °F		08/02/18	18:44	866 (gpm)
27	2,503	9.10	7.00	2490.32	4.42	198.80	7.17	198.93	2.06	2.35	135 °F		08/02/18	19:25	866 (gpm)
28	2,574	8.80	5.50	2560.46	5.48	209.78	8.37	209.95	2.29	0.54	136 °F		08/02/18	20:41	866 (gpm)
29	2,675	8.10	6.30	2660.36	6.80	224.54	9.89	224.76	2.52	0.70	102 °F		08/05/18	21:57	598 (gpm)
30	2,764	9.40	0.50	2748.32	7.36	238.04	10.64	238.28	2.56	1.76	108 °F		08/05/18	14:45	598 (gpm)
31	2,854	9.90	358.70	2837.05	7.04	253.13	10.53	253.35	2.38	0.65	109 °F		08/05/18	15:02	598 (gpm)
32	2,943	9.40	358.60	2924.79	6.48	268.04	10.18	268.24	2.18	0.56	109 °F		08/05/18	15:19	598 (gpm)
33	3,032	9.50	357.20	3012.58	5.75	282.64	9.64	282.81	1.95	0.28	111 °F		08/05/18	15:35	598 (gpm)
34	3,122	9.00	355.60	3101.41	4.64	297.08	8.74	297.21	1.69	0.62	111 °F		08/05/18	15:51	598 (gpm)
35	3,211	9.80	352.70	3189.22	2.95	311.54	7.25	311.62	1.33	1.04	113 °F		08/05/18	16:18	598 (gpm)
36	3,301	11.40	355.20	3277.68	1.00	328.00	5.53	328.04	0.97	1.85	115 °F		08/05/18	16:35	598 (gpm)
37	3,480	9.40	351.20	3453.73	-3.15	360.08	1.81	360.08	0.29	1.19	117 °F		08/05/18	17:14	598 (gpm)
38	3,570	9.40	353.30	3542.52	-5.34	374.64	-0.17	374.64	359.97	0.38	118 °F		08/05/18	17:40	598 (gpm)
39	3,659	10.00	355.40	3630.25	-7.01	389.56	-1.64	389.56	359.76	0.78	118 °F		08/05/18	18:01	598 (gpm)
40	3,749	9.70	354.50	3718.93	-8.57	404.90	-2.99	404.91	359.58	0.37	120 °F		08/05/18	18:23	598 (gpm)
41	3,839	9.90	353.20	3807.61	-10.43	420.12	-4.64	420.15	359.37	0.33	120 °F		08/05/18	18:40	588 (gpm)
42	3,928	10.60	354.00	3895.19	-12.41	435.86	-6.40	435.91	359.16	0.80	120 °F		08/05/18	19:06	588 (gpm)
43	4,018	10.00	358.00	3983.74	-13.76	451.91	-7.53	451.97	359.04	1.04	120 °F		08/05/18	19:22	588 (gpm)
44	4,107	9.10	355.20	4071.51	-14.83	466.64	-8.39	466.72	358.97	1.14	122 °F		08/05/18	19:40	588 (gpm)
45	4,197	8.70	356.00	4160.42	-16.09	480.52	-9.46	480.62	358.87	0.47	124 °F		08/05/18	20:07	598 (gpm)
46	4,286	9.50	1.90	4248.30	-16.51	494.58	-9.69	494.67	358.88	1.38	124 °F		08/05/18	20:25	598 (gpm)
47	4,376	9.30	1.50	4337.10	-16.27	509.27	-9.25	509.36	358.96	0.23	126 °F		08/05/18	20:42	598 (gpm)
48	4,465	9.40	0.90	4424.91	-16.17	523.73	-8.95	523.81	359.02	0.16	126 °F		08/05/18	21:00	598 (gpm)
49	4,555	10.60	0.50	4513.54	-16.20	539.36	-8.76	539.43	359.07	1.34	126 °F		08/05/18	21:27	598 (gpm)
50	4,645	10.90	0.90	4601.97	-16.22	556.14	-8.56	556.21	359.12	0.34	126 °F		08/05/18	21:44	598 (gpm)
51	4,734	10.10	359.80	4689.47	-16.34	572.36	-8.45	572.42	359.15	0.93	127 °F		08/05/18	22:05	598 (gpm)

MWD SURVEYS

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Field/Block:	Carlsbad	Directional Driller:	Mark Waddle
County:	Eddy	Date of First Survey:	July 31, 2018
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PRODIRECTIONAL

Total Correction: 7.04 East Grid

Vertical Section Plane:			90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:				0.480				
Svy #	Measured Depth	Inc.	Az.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
52	4,823	8.90	357.30	4777.25	-16.90	587.04	-8.80	587.11	359.14	1.43	129 °F		08/05/18	22:25	598 (gpm)
53	4,913	9.30	1.90	4866.12	-17.18	601.26	-8.89	601.33	359.15	0.92	129 °F		08/05/18	22:56	598 (gpm)
54	5,003	8.60	4.50	4955.02	-16.60	615.24	-8.12	615.29	359.24	0.90	129 °F		08/05/18	23:17	598 (gpm)
55	5,092	8.00	2.30	5043.09	-16.01	628.06	-7.35	628.11	359.33	0.76	129 °F		08/05/18	23:49	598 (gpm)
56	5,182	7.20	359.50	5132.30	-15.97	639.96	-7.15	640.00	359.36	0.98	131 °F		08/06/18	0:09	598 (gpm)
57	5,271	7.80	4.80	5220.54	-15.67	651.56	-6.69	651.59	359.41	1.03	129 °F		08/06/18	1:08	598 (gpm)
58	5,361	9.00	6.90	5309.57	-14.50	664.63	-5.34	664.65	359.54	1.38	129 °F		08/06/18	1:46	598 (gpm)
59	5,451	9.70	5.30	5398.38	-13.15	679.17	-3.79	679.18	359.68	0.83	131 °F		08/06/18	2:15	598 (gpm)
60	5,541	9.80	6.90	5487.08	-11.74	694.32	-2.17	694.33	359.82	0.32	129 °F		08/06/18	2:54	598 (gpm)
61	5,630	10.20	7.40	5574.73	-10.03	709.66	-0.24	709.66	359.98	0.46	131 °F		08/06/18	3:17	598 (gpm)
62	5,720	10.80	3.60	5663.22	-8.70	725.97	1.31	725.98	0.10	1.02	129 °F		08/06/18	3:59	598 (gpm)
63	5,810	10.80	2.60	5751.63	-8.02	742.81	2.22	742.82	0.17	0.21	131 °F		08/06/18	4:22	598 (gpm)
64	5,899	10.70	3.70	5839.06	-7.34	759.39	3.14	759.39	0.24	0.26	131 °F		08/06/18	5:03	598 (gpm)
65	5,989	10.30	4.30	5927.56	-6.42	775.75	4.28	775.76	0.32	0.46	133 °F		08/06/18	5:30	598 (gpm)
66	6,079	10.60	2.70	6016.06	-5.65	792.04	5.27	792.06	0.38	0.46	133 °F		08/06/18	6:34	598 (gpm)
67	6,171	10.70	4.30	6106.48	-4.84	809.01	6.31	809.04	0.45	0.34	109 °F		08/06/18	21:24	496 (gpm)
68	6,261	9.40	2.20	6195.10	-4.15	824.69	7.22	824.72	0.50	1.50	113 °F		08/06/18	22:22	496 (gpm)
69	6,351	8.40	357.50	6284.01	-4.35	838.60	7.21	838.63	0.49	1.37	113 °F		08/06/18	23:21	598 (gpm)
70	6,440	9.80	354.00	6371.89	-5.62	852.63	6.14	852.65	0.41	1.69	117 °F		08/07/18	0:31	598 (gpm)
71	6,530	11.30	346.50	6460.37	-8.70	868.82	3.28	868.83	0.22	2.26	118 °F		08/07/18	1:31	598 (gpm)
72	6,619	9.80	337.80	6547.87	-13.81	884.31	-1.62	884.32	359.90	2.45	120 °F		08/07/18	2:12	598 (gpm)
73	6,708	9.90	331.30	6635.56	-20.54	898.04	-8.15	898.08	359.48	1.25	122 °F		08/07/18	3:15	598 (gpm)
74	6,799	7.60	317.70	6725.51	-28.50	909.35	-15.96	909.49	358.99	3.38	124 °F		08/07/18	3:51	598 (gpm)
75	6,888	6.30	315.50	6813.85	-35.99	917.19	-23.35	917.49	358.54	1.49	124 °F		08/07/18	4:54	598 (gpm)
76	6,978	8.70	318.30	6903.07	-44.10	925.80	-31.34	926.33	358.06	2.70	126 °F		08/07/18	5:55	598 (gpm)
77	7,068	9.50	318.40	6991.94	-53.70	936.43	-40.80	937.32	357.51	0.89	127 °F		08/07/18	7:02	598 (gpm)
78	7,157	9.90	319.90	7079.67	-63.66	947.78	-50.60	949.13	356.94	0.53	126 °F		08/07/18	8:27	598 (gpm)

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Svy #	Measured Depth	Inc.	Azim.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
79	7,247	13.60	327.90	7167.77	-74.48	962.66	-61.21	964.61	356.36	4.48	127 °F		08/07/18	9:27	598 (gpm)
80	7,337	11.60	325.40	7255.60	-85.47	979.08	-71.97	981.72	355.80	2.30	129 °F		08/07/18	10:02	598 (gpm)
81	7,427	11.40	326.60	7343.79	-95.71	993.95	-82.01	997.33	355.28	0.35	129 °F		08/07/18	11:40	598 (gpm)
82	7,516	10.10	329.10	7431.23	-104.75	1007.99	-90.86	1012.08	354.85	1.55	131 °F		08/07/18	12:19	598 (gpm)
83	7,606	11.60	333.30	7519.62	-113.07	1022.85	-98.98	1027.63	354.47	1.88	133 °F		08/07/18	13:40	598 (gpm)
84	7,696	11.90	335.00	7607.73	-121.28	1039.34	-106.96	1044.83	354.12	0.51	135 °F		08/07/18	14:25	598 (gpm)
85	7,786	9.40	333.50	7696.18	-128.69	1054.33	-114.17	1060.49	353.82	2.79	133 °F		08/07/18	16:11	598 (gpm)
86	7,875	7.70	330.40	7784.19	-135.04	1066.02	-120.36	1072.79	353.56	1.98	131 °F		08/07/18	17:58	598 (gpm)
87	7,965	11.40	332.20	7872.92	-142.35	1079.14	-127.48	1086.64	353.26	4.12	133 °F		08/07/18	19:17	598 (gpm)
88	8,054	10.10	335.80	7960.36	-149.86	1094.04	-134.79	1102.31	352.98	1.64	135 °F		08/07/18	20:02	598 (gpm)
89	8,144	10.40	334.40	8048.92	-156.80	1108.56	-141.53	1117.56	352.72	0.43	135 °F		08/07/18	21:39	551 (gpm)
90	8,232	11.30	335.50	8135.35	-164.02	1123.57	-148.54	1133.34	352.47	1.05	133 °F		08/08/18	15:23	598 (gpm)
91	8,322	11.80	334.60	8223.53	-171.84	1139.90	-156.14	1150.55	352.20	0.59	138 °F		08/08/18	16:23	598 (gpm)
92	8,411	9.20	329.70	8311.03	-179.54	1154.27	-163.64	1165.81	351.93	3.09	140 °F		08/08/18	17:01	598 (gpm)
93	8,501	8.80	326.40	8399.92	-187.14	1166.22	-171.08	1178.70	351.65	0.73	140 °F		08/08/18	6:14	598 (gpm)
94	8,590	7.30	323.10	8488.05	-194.44	1176.41	-178.24	1189.84	351.38	1.76	144 °F		08/08/18	18:52	577 (gpm)
95	8,680	8.10	317.20	8577.23	-202.31	1185.63	-185.98	1200.13	351.09	1.25	144 °F		08/08/18	20:09	598 (gpm)
96	8,770	11.20	318.60	8665.95	-212.55	1196.85	-196.07	1212.80	350.70	3.45	145 °F		08/08/18	21:15	598 (gpm)
97	8,859	10.10	323.40	8753.42	-223.10	1209.60	-206.44	1227.09	350.31	1.59	147 °F		08/08/18	21:56	598 (gpm)
98	8,949	8.00	319.10	8842.29	-232.06	1220.67	-215.25	1239.50	350.00	2.45	149 °F		08/08/18	22:39	598 (gpm)
99	9,038	6.50	316.30	8930.58	-239.71	1228.99	-222.78	1249.02	349.73	1.73	151 °F		08/08/18	22:22	598 (gpm)
100	9,128	6.90	317.60	9019.96	-246.98	1236.66	-229.95	1257.86	349.47	0.48	151 °F		08/09/18	0:49	598 (gpm)
101	9,217	6.40	319.00	9108.37	-253.94	1244.36	-236.81	1266.69	349.23	0.59	153 °F		08/09/18	1:41	598 (gpm)
102	9,307	5.70	319.50	9197.86	-260.23	1251.54	-243.00	1274.91	349.01	0.78	154 °F		08/09/18	2:41	598 (gpm)
103	9,397	5.20	316.10	9287.46	-266.05	1257.88	-248.73	1282.23	348.81	0.66	154 °F		08/09/18	4:36	598 (gpm)
104	9,487	4.40	308.00	9377.14	-271.67	1262.94	-254.28	1288.29	348.62	1.16	154 °F		08/09/18	6:14	598 (gpm)
105	9,558	3.90	306.70	9447.95	-275.79	1266.06	-258.36	1292.15	348.47	0.72	156 °F		08/09/18	7:04	598 (gpm)
106	9,689	1.20	16.40	9578.83	-279.03	1270.04	-261.55	1296.69	348.36	2.79	145 °F		10/04/18	17:59	273 (gpm)

MWD SURVEYS	Customer:	Marathon Oil	ProDirectional Job #:	LNM1389518
	Well:	Fiddle Fee 24-28-23 WD 7H	MWD Operator:	Mike Remore
	Field/Block:	Carlsbad	Directional Driller:	Mark Waddle
	County:	Eddy	Date of First Survey:	July 31, 2018
	State:	New Mexico	Date of Last Survey:	October 9, 2018

PRODIRECTIONAL

Total Correction: 7.04 East Grid

Vertical Section Plane:			90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:			0.480					
Svy #	Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
107	9,784	2.00	85.10	9673.80	-277.12	1271.14	-259.62	1297.38	348.46	2.02	136 °F		10/04/18	23:42	252 (gpm)
108	9,878	13.60	80.30	9766.77	-264.57	1273.15	-247.04	1296.89	349.02	12.35	145 °F		10/05/18	2:36	252 (gpm)
109	9,973	20.00	75.60	9857.68	-237.88	1279.08	-220.27	1297.90	350.23	6.88	147 °F		10/05/18	6:07	252 (gpm)
110	10,067	25.40	77.60	9944.36	-202.72	1287.41	-184.98	1300.63	351.82	5.80	149 °F		10/05/18	8:56	252 (gpm)
111	10,160	31.70	77.50	10026.01	-159.47	1296.99	-141.60	1304.70	353.77	6.77	151 °F		10/05/18	12:09	252 (gpm)
112	10,255	35.50	79.30	10105.13	-108.13	1307.52	-90.11	1310.62	356.06	4.13	145 °F		10/05/18	15:07	210 (gpm)
113	10,349	46.20	85.40	10176.16	-47.41	1315.33	-29.28	1315.66	358.72	12.14	151 °F		10/06/18	9:53	252 (gpm)
114	10,444	63.70	89.80	10230.52	29.92	1318.25	48.10	1319.13	2.09	18.80	156 °F		10/06/18	12:35	252 (gpm)
115	10,538	70.00	87.40	10267.46	116.24	1320.41	134.46	1327.23	5.81	7.10	156 °F		10/06/18	15:24	252 (gpm)
116	10,633	86.10	88.60	10287.07	208.76	1323.61	227.04	1342.94	9.73	16.99	160 °F		10/06/18	19:15	252 (gpm)
117	10,727	88.30	87.30	10291.66	302.53	1326.97	320.85	1365.21	13.59	2.72	149 °F		10/07/18	14:20	325 (gpm)
118	10,822	88.00	87.70	10294.73	397.32	1331.11	415.71	1394.52	17.34	0.53	156 °F		10/07/18	15:20	325 (gpm)
119	10,917	87.50	88.30	10298.46	492.14	1334.42	510.58	1428.77	20.94	0.82	160 °F		10/07/18	16:11	325 (gpm)
120	11,011	88.00	89.70	10302.15	586.01	1336.06	604.49	1466.45	24.34	1.58	162 °F		10/07/18	17:15	325 (gpm)
121	11,106	88.00	90.40	10305.46	680.95	1335.98	699.43	1508.00	27.63	0.74	165 °F		10/07/18	18:13	252 (gpm)
122	11,201	87.80	90.50	10308.95	775.88	1335.23	794.37	1553.66	30.75	0.24	167 °F		10/07/18	19:06	252 (gpm)
123	11,295	86.60	90.10	10313.54	869.77	1334.74	888.25	1603.29	33.64	1.35	169 °F		10/07/18	19:58	252 (gpm)
124	11,390	86.70	90.90	10319.09	964.60	1333.91	983.09	1657.04	36.39	0.85	171 °F		10/07/18	20:42	252 (gpm)
125	11,484	85.60	90.10	10325.40	1058.39	1333.10	1076.87	1713.71	38.93	1.45	171 °F		10/07/18	22:25	252 (gpm)
126	11,579	88.80	90.60	10330.04	1153.26	1332.52	1171.74	1774.42	41.33	3.41	167 °F		10/07/18	23:49	252 (gpm)
127	11,673	88.90	91.10	10331.93	1247.24	1331.12	1265.71	1836.82	43.56	0.54	171 °F		10/08/18	00:36	252 (gpm)
128	11,768	88.60	91.20	10334.00	1342.21	1329.22	1360.67	1902.17	45.67	0.33	172 °F		10/08/18	01:21	252 (gpm)
129	11,862	88.10	91.80	10336.71	1436.17	1326.76	1454.60	1968.79	47.63	0.83	174 °F		10/08/18	02:04	252 (gpm)
130	11,956	90.60	91.70	10337.77	1530.14	1323.89	1548.54	2037.31	49.47	2.66	172 °F		10/08/18	03:22	252 (gpm)
131	12,051	90.60	91.30	10336.78	1625.13	1321.40	1643.50	2108.84	51.20	0.42	172 °F		10/08/18	04:10	252 (gpm)
132	12,145	90.10	90.40	10336.20	1719.12	1320.00	1737.49	2182.04	52.78	1.10	176 °F		10/08/18	05:28	252 (gpm)
133	12,240	88.50	89.70	10337.36	1814.10	1319.92	1832.48	2258.35	54.24	1.84	176 °F		10/08/18	06:44	299 (gpm)

MWD SURVEYS	Customer:	Marathon Oil	ProDirectional Job #:	LNM1389518
	Well:	Fiddle Fee 24-28-23 WD 7H	MWD Operator:	Mike Remore
	Field/Block:	Carlsbad	Directional Driller:	Mark Waddle
	County:	Eddy	Date of First Survey:	July 31, 2018
	State:	New Mexico	Date of Last Survey:	October 9, 2018

PRODIRECTIONAL

Total Correction: 7.04 East Grid

Vertical Section Plane:			90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:			0.480					
Svy #	Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
134	12,335	88.60	89.80	10339.77	1909.06	1320.34	1927.45	2336.31	55.59	0.15	180 °F		10/08/18	07:33	299 (gpm)
135	12,429	86.80	88.40	10343.54	2002.94	1321.81	2021.35	2415.17	56.82	2.43	180 °F		10/08/18	08:21	299 (gpm)
136	12,524	88.70	89.20	10347.27	2097.80	1323.80	2116.25	2496.19	57.97	2.17	180 °F		10/08/18	09:41	299 (gpm)
137	12,618	87.70	88.50	10350.22	2191.70	1325.68	2210.19	2577.28	59.04	1.30	181 °F		10/08/18	10:33	299 (gpm)
138	12,713	88.60	89.20	10353.29	2286.59	1327.59	2305.12	2660.09	60.06	1.20	181 °F		10/08/18	11:41	299 (gpm)
139	12,807	88.10	89.50	10356.00	2380.52	1328.65	2399.07	2742.42	61.02	0.62	181 °F		10/08/18	12:32	299 (gpm)
140	12,902	89.20	91.90	10358.23	2475.49	1327.49	2494.03	2825.32	61.98	2.78	181 °F		10/08/18	13:50	299 (gpm)
141	12,997	88.90	91.20	10359.81	2570.47	1324.92	2588.98	2908.31	62.90	0.80	181 °F		10/08/18	14:36	299 (gpm)
142	13,092	88.90	91.30	10361.63	2665.45	1322.85	2683.94	2992.24	63.76	0.11	185 °F		10/08/18	15:39	299 (gpm)
143	13,187	88.80	91.20	10363.54	2760.42	1320.78	2778.90	3076.81	64.58	0.15	181 °F		10/08/18	17:08	299 (gpm)
144	13,281	90.50	92.90	10364.11	2854.39	1317.42	2872.83	3160.50	65.36	2.56	183 °F		10/08/18	19:48	299 (gpm)
145	13,376	87.90	91.70	10365.44	2949.34	1313.61	2967.73	3245.46	66.12	3.01	183 °F		10/08/18	20:49	299 (gpm)
146	13,471	85.70	91.20	10370.74	3044.18	1311.21	3062.55	3331.44	66.82	2.37	183 °F		10/08/18	21:40	299 (gpm)
147	13,566	85.50	91.30	10378.03	3138.90	1309.14	3157.25	3417.90	67.48	0.24	183 °F		10/08/18	22:28	299 (gpm)
148	13,660	85.20	91.30	10385.65	3232.58	1307.01	3250.91	3503.82	68.10	0.32	187 °F		10/08/18	23:24	299 (gpm)
149	13,755	87.70	91.60	10391.53	3327.39	1304.61	3345.69	3591.06	68.70	2.65	185 °F		10/09/18	00:52	299 (gpm)
150	13,849	87.00	91.20	10395.88	3421.28	1302.32	3439.56	3677.86	69.26	0.86	185 °F		10/09/18	01:38	299 (gpm)
151	13,944	89.30	92.70	10398.95	3516.20	1299.09	3534.45	3765.63	69.82	2.89	187 °F		10/09/18	03:15	299 (gpm)
152	14,039	89.80	91.80	10399.69	3611.17	1295.36	3629.37	3853.61	70.36	1.08	187 °F		10/09/18	04:08	299 (gpm)
153	14,133	90.90	91.20	10399.12	3705.16	1292.90	3723.34	3941.42	70.85	1.33	189 °F		10/09/18	05:10	299 (gpm)
154	14,228	87.40	88.90	10400.53	3800.12	1292.82	3818.30	4031.23	71.29	4.41	189 °F		10/09/18	06:24	299 (gpm)
155	14,323	88.80	89.30	10403.68	3895.02	1294.31	3913.24	4121.73	71.70	1.53	190 °F		10/09/18	07:37	299 (gpm)
156	14,417	86.80	88.20	10407.29	3988.89	1296.35	4007.14	4211.62	72.07	2.43	190 °F		10/09/18	08:42	299 (gpm)
157	14,512	88.50	89.40	10411.18	4083.74	1298.34	4102.03	4302.60	72.44	2.19	190 °F		10/09/18	10:13	299 (gpm)
158	14,607	87.70	88.70	10414.33	4178.65	1299.92	4196.97	4393.67	72.79	1.12	192 °F		10/09/18	11:11	299 (gpm)
159	14,701	88.70	90.40	10417.28	4272.57	1300.65	4290.91	4483.71	73.14	2.10	190 °F		10/09/18	12:56	299 (gpm)
160	14,796	88.80	90.00	10419.36	4367.55	1300.32	4385.89	4574.59	73.49	0.43	192 °F		10/09/18	14:02	299 (gpm)

MWD SURVEYS	Customer: Marathon Oil		ProDirectional Job #: LNM1389518	
	Well: Fiddle Fee 24-28-23 WD 7H		MWD Operator: Mike Remore	
	Field/Block: Carlsbad		Directional Driller: Mark Waddle	
	County: Eddy		Date of First Survey: July 31, 2018	
	State: New Mexico		Date of Last Survey: October 9, 2018	

PRODIRECTIONAL

Total Correction: <u>7.04</u> East Grid		
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Vertical Section Plane:		90.79	Nominal Dip Angle:		59.98	Magnetic Field Strength:				0.480					
Svy #	Measured Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	Coordinates		Closure		DLS	Temp (°F)	Vib/Shk Color	Date	Time	Flow Rate
						+N / -S	+E / -W	Dist.	Angle						
161	14,891	89.10	89.80	10421.10	4462.52	1300.49	4480.87	4665.78	73.82	0.38	192 °F		10/09/18	15:13	299 (gpm)
162	14,985	88.10	89.90	10423.39	4556.48	1300.73	4574.84	4756.17	74.13	1.07	194 °F		10/09/18	16:15	299 (gpm)
163	15,080	89.60	89.90	10425.30	4651.44	1300.90	4669.82	4847.64	74.43	1.58	194 °F		10/09/18	17:20	299 (gpm)
164	15,175	89.30	90.20	10426.21	4746.43	1300.82	4764.82	4939.19	74.73	0.45	194 °F		10/09/18	18:24	299 (gpm)
165	15,248	88.10	89.60	10427.87	4819.40	1300.94	4837.80	5009.66	74.95	1.84	194 °F		10/09/18	19:26	299 (gpm)
PTB	15,318	88.10	89.60	10430.19	4889.35	1301.43	4907.76	5077.38	75.15	0.00					

PRODIRECTIONAL