

30-015-44374

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 2H
Field Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Provide Signature Page for
Directional Survey

Vertical Section Plane: 88.25 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480
Total Correction: 7.50 East Grid

Measured		Coordinates		Closure		Vib/Shk									
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color	Date	Time	Flow Rate	
Survey's are tied into: Gyro										Date Received:					
Company:															
Tie-in	0.00	0.00	0.0	0.00	0.00	0.00	0.00	0.00	0.00						
1	182	0.3	11.2	182.00	0.11	0.47	0.09	0.48	11.20	0.16	90 °F		10/13/17	23:36	835 (gpm)
2	213	0.4	8.4	213.00	0.14	0.65	0.12	0.67	10.75	0.33	91 °F		10/13/17	23:59	835 (gpm)
3	304	0.3	303.2	304.00	0.00	1.10	-0.03	1.10	358.50	0.42	95 °F		10/14/17	00:31	835 (gpm)
4	396	0.3	253.5	396.00	-0.43	1.16	-0.46	1.25	338.35	0.27	97 °F		10/14/17	01:16	833 (gpm)
5	425	0.3	245.2	425.00	-0.57	1.11	-0.60	1.26	331.46	0.15	97 °F		10/14/17	01:46	833 (gpm)
6	524	0.3	316.5	523.99	-0.98	1.19	-1.02	1.56	319.45	0.35	92 °F		10/15/17	14:15	550 (gpm)
7	616	0.1	34.0	615.99	-1.09	1.43	-1.14	1.83	321.48	0.32	92 °F		10/15/17	15:18	550 (gpm)
8	708	0.0	176.5	707.99	-1.05	1.50	-1.09	1.85	323.85	0.11	97 °F		10/15/17	16:23	740 (gpm)
9	800	0.3	207.8	799.99	-1.17	1.28	-1.21	1.76	316.79	0.33	97 °F		10/15/17	17:13	740 (gpm)
10	891	0.3	191.0	890.99	-1.34	0.84	-1.36	1.60	301.62	0.10	97 °F		10/15/17	17:58	800 (gpm)
11	983	0.3	150.2	982.99	-1.28	0.39	-1.29	1.35	286.96	0.23	97 °F		10/15/17	18:44	808 (gpm)
12	1,076	0.5	114.6	1,075.99	-0.80	0.01	-0.80	0.80	270.91	0.33	115 °F		10/15/17	19:29	808 (gpm)
13	1,170	1.0	104.3	1,169.98	0.36	-0.36	0.37	0.52	134.28	0.55	115 °F		10/15/17	20:01	808 (gpm)
14	1,265	2.6	101.5	1,264.93	3.25	-1.00	3.28	3.43	106.85	1.69	113 °F		10/15/17	20:45	808 (gpm)
15	1,359	1.5	118.7	1,358.87	6.39	-2.01	6.45	6.76	107.31	1.33	117 °F		10/15/17	21:56	808 (gpm)
16	1,454	1.3	175.0	1,453.85	7.52	-3.68	7.64	8.48	115.74	1.40	118 °F		10/15/17	23:04	808 (gpm)
17	1,548	2.4	191.7	1,547.80	7.12	-6.67	7.33	9.91	132.30	1.29	118 °F		10/16/17	00:04	833 (gpm)
18	1,643	3.6	196.7	1,642.66	5.72	-11.48	6.07	12.98	152.12	1.29	118 °F		10/16/17	00:52	833 (gpm)
19	1,737	4.4	195.6	1,736.43	3.71	-17.78	4.25	18.28	166.54	0.85	122 °F		10/16/17	02:23	758 (gpm)
20	1,831	4.8	203.9	1,830.13	0.93	-24.84	1.69	24.90	176.11	0.83	120 °F		10/16/17	04:17	758 (gpm)
21	1,925	4.7	207.0	1,923.81	-2.62	-31.87	-1.65	31.91	182.97	0.29	122 °F		10/16/17	06:00	758 (gpm)
22	1,933	4.6	208.7	1,931.78	-2.94	-32.44	-1.95	32.50	183.45	2.13	122 °F		10/16/17	06:18	758 (gpm)
23	1,995	4.3	207.0	1,993.60	-5.32	-36.70	-4.20	36.94	186.53	0.53	122 °F		10/17/17	06:29	507 (gpm)
24	2,089	6.1	207.2	2,087.21	-9.43	-44.28	-8.09	45.01	190.35	1.91	86 °F		10/17/17	07:30	507 (gpm)
25	2,184	8.1	206.3	2,181.47	-15.03	-54.77	-13.36	56.38	193.71	2.11	88 °F		10/17/17	08:10	507 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 2H
Field/Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Total Correction: 7.50 East Grid
Vertical Section Plane: 88.25 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured			Coordinates		Closure						Vib/Shk				
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color	Date	Time	Flow Rate	
26	2,278	9.5	205.1	2,274.36	-21.64	-67.73	-19.58	70.51	196.13	1.50	90 °F		10/17/17	08:44	507 (gpm)
27	2,372	10.6	204.5	2,366.92	-28.97	-82.62	-26.46	86.76	197.76	1.18	91 °F		10/17/17	09:29	507 (gpm)
28	2,467	11.5	204.1	2,460.16	-36.97	-99.22	-33.95	104.87	198.89	0.95	91 °F		10/17/17	09:57	550 (gpm)
29	2,561	12.7	199.4	2,552.07	-44.78	-117.52	-41.21	124.54	199.32	1.65	95 °F		10/17/17	10:29	550 (gpm)
30	2,656	13.9	197.5	2,644.52	-52.31	-138.25	-48.11	146.39	199.19	1.34	95 °F		10/17/17	10:56	565 (gpm)
31	2,750	15.4	201.3	2,735.46	-60.92	-160.65	-56.04	170.15	199.23	1.89	97 °F		10/17/17	11:29	550 (gpm)
32	2,844	15.0	201.3	2,826.18	-70.57	-183.62	-64.99	194.78	199.49	0.43	99 °F		10/17/17	12:00	550 (gpm)
33	2,939	15.9	201.9	2,917.74	-80.60	-207.14	-74.31	220.07	199.74	0.96	99 °F		10/17/17	12:29	550 (gpm)
34	3,033	17.3	206.0	3,007.83	-92.28	-231.65	-85.24	246.84	200.20	1.94	100 °F		10/17/17	13:06	550 (gpm)
35	3,127	17.2	206.2	3,097.60	-105.30	-256.69	-97.51	274.58	200.80	0.12	100 °F		10/17/17	13:23	550 (gpm)
36	3,222	18.1	206.6	3,188.12	-118.89	-282.49	-110.32	303.26	201.33	0.96	102 °F		10/17/17	13:47	550 (gpm)
37	3,316	17.8	205.6	3,277.55	-132.43	-308.50	-123.06	332.14	201.75	0.46	104 °F		10/17/17	14:11	550 (gpm)
38	3,410	17.6	205.4	3,367.10	-145.51	-334.29	-135.37	360.66	202.04	0.22	104 °F		10/17/17	14:39	550 (gpm)
39	3,505	18.0	205.7	3,457.55	-158.83	-360.50	-147.89	389.65	202.31	0.43	104 °F		10/17/17	15:07	550 (gpm)
40	3,599	18.3	206.8	3,546.87	-172.58	-386.75	-160.84	418.87	202.58	0.48	104 °F		10/17/17	15:36	550 (gpm)
41	3,693	18.5	206.5	3,636.07	-186.69	-413.27	-174.15	448.47	202.85	0.24	104 °F		10/17/17	16:10	550 (gpm)
42	3,788	18.1	204.5	3,726.26	-200.35	-440.19	-187.00	478.26	203.02	0.78	106 °F		10/17/17	16:45	550 (gpm)
43	3,882	16.9	201.2	3,815.91	-212.14	-466.22	-197.99	506.52	203.01	1.66	106 °F		10/17/17	17:17	550 (gpm)
44	3,977	17.2	201.4	3,906.74	-223.05	-492.17	-208.11	534.36	202.92	0.32	108 °F		10/17/17	17:47	550 (gpm)
45	4,071	16.3	202.8	3,996.75	-233.99	-517.27	-218.30	561.45	202.88	1.05	106 °F		10/17/17	18:32	550 (gpm)
46	4,165	15.1	203.8	4,087.24	-244.75	-540.63	-228.35	586.88	202.90	1.31	106 °F		10/17/17	19:08	550 (gpm)
47	4,259	16.2	204.4	4,177.76	-255.81	-563.78	-238.71	612.23	202.95	1.18	106 °F		10/17/17	19:57	550 (gpm)
48	4,354	15.8	205.3	4,269.08	-267.53	-587.54	-249.71	638.40	203.03	0.50	106 °F		10/17/17	20:28	550 (gpm)
49	4,448	16.3	203.1	4,359.41	-278.90	-611.24	-260.35	664.38	203.07	0.84	106 °F		10/17/17	21:15	571 (gpm)
50	4,543	16.4	203.5	4,450.57	-290.22	-635.81	-270.93	691.12	203.08	0.16	108 °F		10/17/17	21:48	571 (gpm)
51	4,637	15.0	204.3	4,541.06	-301.22	-659.06	-281.23	716.56	203.11	1.51	108 °F		10/17/17	22:48	571 (gpm)
52	4,732	16.2	201.5	4,632.56	-311.86	-682.60	-291.15	742.10	203.10	1.49	108 °F		10/17/17	23:07	571 (gpm)
53	4,826	16.2	201.0	4,722.83	-322.10	-707.04	-300.65	768.31	203.04	0.15	108 °F		10/18/17	00:16	571 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 2H
Field/Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Total Correction: 7.50 East Grid
Vertical Section Plane: 88.25 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

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						
54	4,920	16.1	200.6	4,813.12	-332.13	-731.48	-309.94	794.44	202.96	0.16	109 °F	10/18/17	00:51	571 (gpm)
55	5,015	15.0	200.7	4,904.64	-341.83	-755.31	-318.92	819.88	202.89	1.16	109 °F	10/18/17	01:22	571 (gpm)
56	5,109	15.5	200.6	4,995.33	-351.25	-778.45	-327.63	844.59	202.83	0.53	109 °F	10/18/17	02:19	571 (gpm)
57	5,204	17.2	201.4	5,086.49	-361.60	-803.41	-337.23	871.32	202.77	1.81	111 °F	10/18/17	03:19	571 (gpm)
58	5,298	17.0	201.6	5,176.33	-372.52	-829.13	-347.36	898.95	202.73	0.22	111 °F	10/18/17	03:58	571 (gpm)
59	5,393	17.4	203.8	5,267.08	-384.15	-855.04	-358.20	927.04	202.73	0.80	111 °F	10/18/17	05:04	571 (gpm)
60	5,487	17.1	204.0	5,356.85	-396.21	-880.52	-369.49	954.91	202.76	0.33	111 °F	10/18/17	05:52	571 (gpm)
61	5,581	15.3	202.4	5,447.12	-407.29	-904.62	-379.84	981.13	202.78	1.97	111 °F	10/18/17	06:42	571 (gpm)
62	5,676	14.9	201.6	5,538.84	-417.26	-927.56	-389.11	1,005.87	202.76	0.47	113 °F	10/18/17	07:48	571 (gpm)
63	5,770	14.0	200.5	5,629.86	-426.36	-949.45	-397.55	1,029.32	202.72	1.00	113 °F	10/18/17	08:52	550 (gpm)
64	5,864	14.3	201.2	5,721.01	-435.19	-970.92	-405.73	1,052.29	202.68	0.37	113 °F	10/18/17	10:04	550 (gpm)
65	5,959	14.5	207.8	5,813.03	-445.63	-992.38	-415.52	1,075.86	202.72	1.74	113 °F	10/18/17	11:16	550 (gpm)
66	6,053	12.5	205.3	5,904.43	-456.06	-1,011.99	-425.35	1,097.75	202.80	2.22	113 °F	10/18/17	12:12	550 (gpm)
67	6,148	11.1	204.0	5,997.42	-464.71	-1,029.64	-433.47	1,117.16	202.83	1.50	113 °F	10/18/17	13:14	550 (gpm)
68	6,242	7.7	200.2	6,090.15	-470.99	-1,043.82	-439.32	1,132.51	202.83	3.67	113 °F	10/18/17	15:07	550 (gpm)
69	6,336	4.5	198.5	6,183.60	-474.63	-1,053.23	-442.67	1,142.48	202.80	3.41	115 °F	10/18/17	16:28	550 (gpm)
70	6,431	0.7	159.4	6,278.49	-475.73	-1,057.31	-443.65	1,146.62	202.76	4.19	115 °F	10/18/17	17:54	550 (gpm)
71	6,525	1.8	1.2	6,372.48	-475.47	-1,056.37	-443.41	1,145.66	202.77	2.62	106 °F	10/19/17	15:46	540 (gpm)
72	6,620	2.5	353.4	6,467.41	-475.57	-1,052.82	-443.62	1,142.47	202.85	0.80	106 °F	10/19/17	16:45	540 (gpm)
73	6,714	3.4	358.2	6,561.29	-475.74	-1,048.00	-443.94	1,138.15	202.96	0.99	109 °F	10/19/17	03:58	540 (gpm)
74	6,808	3.5	352.7	6,655.12	-476.02	-1,042.37	-444.40	1,133.14	203.09	0.37	111 °F	10/19/17	18:18	540 (gpm)
75	6,902	2.8	339.5	6,748.98	-477.04	-1,037.37	-445.57	1,129.01	203.24	1.07	115 °F	10/19/17	19:02	540 (gpm)
76	6,997	3.6	340.0	6,843.83	-478.72	-1,032.39	-447.40	1,125.17	203.43	0.84	117 °F	10/19/17	19:57	540 (gpm)
77	7,091	4.0	337.5	6,937.62	-480.80	-1,026.59	-449.66	1,120.75	203.65	0.46	117 °F	10/19/17	20:32	540 (gpm)
78	7,186	4.3	351.7	7,032.37	-482.38	-1,020.01	-451.44	1,115.44	203.87	1.12	118 °F	10/19/17	21:22	540 (gpm)
79	7,280	4.1	355.5	7,126.12	-482.95	-1,013.17	-452.22	1,109.51	204.05	0.36	120 °F	10/19/17	21:50	540 (gpm)
80	7,375	3.3	349.2	7,220.92	-483.54	-1,007.10	-453.00	1,104.29	204.22	0.94	122 °F	10/19/17	22:31	548 (gpm)
81	7,470	3.1	340.2	7,315.77	-484.77	-1,001.99	-454.38	1,100.21	204.39	0.57	122 °F	10/19/17	23:27	548 (gpm)

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 2H
Field/Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Vertical Section Plane: 88.25 Total Correction: 7.50 East Grid
Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

	Measured				Coordinates			Closure				Vib/Shk		Date	Time	Flow Rate
	Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color				
82	7,564	2.5	322.7	7,409.66	-486.74	-997.97	-456.48	1,097.42	204.58	1.10	124 °F	Green	10/20/17	00:12	548 (gpm)	
83	7,658	3.0	327.6	7,503.56	-489.19	-994.26	-459.04	1,095.12	204.78	0.59	124 °F	Green	10/20/17	01:15	548 (gpm)	
84	7,753	3.9	346.0	7,598.38	-491.14	-989.03	-461.16	1,091.26	205.00	1.49	124 °F	Green	10/20/17	02:11	548 (gpm)	
85	7,847	3.7	318.4	7,692.19	-493.77	-983.66	-463.94	1,087.58	205.25	1.94	124 °F	Green	10/20/17	02:51	548 (gpm)	
86	7,942	4.1	279.8	7,786.98	-499.06	-980.79	-469.33	1,087.30	205.57	2.74	127 °F	Pink	10/20/17	03:34	548 (gpm)	
87	8,036	1.3	273.6	7,880.87	-503.41	-980.15	-473.70	1,088.62	205.79	2.99	127 °F	Pink	10/20/17	04:37	548 (gpm)	
88	8,131	2.5	7.3	7,975.83	-504.16	-978.03	-474.51	1,087.06	205.88	3.04	127 °F	Pink	10/20/17	05:43	548 (gpm)	
89	8,225	3.9	9.1	8,069.68	-503.24	-972.84	-473.75	1,082.06	205.96	1.49	127 °F	Green	10/20/17	06:59	548 (gpm)	
90	8,319	3.3	4.5	8,163.50	-502.34	-966.98	-473.03	1,076.48	206.07	0.71	127 °F	Green	10/20/17	07:44	548 (gpm)	
91	8,414	3.1	5.5	8,258.35	-501.72	-961.70	-472.57	1,071.54	206.17	0.22	127 °F	Green	10/20/17	08:58	548 (gpm)	
92	8,508	3.0	16.4	8,352.22	-500.63	-956.81	-471.63	1,066.73	206.24	0.63	127 °F	Green	10/20/17	10:33	548 (gpm)	
93	8,603	3.7	16.8	8,447.05	-498.88	-951.49	-470.04	1,061.26	206.29	0.74	129 °F	Green	10/20/17	11:55	548 (gpm)	
94	8,697	3.2	22.6	8,540.88	-496.83	-946.17	-468.16	1,055.65	206.33	0.65	129 °F	Green	10/20/17	12:44	548 (gpm)	
95	8,792	3.3	30.1	8,635.73	-494.30	-941.35	-465.77	1,050.28	206.33	0.46	131 °F	Green	10/20/17	14:07	548 (gpm)	
96	8,886	4.7	23.9	8,729.50	-491.20	-935.49	-462.85	1,043.73	206.32	1.56	131 °F	Green	10/20/17	16:02	548 (gpm)	
97	8,981	4.7	19.6	8,824.18	-488.10	-928.27	-459.97	1,035.98	206.36	0.37	131 °F	Green	10/20/17	16:58	548 (gpm)	
98	9,055	4.2	20.7	8,897.96	-485.96	-922.87	-457.99	1,030.27	206.39	0.69	131 °F	Green	10/20/17	18:05	548 (gpm)	
99	9,129	3.0	19.4	8,971.81	-484.23	-918.51	-456.39	1,025.65	206.42	1.63	140 °F	Green	11/08/17	20:18	271 (gpm)	
100	9,141	3.0	15.7	8,983.79	-484.02	-917.91	-456.20	1,025.03	206.43	1.61	140 °F	Green	11/08/17	21:00	271 (gpm)	
101	9,235	4.5	39.2	9,077.59	-480.87	-912.69	-453.21	1,019.02	206.41	2.25	149 °F	Green	11/08/17	23:43	271 (gpm)	
102	9,330	6.3	59.1	9,172.18	-473.87	-907.12	-446.38	1,011.00	206.20	2.71	149 °F	Green	11/09/17	07:20	271 (gpm)	
103	9,425	20.4	58.9	9,264.38	-454.79	-895.84	-427.63	992.67	205.52	14.84	154 °F	Green	11/09/17	12:46	274 (gpm)	
104	9,519	26.9	57.0	9,350.44	-422.30	-875.77	-395.74	961.03	204.32	6.96	162 °F	Green	11/09/17	22:22	274 (gpm)	
105	9,614	41.8	65.4	9,428.69	-374.45	-850.73	-348.63	919.40	202.28	16.43	162 °F	Green	11/10/17	05:52	274 (gpm)	
106	9,708	55.0	74.4	9,491.03	-307.83	-827.21	-282.70	874.18	198.87	15.74	165 °F	Green	11/10/17	09:54	274 (gpm)	
107	9,802	67.1	83.2	9,536.52	-226.90	-811.65	-202.21	836.46	193.99	15.24	165 °F	Green	11/10/17	14:39	274 (gpm)	
108	9,897	70.6	86.8	9,570.80	-138.47	-803.96	-113.97	812.00	188.07	5.10	165 °F	Green	11/10/17	17:33	274 (gpm)	
109	9,991	81.3	86.5	9,593.59	-47.45	-798.63	-23.08	798.97	181.66	11.39	169 °F	Green	11/10/17	21:17	274 (gpm)	

MWD SURVEYS

Customer: Marathon Oil
Well: Cypress Fee 2H
Field/Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Total Correction: 7.50 East Grid
Vertical Section Plane: 88.25 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

	Measured				Coordinates			Closure		DLS	Temp (°F)	Vib/Shk	Date	Time	Flow Rate
	Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle			Color			
110	10,086	92.0	86.2	9,599.13	47.19	-792.60	71.43	795.81	174.85	11.27	169 °F		11/10/17	23:06	274 (gpm)
111	10,181	93.9	93.3	9,594.23	141.97	-792.18	166.24	809.44	168.15	7.73	151 °F		11/11/17	17:24	274 (gpm)
112	10,275	91.3	96.4	9,589.97	235.23	-800.12	259.79	841.24	162.01	4.30	162 °F	Yellow	11/11/17	20:35	274 (gpm)
113	10,370	84.9	100.8	9,593.12	328.56	-814.30	353.60	887.76	156.53	8.17	163 °F	Yellow	11/12/17	02:36	274 (gpm)
114	10,464	86.1	98.9	9,600.50	420.35	-830.33	445.92	942.50	151.76	2.39	163 °F		11/12/17	10:07	292 (gpm)
115	10,559	86.2	98.2	9,606.87	513.61	-844.43	539.65	1,002.14	147.42	0.74	171 °F		11/12/17	14:36	292 (gpm)
116	10,653	89.1	93.5	9,610.73	606.67	-853.99	633.05	1,063.04	143.45	5.87	162 °F		11/13/17	04:26	292 (gpm)
117	10,747	89.1	91.3	9,612.21	700.41	-857.93	726.95	1,124.50	139.72	2.34	162 °F		11/13/17	06:13	292 (gpm)
118	10,842	88.8	90.6	9,613.95	795.29	-859.50	821.92	1,189.24	136.28	0.80	162 °F		11/13/17	06:54	292 (gpm)
119	10,936	86.8	89.1	9,617.56	889.17	-859.26	915.84	1,255.82	133.17	2.66	171 °F	Yellow	11/13/17	07:40	292 (gpm)
120	11,031	91.3	88.9	9,619.13	984.13	-857.60	1,010.79	1,325.58	130.31	4.74	174 °F	Yellow	11/13/17	09:29	286 (gpm)
121	11,125	91.3	88.0	9,617.00	1,078.10	-855.06	1,104.73	1,396.98	127.74	0.96	176 °F	Yellow	11/13/17	10:56	286 (gpm)
122	11,220	92.4	91.1	9,613.93	1,173.01	-854.31	1,199.66	1,472.77	125.46	3.46	176 °F		11/13/17	12:30	286 (gpm)
123	11,315	89.4	92.2	9,612.44	1,267.82	-857.04	1,294.60	1,552.58	123.51	3.36	176 °F		11/13/17	14:12	286 (gpm)
124	11,410	85.6	90.6	9,616.58	1,362.57	-859.37	1,389.46	1,633.74	121.74	4.34	178 °F		11/13/17	15:43	286 (gpm)
125	11,504	88.6	92.1	9,621.34	1,456.30	-861.58	1,483.30	1,715.37	120.15	3.57	180 °F		11/13/17	18:37	286 (gpm)
126	11,599	89.0	91.2	9,623.33	1,551.11	-864.31	1,578.24	1,799.41	118.71	1.04	183 °F		11/13/17	20:07	286 (gpm)
127	11,693	87.5	89.5	9,626.20	1,645.00	-864.89	1,672.19	1,882.62	117.35	2.41	185 °F		11/13/17	22:53	286 (gpm)
128	11,788	84.8	89.1	9,632.58	1,739.76	-863.73	1,766.96	1,966.77	116.05	2.87	187 °F		11/14/17	00:05	286 (gpm)
129	11,882	84.5	88.4	9,641.34	1,833.34	-861.69	1,860.53	2,050.38	114.85	0.81	187 °F		11/14/17	02:15	286 (gpm)
130	11,977	83.9	86.5	9,650.94	1,927.84	-857.48	1,954.94	2,134.73	113.68	2.09	189 °F		11/14/17	04:49	286 (gpm)
131	12,072	84.8	83.3	9,660.30	2,022.21	-849.08	2,049.09	2,218.04	112.51	3.48	189 °F		11/14/17	07:31	292 (gpm)
132	12,166	87.8	83.9	9,666.36	2,115.69	-838.63	2,142.30	2,300.60	111.38	3.25	189 °F	Yellow	11/14/17	10:40	292 (gpm)
133	12,261	92.7	86.2	9,665.95	2,210.51	-830.43	2,236.91	2,386.08	110.37	5.70	189 °F		11/14/17	14:26	292 (gpm)
134	12,356	96.3	87.6	9,658.50	2,305.17	-825.31	2,331.46	2,473.22	109.49	4.06	190 °F		11/14/17	18:04	292 (gpm)
135	12,450	93.0	92.8	9,650.87	2,398.76	-825.64	2,425.10	2,561.80	108.80	6.54	189 °F		11/14/17	21:40	292 (gpm)
136	12,545	89.7	92.5	9,648.63	2,493.44	-830.03	2,519.96	2,653.14	108.23	3.49	194 °F		11/14/17	22:56	292 (gpm)
137	12,640	86.5	92.8	9,651.78	2,588.09	-834.42	2,614.80	2,744.71	107.70	3.38	196 °F		11/15/17	00:50	292 (gpm)

MWD SURVEYS

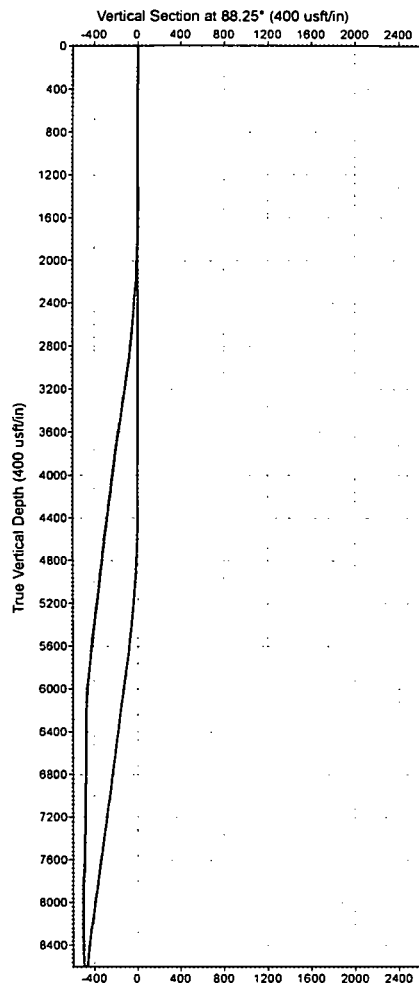
Customer: Marathon Oil
Well: Cypress Fee 2H
Field/Block: Wolfcamp
Co./Parish: Eddy County
State: New Mexico

PGS Job #: LNM1334117
MWD Operator: Ronnie Watson
Directional Driller: Johnny Gabrielson
Date of First Survey: October 13, 2017
Date of Last Survey: November 17, 2017



Total Correction: 7.50 East Grid
Vertical Section Plane: 88.25 Nominal Dip Angle: 60.07 Magnetic Field Strength: 0.480

Measured		Coordinates		Closure		Vib/Shk									
Depth	Inc.	Azm.	T.V.D.	Ver. Sect.	+N / -S	+E / -W	Dist.	Angle	DLS	Temp (°F)	Color	Date	Time	Flow Rate	
138	12,734	87.1	91.7	9,657.03	2,681.72	-838.11	2,708.58	2,835.28	107.19	1.33	194 °F	Green	11/15/17	03:33	292 (gpm)
139	12,829	86.1	89.1	9,662.66	2,776.47	-838.77	2,803.40	2,926.19	106.66	2.93	198 °F	Green	11/15/17	05:22	292 (gpm)
140	12,923	89.9	88.1	9,665.94	2,870.40	-836.48	2,897.29	3,015.63	106.10	4.18	198 °F	Green	11/15/17	08:18	292 (gpm)
141	13,018	88.3	85.6	9,667.44	2,965.35	-831.26	2,992.13	3,105.45	105.53	3.12	198 °F	Yellow	11/15/17	09:57	292 (gpm)
142	13,113	94.4	88.0	9,665.20	3,060.24	-825.96	3,086.90	3,195.49	104.98	6.90	199 °F	Yellow	11/15/17	12:56	292 (gpm)
143	13,207	91.7	89.8	9,660.20	3,154.09	-824.16	3,180.74	3,285.78	104.53	3.45	180 °F	Green	11/16/17	12:45	292 (gpm)
144	13,302	91.1	90.6	9,657.88	3,249.00	-824.49	3,275.71	3,377.88	104.13	1.05	190 °F	Green	11/16/17	13:58	292 (gpm)
145	13,397	86.0	86.5	9,660.28	3,343.92	-822.09	3,370.60	3,469.40	103.71	6.89	190 °F	Green	11/16/17	17:21	292 (gpm)
146	13,491	85.1	87.2	9,667.57	3,437.61	-816.94	3,464.17	3,559.19	103.27	1.21	192 °F	Green	11/16/17	18:46	292 (gpm)
147	13,586	88.1	87.2	9,673.21	3,532.41	-812.31	3,558.88	3,650.40	102.86	3.16	194 °F	Green	11/16/17	21:41	292 (gpm)
148	13,680	92.3	88.9	9,672.88	3,626.39	-809.11	3,652.80	3,741.34	102.49	4.82	198 °F	Green	11/16/17	22:51	292 (gpm)
149	13,774	89.9	89.1	9,671.08	3,720.35	-807.47	3,746.76	3,832.78	102.16	2.56	199 °F	Green	11/16/17	11:59	292 (gpm)
150	13,869	93.4	90.0	9,668.34	3,815.27	-806.72	3,841.70	3,925.49	101.86	3.80	201 °F	Green	11/17/17	01:13	292 (gpm)
151	13,963	91.8	90.8	9,664.08	3,909.11	-807.38	3,935.60	4,017.56	101.59	1.90	201 °F	Green	11/17/17	03:03	292 (gpm)
152	14,058	88.8	88.6	9,663.58	4,004.06	-806.88	4,030.58	4,110.55	101.32	3.92	199 °F	Green	11/17/17	05:55	292 (gpm)
153	14,153	86.0	86.9	9,667.89	4,098.94	-803.16	4,125.40	4,202.85	101.02	3.45	199 °F	Green	11/17/17	08:43	292 (gpm)
154	14,247	85.0	86.1	9,675.26	4,192.61	-797.44	4,218.93	4,293.63	100.70	1.36	199 °F	Green	11/17/17	09:52	292 (gpm)
155	14,342	83.3	85.5	9,684.95	4,287.02	-790.52	4,313.18	4,385.02	100.39	1.90	199 °F	Green	11/17/17	10:58	292 (gpm)
156	14,362	83.2	85.4	9,687.30	4,306.86	-788.94	4,332.98	4,404.21	100.32	0.70	207 °F	Green	11/17/17	11:32	292 (gpm)
PTB	14,431	83.2	85.4	9,695.47	4,375.29	-783.45	4,401.27	4,470.45	100.09	0.00	207 °F	Green	11/17/17		TD Well



Marathon Oil
Eddy County, NM
Cypress Fee 23-27-9 (2-3-4)
No. 2H
Plan #5 - FINAL PVA
GL: 3159' + KB: 26.5' (H&P480)

US State Plane 1927 (Exact solution)
 NAD 1927 (NADCON CONUS)
 Clarke 1866
 New Mexico East 3001
 Mean Sea Level

RKB Elevation: Well @ 3185.50usft (GL: 3159' + KB: 26.5' (H&P480))

+N-S	+E-W	Northing	Easting	Latitude	Longitude	Spot
0.00	0.00	478939.79	540778.74	32° 18' 59.9497 N	104° 12' 4.7921 W	

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N-S	+E-W	Diag	Vsect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	4239.88	0.00	0.00	4239.88	0.00	0.00	0.00	0.00
3	5839.88	16.00	205.91	5819.15	-199.64	-96.99	1.00	-103.04
4	8460.82	16.00	205.91	8338.57	-849.45	-412.67	0.00	-438.42
5	8994.15	0.00	0.00	8885.00	-916.00	-445.00	3.00	-472.77
6	9194.15	0.00	0.00	9065.00	-916.00	-445.00	0.00	-472.77
7	10088.14	89.40	89.25	9637.93	-898.65	121.68	10.00	64.18
8	14370.19	89.40	89.25	9682.83	-767.61	4401.49	0.00	4376.00

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N-S	+E-W	Northing	Easting
[CypressFee#2H]FTP	0.00	-1008.94	-213.38	477930.85	540565.38
[CypressFee#2H]KOP	0.00	-1016.00	-442.00	477923.79	540336.74
[CypressFee#2H]LTP/BHL	0.00	-867.61	4404.49	478072.18	545183.23
[CypressFee#2H]NewKOP	9024.00	-916.00	-445.00	478023.79	540333.74
[CypressFee#2H]NewFTP	9586.76	-808.94	-216.38	478030.85	540562.38
[CypressFee#2H]NewLTP/BHL	9682.83	-767.61	4401.49	478172.18	545180.23

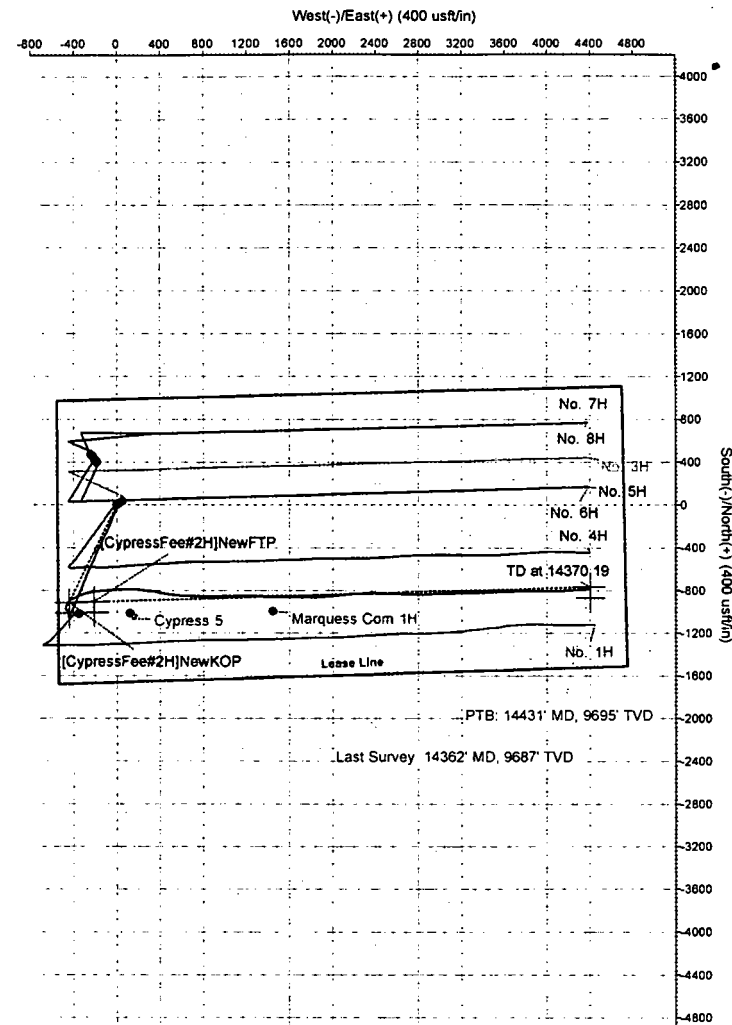


Azimuths to Grid North
 True North: 0.07°
 Magnetic North: 7.50°
 Magnetic Field
 Strength: 48038.3enT
 Dip Angle: 60.07°
 Date: 10/9/2017
 Model: USER DEFINED

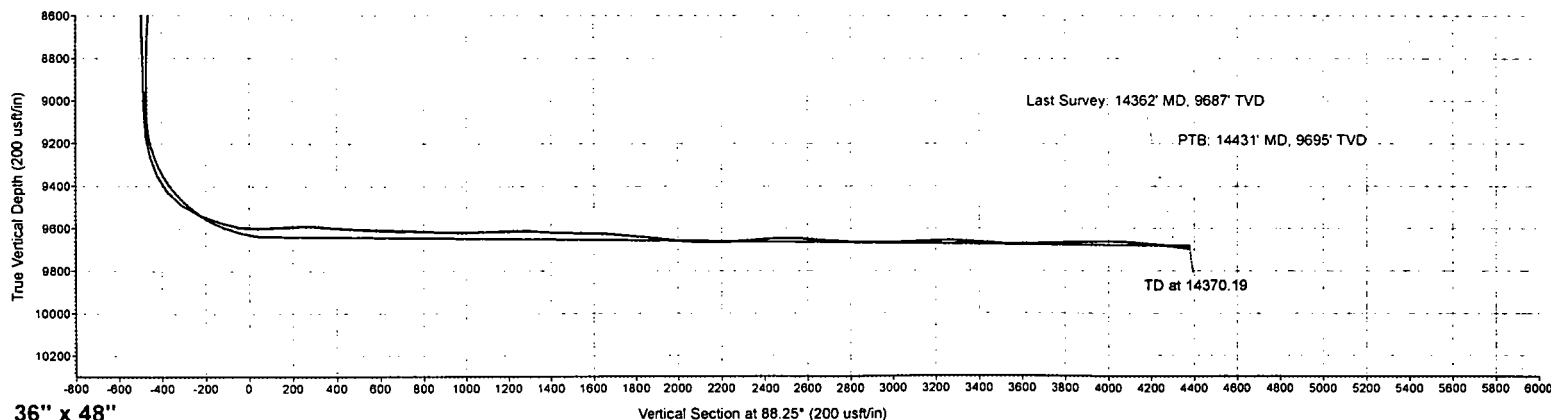
Azimuth Corrections

Total Magnetic Corr. (M to G): 7.50°

Declination (M to T): 7.57° East



Target Line: 9637' TVD @ 0' VS, 89.4° INC



36" x 48"

Vertical Section at 88.25° (200 usft/in)

Marathon Oil
 Corporation

