



HOBBS OCD

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Marathon Oil Corporation

**Blueberry Hill 19 WA Fee No. 6H
Lea County, NM**

October 28, 2019

**Job No. LNM1454819
API No. 30-025-44665**

Survey Completion Report



PRODIRECTIONAL

Survey Certification Letter

October 28, 2019



Marathon Oil[®]
Corporation

Operator Name: Marathon Oil
Well Name: Blueberry Hill 19 WA Fee No. 6H
County/Parish: Lea County,
State: NM
Rig Name: Precision 101
Job Number: LNM1454819

This is to certify the surveys performed on the referenced well by Professional Directional Ent., Inc. are true and correct MWD Surveys, data provided as follows:

<u>Surveyor</u>	<u>Surveyed Depths</u>	<u>Projection to Bit</u>	<u>Dates Performed</u>	<u>Type of Survey</u>
ProDirectional	1,180' MD – 19,247' MD	19,346' MD	06/11/19 – 10/01/19	MWD

Sincerely,

Mike Coats

Mike Coats
Regulatory Specialist
Professional Directional

850 Conroe Park West Drive | Conroe, TX 77303 | Phone: 936.441.7266

prodirectional.com

The Standard of Excellence in Directional Supervision



Marathon Oil

Marathon Oil

Lea County, NM(NAD 83)

Blueberry Hill 19 WA Fee

No. 6H

OH

Design: Gyro-MWD-120'-19247', PTB: 19346'

Survey Report

28 October, 2019



PRODIRECTIONAL



ProDirectional Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Blueberry Hill 19 WA Fee
Well: No. 6H
Wellbore: OH
Design: Gyro-MWD-120'-19247', PTB: 19346'

Local Co-ordinate Reference: Well No. 6H
TVD Reference: Well @ 3362.00usft
MD Reference: Well @ 3362.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Project Lea County, NM(NAD 83)

Map System: US State Plane 1983
Geo Datum: North American Datum 1983
Map Zone: New Mexico Eastern Zone

System Datum: Mean Sea Level

Site Blueberry Hill 19 WA Fee

Site Position:		Northing:	439,067.81 usft	Latitude:	32.203647
From:	Map	Easting:	829,278.18 usft	Longitude:	-103.402411
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.50 °

Well No. 6H, LNM1454819

Well Position	+N/-S	0.00 usft	Northing:	439,067.81 usft	Latitude:	32.203645
	+E/-W	0.00 usft	Easting:	829,368.18 usft	Longitude:	-103.402120
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,337.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	6/20/2019	6.62	59.85	47,891.30

Design Gyro-MWD-120'-19247', PTB: 19346'

Audit Notes:

Version: 1.0 **Phase:** ACTUAL **Tie On Depth:** 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.50



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Survey Program		Date	10/28/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
120.00	1,100.00	Survey #1 (OH)	MWD - OWSG	MWD - OWSG	
1,180.00	19,346.00	Survey #2 (OH)	MWD+HDGM	OWSG MWD + HRGM	

Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	439,067.81	829,368.18
120.00	0.90	313.00	120.00	0.65	0.64	-0.69	0.94	313.00	439,068.45	829,367.49
214.00	1.00	88.00	213.99	1.18	1.17	-0.41	1.24	340.79	439,068.98	829,367.77
297.00	0.90	140.00	296.98	0.69	0.70	0.73	1.01	46.30	439,068.51	829,368.91
418.00	0.90	66.00	417.97	0.34	0.36	2.21	2.24	80.77	439,068.17	829,370.39
513.00	1.00	95.00	512.96	0.56	0.59	3.72	3.77	80.98	439,068.40	829,371.90
607.00	0.60	36.00	606.95	0.88	0.92	4.83	4.91	79.24	439,068.73	829,373.01
702.00	1.20	175.00	701.94	0.28	0.33	5.21	5.22	86.39	439,068.14	829,373.39
796.00	0.90	92.00	795.93	-0.73	-0.68	6.03	6.07	96.41	439,067.13	829,374.21
891.00	1.20	202.00	890.92	-1.68	-1.63	6.40	6.61	104.25	439,066.18	829,374.58
985.00	1.20	144.00	984.90	-3.39	-3.34	6.61	7.41	116.77	439,064.47	829,374.79
1,100.00	1.00	205.00	1,099.89	-5.28	-5.22	6.90	8.65	127.12	439,062.59	829,375.08
1,180.00	1.30	141.10	1,179.87	-6.62	-6.56	7.17	9.72	132.44	439,061.25	829,375.35
Pro MWD First Survey: 1180' MD										
1,274.00	1.30	139.80	1,273.85	-8.28	-8.20	8.53	11.83	133.88	439,059.61	829,376.71
1,368.00	1.00	152.10	1,367.83	-9.82	-9.74	9.60	13.68	135.42	439,058.07	829,377.78
1,462.00	1.60	115.30	1,461.81	-11.12	-11.03	11.17	15.70	134.63	439,056.78	829,379.35
1,556.00	2.60	102.20	1,555.74	-12.16	-12.04	14.44	18.80	129.82	439,055.77	829,382.62
1,646.00	3.60	98.50	1,645.61	-13.06	-12.89	19.23	23.15	123.83	439,054.92	829,387.41
1,735.00	5.20	91.80	1,734.35	-13.65	-13.43	26.03	29.29	117.29	439,054.38	829,394.21
1,825.00	5.30	91.80	1,823.97	-13.98	-13.69	34.26	36.89	111.78	439,054.12	829,402.44



ProDirectional Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Blueberry Hill 19 WA Fee
Well: No. 6H
Wellbore: OH
Design: Gyro-MWD-120'-19247', PTB: 19346'

Local Co-ordinate Reference: Well No. 6H
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
1,914.00	6.50	92.30	1,912.49	-14.40	-14.02	43.40	45.61	107.90	439,053.79	829,411.58
2,004.00	8.00	93.20	2,001.77	-15.05	-14.57	54.74	56.65	104.91	439,053.24	829,422.92
2,093.00	8.00	94.20	2,089.91	-15.96	-15.37	67.10	68.84	102.90	439,052.44	829,435.28
2,183.00	8.10	93.50	2,179.02	-16.91	-16.22	79.68	81.31	101.50	439,051.59	829,447.86
2,272.00	8.10	92.40	2,267.13	-17.67	-16.86	92.20	93.73	100.36	439,050.95	829,460.38
2,362.00	8.20	92.50	2,356.22	-18.32	-17.41	104.95	106.38	99.42	439,050.40	829,473.13
2,451.00	8.40	92.60	2,444.29	-19.01	-17.98	117.78	119.15	98.68	439,049.83	829,485.96
2,541.00	8.50	90.70	2,533.31	-19.50	-18.36	131.00	132.28	97.98	439,049.45	829,499.18
2,630.00	8.20	95.10	2,621.37	-20.26	-19.00	143.90	145.15	97.52	439,048.81	829,512.08
2,719.00	8.00	99.20	2,709.48	-21.92	-20.56	156.34	157.68	97.49	439,047.25	829,524.52
2,809.00	8.10	97.80	2,798.60	-23.89	-22.42	168.80	170.28	97.57	439,045.39	829,536.98
2,899.00	8.40	96.20	2,887.67	-25.57	-23.99	181.62	183.19	97.52	439,043.82	829,549.80
2,988.00	8.70	96.20	2,975.68	-27.12	-25.42	194.77	196.42	97.44	439,042.39	829,562.95
3,077.00	8.90	96.40	3,063.63	-28.73	-26.91	208.31	210.04	97.36	439,040.90	829,576.49
3,167.00	8.40	98.10	3,152.61	-30.55	-28.62	221.73	223.57	97.35	439,039.19	829,589.91
3,257.00	8.10	99.00	3,241.67	-32.58	-30.53	234.50	236.48	97.42	439,037.28	829,602.68
3,347.00	7.60	97.60	3,330.83	-34.46	-32.31	246.66	248.77	97.46	439,035.50	829,614.84
3,436.00	7.30	96.20	3,419.08	-35.95	-33.70	258.12	260.31	97.44	439,034.11	829,626.30
3,526.00	8.00	96.80	3,508.28	-37.42	-35.06	270.02	272.29	97.40	439,032.75	829,638.20
3,615.00	7.30	96.30	3,596.48	-38.87	-36.41	281.79	284.14	97.36	439,031.40	829,649.97
3,705.00	6.80	97.70	3,685.80	-40.31	-37.76	292.76	295.18	97.35	439,030.05	829,660.94
3,795.00	7.30	98.50	3,775.12	-41.96	-39.32	303.69	306.23	97.38	439,028.49	829,671.87
3,885.00	7.00	100.70	3,864.42	-43.92	-41.18	314.74	317.42	97.45	439,026.63	829,682.92
3,974.00	6.60	103.60	3,952.80	-46.22	-43.39	325.04	327.92	97.60	439,024.42	829,693.22
4,064.00	6.60	101.70	4,042.20	-48.58	-45.65	335.13	338.22	97.76	439,022.16	829,703.31
4,154.00	6.70	101.70	4,131.60	-50.78	-47.77	345.33	348.62	97.88	439,020.04	829,713.51
4,243.00	6.50	101.00	4,220.01	-52.88	-49.78	355.36	358.83	97.97	439,018.03	829,723.54



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Survey

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4,333.00	8.00	98.50	4,309.28	-54.88	-51.68	366.56	370.18	98.02	439,016.13	829,734.74
4,423.00	8.60	98.40	4,398.34	-56.90	-53.59	379.41	383.17	98.04	439,014.22	829,747.59
4,513.00	9.30	97.30	4,487.24	-58.92	-55.49	393.28	397.18	98.03	439,012.32	829,761.46
4,602.00	8.80	98.20	4,575.14	-60.93	-57.38	407.15	411.17	98.02	439,010.43	829,775.33
4,692.00	8.30	97.50	4,664.14	-62.88	-59.21	420.41	424.55	98.02	439,008.60	829,788.59
4,782.00	9.40	90.70	4,753.07	-63.93	-60.15	434.20	438.34	97.89	439,007.66	829,802.38
4,871.00	10.40	90.40	4,840.74	-64.21	-60.29	449.50	453.52	97.64	439,007.52	829,817.68
4,961.00	9.90	92.80	4,929.33	-64.78	-60.73	465.35	469.29	97.43	439,007.08	829,833.53
5,051.00	9.80	91.00	5,018.00	-65.43	-61.24	480.73	484.62	97.26	439,006.57	829,848.91
5,141.00	8.20	88.70	5,106.89	-65.54	-61.23	494.81	498.58	97.05	439,006.58	829,862.99
5,230.00	7.60	89.70	5,195.05	-65.47	-61.05	507.04	510.70	96.87	439,006.76	829,875.22
5,320.00	6.90	90.60	5,284.33	-65.60	-61.08	518.40	521.98	96.72	439,006.73	829,886.58
5,410.00	6.20	91.30	5,373.74	-65.85	-61.24	528.66	532.20	96.61	439,006.57	829,896.84
5,497.00	6.20	94.70	5,460.23	-66.43	-61.73	538.04	541.57	96.55	439,006.08	829,906.22
5,586.00	7.40	98.70	5,548.60	-67.78	-63.00	548.50	552.10	96.55	439,004.81	829,916.68
5,676.00	7.60	98.80	5,637.83	-69.67	-64.78	560.11	563.84	96.60	439,003.03	829,928.29
5,766.00	7.70	98.90	5,727.03	-71.61	-66.63	571.95	575.81	96.64	439,001.18	829,940.13
5,855.00	7.60	97.30	5,815.24	-73.39	-68.30	583.67	587.66	96.67	438,999.51	829,951.85
5,945.00	7.40	97.30	5,904.47	-74.98	-69.79	595.33	599.40	96.69	438,998.02	829,963.51
6,035.00	7.80	97.90	5,993.68	-76.66	-71.37	607.12	611.30	96.70	438,996.44	829,975.30
6,124.00	8.00	97.80	6,081.84	-78.44	-73.04	619.24	623.53	96.73	438,994.77	829,987.42
6,214.00	8.00	96.70	6,170.96	-80.13	-74.62	631.67	636.06	96.74	438,993.19	829,999.85
6,304.00	7.70	101.80	6,260.12	-82.20	-76.58	643.79	648.33	96.78	438,991.23	830,011.97
6,393.00	7.60	105.30	6,348.33	-85.07	-79.35	655.30	660.09	96.90	438,988.46	830,023.48
6,483.00	7.40	102.80	6,437.56	-88.02	-82.21	666.69	671.74	97.03	438,985.60	830,034.87
6,572.00	7.30	100.40	6,525.83	-90.41	-84.50	677.85	683.09	97.11	438,983.31	830,046.03
6,662.00	7.30	100.30	6,615.10	-92.56	-86.55	689.09	694.51	97.16	438,981.26	830,057.27

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6,751.00	8.30	99.40	6,703.27	-94.73	-88.61	701.00	706.57	97.20	438,979.20	830,069.18
6,841.00	9.10	97.90	6,792.24	-96.88	-90.65	714.45	720.18	97.23	438,977.16	830,082.63
6,931.00	9.30	96.50	6,881.08	-98.81	-92.45	728.73	734.57	97.23	438,975.36	830,096.91
7,021.00	9.60	99.40	6,969.86	-100.99	-94.50	743.36	749.34	97.25	438,973.31	830,111.54
7,110.00	9.80	101.90	7,057.58	-103.89	-97.28	758.09	764.31	97.31	438,970.53	830,126.27
7,200.00	9.80	101.00	7,146.27	-107.06	-100.32	773.11	779.59	97.39	438,967.49	830,141.29
7,290.00	9.20	101.30	7,235.04	-110.06	-103.19	787.68	794.41	97.46	438,964.62	830,155.86
7,379.00	8.80	100.60	7,322.94	-112.82	-105.83	801.35	808.31	97.52	438,961.98	830,169.53
7,469.00	8.50	98.80	7,411.92	-115.22	-108.12	814.69	821.83	97.56	438,959.69	830,182.87
7,558.00	8.10	100.40	7,499.98	-117.47	-110.26	827.36	834.67	97.59	438,957.55	830,195.54
7,648.00	7.70	101.10	7,589.13	-119.88	-112.56	839.51	847.02	97.64	438,955.25	830,207.69
7,738.00	7.70	100.00	7,678.32	-122.19	-114.77	851.36	859.06	97.68	438,953.04	830,219.54
7,827.00	7.40	100.90	7,766.55	-124.41	-116.89	862.86	870.74	97.71	438,950.92	830,231.04
7,917.00	7.30	100.30	7,855.81	-126.63	-119.01	874.18	882.24	97.75	438,948.80	830,242.36
8,007.00	6.70	100.00	7,945.14	-128.66	-120.94	884.98	893.20	97.78	438,946.87	830,253.16
8,096.00	6.20	99.90	8,033.57	-130.47	-122.67	894.82	903.19	97.81	438,945.14	830,263.00
8,186.00	5.50	99.30	8,123.10	-132.08	-124.20	903.87	912.36	97.82	438,943.61	830,272.05
8,276.00	5.00	101.30	8,212.73	-133.62	-125.67	911.97	920.59	97.85	438,942.14	830,280.15
8,365.00	4.80	98.90	8,301.40	-135.02	-127.00	919.45	928.18	97.86	438,940.81	830,287.63
8,455.00	3.80	105.90	8,391.15	-136.48	-128.40	926.04	934.90	97.89	438,939.41	830,294.22
8,544.00	3.10	112.30	8,479.99	-138.24	-130.12	931.10	940.15	97.96	438,937.69	830,299.28
8,633.00	2.50	115.90	8,568.88	-140.04	-131.88	935.08	944.33	98.03	438,935.93	830,303.26
8,723.00	1.50	122.10	8,658.82	-141.55	-133.37	937.84	947.28	98.09	438,934.44	830,306.02
8,812.00	1.30	125.80	8,747.80	-142.77	-134.58	939.65	949.23	98.15	438,933.23	830,307.83
8,902.00	1.30	116.40	8,837.77	-143.84	-135.63	941.39	951.11	98.20	438,932.18	830,309.57
8,991.00	1.10	108.10	8,926.75	-144.57	-136.34	943.10	952.91	98.23	438,931.47	830,311.28
9,079.00	1.20	106.30	9,014.74	-145.10	-136.86	944.79	954.65	98.24	438,930.95	830,312.97

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9,168.00	1.00	109.70	9,103.72	-145.64	-137.39	946.42	956.34	98.26	438,930.42	830,314.60
9,257.00	1.00	192.10	9,192.71	-146.67	-138.41	946.99	957.05	98.32	438,929.40	830,315.17
9,347.00	1.10	189.80	9,282.69	-148.28	-140.03	946.67	956.97	98.41	438,927.78	830,314.85
9,436.00	0.90	181.70	9,371.68	-149.82	-141.57	946.51	957.04	98.51	438,926.24	830,314.69
9,526.00	0.70	162.60	9,461.67	-151.06	-142.80	946.65	957.36	98.58	438,925.01	830,314.83
9,615.00	0.00	47.50	9,550.67	-151.58	-143.32	946.81	957.60	98.61	438,924.49	830,314.99
9,705.00	0.30	316.00	9,640.67	-151.40	-143.15	946.65	957.41	98.60	438,924.66	830,314.83
9,794.00	0.10	250.50	9,729.67	-151.26	-143.01	946.42	957.16	98.59	438,924.80	830,314.60
9,884.00	0.30	134.00	9,819.67	-151.45	-143.20	946.51	957.28	98.60	438,924.61	830,314.69
9,973.00	0.40	109.40	9,908.67	-151.72	-143.46	946.97	957.78	98.61	438,924.35	830,315.15
10,063.00	0.10	37.20	9,998.67	-151.77	-143.50	947.32	958.12	98.61	438,924.31	830,315.50
10,153.00	0.80	334.80	10,088.66	-151.28	-143.02	947.16	957.90	98.59	438,924.79	830,315.34
10,242.00	0.90	353.20	10,177.66	-150.16	-141.90	946.88	957.45	98.52	438,925.91	830,315.06
10,331.00	1.00	15.10	10,266.65	-148.71	-140.46	947.00	957.36	98.44	438,927.35	830,315.18
10,421.00	0.90	358.10	10,356.63	-147.25	-138.99	947.18	957.33	98.35	438,928.82	830,315.36
10,510.00	1.30	250.10	10,445.62	-146.89	-138.64	946.21	956.31	98.34	438,929.17	830,314.39
10,599.00	1.50	246.50	10,534.60	-147.68	-139.44	944.19	954.43	98.40	438,928.37	830,312.37
10,689.00	0.90	257.00	10,624.58	-148.29	-140.07	942.42	952.78	98.45	438,927.74	830,310.60
10,778.00	0.70	267.40	10,713.57	-148.46	-140.25	941.20	951.59	98.48	438,927.56	830,309.38
10,868.00	0.60	263.30	10,803.56	-148.53	-140.33	940.18	950.60	98.49	438,927.48	830,308.36
10,957.00	0.90	276.60	10,892.55	-148.50	-140.31	939.02	949.45	98.50	438,927.50	830,307.20
11,047.00	0.90	275.90	10,982.54	-148.33	-140.15	937.62	948.04	98.50	438,927.66	830,305.80
11,136.00	1.10	311.00	11,071.53	-147.69	-139.52	936.28	946.62	98.48	438,928.29	830,304.46
11,226.00	1.50	318.00	11,161.51	-146.23	-138.08	934.84	944.98	98.40	438,929.73	830,303.02
11,315.00	1.50	293.90	11,250.48	-144.88	-136.74	932.99	942.96	98.34	438,931.07	830,301.17
11,404.00	1.40	280.00	11,339.45	-144.20	-136.08	930.86	940.75	98.32	438,931.73	830,299.04
11,494.00	2.10	262.90	11,429.41	-144.19	-136.09	928.14	938.06	98.34	438,931.72	830,296.32



ProDirectional
Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Blueberry Hill 19 WA Fee
Well: No. 6H
Wellbore: OH
Design: Gyro-MWD-120'-19247', PTB: 19346'

Local Co-ordinate Reference: Well No. 6H
TVD Reference: Well @ 3362.00usft
MD Reference: Well @ 3362.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
11,583.00	3.10	258.80	11,518.32	-144.82	-136.76	924.16	934.23	98.42	438,931.05	830,292.34
11,672.00	2.00	254.00	11,607.23	-145.69	-137.66	920.31	930.55	98.51	438,930.15	830,288.49
11,762.00	1.90	247.50	11,697.17	-146.66	-138.66	917.42	927.84	98.59	438,929.15	830,285.60
11,882.00	2.40	246.40	11,817.09	-148.39	-140.43	913.28	924.01	98.74	438,927.38	830,281.46
11,977.00	2.70	250.60	11,911.99	-149.90	-141.97	909.34	920.36	98.87	438,925.84	830,277.52
12,071.00	3.00	331.90	12,005.91	-148.44	-140.54	906.10	916.93	98.82	438,927.27	830,274.28
12,166.00	15.40	8.00	12,099.55	-133.69	-125.79	906.68	915.37	97.90	438,942.02	830,274.86
12,261.00	16.40	7.60	12,190.91	-107.94	-100.00	910.21	915.69	96.27	438,967.81	830,278.39
12,355.00	24.30	4.30	12,278.98	-75.48	-67.51	913.42	915.92	94.23	439,000.30	830,281.60
12,449.00	38.40	9.20	12,359.07	-27.18	-19.15	919.57	919.77	91.19	439,048.66	830,287.75
12,543.00	57.10	4.40	12,422.01	41.55	49.65	927.34	928.67	86.94	439,117.46	830,295.52
12,637.00	67.70	1.60	12,465.50	124.57	132.71	931.59	941.00	81.89	439,200.52	830,299.77
12,732.00	78.70	359.10	12,492.92	215.36	223.51	932.09	958.51	76.52	439,291.32	830,300.27
12,826.00	88.20	357.20	12,503.63	308.61	316.73	929.07	981.57	71.18	439,384.54	830,297.25
12,920.00	90.30	358.90	12,504.86	402.57	410.66	925.87	1,012.85	66.08	439,478.47	830,294.05
13,015.00	91.80	0.10	12,503.12	497.54	505.64	925.04	1,054.21	61.34	439,573.45	830,293.22
13,118.00	91.60	0.30	12,500.07	600.49	608.59	925.40	1,107.58	56.67	439,676.40	830,293.58
13,212.00	94.30	1.50	12,495.23	694.33	702.44	926.87	1,162.98	52.84	439,770.25	830,295.05
13,307.00	97.10	1.90	12,485.80	788.78	796.92	929.67	1,224.49	49.40	439,864.73	830,297.85
13,401.00	98.80	2.00	12,472.79	881.79	889.96	932.84	1,289.27	46.35	439,957.77	830,301.02
13,509.00	99.70	1.90	12,455.43	988.28	996.49	936.47	1,367.47	43.22	440,064.30	830,304.65
13,604.00	95.40	359.80	12,442.95	1,082.41	1,090.63	937.86	1,438.42	40.69	440,158.44	830,306.04
13,698.00	90.20	357.30	12,438.36	1,176.24	1,184.45	935.48	1,509.32	38.30	440,252.26	830,303.66
13,792.00	90.00	357.90	12,438.20	1,270.19	1,278.37	931.54	1,581.77	36.08	440,346.18	830,299.72
13,886.00	88.30	357.40	12,439.59	1,364.13	1,372.28	927.69	1,656.43	34.06	440,440.09	830,295.87
13,981.00	87.90	356.90	12,442.74	1,458.99	1,467.11	922.97	1,733.28	32.17	440,534.92	830,291.15
14,075.00	88.00	357.50	12,446.11	1,552.86	1,560.93	918.38	1,811.06	30.47	440,628.74	830,286.56

Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Blueberry Hill 19 WA Fee
Well: No. 6H
Wellbore: OH
Design: Gyro-MWD-120'-19247', PTB: 19346'

Local Co-ordinate Reference: Well No. 6H
TVD Reference: Well @ 3362.00usft
MD Reference: Well @ 3362.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
14,169.00	85.60	357.20	12,451.35	1,646.64	1,654.68	914.04	1,890.35	28.92	440,722.49	830,282.22	
14,264.00	90.20	358.30	12,454.83	1,741.50	1,749.51	910.32	1,972.18	27.49	440,817.32	830,278.50	
14,359.00	87.50	358.00	12,456.74	1,836.45	1,844.44	907.25	2,055.49	26.19	440,912.25	830,275.43	
14,453.00	87.10	358.60	12,461.17	1,930.32	1,938.29	904.46	2,138.93	25.02	441,006.10	830,272.64	
14,547.00	89.40	358.50	12,464.04	2,024.26	2,032.21	902.09	2,223.43	23.94	441,100.02	830,270.27	
14,642.00	86.50	358.80	12,467.44	2,119.18	2,127.11	899.85	2,309.62	22.93	441,194.92	830,268.03	
14,736.00	88.30	359.40	12,471.70	2,213.08	2,221.00	898.38	2,395.81	22.02	441,288.81	830,266.56	
14,831.00	89.10	358.70	12,473.86	2,308.05	2,315.96	896.80	2,483.53	21.17	441,383.77	830,264.98	
14,925.00	89.70	358.30	12,474.84	2,402.03	2,409.92	894.34	2,570.52	20.36	441,477.73	830,262.52	
15,019.00	89.10	358.60	12,475.82	2,496.01	2,503.88	891.80	2,657.96	19.60	441,571.69	830,259.98	
15,113.00	89.30	0.00	12,477.14	2,589.99	2,597.86	890.65	2,746.30	18.92	441,665.67	830,258.83	
15,206.00	90.40	0.00	12,477.38	2,682.99	2,690.86	890.65	2,834.43	18.31	441,758.67	830,258.83	
15,301.00	86.90	358.50	12,479.62	2,777.94	2,785.81	889.41	2,924.34	17.71	441,853.62	830,257.59	
15,396.00	85.00	359.50	12,486.33	2,872.70	2,880.55	887.75	3,014.25	17.13	441,948.36	830,255.93	
15,490.00	88.90	359.80	12,491.33	2,966.55	2,974.40	887.18	3,103.89	16.61	442,042.21	830,255.36	
15,585.00	92.20	1.10	12,490.42	3,061.51	3,069.38	887.93	3,195.23	16.13	442,137.19	830,256.11	
15,680.00	91.20	1.50	12,487.60	3,156.42	3,164.31	890.08	3,287.11	15.71	442,232.12	830,258.26	
15,774.00	89.70	359.90	12,486.86	3,250.39	3,258.30	891.23	3,377.98	15.30	442,326.11	830,259.41	
15,869.00	91.00	1.30	12,486.28	3,345.37	3,353.28	892.22	3,469.95	14.90	442,421.09	830,260.40	
15,963.00	87.50	358.80	12,487.51	3,439.34	3,447.25	892.31	3,560.87	14.51	442,515.06	830,260.49	
16,058.00	87.60	359.50	12,491.57	3,534.25	3,542.16	890.90	3,652.47	14.12	442,609.97	830,259.08	
16,152.00	88.00	358.10	12,495.18	3,628.17	3,636.06	888.93	3,743.15	13.74	442,703.87	830,257.11	
16,247.00	91.30	357.20	12,495.76	3,723.10	3,730.97	885.04	3,834.50	13.34	442,798.78	830,253.22	
16,341.00	88.40	355.80	12,496.01	3,816.96	3,824.78	879.30	3,924.55	12.95	442,892.59	830,247.48	
16,436.00	90.70	354.70	12,496.75	3,911.69	3,919.44	871.43	4,015.15	12.53	442,987.25	830,239.61	
16,530.00	92.20	357.00	12,494.37	4,005.46	4,013.16	864.63	4,105.24	12.16	443,080.97	830,232.81	
16,625.00	93.20	359.70	12,489.90	4,100.32	4,108.00	861.90	4,197.45	11.85	443,175.81	830,230.08	



ProDirectional
Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Blueberry Hill 19 WA Fee
Well: No. 6H
Wellbore: OH
Design: Gyro-MWD-120'-19247', PTB: 19346'

Local Co-ordinate Reference: Well No. 6H
TVD Reference: Well @ 3362.00usft
MD Reference: Well @ 3362.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey											
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)	
16,719.00	93.70	358.70	12,484.24	4,194.15	4,201.82	860.59	4,289.05	11.57	443,269.63	830,228.77	
16,813.00	91.80	358.70	12,479.73	4,288.03	4,295.68	858.46	4,380.62	11.30	443,363.49	830,226.64	
16,908.00	92.70	0.10	12,476.00	4,382.95	4,390.60	857.46	4,473.55	11.05	443,458.41	830,225.64	
17,003.00	90.60	358.60	12,473.27	4,477.90	4,485.55	856.39	4,566.57	10.81	443,553.36	830,224.57	
17,097.00	94.40	359.20	12,469.17	4,571.79	4,579.42	854.58	4,658.48	10.57	443,647.23	830,222.76	
17,192.00	91.70	358.30	12,464.11	4,666.64	4,674.26	852.51	4,751.36	10.34	443,742.07	830,220.69	
17,286.00	92.10	0.30	12,460.99	4,760.58	4,768.19	851.36	4,843.60	10.12	443,836.00	830,219.54	
17,358.00	92.50	1.50	12,458.10	4,832.50	4,840.13	852.49	4,914.63	9.99	443,907.94	830,220.67	
17,452.00	96.00	8.70	12,451.13	4,925.72	4,933.42	860.81	5,007.96	9.90	444,001.23	830,228.99	
17,547.00	96.70	6.10	12,440.62	5,019.23	5,027.04	872.97	5,102.28	9.85	444,094.85	830,241.15	
17,641.00	97.10	2.60	12,429.33	5,112.20	5,120.08	880.05	5,195.16	9.75	444,187.89	830,248.23	
17,736.00	96.40	5.70	12,418.16	5,206.22	5,214.16	886.87	5,289.05	9.65	444,281.97	830,255.05	
17,831.00	98.10	4.00	12,406.17	5,300.04	5,308.06	894.84	5,382.95	9.57	444,375.87	830,263.02	
17,925.00	97.20	0.10	12,393.65	5,393.10	5,401.14	898.17	5,475.31	9.44	444,468.95	830,266.35	
18,020.00	98.90	0.00	12,380.35	5,487.15	5,495.20	898.26	5,568.13	9.28	444,563.01	830,266.44	
18,115.00	97.70	359.90	12,366.63	5,581.15	5,589.20	898.17	5,660.91	9.13	444,657.01	830,266.35	
18,209.00	97.40	355.60	12,354.28	5,674.27	5,682.29	894.51	5,752.27	8.95	444,750.10	830,262.69	
18,304.00	98.00	356.60	12,341.55	5,768.25	5,776.22	888.11	5,844.09	8.74	444,844.03	830,256.29	
18,399.00	98.70	356.60	12,327.75	5,862.12	5,870.04	882.54	5,936.02	8.55	444,937.85	830,250.72	
18,494.00	99.40	355.80	12,312.81	5,955.78	5,963.65	876.32	6,027.69	8.36	445,031.46	830,244.50	
18,588.00	99.70	355.70	12,297.21	6,048.28	6,056.10	869.45	6,118.19	8.17	445,123.91	830,237.63	
18,682.00	99.10	355.20	12,281.86	6,140.78	6,148.54	862.09	6,208.68	7.98	445,216.35	830,230.27	
18,776.00	99.20	358.60	12,266.91	6,233.48	6,241.19	857.07	6,299.77	7.82	445,309.00	830,225.25	
18,870.00	98.80	0.20	12,252.20	6,326.32	6,334.03	856.10	6,391.62	7.70	445,401.84	830,224.28	
18,964.00	99.30	0.80	12,237.42	6,419.13	6,426.85	856.91	6,483.73	7.59	445,494.66	830,225.09	
19,059.00	100.30	1.50	12,221.25	6,512.70	6,520.45	858.79	6,576.76	7.50	445,588.26	830,226.97	
19,153.00	99.20	1.30	12,205.33	6,605.29	6,613.06	861.05	6,668.88	7.42	445,680.87	830,229.23	

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Local Co-ordinate Reference: Well No. 6H
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Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
19,247.00	97.40	0.80	12,191.76	6,698.27	6,706.06	862.76	6,761.33	7.33	445,773.87	830,230.94
Last Survey: 19247' MD										
19,346.00	97.40	0.80	12,179.01	6,796.42	6,804.22	864.13	6,858.87	7.24	445,872.03	830,232.31
PTB: 19346' MD										

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,180.00	1,179.87	-6.56	7.17	Pro MWD First Survey: 1180' MD
19,247.00	12,191.76	6,706.06	862.76	Last Survey: 19247' MD
19,346.00	12,179.01	6,804.22	864.13	PTB: 19346' MD

