



HOBBS OCD

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Marathon Oil

Corporation

Will Kane 15 WXY Fee No. 3H
Lea County, NM

October 10, 2019

Job No. LNM1519819
API No. 30-025-45999

Survey Completion Report

Double Sided



Marathon Oil

Marathon Oil

Lea County, NM

Will Kane 15 WXY Fee

No. 3H

OH

Survey: ProDirectional

Survey Report

10 October, 2019





ProDirectional Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 3H
Wellbore: OH
Design: MWD-100'-17281', PTB: 17337'

Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey Program		Date	10/10/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description	
100.00	1,267.00	Survey #1 (OH)	Standard Keeper 103	Standard Wireline Keeper ver 1.0.3	
1,432.00	17,337.00	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	441,865.26	813,367.40	
100.00	0.32	148.75	100.00	-0.24	-0.24	0.14	0.28	148.75	441,865.02	813,367.54	
125.00	0.12	142.38	125.00	-0.32	-0.32	0.20	0.38	148.31	441,864.94	813,367.60	
150.00	0.29	111.78	150.00	-0.37	-0.36	0.27	0.45	143.20	441,864.90	813,367.67	
175.00	0.52	110.12	175.00	-0.43	-0.43	0.44	0.61	134.26	441,864.83	813,367.84	
200.00	0.62	111.13	200.00	-0.52	-0.51	0.67	0.84	127.49	441,864.75	813,368.07	
225.00	0.66	121.40	225.00	-0.64	-0.64	0.92	1.12	124.75	441,864.62	813,368.32	
250.00	0.69	130.25	249.99	-0.82	-0.81	1.16	1.41	124.99	441,864.45	813,368.56	
275.00	0.70	122.96	274.99	-1.00	-0.99	1.40	1.71	125.27	441,864.27	813,368.80	
300.00	0.68	118.81	299.99	-1.16	-1.14	1.66	2.01	124.62	441,864.12	813,369.06	
325.00	0.70	111.05	324.99	-1.29	-1.27	1.93	2.31	123.36	441,863.99	813,369.33	
350.00	0.70	109.82	349.99	-1.39	-1.38	2.22	2.61	121.86	441,863.88	813,369.62	
375.00	0.87	116.64	374.98	-1.53	-1.51	2.53	2.95	120.91	441,863.75	813,369.93	
400.00	0.77	122.63	399.98	-1.71	-1.69	2.84	3.31	120.75	441,863.57	813,370.24	
425.00	0.67	133.61	424.98	-1.90	-1.88	3.09	3.62	121.35	441,863.38	813,370.49	
450.00	0.63	151.20	449.98	-2.13	-2.10	3.26	3.88	122.82	441,863.16	813,370.66	
475.00	0.62	178.72	474.98	-2.38	-2.36	3.33	4.08	125.31	441,862.90	813,370.73	
500.00	0.55	190.24	499.98	-2.64	-2.61	3.31	4.22	128.27	441,862.65	813,370.71	
525.00	0.59	180.99	524.97	-2.88	-2.86	3.29	4.36	131.01	441,862.40	813,370.69	
550.00	0.68	173.08	549.97	-3.16	-3.13	3.30	4.55	133.50	441,862.13	813,370.70	
575.00	0.69	171.23	574.97	-3.46	-3.43	3.34	4.79	135.73	441,861.83	813,370.74	



ProDirectional Survey Report



Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 3H
Wellbore: OH
Design: MWD-100'-17281', PTB: 17337'

Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
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)
6,079.00	8.22	247.59	6,051.57	-197.57	-200.87	-437.93	481.80	245.36	441,664.39	812,929.47
6,169.00	8.26	248.29	6,140.64	-202.33	-205.71	-449.89	494.69	245.43	441,659.55	812,917.51
6,258.00	8.26	246.44	6,228.71	-207.16	-210.63	-461.69	507.46	245.48	441,654.63	812,905.71
6,347.00	8.00	248.02	6,316.82	-211.95	-215.50	-473.29	520.04	245.52	441,649.76	812,894.11
6,437.00	7.69	246.88	6,405.98	-216.57	-220.21	-484.63	532.32	245.56	441,645.05	812,882.77
6,526.00	7.65	247.41	6,494.18	-221.10	-224.83	-495.58	544.19	245.60	441,640.43	812,871.82
6,615.00	8.09	243.54	6,582.34	-226.08	-229.89	-506.66	556.37	245.59	441,635.37	812,860.74
6,704.00	7.87	244.60	6,670.48	-231.40	-235.30	-517.77	568.72	245.56	441,629.96	812,849.63
6,794.00	8.79	242.22	6,759.53	-237.16	-241.14	-529.42	581.75	245.51	441,624.12	812,837.98
6,882.00	9.19	243.10	6,846.45	-243.39	-247.46	-541.63	595.48	245.45	441,617.80	812,825.77
6,971.00	9.27	242.22	6,934.30	-249.85	-254.01	-554.31	609.74	245.38	441,611.25	812,813.09
7,061.00	9.27	242.58	7,023.12	-256.47	-260.73	-567.16	624.22	245.31	441,604.53	812,800.24
7,150.00	8.97	243.19	7,111.00	-262.80	-267.16	-579.72	638.31	245.26	441,598.10	812,787.68
7,240.00	8.92	243.89	7,199.90	-268.94	-273.40	-592.24	652.30	245.22	441,591.86	812,775.16
7,329.00	8.84	243.45	7,287.84	-274.95	-279.49	-604.56	666.04	245.19	441,585.77	812,762.84
7,418.00	8.75	243.81	7,375.79	-280.90	-285.53	-616.75	679.64	245.16	441,579.73	812,750.65
7,508.00	7.96	242.66	7,464.83	-286.69	-291.42	-628.43	692.71	245.12	441,573.84	812,738.97
7,597.00	7.65	244.25	7,553.01	-292.02	-296.82	-639.24	704.79	245.09	441,568.44	812,728.16
7,686.00	7.25	244.60	7,641.26	-296.92	-301.80	-649.65	716.33	245.08	441,563.46	812,717.75
7,776.00	7.16	242.31	7,730.55	-301.89	-306.85	-659.74	727.61	245.06	441,558.41	812,707.66
7,866.00	7.25	241.35	7,819.84	-307.14	-312.18	-669.69	738.88	245.01	441,553.08	812,697.71
7,955.00	7.16	241.96	7,908.13	-312.37	-317.48	-679.52	750.02	244.96	441,547.78	812,687.88
8,045.00	6.86	241.52	7,997.46	-317.49	-322.68	-689.19	760.99	244.91	441,542.58	812,678.21
8,134.00	6.29	240.03	8,085.88	-322.40	-327.65	-698.09	771.15	244.86	441,537.61	812,669.31
8,223.00	6.46	237.92	8,174.33	-327.43	-332.74	-706.55	780.98	244.78	441,532.52	812,660.85
8,313.00	8.13	244.69	8,263.60	-332.76	-338.15	-716.60	792.37	244.74	441,527.11	812,650.80
8,402.00	8.09	245.39	8,351.71	-337.98	-343.45	-727.98	804.93	244.74	441,521.81	812,639.42



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Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
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)
15,745.00	87.30	0.88	12,321.95	3,117.26	3,110.27	-943.69	3,250.28	343.12	444,975.53	812,423.71
15,835.00	89.49	1.14	12,324.47	3,207.19	3,200.21	-942.10	3,336.00	343.60	445,065.47	812,425.30
15,925.00	89.45	359.91	12,325.30	3,297.17	3,290.20	-941.28	3,422.20	344.04	445,155.46	812,426.12
16,014.00	89.27	0.35	12,326.29	3,386.16	3,379.20	-941.07	3,507.79	344.44	445,244.46	812,426.33
16,104.00	86.68	358.94	12,329.47	3,476.10	3,469.13	-941.63	3,594.65	344.81	445,334.39	812,425.77
16,194.00	88.62	0.79	12,333.16	3,566.01	3,559.04	-941.84	3,681.56	345.18	445,424.30	812,425.56
16,284.00	88.40	0.00	12,335.50	3,655.97	3,649.01	-941.22	3,768.45	345.54	445,514.27	812,426.18
16,373.00	88.57	0.00	12,337.86	3,744.94	3,737.98	-941.22	3,854.66	345.87	445,603.24	812,426.18
16,462.00	91.21	1.40	12,338.03	3,833.91	3,826.96	-940.13	3,940.75	346.20	445,692.22	812,427.27
16,551.00	90.64	1.93	12,336.59	3,922.84	3,915.91	-937.55	4,026.58	346.54	445,781.17	812,429.85
16,641.00	92.18	1.05	12,334.38	4,012.76	4,005.85	-935.21	4,113.57	346.86	445,871.11	812,432.19
16,731.00	92.18	2.46	12,330.95	4,102.63	4,095.74	-932.45	4,200.54	347.17	445,961.00	812,434.95
16,821.00	91.21	1.58	12,328.29	4,192.50	4,185.65	-929.28	4,287.56	347.48	446,050.91	812,438.12
16,910.00	90.07	0.88	12,327.30	4,281.46	4,274.62	-927.37	4,374.06	347.76	446,139.88	812,440.03
17,000.00	89.63	0.79	12,327.53	4,371.43	4,364.61	-926.06	4,461.77	348.02	446,229.87	812,441.34
17,090.00	89.80	1.40	12,327.98	4,461.40	4,454.59	-924.34	4,549.48	348.28	446,319.85	812,443.06
17,180.00	90.55	0.26	12,327.71	4,551.38	4,544.58	-923.04	4,637.37	348.52	446,409.84	812,444.36
17,281.00	88.88	358.86	12,328.21	4,652.37	4,645.57	-923.81	4,736.53	348.75	446,510.83	812,443.59
Last Survey: 17281' MD										
17,337.00	88.88	358.86	12,329.30	4,708.35	4,701.55	-924.93	4,791.66	348.87	446,566.81	812,442.47
PTB: 17337' MD										

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Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
1,432.00	1,431.94	-10.04	2.15	Pro MWD First Survey: 1432' MD
17,281.00	12,328.21	4,645.57	-923.81	Last Survey: 17281' MD
17,337.00	12,329.30	4,701.55	-924.93	PTB: 17337' MD

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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)
13,326.00	89.63	358.68	12,320.35	699.93	692.84	-947.85	1,174.07	306.17	442,558.10	812,419.55
13,416.00	89.05	1.14	12,321.38	789.92	782.83	-947.99	1,229.43	309.55	442,648.09	812,419.41
13,506.00	88.84	0.79	12,323.04	879.88	872.80	-946.48	1,287.48	312.68	442,738.06	812,420.92
13,596.00	91.69	0.70	12,322.63	969.85	962.78	-945.31	1,349.28	315.52	442,828.04	812,422.09
13,685.00	92.53	0.79	12,319.35	1,058.77	1,051.71	-944.15	1,413.33	318.08	442,916.97	812,423.25
13,775.00	92.48	1.14	12,315.41	1,148.65	1,141.61	-942.64	1,480.49	320.45	443,006.87	812,424.76
13,864.00	91.74	1.23	12,312.14	1,237.56	1,230.53	-940.80	1,548.97	322.60	443,095.79	812,426.60
13,954.00	91.47	0.17	12,309.62	1,327.50	1,320.49	-939.70	1,620.72	324.56	443,185.75	812,427.70
14,043.00	88.57	1.58	12,309.59	1,416.47	1,409.47	-938.34	1,693.24	326.35	443,274.73	812,429.06
14,133.00	89.45	0.79	12,311.14	1,506.42	1,499.43	-936.48	1,767.85	328.01	443,364.69	812,430.92
14,222.00	89.01	359.91	12,312.34	1,595.40	1,588.42	-935.93	1,843.65	329.49	443,453.68	812,431.47
14,311.00	88.00	359.21	12,314.66	1,684.37	1,677.39	-936.62	1,921.17	330.82	443,542.65	812,430.78
14,401.00	87.38	358.06	12,318.29	1,774.28	1,767.29	-938.76	2,001.14	332.02	443,632.55	812,428.64
14,490.00	87.38	359.03	12,322.36	1,863.17	1,856.16	-941.02	2,081.07	333.12	443,721.42	812,426.38
14,580.00	90.77	358.33	12,323.81	1,953.14	1,946.11	-943.09	2,162.59	334.15	443,811.37	812,424.31
14,670.00	91.43	357.89	12,322.08	2,043.09	2,036.05	-946.06	2,245.11	335.08	443,901.31	812,421.34
14,759.00	93.67	358.68	12,318.12	2,131.97	2,124.91	-948.72	2,327.09	335.94	443,990.17	812,418.68
14,847.00	90.73	1.32	12,314.74	2,219.89	2,212.83	-948.72	2,407.63	336.79	444,078.09	812,418.68
14,937.00	89.71	1.58	12,314.40	2,309.84	2,302.80	-946.44	2,489.71	337.66	444,168.06	812,420.96
15,027.00	89.32	2.02	12,315.16	2,399.77	2,392.75	-943.61	2,572.09	338.48	444,258.01	812,423.79
15,117.00	89.23	2.99	12,316.30	2,489.64	2,482.66	-939.68	2,654.54	339.27	444,347.92	812,427.72
15,206.00	86.86	358.86	12,319.33	2,578.54	2,571.57	-938.24	2,737.38	339.96	444,436.83	812,429.16
15,296.00	88.70	358.42	12,322.82	2,668.45	2,661.47	-940.38	2,822.72	340.54	444,526.73	812,427.02
15,386.00	90.02	358.68	12,323.83	2,758.43	2,751.44	-942.65	2,908.43	341.09	444,616.70	812,424.75
15,475.00	91.65	359.03	12,322.53	2,847.41	2,840.41	-944.43	2,993.30	341.61	444,705.67	812,422.97
15,566.00	92.09	359.65	12,319.56	2,938.36	2,931.35	-945.48	3,080.06	342.12	444,796.61	812,421.92
15,655.00	88.79	0.88	12,318.88	3,027.34	3,020.33	-945.07	3,164.74	342.63	444,885.59	812,422.33

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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)
8,492.00	7.65	244.95	8,440.86	-343.06	-348.62	-739.16	817.25	244.75	441,516.64	812,628.24
8,581.00	7.38	243.63	8,529.09	-348.03	-353.67	-749.65	828.89	244.74	441,511.59	812,617.75
8,670.00	7.47	245.83	8,617.35	-352.86	-358.58	-760.05	840.39	244.74	441,506.68	812,607.35
8,760.00	6.95	246.88	8,706.64	-357.32	-363.11	-770.40	851.68	244.76	441,502.15	812,597.00
8,849.00	8.18	240.73	8,794.86	-362.45	-368.32	-780.87	863.38	244.75	441,496.94	812,586.53
8,939.00	8.35	241.52	8,883.93	-368.61	-374.57	-792.20	876.29	244.69	441,490.69	812,575.20
9,028.00	8.13	242.40	8,972.01	-374.52	-380.56	-803.46	889.03	244.66	441,484.70	812,563.94
9,117.00	7.82	242.31	9,060.15	-380.17	-386.29	-814.40	901.37	244.62	441,478.97	812,553.00
9,206.00	7.38	242.75	9,148.36	-385.52	-391.72	-824.84	913.13	244.60	441,473.54	812,542.56
9,296.00	6.99	241.61	9,237.66	-390.70	-396.97	-834.80	924.38	244.57	441,468.29	812,532.60
9,385.00	6.46	243.98	9,326.04	-395.40	-401.75	-844.06	934.79	244.55	441,463.51	812,523.34
9,474.00	5.80	244.07	9,414.54	-399.50	-405.91	-852.60	944.30	244.54	441,459.35	812,514.80
9,564.00	5.45	243.81	9,504.10	-403.31	-409.78	-860.53	953.12	244.54	441,455.48	812,506.87
9,653.00	5.14	250.84	9,592.72	-406.43	-412.96	-868.09	961.31	244.56	441,452.30	812,499.31
9,743.00	5.23	245.56	9,682.35	-409.39	-415.98	-875.63	969.41	244.59	441,449.28	812,491.77
9,832.00	4.09	237.13	9,771.06	-412.75	-419.38	-881.99	976.62	244.57	441,445.88	812,485.41
9,921.00	3.69	235.02	9,859.86	-416.07	-422.74	-887.00	982.59	244.52	441,442.52	812,480.40
10,011.00	3.16	234.40	9,949.69	-419.15	-425.85	-891.39	987.89	244.46	441,439.41	812,476.01
10,100.00	3.03	234.05	10,038.56	-421.93	-428.66	-895.29	992.62	244.42	441,436.60	812,472.11
10,190.00	2.33	236.07	10,128.47	-424.32	-431.07	-898.73	996.77	244.38	441,434.19	812,468.67
10,279.00	2.33	237.13	10,217.39	-426.29	-433.07	-901.75	1,000.35	244.35	441,432.19	812,465.65
10,368.00	2.46	233.35	10,306.31	-428.39	-435.19	-904.81	1,004.02	244.31	441,430.07	812,462.59
10,457.00	2.51	241.08	10,395.23	-430.44	-437.27	-908.04	1,007.84	244.29	441,427.99	812,459.36
10,547.00	1.80	256.99	10,485.17	-431.69	-438.54	-911.15	1,011.19	244.30	441,426.72	812,456.25
10,637.00	1.89	259.71	10,575.12	-432.25	-439.13	-913.98	1,014.00	244.34	441,426.13	812,453.42
10,727.00	2.11	253.47	10,665.07	-432.97	-439.86	-917.03	1,017.07	244.37	441,425.40	812,450.37
10,816.00	2.20	253.56	10,754.00	-433.89	-440.81	-920.24	1,020.37	244.40	441,424.45	812,447.16

Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 3H
Wellbore: OH
Design: MWD-100'-17281', PTB: 17337'

Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
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)
3,666.00	6.20	237.30	3,657.26	-77.24	-78.51	-169.56	186.86	245.15	441,786.75	813,197.84
3,755.00	6.02	234.84	3,745.75	-82.46	-83.80	-177.42	196.22	244.72	441,781.46	813,189.98
3,845.00	6.59	240.38	3,835.21	-87.67	-89.07	-185.77	206.02	244.38	441,776.19	813,181.63
3,934.00	6.95	241.70	3,923.59	-92.68	-94.15	-194.95	216.49	244.22	441,771.11	813,172.45
4,023.00	6.90	238.80	4,011.94	-97.93	-99.47	-204.26	227.19	244.04	441,765.79	813,163.14
4,113.00	6.95	237.21	4,101.28	-103.61	-105.22	-213.47	237.99	243.76	441,760.04	813,153.93
4,202.00	7.21	237.57	4,189.60	-109.45	-111.13	-222.71	248.89	243.48	441,754.13	813,144.69
4,292.00	7.74	236.51	4,278.84	-115.75	-117.50	-232.53	260.53	243.19	441,747.76	813,134.87
4,381.00	7.74	236.77	4,367.03	-122.27	-124.09	-242.54	272.44	242.90	441,741.17	813,124.86
4,470.00	7.65	236.77	4,455.23	-128.72	-130.62	-252.51	284.29	242.65	441,734.64	813,114.89
4,560.00	7.25	240.03	4,544.47	-134.77	-136.74	-262.44	295.93	242.48	441,728.52	813,104.96
4,649.00	6.42	235.90	4,632.83	-140.30	-142.34	-271.42	306.48	242.33	441,722.92	813,095.98
4,738.00	5.85	229.48	4,721.32	-145.98	-148.07	-278.99	315.85	242.04	441,717.19	813,088.41
4,827.00	6.20	232.03	4,809.83	-151.83	-153.98	-286.23	325.02	241.72	441,711.28	813,081.17
4,917.00	7.52	250.75	4,899.20	-156.69	-158.91	-295.62	335.63	241.74	441,706.35	813,071.78
5,006.00	6.86	252.68	4,987.50	-160.11	-162.41	-306.19	346.60	242.06	441,702.85	813,061.21
5,095.00	5.98	248.90	5,075.94	-163.29	-165.67	-315.59	356.43	242.30	441,699.59	813,051.81
5,185.00	6.77	251.72	5,165.38	-166.57	-169.02	-325.00	366.33	242.52	441,696.24	813,042.40
5,274.00	7.08	254.53	5,253.73	-169.60	-172.13	-335.27	376.87	242.82	441,693.13	813,032.13
5,364.00	6.59	253.39	5,343.09	-172.48	-175.08	-345.57	387.39	243.13	441,690.18	813,021.83
5,453.00	6.51	252.07	5,431.51	-175.42	-178.09	-355.26	397.40	243.38	441,687.17	813,012.14
5,542.00	6.99	253.39	5,519.89	-178.45	-181.20	-365.25	407.72	243.61	441,684.06	813,002.15
5,632.00	7.96	256.90	5,609.13	-181.34	-184.17	-376.57	419.19	243.94	441,681.09	812,990.83
5,721.00	8.18	257.34	5,697.25	-184.04	-186.96	-388.75	431.37	244.32	441,678.30	812,978.65
5,811.00	8.13	257.52	5,786.34	-186.72	-189.74	-401.21	443.81	244.69	441,675.52	812,966.19
5,900.00	8.31	256.11	5,874.42	-189.53	-192.64	-413.60	456.26	245.03	441,672.62	812,953.80
5,990.00	8.26	250.75	5,963.49	-193.13	-196.33	-426.01	469.08	245.26	441,668.93	812,941.39

Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 3H
Wellbore: OH
Design: MWD-100'-17281', PTB: 17337'

Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
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)
600.00	0.84	169.37	599.97	-3.78	-3.76	3.40	5.07	137.87	441,861.50	813,370.80
625.00	0.77	163.00	624.97	-4.13	-4.10	3.48	5.38	139.65	441,861.16	813,370.88
650.00	0.70	169.04	649.96	-4.44	-4.41	3.56	5.67	141.08	441,860.85	813,370.96
675.00	0.57	184.78	674.96	-4.71	-4.68	3.58	5.90	142.61	441,860.58	813,370.98
700.00	0.43	188.08	699.96	-4.93	-4.90	3.56	6.06	144.03	441,860.36	813,370.96
725.00	0.48	193.20	724.96	-5.12	-5.10	3.52	6.19	145.37	441,860.16	813,370.92
750.00	0.37	183.34	749.96	-5.30	-5.28	3.49	6.33	146.52	441,859.98	813,370.89
775.00	0.38	177.21	774.96	-5.47	-5.44	3.49	6.47	147.32	441,859.82	813,370.89
800.00	0.41	169.88	799.96	-5.64	-5.61	3.51	6.62	147.98	441,859.65	813,370.91
825.00	0.46	166.97	824.96	-5.83	-5.80	3.55	6.80	148.53	441,859.46	813,370.95
850.00	0.41	168.16	849.96	-6.01	-5.98	3.59	6.98	149.04	441,859.28	813,370.99
875.00	0.42	167.55	874.96	-6.19	-6.16	3.63	7.15	149.51	441,859.10	813,371.03
900.00	0.41	183.81	899.96	-6.37	-6.34	3.64	7.31	150.13	441,858.92	813,371.04
925.00	0.50	199.94	924.96	-6.56	-6.53	3.60	7.46	151.15	441,858.73	813,371.00
950.00	0.45	215.33	949.95	-6.74	-6.71	3.50	7.57	152.44	441,858.55	813,370.90
975.00	0.42	213.79	974.95	-6.90	-6.87	3.40	7.66	153.69	441,858.39	813,370.80
1,000.00	0.48	211.83	999.95	-7.06	-7.04	3.29	7.77	154.93	441,858.22	813,370.69
1,025.00	0.42	205.02	1,024.95	-7.23	-7.21	3.20	7.88	156.08	441,858.05	813,370.60
1,050.00	0.49	188.43	1,049.95	-7.42	-7.40	3.14	8.04	156.98	441,857.86	813,370.54
1,075.00	0.61	176.22	1,074.95	-7.66	-7.64	3.14	8.25	157.67	441,857.62	813,370.54
1,100.00	0.74	184.68	1,099.95	-7.95	-7.93	3.13	8.52	158.45	441,857.33	813,370.53
1,125.00	0.69	182.17	1,124.95	-8.26	-8.24	3.11	8.81	159.31	441,857.02	813,370.51
1,150.00	0.58	181.24	1,149.95	-8.54	-8.52	3.10	9.06	159.98	441,856.74	813,370.50
1,175.00	0.43	191.28	1,174.94	-8.76	-8.74	3.08	9.26	160.56	441,856.52	813,370.48
1,200.00	0.28	189.42	1,199.94	-8.91	-8.89	3.05	9.40	161.04	441,856.37	813,370.45
1,225.00	0.18	206.62	1,224.94	-9.01	-8.98	3.03	9.48	161.38	441,856.28	813,370.43
1,250.00	0.39	203.61	1,249.94	-9.12	-9.10	2.97	9.57	161.89	441,856.16	813,370.37

Company: Marathon Oil
Project: Lea County, NM(NAD 83)
Site: Will Kane 15 WXY Fee
Well: No. 3H
Wellbore: OH
Design: MWD-100'-17281', PTB: 17337'

Local Co-ordinate Reference: Well No. 3H
TVD Reference: Well @ 3533.00usft
MD Reference: Well @ 3533.00usft
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 Will Kane 15 WXY Fee

Site Position:		Northing:	441,865.26 usft	Latitude:	32.211705
From:	Map	Easting:	813,367.40 usft	Longitude:	-103.453772
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.47 °

Well No. 3H, LNM1519819

Well Position	+N/-S	0.00 usft	Northing:	441,865.26 usft	Latitude:	32.211705
	+E/-W	0.00 usft	Easting:	813,367.40 usft	Longitude:	-103.453772
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,508.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	8/7/2019	6.62	59.87	47,878.00

Design MWD-100'-17281', PTB: 17337'

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	359.57



PRODIRECTIONAL

Survey Certification Letter

October 10, 2019



Marathon Oil[®]
Corporation

Operator Name: Marathon Oil
Well Name: Will Kane 15 WXY Fee No. 3H
County/Parish: Lea County,
State: NM
Rig Name: Precision 594
Job Number: LNM1519819

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	1,432' MD – 17,281' MD	17,337' MD	08/30/19 – 09/13/19	MWD

Sincerely,

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