

**Provide Signature Page for
Directional Survey**



Marathon Oil

Marathon Oil

30-015-44503

Eddy County, NM

Hermes Fee 23-28-30

TB #3H

OH

Design: MWD 164'-13873' PTB 13930'

Survey Report

12 January, 2018





Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Hermes Fee 23-28-30
Well: TB #3H
Wellbore: OH
Design: MWD 164'-13873' PTB 13930'

Local Co-ordinate Reference: Well TB #3H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	System Datum:	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Hermes Fee 23-28-30		
Site Position:		Northing:	461,896.31 usft
From:	Lat/Long	Easting:	565,002.00 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 10.9009 N
		Longitude:	104° 7' 22.9015 W
		Grid Convergence:	0.11 °

Well	TB #3H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 10.9019 N
		Longitude:	104° 7' 22.9017 W
		Ground Level:	3,117.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	User Defined	12/9/2017	7.40
			Dip Angle (°)
			60.04
			Field Strength (nT)
			48,013.40

Design	MWD 164'-13873' PTB 13930'		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
		Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°)
			359.93

Survey Program	Date 1/12/2018		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name
164.00	13,930.00	Survey #1 (OH)	MWD+IFR1
			Description
			OWSG MWD + IFR1



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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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	461,896.41	565,001.98	
164.00	0.50	202.80	164.00	-0.66	-0.66	-0.28	0.72	202.80	461,895.75	565,001.70	
224.00	0.40	266.70	224.00	-0.91	-0.91	-0.59	1.09	212.77	461,895.50	565,001.39	
315.00	0.30	265.00	314.99	-0.95	-0.95	-1.14	1.49	230.19	461,895.46	565,000.84	
407.00	0.90	255.80	406.99	-1.15	-1.15	-2.08	2.38	241.09	461,895.26	564,999.90	
447.00	1.40	264.30	446.98	-1.27	-1.28	-2.87	3.14	246.06	461,895.13	564,999.11	
532.00	1.20	247.70	531.96	-1.71	-1.72	-4.73	5.03	250.05	461,894.69	564,997.25	
593.00	1.10	231.20	592.95	-2.32	-2.33	-5.78	6.23	248.07	461,894.08	564,996.20	
685.00	2.30	273.20	684.91	-2.77	-2.78	-8.31	8.76	251.52	461,893.63	564,993.67	
776.00	2.70	274.60	775.82	-2.49	-2.50	-12.27	12.52	258.47	461,893.91	564,989.71	
867.00	2.70	241.20	866.73	-3.34	-3.36	-16.28	16.63	258.33	461,893.05	564,985.70	
959.00	3.10	255.70	958.61	-5.00	-5.02	-20.59	21.20	256.30	461,891.39	564,981.39	
1,050.00	1.00	263.70	1,049.55	-5.69	-5.72	-23.77	24.44	256.48	461,890.69	564,978.21	
1,145.00	0.20	311.20	1,144.54	-5.67	-5.70	-24.72	25.36	257.02	461,890.71	564,977.26	
1,239.00	0.40	237.00	1,238.54	-5.74	-5.77	-25.11	25.77	257.06	461,890.64	564,976.87	
1,334.00	0.70	252.10	1,333.53	-6.10	-6.13	-25.94	26.66	256.71	461,890.28	564,976.04	
1,428.00	0.70	250.80	1,427.53	-6.46	-6.49	-27.03	27.80	256.49	461,889.92	564,974.95	
1,523.00	0.80	264.50	1,522.52	-6.71	-6.75	-28.24	29.04	256.56	461,889.66	564,973.74	
1,617.00	0.80	239.10	1,616.51	-7.11	-7.15	-29.46	30.31	256.36	461,889.26	564,972.52	
1,712.00	0.50	247.30	1,711.50	-7.61	-7.65	-30.41	31.36	255.88	461,888.76	564,971.57	
1,806.00	0.80	154.20	1,805.50	-8.36	-8.40	-30.50	31.64	254.61	461,888.01	564,971.48	
1,901.00	1.80	127.20	1,900.48	-9.86	-9.90	-29.03	30.67	251.17	461,886.51	564,972.95	
1,995.00	2.30	124.90	1,994.42	-11.84	-11.87	-26.30	28.86	245.71	461,884.54	564,975.68	
2,090.00	3.00	124.30	2,089.31	-14.33	-14.36	-22.69	26.85	237.67	461,882.05	564,979.29	
2,184.00	3.00	134.60	2,183.18	-17.45	-17.47	-18.90	25.74	227.25	461,878.94	564,983.08	
2,278.00	3.40	134.20	2,277.04	-21.13	-21.14	-15.15	26.01	215.63	461,875.27	564,986.83	
2,373.00	3.10	139.00	2,371.89	-25.03	-25.05	-11.45	27.54	204.56	461,871.36	564,990.53	



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2,418.00	3.00	143.20	2,416.82	-26.90	-26.91	-9.94	28.69	200.28	461,869.50	564,992.04	
2,556.00	2.40	144.20	2,554.67	-32.14	-32.14	-6.09	32.71	190.73	461,864.27	564,995.89	
2,650.00	2.50	143.70	2,648.58	-35.39	-35.39	-3.72	35.59	186.01	461,861.02	564,998.26	
2,745.00	2.90	169.10	2,743.48	-39.42	-39.42	-2.04	39.47	182.97	461,856.99	564,999.94	
2,840.00	3.60	193.90	2,838.33	-44.67	-44.68	-2.31	44.74	182.95	461,851.73	564,999.67	
2,934.00	4.00	213.90	2,932.13	-50.26	-50.26	-4.84	50.50	185.50	461,846.15	564,997.14	
3,029.00	4.20	226.30	3,026.89	-55.40	-55.42	-9.21	56.18	189.43	461,840.99	564,992.77	
3,123.00	4.30	245.50	3,120.63	-59.24	-59.26	-14.90	61.10	194.12	461,837.15	564,987.08	
3,217.00	4.80	252.90	3,214.34	-61.85	-61.87	-21.87	65.62	199.46	461,834.54	564,980.11	
3,312.00	4.60	251.40	3,309.02	-64.22	-64.26	-29.28	70.61	204.50	461,832.15	564,972.70	
3,406.00	5.10	256.90	3,402.68	-66.36	-66.41	-36.92	75.98	209.07	461,830.00	564,965.06	
3,501.00	6.10	261.60	3,497.23	-68.05	-68.10	-46.03	82.20	214.05	461,828.31	564,955.95	
3,595.00	7.40	261.50	3,590.57	-69.66	-69.73	-56.95	90.03	219.24	461,826.68	564,945.03	
3,690.00	7.90	260.10	3,684.73	-71.67	-71.75	-69.44	99.85	224.06	461,824.66	564,932.54	
3,784.00	7.80	258.80	3,777.85	-74.00	-74.10	-82.06	110.56	227.92	461,822.31	564,919.92	
3,879.00	9.30	260.60	3,871.79	-76.49	-76.61	-95.95	122.78	231.40	461,819.80	564,906.03	
3,973.00	10.00	259.90	3,964.46	-79.14	-79.28	-111.48	136.80	234.58	461,817.13	564,890.50	
4,067.00	10.30	259.40	4,056.99	-82.10	-82.26	-127.78	151.97	237.23	461,814.15	564,874.20	
4,162.00	10.80	258.60	4,150.38	-85.40	-85.58	-144.85	168.24	239.43	461,810.83	564,857.13	
4,256.00	11.20	258.00	4,242.65	-89.02	-89.22	-162.41	185.31	241.22	461,807.19	564,839.57	
4,351.00	10.30	259.50	4,335.99	-92.46	-92.68	-179.79	202.27	242.73	461,803.73	564,822.19	
4,445.00	9.90	260.30	4,428.53	-95.34	-95.58	-196.02	218.08	244.01	461,800.83	564,805.96	
4,539.00	9.60	257.30	4,521.17	-98.40	-98.66	-211.63	233.50	245.01	461,797.75	564,790.35	
4,634.00	9.20	255.00	4,614.90	-102.09	-102.37	-226.69	248.74	245.70	461,794.04	564,775.29	
4,728.00	8.20	253.40	4,707.81	-105.93	-106.23	-240.38	262.80	246.16	461,790.18	564,761.60	
4,823.00	8.90	251.10	4,801.76	-110.23	-110.54	-253.82	276.85	246.47	461,785.87	564,748.16	
4,917.00	8.60	249.40	4,894.66	-115.05	-115.37	-267.28	291.12	246.65	461,781.04	564,734.70	



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5,012.00	9.70	248.60	4,988.45	-120.45	-120.79	-281.38	306.21	246.77	461,775.62	564,720.60
5,106.00	10.00	245.30	5,081.07	-126.73	-127.09	-296.17	322.29	246.77	461,769.32	564,705.81
5,200.00	9.80	244.10	5,173.67	-133.62	-134.00	-310.78	338.44	246.68	461,762.41	564,691.20
5,295.00	9.00	242.90	5,267.39	-140.52	-140.91	-324.67	353.93	246.54	461,755.50	564,677.31
5,390.00	8.80	241.50	5,361.25	-147.35	-147.77	-337.67	368.58	246.37	461,748.64	564,664.31
5,484.00	9.10	242.00	5,454.10	-154.26	-154.69	-350.55	383.16	246.19	461,741.72	564,651.43
5,579.00	8.90	242.90	5,547.93	-161.12	-161.56	-363.73	397.99	246.05	461,734.85	564,638.25
5,673.00	9.90	242.50	5,640.67	-168.14	-168.60	-377.37	413.32	245.93	461,727.81	564,624.61
5,768.00	9.30	242.80	5,734.34	-175.41	-175.88	-391.44	429.14	245.80	461,720.53	564,610.54
5,862.00	9.00	241.40	5,827.14	-182.38	-182.88	-404.65	444.05	245.68	461,713.53	564,597.33
5,957.00	8.30	248.00	5,921.07	-188.49	-189.00	-417.53	458.32	245.65	461,707.41	564,584.45
6,051.00	8.80	254.60	6,014.02	-192.93	-193.45	-430.75	472.20	245.82	461,702.96	564,571.23
6,145.00	10.00	255.80	6,106.76	-196.82	-197.36	-445.60	487.35	246.11	461,699.05	564,556.38
6,240.00	10.60	254.00	6,200.23	-201.23	-201.80	-462.00	504.14	246.40	461,694.61	564,539.98
6,334.00	8.80	248.00	6,292.88	-206.29	-206.87	-476.97	519.91	246.55	461,689.54	564,525.01
6,429.00	8.40	247.80	6,386.81	-211.62	-212.22	-490.14	534.11	246.59	461,684.19	564,511.84
6,523.00	9.40	248.60	6,479.68	-217.00	-217.61	-503.64	548.64	246.63	461,678.80	564,498.34
6,618.00	7.90	243.70	6,573.60	-222.71	-223.34	-516.72	562.92	246.62	461,673.07	564,485.26
6,712.00	8.30	245.90	6,666.66	-228.32	-228.97	-528.70	576.15	246.58	461,667.44	564,473.28
6,807.00	10.10	247.50	6,760.44	-234.29	-234.96	-542.66	591.34	246.59	461,661.45	564,459.32
6,901.00	10.50	247.00	6,852.92	-240.78	-241.46	-558.16	608.15	246.61	461,654.95	564,443.82
6,995.00	9.10	240.90	6,945.55	-247.72	-248.42	-572.54	624.11	246.54	461,647.99	564,429.44
7,090.00	8.60	237.70	7,039.42	-255.15	-255.87	-585.11	638.61	246.38	461,640.54	564,416.87
7,185.00	7.80	239.20	7,133.45	-262.24	-262.97	-596.65	652.03	246.22	461,633.44	564,405.33
7,279.00	7.00	247.10	7,226.67	-267.72	-268.46	-607.40	664.09	246.16	461,627.95	564,394.58
7,373.00	4.30	263.90	7,320.21	-270.31	-271.07	-616.19	673.17	246.25	461,625.34	564,385.79
7,468.00	1.60	253.20	7,415.07	-271.07	-271.83	-621.00	677.89	246.36	461,624.58	564,380.98



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7,562.00	1.60	207.80	7,509.04	-272.61	-273.37	-622.87	680.22	246.30	461,623.04	564,379.11
7,657.00	2.40	200.40	7,603.98	-275.64	-276.41	-624.18	682.64	246.11	461,620.00	564,377.80
7,751.00	1.50	186.60	7,697.93	-278.71	-279.47	-625.01	684.64	245.91	461,616.94	564,376.97
7,846.00	0.80	171.40	7,792.91	-280.60	-281.36	-625.05	685.46	245.77	461,615.05	564,376.93
7,940.00	0.70	312.50	7,886.90	-280.86	-281.62	-625.38	685.86	245.76	461,614.79	564,376.60
8,035.00	2.50	313.00	7,981.86	-279.05	-279.82	-627.32	686.90	245.96	461,616.59	564,374.66
8,129.00	2.50	308.10	8,075.77	-276.39	-277.16	-630.43	688.66	246.27	461,619.25	564,371.55
8,224.00	1.80	305.10	8,170.71	-274.25	-275.02	-633.28	690.42	246.53	461,621.39	564,368.70
8,318.00	1.70	326.10	8,264.66	-272.24	-273.01	-635.27	691.45	246.74	461,623.40	564,366.71
8,413.00	1.90	331.70	8,359.62	-269.68	-270.46	-636.80	691.85	246.99	461,625.95	564,365.18
8,507.00	1.30	329.40	8,453.58	-267.39	-268.17	-638.08	692.14	247.20	461,628.24	564,363.90
8,602.00	1.00	314.00	8,548.56	-265.88	-266.66	-639.23	692.62	247.36	461,629.75	564,362.75
8,697.00	1.00	58.20	8,643.55	-264.87	-265.65	-639.12	692.13	247.43	461,630.76	564,362.86
8,792.00	4.80	7.00	8,738.42	-260.49	-261.27	-637.93	689.36	247.73	461,635.14	564,364.05
8,823.00	8.00	3.20	8,769.22	-257.05	-257.82	-637.65	687.80	247.98	461,638.59	564,364.33
8,854.00	11.10	6.50	8,799.79	-251.93	-252.70	-637.19	685.47	248.37	461,643.71	564,364.79
8,886.00	13.80	5.00	8,831.03	-245.06	-245.84	-636.51	682.34	248.88	461,650.57	564,365.47
8,917.00	17.50	2.80	8,860.88	-236.72	-237.50	-635.96	678.86	249.52	461,658.91	564,366.02
8,949.00	21.10	2.00	8,891.08	-226.16	-226.93	-635.52	674.83	250.35	461,669.48	564,366.46
8,980.00	23.70	4.00	8,919.74	-214.36	-215.14	-634.89	670.36	251.28	461,681.27	564,367.09
9,012.00	27.30	4.50	8,948.61	-200.63	-201.40	-633.87	665.10	252.37	461,695.01	564,368.11
9,043.00	30.70	2.00	8,975.72	-185.63	-186.40	-633.04	659.91	253.59	461,710.01	564,368.94
9,075.00	33.70	358.00	9,002.80	-168.59	-169.36	-633.06	655.32	255.02	461,727.05	564,368.92
9,106.00	37.70	355.80	9,027.97	-150.53	-151.31	-634.06	651.86	256.58	461,745.10	564,367.92
9,138.00	42.10	354.30	9,052.52	-130.09	-130.86	-635.84	649.17	258.37	461,765.55	564,366.14
9,169.00	46.20	353.60	9,074.76	-108.62	-109.40	-638.12	647.43	260.27	461,787.01	564,363.86
9,201.00	49.80	353.00	9,096.16	-85.00	-85.78	-640.90	646.61	262.38	461,810.63	564,361.08



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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)
9,232.00	52.20	353.00	9,115.67	-61.09	-61.87	-643.83	646.80	264.51	461,834.54	564,358.15
9,264.00	54.60	354.40	9,134.75	-35.55	-36.34	-646.65	647.67	266.78	461,860.07	564,355.33
9,295.00	57.00	354.10	9,152.17	-10.04	-10.83	-649.22	649.31	269.04	461,885.58	564,352.76
9,327.00	60.10	353.90	9,168.87	17.11	16.31	-652.07	652.27	271.43	461,912.72	564,349.91
9,358.00	62.50	354.80	9,183.75	44.17	43.37	-654.74	656.18	273.79	461,939.78	564,347.24
9,390.00	64.80	355.70	9,197.96	72.75	71.95	-657.12	661.04	276.25	461,968.36	564,344.86
9,421.00	67.30	356.60	9,210.54	101.02	100.21	-659.02	666.59	278.65	461,996.62	564,342.96
9,453.00	69.80	357.80	9,222.24	130.76	129.96	-660.47	673.13	281.13	462,026.37	564,341.51
9,484.00	72.20	358.20	9,232.33	160.06	159.25	-661.49	680.39	283.54	462,055.66	564,340.49
9,516.00	73.60	358.80	9,241.74	190.63	189.82	-662.29	688.96	285.99	462,086.23	564,339.69
9,547.00	75.40	359.90	9,250.03	220.50	219.69	-662.63	698.10	288.34	462,116.10	564,339.35
9,579.00	78.60	0.20	9,257.22	251.68	250.87	-662.60	708.50	290.74	462,147.28	564,339.38
9,610.00	81.50	0.20	9,262.58	282.21	281.40	-662.49	719.78	293.01	462,177.81	564,339.49
9,642.00	83.90	0.90	9,266.65	313.94	313.13	-662.19	732.49	295.31	462,209.54	564,339.79
9,673.00	86.50	2.70	9,269.24	344.81	344.00	-661.22	745.35	297.49	462,240.41	564,340.76
9,736.00	88.70	2.80	9,271.88	407.68	406.87	-658.20	773.80	301.72	462,303.28	564,343.78
9,830.00	91.20	2.10	9,271.96	501.58	500.78	-654.18	823.85	307.43	462,397.19	564,347.80
9,925.00	90.90	1.20	9,270.22	596.52	595.72	-651.44	882.76	312.44	462,492.13	564,350.54
10,019.00	91.60	0.80	9,268.17	690.48	689.69	-649.80	947.58	316.71	462,586.10	564,352.18
10,114.00	91.00	359.20	9,266.01	785.45	784.66	-649.80	1,018.79	320.37	462,681.07	564,352.18
10,208.00	90.20	359.10	9,265.03	879.44	878.64	-651.20	1,093.65	323.46	462,775.05	564,350.78
10,303.00	89.30	358.90	9,265.44	974.42	973.62	-652.86	1,172.25	326.16	462,870.03	564,349.12
10,397.00	87.70	358.70	9,267.90	1,068.37	1,067.57	-654.82	1,252.40	328.48	462,963.98	564,347.16
10,492.00	90.30	358.60	9,269.56	1,163.32	1,162.52	-657.06	1,335.36	330.52	463,058.93	564,344.92
10,586.00	90.20	358.10	9,269.15	1,257.28	1,256.48	-659.77	1,419.17	332.30	463,152.89	564,342.21
10,681.00	89.10	358.70	9,269.73	1,352.25	1,351.44	-662.42	1,505.05	333.89	463,247.85	564,339.56
10,775.00	89.50	359.60	9,270.88	1,446.23	1,445.42	-663.82	1,590.56	335.33	463,341.83	564,338.16



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Hermes Fee 23-28-30
Well: TB #3H
Wellbore: OH
Design: MWD 164'-13873' PTB 13930'

Local Co-ordinate Reference: Well TB #3H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
MD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
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)
10,869.00	89.00	0.30	9,272.11	1,540.22	1,539.41	-663.90	1,676.47	336.67	463,435.82	564,338.08
10,964.00	88.00	2.80	9,274.60	1,635.14	1,634.34	-661.33	1,763.07	337.97	463,530.75	564,340.65
11,058.00	90.90	5.60	9,275.50	1,728.86	1,728.06	-654.45	1,847.83	339.26	463,624.47	564,347.53
11,152.00	89.40	6.10	9,275.25	1,822.35	1,821.57	-644.87	1,932.34	340.51	463,717.98	564,357.11
11,247.00	86.70	6.50	9,278.49	1,916.70	1,915.93	-634.45	2,018.24	341.68	463,812.34	564,367.53
11,341.00	86.60	6.10	9,283.98	2,009.96	2,009.20	-624.15	2,103.91	342.74	463,905.61	564,377.83
11,436.00	86.40	4.00	9,289.78	2,104.40	2,103.65	-615.80	2,191.93	343.68	464,000.06	564,386.18
11,530.00	86.40	1.50	9,295.68	2,198.10	2,197.35	-611.30	2,280.80	344.45	464,093.76	564,390.68
11,625.00	87.40	0.70	9,300.82	2,292.93	2,292.19	-609.48	2,371.84	345.11	464,188.60	564,392.50
11,719.00	89.10	0.00	9,303.69	2,386.88	2,386.14	-608.91	2,462.61	345.68	464,282.55	564,393.07
11,814.00	91.00	359.10	9,303.61	2,481.88	2,481.13	-609.66	2,554.94	346.19	464,377.54	564,392.32
11,908.00	90.20	358.90	9,302.62	2,575.86	2,575.11	-611.30	2,646.68	346.65	464,471.52	564,390.68
12,003.00	89.60	358.90	9,302.79	2,670.84	2,670.10	-613.12	2,739.58	347.07	464,566.51	564,388.86
12,097.00	89.60	358.10	9,303.45	2,764.81	2,764.06	-615.58	2,831.78	347.44	464,660.47	564,386.40
12,192.00	89.10	357.20	9,304.52	2,859.73	2,858.97	-619.48	2,925.32	347.77	464,755.38	564,382.50
12,286.00	91.30	357.60	9,304.20	2,953.63	2,952.87	-623.74	3,018.03	348.07	464,849.28	564,378.24
12,380.00	90.50	358.00	9,302.72	3,047.55	3,046.79	-627.35	3,110.70	348.37	464,943.20	564,374.63
12,475.00	92.40	359.30	9,300.31	3,142.49	3,141.72	-629.58	3,204.19	348.67	465,038.13	564,372.40
12,569.00	91.30	358.50	9,297.28	3,236.42	3,235.66	-631.39	3,296.68	348.96	465,132.07	564,370.59
12,664.00	91.30	357.90	9,295.12	3,331.36	3,330.58	-634.37	3,390.46	349.22	465,226.99	564,367.61
12,758.00	89.10	358.20	9,294.80	3,425.30	3,424.52	-637.57	3,483.37	349.45	465,320.93	564,364.41
12,853.00	89.20	358.00	9,296.21	3,520.24	3,519.46	-640.72	3,577.31	349.68	465,415.87	564,361.26
12,947.00	88.50	358.60	9,298.09	3,614.18	3,613.40	-643.51	3,670.25	349.90	465,509.81	564,358.47
13,041.00	89.70	358.80	9,299.57	3,708.15	3,707.36	-645.64	3,763.16	350.12	465,603.77	564,356.34
13,136.00	89.90	359.70	9,299.90	3,803.14	3,802.35	-646.88	3,856.99	350.34	465,698.76	564,355.10
13,230.00	90.50	359.90	9,299.57	3,897.14	3,896.35	-647.21	3,949.74	350.57	465,792.76	564,354.77
13,325.00	92.30	359.50	9,297.25	3,992.10	3,991.32	-647.71	4,043.53	350.78	465,887.73	564,354.27



Professional Directional
Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Hermes Fee 23-28-30
Well: TB #3H
Wellbore: OH
Design: MWD 164'-13873' PTB 13930'

Local Co-ordinate Reference: Well TB #3H
TVD Reference: Well @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

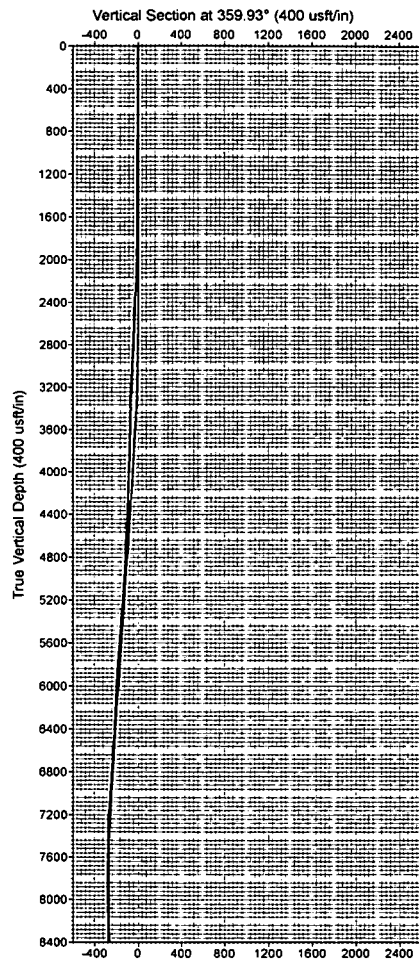
Survey

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)
13,419.00	92.70	358.90	9,293.15	4,086.01	4,085.22	-649.02	4,136.45	350.97	465,981.63	564,352.96
13,514.00	94.20	358.40	9,287.43	4,180.81	4,180.02	-651.25	4,230.44	351.14	466,076.43	564,350.73
13,608.00	93.40	357.50	9,281.20	4,274.54	4,273.75	-654.61	4,323.59	351.29	466,170.16	564,347.37
13,703.00	94.30	357.10	9,274.83	4,369.23	4,368.43	-659.07	4,417.86	351.42	466,264.84	564,342.91
13,797.00	94.00	357.50	9,268.02	4,462.88	4,462.08	-663.49	4,511.13	351.54	466,358.49	564,338.49
13,873.00	94.90	357.50	9,262.13	4,538.58	4,537.77	-666.79	4,586.50	351.64	466,434.18	564,335.19
Last Survey: 13873' MD, 9262' TVD										
13,930.00	94.90	357.50	9,257.26	4,595.33	4,594.51	-669.27	4,643.00	351.71	466,490.92	564,332.71
PTB: 13930' MD, 9257' TVD										

Design Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,873.00	9,262.13	4,537.77	-666.79	Last Survey: 13873' MD, 9262' TVD
13,930.00	9,257.26	4,594.51	-669.27	PTB: 13930' MD, 9257' TVD

Checked By: _____ Approved By: _____ Date: _____



Marathon Oil
Eddy County, NM
Hermes Fee 23-28-30
TB #3H
Plan #4 - FINAL PVA
GL: 3117' + 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 @ 3143.50usft (GL: 3117' + KB: 26.5' (H&P480))

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	461896.41	565001.98	32° 16' 10.9019 N	104° 7' 22.9017 W	

SECTION DETAILS

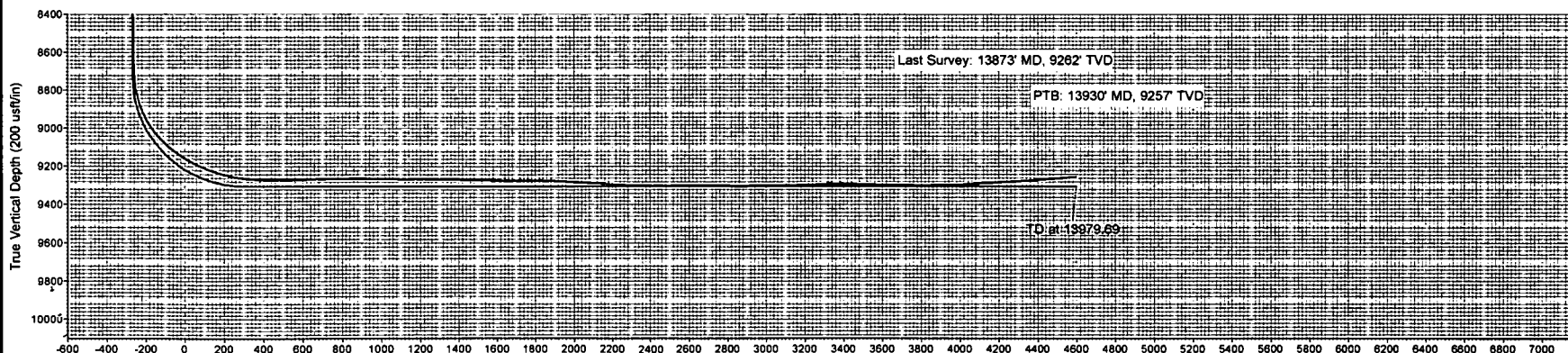
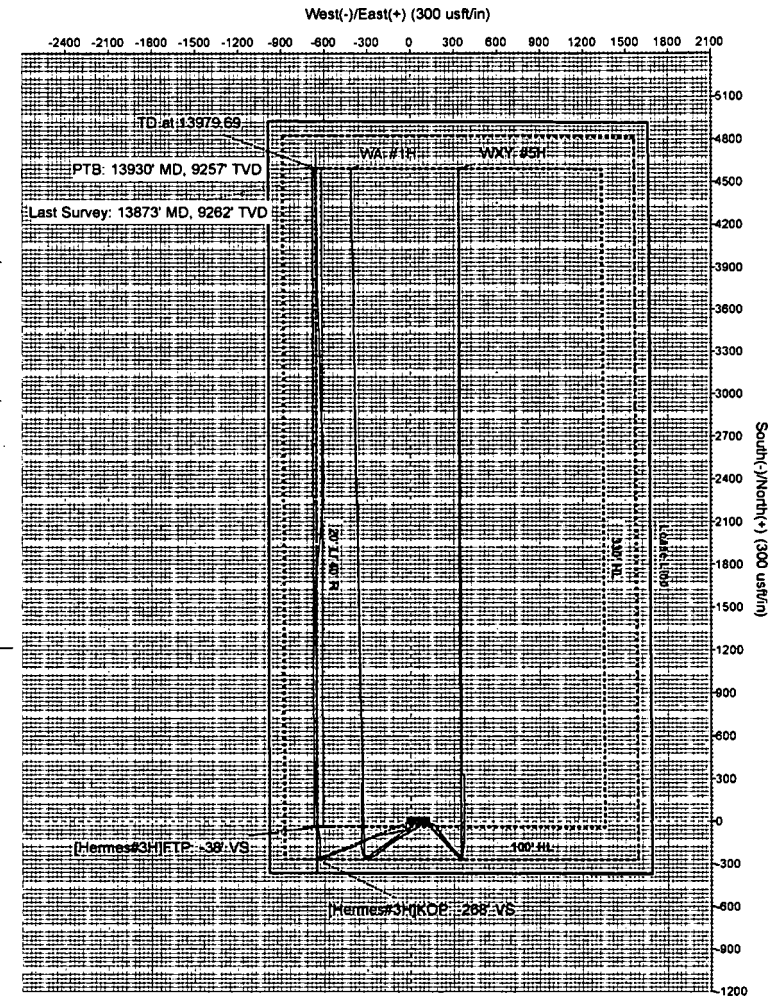
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSecl
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	2600.00	0.00	0.00	2600.00	0.00	0.00	0.00	0.00
3	3933.33	10.00	247.62	3926.57	-44.19	-107.32	0.75	-44.06
4	7082.93	10.00	247.62	7028.32	-252.43	-613.05	0.00	-251.68
5	7582.93	0.00	0.00	7525.79	-269.00	-653.29	2.00	-268.20
6	8789.14	0.00	0.00	8732.00	-269.00	-653.29	0.00	-268.20
7	9689.14	90.00	359.93	9304.96	303.95	-653.96	10.00	304.75
8	13979.69	90.00	359.93	9305.00	4594.50	-658.96	0.00	4595.30

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[Hermes#3H]FTP: -38' VS	0.00	-38.71	-653.29	461857.70	564348.69
[Hermes#3H]KOP: -268' VS	8732.00	-269.00	-653.29	461627.41	564348.69
[Hermes#3H]LTP/BHL: 4595' VS	9305.00	4594.50	-658.96	466490.91	564343.02



Target Line: 9305' TVD @ 0° VS: 90° INC



Azimuths to Grid North
True North: -0.11°
Magnetic North: 7.29°
Magnetic Field
Strength: 48013.4nT
Dip Angle: 60.04°
Date: 12/8/2017
Model: USER DEFINED

Azimuth Corrections

Total Magnetic Corr. (M to G): 7.29°

Declination (M to T): 7.40° East

36" x 48"

Vertical Section at 359.93° (200 usf/in)