

**Provide Signature Page for
Directional Survey**



Marathon Oil

Eddy County, NM

El Presidente State 5-6-10

WA #5H

OH

30.015-44483

Design: OH 195'-14045' PTB 14109'

Survey Report

19 February, 2018

**NM OIL CONSERVATION
ARTESIA DISTRICT**

JUL 30 2018

RECEIVED



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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	El Presidente State 5-6-10		
Site Position:		Northing:	451,111.94 usft
From:	Map	Easting:	555,065.83 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 14' 24.3537 N
		Longitude:	104° 9' 18.8390 W
		Grid Convergence:	0.10 °

Well	WA #5H					
Well Position	+N/-S	0.00 usft	Northing:	451,111.94 usft	Latitude:	32° 14' 24.3537 N
	+E/-W	0.00 usft	Easting:	555,065.83 usft	Longitude:	104° 9' 18.8390 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	usft	Ground Level:	3,135.00 usft

Wellbore	OH					
Magnetics	Model Name	Sample Date	Declination	Dip Angle	Field Strength	
			(°)	(°)	(nT)	
	HDGM	12/31/2017	7.33	60.05	48,032.60	

Design	OH 195'-14045' PTB 14109'				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W	Direction	
	(usft)	(usft)	(usft)	(°)	
	0.00	0.00	0.00	1.20	



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey Program Date 2/19/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
195.00	525.00	Survey #1 (OH)	GYRO-MWD	OWSG Gyro MWD
600.00	14,109.00	Survey #2 (OH)	MWD+IFR1	OWSG MWD + IFR1

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	451,111.94	555,065.83
[EIPresWA#5H]FTP										
195.00	0.50	16.10	195.00	0.82	0.82	0.24	0.85	16.10	451,112.76	555,066.07
284.00	0.10	62.00	284.00	1.24	1.23	0.41	1.29	18.57	451,113.17	555,066.24
376.00	0.50	100.00	375.99	1.21	1.20	0.88	1.48	36.32	451,113.14	555,066.71
468.00	0.50	76.10	467.99	1.26	1.22	1.66	2.06	53.70	451,113.16	555,067.49
525.00	0.70	74.00	524.99	1.42	1.38	2.24	2.63	58.41	451,113.32	555,068.07
600.00	1.10	57.60	599.98	1.96	1.89	3.29	3.79	60.11	451,113.83	555,069.12
692.00	0.80	67.20	691.97	2.71	2.61	4.63	5.31	60.55	451,114.55	555,070.46
784.00	0.40	173.40	783.96	2.65	2.54	5.25	5.84	64.19	451,114.48	555,071.08
875.00	1.00	188.20	874.96	1.55	1.44	5.18	5.37	74.46	451,113.38	555,071.01
967.00	1.30	182.30	966.94	-0.29	-0.40	5.02	5.04	94.53	451,111.54	555,070.85
1,058.00	1.50	171.40	1,057.91	-2.50	-2.61	5.16	5.78	116.81	451,109.33	555,070.99
1,153.00	1.60	208.80	1,152.88	-4.90	-5.00	4.70	6.86	136.73	451,106.94	555,070.53
1,341.00	3.60	242.70	1,340.68	-10.04	-10.01	-1.81	10.17	190.23	451,101.93	555,064.02
1,436.00	3.20	232.00	1,435.52	-13.14	-13.01	-6.55	14.56	206.71	451,098.93	555,059.28
1,531.00	3.10	226.70	1,530.37	-16.62	-16.40	-10.50	19.48	212.64	451,095.54	555,055.33
1,625.00	2.90	212.40	1,624.25	-20.43	-20.15	-13.63	24.33	214.07	451,091.79	555,052.20
1,719.00	3.60	208.20	1,718.10	-25.10	-24.76	-16.30	29.64	213.35	451,087.18	555,049.53
1,814.00	4.50	222.90	1,812.86	-30.54	-30.12	-20.24	36.29	213.91	451,081.82	555,045.59
1,909.00	4.70	220.70	1,907.55	-36.32	-35.80	-25.32	43.85	215.27	451,076.14	555,040.51



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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)	
2,003.00	5.20	225.60	2,001.20	-42.34	-41.70	-30.87	51.88	216.51	451,070.24	555,034.96	
2,098.00	6.20	233.40	2,095.73	-48.56	-47.77	-38.07	61.08	218.55	451,064.17	555,027.76	
2,193.00	6.90	240.50	2,190.11	-54.62	-53.64	-47.15	71.42	221.32	451,058.30	555,018.68	
2,288.00	7.30	242.90	2,284.39	-60.39	-59.20	-57.49	82.52	224.16	451,052.74	555,008.34	
2,341.00	7.40	244.90	2,336.95	-63.50	-62.18	-63.58	88.93	225.64	451,049.76	555,002.25	
2,477.00	9.40	248.70	2,471.49	-71.63	-69.93	-81.86	107.66	229.49	451,042.01	554,983.97	
2,571.00	9.90	249.80	2,564.16	-77.52	-75.51	-96.60	122.61	231.99	451,036.43	554,969.23	
2,666.00	9.80	249.50	2,657.76	-83.49	-81.16	-111.83	138.18	234.03	451,030.78	554,954.00	
2,760.00	9.70	249.50	2,750.40	-89.37	-86.74	-126.75	153.58	235.61	451,025.20	554,939.08	
2,855.00	9.40	249.70	2,844.08	-95.17	-92.23	-141.52	168.92	236.91	451,019.71	554,924.31	
2,950.00	11.10	247.80	2,937.56	-101.65	-98.38	-157.26	185.50	237.97	451,013.56	554,908.57	
3,044.00	11.20	248.50	3,029.79	-108.77	-105.14	-174.13	203.41	238.88	451,006.80	554,891.70	
3,139.00	10.30	247.40	3,123.12	-115.75	-111.79	-190.56	220.93	239.60	451,000.15	554,875.27	
3,233.00	10.50	245.10	3,215.58	-122.91	-118.62	-206.09	237.79	240.08	450,993.32	554,859.74	
3,328.00	11.10	245.30	3,308.89	-130.72	-126.09	-222.25	255.52	240.43	450,985.85	554,843.58	
3,423.00	10.90	244.90	3,402.15	-138.69	-133.72	-238.69	273.59	240.74	450,978.22	554,827.14	
3,518.00	10.80	244.60	3,495.45	-146.66	-141.35	-254.86	291.44	240.99	450,970.59	554,810.97	
3,612.00	10.30	244.90	3,587.86	-154.32	-148.69	-270.43	308.61	241.20	450,963.25	554,795.40	
3,707.00	11.20	242.40	3,681.19	-162.53	-156.57	-286.30	326.31	241.33	450,955.37	554,779.53	
3,802.00	11.00	241.60	3,774.41	-171.45	-165.15	-302.44	344.60	241.36	450,946.79	554,763.39	
3,897.00	10.80	241.60	3,867.70	-180.33	-173.70	-318.25	362.56	241.37	450,938.24	554,747.58	
3,992.00	10.50	242.40	3,961.06	-188.89	-181.94	-333.75	380.12	241.40	450,930.00	554,732.08	
4,087.00	10.50	242.40	4,054.47	-197.23	-189.96	-349.09	397.43	241.45	450,921.98	554,716.74	
4,181.00	10.10	242.40	4,146.96	-205.33	-197.75	-363.98	414.23	241.49	450,914.19	554,701.85	
4,276.00	9.90	242.20	4,240.51	-213.30	-205.42	-378.59	430.73	241.52	450,906.52	554,687.24	
4,371.00	7.50	244.90	4,334.41	-220.01	-211.86	-391.43	445.09	241.58	450,900.08	554,674.40	
4,466.00	6.80	245.90	4,428.68	-225.16	-216.78	-402.18	456.88	241.67	450,895.16	554,663.65	



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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)	
4,560.00	5.80	243.10	4,522.11	-229.77	-221.21	-411.50	467.18	241.74	450,890.73	554,654.33	
4,654.00	4.90	244.60	4,615.70	-233.81	-225.08	-419.36	475.94	241.78	450,886.86	554,646.47	
4,749.00	5.00	242.10	4,710.34	-237.64	-228.75	-426.68	484.13	241.80	450,883.19	554,639.15	
4,844.00	4.90	240.30	4,804.99	-241.74	-232.70	-433.86	492.33	241.79	450,879.24	554,631.97	
4,939.00	4.40	240.80	4,899.68	-245.66	-236.49	-440.57	500.03	241.77	450,875.45	554,625.26	
5,033.00	2.50	239.90	4,993.50	-248.55	-239.28	-445.49	505.68	241.76	450,872.66	554,620.34	
5,128.00	2.50	235.20	5,088.41	-250.85	-241.50	-448.99	509.81	241.73	450,870.44	554,616.84	
5,222.00	2.30	232.10	5,182.33	-253.24	-243.83	-452.16	513.71	241.66	450,868.11	554,613.67	
5,317.00	1.20	256.00	5,277.28	-254.71	-245.24	-454.63	516.55	241.66	450,866.70	554,611.20	
5,412.00	1.10	245.70	5,372.26	-255.36	-245.85	-456.42	518.43	241.69	450,866.09	554,609.41	
5,507.00	1.20	233.20	5,467.24	-256.36	-246.83	-458.05	520.32	241.68	450,865.11	554,607.78	
5,601.00	1.10	229.00	5,561.23	-257.58	-248.01	-459.52	522.17	241.64	450,863.93	554,606.31	
5,696.00	1.20	207.00	5,656.21	-259.08	-249.49	-460.66	523.88	241.56	450,862.45	554,605.17	
5,791.00	1.20	188.80	5,751.19	-260.97	-251.36	-461.26	525.31	241.41	450,860.58	554,604.57	
5,886.00	1.70	197.90	5,846.16	-263.30	-253.69	-461.85	526.94	241.22	450,858.25	554,603.98	
5,980.00	2.00	192.30	5,940.11	-266.25	-256.62	-462.63	529.03	240.98	450,855.32	554,603.20	
6,075.00	1.80	170.70	6,035.06	-269.34	-259.71	-462.74	530.64	240.70	450,852.23	554,603.09	
6,170.00	2.20	177.70	6,130.00	-272.63	-263.00	-462.42	531.98	240.37	450,848.94	554,603.41	
6,264.00	2.20	193.80	6,223.93	-276.19	-266.56	-462.78	534.06	240.06	450,845.38	554,603.05	
6,359.00	1.40	228.30	6,318.88	-278.76	-269.10	-464.08	536.46	239.89	450,842.84	554,601.75	
6,454.00	0.60	150.50	6,413.87	-279.98	-270.30	-464.71	537.60	239.81	450,841.64	554,601.12	
6,548.00	1.30	153.40	6,507.86	-281.34	-271.69	-463.99	537.68	239.65	450,840.25	554,601.84	
6,643.00	0.80	114.00	6,602.84	-282.55	-272.92	-462.90	537.36	239.48	450,839.02	554,602.93	
6,738.00	0.30	114.60	6,697.84	-282.91	-273.29	-462.07	536.84	239.40	450,838.65	554,603.76	
6,833.00	0.10	47.50	6,792.84	-282.95	-273.34	-461.78	536.61	239.38	450,838.60	554,604.05	
6,928.00	0.50	228.00	6,887.84	-283.18	-273.56	-462.03	536.94	239.37	450,838.38	554,603.80	
7,023.00	1.20	334.40	6,982.83	-282.57	-272.94	-462.76	537.26	239.47	450,839.00	554,603.07	

Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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)
7,118.00	1.90	337.70	7,077.80	-280.24	-270.59	-463.79	536.95	239.74	450,841.35	554,602.04
7,212.00	1.00	40.40	7,171.77	-278.18	-268.52	-463.85	535.97	239.93	450,843.42	554,601.98
7,307.00	0.80	99.80	7,266.76	-277.63	-268.00	-462.66	534.68	239.92	450,843.94	554,603.17
7,401.00	0.60	168.00	7,360.75	-278.21	-268.60	-461.91	534.33	239.82	450,843.34	554,603.92
7,496.00	0.50	215.70	7,455.75	-279.04	-269.42	-462.05	534.86	239.75	450,842.52	554,603.78
7,591.00	0.70	216.30	7,550.74	-279.85	-270.22	-462.63	535.77	239.71	450,841.72	554,603.20
7,685.00	1.00	223.40	7,644.73	-280.93	-271.28	-463.54	537.09	239.66	450,840.66	554,602.29
7,780.00	1.10	238.40	7,739.72	-282.04	-272.36	-464.88	538.79	239.64	450,839.58	554,600.95
7,874.00	1.30	240.90	7,833.70	-283.07	-273.35	-466.58	540.76	239.64	450,838.59	554,599.25
7,969.00	1.60	343.40	7,928.68	-282.35	-272.61	-467.91	541.53	239.77	450,839.33	554,597.92
8,064.00	1.60	325.80	8,023.64	-280.00	-270.24	-469.03	541.31	240.05	450,841.70	554,596.80
8,159.00	1.00	101.20	8,118.63	-279.06	-269.30	-468.96	540.79	240.13	450,842.64	554,596.87
8,254.00	1.10	163.30	8,213.62	-280.08	-270.34	-467.89	540.37	239.98	450,841.60	554,597.94
8,348.00	2.50	168.70	8,307.57	-282.94	-273.21	-467.23	541.24	239.68	450,838.73	554,598.60
8,443.00	3.20	175.80	8,402.45	-287.60	-277.89	-466.63	543.10	239.23	450,834.05	554,599.20
8,537.00	1.80	177.00	8,496.36	-291.68	-281.98	-466.36	544.98	238.84	450,829.96	554,599.47
8,590.00	1.60	199.00	8,549.34	-293.22	-283.51	-466.55	545.94	238.71	450,828.43	554,599.28
8,632.00	1.50	200.30	8,591.32	-294.30	-284.58	-466.93	546.82	238.64	450,827.36	554,598.90
8,727.00	1.30	281.80	8,686.30	-295.27	-285.53	-468.42	548.58	238.64	450,826.41	554,597.41
8,756.69	4.20	340.23	8,715.96	-294.19	-284.43	-469.12	548.61	238.77	450,827.51	554,596.71
[EIPresWA#5H]KOP										
8,822.00	12.20	351.80	8,780.55	-285.14	-275.33	-470.92	545.50	239.69	450,836.61	554,594.91
8,917.00	23.00	358.80	8,870.98	-256.60	-246.76	-472.74	533.27	242.44	450,865.18	554,593.09
9,012.00	31.50	359.80	8,955.36	-213.17	-203.30	-473.22	515.04	246.75	450,908.64	554,592.61
9,106.00	40.00	0.60	9,031.58	-158.31	-148.43	-472.99	495.73	252.58	450,963.51	554,592.84
9,151.00	45.00	4.50	9,064.75	-127.94	-118.09	-471.59	486.15	255.94	450,993.85	554,594.24
9,201.00	46.00	4.30	9,099.79	-92.33	-82.53	-468.85	476.06	260.02	451,029.41	554,596.98



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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)
9,248.00	48.80	2.10	9,131.61	-57.76	-47.99	-466.94	469.40	264.13	451,063.95	554,598.89
9,295.00	51.90	0.30	9,161.60	-21.58	-11.82	-466.19	466.34	268.55	451,100.12	554,599.64
9,342.00	56.50	1.60	9,189.08	16.53	26.28	-465.55	466.29	273.23	451,138.22	554,600.28
9,390.00	63.60	3.60	9,213.03	58.07	67.80	-463.63	468.57	278.32	451,179.74	554,602.20
9,437.00	68.80	3.80	9,231.99	101.02	110.70	-460.86	473.97	283.51	451,222.64	554,604.97
9,485.00	69.90	4.60	9,248.92	145.88	155.49	-457.57	483.27	288.77	451,267.43	554,608.26
9,532.00	71.80	0.80	9,264.34	190.25	199.83	-455.49	497.39	293.69	451,311.77	554,610.34
9,579.00	75.70	358.30	9,277.49	235.34	244.94	-455.85	517.49	298.25	451,356.88	554,609.98
9,621.00	81.70	356.30	9,285.72	276.41	286.06	-457.80	539.82	302.00	451,398.00	554,608.03
9,738.00	91.40	0.60	9,292.76	392.89	402.64	-460.93	612.02	311.14	451,514.58	554,604.90
9,832.00	92.20	0.60	9,289.80	486.84	496.58	-459.95	676.86	317.19	451,608.52	554,605.88
9,926.00	90.90	1.90	9,287.26	580.80	590.52	-457.90	747.25	322.21	451,702.46	554,607.93
10,020.00	90.00	1.20	9,286.52	674.80	684.48	-455.35	822.11	326.37	451,796.42	554,610.48
10,114.00	90.40	1.70	9,286.19	768.80	778.45	-452.97	900.65	329.81	451,890.39	554,612.86
10,209.00	90.50	2.20	9,285.45	863.78	873.39	-449.74	982.39	332.75	451,985.33	554,616.09
10,302.00	88.80	2.00	9,286.02	956.77	966.33	-446.33	1,064.43	335.21	452,078.27	554,619.50
10,397.00	88.80	2.00	9,288.01	1,051.74	1,061.25	-443.02	1,150.01	337.34	452,173.19	554,622.81
10,492.00	87.50	1.80	9,291.07	1,146.68	1,156.14	-439.87	1,237.00	339.17	452,268.08	554,625.96
10,584.00	89.40	3.00	9,293.56	1,238.62	1,248.02	-436.02	1,322.00	340.74	452,359.96	554,629.81
10,678.00	88.70	2.70	9,295.12	1,332.57	1,341.89	-431.35	1,409.52	342.18	452,453.83	554,634.48
10,773.00	89.80	3.60	9,296.36	1,427.50	1,436.74	-426.13	1,498.60	343.48	452,548.68	554,639.70
10,867.00	89.20	3.20	9,297.18	1,521.43	1,530.57	-420.55	1,587.30	344.64	452,642.51	554,645.28
10,961.00	88.70	2.40	9,298.91	1,615.37	1,624.44	-415.96	1,676.85	345.64	452,736.38	554,649.87
11,055.00	90.20	2.30	9,299.81	1,709.35	1,718.36	-412.11	1,767.08	346.51	452,830.30	554,653.72
11,150.00	90.50	1.00	9,299.23	1,804.34	1,813.31	-409.37	1,858.95	347.28	452,925.25	554,656.46
11,244.00	91.20	0.30	9,297.83	1,898.33	1,907.29	-408.31	1,950.51	347.92	453,019.23	554,657.52
11,338.00	90.60	0.10	9,296.36	1,992.30	2,001.28	-407.98	2,042.44	348.48	453,113.22	554,657.85



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

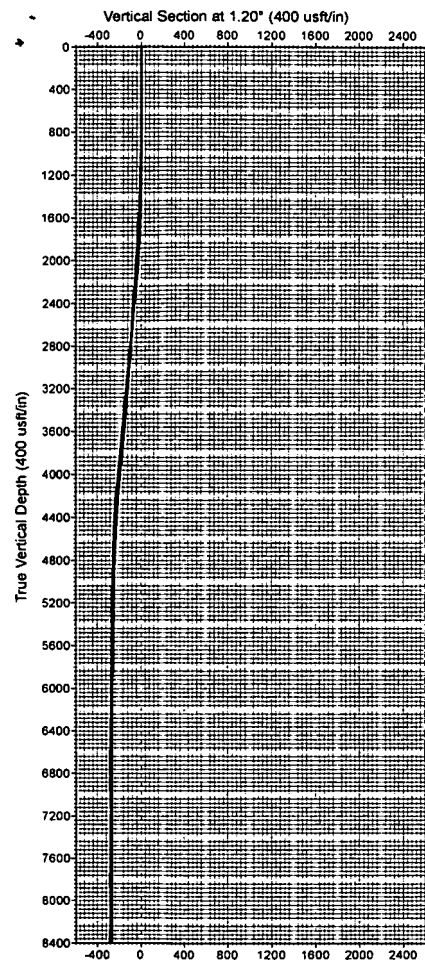
Survey										
MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	V. Sec (usft)	N/S (usft)	E/W (usft)	Closure Distance (usft)	Closure Azimuth (°)	Northing (usft)	Easting (usft)
11,433.00	92.00	1.40	9,294.20	2,087.27	2,096.25	-406.73	2,135.34	349.02	453,208.19	554,659.10
11,527.00	92.80	5.50	9,290.26	2,181.09	2,189.97	-401.09	2,226.40	349.62	453,301.91	554,664.74
11,621.00	90.10	6.80	9,287.89	2,274.70	2,283.39	-391.02	2,316.63	350.28	453,395.33	554,674.81
11,716.00	86.30	4.00	9,290.87	2,369.37	2,377.89	-382.08	2,408.40	350.87	453,489.83	554,683.75
11,810.00	86.70	2.40	9,296.61	2,463.14	2,471.57	-376.85	2,500.13	351.33	453,583.51	554,688.98
11,904.00	88.10	1.30	9,300.87	2,557.03	2,565.42	-373.81	2,592.51	351.71	453,677.36	554,692.02
11,999.00	89.50	359.80	9,302.86	2,652.00	2,660.39	-372.90	2,686.40	352.02	453,772.33	554,692.93
12,093.00	88.80	0.00	9,304.26	2,745.96	2,754.38	-373.07	2,779.53	352.29	453,866.32	554,692.76
12,188.00	88.80	359.30	9,306.25	2,840.91	2,849.36	-373.65	2,873.75	352.53	453,961.30	554,692.18
12,283.00	89.60	359.80	9,307.57	2,935.86	2,944.34	-374.39	2,968.05	352.75	454,056.28	554,691.44
12,377.00	88.90	359.50	9,308.80	3,029.81	3,038.33	-374.97	3,061.38	352.96	454,150.27	554,690.86
12,471.00	89.10	358.60	9,310.44	3,123.73	3,132.30	-376.53	3,154.85	353.15	454,244.24	554,689.30
12,565.00	88.40	358.30	9,312.49	3,217.60	3,226.25	-379.07	3,248.44	353.30	454,338.19	554,686.76
12,659.00	89.80	357.80	9,313.97	3,311.44	3,320.18	-382.27	3,342.11	353.43	454,432.12	554,683.56
12,753.00	90.10	359.50	9,314.05	3,405.35	3,414.15	-384.48	3,435.73	353.57	454,526.09	554,681.35
12,846.00	89.00	359.30	9,314.78	3,498.30	3,507.14	-385.45	3,528.26	353.73	454,619.08	554,680.38
12,942.00	94.30	4.20	9,312.02	3,594.19	3,602.99	-382.53	3,623.24	353.94	454,714.93	554,683.30
13,036.00	91.40	2.00	9,307.34	3,688.01	3,696.72	-377.46	3,715.94	354.17	454,808.66	554,688.37
13,131.00	92.10	1.90	9,304.44	3,782.95	3,791.62	-374.23	3,810.04	354.36	454,903.56	554,691.60
13,225.00	89.70	1.70	9,302.97	3,876.93	3,885.56	-371.27	3,903.25	354.54	454,997.50	554,694.56
13,319.00	88.00	359.80	9,304.85	3,970.90	3,979.52	-370.04	3,996.69	354.69	455,091.46	554,695.79
13,385.00	87.00	359.70	9,307.73	4,036.81	4,045.46	-370.33	4,062.37	354.77	455,157.40	554,695.50
13,480.00	88.00	359.60	9,311.88	4,131.69	4,140.36	-370.91	4,156.94	354.88	455,252.30	554,694.92
13,574.00	88.50	359.30	9,314.75	4,225.60	4,234.32	-371.81	4,250.61	354.98	455,346.26	554,694.02
13,668.00	89.40	359.10	9,316.47	4,319.53	4,328.29	-373.13	4,344.34	355.07	455,440.23	554,692.70
13,762.00	91.30	1.70	9,315.89	4,413.50	4,422.27	-372.47	4,437.93	355.19	455,534.21	554,693.36
13,857.00	90.70	2.60	9,314.24	4,508.47	4,517.19	-368.91	4,532.23	355.33	455,629.13	554,696.92

Company: Marathon Oil
Project: Eddy County, NM
Site: El Presidente State 5-6-10
Well: WA #5H
Wellbore: OH
Design: OH 195'-14045' PTB 14109'

Local Co-ordinate Reference: Well WA #5H
TVD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
MD Reference: Well @ 3161.50usft (GL: 3135' + KB: 26.5' (H&P423))
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)	
13,952.00	90.20	2.10	9,313.49	4,603.45	4,612.11	-365.01	4,626.53	355.47	455,724.05	554,700.82	
14,045.00	90.30	2.80	9,313.08	4,696.43	4,705.02	-361.04	4,718.85	355.61	455,816.96	554,704.79	
Last Survey: 14045' MD, 9313' TVD - [ElPresWA#5H]LTP/BHL											
14,109.00	90.30	2.80	9,312.75	4,760.40	4,768.94	-357.91	4,782.36	355.71	455,880.88	554,707.92	
PTB: 14109' MD, 9313' TVD											

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates			
		+N/-S (usft)	+E/-W (usft)	Comment	
14,045.00	9,313.08	4,705.02	-361.04	Last Survey: 14045' MD, 9313' TVD	
14,109.00	9,312.75	4,768.94	-357.91	PTB: 14109' MD, 9313' TVD	



Marathon Oil
Eddy County, NM
El Presidente State 5-6-10
WA #5H
Plan #1 - FINAL PVA
GL: 3135' + KB: 26.5' (H&P423)

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

RKB Elevation: Well @ 3181.50usft (GL: 3135' + KB: 26.5' (H&P423))

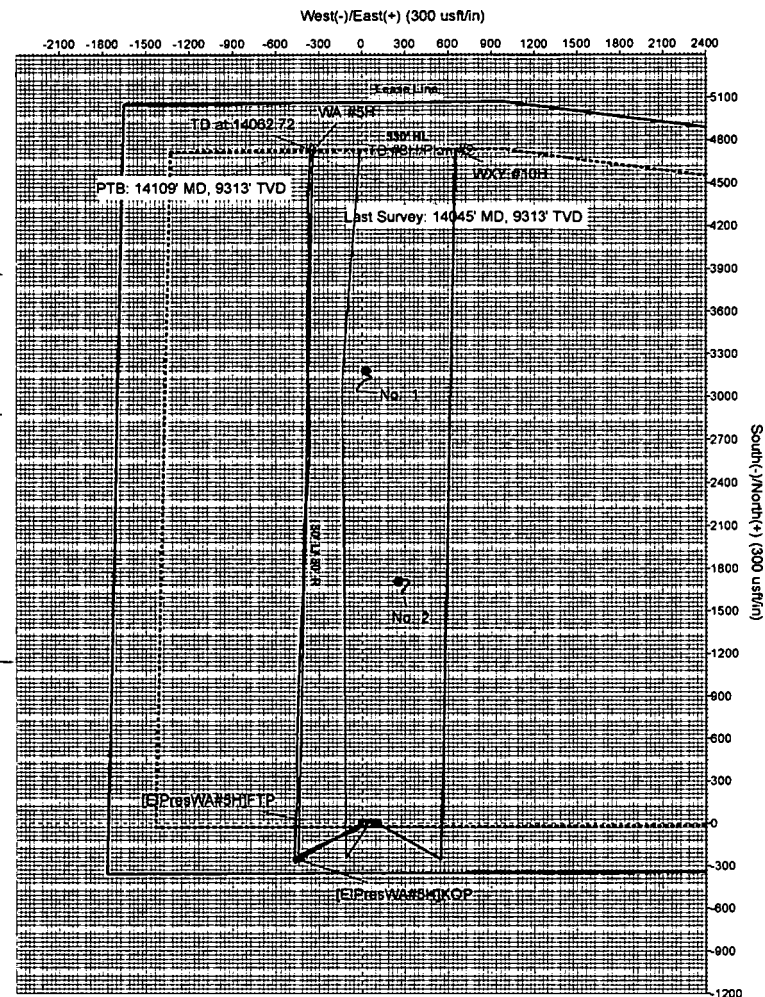
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Spot
0.00	0.00	451111.94	555065.83	32° 14' 24.3537 N	104° 9' 18.8390 W	

SECTION DETAILS

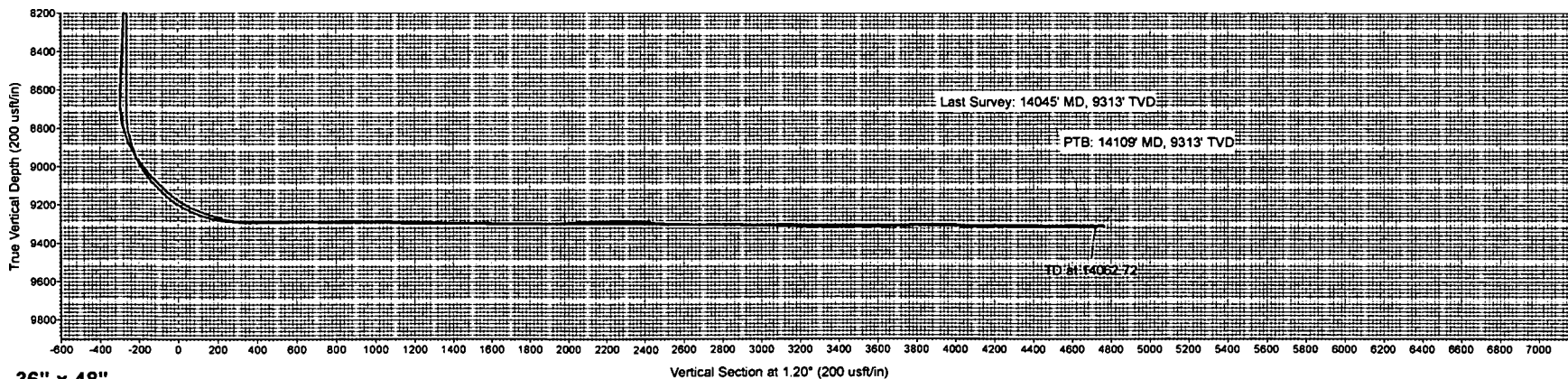
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSecl
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1200.00	0.00	0.00	1200.00	0.00	0.00	0.00	0.00
3	2200.00	10.00	240.20	2194.93	-43.26	-75.53	1.00	-44.83
4	4163.89	10.00	240.20	4128.99	-212.74	-371.47	0.00	-220.47
5	5163.89	0.00	0.00	5123.92	-256.00	-447.00	1.00	-265.31
6	8753.47	0.00	0.00	8713.50	-256.00	-447.00	0.00	-265.31
7	9650.46	89.70	1.20	9286.45	313.81	-435.03	10.00	304.63
8	14062.72	89.70	1.20	9309.70	4725.04	-342.35	0.00	4716.83

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[EIPresWA#5H]FTP	0.00	25.42	-441.04	451137.36	554824.78
[EIPresWA#5H]KOP	8713.50	-256.00	-447.00	450855.94	554618.83
[EIPresWA#5H]LTP/BHL	9309.70	4725.04	-342.35	455836.98	554723.48



Target Line: 9285' TVD @ 0' VS: 89.7° INC



Azimuths to Grid North
True North: -0.09°
Magnetic North: 7.24°
Magnetic Field
Strength: 48032.6nT
Dip Angle: 60.05°
Date: 12/31/2017
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 7.24°

Declination (M to T): 7.33° East