



Marathon Oil

NM OIL CONSERVATION
ARTESIA DISTRICT

JUL 30 2018

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Marathon Oil

Eddy County, NM

Black River 15-10 State Com

X No. 7H 30-015-44456

OH

Design: OH 100'-19618' PTB 19683'

Standard Survey Report

28 March, 2018



PRODIRECTIONAL



Professional Directional Survey Report



Company: Marathon Oil
Project: Eddy County, NM
Site: Black River 15-10 State Com
Well: X No. 7H
Wellbore: OH
Design: OH 100'-19618' PTB 19683'

Local Co-ordinate Reference: Well X No. 7H
TVD Reference: Well @ 3255.50usft (GL: 3229' + KB: 26.5' (H&P423))
MD Reference: Well @ 3255.50usft (GL: 3229' + 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	Black River 15-10 State Com		
Site Position:		Northing:	440,358.91 usft
From:	Map	Easting:	548,621.57 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32.2105660
		Longitude:	-104.1761266
		Grid Convergence:	0.08 °

Well	X No. 7H		
Well Position	+N/-S	0.00 usft	Northing:
	+E/-W	0.00 usft	Easting:
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32.2105679
		Longitude:	-104.1760296
		Ground Level:	3,229.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination
	HDGM	3/7/2018	7.37
		Dip Angle	59.97
		Field Strength	47,986.80
		(°)	
		(nT)	

Design	OH 100'-19618' PTB 19683'		
Audit Notes:			
Version:	1.0	Phase:	ACTUAL
Vertical Section:	Depth From (TVD)	+N/-S	+E/-W
	(usft)	(usft)	(usft)
	0.00	0.00	0.00
			Direction
			(°)
			0.18

Survey Program	Date	3/28/2018	
From	To	Survey (Wellbore)	Tool Name
(usft)	(usft)		
100.00	375.00	Survey #1 (OH)	GYRO-MWD
507.00	19,683.00	Survey #2 (OH)	MWD+IFR1
			Description
			OWSG Gyro MWD
			OWSG MWD + IFR1

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
[BikRvr#7H]NewFTP									
0.07	0.00	280.53	0.07	0.00	0.00	0.00	0.00	0.00	0.00
[BikRvr#7H]PlatFTP									
100.00	0.30	280.53	100.00	0.05	-0.26	0.05	0.30	0.30	0.00
200.00	1.25	234.72	199.99	-0.53	-1.41	-0.54	1.06	0.95	-45.81
300.00	1.54	232.45	299.96	-1.98	-3.36	-1.99	0.30	0.29	-2.27
375.00	1.82	234.58	374.93	-3.29	-5.13	-3.30	0.38	0.37	2.84

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507.00	1.60	255.80	506.87	-4.95	-8.63	-4.98	0.50	-0.17	16.08
599.00	1.20	218.80	598.84	-6.02	-10.47	-6.05	1.05	-0.43	-40.22
691.00	1.60	193.80	690.82	-8.02	-11.38	-8.05	0.78	0.43	-27.17
781.00	1.40	207.20	780.79	-10.22	-12.19	-10.25	0.45	-0.22	14.89
873.00	1.90	204.50	872.75	-12.60	-13.33	-12.65	0.55	0.54	-2.93
965.00	1.90	208.60	964.70	-15.33	-14.70	-15.38	0.15	0.00	4.46
1,055.00	0.90	220.90	1,054.67	-17.18	-15.87	-17.23	1.15	-1.11	13.67
1,150.00	0.80	227.40	1,149.66	-18.19	-16.85	-18.24	0.15	-0.11	6.84
1,244.00	0.80	324.90	1,243.65	-18.10	-17.71	-18.15	1.28	0.00	103.72
1,339.00	1.20	337.00	1,338.64	-16.64	-18.48	-16.70	0.47	0.42	12.74
1,433.00	1.40	43.60	1,432.62	-14.90	-18.07	-14.96	1.53	0.21	70.85
1,527.00	2.80	70.70	1,526.56	-13.31	-15.11	-13.36	1.79	1.49	28.83
1,622.00	3.20	77.00	1,621.43	-11.95	-10.34	-11.98	0.55	0.42	6.63
1,716.00	1.80	80.90	1,715.33	-11.12	-6.33	-11.14	1.50	-1.49	4.15
1,811.00	2.50	83.80	1,810.27	-10.66	-2.79	-10.67	0.75	0.74	3.05
1,906.00	3.80	85.30	1,905.12	-10.18	2.41	-10.17	1.37	1.37	1.58
2,001.00	3.70	97.30	1,999.92	-10.31	8.58	-10.28	0.83	-0.11	12.63
2,095.00	2.40	105.40	2,093.79	-11.22	13.49	-11.18	1.45	-1.38	8.62
2,190.00	1.20	137.30	2,188.74	-12.48	16.08	-12.43	1.60	-1.26	33.58
2,250.00	1.40	138.70	2,248.72	-13.49	16.99	-13.44	0.34	0.33	2.33
2,379.00	1.50	115.10	2,377.68	-15.39	19.56	-15.33	0.47	0.08	-18.29
2,473.00	1.50	110.40	2,471.65	-16.34	21.83	-16.27	0.13	0.00	-5.00
2,568.00	1.60	108.20	2,566.62	-17.19	24.25	-17.11	0.12	0.11	-2.32
2,663.00	1.70	103.20	2,661.58	-17.93	26.89	-17.84	0.18	0.11	-5.26
2,758.00	0.90	149.20	2,756.55	-18.89	28.64	-18.80	1.32	-0.84	48.42
2,852.00	1.00	183.00	2,850.54	-20.34	28.97	-20.25	0.60	0.11	35.96
2,947.00	1.10	187.30	2,945.53	-22.07	28.82	-21.98	0.13	0.11	4.53
3,041.00	1.10	274.40	3,039.51	-22.90	27.80	-22.81	1.61	0.00	92.66
3,136.00	1.60	280.80	3,134.49	-22.58	25.59	-22.50	0.55	0.53	6.74
3,230.00	1.60	281.30	3,228.45	-22.08	23.01	-22.01	0.01	0.00	0.53
3,325.00	1.70	279.40	3,323.41	-21.59	20.32	-21.52	0.12	0.11	-2.00
3,420.00	1.60	277.60	3,418.37	-21.18	17.62	-21.13	0.12	-0.11	-1.89
3,515.00	1.60	276.40	3,513.33	-20.86	14.98	-20.81	0.04	0.00	-1.26
3,609.00	1.50	277.50	3,607.30	-20.55	12.46	-20.51	0.11	-0.11	1.17
3,704.00	1.60	274.40	3,702.27	-20.29	9.91	-20.26	0.14	0.11	-3.26
3,799.00	1.50	279.30	3,797.23	-19.99	7.36	-19.96	0.17	-0.11	5.16
3,894.00	1.60	276.00	3,892.20	-19.65	4.81	-19.63	0.14	0.11	-3.47
3,988.00	1.50	274.50	3,986.16	-19.41	2.28	-19.41	0.11	-0.11	-1.60
4,083.00	1.60	270.30	4,081.13	-19.31	-0.29	-19.31	0.16	0.11	-4.42
4,178.00	1.50	266.30	4,176.09	-19.38	-2.85	-19.39	0.16	-0.11	-4.21
4,273.00	1.70	314.90	4,271.06	-18.47	-5.09	-18.48	1.40	0.21	51.16
4,367.00	1.90	325.30	4,365.01	-16.20	-6.97	-16.22	0.41	0.21	11.06

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4,461.00	1.70	319.80	4,458.97	-13.86	-8.76	-13.88	0.28	-0.21	-5.85
4,556.00	1.60	316.90	4,553.93	-11.81	-10.57	-11.84	0.14	-0.11	-3.05
4,650.00	2.00	354.20	4,647.88	-9.22	-11.63	-9.26	1.29	0.43	39.68
4,745.00	2.50	6.20	4,742.81	-5.51	-11.58	-5.55	0.72	0.53	12.63
4,840.00	1.10	28.60	4,837.76	-2.65	-10.92	-2.69	1.62	-1.47	23.58
4,934.00	1.00	54.00	4,931.75	-1.38	-9.82	-1.41	0.50	-0.11	27.02
5,029.00	1.00	51.30	5,026.73	-0.37	-8.50	-0.40	0.05	0.00	-2.84
5,124.00	1.00	46.30	5,121.72	0.72	-7.26	0.70	0.09	0.00	-5.26
5,219.00	0.90	49.20	5,216.71	1.78	-6.09	1.76	0.12	-0.11	3.05
5,313.00	0.80	47.80	5,310.70	2.70	-5.05	2.69	0.11	-0.11	-1.49
5,408.00	0.60	50.50	5,405.69	3.46	-4.17	3.45	0.21	-0.21	2.84
5,503.00	0.60	53.50	5,500.68	4.08	-3.39	4.07	0.03	0.00	3.16
5,598.00	0.60	57.40	5,595.68	4.64	-2.57	4.63	0.04	0.00	4.11
5,693.00	0.70	48.70	5,690.67	5.29	-1.72	5.29	0.15	0.11	-9.16
5,787.00	0.70	30.80	5,784.66	6.16	-0.99	6.16	0.23	0.00	-19.04
5,882.00	0.90	25.10	5,879.66	7.34	-0.38	7.34	0.23	0.21	-6.00
5,977.00	1.10	25.30	5,974.64	8.84	0.33	8.84	0.21	0.21	0.21
6,072.00	1.50	18.80	6,069.62	10.84	1.12	10.84	0.45	0.42	-6.84
6,167.00	0.30	125.50	6,164.61	11.87	1.72	11.88	1.70	-1.26	112.32
6,261.00	0.40	310.50	6,258.60	11.94	1.67	11.95	0.74	0.11	-186.17
6,356.00	0.90	359.90	6,353.60	12.90	1.42	12.91	0.75	0.53	52.00
6,451.00	0.70	169.10	6,448.60	13.08	1.53	13.09	1.68	-0.21	178.11
6,546.00	0.70	161.50	6,543.59	11.96	1.82	11.97	0.10	0.00	-8.00
6,641.00	0.60	126.70	6,638.58	11.11	2.41	11.12	0.42	-0.11	-36.63
6,735.00	0.70	117.30	6,732.58	10.56	3.31	10.57	0.16	0.11	-10.00
6,830.00	1.10	119.90	6,827.56	9.83	4.62	9.85	0.42	0.42	2.74
6,925.00	1.40	111.20	6,922.54	8.96	6.49	8.98	0.37	0.32	-9.16
7,019.00	1.20	110.30	7,016.52	8.20	8.48	8.23	0.21	-0.21	-0.96
7,114.00	1.50	125.50	7,111.49	7.14	10.43	7.17	0.49	0.32	16.00
7,208.00	1.60	137.10	7,205.46	5.46	12.32	5.50	0.35	0.11	12.34
7,303.00	2.10	137.80	7,300.41	3.20	14.40	3.24	0.53	0.53	0.74
7,398.00	2.20	150.80	7,395.34	0.32	16.45	0.37	0.52	0.11	13.68
7,492.00	2.00	160.10	7,489.28	-2.80	17.89	-2.74	0.42	-0.21	9.89
7,587.00	1.60	162.60	7,584.23	-5.62	18.85	-5.56	0.43	-0.42	2.63
7,681.00	1.30	162.10	7,678.20	-7.89	19.57	-7.83	0.32	-0.32	-0.53
7,776.00	2.20	150.10	7,773.16	-10.50	20.81	-10.43	1.02	0.95	-12.63
7,871.00	3.30	139.20	7,868.05	-14.15	23.51	-14.07	1.28	1.16	-11.47
7,966.00	2.60	139.40	7,962.92	-17.85	26.70	-17.77	0.74	-0.74	0.21
8,061.00	3.70	147.60	8,057.78	-22.08	29.74	-21.98	1.25	1.16	8.63
8,156.00	5.00	144.00	8,152.50	-28.01	33.82	-27.91	1.40	1.37	-3.79
8,251.00	7.40	142.40	8,246.94	-36.21	39.99	-36.09	2.53	2.53	-1.68
8,345.00	7.20	144.00	8,340.18	-45.77	47.14	-45.63	0.30	-0.21	1.70

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8,440.00	5.60	148.60	8,434.58	-54.55	53.06	-54.38	1.77	-1.68	4.84
8,535.00	5.90	147.70	8,529.10	-62.63	58.08	-62.45	0.33	0.32	-0.95
8,629.00	4.90	147.10	8,622.68	-70.09	62.84	-69.89	1.07	-1.06	-0.64
8,724.00	5.30	148.40	8,717.31	-77.23	67.35	-77.02	0.44	0.42	1.37
8,818.00	4.90	150.00	8,810.94	-84.40	71.63	-84.18	0.45	-0.43	1.70
8,913.00	4.60	151.40	8,905.61	-91.26	75.48	-91.02	0.34	-0.32	1.47
9,008.00	4.60	150.90	9,000.30	-97.94	79.16	-97.69	0.04	0.00	-0.53
9,080.00	4.60	152.20	9,072.07	-103.01	81.91	-102.75	0.14	0.00	1.81
9,157.00	4.40	151.20	9,148.83	-108.33	84.77	-108.06	0.28	-0.26	-1.30
9,251.00	4.00	39.60	9,242.70	-108.97	88.60	-108.69	7.39	-0.43	-118.72
9,298.00	11.10	2.70	9,289.28	-103.17	89.86	-102.89	17.56	15.11	-78.51
9,346.00	19.10	4.60	9,335.59	-90.71	90.71	-90.42	16.70	16.67	3.96
9,393.00	22.20	8.60	9,379.56	-74.26	92.66	-73.97	7.24	6.60	8.51
9,440.00	25.70	7.50	9,422.51	-55.37	95.31	-55.07	7.51	7.45	-2.34
9,487.00	29.50	8.40	9,464.15	-33.81	98.34	-33.50	8.13	8.09	1.91
9,534.00	31.60	7.50	9,504.63	-10.15	101.63	-9.83	4.57	4.47	-1.91
9,587.00	35.70	8.30	9,548.74	18.93	105.68	19.26	7.78	7.74	1.51
9,628.00	40.70	6.80	9,580.95	44.06	108.99	44.40	12.40	12.20	-3.66
9,675.00	45.10	8.10	9,615.37	75.77	113.16	76.12	9.55	9.36	2.77
9,722.00	50.00	6.50	9,647.08	110.16	117.54	110.53	10.72	10.43	-3.40
9,769.00	55.60	3.80	9,675.49	147.42	120.87	147.80	12.76	11.91	-5.74
9,816.00	58.70	3.30	9,700.98	186.83	123.31	187.22	6.66	6.60	-1.06
9,863.00	61.80	3.40	9,724.30	227.56	125.69	227.95	6.60	6.60	0.21
9,911.00	63.40	2.20	9,746.39	270.12	127.77	270.52	4.00	3.33	-2.50
9,958.00	65.70	1.80	9,766.59	312.53	129.25	312.94	4.95	4.89	-0.85
10,004.00	71.50	2.70	9,783.37	355.31	130.94	355.72	12.74	12.61	1.96
10,051.00	74.60	4.60	9,797.07	400.17	133.81	400.59	7.65	6.60	4.04
10,098.00	76.00	4.90	9,808.99	445.47	137.57	445.90	3.04	2.98	0.64
10,145.00	78.60	3.70	9,819.33	491.19	141.01	491.63	6.07	5.53	-2.55
10,193.00	86.10	0.10	9,825.71	538.69	142.57	539.14	17.30	15.63	-7.50
10,288.00	89.80	357.90	9,829.11	633.59	140.91	634.03	4.53	3.89	-2.32
10,382.00	90.20	1.90	9,829.11	727.58	140.75	728.01	4.28	0.43	4.26
10,476.00	90.90	1.30	9,828.21	821.53	143.37	821.98	0.98	0.74	-0.64
10,570.00	90.60	1.20	9,826.98	915.50	145.42	915.96	0.34	-0.32	-0.11
10,662.00	89.80	1.80	9,826.66	1,007.47	147.83	1,007.93	1.09	-0.87	0.65
10,757.00	87.70	2.50	9,828.73	1,102.37	151.39	1,102.84	2.33	-2.21	0.74
10,852.00	87.30	1.40	9,832.87	1,197.23	154.62	1,197.71	1.23	-0.42	-1.16
10,946.00	88.20	0.80	9,836.56	1,291.14	156.43	1,291.62	1.15	0.96	-0.64
11,040.00	88.60	359.80	9,839.19	1,385.10	156.92	1,385.58	1.15	0.43	-1.06
11,134.00	92.60	359.80	9,838.20	1,479.07	156.59	1,479.56	4.26	4.26	0.00
11,229.00	89.80	358.10	9,836.22	1,574.02	154.85	1,574.50	3.45	-2.95	-1.79
11,324.00	90.10	357.30	9,836.30	1,668.94	151.04	1,669.41	0.90	0.32	-0.84

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Database: WellPlanner1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,419.00	90.90	359.10	9,835.47	1,763.89	148.05	1,764.35	2.07	0.84	1.89
11,513.00	91.40	358.50	9,833.58	1,857.85	146.08	1,858.30	0.83	0.53	-0.64
11,600.00	90.40	356.30	9,832.22	1,944.74	142.14	1,945.18	2.78	-1.15	-2.53
11,694.00	91.70	358.60	9,830.49	2,038.63	137.96	2,039.05	2.81	1.38	2.45
11,788.00	89.90	0.70	9,829.18	2,132.61	137.38	2,133.03	2.94	-1.91	2.23
11,882.00	88.90	0.30	9,830.16	2,226.60	138.20	2,227.02	1.15	-1.06	-0.43
11,976.00	87.70	0.30	9,832.95	2,320.55	138.69	2,320.98	1.28	-1.28	0.00
12,071.00	89.20	0.40	9,835.52	2,415.51	139.27	2,415.94	1.58	1.58	0.11
12,166.00	90.50	1.40	9,835.77	2,510.50	140.77	2,510.93	1.73	1.37	1.05
12,259.00	90.30	1.30	9,835.12	2,603.47	142.96	2,603.90	0.24	-0.22	-0.11
12,353.00	90.40	0.70	9,834.55	2,697.45	144.60	2,697.89	0.65	0.11	-0.64
12,447.00	91.20	2.00	9,833.24	2,791.41	146.81	2,791.86	1.62	0.85	1.38
12,542.00	89.90	0.70	9,832.32	2,886.38	149.05	2,886.83	1.94	-1.37	-1.37
12,636.00	89.50	359.50	9,832.82	2,980.38	149.21	2,980.83	1.35	-0.43	-1.28
12,730.00	85.90	358.00	9,836.59	3,074.26	147.17	3,074.71	4.15	-3.83	-1.60
12,823.00	90.50	358.80	9,839.51	3,167.15	144.57	3,167.59	5.02	4.95	0.86
12,918.00	90.60	358.00	9,838.60	3,262.11	141.92	3,262.54	0.85	0.11	-0.84
13,012.00	89.80	357.80	9,838.27	3,356.04	138.48	3,356.46	0.88	-0.85	-0.21
13,107.00	89.00	357.40	9,839.26	3,450.96	134.50	3,451.36	0.94	-0.84	-0.42
13,202.00	92.60	359.70	9,837.94	3,545.89	132.09	3,546.29	4.50	3.79	2.42
13,295.00	93.10	358.10	9,833.31	3,638.76	130.31	3,639.15	1.80	0.54	-1.72
13,389.00	93.70	0.30	9,827.74	3,732.58	129.00	3,732.96	2.42	0.64	2.34
13,483.00	92.60	1.50	9,822.57	3,826.42	130.48	3,826.81	1.73	-1.17	1.28
13,576.00	91.00	2.20	9,819.65	3,919.32	133.48	3,919.72	1.88	-1.72	0.75
13,671.00	88.90	2.10	9,819.73	4,014.25	137.04	4,014.66	2.21	-2.21	-0.11
13,765.00	89.10	2.40	9,821.37	4,108.16	140.73	4,108.59	0.38	0.21	0.32
13,859.00	89.50	1.70	9,822.52	4,202.10	144.09	4,202.53	0.86	0.43	-0.74
13,953.00	91.10	2.40	9,822.03	4,296.03	147.46	4,296.47	1.86	1.70	0.74
14,048.00	87.50	359.60	9,823.19	4,390.98	149.11	4,391.43	4.80	-3.79	-2.95
14,144.00	92.50	2.40	9,823.19	4,486.93	150.79	4,487.38	5.97	5.21	2.92
14,239.00	92.50	1.80	9,819.05	4,581.77	154.27	4,582.24	0.63	0.00	-0.63
14,333.00	89.20	4.20	9,817.65	4,675.62	159.18	4,676.09	4.34	-3.51	2.55
14,426.00	87.00	4.60	9,820.74	4,768.28	166.32	4,768.78	2.40	-2.37	0.43
14,521.00	88.40	3.20	9,824.55	4,862.98	172.77	4,863.50	2.08	1.47	-1.47
14,615.00	88.40	359.30	9,827.17	4,956.91	174.82	4,957.43	4.15	0.00	-4.15
14,710.00	90.40	0.00	9,828.17	5,051.89	174.24	5,052.42	2.23	2.11	0.74
14,805.00	90.60	0.30	9,827.34	5,146.89	174.49	5,147.41	0.38	0.21	0.32
14,899.00	91.00	359.50	9,826.03	5,240.88	174.32	5,241.40	0.95	0.43	-0.85
14,993.00	90.20	358.00	9,825.04	5,334.85	172.27	5,335.36	1.81	-0.85	-1.60
15,088.00	89.30	357.40	9,825.46	5,429.77	168.46	5,430.27	1.14	-0.95	-0.63
15,182.00	89.40	355.20	9,826.52	5,523.56	162.40	5,524.05	2.34	0.11	-2.34
15,276.00	89.10	355.70	9,827.75	5,617.26	154.94	5,617.72	0.62	-0.32	0.53

Company: Marathon Oil
Project: Eddy County, NM
Site: Black River 15-10 State Com
Well: X No. 7H
Wellbore: OH
Design: OH 100'-19618' PTB 19683'

Local Co-ordinate Reference: Well X No. 7H
TVD Reference: Well @ 3255.50usft (GL: 3229' + KB: 26.5' (H&P423))
MD Reference: Well @ 3255.50usft (GL: 3229' + KB: 26.5' (H&P423))
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,371.00	91.30	2.10	9,827.42	5,712.18	153.12	5,712.64	7.12	2.32	6.74
15,466.00	90.20	1.30	9,826.18	5,807.13	155.93	5,807.59	1.43	-1.16	-0.84
15,560.00	90.80	2.00	9,825.36	5,901.09	158.64	5,901.56	0.98	0.64	0.74
15,656.00	88.80	0.90	9,825.69	5,997.05	161.07	5,997.53	2.38	-2.08	-1.15
15,750.00	88.00	359.40	9,828.32	6,091.01	161.32	6,091.49	1.81	-0.85	-1.60
15,845.00	88.00	358.90	9,831.63	6,185.94	159.91	6,186.41	0.53	0.00	-0.53
15,939.00	87.90	358.30	9,835.00	6,279.85	157.61	6,280.32	0.65	-0.11	-0.64
16,034.00	88.10	358.70	9,838.31	6,374.76	155.13	6,375.22	0.47	0.21	0.42
16,128.00	88.50	0.40	9,841.10	6,468.71	154.39	6,469.17	1.86	0.43	1.81
16,223.00	90.60	0.00	9,841.85	6,563.71	154.72	6,564.16	2.25	2.21	-0.42
16,316.00	91.50	0.30	9,840.14	6,656.69	154.97	6,657.14	1.02	0.97	0.32
16,411.00	90.60	0.00	9,838.40	6,751.67	155.21	6,752.13	1.00	-0.95	-0.32
16,505.00	91.00	1.70	9,837.09	6,845.65	156.61	6,846.11	1.86	0.43	1.81
16,599.00	89.70	0.10	9,836.51	6,939.63	158.08	6,940.09	2.19	-1.38	-1.70
16,693.00	89.10	358.20	9,837.50	7,033.61	156.69	7,034.07	2.12	-0.64	-2.02
16,788.00	90.20	359.00	9,838.08	7,128.58	154.37	7,129.03	1.43	1.16	0.84
16,882.00	89.30	356.80	9,838.49	7,222.51	150.92	7,222.94	2.53	-0.96	-2.34
16,976.00	90.40	0.40	9,838.74	7,316.46	148.63	7,316.89	4.00	1.17	3.83
17,071.00	90.60	0.30	9,837.91	7,411.46	149.21	7,411.89	0.24	0.21	-0.11
17,166.00	89.60	357.90	9,837.74	7,506.44	147.72	7,506.86	2.74	-1.05	-2.53
17,260.00	88.30	358.20	9,839.46	7,600.36	144.52	7,600.78	1.42	-1.38	0.32
17,354.00	90.70	358.80	9,840.28	7,694.32	142.06	7,694.73	2.63	2.55	0.64
17,449.00	89.60	2.00	9,840.04	7,789.30	142.72	7,789.71	3.56	-1.16	3.37
17,543.00	89.60	2.20	9,840.69	7,883.24	146.17	7,883.66	0.21	0.00	0.21
17,637.00	89.00	1.60	9,841.84	7,977.18	149.28	7,977.61	0.90	-0.64	-0.64
17,732.00	89.50	1.50	9,843.08	8,072.14	151.85	8,072.57	0.54	0.53	-0.11
17,826.00	91.00	1.60	9,842.67	8,166.10	154.39	8,166.54	1.60	1.60	0.11
17,921.00	90.80	1.50	9,841.18	8,261.05	156.96	8,261.50	0.24	-0.21	-0.11
18,015.00	91.30	0.60	9,839.46	8,355.02	158.69	8,355.48	1.10	0.53	-0.96
18,110.00	90.90	359.30	9,837.63	8,450.00	158.60	8,450.45	1.43	-0.42	-1.37
18,203.00	90.60	358.00	9,836.42	8,542.96	156.41	8,543.41	1.43	-0.32	-1.40
18,298.00	89.30	356.50	9,836.50	8,637.85	151.85	8,638.28	2.09	-1.37	-1.58
18,392.00	89.80	0.70	9,837.24	8,731.80	149.56	8,732.22	4.50	0.53	4.47
18,486.00	88.40	0.50	9,838.72	8,825.78	150.54	8,826.21	1.50	-1.49	-0.21
18,581.00	87.50	359.20	9,842.11	8,920.71	150.29	8,921.14	1.66	-0.95	-1.37
18,675.00	87.70	0.10	9,846.05	9,014.63	149.72	9,015.05	0.98	0.21	0.96
18,769.00	87.10	1.40	9,850.31	9,108.52	150.95	9,108.95	1.52	-0.64	1.38
18,863.00	91.10	1.90	9,851.79	9,202.45	153.66	9,202.89	4.29	4.26	0.53
18,958.00	91.90	2.80	9,849.30	9,297.34	157.55	9,297.79	1.27	0.84	0.95
19,052.00	91.10	2.60	9,846.84	9,391.20	161.98	9,391.66	0.88	-0.85	-0.21
19,147.00	90.20	3.00	9,845.77	9,486.08	166.62	9,486.55	1.04	-0.95	0.42
19,240.00	88.40	3.10	9,846.90	9,578.94	171.56	9,579.43	1.94	-1.94	0.11

Company: Marathon Oil
Project: Eddy County, NM
Site: Black River 15-10 State Com
Well: X No. 7H
Wellbore: OH
Design: OH 100'-19618' PTB 19683'

Local Co-ordinate Reference: Well X No. 7H
TVD Reference: Well @ 3255.50usft (GL: 3229' + KB: 26.5' (H&P423))
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North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: WellPlanner1

Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
19,334.00	90.10	3.40	9,848.13	9,672.77	176.89	9,673.28	1.84	1.81	0.32
19,429.00	89.20	3.30	9,848.71	9,767.61	182.44	9,768.13	0.95	-0.95	-0.11
19,523.00	91.50	4.30	9,848.14	9,861.39	188.67	9,861.94	2.67	2.45	1.06
19,618.00	88.40	1.40	9,848.22	9,956.25	193.40	9,956.81	4.47	-3.26	-3.05
Last Survey: 19618' MD, 9848' TVD - [BlkRvr#7H]PlatBHL - [BlkRvr#7H]NewBHL: 9979' VS									
19,683.00	88.40	1.40	9,850.04	10,021.21	194.98	10,021.77	0.00	0.00	0.00
PTB: 19683' MD, 9850' TVD									

Design Annotations					
Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment	
		+N/-S (usft)	+E/-W (usft)		
19,618.00	9,848.22	9,956.25	193.40	Last Survey: 19618' MD, 9848' TVD	
19,683.00	9,850.04	10,021.21	194.98	PTB: 19683' MD, 9850' TVD	



Marathon Oil
Eddy County, NM
Black River 15-10 State Com
X No. 7H
Plan #3 - FINAL PVA
GL: 3229' + 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 @ 3255.50usft (GL: 3229' + KB: 26.5' (H&P423))

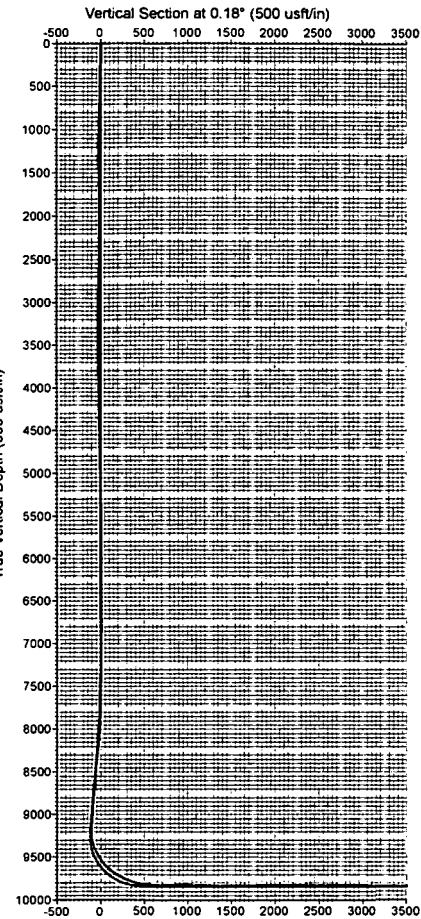
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	440359.65	548651.57	32.2105679	-104.1760296	

SECTION DETAILS

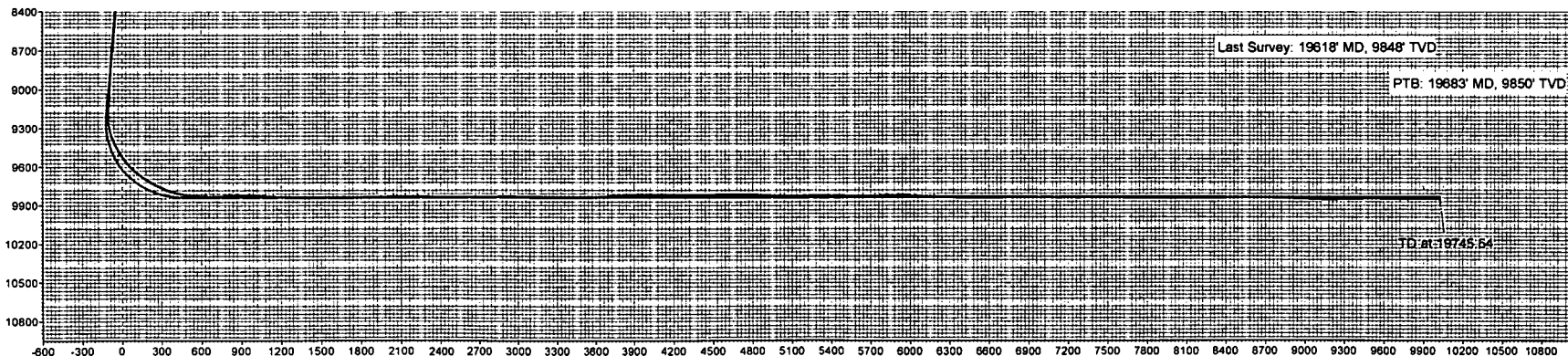
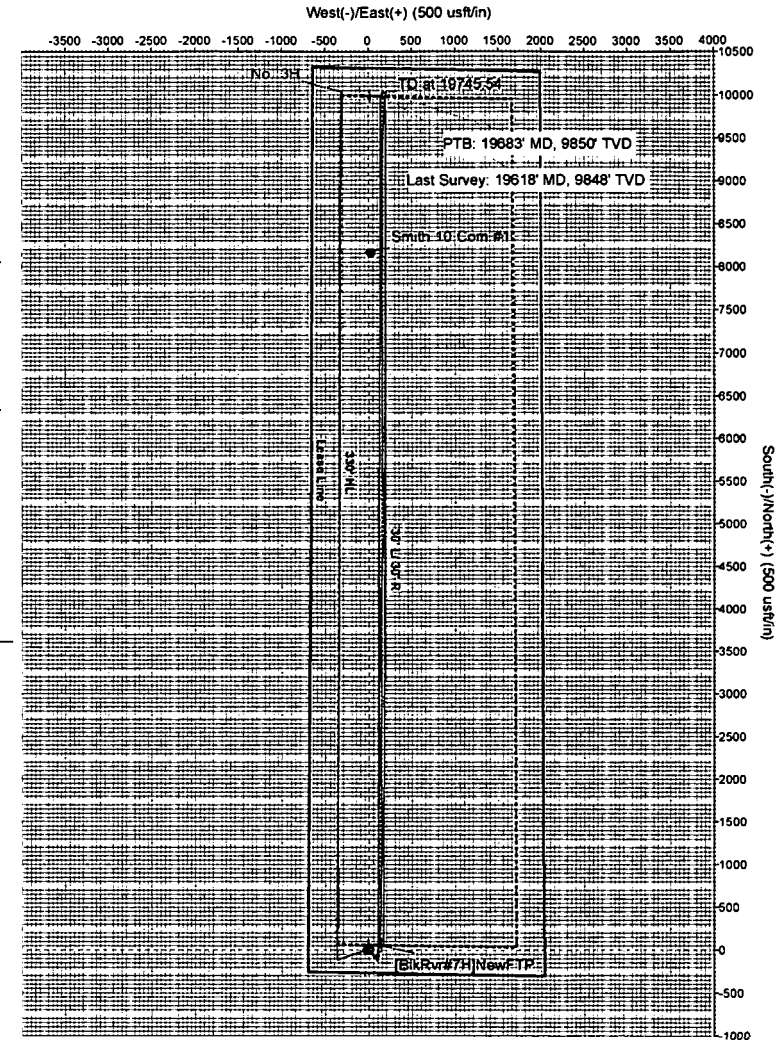
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	7666.00	0.00	0.00	7666.00	0.00	0.00	0.00	0.00
3	8099.52	6.50	142.85	8098.59	-19.59	14.84	1.50	-19.54
4	9220.07	6.50	142.85	9211.93	-120.74	91.47	0.00	-120.46
5	10171.74	90.00	0.18	9835.00	449.75	136.32	10.00	450.17
6	19700.54	90.00	0.18	9835.00	9978.50	166.26	0.00	9978.97
7	19745.54	90.00	0.18	9835.00	10023.50	166.40	0.00	10023.97

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[BltRvr#7H]NewFTP	0.00	56.00	135.26	440415.65	548786.83
[BltRvr#7H]PlatBHL	0.00	9981.74	16.61	450341.39	548668.18
[BltRvr#7H]PlatFTP	0.00	60.27	-14.99	440419.92	548636.56
[BltRvr#7H]NewBHL: 9979' VS	9835.00	9978.50	166.26	450338.15	548817.83



Target Line: 9835' TVD @ 0° VS: 90° INC



Azimuths to Grid North
True North: -0.06°
Magnetic North: 7.28°

Magnetic Field
Strength: 47966.8nT
Dip Angle: 59.97°
Date: 3/7/2018
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 7.28°

Declination (M to T): 7.37° East