

**Provide Signature Page for
Directional Survey**

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Sterling State 23-27-20

WA #6H

30-015-44620

ST1

Survey: SDI Survey #2

Standard Survey Report

26 March, 2018



Survey Report

Company: Marathon Oil Permian, LLC
Project: Eddy County, NM (NAD27)
Site: Sterling State 23-27-20
Well: WA #6H
Wellbore: ST1
Design: ST1

Local Co-ordinate Reference: Well WA #6H
TVD Reference: KB = 25' @ 3206.00usft (Precision 594)
MD Reference: KB = 25' @ 3206.00usft (Precision 594)
North Reference: Grid
Survey Calculation Method: Minimum Curvature
Database: Midland District

Project	Eddy County, NM (NAD27)		
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		Using geodetic scale factor

Site		Sterling State 23-27-20			
Site Position:		Northing:	467,254.93 usft	Latitude:	32° 17' 4.337 N
From:	Map	Easting:	538,802.63 usft	Longitude:	104° 12' 27.980 W
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.07 °

Well	WA #6H					
Well Position	+N/-S	0.00 usft	Northing:	467,254.93 usft	Latitude:	32° 17' 4.336 N
	+E/-W	0.00 usft	Easting:	538,852.63 usft	Longitude:	104° 12' 27.397 W
Position Uncertainty		0.00 usft	Wellhead Elevation:	0.00 usft	Ground Level:	3,181.00 usft

Wellbore	ST1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/7/2018	7.37	60.02	48,003

Design	ST1				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	8,377.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)	
	0.00	0.00	0.00	10.81	

Survey Program	Date 3/26/2018			
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
683.00	8,377.00	SDI Survey #1 (OH)	MWD+HDGM	OWSG MWD + HDGM
8,377.00	11,240.00	SDI Survey #2 (ST1)	MWD+HDGM	OWSG MWD + HDGM

Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
8,377.00	3.30	139.24	8,351.89	-319.01	351.04	-247.51	0.00	0.00	0.00	
8,409.00	1.67	183.97	8,383.86	-320.17	351.61	-248.54	7.56	-5.09	139.78	
8,441.00	1.32	177.38	8,415.85	-321.01	351.59	-249.37	1.22	-1.09	-20.59	
8,535.00	3.61	344.37	8,509.80	-319.24	350.85	-247.77	5.22	2.44	177.65	
8,630.00	6.42	348.15	8,604.43	-311.16	348.95	-240.19	2.98	2.96	3.98	
8,661.00	8.01	352.28	8,635.18	-307.32	348.30	-236.54	5.39	5.13	13.32	
8,706.00	10.14	352.78	8,679.62	-300.28	347.38	-229.80	4.74	4.73	1.11	
8,801.00	10.96	349.56	8,773.01	-283.10	344.70	-213.43	1.06	0.86	-3.39	
8,896.00	13.72	344.67	8,865.81	-263.35	340.08	-194.90	3.10	2.91	-5.15	
8,991.00	20.22	358.02	8,956.66	-236.04	336.53	-168.73	7.94	6.84	14.05	

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Database: Midland District

Survey

Measured Depth (usft)	Inclination (°)	Azimuth (bearing)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,085.00	28.90	357.44	9,042.07	-197.04	334.95	-130.72	9.24	9.23	-0.62
9,130.00	33.73	356.50	9,080.51	-173.69	333.70	-108.02	10.79	10.73	-2.09
9,160.27	35.90	356.45	9,105.36	-156.44	332.64	-91.28	7.17	7.17	-0.17
FTP[SS/WA#6H]									
9,214.00	39.75	356.37	9,147.79	-123.57	330.57	-59.37	7.17	7.17	-0.15
9,331.00	68.73	355.56	9,215.44	-29.88	323.84	31.39	24.78	24.77	-0.69
9,434.00	72.51	357.41	9,249.61	67.08	317.90	125.52	4.04	3.67	1.80
9,528.00	80.77	356.76	9,271.31	158.34	313.25	214.28	8.81	8.79	-0.69
9,577.00	85.56	356.75	9,277.14	206.90	310.49	261.46	9.78	9.78	-0.02
9,672.00	92.82	1.51	9,278.49	301.79	309.06	354.40	9.14	7.64	5.01
9,766.00	93.87	3.36	9,273.00	395.54	313.04	447.23	2.26	1.12	1.97
9,861.00	94.50	5.48	9,266.07	490.00	320.34	541.39	2.32	0.66	2.23
9,955.00	94.06	6.05	9,259.05	583.26	329.76	634.76	0.76	-0.47	0.61
10,050.00	94.03	5.90	9,252.35	677.51	339.62	729.19	0.16	-0.03	-0.16
10,144.00	92.65	5.16	9,246.87	770.91	348.67	822.62	1.67	-1.47	-0.79
10,239.00	91.91	3.62	9,243.10	865.55	355.93	916.95	1.80	-0.78	-1.62
10,333.00	86.58	1.18	9,244.33	959.42	359.87	1,009.89	6.24	-5.67	-2.60
10,427.00	95.65	0.01	9,242.51	1,053.30	360.84	1,102.29	9.73	9.65	-1.24
10,522.00	93.69	358.64	9,234.77	1,147.97	359.73	1,195.07	2.51	-2.06	-1.44
10,617.00	97.77	0.48	9,225.29	1,242.47	359.00	1,287.75	4.71	4.29	1.94
10,711.00	95.98	359.99	9,214.04	1,335.79	359.38	1,379.49	1.97	-1.90	-0.52
10,805.00	95.17	0.05	9,204.90	1,429.34	359.41	1,471.39	0.86	-0.86	0.06
10,899.00	94.50	0.95	9,196.98	1,523.00	360.23	1,563.54	1.19	-0.71	0.96
10,994.00	94.67	0.60	9,189.39	1,617.69	361.51	1,656.79	0.41	0.18	-0.37
11,088.00	86.64	358.22	9,188.31	1,711.60	360.54	1,748.84	8.91	-8.54	-2.53
ST1 / FINAL MWD Survey (11088.00' MD)									
11,240.00	86.64	358.22	9,197.22	1,863.26	355.83	1,896.93	0.00	0.00	0.00
ST1 / FINAL Proj. to Bit (11240.00' MD) - BHL[SS/WA#6H] - Targ.Win[SS/WA#6H]									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
11,088.00	9,188.31	1,711.60	360.54	ST1 / FINAL MWD Survey (11088.00' MD)
11,240.00	9,197.22	1,863.26	355.83	ST1 / FINAL Proj. to Bit (11240.00' MD)

Checked By: _____ Approved By: _____ Date: _____