

**Provide Signature Page for
Directional Survey**

Marathon Oil Permian, LLC

Eddy County, NM (NAD27)

Sterling State 23-27-20

WA #6H

30-015-44620

ST2

Survey: SDI Survey #3

Standard Survey Report

26 March, 2018



Survey Report

Company:	Marathon Oil Permian, LLC	Local Co-ordinate Reference:	Well WA #6H
Project:	Eddy County, NM (NAD27)	TVD Reference:	KB = 25' @ 3206.00usft (Precision 594)
Site:	Sterling State 23-27-20	MD Reference:	KB = 25' @ 3206.00usft (Precision 594)
Well:	WA #6H	North Reference:	Grid
Wellbore:	ST2	Survey Calculation Method:	Minimum Curvature
Design:	ST2	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
From:	Map	Easting:	538,802.63 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 17' 4.337 N
		Longitude:	104° 12' 27.980 W
		Grid Convergence:	0.07 °

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

Wellbore	ST2				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	3/19/2018	7.37	60.02	47,999

Design	ST2				
Audit Notes:					
Version:	1.0	Phase:	ACTUAL	Tie On Depth:	10,388.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (bearing)	
	0.00	0.00	0.00	6.98	

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	10,388.00	SDI Survey #2 (ST1)	MWD+HDGM	OWSG MWD + HDGM	
10,427.00	13,794.00	SDI Survey #3 (ST2)	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)	
10,388.00	91.89	0.50	9,245.07	1,014.40	360.63	1,050.70	0.00	0.00	0.00	
FTP[SS/WA#6H]										
10,427.00	85.60	6.49	9,245.93	1,053.29	363.00	1,089.58	22.26	-16.12	15.37	
10,521.00	95.45	11.79	9,245.07	1,145.94	377.90	1,183.36	11.90	10.48	5.64	
10,616.00	95.01	9.46	9,236.41	1,238.92	395.34	1,277.77	2.49	-0.46	-2.45	
10,710.00	95.82	10.24	9,227.54	1,331.12	411.35	1,371.23	1.19	0.86	0.83	
10,805.00	95.92	1.89	9,217.80	1,425.00	421.33	1,465.64	8.74	0.11	-8.79	
10,899.00	94.87	1.53	9,208.97	1,518.55	424.12	1,558.82	1.18	-1.12	-0.38	
10,993.00	93.49	358.22	9,202.11	1,612.28	423.91	1,651.84	3.81	-1.47	-3.52	

Survey Report

Company: Marathon Oil Permian, LLC
 Project: Eddy County, NM (NAD27)
 Site: Sterling State 23-27-20
 Well: WA #6H
 Wellbore: ST2
 Design: ST2

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

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)
11,088.00	93.42	357.66	9,196.39	1,707.05	420.50	1,745.49	0.59	-0.07	-0.59
11,182.00	89.73	353.08	9,193.80	1,800.66	412.92	1,837.49	6.25	-3.93	-4.87
11,277.00	92.79	354.31	9,191.71	1,895.05	402.49	1,929.91	3.47	3.22	1.29
11,371.00	93.49	357.55	9,186.56	1,988.66	395.83	2,022.02	3.52	0.74	3.45
11,465.00	93.26	358.05	9,181.03	2,082.43	392.23	2,114.65	0.58	-0.24	0.53
11,560.00	92.95	358.18	9,175.88	2,177.24	389.11	2,208.38	0.35	-0.33	0.14
11,655.00	92.55	358.46	9,171.33	2,272.09	386.32	2,302.19	0.51	-0.42	0.29
11,749.00	91.58	358.64	9,167.94	2,365.99	383.95	2,395.11	1.05	-1.03	0.19
11,843.00	91.31	358.31	9,165.57	2,459.93	381.45	2,488.05	0.45	-0.29	-0.35
11,938.00	90.23	358.07	9,164.29	2,554.87	378.45	2,581.93	1.16	-1.14	-0.25
12,033.00	91.11	358.96	9,163.18	2,649.83	375.98	2,675.88	1.32	0.93	0.94
12,127.00	90.74	359.33	9,161.66	2,743.81	374.58	2,768.99	0.56	-0.39	0.39
12,222.00	91.17	359.83	9,160.08	2,838.79	373.89	2,863.19	0.69	0.45	0.53
12,316.00	90.84	0.93	9,158.43	2,932.78	374.51	2,956.55	1.22	-0.35	1.17
12,410.00	89.77	0.58	9,157.93	3,026.76	375.75	3,049.99	1.20	-1.14	-0.37
12,504.00	91.14	0.40	9,157.19	3,120.76	376.55	3,143.39	1.47	1.46	-0.19
12,599.00	89.83	1.66	9,156.38	3,215.73	378.26	3,237.87	1.91	-1.38	1.33
12,693.00	88.59	1.98	9,157.68	3,309.67	381.24	3,331.48	1.36	-1.32	0.34
12,787.00	89.83	1.51	9,158.97	3,403.62	384.11	3,425.07	1.41	1.32	-0.50
12,882.00	88.66	1.07	9,160.22	3,498.59	386.24	3,519.60	1.32	-1.23	-0.46
12,977.00	90.07	0.81	9,161.28	3,593.56	387.80	3,614.06	1.51	1.48	-0.27
13,071.00	89.80	2.19	9,161.38	3,687.53	390.26	3,707.63	1.50	-0.29	1.47
13,165.00	89.23	1.82	9,162.18	3,781.47	393.55	3,801.27	0.72	-0.61	-0.39
13,260.00	89.16	2.36	9,163.51	3,876.40	397.02	3,895.92	0.57	-0.07	0.57
13,354.00	89.23	0.45	9,164.84	3,970.35	399.32	3,989.46	2.03	0.07	-2.03
13,449.00	89.33	0.21	9,166.03	4,065.34	399.87	4,083.81	0.27	0.11	-0.25
13,543.00	87.48	359.62	9,168.65	4,159.30	399.73	4,177.06	2.07	-1.97	-0.63
13,638.00	87.42	359.60	9,172.87	4,254.21	399.08	4,271.18	0.07	-0.06	-0.02
13,732.00	89.63	0.68	9,175.29	4,348.17	399.31	4,364.47	2.62	2.35	1.15
13,741.00	90.13	1.06	9,175.31	4,357.17	399.45	4,373.42	6.98	5.56	4.22
FINAL MWD Survey (13741.00' MD) - BHL[SS/WA#6H]									
13,792.30	90.13	1.06	9,175.19	4,408.46	400.40	4,424.45	0.00	0.00	0.00
Targ.Win[SS\WA#6H]									
13,794.00	90.13	1.06	9,175.19	4,410.16	400.43	4,426.14	0.00	0.00	0.00
FINAL Proj. to Bit (12457.00' MD)									

Survey Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates		Comment
		+N/-S (usft)	+E/-W (usft)	
13,741.00	9,175.31	4,357.17	399.45	FINAL MWD Survey (13741.00' MD)
13,794.00	9,175.19	4,410.16	400.43	FINAL Proj. to Bit (12457.00' MD)

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Wellbore: ST2
Design: ST2

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Checked By: _____	Approved By: _____	Date: _____
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