

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720

District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720

District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170

District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

State of New Mexico
Energy, Minerals and Natural Resources
Oil Conservation Division
1220 S. St Francis Dr.
Santa Fe, NM 87505

Form C-101
August 1, 2011
Permit 271588

APPLICATION FOR PERMIT TO DRILL, RE-ENTER, DEEPEN, PLUGBACK, OR ADD A ZONE

1. Operator Name and Address MARATHON OIL PERMIAN LLC 5555 San Felipe St. Houston, TX 77056		2. OGRID Number 372098
4. Property Code 326101		3. API Number 30-015-46271
5. Property Name THOR 28 WA FEE		6. Well No. 003H

7. Surface Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
M	28	23S	28E		612	S	1222	W	Eddy

8. Proposed Bottom Hole Location

UL - Lot	Section	Township	Range	Lot Idn	Feet From	N/S Line	Feet From	E/W Line	County
C	28	23S	28E	C	330	N	1342	W	Eddy

9. Pool Information

PURPLE SAGE;WOLFCAMP (GAS)	98220
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Additional Well Information

11. Work Type New Well	12. Well Type GAS	13. Cable/Rotary	14. Lease Type Private	15. Ground Level Elevation 3083
16. Multiple N	17. Proposed Depth 14330	18. Formation Wolfcamp	19. Contractor	20. Spud Date 2/8/2020
Depth to Ground water		Distance from nearest fresh water well		Distance to nearest surface water

☒ We will be using a closed-loop system in lieu of lined pits

21. Proposed Casing and Cement Program

Type	Hole Size	Casing Size	Casing Weight/ft	Setting Depth	Sacks of Cement	Estimated TOC
Surf	17.5	13.375	54.5	350	366	0
Int1	12.25	9.625	36	2500	725	0
Prod	8.75	7	29	9943	712	2200
Liner1	6.125	4.5	13.5	14330	470	9643

Casing/Cement Program: Additional Comments

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22. Proposed Blowout Prevention Program

Type	Working Pressure	Test Pressure	Manufacturer
Annular	5000	2500	
Double Ram	5000	5000	
Pipe	5000	5000	
Blind	5000	5000	

23. I hereby certify that the information given above is true and complete to the best of my knowledge and belief.
 I further certify I have complied with 19.15.14.9 (A) NMAC ☒ and/or 19.15.14.9 (B) NMAC ☒ if applicable.

OIL CONSERVATION DIVISION

Signature:

Printed Name: Electronically filed by Melissa Szudera	Approved By: Raymond Podany
Title: Regulatory Compliance Representative	Title: Geologist
Email Address: mszudera@marathonoil.com	Approved Date: 9/11/2019 Expiration Date: 9/11/2021
Date: 8/27/2019 Phone: 701-260-7272	Conditions of Approval Attached

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State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number	² Pool Code 98220	³ Pool Name PURPLE SAGE; WOLFCAMP (GAS)
⁴ Property Code	⁵ Property Name THOR 28 WA FEE	⁶ Well Number 3H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 3083'

¹⁰ Surface Location

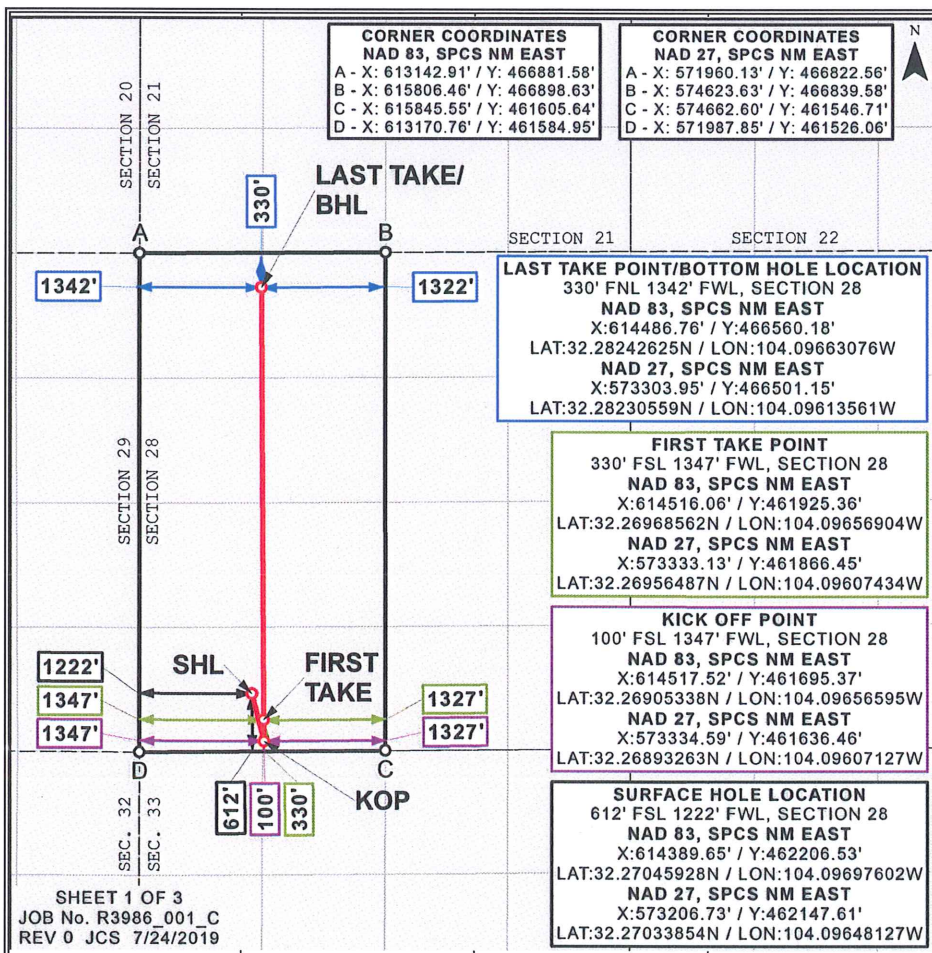
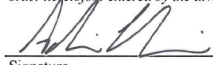
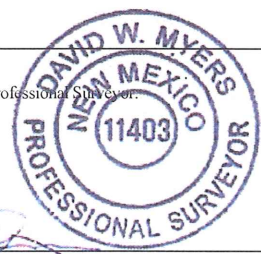
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	28	23S	28E		612	SOUTH	1222	WEST	EDDY

¹¹ Bottom Hole Location If Different From Surface

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	28	23S	28E		330	NORTH	1342	WEST	EDDY

¹² Dedicated Acres 320.0	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.

	¹⁷ OPERATOR CERTIFICATION I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature:  Date: 8/27/2019 Printed Name: Adrian Covarrubias E-mail Address: ¹⁸ SURVEYOR CERTIFICATION I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief. Date of Survey: AUGUST 7, 2019 Signature and Seal of Professional Surveyor:  Certificate Number: DAVID W. MYERS 11403
	CORNER COORDINATES NAD 83, SPCS NM EAST A - X: 613142.91' / Y: 466881.58' B - X: 615806.46' / Y: 466898.63' C - X: 615845.55' / Y: 461605.64' D - X: 613170.76' / Y: 461584.95'
	CORNER COORDINATES NAD 27, SPCS NM EAST A - X: 571960.13' / Y: 466822.56' B - X: 574623.63' / Y: 466839.58' C - X: 574662.60' / Y: 461546.71' D - X: 571987.85' / Y: 461526.06'
	LAST TAKE POINT/BOTTOM HOLE LOCATION 330' FNL 1342' FWL, SECTION 28 NAD 83, SPCS NM EAST X: 614486.76' / Y: 466560.18' LAT: 32.28242625N / LON: 104.09663076W NAD 27, SPCS NM EAST X: 573303.95' / Y: 466501.15' LAT: 32.28230559N / LON: 104.09613561W
FIRST TAKE POINT 330' FSL 1347' FWL, SECTION 28 NAD 83, SPCS NM EAST X: 614516.06' / Y: 461925.36' LAT: 32.26968562N / LON: 104.09656904W NAD 27, SPCS NM EAST X: 573333.13' / Y: 461866.45' LAT: 32.26956487N / LON: 104.09607434W	
KICK OFF POINT 100' FSL 1347' FWL, SECTION 28 NAD 83, SPCS NM EAST X: 614517.52' / Y: 461695.37' LAT: 32.26905338N / LON: 104.09656595W NAD 27, SPCS NM EAST X: 573334.59' / Y: 461636.46' LAT: 32.26893263N / LON: 104.09607127W	
SURFACE HOLE LOCATION 612' FSL 1222' FWL, SECTION 28 NAD 83, SPCS NM EAST X: 614389.65' / Y: 462206.53' LAT: 32.27045928N / LON: 104.09697602W NAD 27, SPCS NM EAST X: 573206.73' / Y: 462147.61' LAT: 32.27033854N / LON: 104.09648127W	

Distances/areas relative to NAD 83 Combined Scale Factor: 0.999915187 Convergence: 00°07'33.71903"

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Santa Fe, NM 87505

Form APD Comments

Permit 271588

PERMIT COMMENTS

Operator Name and Address: MARATHON OIL PERMIAN LLC [372098] 5555 San Felipe St. Houston, TX 77056		API Number: 30-015-46271
		Well: THOR 28 WA FEE #003H
Created By	Comment	Comment Date
acovarrubias	GCP and Directional will be sent via mail.	8/27/2019

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Form APD Conditions

Permit 271588

PERMIT CONDITIONS OF APPROVAL

Operator Name and Address: MARATHON OIL PERMIAN LLC [372098] 5555 San Felipe St. Houston, TX 77056		API Number: 30-015-46271
		Well: THOR 28 WA FEE #003H
OCD Reviewer	Condition	
rpodany	Will require a directional survey with the C-104	
rpodany	Cement is required to circulate on both surface and intermediate1 strings of casing	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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	Thor 28 (1-3-5-8)		
Site Position:		Northing:	462,147.63 usft
From:	Map	Easting:	573,236.71 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 13.218256 N
		Longitude:	104° 5' 46.983432 W
		Grid Convergence:	0.13 °

Well	WXY Fee #5H		
Well Position	+N/-S	0.00 usft	Northing: 462,147.58 usft
	+E/-W	0.00 usft	Easting: 573,176.71 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 13.219072 N
		Longitude:	104° 5' 47.682272 W
		Ground Level:	3,083.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	8/15/2019	7.12
			Dip Angle (°) 59.98
			Field Strength (nT) 47,872.20

Design	Prelim Plan A		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 359.70

Survey Tool Program	Date	8/15/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
5,400.00	9,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
9,000.00	14,294.96	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

Planned 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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[ThorWXY#5H]FTP										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	2.00	235.64	1,599.98	-0.99	-1.44	-0.98	2.00	2.00	0.00
1,700.00	4.00	235.64	1,699.84	-3.94	-5.76	-3.91	2.00	2.00	0.00
1,800.00	6.00	235.64	1,799.45	-8.86	-12.95	-8.79	2.00	2.00	0.00
1,900.00	8.00	235.64	1,898.70	-15.74	-23.01	-15.62	2.00	2.00	0.00
2,000.00	10.00	235.64	1,997.47	-24.57	-35.93	-24.38	2.00	2.00	0.00
2,100.00	10.00	235.64	2,095.95	-34.37	-50.26	-34.10	0.00	0.00	0.00
2,200.00	10.00	235.64	2,194.43	-44.17	-64.60	-43.83	0.00	0.00	0.00
2,300.00	10.00	235.64	2,292.91	-53.97	-78.93	-53.55	0.00	0.00	0.00
2,400.00	10.00	235.64	2,391.39	-63.77	-93.26	-63.28	0.00	0.00	0.00
2,500.00	10.00	235.64	2,489.87	-73.57	-107.60	-73.01	0.00	0.00	0.00
2,600.00	10.00	235.64	2,588.35	-83.37	-121.93	-82.73	0.00	0.00	0.00
2,700.00	10.00	235.64	2,686.83	-93.17	-136.27	-92.46	0.00	0.00	0.00
2,800.00	10.00	235.64	2,785.31	-102.97	-150.60	-102.18	0.00	0.00	0.00
2,900.00	10.00	235.64	2,883.79	-112.78	-164.94	-111.91	0.00	0.00	0.00
3,000.00	10.00	235.64	2,982.27	-122.58	-179.27	-121.64	0.00	0.00	0.00
3,100.00	10.00	235.64	3,080.75	-132.38	-193.61	-131.36	0.00	0.00	0.00
3,200.00	10.00	235.64	3,179.23	-142.18	-207.94	-141.09	0.00	0.00	0.00
3,300.00	10.00	235.64	3,277.72	-151.98	-222.27	-150.81	0.00	0.00	0.00
3,400.00	10.00	235.64	3,376.20	-161.78	-236.61	-160.54	0.00	0.00	0.00
3,500.00	10.00	235.64	3,474.68	-171.58	-250.94	-170.27	0.00	0.00	0.00
3,600.00	10.00	235.64	3,573.16	-181.38	-265.28	-179.99	0.00	0.00	0.00
3,700.00	10.00	235.64	3,671.64	-191.19	-279.61	-189.72	0.00	0.00	0.00
3,800.00	10.00	235.64	3,770.12	-200.99	-293.95	-199.44	0.00	0.00	0.00
3,900.00	10.00	235.64	3,868.60	-210.79	-308.28	-209.17	0.00	0.00	0.00
4,000.00	10.00	235.64	3,967.08	-220.59	-322.61	-218.90	0.00	0.00	0.00
4,100.00	10.00	235.64	4,065.56	-230.39	-336.95	-228.62	0.00	0.00	0.00
4,200.00	10.00	235.64	4,164.04	-240.19	-351.28	-238.35	0.00	0.00	0.00
4,300.00	10.00	235.64	4,262.52	-249.99	-365.62	-248.07	0.00	0.00	0.00
4,400.00	10.00	235.64	4,361.00	-259.79	-379.95	-257.80	0.00	0.00	0.00
4,500.00	10.00	235.64	4,459.48	-269.59	-394.29	-267.53	0.00	0.00	0.00
4,600.00	10.00	235.64	4,557.97	-279.40	-408.62	-277.25	0.00	0.00	0.00
4,700.00	10.00	235.64	4,656.45	-289.20	-422.95	-286.98	0.00	0.00	0.00
4,800.00	10.00	235.64	4,754.93	-299.00	-437.29	-296.70	0.00	0.00	0.00
4,900.00	10.00	235.64	4,853.41	-308.80	-451.62	-306.43	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
5,000.00	10.00	235.64	4,951.89	-318.60	-465.96	-316.16	0.00	0.00	0.00
5,100.00	10.00	235.64	5,050.37	-328.40	-480.29	-325.88	0.00	0.00	0.00
5,200.00	10.00	235.64	5,148.85	-338.20	-494.63	-335.61	0.00	0.00	0.00
5,300.00	10.00	235.64	5,247.33	-348.00	-508.96	-345.33	0.00	0.00	0.00
5,400.00	10.00	235.64	5,345.81	-357.81	-523.30	-355.06	0.00	0.00	0.00
5,500.00	10.00	235.64	5,444.29	-367.61	-537.63	-364.79	0.00	0.00	0.00
5,600.00	10.00	235.64	5,542.77	-377.41	-551.96	-374.51	0.00	0.00	0.00
5,700.00	10.00	235.64	5,641.25	-387.21	-566.30	-384.24	0.00	0.00	0.00
5,800.00	10.00	235.64	5,739.73	-397.01	-580.63	-393.96	0.00	0.00	0.00
5,900.00	10.00	235.64	5,838.22	-406.81	-594.97	-403.69	0.00	0.00	0.00
6,000.00	10.00	235.64	5,936.70	-416.61	-609.30	-413.42	0.00	0.00	0.00
6,100.00	10.00	235.64	6,035.18	-426.41	-623.64	-423.14	0.00	0.00	0.00
6,200.00	10.00	235.64	6,133.66	-436.22	-637.97	-432.87	0.00	0.00	0.00
6,300.00	10.00	235.64	6,232.14	-446.02	-652.30	-442.59	0.00	0.00	0.00
6,400.00	10.00	235.64	6,330.62	-455.82	-666.64	-452.32	0.00	0.00	0.00
6,500.00	10.00	235.64	6,429.10	-465.62	-680.97	-462.05	0.00	0.00	0.00
6,600.00	10.00	235.64	6,527.58	-475.42	-695.31	-471.77	0.00	0.00	0.00
6,700.00	10.00	235.64	6,626.06	-485.22	-709.64	-481.50	0.00	0.00	0.00
6,793.70	10.00	235.64	6,718.34	-494.40	-723.07	-490.61	0.00	0.00	0.00
6,800.00	9.87	235.64	6,724.54	-495.02	-723.97	-491.22	2.00	-2.00	0.00
6,900.00	7.87	235.64	6,823.34	-503.72	-736.70	-499.86	2.00	-2.00	0.00
7,000.00	5.87	235.64	6,922.62	-510.48	-746.58	-506.56	2.00	-2.00	0.00
7,100.00	3.87	235.64	7,022.25	-515.28	-753.60	-511.32	2.00	-2.00	0.00
7,200.00	1.87	235.64	7,122.12	-518.11	-757.74	-514.13	2.00	-2.00	0.00
7,293.70	0.00	0.00	7,215.80	-518.97	-759.00	-514.99	2.00	-2.00	0.00
7,300.00	0.00	0.00	7,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,400.00	0.00	0.00	7,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,500.00	0.00	0.00	7,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,600.00	0.00	0.00	7,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,700.00	0.00	0.00	7,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,800.00	0.00	0.00	7,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,900.00	0.00	0.00	7,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,000.00	0.00	0.00	7,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,100.00	0.00	0.00	8,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,200.00	0.00	0.00	8,122.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,300.00	0.00	0.00	8,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,400.00	0.00	0.00	8,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,500.00	0.00	0.00	8,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,600.00	0.00	0.00	8,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,700.00	0.00	0.00	8,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,800.00	0.00	0.00	8,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,900.00	0.00	0.00	8,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,000.00	0.00	0.00	8,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,100.00	0.00	0.00	9,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
9,148.40	0.00	0.00	9,070.50	-518.97	-759.00	-514.99	0.00	0.00	0.00
[ThorWXY#5H]KOP									
9,150.00	0.19	350.55	9,072.10	-518.97	-759.00	-514.99	12.00	12.00	0.00
9,175.00	3.19	350.55	9,097.09	-518.24	-759.12	-514.26	12.00	12.00	0.00
9,200.00	6.19	350.55	9,122.00	-516.22	-759.46	-512.24	12.00	12.00	0.00
9,225.00	9.19	350.55	9,146.78	-512.92	-760.01	-508.93	12.00	12.00	0.00
9,250.00	12.19	350.55	9,171.34	-508.35	-760.77	-504.36	12.00	12.00	0.00
9,275.00	15.19	350.55	9,195.63	-502.51	-761.74	-498.51	12.00	12.00	0.00
9,300.00	18.19	350.55	9,219.57	-495.43	-762.92	-491.43	12.00	12.00	0.00
9,325.00	21.19	350.55	9,243.10	-487.12	-764.30	-483.11	12.00	12.00	0.00
9,350.00	24.19	350.55	9,266.17	-477.61	-765.88	-473.59	12.00	12.00	0.00
9,375.00	27.19	350.55	9,288.69	-466.92	-767.66	-462.89	12.00	12.00	0.00
9,400.00	30.19	350.55	9,310.62	-455.08	-769.63	-451.04	12.00	12.00	0.00
9,425.00	33.19	350.55	9,331.89	-442.12	-771.79	-438.08	12.00	12.00	0.00
9,450.00	36.19	350.55	9,352.44	-428.09	-774.13	-424.03	12.00	12.00	0.00
9,475.00	39.19	350.55	9,372.22	-413.01	-776.64	-408.94	12.00	12.00	0.00
9,500.00	42.19	350.55	9,391.18	-396.93	-779.31	-392.85	12.00	12.00	0.00
9,525.00	45.19	350.55	9,409.25	-379.90	-782.15	-375.80	12.00	12.00	0.00
9,550.00	48.19	350.55	9,426.40	-361.96	-785.13	-357.84	12.00	12.00	0.00
9,575.00	51.19	350.55	9,442.57	-343.15	-788.26	-339.02	12.00	12.00	0.00
9,600.00	54.19	350.55	9,457.72	-323.54	-791.53	-319.39	12.00	12.00	0.00
9,625.00	57.19	350.55	9,471.81	-303.17	-794.92	-299.01	12.00	12.00	0.00
9,650.00	60.19	350.55	9,484.80	-282.11	-798.42	-277.92	12.00	12.00	0.00
9,675.00	63.19	350.55	9,496.65	-260.40	-802.04	-256.19	12.00	12.00	0.00
9,700.00	66.19	350.55	9,507.34	-238.11	-805.75	-233.88	12.00	12.00	0.00
9,725.00	69.19	350.55	9,516.82	-215.29	-809.55	-211.05	12.00	12.00	0.00
9,750.00	72.19	350.55	9,525.09	-192.02	-813.42	-187.76	12.00	12.00	0.00
9,775.00	75.19	350.55	9,532.11	-168.36	-817.36	-164.07	12.00	12.00	0.00
9,800.00	78.19	350.55	9,537.86	-144.36	-821.35	-140.06	12.00	12.00	0.00
9,825.00	81.19	350.55	9,542.33	-120.10	-825.39	-115.78	12.00	12.00	0.00
9,850.00	84.19	350.55	9,545.51	-95.64	-829.46	-91.30	12.00	12.00	0.00
9,875.00	87.19	350.55	9,547.39	-71.05	-833.55	-66.69	12.00	12.00	0.00
9,898.40	90.00	350.55	9,547.97	-47.98	-837.39	-43.60	12.00	12.00	0.00
9,900.00	90.00	350.60	9,547.97	-46.40	-837.66	-42.02	3.00	0.00	3.00
10,000.00	90.00	353.60	9,547.97	52.64	-851.40	57.09	3.00	0.00	3.00
10,100.00	90.00	356.60	9,547.97	152.26	-859.95	156.76	3.00	0.00	3.00
10,203.33	90.00	359.70	9,547.97	255.52	-863.29	260.04	3.00	0.00	3.00
10,300.00	90.00	359.70	9,547.97	352.19	-863.79	356.71	0.00	0.00	0.00
10,400.00	90.00	359.70	9,547.97	452.19	-864.32	456.71	0.00	0.00	0.00
10,500.00	90.00	359.70	9,547.97	552.19	-864.85	556.71	0.00	0.00	0.00
10,600.00	90.00	359.70	9,547.97	652.19	-865.38	656.71	0.00	0.00	0.00
10,700.00	90.00	359.70	9,547.97	752.19	-865.90	756.71	0.00	0.00	0.00
10,800.00	90.00	359.70	9,547.97	852.18	-866.43	856.71	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)	
10,900.00	90.00	359.70	9,547.97	952.18	-866.96	956.71	0.00	0.00	0.00	
11,000.00	90.00	359.70	9,547.97	1,052.18	-867.49	1,056.71	0.00	0.00	0.00	
11,100.00	90.00	359.70	9,547.97	1,152.18	-868.01	1,156.71	0.00	0.00	0.00	
11,200.00	90.00	359.70	9,547.97	1,252.18	-868.54	1,256.71	0.00	0.00	0.00	
11,300.00	90.00	359.70	9,547.98	1,352.18	-869.07	1,356.71	0.00	0.00	0.00	
11,400.00	90.00	359.70	9,547.98	1,452.18	-869.60	1,456.71	0.00	0.00	0.00	
11,500.00	90.00	359.70	9,547.98	1,552.17	-870.12	1,556.71	0.00	0.00	0.00	
11,600.00	90.00	359.70	9,547.98	1,652.17	-870.65	1,656.71	0.00	0.00	0.00	
11,700.00	90.00	359.70	9,547.98	1,752.17	-871.18	1,756.71	0.00	0.00	0.00	
11,800.00	90.00	359.70	9,547.98	1,852.17	-871.70	1,856.71	0.00	0.00	0.00	
11,900.00	90.00	359.70	9,547.98	1,952.17	-872.23	1,956.71	0.00	0.00	0.00	
12,000.00	90.00	359.70	9,547.98	2,052.17	-872.76	2,056.71	0.00	0.00	0.00	
12,100.00	90.00	359.70	9,547.98	2,152.17	-873.29	2,156.71	0.00	0.00	0.00	
12,200.00	90.00	359.70	9,547.98	2,252.17	-873.81	2,256.71	0.00	0.00	0.00	
12,300.00	90.00	359.70	9,547.98	2,352.16	-874.34	2,356.71	0.00	0.00	0.00	
12,400.00	90.00	359.70	9,547.98	2,452.16	-874.87	2,456.71	0.00	0.00	0.00	
12,500.00	90.00	359.70	9,547.99	2,552.16	-875.40	2,556.71	0.00	0.00	0.00	
12,600.00	90.00	359.70	9,547.99	2,652.16	-875.92	2,656.71	0.00	0.00	0.00	
12,700.00	90.00	359.70	9,547.99	2,752.16	-876.45	2,756.71	0.00	0.00	0.00	
12,800.00	90.00	359.70	9,547.99	2,852.16	-876.98	2,856.71	0.00	0.00	0.00	
12,900.00	90.00	359.70	9,547.99	2,952.16	-877.50	2,956.71	0.00	0.00	0.00	
13,000.00	90.00	359.70	9,547.99	3,052.15	-878.03	3,056.71	0.00	0.00	0.00	
13,100.00	90.00	359.70	9,547.99	3,152.15	-878.56	3,156.71	0.00	0.00	0.00	
13,200.00	90.00	359.70	9,547.99	3,252.15	-879.09	3,256.71	0.00	0.00	0.00	
13,300.00	90.00	359.70	9,547.99	3,352.15	-879.61	3,356.71	0.00	0.00	0.00	
13,400.00	90.00	359.70	9,547.99	3,452.15	-880.14	3,456.71	0.00	0.00	0.00	
13,500.00	90.00	359.70	9,547.99	3,552.15	-880.67	3,556.71	0.00	0.00	0.00	
13,600.00	90.00	359.70	9,547.99	3,652.15	-881.20	3,656.71	0.00	0.00	0.00	
13,700.00	90.00	359.70	9,548.00	3,752.14	-881.72	3,756.71	0.00	0.00	0.00	
13,800.00	90.00	359.70	9,548.00	3,852.14	-882.25	3,856.71	0.00	0.00	0.00	
13,900.00	90.00	359.70	9,548.00	3,952.14	-882.78	3,956.71	0.00	0.00	0.00	
14,000.00	90.00	359.70	9,548.00	4,052.14	-883.30	4,056.71	0.00	0.00	0.00	
14,100.00	90.00	359.70	9,548.00	4,152.14	-883.83	4,156.71	0.00	0.00	0.00	
14,200.00	90.00	359.70	9,548.00	4,252.14	-884.36	4,256.71	0.00	0.00	0.00	
14,294.96	90.00	359.70	9,548.00	4,347.10	-884.86	4,351.67	0.00	0.00	0.00	
[ThorWXY#5H]LTP/BHL										

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[ThorWXY#5H]FTP - plan misses target center by 907.82usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-288.98	-860.60	461,858.60	572,316.11	32° 16' 10.377939 N	104° 5' 57.713282 W
[ThorWXY#5H]KOP - plan hits target center - Point	0.00	0.00	9,070.50	-518.97	-759.00	461,628.61	572,417.71	32° 16' 8.099712 N	104° 5' 56.535774 W
[ThorWXY#5H]LTP/BHL - plan hits target center - Point	0.00	0.00	9,548.00	4,347.10	-884.86	466,494.68	572,291.85	32° 16' 56.258123 N	104° 5' 57.878120 W

Checked By: _____	Approved By: _____	Date: _____
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Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	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	Thor 28 (1-3-5-8)		
Site Position:		Northing:	462,147.63 usft
From:	Map	Easting:	573,236.71 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 16' 13.218256 N
		Longitude:	104° 5' 46.983432 W
		Grid Convergence:	0.13 °

Well	WXY Fee #5H		
Well Position	+N/-S	0.00 usft	Northing: 462,147.58 usft
	+E/-W	0.00 usft	Easting: 573,176.71 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
		Latitude:	32° 16' 13.219072 N
		Longitude:	104° 5' 47.682272 W
		Ground Level:	3,083.00 usft

Wellbore	OH		
Magnetics	Model Name	Sample Date	Declination (°)
	HDGM	8/15/2019	7.12
			Dip Angle (°) 59.98
			Field Strength (nT) 47,872.20

Design	Prelim Plan A		
Audit Notes:			
Version:	Phase:	PLAN	Tie On Depth: 0.00
Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)
	0.00	0.00	0.00
			Direction (°) 359.70

Survey Tool Program	Date	8/15/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
5,400.00	9,000.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
9,000.00	14,294.96	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

Planned 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)	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
[ThorWXY#5H]FTP										
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00	
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00	
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00	
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00	
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00	
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00	

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	2.00	235.64	1,599.98	-0.99	-1.44	-0.98	2.00	2.00	0.00
1,700.00	4.00	235.64	1,699.84	-3.94	-5.76	-3.91	2.00	2.00	0.00
1,800.00	6.00	235.64	1,799.45	-8.86	-12.95	-8.79	2.00	2.00	0.00
1,900.00	8.00	235.64	1,898.70	-15.74	-23.01	-15.62	2.00	2.00	0.00
2,000.00	10.00	235.64	1,997.47	-24.57	-35.93	-24.38	2.00	2.00	0.00
2,100.00	10.00	235.64	2,095.95	-34.37	-50.26	-34.10	0.00	0.00	0.00
2,200.00	10.00	235.64	2,194.43	-44.17	-64.60	-43.83	0.00	0.00	0.00
2,300.00	10.00	235.64	2,292.91	-53.97	-78.93	-53.55	0.00	0.00	0.00
2,400.00	10.00	235.64	2,391.39	-63.77	-93.26	-63.28	0.00	0.00	0.00
2,500.00	10.00	235.64	2,489.87	-73.57	-107.60	-73.01	0.00	0.00	0.00
2,600.00	10.00	235.64	2,588.35	-83.37	-121.93	-82.73	0.00	0.00	0.00
2,700.00	10.00	235.64	2,686.83	-93.17	-136.27	-92.46	0.00	0.00	0.00
2,800.00	10.00	235.64	2,785.31	-102.97	-150.60	-102.18	0.00	0.00	0.00
2,900.00	10.00	235.64	2,883.79	-112.78	-164.94	-111.91	0.00	0.00	0.00
3,000.00	10.00	235.64	2,982.27	-122.58	-179.27	-121.64	0.00	0.00	0.00
3,100.00	10.00	235.64	3,080.75	-132.38	-193.61	-131.36	0.00	0.00	0.00
3,200.00	10.00	235.64	3,179.23	-142.18	-207.94	-141.09	0.00	0.00	0.00
3,300.00	10.00	235.64	3,277.72	-151.98	-222.27	-150.81	0.00	0.00	0.00
3,400.00	10.00	235.64	3,376.20	-161.78	-236.61	-160.54	0.00	0.00	0.00
3,500.00	10.00	235.64	3,474.68	-171.58	-250.94	-170.27	0.00	0.00	0.00
3,600.00	10.00	235.64	3,573.16	-181.38	-265.28	-179.99	0.00	0.00	0.00
3,700.00	10.00	235.64	3,671.64	-191.19	-279.61	-189.72	0.00	0.00	0.00
3,800.00	10.00	235.64	3,770.12	-200.99	-293.95	-199.44	0.00	0.00	0.00
3,900.00	10.00	235.64	3,868.60	-210.79	-308.28	-209.17	0.00	0.00	0.00
4,000.00	10.00	235.64	3,967.08	-220.59	-322.61	-218.90	0.00	0.00	0.00
4,100.00	10.00	235.64	4,065.56	-230.39	-336.95	-228.62	0.00	0.00	0.00
4,200.00	10.00	235.64	4,164.04	-240.19	-351.28	-238.35	0.00	0.00	0.00
4,300.00	10.00	235.64	4,262.52	-249.99	-365.62	-248.07	0.00	0.00	0.00
4,400.00	10.00	235.64	4,361.00	-259.79	-379.95	-257.80	0.00	0.00	0.00
4,500.00	10.00	235.64	4,459.48	-269.59	-394.29	-267.53	0.00	0.00	0.00
4,600.00	10.00	235.64	4,557.97	-279.40	-408.62	-277.25	0.00	0.00	0.00
4,700.00	10.00	235.64	4,656.45	-289.20	-422.95	-286.98	0.00	0.00	0.00
4,800.00	10.00	235.64	4,754.93	-299.00	-437.29	-296.70	0.00	0.00	0.00
4,900.00	10.00	235.64	4,853.41	-308.80	-451.62	-306.43	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
5,000.00	10.00	235.64	4,951.89	-318.60	-465.96	-316.16	0.00	0.00	0.00
5,100.00	10.00	235.64	5,050.37	-328.40	-480.29	-325.88	0.00	0.00	0.00
5,200.00	10.00	235.64	5,148.85	-338.20	-494.63	-335.61	0.00	0.00	0.00
5,300.00	10.00	235.64	5,247.33	-348.00	-508.96	-345.33	0.00	0.00	0.00
5,400.00	10.00	235.64	5,345.81	-357.81	-523.30	-355.06	0.00	0.00	0.00
5,500.00	10.00	235.64	5,444.29	-367.61	-537.63	-364.79	0.00	0.00	0.00
5,600.00	10.00	235.64	5,542.77	-377.41	-551.96	-374.51	0.00	0.00	0.00
5,700.00	10.00	235.64	5,641.25	-387.21	-566.30	-384.24	0.00	0.00	0.00
5,800.00	10.00	235.64	5,739.73	-397.01	-580.63	-393.96	0.00	0.00	0.00
5,900.00	10.00	235.64	5,838.22	-406.81	-594.97	-403.69	0.00	0.00	0.00
6,000.00	10.00	235.64	5,936.70	-416.61	-609.30	-413.42	0.00	0.00	0.00
6,100.00	10.00	235.64	6,035.18	-426.41	-623.64	-423.14	0.00	0.00	0.00
6,200.00	10.00	235.64	6,133.66	-436.22	-637.97	-432.87	0.00	0.00	0.00
6,300.00	10.00	235.64	6,232.14	-446.02	-652.30	-442.59	0.00	0.00	0.00
6,400.00	10.00	235.64	6,330.62	-455.82	-666.64	-452.32	0.00	0.00	0.00
6,500.00	10.00	235.64	6,429.10	-465.62	-680.97	-462.05	0.00	0.00	0.00
6,600.00	10.00	235.64	6,527.58	-475.42	-695.31	-471.77	0.00	0.00	0.00
6,700.00	10.00	235.64	6,626.06	-485.22	-709.64	-481.50	0.00	0.00	0.00
6,793.70	10.00	235.64	6,718.34	-494.40	-723.07	-490.61	0.00	0.00	0.00
6,800.00	9.87	235.64	6,724.54	-495.02	-723.97	-491.22	2.00	-2.00	0.00
6,900.00	7.87	235.64	6,823.34	-503.72	-736.70	-499.86	2.00	-2.00	0.00
7,000.00	5.87	235.64	6,922.62	-510.48	-746.58	-506.56	2.00	-2.00	0.00
7,100.00	3.87	235.64	7,022.25	-515.28	-753.60	-511.32	2.00	-2.00	0.00
7,200.00	1.87	235.64	7,122.12	-518.11	-757.74	-514.13	2.00	-2.00	0.00
7,293.70	0.00	0.00	7,215.80	-518.97	-759.00	-514.99	2.00	-2.00	0.00
7,300.00	0.00	0.00	7,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,400.00	0.00	0.00	7,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,500.00	0.00	0.00	7,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,600.00	0.00	0.00	7,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,700.00	0.00	0.00	7,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,800.00	0.00	0.00	7,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
7,900.00	0.00	0.00	7,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,000.00	0.00	0.00	7,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,100.00	0.00	0.00	8,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,200.00	0.00	0.00	8,122.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,300.00	0.00	0.00	8,222.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,400.00	0.00	0.00	8,322.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,500.00	0.00	0.00	8,422.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,600.00	0.00	0.00	8,522.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,700.00	0.00	0.00	8,622.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,800.00	0.00	0.00	8,722.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
8,900.00	0.00	0.00	8,822.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,000.00	0.00	0.00	8,922.10	-518.97	-759.00	-514.99	0.00	0.00	0.00
9,100.00	0.00	0.00	9,022.10	-518.97	-759.00	-514.99	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)
9,148.40	0.00	0.00	9,070.50	-518.97	-759.00	-514.99	0.00	0.00	0.00
[ThorWXY#5H]KOP									
9,150.00	0.19	350.55	9,072.10	-518.97	-759.00	-514.99	12.00	12.00	0.00
9,175.00	3.19	350.55	9,097.09	-518.24	-759.12	-514.26	12.00	12.00	0.00
9,200.00	6.19	350.55	9,122.00	-516.22	-759.46	-512.24	12.00	12.00	0.00
9,225.00	9.19	350.55	9,146.78	-512.92	-760.01	-508.93	12.00	12.00	0.00
9,250.00	12.19	350.55	9,171.34	-508.35	-760.77	-504.36	12.00	12.00	0.00
9,275.00	15.19	350.55	9,195.63	-502.51	-761.74	-498.51	12.00	12.00	0.00
9,300.00	18.19	350.55	9,219.57	-495.43	-762.92	-491.43	12.00	12.00	0.00
9,325.00	21.19	350.55	9,243.10	-487.12	-764.30	-483.11	12.00	12.00	0.00
9,350.00	24.19	350.55	9,266.17	-477.61	-765.88	-473.59	12.00	12.00	0.00
9,375.00	27.19	350.55	9,288.69	-466.92	-767.66	-462.89	12.00	12.00	0.00
9,400.00	30.19	350.55	9,310.62	-455.08	-769.63	-451.04	12.00	12.00	0.00
9,425.00	33.19	350.55	9,331.89	-442.12	-771.79	-438.08	12.00	12.00	0.00
9,450.00	36.19	350.55	9,352.44	-428.09	-774.13	-424.03	12.00	12.00	0.00
9,475.00	39.19	350.55	9,372.22	-413.01	-776.64	-408.94	12.00	12.00	0.00
9,500.00	42.19	350.55	9,391.18	-396.93	-779.31	-392.85	12.00	12.00	0.00
9,525.00	45.19	350.55	9,409.25	-379.90	-782.15	-375.80	12.00	12.00	0.00
9,550.00	48.19	350.55	9,426.40	-361.96	-785.13	-357.84	12.00	12.00	0.00
9,575.00	51.19	350.55	9,442.57	-343.15	-788.26	-339.02	12.00	12.00	0.00
9,600.00	54.19	350.55	9,457.72	-323.54	-791.53	-319.39	12.00	12.00	0.00
9,625.00	57.19	350.55	9,471.81	-303.17	-794.92	-299.01	12.00	12.00	0.00
9,650.00	60.19	350.55	9,484.80	-282.11	-798.42	-277.92	12.00	12.00	0.00
9,675.00	63.19	350.55	9,496.65	-260.40	-802.04	-256.19	12.00	12.00	0.00
9,700.00	66.19	350.55	9,507.34	-238.11	-805.75	-233.88	12.00	12.00	0.00
9,725.00	69.19	350.55	9,516.82	-215.29	-809.55	-211.05	12.00	12.00	0.00
9,750.00	72.19	350.55	9,525.09	-192.02	-813.42	-187.76	12.00	12.00	0.00
9,775.00	75.19	350.55	9,532.11	-168.36	-817.36	-164.07	12.00	12.00	0.00
9,800.00	78.19	350.55	9,537.86	-144.36	-821.35	-140.06	12.00	12.00	0.00
9,825.00	81.19	350.55	9,542.33	-120.10	-825.39	-115.78	12.00	12.00	0.00
9,850.00	84.19	350.55	9,545.51	-95.64	-829.46	-91.30	12.00	12.00	0.00
9,875.00	87.19	350.55	9,547.39	-71.05	-833.55	-66.69	12.00	12.00	0.00
9,898.40	90.00	350.55	9,547.97	-47.98	-837.39	-43.60	12.00	12.00	0.00
9,900.00	90.00	350.60	9,547.97	-46.40	-837.66	-42.02	3.00	0.00	3.00
10,000.00	90.00	353.60	9,547.97	52.64	-851.40	57.09	3.00	0.00	3.00
10,100.00	90.00	356.60	9,547.97	152.26	-859.95	156.76	3.00	0.00	3.00
10,203.33	90.00	359.70	9,547.97	255.52	-863.29	260.04	3.00	0.00	3.00
10,300.00	90.00	359.70	9,547.97	352.19	-863.79	356.71	0.00	0.00	0.00
10,400.00	90.00	359.70	9,547.97	452.19	-864.32	456.71	0.00	0.00	0.00
10,500.00	90.00	359.70	9,547.97	552.19	-864.85	556.71	0.00	0.00	0.00
10,600.00	90.00	359.70	9,547.97	652.19	-865.38	656.71	0.00	0.00	0.00
10,700.00	90.00	359.70	9,547.97	752.19	-865.90	756.71	0.00	0.00	0.00
10,800.00	90.00	359.70	9,547.97	852.18	-866.43	856.71	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned 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)	
10,900.00	90.00	359.70	9,547.97	952.18	-866.96	956.71	0.00	0.00	0.00	
11,000.00	90.00	359.70	9,547.97	1,052.18	-867.49	1,056.71	0.00	0.00	0.00	
11,100.00	90.00	359.70	9,547.97	1,152.18	-868.01	1,156.71	0.00	0.00	0.00	
11,200.00	90.00	359.70	9,547.97	1,252.18	-868.54	1,256.71	0.00	0.00	0.00	
11,300.00	90.00	359.70	9,547.98	1,352.18	-869.07	1,356.71	0.00	0.00	0.00	
11,400.00	90.00	359.70	9,547.98	1,452.18	-869.60	1,456.71	0.00	0.00	0.00	
11,500.00	90.00	359.70	9,547.98	1,552.17	-870.12	1,556.71	0.00	0.00	0.00	
11,600.00	90.00	359.70	9,547.98	1,652.17	-870.65	1,656.71	0.00	0.00	0.00	
11,700.00	90.00	359.70	9,547.98	1,752.17	-871.18	1,756.71	0.00	0.00	0.00	
11,800.00	90.00	359.70	9,547.98	1,852.17	-871.70	1,856.71	0.00	0.00	0.00	
11,900.00	90.00	359.70	9,547.98	1,952.17	-872.23	1,956.71	0.00	0.00	0.00	
12,000.00	90.00	359.70	9,547.98	2,052.17	-872.76	2,056.71	0.00	0.00	0.00	
12,100.00	90.00	359.70	9,547.98	2,152.17	-873.29	2,156.71	0.00	0.00	0.00	
12,200.00	90.00	359.70	9,547.98	2,252.17	-873.81	2,256.71	0.00	0.00	0.00	
12,300.00	90.00	359.70	9,547.98	2,352.16	-874.34	2,356.71	0.00	0.00	0.00	
12,400.00	90.00	359.70	9,547.98	2,452.16	-874.87	2,456.71	0.00	0.00	0.00	
12,500.00	90.00	359.70	9,547.99	2,552.16	-875.40	2,556.71	0.00	0.00	0.00	
12,600.00	90.00	359.70	9,547.99	2,652.16	-875.92	2,656.71	0.00	0.00	0.00	
12,700.00	90.00	359.70	9,547.99	2,752.16	-876.45	2,756.71	0.00	0.00	0.00	
12,800.00	90.00	359.70	9,547.99	2,852.16	-876.98	2,856.71	0.00	0.00	0.00	
12,900.00	90.00	359.70	9,547.99	2,952.16	-877.50	2,956.71	0.00	0.00	0.00	
13,000.00	90.00	359.70	9,547.99	3,052.15	-878.03	3,056.71	0.00	0.00	0.00	
13,100.00	90.00	359.70	9,547.99	3,152.15	-878.56	3,156.71	0.00	0.00	0.00	
13,200.00	90.00	359.70	9,547.99	3,252.15	-879.09	3,256.71	0.00	0.00	0.00	
13,300.00	90.00	359.70	9,547.99	3,352.15	-879.61	3,356.71	0.00	0.00	0.00	
13,400.00	90.00	359.70	9,547.99	3,452.15	-880.14	3,456.71	0.00	0.00	0.00	
13,500.00	90.00	359.70	9,547.99	3,552.15	-880.67	3,556.71	0.00	0.00	0.00	
13,600.00	90.00	359.70	9,547.99	3,652.15	-881.20	3,656.71	0.00	0.00	0.00	
13,700.00	90.00	359.70	9,548.00	3,752.14	-881.72	3,756.71	0.00	0.00	0.00	
13,800.00	90.00	359.70	9,548.00	3,852.14	-882.25	3,856.71	0.00	0.00	0.00	
13,900.00	90.00	359.70	9,548.00	3,952.14	-882.78	3,956.71	0.00	0.00	0.00	
14,000.00	90.00	359.70	9,548.00	4,052.14	-883.30	4,056.71	0.00	0.00	0.00	
14,100.00	90.00	359.70	9,548.00	4,152.14	-883.83	4,156.71	0.00	0.00	0.00	
14,200.00	90.00	359.70	9,548.00	4,252.14	-884.36	4,256.71	0.00	0.00	0.00	
14,294.96	90.00	359.70	9,548.00	4,347.10	-884.86	4,351.67	0.00	0.00	0.00	
[ThorWXY#5H]LTP/BHL										

Company:	Marathon Oil	Local Co-ordinate Reference:	Well WXY Fee #5H
Project:	Eddy County, NM	TVD Reference:	well @ 3108.00usft
Site:	Thor 28 (1-3-5-8)	MD Reference:	well @ 3108.00usft
Well:	WXY Fee #5H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Design Targets									
Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[ThorWXY#5H]FTP - plan misses target center by 907.82usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E) - Point	0.00	0.00	0.00	-288.98	-860.60	461,858.60	572,316.11	32° 16' 10.377939 N	104° 5' 57.713282 W
[ThorWXY#5H]KOP - plan hits target center - Point	0.00	0.00	9,070.50	-518.97	-759.00	461,628.61	572,417.71	32° 16' 8.099712 N	104° 5' 56.535774 W
[ThorWXY#5H]LTP/BHL - plan hits target center - Point	0.00	0.00	9,548.00	4,347.10	-884.86	466,494.68	572,291.85	32° 16' 56.258123 N	104° 5' 57.878120 W

Checked By: _____	Approved By: _____	Date: _____
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