Form 3160-3
(June 2015)

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☐ DRILL ☐ REENTER

1b. Type of Well: ☐ Oil Well ☐ Gas Well ☐ Other

1c. Type of Completion: ☐ Hydraulic Fracturing ☐ Single Zone ☐ Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.

2. Name of Operator

9. API Well No.
30-015-49858

3a. Address

3b. Phone No. *(include area code)*

10. Field and Pool, or Exploratory

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface

At proposed prod. zone

11. Sec., T. R. M. or Blk. and Survey or Area

14. Distance in miles and direction from nearest town or post office*

12. County or Parish

13. State

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)

16. No of acres in lease

17. Spacing Unit dedicated to this well

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.

19. Proposed Depth

20. BLM/BIA Bond No. in file

21. Elevations (Show whether DF, KDB, RT, GL, etc.)

22. Approximate date work will start*

23. Estimated duration

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification.
6. Such other site specific information and/or plans as may be requested by the BLM.

25. Signature

Name *(Printed/Typed)*

Date

Title

Approved by *(Signature)*

Name *(Printed/Typed)*

Date

Title

Office

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.
Conditions of approval, if any, are attached.

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Dean R McClure

08/23/2022

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 05/16/2022

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 Road, Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

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	[3] Pool Name
30-015-49858	98220	PURPLE SAGE; WOLFCAMP (GAS)

[4] Property Code	[5] Property Name	[6] Well Number
333196	CROSSBOW FEDERAL 23-27-8 WA	10H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372098	MARATHON OIL PERMIAN LLC	3158'

[10] Surface Location

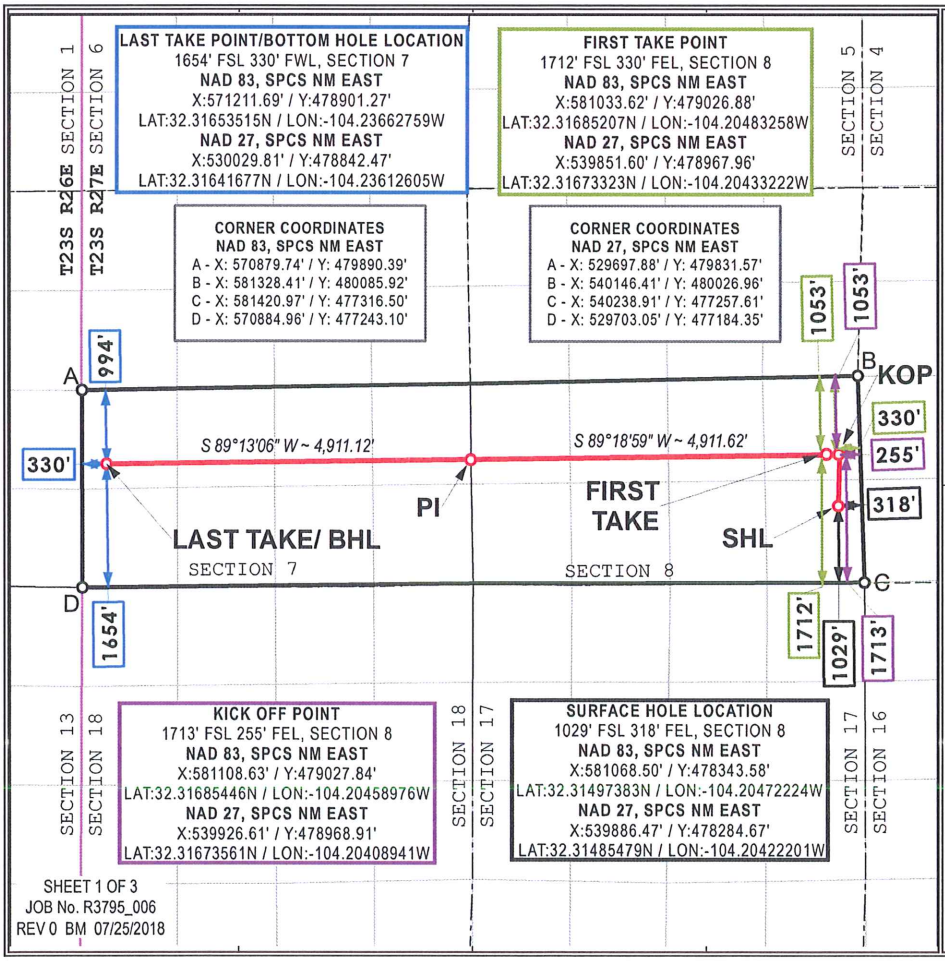
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	8	23S	27E		1029	SOUTH	318	EAST	EDDY

[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
L	7	23S	27E		1654	SOUTH	330	WEST	EDDY

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
637.68			

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: 10/21/2020

Adrian Covarrubias
Printed Name

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.

SEPTEMBER 4, 2018
Date of Survey

Signature and Seal of Professional Surveyor:

LLOYD P. SHORT NEW MEXICO 21653 PROFESSIONAL SURVEYOR

Certificate Number
LLOYD P. SHORT 21653

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

Oil Conservation Division
1220 South St. Francis Dr.
Santa Fe, NM 87505

NATURAL GAS MANAGEMENT PLAN

This Natural Gas Management Plan must be submitted with each Application for Permit to Drill (APD) for a new or recompleted well.

Section 1 – Plan Description
Effective May 25, 2021

I. Operator: Marathon Oil Permian, LLC. **OGRID:** 372098 **Date:** 06 / 30 / 2022

II. Type: ☒ Original ☐ Amendment due to ☐ 19.15.27.9.D(6)(a) NMAC ☐ 19.15.27.9.D(6)(b) NMAC ☐ Other.

If Other, please describe:

III. Well(s): Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Crossbow 8 WA Fed Com 4H		P-8-23S-27E	1029 FSL 378 FEL	1800	4300	7000
Crossbow 8 WXY Fed Com 10H		P-8-23S-27E	1029 FSL 318 FEL	1800	4300	7000
Crossbow 8 WXY Fed Com 2H		P-8-23S-27E	1029 FSL 288 FEL	1800	4300	7000
Crossbow 8 WXY Fed Com 8H		P-8-23S-27E	1029 FSL 348 FEL	1800	4300	7000

IV. Central Delivery Point Name: Crossbow South CTB [See 19.15.27.9(D)(1) NMAC]

V. Anticipated Schedule: Provide the following information for each new or recompleted well or set of wells proposed to be drilled or proposed to be recompleted from a single well pad or connected to a central delivery point.

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Crossbow 8 WA Fed Com 4H		09/12/2023	10/05/2023	12/17/2023	01/08/2024	01/11/2024
Crossbow 8 WXY Fed Com 10H		10/06/2023	10/25/2023	12/26/2023	01/08/2024	01/11/2024
Crossbow 8 WXY Fed Com 2H		10/26/2023	11/14/2023	01/01/2024	01/23/2024	01/26/2024
Crossbow 8 WXY Fed Com 8H		11/15/2023	12/08/2023	01/07/2024	01/23/2024	01/26/2024

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.
VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.
VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

Section 2 – Enhanced Plan

EFFECTIVE APRIL 1, 2022

Beginning April 1, 2022, an operator that is not in compliance with its statewide natural gas capture requirement for the applicable reporting area must complete this section.

☒ Operator certifies that it is not required to complete this section because Operator is in compliance with its statewide natural gas capture requirement for the applicable reporting area.

IX. Anticipated Natural Gas Production:

Well	API	Anticipated Average Natural Gas Rate MCF/D	Anticipated Volume of Natural Gas for the First Year MCF

X. Natural Gas Gathering System (NGGS):

Operator	System	ULSTR of Tie-in	Anticipated Gathering Start Date	Available Maximum Daily Capacity of System Segment Tie-in

XI. Map. ☐ Attach an accurate and legible map depicting the location of the well(s), the anticipated pipeline route(s) connecting the production operations to the existing or planned interconnect of the natural gas gathering system(s), and the maximum daily capacity of the segment or portion of the natural gas gathering system(s) to which the well(s) will be connected.

XII. Line Capacity. The natural gas gathering system ☐ will ☐ will not have capacity to gather 100% of the anticipated natural gas production volume from the well prior to the date of first production.

XIII. Line Pressure. Operator ☐ does ☐ does not anticipate that its existing well(s) connected to the same segment, or portion, of the natural gas gathering system(s) described above will continue to meet anticipated increases in line pressure caused by the new well(s).

☐ Attach Operator's plan to manage production in response to the increased line pressure.

XIV. Confidentiality: ☐ Operator asserts confidentiality pursuant to Section 71-2-8 NMSA 1978 for the information provided in Section 2 as provided in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and attaches a full description of the specific information for which confidentiality is asserted and the basis for such assertion.

Section 3 - Certifications

Effective May 25, 2021

Operator certifies that, after reasonable inquiry and based on the available information at the time of submittal:

☒ Operator will be able to connect the well(s) to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system; or

☐ Operator will not be able to connect to a natural gas gathering system in the general area with sufficient capacity to transport one hundred percent of the anticipated volume of natural gas produced from the well(s) commencing on the date of first production, taking into account the current and anticipated volumes of produced natural gas from other wells connected to the pipeline gathering system. ***If Operator checks this box, Operator will select one of the following:***

Well Shut-In. ☐ Operator will shut-in and not produce the well until it submits the certification required by Paragraph (4) of Subsection D of 19.15.27.9 NMAC; or

Venting and Flaring Plan. ☐ Operator has attached a venting and flaring plan that evaluates and selects one or more of the potential alternative beneficial uses for the natural gas until a natural gas gathering system is available, including:

- **(a)** power generation on lease;
- **(b)** power generation for grid;
- **(c)** compression on lease;
- **(d)** liquids removal on lease;
- **(e)** reinjection for underground storage;
- **(f)** reinjection for temporary storage;
- **(g)** reinjection for enhanced oil recovery;
- **(h)** fuel cell production; and
- **(i)** other alternative beneficial uses approved by the division.

Section 4 - Notices

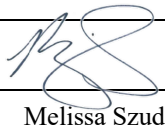
1. If, at any time after Operator submits this Natural Gas Management Plan and before the well is spud:

(a) Operator becomes aware that the natural gas gathering system it planned to connect the well(s) to has become unavailable or will not have capacity to transport one hundred percent of the production from the well(s), no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised venting and flaring plan containing the information specified in Paragraph (5) of Subsection D of 19.15.27.9 NMAC; or

(b) Operator becomes aware that it has, cumulatively for the year, become out of compliance with its baseline natural gas capture rate or natural gas capture requirement, no later than 20 days after becoming aware of such information, Operator shall submit for OCD's approval a new or revised Natural Gas Management Plan for each well it plans to spud during the next 90 days containing the information specified in Paragraph (2) of Subsection D of 19.15.27.9 NMAC, and shall file an update for each Natural Gas Management Plan until Operator is back in compliance with its baseline natural gas capture rate or natural gas capture requirement.

2. OCD may deny or conditionally approve an APD if Operator does not make a certification, fails to submit an adequate venting and flaring plan which includes alternative beneficial uses for the anticipated volume of natural gas produced, or if OCD determines that Operator will not have adequate natural gas takeaway capacity at the time a well will be spud.

I certify that, after reasonable inquiry, the statements in and attached to this Natural Gas Management Plan are true and correct to the best of my knowledge and acknowledge that a false statement may be subject to civil and criminal penalties under the Oil and Gas Act.

Signature:	
Printed Name:	Melissa Szudera
Title:	Sr. Regulatory Compliance Representative
E-mail Address:	mszudera@marathonoil.com
Date:	06/30/2022
Phone:	713-296-3179

OIL CONSERVATION DIVISION
(Only applicable when submitted as a standalone form)

Approved By:	
Title:	
Approval Date:	
Conditions of Approval:	

APPENDIX

Section 1 - Parts VI, VII, and VIII

VI. Separation Equipment: ☒ Attach a complete description of how Operator will size separation equipment to optimize gas capture.

- Separation equipment is sized to allow for retention time and velocity to adequately separate oil, gas, and water at anticipated peak rates.
- All central tank battery equipment is designed to efficiently capture the remaining gas from the liquid phase.
- Valves and meters are designed to service without flow interruption or venting of gas.

VII. Operational Practices: ☒ Attach a complete description of the actions Operator will take to comply with the requirements of Subsection A through F of 19.15.27.8 NMAC.

- **19.15.27.8 (A) – Venting and Flaring Of Natural Gas**
  - Marathon Oil Permian's field operations are designed with the goal of minimizing flaring and preventing venting of natural gas. If capturing the gas is not possible then the gas is combusted/flared using properly sized flares or combustors in accordance with state air permit rules.
- **19.15.27.8 (B) – Venting and Flaring During Drilling Operations**
  - A properly-sized flare stack will be located at a minimum 100' from the nearest surface hole location on the pad.
  - All natural gas produced during drilling operations will be flared. Venting will only occur if there is an equipment malfunction and/or to avoid risk of an immediate and substantial adverse impact on safety, public health, or the environment.
- **19.15.27.8 (C) – Venting and Flaring During Completion or Recompletion Operations**
  - During all phases of flowback, wells will flow through a sand separator, or other appropriate flowback separation equipment, and the well stream will be directed to a central tank battery (CTB) through properly sized flowlines.
  - The CTB will have properly sized separation equipment for maximum anticipated flow rates.
  - Multiple stages of separation will be used to separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet.
- **19.15.27.8 (D) – Venting and Flaring During Production Operations**
  - During production, the well stream will be routed to the CTB where multiple stages of separation will separate gas from liquids. All gas will be routed to a sales outlet. Fluids will be routed to tanks equipped with a closed loop system that will recover any residual gas from the tanks and route such gas to a sales outlet, minimizing tank emissions.
  - Flares are equipped with auto-ignition systems and continuous pilot operations.
  - Automatic gauging equipment is installed on all tanks.
- **19.15.27.8 (E) – Performance Standards**
  - Production equipment will be designed to handle maximum anticipated rates and pressure.
  - Automatic gauging equipment is installed on all tanks to minimize venting.
  - All flared gas will be combusted in a flare stack that is properly sized and designed to ensure proper combustion.
  - Flares are equipped with continuous pilots and auto-ignitors along with remote monitoring of the pilot status.
  - Weekly AVOs and monthly LDAR inspections will be performed on all wells and facilities that produce more than 60 MCFD.
  - Gas/H2S detectors will be installed throughout the facilities and wellheads to detect leaks and enable timely repairs.

- **19.15.27.8 (F) – Measurement or Estimation of Vented and Flared Natural Gas**
  - All high pressure flared gas is measured by equipment conforming to API 14.10.
  - No meter bypasses are installed.
  - When metering is not practical due to low pressure/low rate, the vented or flared volume will be estimated through flare flow curves with the assistance of air emissions consultants, as necessary.

VIII. Best Management Practices: ☒ Attach a complete description of Operator's best management practices to minimize venting during active and planned maintenance.

- Marathon Oil Permian will use best management practices to vent as minimally as possible during well intervention operations and downhole well maintenance.
- All natural gas is routed into the gas gathering system and directed to one of Marathon Oil Permian's multiple gas sales outlets.
- All venting events will be recorded and all start-up, shutdown, maintenance logs will be kept for control equipment.
- All control equipment will be maintained to provide highest run-time possible.
- All procedures are drafted to keep venting and flaring to the absolute minimum.

Marathon Oil
Eddy County, NM
Crossbow Fed 23-27-8 (2-4-8-10)
WA #10H
Prelim Plan A

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

RKB Elevation: well @ 3183.00usft

+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.00	0.00	478284.67	539886.47	32.3149	-104.2042	

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	1800.00	0.00	0.00	1800.00	0.00	0.00	0.00	0.00
3	2300.00	10.00	3.36	2297.47	43.45	2.55	2.00	-3.10
4	5745.88	10.00	3.36	5691.00	640.79	37.59	0.00	-45.75
5	6245.88	0.00	0.00	6188.46	684.24	40.14	2.00	-48.85
6	8657.42	0.00	0.00	8600.00	684.24	40.14	0.00	-48.85
7	9423.25	91.90	269.27	9077.20	677.94	-453.11	12.00	444.44
8	18832.74	91.90	269.27	8765.28	557.80	-9856.66	0.00	9848.75

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[CrossbowWA#10H]FTP	0.00	683.29	-34.87	478967.96	539851.60
[CrossbowWA#10H]KOP	8600.00	684.24	40.14	478968.91	539926.61
[CrossbowWA#10H]LTP/BHL	8765.28	557.80	-9856.66	478842.47	530029.81
[CrossbowWA#10H]PPP-3	8841.00	588.80	-7582.58	478873.47	532303.89
[CrossbowWA#10H]PPP-2	8928.00	624.76	-4945.63	478909.43	534940.84
[CrossbowWA#10H]PPP-1	9016.00	656.37	-2292.52	478941.04	537593.95

Azimuths to Grid North
True North: -0.07°
Magnetic North: 7.23°

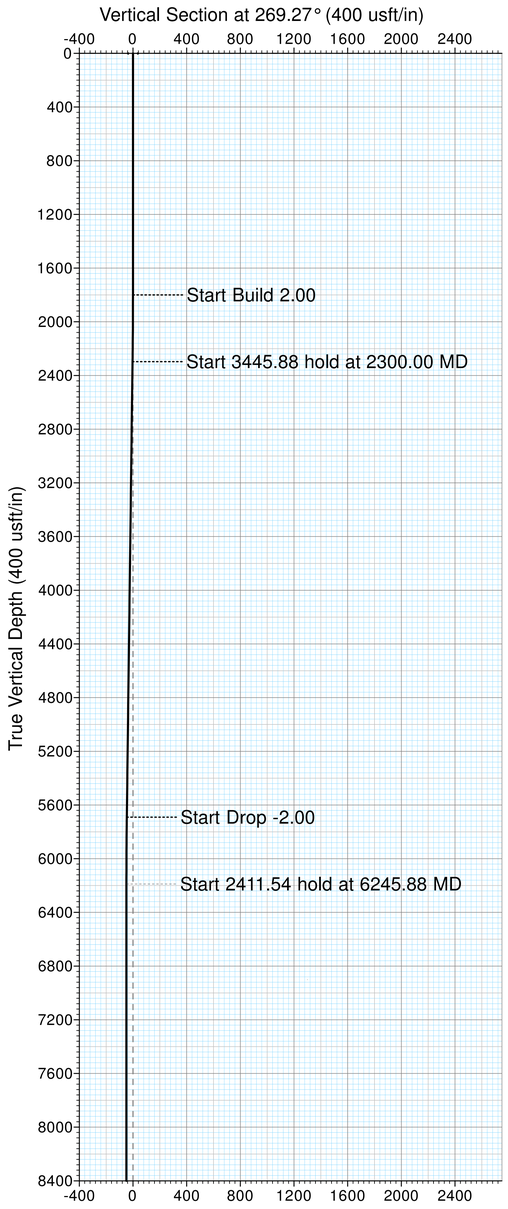
Magnetic Field
Strength: 47944.8snT
Dip Angle: 60.03°
Date: 10/19/2018
Model: HDGM

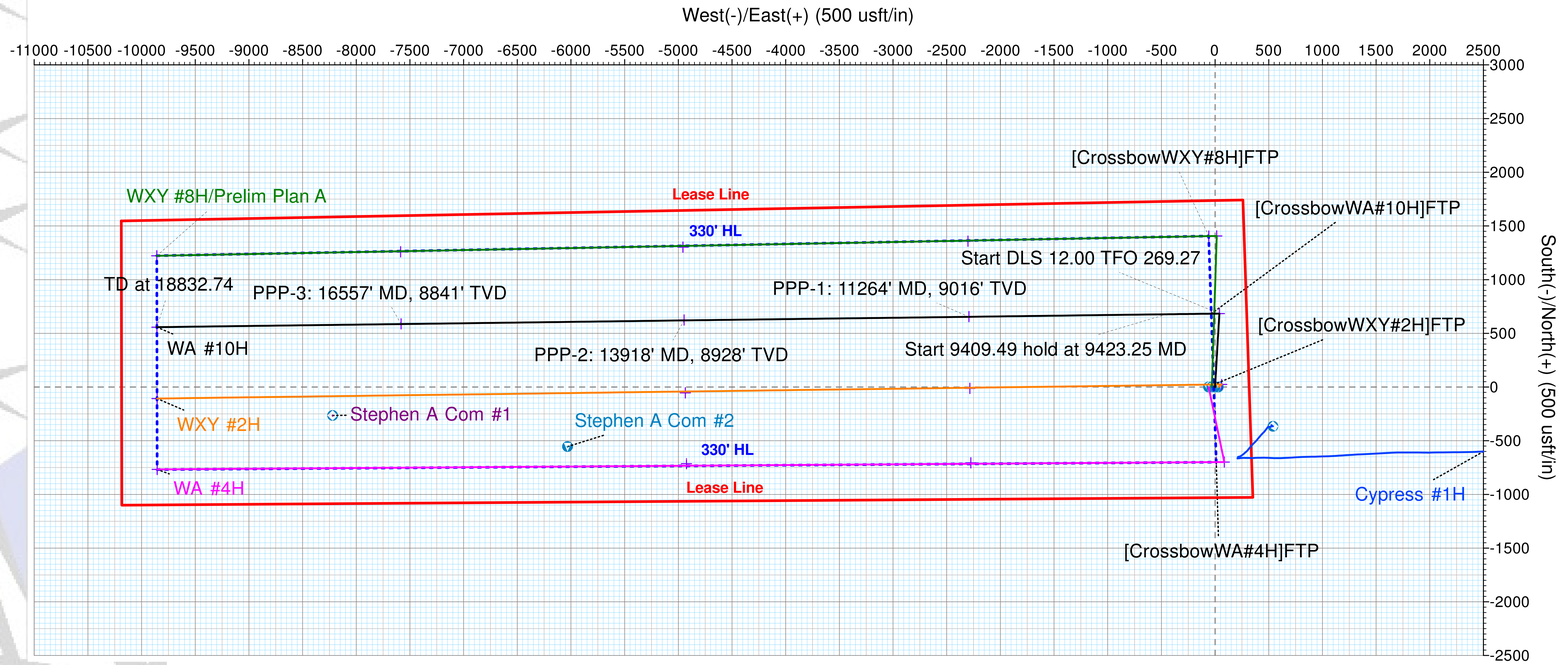
G T M

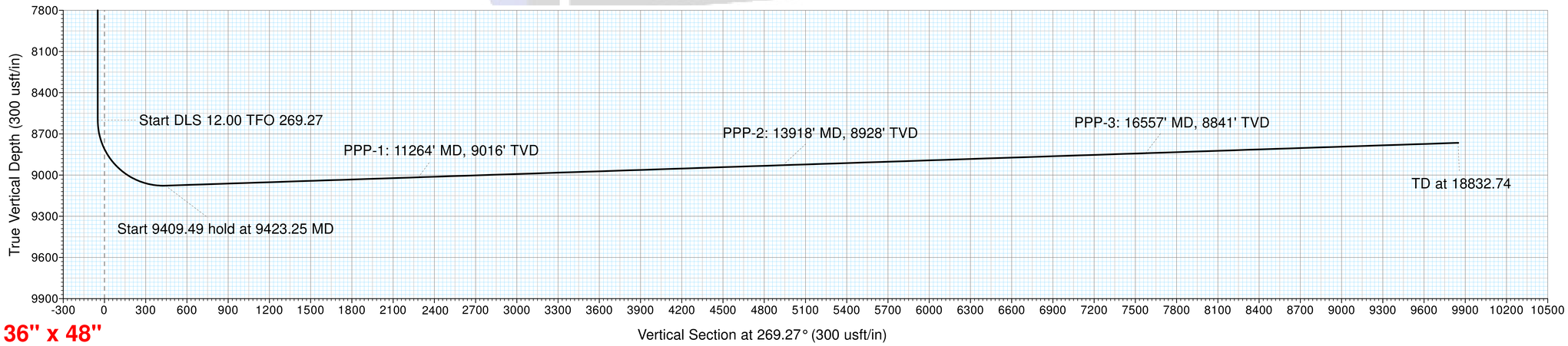
Azimuth Corrections

Total Magnetic Corr. (M to G): 7.23°

Declination (M to T): 7.30° East







36" x 48"

Marathon Oil Corporation

PRODIRECTIONAL

Marathon Oil

Pro Directional
Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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 Crossbow Fed 23-27-8 (2-4-8-10)

Site Position:		**Northing:**	478,284.74 usft	**Latitude:**	32.3149
From:	Map	**Easting:**	539,916.49 usft	**Longitude:**	-104.2041
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.07 °

Well WA #10H

Well Position	**+N/-S**	0.00 usft	**Northing:**	478,284.67 usft	**Latitude:**	32.3149
	+E/-W	0.00 usft	**Easting:**	539,886.47 usft	**Longitude:**	-104.2042
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,158.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	10/19/2018	7.30	60.03	47,944.80

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)	Direction (°)
	0.00	0.00	0.00	269.27

Survey Tool Program **Date** 10/6/2020

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
5,400.00	10,000.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
10,000.00	18,832.74	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1

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
[CrossbowWA#10H]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

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
Start Build 2.00									
1,900.00	2.00	3.36	1,899.98	1.74	0.10	-0.12	2.00	2.00	0.00
2,000.00	4.00	3.36	1,999.84	6.97	0.41	-0.50	2.00	2.00	0.00
2,100.00	6.00	3.36	2,099.45	15.67	0.92	-1.12	2.00	2.00	0.00
2,200.00	8.00	3.36	2,198.70	27.83	1.63	-1.99	2.00	2.00	0.00
2,300.00	10.00	3.36	2,297.47	43.45	2.55	-3.10	2.00	2.00	0.00
Start 3445.88 hold at 2300.00 MD									
2,400.00	10.00	3.36	2,395.95	60.78	3.57	-4.34	0.00	0.00	0.00
2,500.00	10.00	3.36	2,494.43	78.12	4.58	-5.58	0.00	0.00	0.00
2,600.00	10.00	3.36	2,592.91	95.45	5.60	-6.82	0.00	0.00	0.00
2,700.00	10.00	3.36	2,691.39	112.79	6.62	-8.05	0.00	0.00	0.00
2,800.00	10.00	3.36	2,789.87	130.12	7.63	-9.29	0.00	0.00	0.00
2,900.00	10.00	3.36	2,888.35	147.46	8.65	-10.53	0.00	0.00	0.00
3,000.00	10.00	3.36	2,986.83	164.79	9.67	-11.77	0.00	0.00	0.00
3,100.00	10.00	3.36	3,085.31	182.13	10.68	-13.00	0.00	0.00	0.00
3,200.00	10.00	3.36	3,183.79	199.46	11.70	-14.24	0.00	0.00	0.00
3,300.00	10.00	3.36	3,282.27	216.80	12.72	-15.48	0.00	0.00	0.00
3,400.00	10.00	3.36	3,380.75	234.13	13.74	-16.72	0.00	0.00	0.00
3,500.00	10.00	3.36	3,479.23	251.47	14.75	-17.95	0.00	0.00	0.00
3,600.00	10.00	3.36	3,577.72	268.80	15.77	-19.19	0.00	0.00	0.00
3,700.00	10.00	3.36	3,676.20	286.14	16.79	-20.43	0.00	0.00	0.00
3,800.00	10.00	3.36	3,774.68	303.47	17.80	-21.67	0.00	0.00	0.00
3,900.00	10.00	3.36	3,873.16	320.81	18.82	-22.91	0.00	0.00	0.00
4,000.00	10.00	3.36	3,971.64	338.14	19.84	-24.14	0.00	0.00	0.00
4,100.00	10.00	3.36	4,070.12	355.48	20.85	-25.38	0.00	0.00	0.00
4,200.00	10.00	3.36	4,168.60	372.81	21.87	-26.62	0.00	0.00	0.00
4,300.00	10.00	3.36	4,267.08	390.15	22.89	-27.86	0.00	0.00	0.00
4,400.00	10.00	3.36	4,365.56	407.48	23.90	-29.09	0.00	0.00	0.00
4,500.00	10.00	3.36	4,464.04	424.82	24.92	-30.33	0.00	0.00	0.00
4,600.00	10.00	3.36	4,562.52	442.15	25.94	-31.57	0.00	0.00	0.00
4,700.00	10.00	3.36	4,661.00	459.49	26.96	-32.81	0.00	0.00	0.00
4,800.00	10.00	3.36	4,759.48	476.82	27.97	-34.04	0.00	0.00	0.00

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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)
4,900.00	10.00	3.36	4,857.97	494.16	28.99	-35.28	0.00	0.00	0.00
5,000.00	10.00	3.36	4,956.45	511.49	30.01	-36.52	0.00	0.00	0.00
5,100.00	10.00	3.36	5,054.93	528.83	31.02	-37.76	0.00	0.00	0.00
5,200.00	10.00	3.36	5,153.41	546.16	32.04	-39.00	0.00	0.00	0.00
5,300.00	10.00	3.36	5,251.89	563.50	33.06	-40.23	0.00	0.00	0.00
5,400.00	10.00	3.36	5,350.37	580.83	34.07	-41.47	0.00	0.00	0.00
5,500.00	10.00	3.36	5,448.85	598.17	35.09	-42.71	0.00	0.00	0.00
5,600.00	10.00	3.36	5,547.33	615.50	36.11	-43.95	0.00	0.00	0.00
5,700.00	10.00	3.36	5,645.81	632.84	37.12	-45.18	0.00	0.00	0.00
5,745.88	10.00	3.36	5,691.00	640.79	37.59	-45.75	0.00	0.00	0.00
Start Drop -2.00									
5,800.00	8.92	3.36	5,744.38	649.67	38.11	-46.39	2.00	-2.00	0.00
5,900.00	6.92	3.36	5,843.42	663.42	38.92	-47.37	2.00	-2.00	0.00
6,000.00	4.92	3.36	5,942.88	673.71	39.52	-48.10	2.00	-2.00	0.00
6,100.00	2.92	3.36	6,042.64	680.53	39.92	-48.59	2.00	-2.00	0.00
6,200.00	0.92	3.36	6,142.58	683.87	40.12	-48.83	2.00	-2.00	0.00
6,245.88	0.00	0.00	6,188.46	684.24	40.14	-48.85	2.00	-2.00	0.00
Start 2411.54 hold at 6245.88 MD									
6,300.00	0.00	0.00	6,242.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,400.00	0.00	0.00	6,342.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,500.00	0.00	0.00	6,442.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,600.00	0.00	0.00	6,542.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,700.00	0.00	0.00	6,642.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,800.00	0.00	0.00	6,742.58	684.24	40.14	-48.85	0.00	0.00	0.00
6,900.00	0.00	0.00	6,842.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,000.00	0.00	0.00	6,942.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,100.00	0.00	0.00	7,042.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,200.00	0.00	0.00	7,142.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,300.00	0.00	0.00	7,242.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,400.00	0.00	0.00	7,342.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,500.00	0.00	0.00	7,442.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,600.00	0.00	0.00	7,542.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,700.00	0.00	0.00	7,642.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,800.00	0.00	0.00	7,742.58	684.24	40.14	-48.85	0.00	0.00	0.00
7,900.00	0.00	0.00	7,842.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,000.00	0.00	0.00	7,942.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,100.00	0.00	0.00	8,042.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,200.00	0.00	0.00	8,142.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,300.00	0.00	0.00	8,242.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,400.00	0.00	0.00	8,342.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,500.00	0.00	0.00	8,442.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,600.00	0.00	0.00	8,542.58	684.24	40.14	-48.85	0.00	0.00	0.00
8,657.42	0.00	0.00	8,600.00	684.24	40.14	-48.85	0.00	0.00	0.00
Start DLS 12.00 TFO 269.27 - [CrossbowWA#10H]KOP									

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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)
8,675.00	2.11	269.27	8,617.58	684.24	39.82	-48.53	12.00	12.00	0.00
8,700.00	5.11	269.27	8,642.52	684.22	38.24	-46.96	12.00	12.00	0.00
8,725.00	8.11	269.27	8,667.35	684.18	35.37	-44.08	12.00	12.00	0.00
8,750.00	11.11	269.27	8,692.00	684.13	31.19	-39.91	12.00	12.00	0.00
8,775.00	14.11	269.27	8,716.40	684.06	25.74	-34.45	12.00	12.00	0.00
8,800.00	17.11	269.27	8,740.47	683.97	19.01	-27.72	12.00	12.00	0.00
8,825.00	20.11	269.27	8,764.16	683.87	11.03	-19.75	12.00	12.00	0.00
8,850.00	23.11	269.27	8,787.40	683.75	1.83	-10.54	12.00	12.00	0.00
8,875.00	26.11	269.27	8,810.13	683.62	-8.58	-0.13	12.00	12.00	0.00
8,900.00	29.11	269.27	8,832.28	683.47	-20.16	11.45	12.00	12.00	0.00
8,925.00	32.11	269.27	8,853.79	683.31	-32.89	24.18	12.00	12.00	0.00
8,950.00	35.11	269.27	8,874.61	683.13	-46.73	38.02	12.00	12.00	0.00
8,975.00	38.11	269.27	8,894.68	682.94	-61.63	52.93	12.00	12.00	0.00
9,000.00	41.11	269.27	8,913.93	682.74	-77.57	68.86	12.00	12.00	0.00
9,025.00	44.11	269.27	8,932.33	682.52	-94.49	85.79	12.00	12.00	0.00
9,050.00	47.11	269.27	8,949.82	682.29	-112.35	103.65	12.00	12.00	0.00
9,075.00	50.11	269.27	8,966.35	682.05	-131.10	122.40	12.00	12.00	0.00
9,100.00	53.11	269.27	8,981.87	681.80	-150.69	141.99	12.00	12.00	0.00
9,125.00	56.11	269.27	8,996.35	681.54	-171.07	162.37	12.00	12.00	0.00
9,150.00	59.11	269.27	9,009.74	681.27	-192.18	183.48	12.00	12.00	0.00
9,175.00	62.11	269.27	9,022.00	680.99	-213.95	205.26	12.00	12.00	0.00
9,200.00	65.11	269.27	9,033.12	680.71	-236.35	227.65	12.00	12.00	0.00
9,225.00	68.11	269.27	9,043.04	680.41	-259.29	250.60	12.00	12.00	0.00
9,250.00	71.11	269.27	9,051.75	680.12	-282.72	274.03	12.00	12.00	0.00
9,275.00	74.11	269.27	9,059.22	679.81	-306.57	297.88	12.00	12.00	0.00
9,300.00	77.11	269.27	9,065.43	679.50	-330.78	322.09	12.00	12.00	0.00
9,325.00	80.11	269.27	9,070.37	679.19	-355.28	346.60	12.00	12.00	0.00
9,350.00	83.11	269.27	9,074.02	678.87	-380.01	371.33	12.00	12.00	0.00
9,375.00	86.11	269.27	9,076.36	678.55	-404.89	396.22	12.00	12.00	0.00
9,400.00	89.11	269.27	9,077.41	678.24	-429.87	421.19	12.00	12.00	0.00
9,423.25	91.90	269.27	9,077.20	677.94	-453.11	444.44	12.00	12.00	0.00
Start 9409.49 hold at 9423.25 MD									
9,500.00	91.90	269.27	9,074.66	676.96	-529.81	521.15	0.00	0.00	0.00
9,600.00	91.90	269.27	9,071.34	675.68	-629.75	621.09	0.00	0.00	0.00
9,700.00	91.90	269.27	9,068.03	674.40	-729.69	721.04	0.00	0.00	0.00
9,800.00	91.90	269.27	9,064.71	673.13	-829.62	820.98	0.00	0.00	0.00
9,900.00	91.90	269.27	9,061.40	671.85	-929.56	920.93	0.00	0.00	0.00
10,000.00	91.90	269.27	9,058.08	670.57	-1,029.50	1,020.87	0.00	0.00	0.00
10,100.00	91.90	269.27	9,054.77	669.30	-1,129.43	1,120.82	0.00	0.00	0.00
10,200.00	91.90	269.27	9,051.45	668.02	-1,229.37	1,220.76	0.00	0.00	0.00
10,300.00	91.90	269.27	9,048.14	666.74	-1,329.31	1,320.71	0.00	0.00	0.00
10,400.00	91.90	269.27	9,044.82	665.47	-1,429.25	1,420.65	0.00	0.00	0.00
10,500.00	91.90	269.27	9,041.51	664.19	-1,529.18	1,520.60	0.00	0.00	0.00

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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)
10,600.00	91.90	269.27	9,038.19	662.91	-1,629.12	1,620.54	0.00	0.00	0.00
10,700.00	91.90	269.27	9,034.88	661.64	-1,729.06	1,720.49	0.00	0.00	0.00
10,800.00	91.90	269.27	9,031.56	660.36	-1,828.99	1,820.43	0.00	0.00	0.00
10,900.00	91.90	269.27	9,028.25	659.08	-1,928.93	1,920.38	0.00	0.00	0.00
11,000.00	91.90	269.27	9,024.93	657.81	-2,028.87	2,020.32	0.00	0.00	0.00
11,100.00	91.90	269.27	9,021.62	656.53	-2,128.80	2,120.27	0.00	0.00	0.00
11,200.00	91.90	269.27	9,018.30	655.25	-2,228.74	2,220.21	0.00	0.00	0.00
11,263.80	91.90	269.27	9,016.19	654.44	-2,292.50	2,283.98	0.00	0.00	0.00
[CrossbowWA#10H]PPP-1									
11,264.00	91.90	269.27	9,016.18	654.44	-2,292.70	2,284.18	0.00	0.00	0.00
PPP-1: 11264' MD, 9016' TVD									
11,300.00	91.90	269.27	9,014.99	653.98	-2,328.68	2,320.16	0.00	0.00	0.00
11,400.00	91.90	269.27	9,011.67	652.70	-2,428.61	2,420.10	0.00	0.00	0.00
11,500.00	91.90	269.27	9,008.36	651.42	-2,528.55	2,520.05	0.00	0.00	0.00
11,600.00	91.90	269.27	9,005.04	650.15	-2,628.49	2,619.99	0.00	0.00	0.00
11,700.00	91.90	269.27	9,001.73	648.87	-2,728.42	2,719.94	0.00	0.00	0.00
11,800.00	91.90	269.27	8,998.41	647.59	-2,828.36	2,819.88	0.00	0.00	0.00
11,900.00	91.90	269.27	8,995.10	646.32	-2,928.30	2,919.83	0.00	0.00	0.00
12,000.00	91.90	269.27	8,991.78	645.04	-3,028.24	3,019.77	0.00	0.00	0.00
12,100.00	91.90	269.27	8,988.47	643.76	-3,128.17	3,119.72	0.00	0.00	0.00
12,200.00	91.90	269.27	8,985.15	642.49	-3,228.11	3,219.66	0.00	0.00	0.00
12,300.00	91.90	269.27	8,981.84	641.21	-3,328.05	3,319.61	0.00	0.00	0.00
12,400.00	91.90	269.27	8,978.52	639.93	-3,427.98	3,419.55	0.00	0.00	0.00
12,500.00	91.90	269.27	8,975.21	638.66	-3,527.92	3,519.50	0.00	0.00	0.00
12,600.00	91.90	269.27	8,971.89	637.38	-3,627.86	3,619.44	0.00	0.00	0.00
12,700.00	91.90	269.27	8,968.58	636.10	-3,727.79	3,719.39	0.00	0.00	0.00
12,800.00	91.90	269.27	8,965.26	634.82	-3,827.73	3,819.33	0.00	0.00	0.00
12,900.00	91.90	269.27	8,961.95	633.55	-3,927.67	3,919.28	0.00	0.00	0.00
13,000.00	91.90	269.27	8,958.63	632.27	-4,027.60	4,019.22	0.00	0.00	0.00
13,100.00	91.90	269.27	8,955.32	630.99	-4,127.54	4,119.17	0.00	0.00	0.00
13,200.00	91.90	269.27	8,952.00	629.72	-4,227.48	4,219.11	0.00	0.00	0.00
13,300.00	91.90	269.27	8,948.69	628.44	-4,327.41	4,319.06	0.00	0.00	0.00
13,400.00	91.90	269.27	8,945.37	627.16	-4,427.35	4,419.00	0.00	0.00	0.00
13,500.00	91.90	269.27	8,942.06	625.89	-4,527.29	4,518.95	0.00	0.00	0.00
13,600.00	91.90	269.27	8,938.74	624.61	-4,627.23	4,618.89	0.00	0.00	0.00
13,700.00	91.90	269.27	8,935.43	623.33	-4,727.16	4,718.84	0.00	0.00	0.00
13,800.00	91.90	269.27	8,932.11	622.06	-4,827.10	4,818.78	0.00	0.00	0.00
13,900.00	91.90	269.27	8,928.80	620.78	-4,927.04	4,918.73	0.00	0.00	0.00
13,918.00	91.90	269.27	8,928.20	620.55	-4,945.02	4,936.72	0.00	0.00	0.00
PPP-2: 13918' MD, 8928' TVD									
13,918.56	91.90	269.27	8,928.18	620.54	-4,945.58	4,937.27	0.00	0.00	0.00
[CrossbowWA#10H]PPP-2									
14,000.00	91.90	269.27	8,925.48	619.50	-5,026.97	5,018.67	0.00	0.00	0.00
14,100.00	91.90	269.27	8,922.17	618.23	-5,126.91	5,118.62	0.00	0.00	0.00

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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)
14,200.00	91.90	269.27	8,918.85	616.95	-5,226.85	5,218.56	0.00	0.00	0.00
14,300.00	91.90	269.27	8,915.54	615.67	-5,326.78	5,318.51	0.00	0.00	0.00
14,400.00	91.90	269.27	8,912.22	614.40	-5,426.72	5,418.45	0.00	0.00	0.00
14,500.00	91.90	269.27	8,908.91	613.12	-5,526.66	5,518.40	0.00	0.00	0.00
14,600.00	91.90	269.27	8,905.59	611.84	-5,626.59	5,618.34	0.00	0.00	0.00
14,700.00	91.90	269.27	8,902.28	610.57	-5,726.53	5,718.29	0.00	0.00	0.00
14,800.00	91.90	269.27	8,898.96	609.29	-5,826.47	5,818.23	0.00	0.00	0.00
14,900.00	91.90	269.27	8,895.65	608.01	-5,926.41	5,918.18	0.00	0.00	0.00
15,000.00	91.90	269.27	8,892.33	606.74	-6,026.34	6,018.12	0.00	0.00	0.00
15,100.00	91.90	269.27	8,889.02	605.46	-6,126.28	6,118.07	0.00	0.00	0.00
15,200.00	91.90	269.27	8,885.70	604.18	-6,226.22	6,218.01	0.00	0.00	0.00
15,300.00	91.90	269.27	8,882.39	602.91	-6,326.15	6,317.96	0.00	0.00	0.00
15,400.00	91.90	269.27	8,879.07	601.63	-6,426.09	6,417.90	0.00	0.00	0.00
15,500.00	91.90	269.27	8,875.76	600.35	-6,526.03	6,517.85	0.00	0.00	0.00
15,600.00	91.90	269.27	8,872.44	599.07	-6,625.96	6,617.79	0.00	0.00	0.00
15,700.00	91.90	269.27	8,869.13	597.80	-6,725.90	6,717.74	0.00	0.00	0.00
15,800.00	91.90	269.27	8,865.81	596.52	-6,825.84	6,817.68	0.00	0.00	0.00
15,900.00	91.90	269.27	8,862.50	595.24	-6,925.77	6,917.63	0.00	0.00	0.00
16,000.00	91.90	269.27	8,859.18	593.97	-7,025.71	7,017.57	0.00	0.00	0.00
16,100.00	91.90	269.27	8,855.87	592.69	-7,125.65	7,117.52	0.00	0.00	0.00
16,200.00	91.90	269.27	8,852.55	591.41	-7,225.58	7,217.46	0.00	0.00	0.00
16,300.00	91.90	269.27	8,849.24	590.14	-7,325.52	7,317.41	0.00	0.00	0.00
16,400.00	91.90	269.27	8,845.92	588.86	-7,425.46	7,417.35	0.00	0.00	0.00
16,500.00	91.90	269.27	8,842.61	587.58	-7,525.40	7,517.30	0.00	0.00	0.00
16,557.00	91.90	269.27	8,840.72	586.86	-7,582.36	7,574.27	0.00	0.00	0.00
PPP-3: 16557' MD, 8841' TVD									
16,557.19	91.90	269.27	8,840.71	586.85	-7,582.55	7,574.45	0.00	0.00	0.00
[CrossbowWA#10H]PPP-3									
16,600.00	91.90	269.27	8,839.29	586.31	-7,625.33	7,617.24	0.00	0.00	0.00
16,700.00	91.90	269.27	8,835.98	585.03	-7,725.27	7,717.19	0.00	0.00	0.00
16,800.00	91.90	269.27	8,832.66	583.75	-7,825.21	7,817.13	0.00	0.00	0.00
16,900.00	91.90	269.27	8,829.35	582.48	-7,925.14	7,917.08	0.00	0.00	0.00
17,000.00	91.90	269.27	8,826.04	581.20	-8,025.08	8,017.02	0.00	0.00	0.00
17,100.00	91.90	269.27	8,822.72	579.92	-8,125.02	8,116.97	0.00	0.00	0.00
17,200.00	91.90	269.27	8,819.41	578.65	-8,224.95	8,216.91	0.00	0.00	0.00
17,300.00	91.90	269.27	8,816.09	577.37	-8,324.89	8,316.86	0.00	0.00	0.00
17,400.00	91.90	269.27	8,812.78	576.09	-8,424.83	8,416.80	0.00	0.00	0.00
17,500.00	91.90	269.27	8,809.46	574.82	-8,524.76	8,516.75	0.00	0.00	0.00
17,600.00	91.90	269.27	8,806.15	573.54	-8,624.70	8,616.69	0.00	0.00	0.00
17,700.00	91.90	269.27	8,802.83	572.26	-8,724.64	8,716.64	0.00	0.00	0.00
17,800.00	91.90	269.27	8,799.52	570.99	-8,824.57	8,816.58	0.00	0.00	0.00
17,900.00	91.90	269.27	8,796.20	569.71	-8,924.51	8,916.53	0.00	0.00	0.00
18,000.00	91.90	269.27	8,792.89	568.43	-9,024.45	9,016.47	0.00	0.00	0.00
18,100.00	91.90	269.27	8,789.57	567.16	-9,124.39	9,116.42	0.00	0.00	0.00

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**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)
18,200.00	91.90	269.27	8,786.26	565.88	-9,224.32	9,216.36	0.00	0.00	0.00
18,300.00	91.90	269.27	8,782.94	564.60	-9,324.26	9,316.31	0.00	0.00	0.00
18,400.00	91.90	269.27	8,779.63	563.33	-9,424.20	9,416.25	0.00	0.00	0.00
18,500.00	91.90	269.27	8,776.31	562.05	-9,524.13	9,516.20	0.00	0.00	0.00
18,600.00	91.90	269.27	8,773.00	560.77	-9,624.07	9,616.14	0.00	0.00	0.00
18,700.00	91.90	269.27	8,769.68	559.49	-9,724.01	9,716.09	0.00	0.00	0.00
18,800.00	91.90	269.27	8,766.37	558.22	-9,823.94	9,816.03	0.00	0.00	0.00
18,831.74	91.90	269.27	8,765.31	557.81	-9,855.66	9,847.76	0.00	0.00	0.00
TD at 18832.74									
18,832.74	91.90	269.27	8,765.28	557.80	-9,856.66	9,848.75	0.00	0.00	0.00
[CrossbowWA#10H]LTP/BHL									

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
[CrossbowWA#10H]FTP	0.00	0.00	0.00	683.29	-34.87	478,967.96	539,851.60	32.3167	-104.2043
- plan misses target center by 684.18usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									
[CrossbowWA#10H]KOF	0.00	0.00	8,600.00	684.24	40.14	478,968.91	539,926.61	32.3167	-104.2041
- plan hits target center									
- Point									
[CrossbowWA#10H]LTP	0.00	0.00	8,765.28	557.80	-9,856.66	478,842.47	530,029.81	32.3164	-104.2361
- plan hits target center									
- Point									
[CrossbowWA#10H]PPF	0.00	0.00	8,841.00	588.80	-7,582.58	478,873.47	532,303.89	32.3165	-104.2288
- plan misses target center by 1.97usft at 16557.19usft MD (8840.71 TVD, 586.85 N, -7582.55 E)									
- Point									
[CrossbowWA#10H]PPF	0.00	0.00	8,928.00	624.76	-4,945.63	478,909.44	534,940.84	32.3166	-104.2202
- plan misses target center by 4.23usft at 13918.56usft MD (8928.18 TVD, 620.54 N, -4945.58 E)									
- Point									
[CrossbowWA#10H]PPF	0.00	0.00	9,016.00	656.37	-2,292.52	478,941.04	537,593.95	32.3167	-104.2116
- plan misses target center by 1.94usft at 11263.80usft MD (9016.19 TVD, 654.44 N, -2292.50 E)									
- Point									

Marathon Oil

Pro Directional

Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA #10H
Project:	Eddy County, NM	**TVD Reference:**	well @ 3183.00usft
Site:	Crossbow Fed 23-27-8 (2-4-8-10)	**MD Reference:**	well @ 3183.00usft
Well:	WA #10H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
1800	1800	0	0	Start Build 2.00
2300	2297	43	3	Start 3445.88 hold at 2300.00 MD
5746	5691	641	38	Start Drop -2.00
6246	6188	684	40	Start 2411.54 hold at 6245.88 MD
8657	8600	684	40	Start DLS 12.00 TFO 269.27
9423	9077	678	-453	Start 9409.49 hold at 9423.25 MD
11,264	9016	654	-2293	PPP-1: 11264' MD, 9016' TVD
13,918	8928	621	-4945	PPP-2: 13918' MD, 8928' TVD
16,557	8841	587	-7582	PPP-3: 16557' MD, 8841' TVD
18,832	8765	558	-9856	TD at 18832.74

Checked By: _____ Approved By: _____ Date: _____

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

CROSSBOW FEDERAL 23 27 8 WA 10H

SEC. 8, TWP. 23S, RNG. 27E

EDDY COUNTY, NEW MEXICO

1. GEOLOGICAL FORMATIONS

Formation at Surface	Elevation
Rustler	3158

Formation	TVD	MD	Elevation	Lithology	Mineral Resources	Producing Formation
Rustler	0	0	3158	Anhydrite	Brine	No
Salado	120	120	3038	Salt/Anhydrite	Brine	No
Castile	487	487	2671	Salt/Anhydrite	Brine	No
Base of Salt (BX)	1969	1969	1189	Salt/Anhydrite	Brine	No
Lamar	1969	1969	1189	Sandstone/Shale	None	No
Bell Canyon	2108	2108	1050	Sandstone	Oil	No
Cherry Canyon	2881	2881	277	Sandstone	Oil	No
Brushy Canyon	3910	3910	-752	Sandstone	Oil	No
Bone Spring Lime	5401	5401	-2243	Limestone	None	No
Upper Avalon Shale	5722	5722	-2564	Shale	Oil	No
1st Bone Spring Sand	6453	6453	-3295	Sandstone	Oil	No
2nd Bone Spring Carbonate	6680	6680	-3522	Limestone	None	No
2nd Bone Spring Sand	6930	6930	-3772	Sandstone	Oil	No
3rd Bone Spring Carbonate	7139	7139	-3981	Limestone	Oil	No
3rd Bone Spring Sand	8526	8526	-5368	Sandstone	Oil	No
Wolfcamp	8887	8887	-5729	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp A	9039	9039	-5881	Sandstone/Shale/Carbonates	Natural Gas/Oil	Yes
Wolfcamp B	9204	9204	-6046	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp C	9500	9500	-6342	Sandstone/Shale/Carbonates	Natural Gas/Oil	No
Wolfcamp D	9752	9752	-6594	Sandstone/Shale/Carbonates	Natural Gas/Oil	No

2. BLOWOUT PREVENTER TESTING PROCEDURE

BOP installed and tested before drilling which hole?	Size	Min. Required WP	Type		✓	Tested to:
12 1/4	13 5/8	5000	Annular		X	50% of working pressure
			Blind Ram			5000
			Pipe Ram			
			Double Ram			
			Other*	BOP Stack	X	
8 3/4	13 5/8	5000	Annular		X	50% of working pressure
			Blind Ram			5000
			Pipe Ram			
			Double Ram			
			Other*	BOP Stack	X	
			Blind Ram		X	5000
			Pipe Ram			
			Double Ram			
			Other*	BOP Stack	X	

the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams will be operationally checked each 24 hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment will include a Kelly cock, full opening safety valve / inside BOP and choke lines and choke manifold. See attached schematics.

Y	Formation integrity test will be performed per Onshore Order #2. On Exploratory wells or on that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.i.
Y	A variance is requested for the use of a flexible choke line from the BOP to Choke Manifold. See attached for specs and hydrostatic test chart.
	N — Are anchors required by manufacturer?
Y	A multibowl wellhead is being used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested. See attached schematic.

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	17.5	13.375	0	400	0	400	2911	2511	54.5	J55	BTC	5.22	1.81	4.52
Intermediate I	12.25	9.625	0	8557	0	8500	2911	-5589	40	P110HC	BTC	1.20	1.42	2.44
Intermediate II	8.75	5.5	0	18832	0	8765	2911	-5854	23	P110HC	TLW	2.53	1.26	2.22

All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	

Approval Date: 05/16/2022

Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT

String Type	Lead/Tail	Top MD	Bottom MD	Quantity (sks)	Yield (ft3/sks)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	0	100	64	2.12	12.5	135	25	Class C	Extender,Accelerator, LCM
Surface	Tail	100	400	197	1.32	14.8	260	25	Class C	Accelerator
Intermediate	Lead	0	8057	1458	2.18	12.4	3179	25	Class C	Extender,Accelerator, LCM
Intermediate	Tail	8057	8557	147	1.33	14.8	196	25	Class C	Retarder
Production	Tail	8257	18832	2028	1.68	13	3407	25	Class H	Retarder, Extender, Fluid Loss, Suspension Agent

Stage tool depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Stage tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Pilot hole depth: N/A TVD/MD
KOP: N/A TVD/MD

Plug top	Plug Bottom	Excess (%)	Quantity (sx)	Density (ppg)	Yield (ft3/sx)	Water gal/sk	Slurry Description and Cement Type

Attach plugging procedure for pilot hole: N/A

Approval Date: 05/16/2022

5. CIRCULATING MEDIUM

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max. Weight (ppg)
0	510	Water Based Mud	8.4	8.8
510	8557	Brine/Oil based	9.9	10.2
8601	18832	Oil Based mud	10.5	12.5

Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT. The necessary mud products for additional weight and fluid loss control will be on location at all times.

6. TEST, LOGGING, CORING

List of production tests including testing procedures, equipment and safety measures:
GR from TD to surface (horizontal well - vertical portion of hole)
List of open and cased hole logs run in the well:
GR while drilling from Intermediate casing shoe to TD.
Coring operation description for the well:
No coring is planned at this time.

Mud Logger: None.
DST's: None.
Open Hole Logs: GR while drilling from Intermediate casing shoe to TD.

7. PRESSURE

ANTICIPATED BOTTOM HOLE PRESSURE: 5,862 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 195°F

ANTICIPATED ABNORMAL PRESSURE: N

ANTICIPATED ABNORMAL TEMPERATURE: N

POTENTIAL HAZARDS:

A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with Onshore Order #6.

B. No abnormal temperatures or pressures are anticipated. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

C. No losses are anticipated at this time.

D. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well.

E. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely.

8. OTHER

Other Well Information

1. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

a. A Kelly cock will be in the drill string at all times.

b. A full opening drill pipe stabbing valve having the appropriate connections will be on the rig floor unobstructed and readily accessible at all times.

c. Hydrogen Sulfide detection equipment will be in operation after drilling out the surface casing shoe until the production casing is cemented. Breathing equipment will be on location upon drilling the surface casing shoe until total depth is reached. **If Hydrogen Sulfide is encountered , measured amounts and formations will be reported to the BLM**

2. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS

Road and location construction will begin after the BLM has approved the APD. Anticipated spud date will be as soon as possible after BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 30 days.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Marathon Oil**
LEASE NO.:	**NMNM0540701A**
LOCATION:	Section 8, T.23 S., R.27 E., NMPM
COUNTY:	Eddy County, New Mexico

WELL NAME & NO.:	**Crossbow Fed 23 27 8 WA 10H**
SURFACE HOLE FOOTAGE:	1029'/S & 318'/E
BOTTOM HOLE FOOTAGE	1654'/S & 330'/W

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	○ Low	◉ Medium	○ High
Cave/Karst Potential	○ Critical		
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☐ COM	☐ Unit

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **400** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8**

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hours or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept 1/3rd fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst.

Contingency:

Operator is approved to used a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The Operator shall contact BLM within 4 hrs before running the DV tool operation.

❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

3. The minimum required fill of cement behind the **5-1/2** inch production casing is:
   - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
c. Manufacturer representative shall install the test plug for the initial BOP test.

d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

GENERAL REQUIREMENTS

The BLM is to be notified in advance for a representative to witness:

a. Spudding well (minimum of 24 hours)
b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
c. BOPE tests (minimum of 4 hours)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 689-5981

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.

a. Operator is approved to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
b. Operator is approved to set surface casing with Spudder Rig
- **Notify the BLM when moving in and removing the Spudder Rig.**
- **Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.**
- **BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.**

2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.

5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a

larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.

3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been

done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.

e. The results of the test shall be reported to the appropriate BLM office.

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test

does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. WASTE MATERIAL AND FLUIDS

All waste (i.e. drilling fluids, trash, salts, chemicals, sewage, gray water, etc.) created as a result of drilling operations and completion operations shall be safely contained and disposed of properly at a waste disposal facility. No waste material or fluid shall be disposed of on the well location or surrounding area.

Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.
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Approval Date: 05/16/2022

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

COMMENTS

Action 121708

COMMENTS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 121708
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

COMMENTS

Created By	Comment	Comment Date
kpickford	6/30/2022 KP GEO review	6/30/2022

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CONDITIONS

Created By	Condition	Condition Date
dmcclure	Notify OCD 24 hours prior to casing & cement	8/23/2022
dmcclure	Notify OCD 24 hours prior to Spudding	8/23/2022
dmcclure	Will require a File As Drilled C-102 and a Directional Survey with the C-104	8/23/2022
dmcclure	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	8/23/2022
dmcclure	Cement is required to circulate on both surface and intermediate1 strings of casing	8/23/2022
dmcclure	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	8/23/2022
dmcclure	Submit a change of plans with an updated directional plan which has a proposed lateral that remains within the Wolfcamp formation	8/23/2022
dmcclure	Operator shall provide written notice to OCD at least 14 days prior to the start of any drilling or completion activities. The notice shall be filed with OCD.Engineer@state.nm.us.	8/23/2022
dmcclure	Prior to the commencement of any drilling or completion activities within 1 mile of the Carlsbad brine well the operator must first receive written (which includes email) confirmation from the OCD Director or his/her delegate that the OCD has no concerns with such activities proceeding.	8/23/2022