

Form 3160-3
(June 2015)FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No.
1b. Type of Well: <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator		8. Lease Name and Well No.
3a. Address		9. API Well No. 30-025-52537
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.

(Continued on page 2)

*(Instructions on page 2)



Approval Date: 02/01/2024

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 30-025-52537	² Pool Code 96672	³ Pool Name WC-025 G-08 S263412K;BONE SPRING
⁴ Property Code 335353	⁵ Property Name GOLIATH 24 FEDERAL COM	⁶ Well Number 602H
⁷ OGRID No. 372098	⁸ Operator Name MARATHON OIL PERMIAN LLC	⁹ Elevation 3235'

¹⁰ Surface Location

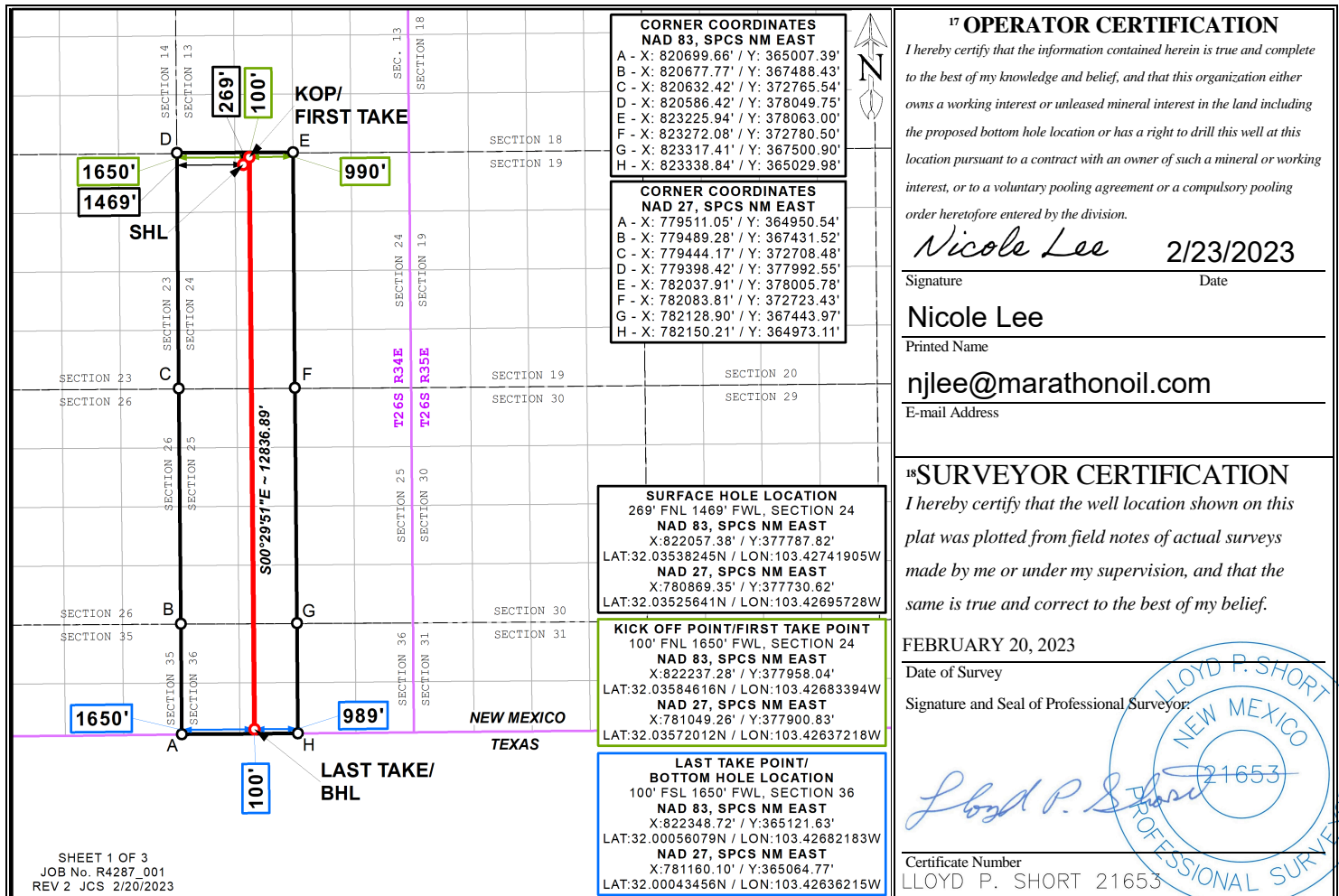
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
C	24	26S	34E		269	NORTH	1469	WEST	LEA

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 3	36	26S	34E		100	SOUTH	1650	WEST	LEA

¹² Dedicated Acres 789.94	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.



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

Submit Electronically
Via E-permitting

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: _____ **OGRID:** _____ **Date:** ____/____/____

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

IV. Central Delivery Point Name: _____ [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

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.

III. Wells

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Goliath 24 Fed Com 301H		C-24-26S-34E	269 FNL 1394 FWL	2300	3400	3500
Goliath 24 Fed Com 302H		C-24-26S-34E	269 FNL 1419 FWL	2300	3400	3500
Goliath 24 Fed Com 303H		C-24-26S-34E	269 FNL 1259 FWL	2300	3400	3500
Goliath 24 Fed Com 501H		C-24-26S-34E	269 FNL 1209 FWL	1500	4200	2300
Goliath 24 Fed Com 502H		C-24-26S-34E	269 FNL 1234 FWL	1500	4200	2300
Goliath 24 Fed Com 503H		C-24-26S-34E	269 FNL 1284 FWL	1500	4200	2300
Goliath 24 Fed Com 601H		D-24-26S-34E	269 FNL 1369 FWL	1400	2400	4100
Goliath 24 Fed Com 602H		D-24-26S-34E	269 FNL 1469 FWL	1400	2400	4100
Goliath 24 Fed Com 701H		D-24-26S-34E	269 FNL 1419 FWL	1400	2400	4100
Goliath 24 Fed Com 702H		D-24-26S-34E	270 FNL 1494 FWL	1400	2400	4100

V. Anticipated Schedule

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Goliath 24 Fed Com 301H		12/8/2023	4/30/2024	8/24/2024	10/23/2024	10/23/2024
Goliath 24 Fed Com 302H						
Goliath 24 Fed Com 303H						
Goliath 24 Fed Com 501H		4/19/2026	5/14/2026	11/5/2026	12/13/2026	12/13/2026
Goliath 24 Fed Com 502H		4/16/2026	6/6/2026	10/28/2026	12/13/2026	12/13/2026
Goliath 24 Fed Com 503H						
Goliath 24 Fed Com 601H		12/5/2023	4/6/2024	9/14/2024	10/23/2024	10/23/2024
Goliath 24 Fed Com 602H		12/11/2023	1/17/2024	9/25/2024	10/23/2024	10/23/2024
Goliath 24 Fed Com 701H		12/3/2023	3/11/2024	9/4/2024	10/23/2024	10/23/2024
Goliath 24 Fed Com 702H		11/30/2023	2/13/2024	8/13/2024	10/23/2024	10/23/2024

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: <i>Nicole Lee</i>
Printed Name:
Title:
E-mail Address:
Date:
Phone:
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 PERMIAN, LLC.
DRILLING AND OPERATIONS PLAN



WELL NAME & NUMBER:

GOLIATH 24 FED COM 602H

LOCATION:

SECTION

24

TOWNSHIP

26S

RANGE

34E

LEA

COUNTY,

NEW MEXICO**Section 1:****GEOLOGICAL FORMATIONS**

Name of Surface Formation:

Permian

Elevation:

3222 feet

Estimated Tops of Important Geological Markers:

Formation	TVD (ft)	MD (ft)	Elevation (ft SS)	Lithologies	Mineral Resources	Producing Formation?
Rustler	1017	1017	2171	Anhydrite	Brine	No
Salado	1428	1428	1720	Salt/Anhydrite	Brine	No
Castile	3680	3680	-354	Salt/Anhydrite	Brine	No
Base of Salt (BX)	5361	5361	-2121	Salt/Anhydrite	Brine	No
Lamar	5361	5361	-2121	Sandstone/Shale	None	No
Bell Canyon	5385	5385	-2146	Sandstone	Oil	No
Cherry Canyon	6698	6698	-3446	Sandstone	Oil	No
Brushy Canyon	7884	7884	-4609	Sandstone	Oil	No
Bone Spring Lime	9368	9368	-6055	Limestone	None	No
Upper Avalon Shale	9399	9399	-6093	Shale	Oil	Yes
1st Bone Spring Sand	10667	10667	-7390	Sandstone	Oil	Yes
2nd Bone Spring Carbonate	10819	10819	-7593	Limestone/Shale	None	No
2nd Bone Spring Sand	11188	11188	-7904	Sandstone	Oil	Yes
3rd Bone Spring Carbonate	11655	11655	-8373	Limestone	Oil	No
3rd Bone Spring Sand	12233	12233	-8964	Sandstone	Oil	Yes
Wolfcamp	12654	12654	-9368	Sandstone/Shale/Carbonates	Natural Gas / Oil	Yes
Wolfcamp A	12801	12801	-9493	Sandstone/Shale/Carbonates	Natural Gas / Oil	Yes
Wolfcamp B	13106	13106	-9822	Sandstone/Shale/Carbonates	Natural Gas / Oil	No
Wolfcamp C	13428	13428	-10140	Sandstone/Shale/Carbonates	Natural Gas / Oil	No
Wolfcamp D	13756	13756	-10531	Sandstone/Shale/Carbonates	Natural Gas / Oil	No

Section 2:**BLOWOUT PREVENTER TESTING PROCEDURE**

Pressure Rating (PSI):

10M

Rating Depth:

10000

Equipment:

13 5/8 BOP Annular (5,000 psi WP) and BOP Stack (10,000 psi WP) will be installed and tested before drilling all holes.

Requesting Variance?

Yes

Variance Request:

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.

Testing Procedure:

BOP/BOPE will be tested to 250 psi low and a high of 100% WP for the Annular and 5,000psi for the BOP Stack before drilling the intermediate hole, 10,000psi for the BOP Stack before drilling the production hole. Testing will be conducted by an independent service company per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the Equipment Description above. If the system is upgraded all the components installed will be functional and tested.

Pipe rams and Blind rams will be operationally checked on each trip out of the hole, but not to exceed more than once per day. 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.

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. 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.

Marathon Oil Permian LLC.

Drilling & Operations Plan - Page 2 of 4

Section 3: CASING PROGRAM

String Type	Hole Size	Casing Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Weight (lbs/ft)	Grade	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
Surface	17.5	13.375	0	1042	0	1042	3222	2180	54.5	J55	BTC	5.22	1.81	BUOY	4.52	BUOY	4.52
Intermediate	12.25	9.625	0	12021	0	12016	3222	-8794	40	P110HC	BTC	1.20	1.42	BUOY	2.44	BUOY	2.44
Production	8.75	5.5	0	25230	0	12594	3222	-9372	23	P110HC	TLW	2.53	1.26	BUOY	2.22	BUOY	2.22
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h												Safety Factors will Meet or Exceed					

Casing Condition: New
Casing Standard: API
Tapered String? No

Yes or No	
Is casing new? If used, attach certification as required in Onshore Order #1.	Yes
Does casing meet API specifications? If no, attach casing specification sheet.	Yes
Is premium or uncommon casing planned? If yes attach casing specification sheet.	No
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Yes
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Yes
Is well located within Capitan Reef?	No
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is proposed well within the designated four string boundary?	
Is well located in R-111-P and SOPA?	No
If yes, are the first three strings cemented to surface?	
Is the second string set 100' to 600' below the base of salt?	
Is well located in SOPA but not in R-111-P?	No
If yes, are the first 2 strings cemented to surface and third string cement tied back 500' into previous casing?	
Is well located in high Cave/Karst?	No
If yes, are there two strings cemented to surface?	
If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	No
If yes, are there three strings cemented to surface?	

Section 4: CEMENT PROGRAM

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	742	327	2.12	12.5	693	25	Class C	Extender,Accelerator,LCM
Surface	Tail	742	1042	197	1.32	14.8	260	25	Class C	Accelerator
Intermediate	Lead	0	11521	2099	2.18	12.4	4575	25	Class C	Extender,Accelerator,LCM
Intermediate	Tail	11521	12021	147	1.33	14.8	196	25	Class C	Retarder
Production	Tail	11721	25230	2580	1.68	13	4334	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? No
Pilot Hole Depth: N/A
KOP Depth: N/A
Plugging Procedure for Pilot Hole: N/A

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

Marathon Oil Permian LLC.

Drilling & Operations Plan - Page 3 of 4

Section 5:CIRCULATING MEDIUM

Mud System Type: Closed

Will an air or gas system be used? No

Describe what will be on location to control well or mitigate other conditions:

The necessary mud products for additional weight and fluid loss control will be on location at all times.

Describe the mud monitoring system utilized:

Losses or gains in the mud system will be monitored visually/manually as well as with an electronic PVT.

Circulating Medium Table:

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max Weight (ppg)
0	1042	Water Based Mud	8.4	8.8
1042	12021	Brine or Oil Based Mud	9.2	10.2
12021	25230	Oil Based Mud	10.5	12.5

Section 6:TESTING, 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:

Run gamma-ray (GR) and corrected neutron log (CNL) or analogous to surface for future development of the area, one per shared well pad not to exceed 200’ radial distance.

Section 7:ANTICIPATED PRESSURE

Anticipated Bottom Hole Pressure: 8186 PSI

Anticipated Bottom Hole Temperature: 195 °F

Anticipated Abnormal Pressure? No

Anticipated Abnormal Temperature? No

Potential Hazards:

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. Adequate flare lines will be installed off the mud/gas separator where gas may be flared safely. All personnel will be familiar with all aspects of safe operation of equipment being used to drill this well. See attached H2S Contingency Plan.

Section 8:OTHER INFORMATION

Auxiliary Well Control and Monitoring Equipment:

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

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.

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.

Marathon Oil Permian LLC.

Drilling & Operations Plan - Page 4 of 4

DRILL PLAN CHANGE REGISTER

GOLIATH 24 FED COM 602H
SECTION 24, TOWNSHIP 26S, RANGE 34E
LEA COUNTY, NEW MEXICO

Original Document Date: Monday, February 14, 2022
Prepared By: Matt McGaugh
Submitted By: Terri Stathem/Adrian Covarrubias

Revised Date:	Monday, October 18, 2021	Submittal Date:	Monday, November 1, 2021
Revised By:	Court Nelson (Drilling Engineer)	Submittal Type:	NOI Change to AAPD Sundry Notice
	Matt Baker (Geologist)	Submitted By:	Melissa Szudera

Summary of Revisions:

Section	Description
2 - Casing	Removed second intermediate string
4 - Cement	Removed second intermediate string
5 - Mud	Removed second intermediate string

Revised Date:		Submittal Date:	
Revised By:		Submittal Type:	
		Submitted By:	

Summary of Revisions:

Section	Description

Revised Date:		Submittal Date:	
Revised By:		Submittal Type:	
		Submitted By:	

Summary of Revisions:

Section	Description

Revised Date:		Submittal Date:	
Revised By:		Submittal Type:	
		Submitted By:	

Summary of Revisions:

Section	Description

Batch Drilling Plan

- Marathon Oil Permian LLC. respectfully requests the option to “batch” drill sections of a well with intentions of returning to the well for later completion.
- When it is determined that the use of a “batch” drilling process to increase overall efficiency and reduce rig time on location, the following steps will be utilized to ensure compliant well control before releasing drilling rig during the batch process.
- Succeeding a successful cement job, fluid levels will be monitored in both the annulus and casing string to be verified static.
- A mandrel hanger packoff will be ran and installed in the multi-bowl wellhead isolating and creating a barrier on the annulus. This packoff will be tested to 5,000 PSI validating the seals.
- At this point the well is secure and the drilling adapter will be removed from the wellhead.
- A 13-5/8” 5M temporary abandonment cap will be installed on the wellhead by stud and nut flange. The seals of the TA cap will then be pressure tested to 5,000 PSI.
- The drilling rig will skid to the next well on the pad to continue the batch drilling process.
- When returning to the well with the TA cap, the TA cap will be removed and the BOP will be nipped up on the wellhead.
- A BOP test will then be conducted according to Onshore Order #2 and drilling operations will resume on the subject well.

Request for Surface Rig

- Marathon Oil Permian LLC. Requests the option to contract a surface rig to drill, set surface casing and cement on the subject well. If the timing between rigs is such that Marathon Oil Permian LLC. would not be able to preset the surface section, the primary drilling rig will drill the well in its entirety per the APD.

1. DRILLING WELL CONTROL PLAN

1.1 WELL CONTROL - CERTIFICATIONS

Required IADC/IWCF Well Control Certifications Supervisor Level:

Any personnel who supervises or operates the BOP must possess a valid current IADC training certification and photo identification. This would include the onsite drilling supervisor, tool pusher/rig manager, driller, and any personnel that will be acting in these capacities. Another example of this may be a wireline or snubbing crew rigged up on the rig to assist the rig, the operator of each system must also have a valid control certification for their level of operation.

BLM recognizes IADC training as the industry approved accredited training. Online self-certifications will not be acceptable. Enforcement actions for the lack of a valid Supervisory Level certificate shall be prompt action to correct the deficiency. **Enforcement actions include but are not limited to immediate replacement of personnel lacking certifications, drilling operations being shut down or installment of a 10M annular.**

IADC Driller Level for all Drillers and general knowledge for the Assistant Driller, Derrick Hands, Floor Hands and Motor Hands is recognized by the BLM; however, a Driller Level certification will need to be presented only if acting in a temporary Driller Level certification capacity.

Well Control-Position/Roles

IADC Well control training and certification is targeted toward each role, e.g., Supervisor Level toward those who direct, Driller Level to those who act, Introductory to those who need to know.

- **Supervisor Level**
 - Specifies and has oversight that the correct actions are carried out
 - Role is to supervise well control equipment, training, testing, and well control events
 - Directs the testing of BOP and other well control equipment
 - Regularly direct well control crew drills
 - Land based rigs – usually runs the choke during a well kill operation
 - Due to role on the rig, training and certification is targeted more toward management of well control and managing an influx out of the well
- **Driller Level**
 - Performs an action to prevent or respond to well control accident
 - Role is to monitor the well via electronic devices while drilling and detect unplanned influxes
 - Assist with the testing of BOP and other well control equipment
 - Regularly assist with well control crew drills
 - When influx is detected, responsible to close the BOP
 - Due to role on the rig, training and certification is targeted more toward monitoring and shutting the well in (closing the BOP) when an influx is detected

(Well Control-Positions/Roles Continued)

- **Derrick Hand, Assistant Driller Introductory Level**
 - Role is to assist Driller with kick detection by physically monitoring the well at the mixing pits/tanks
 - Regularly record mud weights/viscosity for analysis by the Supervisor level and mud engineer so pre-influx signs can be detected
 - Mix required kill fluids as directed by Supervisor or Driller
 - Due to role on the rig, training and certification is targeted more toward monitoring for influxes, either via mud samples or visual signs on the pits/tanks
- **Motorman, Floor Hand Introductory Level**
 - Role is to assist the Supervisor, Driller, or Derrick Hand with detecting influxes
 - Be certain all valves are aligned for proper well control as directed by Supervisor
 - Perform Supervisor or Driller assigned tasks during a well control event
 - Due to role on the rig, training and certification is targeted more toward monitoring for influxes

1.2 WELL CONTROL-COMPONENT AND PREVENTER COMPATIBILITY CHECKLIST

The table below, which covers the drilling and casing of the 10M Stack portion of the well, outlines the tubulars and the compatible preventers in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

- Example 6-1/8" Production hole section, 10M requirement

Component	OD	Preventer	RWP
Drill pipe	4"	Upper and Lower 3.5-5.5" VBRs	10M
HWDP	4"	Upper and Lower 3.5-5.5" VBRs	10M
Drill collars and MWD tools	4.75-5"	Upper and Lower 3.5-5.5" VBRs	10M
Mud Motor	4.75-5.25"	Upper and Lower 3.5-5.5" VBRs	10M
Production casing	4.5"	Upper and Lower 3.5-5.5" VBRs	10M
ALL	0-13-5/8"	Annular	5M
Open-hole	-	Blind Rams	10M

- VBR = Variable Bore Ram. Compatible range listed in chart.

1.3 WELL CONTROL-BOP TESTING

BOP Test will be completed per Onshore Oil and Gas Order #2 Well Control requirements. The 5M Annular Preventer on a required 10M BOP stack will be tested to 70 % of rated working

pressure including a 10 minute low pressure test. Pressure shall be maintained at least 10 minutes.

1.4 WELL CONTROL - DRILLS

The following drills are conducted and recorded in the Daily Drilling Report and the Contractor's reporting system while engaged in drilling operations:

Type	Frequency	Objective	Comments
Shallow gas kick drill - drilling	Once per well with crew on tour	Response training to a shallow gas influx	To be done prior to drilling surface hole if shallow gas is noted
Kick drill - drilling	Once per week per crew	Response training to an influx while drilling (bit on bottom)	Only one kick drill per week per crew is required, alternating between drilling and tripping.
Kick drill - tripping	Once per week per crew	Response training to an influx while tripping (bit off bottom). Practice stabbing TIW valve	

1.5 WELL CONTROL – MONITORING

- Drilling operations which utilize static fluid levels in the wellbore as the active barrier element, a means of accurately monitoring fill-up and displacement volumes during trips are available to the driller and operator. A recirculating trip tank is installed and equipped with a volume indicator easily read from the driller's / operator's position. This data is recorded on a calibrated chart recorder or digitally. The actual volumes are compared to the calculated volumes.
- The On-Site Supervisor ensures hole-filling and pit monitoring procedures are established and documented for every rig operation.
- The well is kept full of fluid with a known density and monitored at all times even when out of the hole.
- Flow checks are a minimum of 15 minutes.
- A flow check is made:
 - In the event of a drilling break.
 - After indications of down hole gains or losses.
 - Prior to all trips out of the hole.
 - After pulling into the casing shoe.
 - Before the BHA enters the BOP stack.
 - If trip displacement is incorrect.

Well Control-Monitoring (Continued)

- Prior to dropping a survey instrument.
- Prior to dropping a core ball.

- After a well kill operation.
- When the mud density is reduced in the well.
- Flow checks may be made at any time at the sole discretion of the driller or his designate. The Onsite Supervisor ensures that personnel are aware of this authority and the authority to close the well in immediately without further consultation.
- Record slow circulating rates (SCR) after each crew change, bit trip, and 500' of new hole drilled and after any variance greater than 0.2 ppg in MW. Slow pump rate recordings should include return flow percent, TVD, MD & pressure. SCR's will be done on all pumps at 30, 40 & 50 SPM. Pressures will be recorded at the choke panel. SCR will be recorded in the IADC daily report and ORB Wellview daily report
- Drilling blind (i.e. without returns) is permissible only in known lithology where the absence of hydrocarbons has been predetermined and written approval of the Drilling Manager.
- All open hole logs to be run with pack-off or lubricator.
- The Drilling Contractor has a fully working pit level totalizer / monitoring system with read out for the driller and an audible alarm set to 10 BBL gain / loss volume. Systems are selectable to enable monitoring of all pits in use. Pit volumes are monitored at all times, especially when transferring fluids. Both systems data is recorded on a calibrated chart recorder or electronically.
- The Drilling Contractor has a fully working return mud flow indicator with drillers display and an audible alarm, and is adjustable to record any variance in return volumes.

1.6 WELL CONTROL – SHUT IN

- The “hard shut in” method (i.e. against a closed choke using either an annular or ram type preventer) is the Company standard.
- The HCR(s) or failsafe valves are left closed during drilling to prevent any erosion and buildup of solids. The adjustable choke should also be left closed.
- The rig specific shut in procedure, the BOP configuration along with space-out position for the tool joints is posted in the Driller's control cabin or doghouse.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Manager.
- During a well kill by circulation, constant bottom hole pressure is maintained throughout.
- Kill sheets are maintained by the Driller and posted in the Driller's control cabin or doghouse. The sheet is updated at a minimum every 500 feet.

2. SHUT-IN PROCEDURES:

2.1 PROCEDURE WHILE DRILLING

- Sound alarm (alert crew)

- Space out drill string – Stop rotating, pick the drill string up off bottom, and space out to ensure no tool joint is located in the BOP element selected for initial closure.
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify toolpusher/company representative
- Gather all relevant data required:
 - SIDPP and SICP
 - Hole Depth and Hole TVD
 - Pit gain
 - Time
 - Kick Volume
 - Pipe depth
 - MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
- If pressure has built or is anticipated during the kill to reach 1,000 psi or greater, the annular preventer will not be used as the primary pressure control device and operations will swap to the upper BOP pipe ram.

2.2 PROCEDURE WHILE TRIPPING

- Sound alarm (alert crew)
- Stab full opening safety valve in the drill string and close.
- Space out drill string (ensure no tool joint is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
 - SIDPP and SICP
 - Hole Depth and Hole TVD
 - Pit gain

Procedure While Tripping (Continued)

- Time
- Kick Volume
- Pipe depth

- MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
- If pressure has built or is anticipated during the kill to reach 1,000 psi or greater, the annular preventer will not be used as the primary pressure control device and operations will swap to the upper BOP pipe ram.

2.3 PROCEDURE WHILE RUNNING CASING

- Sound alarm (alert crew)
- Stab crossover and full opening safety valve and close
- Space out casing (ensure no coupling is located in the BOP element selected for initial closure).
- Shut down pumps (stop pumps and observe well.)
- Shut-in Well - If flow is suspected or confirmed, close uppermost applicable BOP element. (HCR and choke will already be in the closed position.)
 - **Note:** Either the uppermost pipe ram or annular preventer can be used.
- Confirm shut-in
- Notify tool pusher/company representative
- Gather all relevant data required:
 - SIDPP and SICP
 - Hole Depth and Hole TVD
 - Pit gain
 - Time
 - Kick Volume
 - Pipe depth
 - MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit
- If pressure has built or is anticipated during the kill to reach 1,000 psi or greater, the annular preventer will not be used as the primary pressure control device and operations will swap to the upper BOP pipe ram.

2.4 PROCEDURE WITH NO PIPE IN HOLE (OPEN HOLE)

- Sound alarm (alert crew)
- Shut-in with blind rams or BSR. (HCR and choke will already be in the closed position.)
- Confirm shut-in

- Notify toolpusher/company representative
- Gather all relevant data required:
 - Shut-In Pressure
 - Hole Depth and Hole TVD
 - Pit gain
 - Time
 - Kick Volume
 - MW in, MW out
 - SPR's (Slow Pump Rate's)
- Regroup and identify forward plan (let well stabilize, update kill sheet, inventory mud additives and mud volumes on location)
- Company Representative, Drilling Superintendent, Drilling Engineer and Drilling Manager will discuss well control kill method to be utilized. A verbal Risk Assessment and preferred kill method will be finalized. Initial Risk Assessment will be finalized within 1 hour of initial shut in.
- No well kill operation commences until there is a plan agreed by the Superintendent, On-Site Supervisor and the Drilling Contractor PIC.
- Recheck all pressures and fluid volume on accumulator unit.

2.5 PROCEDURE WHILE PULLING BHA THRU STACK

- PRIOR to pulling last joint of drill pipe thru the stack.
- Perform flow check, if flowing.
- Sound alarm (alert crew).
- Stab full opening safety valve and close
- Space out drill string with tool joint just beneath the upper pipe ram.
- Shut-in using upper pipe ram. (HCR and choke will already be in the closed position).
- Confirm shut-in.
- Notify toolpusher/company representative
- Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time
- Regroup and identify forward plan
- **With BHA in the stack and compatible ram preventer and pipe combo immediately available.**
 - Sound alarm (alert crew)
 - Stab crossover and full opening safety valve and close
 - Space out drill string with upset just beneath the compatible pipe ram.
 - Shut-in using compatible pipe ram. (HCR and choke will already be in the closed position.)
 - Confirm shut-in
 - Notify toolpusher/company representative
 - Read and record the following:
 - SIDPP and SICP
 - Pit gain

Procedures While Pulling BHA thru Stack (Continued)

- Time
- Regroup and identify forward plan

- **With BHA in the stack and NO compatible ram preventer and pipe combo immediately available.**
 - Sound alarm (alert crew)
 - If possible to pick up high enough, pull string clear of the stack and follow “Open Hole” scenario.
 - If impossible to pick up high enough to pull the string clear of the stack:
 - Stab crossover, make up one joint/stand of drill pipe, and full opening safety valve and close
 - Space out drill string with tool joint just beneath the upper pipe ram.
 - Shut-in using upper pipe ram. (HCR and choke will already be in the closed position.)
 - Confirm shut-in
 - Notify toolpusher/company representative
 - Read and record the following:
 - SIDPP and SICP
 - Pit gain
 - Time

MarathonOil

Corporation.

Company: Marathon Oil

Well: Goliath 24 FED COM 602H

County: Lea County, New Mexico (NAD 27)

Rig: Cactus 171

Wellbore: Wellbore #1

Design: Design #1

Date: 10:25, February 15 2023

Geodetic System: US State Plane 1927 (Exact solution)

Datum: NAD 1927 (NADCON CONUS)

Ellipsoid: Clarke 1866

Zone: New Mexico East 3001

System Datum: Mean Sea Level

WELL DETAILS: Goliath 24 FED COM 602H

	+N/-S	+E/-W	GL @ 3222.00	WELL @ 3245.50usft (Cactus 171)		
	Northing	Easting	Latitude	Longitude		
	377730.62	780869.35	32° 2' 6.923 N	103° 25' 37.046 W		

SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Annotation
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000	0.00	
1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.000	0.00	Begin 2.00°/100' Build
1614.65	2.29	46.59	1614.62	1.58	1.67	2.00	46.587	-1.56	Begin 2.29° Tangent
7690.28	2.29	46.59	7685.38	168.63	178.24	0.00	0.000	-167.10	Begin 2.00°/100' Drop
7804.93	0.00	0.00	7800.00	170.21	179.91	2.00	180.000	-168.67	Begin Vertical Hold
12120.96	0.00	0.00	12116.04	170.21	179.91	0.00	0.000	-168.67	Begin 12.00°/100' Build
12870.96	90.00	179.51	12593.50	-307.24	184.03	12.00	179.505	308.80	Begin 90.00° Lateral
25230.03	90.00	179.51	12593.50	-12665.85	290.75	0.00	0.000	12667.87	PBHL

DESIGN TARGET DETAILS

Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
FTP_602H	0.00	170.21	179.91	377900.83	781049.26	32° 2' 8.592 N	103° 25' 34.940 W
KOP_602H	12116.04	170.21	179.91	377900.83	781049.26	32° 2' 8.592 N	103° 25' 34.940 W
LTP_602H	12593.50	-12665.85	290.75	365064.77	781160.10	32° 0' 1.564 N	103° 25' 34.904 W
SL_602H	0.00	0.00	0.00	377730.62	780869.35	32° 2' 6.923 N	103° 25' 37.046 W

SURVEY PROGRAM

Depth From	Depth To	Survey/Plan	Tool
0.00	25230.03	Design #1 (Wellbore #1)	MWD+IFR1+FDIR

T

G

M

Azimuths to Grid North

True North: -0.48°

Magnetic North: 5.69°

Magnetic Field

Strength: 47191.2nT

Dip Angle: 59.55°

Date: 11/1/2023

Model: HDGM2023

MS

Directional

Target Line: 12,593.5 TVD @ 0° VS; 90.0° INC;

To convert a Magnetic Direction to a Grid Direction, Add 5.686°

To convert a Magnetic Direction to a True Direction, Add 6.167° East

To convert a True Direction to a Grid Direction, Subtract 0.481°

Begin 2.00°/100' Build

Begin 2.29° Tangent

Begin 2.00°/100' Drop

Begin Vertical Hold

Begin 12.00°/100' Build

Begin 90.00° Lateral

PBHL

Lease Line

100' Hard-Line

Drill Window: 50' LR

Vertical Section at 179.51° (500 usft/in)

South(-)/North(+) (500 usft/in)

West(-)/East(+) (50 usft/in)

Begin 2.00°/100' Build

Begin 2.29° Tangent

Begin 2.00°/100' Drop

Begin Vertical Hold

Begin 12.00°/100' Build

Begin 90.00° Lateral

PBHL

Lease Line

100' Hard-Line

Drill Window: 50' LR

Vertical Section at 179.51° (500 usft/in)

South(-)/North(+) (500 usft/in)

West(-)/East(+) (50 usft/in)

Begin 2.00°/100' Build

Begin 2.29° Tangent

Begin 2.00°/100' Drop

Begin Vertical Hold

Begin 12.00°/100' Build

Begin 90.00° Lateral

PBHL

Lease Line

100' Hard-Line

Drill Window: 50' LR

Vertical Section at 179.51° (500 usft/in)

South(-)/North(+) (500 usft/in)

West(-)/East(+) (50 usft/in)

Marathon Oil

Goliath 24 FED COM 602H

Cactus 171

The customer should only rely on this document after independently verifying all paths, targets, coordinates, lease and hard lines represented. Any decisions made or wells drilled utilizing this or any other information supplied by MS Directional are at the sole risk and responsibility of the customer. MS Directional is not responsible for the accuracy of this schematic or the information contained herein.

Marathon Oil

Goliath 24 FED COM 602H

Cactus 171



Marathon Oil

**Lea County, New Mexico (NAD 27)
Goliath 24 FED COM Pad
Goliath 24 FED COM 602H**

Wellbore #1

Plan: Design #1

Standard Planning Report

15 February, 2023





MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Lea County, New Mexico (NAD 27)		
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	Goliath 24 FED COM Pad		
Site Position:		Northing:	377,730.74 usft
From:	Map	Easting:	780,609.36 usft
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "
		Latitude:	32° 2' 6.946 N
		Longitude:	103° 25' 40.066 W

Well	Goliath 24 FED COM 602H		
Well Position	+N/-S	0.00 usft	Northing: 377,730.62 usft
	+E/-W	0.00 usft	Easting: 780,869.35 usft
Position Uncertainty	0.00 usft	Wellhead Elevation:	usft
Grid Convergence:	0.481 °	Ground Level:	3,222.00 usft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM2023	11/1/2023	6.167	59.550	47,191.20

Design	Design #1				
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	179.51	

Plan Survey Tool Program	Date	2/15/2023			
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks	
1	0.00	25,230.04	Design #1 (Wellbore #1)	MWD+IFR1+FDIR	
				OWSG MWD + IFR1 + FDIIF	

Plan Sections											
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target	
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.000		
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.000		
1,614.65	2.29	46.59	1,614.62	1.58	1.67	2.00	2.00	0.00	46.587		
7,690.28	2.29	46.59	7,685.38	168.63	178.24	0.00	0.00	0.00	0.000		
7,804.93	0.00	0.00	7,800.00	170.21	179.91	2.00	-2.00	0.00	180.000		
12,120.96	0.00	0.00	12,116.04	170.21	179.91	0.00	0.00	0.00	0.000		
12,870.96	90.00	179.51	12,593.50	-307.24	184.03	12.00	12.00	0.00	179.505		
25,230.04	90.00	179.51	12,593.50	-12,665.85	290.75	0.00	0.00	0.00	0.000	LTP_602H	



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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
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
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
Begin 2.00°/100' Build									
1,600.00	2.00	46.59	1,599.98	1.20	1.27	-1.19	2.00	2.00	0.00
1,614.65	2.29	46.59	1,614.62	1.58	1.67	-1.56	2.00	2.00	0.00
Begin 2.29° Tangent									
1,700.00	2.29	46.59	1,699.90	3.92	4.15	-3.89	0.00	0.00	0.00
1,800.00	2.29	46.59	1,799.82	6.67	7.05	-6.61	0.00	0.00	0.00
1,900.00	2.29	46.59	1,899.74	9.42	9.96	-9.34	0.00	0.00	0.00
2,000.00	2.29	46.59	1,999.66	12.17	12.87	-12.06	0.00	0.00	0.00
2,100.00	2.29	46.59	2,099.58	14.92	15.77	-14.79	0.00	0.00	0.00
2,200.00	2.29	46.59	2,199.50	17.67	18.68	-17.51	0.00	0.00	0.00
2,300.00	2.29	46.59	2,299.42	20.42	21.58	-20.24	0.00	0.00	0.00
2,400.00	2.29	46.59	2,399.34	23.17	24.49	-22.96	0.00	0.00	0.00
2,500.00	2.29	46.59	2,499.26	25.92	27.40	-25.69	0.00	0.00	0.00
2,600.00	2.29	46.59	2,599.18	28.67	30.30	-28.41	0.00	0.00	0.00
2,700.00	2.29	46.59	2,699.10	31.42	33.21	-31.13	0.00	0.00	0.00
2,800.00	2.29	46.59	2,799.02	34.17	36.12	-33.86	0.00	0.00	0.00
2,900.00	2.29	46.59	2,898.94	36.92	39.02	-36.58	0.00	0.00	0.00
3,000.00	2.29	46.59	2,998.86	39.67	41.93	-39.31	0.00	0.00	0.00
3,100.00	2.29	46.59	3,098.78	42.42	44.84	-42.03	0.00	0.00	0.00
3,200.00	2.29	46.59	3,198.70	45.17	47.74	-44.76	0.00	0.00	0.00
3,300.00	2.29	46.59	3,298.62	47.92	50.65	-47.48	0.00	0.00	0.00
3,400.00	2.29	46.59	3,398.54	50.67	53.55	-50.21	0.00	0.00	0.00
3,500.00	2.29	46.59	3,498.46	53.42	56.46	-52.93	0.00	0.00	0.00
3,600.00	2.29	46.59	3,598.38	56.17	59.37	-55.66	0.00	0.00	0.00
3,700.00	2.29	46.59	3,698.30	58.92	62.27	-58.38	0.00	0.00	0.00
3,800.00	2.29	46.59	3,798.22	61.67	65.18	-61.11	0.00	0.00	0.00
3,900.00	2.29	46.59	3,898.14	64.42	68.09	-63.83	0.00	0.00	0.00
4,000.00	2.29	46.59	3,998.06	67.16	70.99	-66.56	0.00	0.00	0.00
4,100.00	2.29	46.59	4,097.98	69.91	73.90	-69.28	0.00	0.00	0.00
4,200.00	2.29	46.59	4,197.90	72.66	76.80	-72.00	0.00	0.00	0.00
4,300.00	2.29	46.59	4,297.82	75.41	79.71	-74.73	0.00	0.00	0.00
4,400.00	2.29	46.59	4,397.74	78.16	82.62	-77.45	0.00	0.00	0.00
4,500.00	2.29	46.59	4,497.66	80.91	85.52	-80.18	0.00	0.00	0.00
4,600.00	2.29	46.59	4,597.58	83.66	88.43	-82.90	0.00	0.00	0.00
4,700.00	2.29	46.59	4,697.50	86.41	91.34	-85.63	0.00	0.00	0.00
4,800.00	2.29	46.59	4,797.42	89.16	94.24	-88.35	0.00	0.00	0.00
4,900.00	2.29	46.59	4,897.34	91.91	97.15	-91.08	0.00	0.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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	2.29	46.59	4,997.26	94.66	100.06	-93.80	0.00	0.00	0.00
5,100.00	2.29	46.59	5,097.18	97.41	102.96	-96.53	0.00	0.00	0.00
5,200.00	2.29	46.59	5,197.10	100.16	105.87	-99.25	0.00	0.00	0.00
5,300.00	2.29	46.59	5,297.02	102.91	108.77	-101.98	0.00	0.00	0.00
5,400.00	2.29	46.59	5,396.94	105.66	111.68	-104.70	0.00	0.00	0.00
5,500.00	2.29	46.59	5,496.86	108.41	114.59	-107.43	0.00	0.00	0.00
5,600.00	2.29	46.59	5,596.78	111.16	117.49	-110.15	0.00	0.00	0.00
5,700.00	2.29	46.59	5,696.70	113.91	120.40	-112.87	0.00	0.00	0.00
5,800.00	2.29	46.59	5,796.62	116.66	123.31	-115.60	0.00	0.00	0.00
5,900.00	2.29	46.59	5,896.54	119.41	126.21	-118.32	0.00	0.00	0.00
6,000.00	2.29	46.59	5,996.46	122.16	129.12	-121.05	0.00	0.00	0.00
6,100.00	2.29	46.59	6,096.38	124.91	132.03	-123.77	0.00	0.00	0.00
6,200.00	2.29	46.59	6,196.30	127.66	134.93	-126.50	0.00	0.00	0.00
6,300.00	2.29	46.59	6,296.22	130.41	137.84	-129.22	0.00	0.00	0.00
6,400.00	2.29	46.59	6,396.14	133.16	140.74	-131.95	0.00	0.00	0.00
6,500.00	2.29	46.59	6,496.06	135.91	143.65	-134.67	0.00	0.00	0.00
6,600.00	2.29	46.59	6,595.98	138.66	146.56	-137.40	0.00	0.00	0.00
6,700.00	2.29	46.59	6,695.90	141.40	149.46	-140.12	0.00	0.00	0.00
6,800.00	2.29	46.59	6,795.82	144.15	152.37	-142.85	0.00	0.00	0.00
6,900.00	2.29	46.59	6,895.74	146.90	155.28	-145.57	0.00	0.00	0.00
7,000.00	2.29	46.59	6,995.66	149.65	158.18	-148.30	0.00	0.00	0.00
7,100.00	2.29	46.59	7,095.58	152.40	161.09	-151.02	0.00	0.00	0.00
7,200.00	2.29	46.59	7,195.50	155.15	163.99	-153.74	0.00	0.00	0.00
7,300.00	2.29	46.59	7,295.42	157.90	166.90	-156.47	0.00	0.00	0.00
7,400.00	2.29	46.59	7,395.34	160.65	169.81	-159.19	0.00	0.00	0.00
7,500.00	2.29	46.59	7,495.26	163.40	172.71	-161.92	0.00	0.00	0.00
7,600.00	2.29	46.59	7,595.18	166.15	175.62	-164.64	0.00	0.00	0.00
7,690.28	2.29	46.59	7,685.38	168.63	178.24	-167.10	0.00	0.00	0.00
Begin 2.00°/100' Drop									
7,700.00	2.10	46.59	7,695.10	168.89	178.51	-167.36	2.00	-2.00	0.00
7,804.93	0.00	0.00	7,800.00	170.21	179.91	-168.67	2.00	-2.00	-44.40
Begin Vertical Hold									
7,900.00	0.00	0.00	7,895.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,000.00	0.00	0.00	7,995.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,100.00	0.00	0.00	8,095.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,200.00	0.00	0.00	8,195.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,300.00	0.00	0.00	8,295.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,400.00	0.00	0.00	8,395.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,500.00	0.00	0.00	8,495.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,600.00	0.00	0.00	8,595.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,700.00	0.00	0.00	8,695.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,800.00	0.00	0.00	8,795.07	170.21	179.91	-168.67	0.00	0.00	0.00
8,900.00	0.00	0.00	8,895.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,000.00	0.00	0.00	8,995.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,100.00	0.00	0.00	9,095.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,200.00	0.00	0.00	9,195.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,300.00	0.00	0.00	9,295.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,400.00	0.00	0.00	9,395.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,500.00	0.00	0.00	9,495.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,600.00	0.00	0.00	9,595.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,700.00	0.00	0.00	9,695.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,800.00	0.00	0.00	9,795.07	170.21	179.91	-168.67	0.00	0.00	0.00
9,900.00	0.00	0.00	9,895.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,000.00	0.00	0.00	9,995.07	170.21	179.91	-168.67	0.00	0.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
10,100.00	0.00	0.00	10,095.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,200.00	0.00	0.00	10,195.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,300.00	0.00	0.00	10,295.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,400.00	0.00	0.00	10,395.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,500.00	0.00	0.00	10,495.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,600.00	0.00	0.00	10,595.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,700.00	0.00	0.00	10,695.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,800.00	0.00	0.00	10,795.07	170.21	179.91	-168.67	0.00	0.00	0.00
10,900.00	0.00	0.00	10,895.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,000.00	0.00	0.00	10,995.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,100.00	0.00	0.00	11,095.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,200.00	0.00	0.00	11,195.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,300.00	0.00	0.00	11,295.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,400.00	0.00	0.00	11,395.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,500.00	0.00	0.00	11,495.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,600.00	0.00	0.00	11,595.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,700.00	0.00	0.00	11,695.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,800.00	0.00	0.00	11,795.07	170.21	179.91	-168.67	0.00	0.00	0.00
11,900.00	0.00	0.00	11,895.07	170.21	179.91	-168.67	0.00	0.00	0.00
12,000.00	0.00	0.00	11,995.07	170.21	179.91	-168.67	0.00	0.00	0.00
12,100.00	0.00	0.00	12,095.07	170.21	179.91	-168.67	0.00	0.00	0.00
12,120.96	0.00	0.00	12,116.04	170.21	179.91	-168.67	0.00	0.00	0.00
Begin 12.00°/100' Build									
12,125.00	0.48	179.51	12,120.07	170.19	179.91	-168.65	12.00	12.00	0.00
12,150.00	3.48	179.51	12,145.06	169.33	179.92	-167.78	12.00	12.00	0.00
12,175.00	6.48	179.51	12,169.96	167.16	179.94	-165.61	12.00	12.00	0.00
12,200.00	9.48	179.51	12,194.71	163.68	179.97	-162.14	12.00	12.00	0.00
12,225.00	12.48	179.51	12,219.25	158.92	180.01	-157.37	12.00	12.00	0.00
12,250.00	15.48	179.51	12,243.51	152.88	180.06	-151.33	12.00	12.00	0.00
12,275.00	18.48	179.51	12,267.42	145.58	180.12	-144.03	12.00	12.00	0.00
12,300.00	21.48	179.51	12,290.91	137.03	180.20	-135.49	12.00	12.00	0.00
12,325.00	24.48	179.51	12,313.92	127.27	180.28	-125.73	12.00	12.00	0.00
12,350.00	27.48	179.51	12,336.39	116.32	180.38	-114.78	12.00	12.00	0.00
12,375.00	30.48	179.51	12,358.26	104.21	180.48	-102.66	12.00	12.00	0.00
12,400.00	33.48	179.51	12,379.46	90.97	180.59	-89.42	12.00	12.00	0.00
12,425.00	36.48	179.51	12,399.94	76.64	180.72	-75.09	12.00	12.00	0.00
12,450.00	39.48	179.51	12,419.64	61.25	180.85	-59.71	12.00	12.00	0.00
12,475.00	42.48	179.51	12,438.51	44.86	180.99	-43.31	12.00	12.00	0.00
12,500.00	45.48	179.51	12,456.50	27.50	181.14	-25.95	12.00	12.00	0.00
12,525.00	48.48	179.51	12,473.55	9.22	181.30	-7.67	12.00	12.00	0.00
12,550.00	51.48	179.51	12,489.62	-9.92	181.47	11.47	12.00	12.00	0.00
12,575.00	54.48	179.51	12,504.67	-29.88	181.64	31.43	12.00	12.00	0.00
12,600.00	57.48	179.51	12,518.66	-50.60	181.82	52.15	12.00	12.00	0.00
12,625.00	60.48	179.51	12,531.54	-72.02	182.00	73.57	12.00	12.00	0.00
12,650.00	63.48	179.51	12,543.28	-94.09	182.19	95.64	12.00	12.00	0.00
12,675.00	66.48	179.51	12,553.85	-116.74	182.39	118.29	12.00	12.00	0.00
12,700.00	69.48	179.51	12,563.22	-139.91	182.59	141.47	12.00	12.00	0.00
12,725.00	72.48	179.51	12,571.36	-163.54	182.79	165.10	12.00	12.00	0.00
12,750.00	75.48	179.51	12,578.26	-187.57	183.00	189.13	12.00	12.00	0.00
12,775.00	78.48	179.51	12,583.89	-211.92	183.21	213.48	12.00	12.00	0.00
12,800.00	81.48	179.51	12,588.24	-236.54	183.42	238.10	12.00	12.00	0.00
12,825.00	84.48	179.51	12,591.29	-261.35	183.64	262.91	12.00	12.00	0.00
12,850.00	87.48	179.51	12,593.04	-286.28	183.85	287.85	12.00	12.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)
12,870.96	90.00	179.51	12,593.50	-307.24	184.03	308.80	12.00	12.00	0.00
Begin 90.00° Lateral									
12,900.00	90.00	179.51	12,593.50	-336.27	184.28	337.84	0.00	0.00	0.00
13,000.00	90.00	179.51	12,593.50	-436.27	185.15	437.84	0.00	0.00	0.00
13,100.00	90.00	179.51	12,593.50	-536.27	186.01	537.84	0.00	0.00	0.00
13,200.00	90.00	179.51	12,593.50	-636.26	186.87	637.84	0.00	0.00	0.00
13,300.00	90.00	179.51	12,593.50	-736.26	187.74	737.84	0.00	0.00	0.00
13,400.00	90.00	179.51	12,593.50	-836.26	188.60	837.84	0.00	0.00	0.00
13,500.00	90.00	179.51	12,593.50	-936.25	189.46	937.84	0.00	0.00	0.00
13,600.00	90.00	179.51	12,593.50	-1,036.25	190.33	1,037.84	0.00	0.00	0.00
13,700.00	90.00	179.51	12,593.50	-1,136.25	191.19	1,137.84	0.00	0.00	0.00
13,800.00	90.00	179.51	12,593.50	-1,236.24	192.05	1,237.84	0.00	0.00	0.00
13,900.00	90.00	179.51	12,593.50	-1,336.24	192.92	1,337.84	0.00	0.00	0.00
14,000.00	90.00	179.51	12,593.50	-1,436.23	193.78	1,437.84	0.00	0.00	0.00
14,100.00	90.00	179.51	12,593.50	-1,536.23	194.65	1,537.84	0.00	0.00	0.00
14,200.00	90.00	179.51	12,593.50	-1,636.23	195.51	1,637.84	0.00	0.00	0.00
14,300.00	90.00	179.51	12,593.50	-1,736.22	196.37	1,737.84	0.00	0.00	0.00
14,400.00	90.00	179.51	12,593.50	-1,836.22	197.24	1,837.84	0.00	0.00	0.00
14,500.00	90.00	179.51	12,593.50	-1,936.22	198.10	1,937.84	0.00	0.00	0.00
14,600.00	90.00	179.51	12,593.50	-2,036.21	198.96	2,037.84	0.00	0.00	0.00
14,700.00	90.00	179.51	12,593.50	-2,136.21	199.83	2,137.84	0.00	0.00	0.00
14,800.00	90.00	179.51	12,593.50	-2,236.20	200.69	2,237.84	0.00	0.00	0.00
14,900.00	90.00	179.51	12,593.50	-2,336.20	201.55	2,337.84	0.00	0.00	0.00
15,000.00	90.00	179.51	12,593.50	-2,436.20	202.42	2,437.84	0.00	0.00	0.00
15,100.00	90.00	179.51	12,593.50	-2,536.19	203.28	2,537.84	0.00	0.00	0.00
15,200.00	90.00	179.51	12,593.50	-2,636.19	204.14	2,637.84	0.00	0.00	0.00
15,300.00	90.00	179.51	12,593.50	-2,736.19	205.01	2,737.84	0.00	0.00	0.00
15,400.00	90.00	179.51	12,593.50	-2,836.18	205.87	2,837.84	0.00	0.00	0.00
15,500.00	90.00	179.51	12,593.50	-2,936.18	206.73	2,937.84	0.00	0.00	0.00
15,600.00	90.00	179.51	12,593.50	-3,036.17	207.60	3,037.84	0.00	0.00	0.00
15,700.00	90.00	179.51	12,593.50	-3,136.17	208.46	3,137.84	0.00	0.00	0.00
15,800.00	90.00	179.51	12,593.50	-3,236.17	209.32	3,237.84	0.00	0.00	0.00
15,900.00	90.00	179.51	12,593.50	-3,336.16	210.19	3,337.84	0.00	0.00	0.00
16,000.00	90.00	179.51	12,593.50	-3,436.16	211.05	3,437.84	0.00	0.00	0.00
16,100.00	90.00	179.51	12,593.50	-3,536.16	211.91	3,537.84	0.00	0.00	0.00
16,200.00	90.00	179.51	12,593.50	-3,636.15	212.78	3,637.84	0.00	0.00	0.00
16,300.00	90.00	179.51	12,593.50	-3,736.15	213.64	3,737.84	0.00	0.00	0.00
16,400.00	90.00	179.51	12,593.50	-3,836.14	214.51	3,837.84	0.00	0.00	0.00
16,500.00	90.00	179.51	12,593.50	-3,936.14	215.37	3,937.84	0.00	0.00	0.00
16,600.00	90.00	179.51	12,593.50	-4,036.14	216.23	4,037.84	0.00	0.00	0.00
16,700.00	90.00	179.51	12,593.50	-4,136.13	217.10	4,137.84	0.00	0.00	0.00
16,800.00	90.00	179.51	12,593.50	-4,236.13	217.96	4,237.84	0.00	0.00	0.00
16,900.00	90.00	179.51	12,593.50	-4,336.13	218.82	4,337.84	0.00	0.00	0.00
17,000.00	90.00	179.51	12,593.50	-4,436.12	219.69	4,437.84	0.00	0.00	0.00
17,100.00	90.00	179.51	12,593.50	-4,536.12	220.55	4,537.84	0.00	0.00	0.00
17,200.00	90.00	179.51	12,593.50	-4,636.11	221.41	4,637.84	0.00	0.00	0.00
17,300.00	90.00	179.51	12,593.50	-4,736.11	222.28	4,737.84	0.00	0.00	0.00
17,400.00	90.00	179.51	12,593.50	-4,836.11	223.14	4,837.84	0.00	0.00	0.00
17,500.00	90.00	179.51	12,593.50	-4,936.10	224.00	4,937.84	0.00	0.00	0.00
17,600.00	90.00	179.51	12,593.50	-5,036.10	224.87	5,037.84	0.00	0.00	0.00
17,700.00	90.00	179.51	12,593.50	-5,136.10	225.73	5,137.84	0.00	0.00	0.00
17,800.00	90.00	179.51	12,593.50	-5,236.09	226.59	5,237.84	0.00	0.00	0.00
17,900.00	90.00	179.51	12,593.50	-5,336.09	227.46	5,337.84	0.00	0.00	0.00
18,000.00	90.00	179.51	12,593.50	-5,436.08	228.32	5,437.84	0.00	0.00	0.00



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)	
18,100.00	90.00	179.51	12,593.50	-5,536.08	229.18	5,537.84	0.00	0.00	0.00	
18,200.00	90.00	179.51	12,593.50	-5,636.08	230.05	5,637.84	0.00	0.00	0.00	
18,300.00	90.00	179.51	12,593.50	-5,736.07	230.91	5,737.84	0.00	0.00	0.00	
18,400.00	90.00	179.51	12,593.50	-5,836.07	231.77	5,837.84	0.00	0.00	0.00	
18,500.00	90.00	179.51	12,593.50	-5,936.07	232.64	5,937.84	0.00	0.00	0.00	
18,600.00	90.00	179.51	12,593.50	-6,036.06	233.50	6,037.84	0.00	0.00	0.00	
18,700.00	90.00	179.51	12,593.50	-6,136.06	234.36	6,137.84	0.00	0.00	0.00	
18,800.00	90.00	179.51	12,593.50	-6,236.06	235.23	6,237.84	0.00	0.00	0.00	
18,900.00	90.00	179.51	12,593.50	-6,336.05	236.09	6,337.84	0.00	0.00	0.00	
19,000.00	90.00	179.51	12,593.50	-6,436.05	236.96	6,437.84	0.00	0.00	0.00	
19,100.00	90.00	179.51	12,593.50	-6,536.04	237.82	6,537.84	0.00	0.00	0.00	
19,200.00	90.00	179.51	12,593.50	-6,636.04	238.68	6,637.84	0.00	0.00	0.00	
19,300.00	90.00	179.51	12,593.50	-6,736.04	239.55	6,737.84	0.00	0.00	0.00	
19,400.00	90.00	179.51	12,593.50	-6,836.03	240.41	6,837.84	0.00	0.00	0.00	
19,500.00	90.00	179.51	12,593.50	-6,936.03	241.27	6,937.84	0.00	0.00	0.00	
19,600.00	90.00	179.51	12,593.50	-7,036.03	242.14	7,037.84	0.00	0.00	0.00	
19,700.00	90.00	179.51	12,593.50	-7,136.02	243.00	7,137.84	0.00	0.00	0.00	
19,800.00	90.00	179.51	12,593.50	-7,236.02	243.86	7,237.84	0.00	0.00	0.00	
19,900.00	90.00	179.51	12,593.50	-7,336.01	244.73	7,337.84	0.00	0.00	0.00	
20,000.00	90.00	179.51	12,593.50	-7,436.01	245.59	7,437.84	0.00	0.00	0.00	
20,100.00	90.00	179.51	12,593.50	-7,536.01	246.45	7,537.84	0.00	0.00	0.00	
20,200.00	90.00	179.51	12,593.50	-7,636.00	247.32	7,637.84	0.00	0.00	0.00	
20,300.00	90.00	179.51	12,593.50	-7,736.00	248.18	7,737.84	0.00	0.00	0.00	
20,400.00	90.00	179.51	12,593.50	-7,836.00	249.04	7,837.84	0.00	0.00	0.00	
20,500.00	90.00	179.51	12,593.50	-7,935.99	249.91	7,937.84	0.00	0.00	0.00	
20,600.00	90.00	179.51	12,593.50	-8,035.99	250.77	8,037.84	0.00	0.00	0.00	
20,700.00	90.00	179.51	12,593.50	-8,135.98	251.63	8,137.84	0.00	0.00	0.00	
20,800.00	90.00	179.51	12,593.50	-8,235.98	252.50	8,237.84	0.00	0.00	0.00	
20,900.00	90.00	179.51	12,593.50	-8,335.98	253.36	8,337.84	0.00	0.00	0.00	
21,000.00	90.00	179.51	12,593.50	-8,435.97	254.22	8,437.84	0.00	0.00	0.00	
21,100.00	90.00	179.51	12,593.50	-8,535.97	255.09	8,537.84	0.00	0.00	0.00	
21,200.00	90.00	179.51	12,593.50	-8,635.97	255.95	8,637.84	0.00	0.00	0.00	
21,300.00	90.00	179.51	12,593.50	-8,735.96	256.82	8,737.84	0.00	0.00	0.00	
21,400.00	90.00	179.51	12,593.50	-8,835.96	257.68	8,837.84	0.00	0.00	0.00	
21,500.00	90.00	179.51	12,593.50	-8,935.95	258.54	8,937.84	0.00	0.00	0.00	
21,600.00	90.00	179.51	12,593.50	-9,035.95	259.41	9,037.84	0.00	0.00	0.00	
21,700.00	90.00	179.51	12,593.50	-9,135.95	260.27	9,137.84	0.00	0.00	0.00	
21,800.00	90.00	179.51	12,593.50	-9,235.94	261.13	9,237.84	0.00	0.00	0.00	
21,900.00	90.00	179.51	12,593.50	-9,335.94	262.00	9,337.84	0.00	0.00	0.00	
22,000.00	90.00	179.51	12,593.50	-9,435.94	262.86	9,437.84	0.00	0.00	0.00	
22,100.00	90.00	179.51	12,593.50	-9,535.93	263.72	9,537.84	0.00	0.00	0.00	
22,200.00	90.00	179.51	12,593.50	-9,635.93	264.59	9,637.84	0.00	0.00	0.00	
22,300.00	90.00	179.51	12,593.50	-9,735.92	265.45	9,737.84	0.00	0.00	0.00	
22,400.00	90.00	179.51	12,593.50	-9,835.92	266.31	9,837.84	0.00	0.00	0.00	
22,500.00	90.00	179.51	12,593.50	-9,935.92	267.18	9,937.84	0.00	0.00	0.00	
22,600.00	90.00	179.51	12,593.50	-10,035.91	268.04	10,037.84	0.00	0.00	0.00	
22,700.00	90.00	179.51	12,593.50	-10,135.91	268.90	10,137.84	0.00	0.00	0.00	
22,800.00	90.00	179.51	12,593.50	-10,235.91	269.77	10,237.84	0.00	0.00	0.00	
22,900.00	90.00	179.51	12,593.50	-10,335.90	270.63	10,337.84	0.00	0.00	0.00	
23,000.00	90.00	179.51	12,593.50	-10,435.90	271.49	10,437.84	0.00	0.00	0.00	
23,100.00	90.00	179.51	12,593.50	-10,535.89	272.36	10,537.84	0.00	0.00	0.00	
23,200.00	90.00	179.51	12,593.50	-10,635.89	273.22	10,637.84	0.00	0.00	0.00	
23,300.00	90.00	179.51	12,593.50	-10,735.89	274.08	10,737.84	0.00	0.00	0.00	
23,400.00	90.00	179.51	12,593.50	-10,835.88	274.95	10,837.84	0.00	0.00	0.00	



MS Directional Planning Report



Database:	EDM 5000.15 Conroe DB	Local Co-ordinate Reference:	Well Goliath 24 FED COM 602H
Company:	Marathon Oil	TVD Reference:	WELL @ 3245.50usft (Cactus 171)
Project:	Lea County, New Mexico (NAD 27)	MD Reference:	WELL @ 3245.50usft (Cactus 171)
Site:	Goliath 24 FED COM Pad	North Reference:	Grid
Well:	Goliath 24 FED COM 602H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

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)	
23,500.00	90.00	179.51	12,593.50	-10,935.88	275.81	10,937.84	0.00	0.00	0.00	
23,600.00	90.00	179.51	12,593.50	-11,035.88	276.68	11,037.84	0.00	0.00	0.00	
23,700.00	90.00	179.51	12,593.50	-11,135.87	277.54	11,137.84	0.00	0.00	0.00	
23,800.00	90.00	179.51	12,593.50	-11,235.87	278.40	11,237.84	0.00	0.00	0.00	
23,900.00	90.00	179.51	12,593.50	-11,335.87	279.27	11,337.84	0.00	0.00	0.00	
24,000.00	90.00	179.51	12,593.50	-11,435.86	280.13	11,437.84	0.00	0.00	0.00	
24,100.00	90.00	179.51	12,593.50	-11,535.86	280.99	11,537.84	0.00	0.00	0.00	
24,200.00	90.00	179.51	12,593.50	-11,635.85	281.86	11,637.84	0.00	0.00	0.00	
24,300.00	90.00	179.51	12,593.50	-11,735.85	282.72	11,737.84	0.00	0.00	0.00	
24,400.00	90.00	179.51	12,593.50	-11,835.85	283.58	11,837.84	0.00	0.00	0.00	
24,500.00	90.00	179.51	12,593.50	-11,935.84	284.45	11,937.84	0.00	0.00	0.00	
24,600.00	90.00	179.51	12,593.50	-12,035.84	285.31	12,037.84	0.00	0.00	0.00	
24,700.00	90.00	179.51	12,593.50	-12,135.84	286.17	12,137.84	0.00	0.00	0.00	
24,800.00	90.00	179.51	12,593.50	-12,235.83	287.04	12,237.84	0.00	0.00	0.00	
24,900.00	90.00	179.51	12,593.50	-12,335.83	287.90	12,337.84	0.00	0.00	0.00	
25,000.00	90.00	179.51	12,593.50	-12,435.82	288.76	12,437.84	0.00	0.00	0.00	
25,100.00	90.00	179.51	12,593.50	-12,535.82	289.63	12,537.84	0.00	0.00	0.00	
25,200.00	90.00	179.51	12,593.50	-12,635.82	290.49	12,637.84	0.00	0.00	0.00	
25,230.04	90.00	179.51	12,593.50	-12,665.85	290.75	12,667.87	0.00	0.00	0.00	
PBHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
FTP_602H - hit/miss target - Shape - Point	0.00	0.00	0.00	170.21	179.91	377,900.83	781,049.26	32° 2' 8.592 N	103° 25' 34.940 W	- plan misses target center by 247.67usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)
SL_602H - plan hits target center - Point	0.00	0.00	0.00	0.00	0.00	377,730.62	780,869.35	32° 2' 6.923 N	103° 25' 37.046 W	
KOP_602H - plan hits target center - Point	0.00	0.00	12,116.04	170.21	179.91	377,900.83	781,049.26	32° 2' 8.592 N	103° 25' 34.940 W	
LTP_602H - plan hits target center - Point	0.00	0.00	12,593.50	-12,665.85	290.75	365,064.77	781,160.10	32° 0' 1.564 N	103° 25' 34.904 W	

Plan Annotations					
Measured Depth (usft)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Comment	
1,500.00	1,500.00	0.00	0.00	Begin 2.00°/100' Build	
1,614.65	1,614.62	1.58	1.67	Begin 2.29° Tangent	
7,690.28	7,685.38	168.63	178.24	Begin 2.00°/100' Drop	
7,804.93	7,800.00	170.21	179.91	Begin Vertical Hold	
12,120.96	12,116.04	170.21	179.91	Begin 12.00°/100' Build	
12,870.96	12,593.50	-307.24	184.03	Begin 90.00° Lateral	
25,230.04	12,593.50	-12,665.85	290.75	PBHL	

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Marathon
LEASE NO.:	NMNM65441
LOCATION:	Section 24, T.26 S, R.34 E., NMPM
COUNTY:	Lea County, New Mexico
WELL NAME & NO.:	Goliath 24 Fed Com 602H
SURFACE HOLE FOOTAGE:	269'/N & 1469'/W
BOTTOM HOLE FOOTAGE:	100'/S & 1650'/W

COA

H₂S	<input type="radio"/> Yes	<input checked="" type="radio"/> No		
Potash / WIPP	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P	<input type="checkbox"/> WIPP
Cave / Karst	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input type="radio"/> High	<input type="radio"/> Critical
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both	<input type="radio"/> Diverter
Cementing	<input type="checkbox"/> Primary Squeeze	<input type="checkbox"/> Cont. Squeeze	<input type="checkbox"/> EchoMeter	<input type="checkbox"/> DV Tool
Special Req	<input type="checkbox"/> Break Testing	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit
Variance	<input checked="" type="checkbox"/> Flex Hose	<input type="checkbox"/> Casing Clearance	<input type="checkbox"/> Pilot Hole	<input type="checkbox"/> Capitan Reef
Variance	<input type="checkbox"/> Four-String	<input type="checkbox"/> Offline Cementing	<input type="checkbox"/> Fluid-Filled	<input type="checkbox"/> Open Annulus
<input type="checkbox"/> Batch APD / Sundry				

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 must meet all requirements from **43 CFR 3176**, 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 **1042** feet (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite, above the salt, and below usable fresh water) 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 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.
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 tail cement slurry due to cave/karst.
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 casing shoe shall be **10,000 (10M) psi**. **Variance is approved to use a 5000 (5M) Annular which shall be tested to 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 43 CFR 3172 must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Santa Fe Office, 301 Dinosaur Trail Santa Fe, New Mexico 87508, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the

signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.

- The operator will submit an as-drilled survey well plat of the well completion, but are not limited to, those specified in 43 CFR 3171 and 3172.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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

Email or call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, BLM_NM_CFO_DrillingNotifications@BLM.GOV
(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. In the event the operator has proposed 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. When the operator proposes 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 **43 CFR part 3170 Subpart 3172** 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 integrity 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 integrity 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 **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.
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 **43 CFR part 3170 Subpart 3172** 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 cement), 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 cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)
 - c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** 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 **43 CFR part 3170 Subpart 3172**.

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.

ZS 9/28/2023

Drilling Operations **H2S Contingency Plan**



Marathon Oil Permian, LLC.
4111 South Tidwell Rd
Carlsbad, NM 88220
575-323-9441

EMERGENCY MEDICAL PROCEDURES

DO NOT PANIC

REMAIN CALM-THINK

1. HOLD YOUR BREATH. (DO NOT INHALE, STOP BREATHING)
2. PUT ON BREATHING APPARATUS. (NOTE: DO NOT ATTEMPT RESCUE UNTIL YOU HAVE PUT ON BREATHING APPARATUS.)
3. REMOVE VICTIM (S) TO FRESH AIR AS QUICKLY AS POSSIBLE.
4. BE SURE YOU HAVE MOVED VICTIM OUT OF CONTAMINATED AREA BEFORE REMOVING YOUR RESPIRATOR.
5. APPLY MOUTH-TO-MOUTH ARTIFICIAL RESPIRATION, WHICH IS MORE EFFECTIVE, WHILE SOMEONE ELSE GETS THE OXYGEN RESUSCITATOR. RENDER OXYGEN RESUSCITATION ONLY IF PROPERLY TRAINED IN ITS USE.
6. PROVIDE FOR PROMPT TRANSPORTATION TO HOSPITAL AND CONTINUE GIVING ARTIFICIAL RESPIRATION IF NEEDED.
7. HOSPITAL (S) OR MEDICAL FACILITIES NEED TO BE INFORMED BEFOREHAND, OF THE POSSIBILITY OF H₂S GAS POISONING, NO MATTER HOW REMOTE THE POSSIBILITY IS.

Lea Regional Medical Center	(575)492-5000
5419 N Lovington Hwy, Hobbs, NM 88240	
AMBULANCE	911
FIRE DEPARTMENT- HOBBS, NM	(575) 397-9308
POLICE - HOBBS, NM	(575) 397-9265

8. NOTIFY EMERGENCY-ROOM PERSONEL THAT THE VICTIM (S) HAVE POSSIBLY BEEN EXPOSED TO H₂S GAS POISONING.

H2S DRILLING OPERATIONS PLAN INDEX

- I. INTRODUCTION
 - A. Oil Company Address and Legal Description of Well Site
 - B. Directions to Well Site
 - C. Purpose of Plan
- II. SAFETY EQUIPMENT
 - A. Safety Equipment Provided by TOTAL SAFETY INC.
 - B. Type of Equipment and Storage Locations
 - C. Maximum Number of People on Location at any one time
- III. OPERATING PROCEDURES
 - A. Blowout Prevention Measures During Drilling
 - B. Gas Monitoring Equipment
 - C. Crew Training and Protection
 - D. Metallurgical Considerations
 - E. Mud Program and Treating
 - F. Well Control Equipment
- IV. OPERATING CONDITIONS
 - A. Definition of Warning Flags
 - B. Circulating Out Kick (Wait and Weight Method)
 - C. Coring Operations in H2S Bearing Zones
- V. EMERGENCY PROCEDURES
 - A. Sounding Alarm
 - B. Drilling Crew Actions
 - C. Responsibilities of Personnel
 - D. Steps to be Taken
 - E. Company and Contract Personnel
 - F. Leak Ignition
 - G. General Equipment
 - H. Critical Operations

VI. LIST OF APPENDICES

- A. Emergency and Medical Facilities
- B. Law Enforcement Agencies and Fire Fighting Facilities
- C. Well Control Specialists
- D. Governmental Agencies

VII. RESIDENTS AND LANDOWNERS

- A. Radius of Exposure Map with Residences Shown
- B. Residents Within Radius of Exposure and Telephone Numbers

VIII. ADDITIONAL INFORMATION

- A. Hydrogen Sulfide Essay
- B. Hydrogen Sulfide Hazards
- C. Toxicity Table
- D. Treatment
- E. Characteristics of H₂S
- F. Safe Practices

INTRODUCTION

H2S DRILLING OPERATIONS PLAN

Action Plan for Accidental Release of H2S
written specifically for:

Marathon Oil Permian, LLC.

4111 South Tidwell Rd
Carlsbad, NM 88220
575-323-9441

Information, provisions and practices, as set forth in this plan, may be
subject to revision and/or updating.

H2S CONTINGENCY PLAN

Marathon Oil Permian, LLC.
4111 South Tidwell Rd
Carlsbad, NM 88220

PAD NAME: Goliath 24 Fed Com West Pad

WELLS: Goliath 24 Fed Com #301H
Goliath 24 Fed Com #302H
Goliath 24 Fed Com #601H
Goliath 24 Fed Com #602H
Goliath 24 Fed Com #701H
Goliath 24 Fed Com #702H

PURPOSE OF PLAN: The purpose of this plan is to safeguard the lives of the public, contract personnel and company personnel in the event of equipment failure or disasters during drilling or completion operations in formations that may contain Hydrogen Sulfide Gas, H₂S.

As a precautionary measure, this Drilling Plan has been prepared to assure the safety of all concerned, should a disaster occur. However, the Oil Company Representative may have specified materials and practices for the drilling or completion of this well, which supersede the minimum requirements as outlined in this plan.

DRIVING DIRECTIONS

DRIVING DIRECTIONS

GOLIATH 24 FED COM (EAST)

SEC. 24 TWP. 26-S RGE. 34-E

SURVEY: N.M.P.M.

COUNTY: LEA

OPERATOR: MARATHON OIL PERMIAN LLC

U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.

FROM THE INTERSECTION OF NW COUNTY RD AND US 180 W/US 62 W IN HOBBS COUNTY, NEW MEXICO, HEAD WEST 5.0 MILES TO NM 8 S. TURN LEFT ONTO NM 8 S HEADING SOUTH FOR 15.7 MILES TO NM 176 W . TURN RIGHT ONTO NM 176 W HEADING WEST 2.0 MILES TO WEAVER ROAD. TURN LEFT ONTO WEAVER ROAD HEADING SOUTH FOR 5.0 MILES TO DELAWARE BASIN RD. TURN RIGHT ONTO DELAWARE BASIN RD HEADING WEST AND SOUTH 24.6 MILES TO NM 128 E. TURN LEFT ONTO NM 128 E HEADING SOUTH FOR 0.2 MILE AND CONTINUING ON NM 128 E FOR 9.5 MILES TO AN EXISTING LEASE ROAD. TURN RIGHT ONTO EXISTING LEASE ROAD SOUTH FOR 3.9 MILES. TURN LEFT ON EXISTING LEASE ROAD FOR 3.4 MILES TO ANTHONY ROAD. TURN RIGHT ONTO ANTHONY ROAD HEADING WEST FOR 2.7 MILES TO AN EXISTING LEASE ROAD TO THE LEFT. TURN LEFT ON EXISTING LEASE ROAD HEADING SOUTHWEST FOR 2.1 MILES TO EXISTING LEASE ROAD TO THE RIGHT. TURN RIGHT ONTO EXISTING LEASE ROAD HEADING SOUTH WEST FOR 0.9 MILE TO AN INTERSECTION AND CONTINUE STRAIGHT ON EXISTING LEASE ROAD FOR 0.2 MILE TO THE PROPOSED LEASE ROAD OF THE PROPOSED EAST GOLIATH 24 FED COM WELL PAD. TRAVEL 319 FEET TO ENTER SAID PROPOSED PAD AT THE SOUTHEAST CORNER OF PAD.

PLAN DEFINITIONS

For the purpose of this plan the following definitions are to be referred to:

Controlled Release – Any release that is planned and occurs during normal operations. A controlled release is managed per the procedures outlined in this section.

Uncontrolled Release – Any release that is unplanned and not immediately contained utilizing established shut-in procedures. An uncontrolled release is normally associated with a loss of well control.

SCBA – (Self Contained Breathing Apparatus) – A full-face mask respirator with a supplied positive pressure air source.

Donned SCBA – When it is required per this plan to “**don**” a SCBA, personnel will be 100% masked up and be on supplied breathing air.

SCBA On Person – When it is required per this plan to have SCBA “on person”, personnel will be required to wear the SCBA equipment - but not be masked up.

“Qualified Buddy” – Person who has been fit tested and is trained and is familiar with the requirements of donning an SCBA. This person will provide immediate assistance to another person who may be utilizing an SCBA or SkaPack in an IDLH atmosphere in the event of an emergency situation.

In Scope Personnel – Rig Personnel who will be working or otherwise present in potential H2S release areas, including the rig floor, cellar, pits, and shaker areas. This would not include 3rd party contractors who do not have a function, besides evacuating the rig, during an emergency condition such as during a well control event or H2S / LEL alarm. All qualified personnel that have a function to shut a well in during an emergency will be considered In-Scope per this plan.

Out of Scope Personnel - All personnel that are not in scope will be Out of Scope per the definition of this plan

H2S Office - On-site office trailer space or vehicle that will be designated as the H2S office.

Marathon H2S Plan Custodian - Marathon HES Advisor, Supervisor or Technician that has been specifically assigned per the authorization page of this plan to maintain this document.

SAFETY EQUIPMENT

All H2S related Safety Equipment must be installed, tested and Operational at a depth of 500 fee above, or 3 days prior to penetrating the first zone expected to contain H2S.

<u>QTY</u>	<u>EQUIPMENT</u>
6 each	30-minute self-contained breathing apparatus
6 each	ELSA Escape Packs
1 Lot	Sufficient low-pressure airline hose with quick connects
1	6 Channel fixed H2S monitor
4	H2S Sensors (Loc determined at rig up – General: Cellar, Shale Shaker, floor/driller area)
4	Explosion proof Alarm Station (1-Drill Floor, 1- Pits/Shakers, 1- Generators, 1 Quarters area)
10	Personal H2S Monitors
1	Gastec pump type gas detector
Set	Various range of H2s & SO2 detector tubes
2 each	Windsocks w/frames and poles
1 Set	H2S and briefing area signs
1 Set	Well condition signs and flags
1	Flare Gun & Flares

TYPE OF EQUIPMENT AND STORAGE LOCATIONS

1. There will be six 30-minute self-contained breathing apparatus on location. They will be positioned as follows: Two at Briefing Area #1 Two at Briefing Area#2, Two at rig dog house. SCBA Facepieces will be equipped with voice amplifiers for effective means of communication when using protective breathing apparatus.
2. There will be six Escape-type packs on location. One for the Derrickman. One on the Shaker. One at the bottom of rig dog house stairway and spares.
3. A Gastec, pump type, gas detector with low and high range detector tubes for H2S and SO2 will be located in the doghouse
4. Two Briefing Areas will be designated at opposite ends of the location.
5. The Briefing Area most upwind is designated as the Safety Briefing Area #1. In an emergency, personnel must assemble at this upwind area for instructions from their supervisor.
6. The H2S ‘Safety’ trailer provided by Total Safety, Inc. will contain a cascade system of at least 5 each -300 C.F. air cylinders that will provide a continuous air supply to air lines located on the rig. Note: This trailer will **Only** be provided if H2S conditions require the use of the Air Trailer. (If Required)
7. Two windsocks will be installed so as to be visible from all parts of the location.
8. A well condition warning sign will be displayed at the location entrance to advise of current operating conditions. The condition signs must be at least 200’ from the entrance but not more than 500’ away.
9. A list of emergency telephone numbers will be kept on rig floor, tool pusher’s trailer, the Oil Company’s trailer and in the “safety” trailer (if Provided).

10. The primary means of communication will be cell phones.
11. A barricade will be available to block the entrance to location should an emergency occur. In most cases the use of a vehicle is used to block the entrance.
12. A 6-channel H₂S monitor will be located in the doghouse. The 3 sensors will be installed: one on the shale shaker, one at the Cellar, one at the rig floor.
13. An undulating high and low pitch siren and light will be installed on the derrick "A" leg.
14. If H₂S concentration reach 10 ppm an explosion-proof bug blower (fan) will be installed under the rig floor to disperse possible accumulations of H₂S.
15. Any time it is necessary to flare gas containing H₂S, a Sulfur Dioxide monitor, or Detector tubes will be used to determine SO₂ concentrations.
16. A flare gun with flares will also be provided in the event it is necessary to ignite the well from a safe distance.

OPERATING PROCEDURES

BLOWOUT PREVENTION MEASURES DURING DRILLING

1. Blowout Prevention Requirements:

All BOP equipment shall meet the American Petroleum Institute specifications as to materials acceptable for H₂S service and tested accordingly (or to BLM specifications).

2. Drilling String Requirements:

All drill string components are to be of material that meets the American Petroleum Institute's specifications for H₂S service. All drill string components should be inspected to IADC critical service specifications prior to running in well.

GAS MONITORING EQUIPMENT

1. A continuous H₂S detection system, consisting of three H₂S detectors and an audible/visual warning system will be in operating during all phases of this H₂S Drilling Operations Plan. The detection system will be adjusted and calibrated such that an H₂S exposure of 10 ppm or higher (at any sensor) will trigger the audible and visual portion (wailing or yelping siren) of the warning system (i.e. H₂S continually present at or above threshold levels) a trained operator or H₂S supervisor will monitor the H₂S detection system.

2. When approaching or completing H₂S formations, crewmembers may attach personnel H₂S monitors to their person.

3. Hand held H₂S sampling gas detectors will be used to check areas not covered by automatic monitoring equipment.

CREW TRAINING AND PROTECTION

1. All personnel working at the well site will be properly trained in accordance with the general training requirements outlined in the API Recommended Practices for Safe Drilling of Wells Containing H₂S. The training will cover, but will not be limited to, the following:
 - a. General information of H₂S AND SO₂ GAS
 - b. Hazards of these gases
 - c. Safety equipment on location
 - d. Proper use and care of personal protective equipment
 - e. Operational procedures in dealing with H₂S gas
 - f. Evacuation procedures
 - g. First aid, reviving an H₂S victim, toxicity, etc.
 - h. Designated Safe Briefing Areas
 - i. Buddy System
 - j. Regulations
 - k. Review of Drilling Operations Plan
2. Initial training shall be completed when drilling reaches, a depth of 500' above or 3 days prior to penetrating (whichever comes first) the first zone containing or expected to contain H₂S. It must also include a review of the site specific Drilling Operations Plan and, if applicable, the Public Protections Plan.
3. Weekly H₂S and well control drills for all personnel on each working crew shall be conducted.
4. All training sessions and drills shall be recorded on the driller's log or its equivalent.
5. Safety Equipment:

As outlined in the Safety Equipment index, H₂S safety protection equipment will be available to/or assigned each person on location.
6. One person (by job title) shall be designated and identified to all on-site personnel as the person primarily responsible for the overall operation of the on-site safety and training programs. This will be the PIC

METALLURGICAL CONSIDERATIONS

1. Steel drill pipe used in H₂S environments should have yield strength of 95,000psi or less because of potential embrittlement problems. Must conform to the current National Association of Corrosion Engineers (NACE) Standard MR-0175-90, Material Requirement, Sulfide Stress Cracking Resistant Metallica Material for Oil Field Equipment. Drill stem joints near the top of the drill string are normally under the highest stress levels during drilling and do not have the protection of elevated down hole temperatures. These factors should be considered in design of the drill string. Precautions should be taken to minimize drill string stress caused by conditions such as excessive dogleg severity, improper torque, whip, abrasive wear or tool joints and joint imbalance. American Petroleum Institute, Bulletin RR 7G, will be used as a guideline for drill string precautions.
2. Corrosion inhibitors may be applied to the drill pipe or to the mud system as an additional safeguard.
3. Blowout preventors should meet or exceed the recommendations for H₂S service as set forth in the latest edition of API RI 53.

MUD PROGRAM AND TREATING

1. It is of utmost importance that the mud be closely monitored for detection of H₂S and reliability of the H₂S treating chemicals.
2. Identification and analysis of sulfides in the mud and mud filtrates will be carried out per operators prescribed procedures.
3. The mud system will be pre-treated with Zinc Carbonate, Ironite Sponge or similar chemicals of H₂S control prior to drilling into the H₂S bearing formation. Sufficient quantities of corrosion inhibitor should be on location to treat the drill string during Drill Stem Test Operations. Additionally, Aqua Ammonia should be on hand to treat the drill string for crew protection, should H₂S be encountered while tripping string following drill stem testing

WELL CONTROL EQUIPMENT

1. Flare System
 - a. A flare system shall be designed and installed to safely gather and burn H₂S Bearing gas.
 1. Flare lines shall be located as far from the operating site as feasible and in a manner to compensate for wind changes.
 2. The flare line mouth shall be located not less then 150' from wellbore.
 3. Flare lines shall be straight unless targeted with running tees.
 4. Flare Gun & Flares to ignite the well
2. Remote Controlled Choke
 - a. A remote controlled choke shall be installed for all H₂S drilling and where feasible for completion operations. A remote controlled valve may be used in lieu of this requirement for completions operations.
3. Mud-gas separators and rotating heads shall be installed and operable for all exploratory wells.

OPERATING CONDITIONS

A Well Condition Sign and Flag will be posted on all access roads to the location. The sign shall be legible and large enough to be read by all persons entering the well site and be placed a minimum of 200' but no more than 500' from the well site which allows vehicles to turn around at a safe distance prior to reaching the site.

DEFINITION OF WARNING FLAGS

1. Condition:
GREEN-NORMAL OPERATIONS
Any operation where the possibility of encountering H₂S exists but no H₂S has been detected.
2. Condition:
YELLOW-POTENTIAL DANGER, CAUTION
Any operation where the possibility of encountering H₂S exists and in all situations where concentrations of H₂S are detected in the air below the threshold level (10ppm)
 - a. Cause of condition:
 - *Circulating up drill breaks
 - *Trip gas after trip
 - *Circulating out gas on choke
 - *Poisonous gas present, but below threshold concentrations
 - *Drill stem test
 - b. Safety Action:
 - *Check safety equipment and keep it with you
 - *Be alert for a change in condition
 - *Follow instructions
3. Condition:
RED-EXTREME DANGER
Presence of H₂S at or greater than 10ppm. Breathing apparatus must be worn.
 - a. Safety action:

*MASK UP. All personal will have protective breathing equipment with them. All nonessential personnel will move to the Safe Briefing Area and stay there until instructed to do otherwise. All essential Qualified Personnel, using the "Buddy System" (those necessary to maintain control of the well) will don breathing apparatus to perform operations related to well control.

The decision to ignite the well is the responsibility of the operator's on-site representative and should be made only as a last resort, when it is clear that:

- *human life is endangered
- *there is no hope of controlling the well under prevailing conditions

Order evacuation of local people within the danger zone. Request help from local authorities, State Police, Sheriff's Dept. and Service Representative.

CIRCULATING OUT KICK (WAIT AND WEIGHT METHOD)

If it is suspected that H₂S is present with the gas whenever a kick is taken, the wait and weight method of eliminating gas and raising the mud will be followed.

1. Wait and Weight Method:
 - a. The wait and Weight Method is:
 - *increase density of mud in pits to 'kill' weight mud.
 - *open choke and bring pump to initial circulating pressure by holding casing pressure at original valve until pump is up to predetermined speed.
 - *when initial circulating pressure is obtained on drill pipe, zero pump stroke counter and record time.
 - *reduce drill pipe pressure from initial circulating pressure to final circulating pressure by using pump strokes and/or time according to graph
 - *when 'kill' weight mud is at the bit, hold final circulating pressure until kill weight mud is to surface.
 - b. If a kick has occurred, the standard blowout procedure will be followed and the wait and weight method will be used to kill the well. When the well has been put on the choke and circulation has been established, the following safety procedure must be established.
 - *determine when gas is anticipated to reach surface.

- *all non-essential personnel must be moved to safe briefing area
- *all remaining personnel will check out and keep with them their protective breathing apparatus.
- *mud men will see that the proper amount of H₂S scavenging chemical is in the mud and record times checked
- *make sure ignition flare is burning and valves are open to designated flare stacks

CORING OPERATIONS IN H₂S BEARING ZONES

1. Personal protective breathing apparatus will be worn from 10 to 15 stands in advance of retrieving the core barrel. Cores to be transported should be sealed and marked to the presence of H₂S.
 - a. Yellow Caution Flag will be flown at the well condition sign.
 - b. The "NO SMOKING" rule will be enforced

DRILL STEM TESTING OF H₂S ZONES

1. The DST subsurface equipment will be suitable for H₂S service as recommended by the API
2. Drill stem testing of H₂S zone will be conducted in daylight hours
3. All non-essential personnel will be moved to an established safe area or off location
4. The "NO SMOKING" rule will be enforced
5. DST fluids will be circulated through a remote-controlled choke and a separator to permit flaring of gas. A continuous pilot light will be used.
6. A yellow or red flag will be flown at entrance to location depending on present gas condition
7. If warranted, the use of Aqua Ammonia for neutralizing the toxicity of H₂S from drill string
 - a. During drill stem tests adequate Filming Amine for H₂S corrosion and Aqua Ammonia for neutralizing H₂S should be on location.
8. On completion of DST, if H₂S contaminated formation fluids or gases are present in drill string, floor workers will be masked up before test valve is removed from drill string and continue "mask on" conditions until such time that readings in the work area do not exceed 10ppm of H₂S gas.

U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, N.M.



700'

340'

CLOSE LOOP SYSTEM

PHASE 2 PROPOSED WELL PAD

PROPOSED LEASE ROAD

180'

700'

180'

NOTE:
THIS IS NOT A BOUNDARY SURVEY, APPARENT
PROPERTY CORNERS AND PROPERTY LINES ARE
SHOWN FOR INFORMATION ONLY. BOUNDARY DATA
SHOWN IS FROM STATE OF NEW MEXICO OIL
CONSERVATION DIVISION FORM C-102 INCLUDED
IN THIS SUBMITTAL.

02-20-2023



5	02/17/2023	ANC
REV.	DATE	BY

SHEET 5 OF 6

PREPARED BY:
R-SQUARED GLOBAL, LLC
510 THRENTON ST.
WEST MONROE, LA 71291
318-323-6900 OFFICE
JOB No. R4287-002

H2S CONTINGENCY PLAN PREPAREDNESS

H2S SENSOR	ELSA ESCAPE PACKS
- Cellar	- Pits
- Rig Floor	- Trip Tanks
- Shaker Skid	- Accumulator
- Bell Nipple	- 4 Rig Floor
WIND SOCK	30 MINUTE SCBA
- Dog House	- 3 Briefing Areas
- Company Rep Trailer	- 3 Alternate Briefing
H2S CONDITION SIGN	Areas
- Entrance	

EMERGENCY PROCEDURES

SOUNDING ALARM

In case of an alarm the crews will muster up at the designated area. Total Safety will be dispatched with (2) HES Techs who are to go in under protective breathing air and check the alarm readings and sniff ambient air for the presence of H₂S.

By no means are the Co. Rep or HES Advisor to go in under air with the HES Tech. If there is another method in place where the Rig Manager is to go in with the Tech we need to ensure that the rig company has cleared them and that they are properly trained.

1. The fact is to be instilled in the minds of all rig personnel that the sounding alarm means only one thing: H₂S IS PRESENT. Everyone is to proceed to his assigned station and the contingency plan is put into effect.

DRILLING CREW ACTIONS

1. All personnel will don their protective breathing apparatus. The driller will take necessary precautions as indicated in operating procedures.
2. The Buddy system will be implemented. All personnel will act upon directions from the operator's on-site representative.
3. If there are non-essential personnel on location, they will move off location.
4. Entrance to the location will be patrolled, and the proper well condition flag will be displayed at the entrance to the location.

RESPONSIBILITIES OF PERSONNEL

In order to assure the proper execution of this plan, it is essential that one person be responsible for and in complete charge of implementing these procedures. The responsibility will be as follows:

1. The operator's on-site representative or his assistant
2. Contract Tool Pusher

STEPS TO BE TAKEN

In the event of an accidental release of a potentially hazardous volume of H₂S, the following steps will be taken:

1. Contact by the quickest means of communications: the main offices of Oil Company & Contractor as listed on the preceding page.
2. An assigned crewmember will blockade the entrance to the location. No unauthorized personnel will be allowed entry into the location.
3. The operator's on-site representative will remain on location and attempt to regain control of the well.
4. The drilling company's rig superintendent will begin evacuation of those persons in immediate danger. He will begin by telephoning residents in the danger zone. In the event of no contact by telephoning, the tool pusher will proceed at once to each dwelling for a person-to-person contact. In the event the tool pusher cannot leave the location, he will assign a responsible crewmember to proceed in the evacuation of local residents. Upon arrival, the Sheriff's Department and TOTAL SAFETY personnel will aid in further evacuation.

LEAK IGNITION

Leak Ignition procedure: (used to ignite a leak in the event it becomes necessary to protect the public)

1. Two men, the operator's on-site representative and the contractor's rig superintendent or TOTAL SAFETY's representative(s), wearing self-contained pressure demand air masks must determine the perimeter of the flammable area. This should be done with one man using an H₂S detector and the other one using a flammable gas detector. The flammable perimeter should be established at 30% to 40% of the lower flammable limits.
2. After the flammable perimeter has been established and all employees and citizens have been removed from the area, the ignition team should move to the up-wind area of the leak perimeter and fire a flare into the area if the leak isn't ignited on the first attempt, move in 20 to 30 feet and fire again. Continue moving in and firing until the leak is ignited or the flammable gas detector indicates the ignition.

- team is moving into the hazardous area. If trouble is incurred in igniting the leak by firing toward the leak, try firing 40 degrees to 90 degrees to each side of the area where you have been firing. If still no ignition is accomplished ignite the copper line burner and push it into the leak area. This should accomplish ignition. If ignition is not possible due to the makeup of the gas, the toxic leak perimeter must be established and maintained to insure evacuation is completed and continue until the emergency is secure.
3. The following equipment and man-power will be required to support the ignition team:
 - a. one flare gun with flares
 - b. four pressure demand air packs
 - c. two nylon ropes tied to the ignition team
 - d. two men in a clear area equipped with air packs
 - e. portable propane bottle with copper line
 4. The person with the final authority to ignite the well.

GENERAL EQUIPMENT

1. Two areas on the location will be designated as Briefing Areas. The one that is upwind from the well will be designated a the "Safe Briefing Area"
2. In the case of an emergency, personnel will assemble in the upwind area as per prior instructions from the operator's representative.
3. The H2S "Safety" trailer provide by TOTAL SAFETY will contain 10 air cylinders, a resuscitator, one 30-minute air pack and will have a windsock.
4. Two other windsocks will be installed.
5. A condition warning sign will be displayed at the location entrance.
6. A list of emergency telephone numbers will be kept on the rig floor, tool pusher's trailer and the Oil Company's trailer.
7. Two barricades will be available to block the entrance to location.
8. An undulating high and low pitch siren will be installed.
9. A telephone line or mobile phone will be available at the well site for incoming and outgoing communications.

CRITICAL OPERATIONS

These guidelines will be implemented during H2S alarms on drilling locations with the intent of minimizing catastrophic damage of “**critical tasks**” ONLY and exposure of field personnel (e.g. cement in the stack). We will wait on Total Safety (or H2S Safety Company) for all other alarm events that aren't defined as “critical”.

- 1.) H2S alarm sounds, crews secure well, and muster based off of wind direction. MOC Operation, MOC Safety, and H2S service company notification will be made and representative from the H2S Service Company is in route to location.
- 2.) Two qualified in scope personnel will don SCBA, utilizing the "buddy system", and respond to area of H2S alarm location to verify the presence of H2S utilizing hand held four gas analyzer or other approved and provided method.
- 3.) If no H2S is found, the “all clear” will be authorized by the Marathon Oil Drilling Superintendent and HES to resume operations. H2S service company will still be required to respond.

Note: Personnel will return to muster area awaiting H2S service company and additional equipment if H2S is verified.

Note: Personnel will be trained annually on H2S and the elements of this guideline. The MOC HES Advisor and Co Man will receive hands on training from a H2S service company field tech, on how to properly identify the location of the alarming sensor, and the proper method for checking the alarmed area.

APPENDICES

EMERGENCY & MEDICAL FACILITIES:

Marathon Oil Corporation Emergency Numbers			
Eric Pulpan	Drilling Manager	epulpan@marathonoil.com	713-296-2985
Allen Livingston	Drilling Superintendent	alivingston@marathonoil.com	
Joshua Love	Drilling Superintendent	jlove@marathonoil.com	405-657-6126
Matt McGaugh	Drilling Engineer	jmmcgaugh@marathonoil.com	713-397-6190
Court Nelson	Drilling Engineer	cnelson1@marathonoil.com	406-565-0604
Scott Schmidt	Drilling Engineer	sschmidt1@marathonoil.com	
Don Eynon	Drilling Engineer	deenyon@marathonoil.com	713-296-3265
Joe Olivas	HES Professional	jolivas@marathonoil.com	713-296-3999
Jeremy Wilson	Lead HES Advisor	pbcomphe2@marathonoil.com	940-507-1991
Scott Doughty	Lead HES Advisor	pbcomphe2@marathonoil.com	281-772-0843
Cactus Rig 169	Company Man	cactus169@marathonoil.com	
Cactus Rig 170	Company Man	cactus170@marathonoil.com	
Cactus Rig 171	Company Man	cactus171@marathonoil.com	

Emergency Services Area Numbers: Or Call 911			
Sheriff (Eddy County, NM)	575-887-7551	New Mexico Poison Control	800-222-1222
Sheriff (Lea County, NM)	575-396-3611	Border Patrol (Las Cruces, NM)	575-528-6600
New Mexico State Police	575-392-5580/5588	Energy Minerals & Natural Resources Dept.	575-748-1283
Carlsbad Medical Center	575-887-4100	Environmental Health Dept.	505-476-8600
Lea Regional Medical Center	575-492-5000	OSHA (Santa Fe, NM)	505-827-2855
Police (Carlsbad, NM)	575-885-2111		
Police (Hobbs, NM)	575-392-9265		
Fire (Carlsbad, NM)	575-885-3124		
Fire (Hobbs, NM)	575-397-9308		
Ambulance Service	911	TOTAL SAFETY H2S – SAFETY SERVICES	432-561-5049

For Life Flight, 1st dial “911” They will determine nearest helicopter and confirm the need for helicopter.

ADDITIONAL INFORMATION

A. HYDROGEN SULFIDE ESSAY

A deadly enemy of those people employed in the petroleum industry, this gas can paralyze or kill quickly. At least part of the answer lies in education in the hazards, symptoms, characteristics, safe practices, treatment, and the proper use of personal protective equipment.

B. HYDROGEN SULFIDE HAZARDS

The principal hazard to personnel is asphyxiation or poisoning by inhalation. Hydrogen Sulfide is a colorless, flammable gas having an offensive odor and a sweetish taste. It is highly toxic and doubly hazardous because it is heavier than air (specific gravity = 1.19). Its offensive odor, like that of a rotten egg, has been used as an indicator by many old timers in the oil field, but is not a reliable warning of the presence of gas in a dangerous concentration because people differ greatly in their ability to detect smells. Where high concentrations are encountered, the olfactory nerves are rapidly paralyzed, diluting the sense of smell as a warning indicator. A concentration of a few hundredths of one percent higher than that causing irritation can cause asphyxia and death—in other words there is a very narrow margin between consciousness and unconsciousness, and between unconsciousness and death.

Where high concentrations cause respiratory paralysis, spontaneous breathing does not return unless artificial respiration is applied. Although breathing is paralyzed the heart may continue beating for ten minutes after the attack.

C. PHYSIOLOGICAL SYSTEMS

ACUTE: results in almost instantaneous asphyxia, with seeming respiratory paralysis acute poisoning, or strangulation, may occur after even a few seconds inhalation of high concentration and results in panting respiration, pallor, cramps, paralysis and almost immediate loss of consciousness with extreme rapidity from respiratory and cardiac paralysis. One breath of a sufficiently high concentration may have this result.

SUBACUTE: RESULTS IN IRRITATION, PRINCIPALLY OF THE EYES, PERSISTENT COUGH, TIGHTENING OR BURNING IN THE CHEST AND SKIN IRRITATION FOLLOWS BY DEPRESSION OF THE CENTRAL NERVOUS SYSTEM. The eye irritation ranges in severity from mild conjunctivitis to swelling and bulging of the conjunctiva photophobia (abnormal intolerance of light) and temporary blindness.

D. TREATMENT

1. Victim should be removed to fresh air immediately by rescuers wearing respiratory protective equipment. Protect yourself while rescuing.
2. If the victim is not breathing, begin immediately to apply artificial respiration. (See other chart for the chances for life after breathing has stopped.) If a resuscitator is available let another employee get it and prepare for use.
3. Treat for shock, keep victim warm and comfortable
4. Call a doctor, in all cases, victims of poisoning should be attended by a physician.

E. CHARACTERISTICS OF H₂S

1. Extremely Toxic (refer to chart for toxicity of Hydrogen Sulfide).
2. Heavier than air. Specific gravity= 1.19.
3. Colorless, has odor of rotten eggs.
4. Burns with a blue flame and produces sulfur Dioxide (SO₂) gas, which is very irritating to eyes and lungs. The SO₂ is also toxic and can cause serious injury.
5. H₂S is almost as toxic as hydrogen cyanide.
6. H₂S forms explosive mixture, with air between 4.3% and 46% by volume.
7. Between 5 and 6 times as toxic as carbon monoxide.
8. Produces irritation to eyes, throat, and respiratory tract.
9. Threshold Limit Value (TLV) maximum of eight hours exposure without protective respiratory equipment-10ppm.

F. SAFE PRACTICES

If you are faced with an H₂S problem in your operations, the following safe practices are recommended:

1. Be absolutely sure all concerned are familiar with the hazards concerning H₂S and how to avoid it.
2. All employees should know how to operate and maintain respiration equipment.
3. Be able to give and demonstrate artificial respiration.
4. Post areas where there is poisonous gas with suitable warning signs.
5. Be sure all new employees are thoroughly schooled before they are sent to the field-tomorrow may be too late.
6. Teach men to avoid gas whenever possible-work on the windward side, have fresh air mask available.
7. Never let bad judgment guide you-wear respiratory equipment when gauging tanks, etc. Never try to hold your breath in order to enter a contaminated atmosphere.
8. In areas of high concentration, a two-man operation is preferred.
9. Never enter a tank, cellar or other enclosed place where gas can accumulate without proper respiratory protective equipment and a safety belt secured to a lifeline held by another person outside.
10. Always check out danger areas first with H₂S detectors before allowing anyone to enter. DO NOT TRY TO DETERMINE THE PRESENCE OF GAS BY its ODOR.
11. Wear proper respiratory equipment for the job at hand. Never take a chance with equipment with which you are unfamiliar. If in doubt, consult your supervisor.
12. Carry out practice drills every month with emergency and maintenance breathing air equipment. Telling or showing a group how to operate equipment is not enough-make them show you.
13. Maximum care should be taken to prevent the escape of fumes into the air of working places by leaks, etc.
14. Communication such as radio and telephones should be provided for those people employed where H₂S may be present.

TOXICITY OF HYDROGEN SULFIDE TO MEN							
H2S Per Cent (PPM)**	0 - 2 Minutes	0 - 15 Minutes	15 - 30 Minutes	30 Minutes to 1 hour	1 - 4 Hours	4 - 8 Hours	4 - 48 Hours
0.005 (50) 0.010 (100)				Mild Conjunctiv- ities; respiratory <u>tract irritation</u>			
<u>0.010 (100)</u> 0.015 (150)		Coughing; irritation of eyes; loss of	<u>Disturbed</u> respiration; pain in eyes;	Throat	Salivation & mucous dis- charge; sharp	Increased symptoms*	Hemorrhage & death*
		sense of smell	sleepiness		pain in eyes; <u>coughing</u>		
0.015 (150) 0.020 (200)		Loss of sense of smell	<u>Throat--&eye</u> irritation	Throat & eye irritation	Difficult breathing; blurred vision;	Serious irritating effects	Hemorrhage & death*
0.025 (250)			Painful	Light- shy;	<u>light & shy</u>		
0.035 (350)	Irritation of eyes; loss of sense of	Irritation of eyes	secretion of tears; weari- ness	& nasal catarrh; pain in eyes; difficult	Hemorrhage & death		
<u>0.035 (350)</u>	smell			breathin g			
		Irritation of eyes; loss of sense of smell	<u>Difficult-</u> respiration coughing; irritation of eyes	Increased irritation of eyes and nasal tract; dull pain head; weariness;	Dizziness weak- ness; increased irritation; death	Death*	
0.050 (500)	Coughing collapse & unconscious- ness	Respiratory disturbances; irritation of eyes; collapse	Serious eye irritation; palpitation of heart; few cases of	<u>light shy</u> Severe pain in eyes and head dizziness; trem- bling of extre- mities; great			
0.060 (600) 0.070 (700)	Collapse * unconscious-	co-llapse* unconscious-	<u>death*</u>	weakness & death*			

0.808 (800) ness; death* ness; death*
0.100 (1 000)
0.150 (1500)

*Data secured from experiments of dogs which have susceptibility similar to men. **PPM - parts per million

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

CONDITIONS

Action 314717

CONDITIONS

Operator: MARATHON OIL PERMIAN LLC 990 Town & Country Blvd. Houston, TX 77024	OGRID: 372098
	Action Number: 314717
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104	2/19/2024
pkautz	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	2/19/2024
pkautz	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	2/19/2024
pkautz	Cement is required to circulate on both surface and intermediate1 strings of casing	2/19/2024
pkautz	If cement does not circulate on any string, a CBL is required for that string of casing	2/19/2024