Form 3160-3
(June 2015)

OCD – HOBBS
07/21/2020
RECEIVED

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM123528

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

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

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

8. Lease Name and Well No.
NED PEPPER 18 WA FEDERAL COM 2H [328913]

2. Name of Operator
MARATHON OIL PERMIAN LLC [372098]

9. API Well No.
30-025-47478

3a. Address
5555 San Felipe St. Houston TX 77056

3b. Phone No. *(include area code)*
(713)629-6600

10. Field and Pool, or Exploratory [98135]
ANTELOPE RIDGE; WOLFCAMP / WOLF

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface LOT 4 / 723 FSL / 611 FWL / LAT 32.2122969 / LONG -103.5155314
At proposed prod. zone LOT 1 / 100 FNL / 660 FWL / LAT 32.2245479 / LONG -103.5153795

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 18 / T24S / R34E / NMP

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
239.57

17. Spacing Unit dedicated to this well
320

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.
2000 feet

19. Proposed Depth
12067 feet / 17073 feet

20. BLM/BIA Bond No. in file
FED: NMB001555

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3567 feet

22. Approximate date work will start*
12/01/2019

23. Estimated duration
30 days

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
(Electronic Submission)

Name *(Printed/Typed)*
Jennifer V Curen / Ph: (432)687-7328

Date
05/02/2019

Title
Permitting Team Lean

Approved by *(Signature)*
(Electronic Submission)

Name *(Printed/Typed)*
Cody Layton / Ph: (575)234-5959

Date
07/09/2020

Title
Assistant Field Manager Lands & Minerals

Office
CARLSBAD

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.

GCP Rec 07/21/2020

SL

APPROVED WITH CONDITIONS

07/31/2020

Approval Date: 07/09/2020

(Continued on page 2)

*(Instructions on page 2)

TOTAL SAFETY

MARATHON OIL COMPANY

NED PEPPER FEDERAL-18
TB Well # 1H
WA Well # 2H
WXY Well # 6H

SHL: 722' FSL & 581' FWL of Lot M, Section 18, T-24S, R-34E
BHL: 100' FNL & 330' FWL of Lot O, Section 18, T-24-S, R-34E

LEA County, New Mexico

Rig: PRECISION 594

03/08/2019

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 PORPERLY TRAINED IN ITS USE.

6. PROVIDE FOR PROMPT TRANSPORTATION TO HOSPITAL AND CONTUNUE 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 POSSIBLITY 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.

****
****

TOTAL SAFETY INC
1420 East Greene St.
Carlsbad, NM 88220

THIS H2S DRILLING OPERATIONS PLAN WAS
PREPARED BY: Sean Chamblee
Strategic Account Manager
Cell: 713-703-6295

TOTAL SAFETY INC

1420 East Greene St
Carlsbad, NM 88220
Phone: 432-561-5049

H2S DRILLING OPERATIONS PLAN INDEX

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

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

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- 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
This Drilling Operations Plan was written specifically for:

MARATHON OIL COMPANY
3122 NATIONAL PARKS HIGHWAY
CALRSBAD, NM 88220

Action Plan for Accidental Release of H2S

NED PEPPER FEDERAL-18
TB Well # 1H
WA Well # 2H
WXY Well # 6H

LEA COUNTY, NM

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

03/08/2019

MARATHON OIL COMPANY
3122 NATIONAL PARKS HIGHWAY
CALRSBAD, NM 88220

NED PEPPER FEDERAL-18
TB Well # 1H
WA Well # 2H
WXY Well # 6H

LEA COUNTY, NM

Directions:

FROM JAL, NM AT THE CROSS STREET OF N. 3RD ST. AND KANSAS AVE. HEAD WEST ON W. KANSAS AVE. AND CONTINUE TO FOLLOW W. KANSAS AVE. TO NM-128W FOR 20.4 MILES TO DELAWARE BASIN ROAD ON THE RIGHT, TRAVEL NORTH ON DELAWARE BASIN ROAD FOR .16 MILES TO PROPOSED LEASE ROAD ON THE LEFT.

GPS Coordinates: 32.212294, -103.515628
LEA COUNTY, NEW MEXICO

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.

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 – Onsite 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 feet above, or 3 days prior to penetrating the first zone expected to contain H2S.

SAFETY EQUIPMENT PROVIDED BY TOTAL SAFETY INC.

QTY	EQUIPMENT
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.

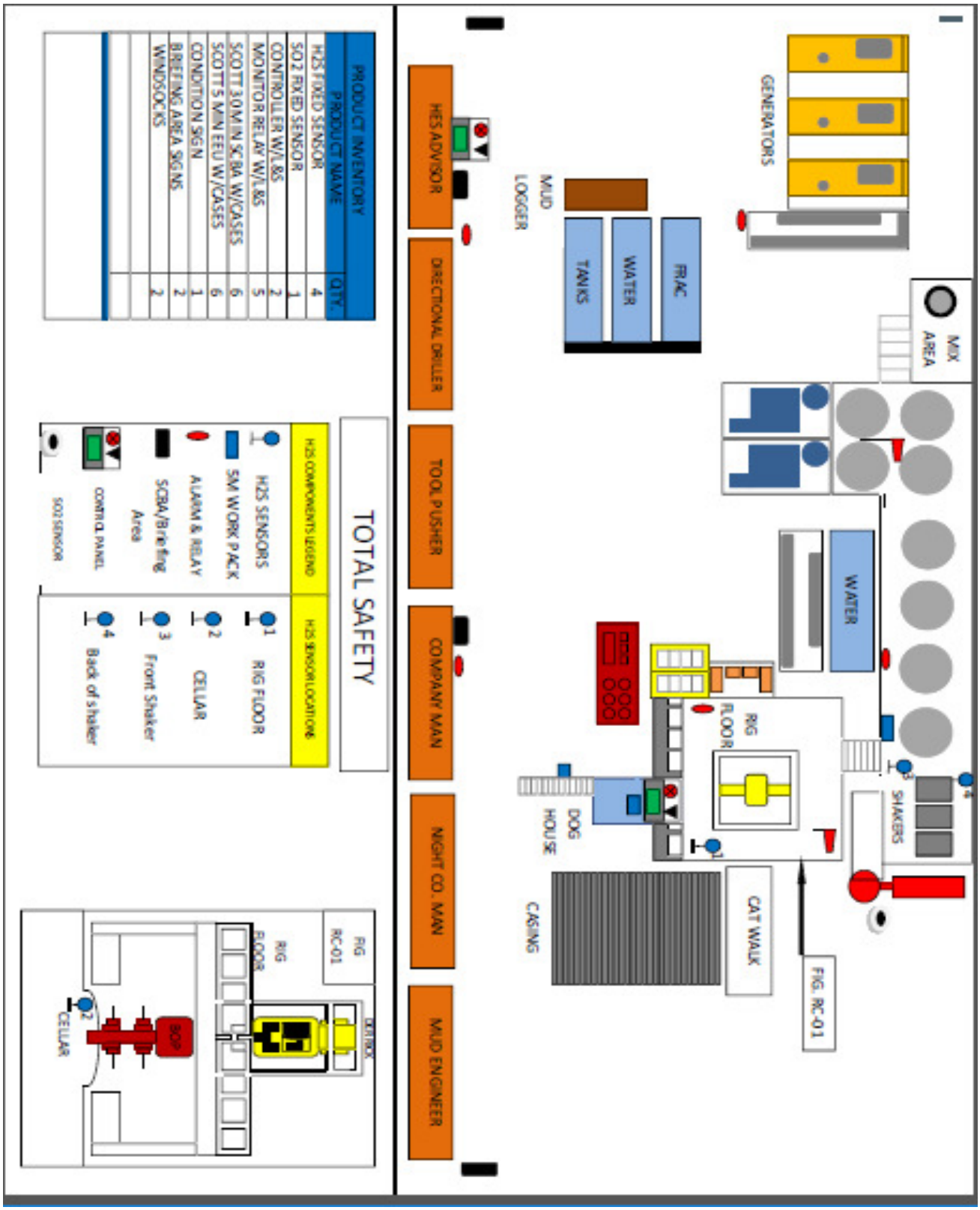
13. An undulating high and low pitch siren and light will be installed on the derrick "A" leg.

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.

SAFETY EQUIPMENT LAYOUT



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 personal 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 CONSIDERATONS

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.

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 off 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			
Brent Evans	Drilling Manager	blevans@marathonoil.com	832 967-8474
Mark Bly	Drilling Superintendent	permiansuper@marathonoil.com	281-840-0467
Chad Butler	Drilling Superintendent	permiansuper@marathonoil.com	281-840-0467
Jacob Beaty	Drilling Engineer	jabeaty@marathonoil.com	713-296-1915
Noah Adams	HES Professional	njadams@marathonoil.com	713-591-4068
Nick Rogers	Lead HES Advisor	permiandches@marathonoil.com	281-659-3734
Scott Doughty	Lead HES Advisor	permiandches@marathonoil.com	281-659-3734
H&P 480	Company Man	Hp480@marathonoil.com	281-768-9946
H&P 498	Company Man	Hp498@marathonoil.com	281-745-0771
H&P 441	Company Man	Hp441@marathonoil.com	
Precision 582	Company Man	prec582@marathonoil.com	
Precision 594	Company Man	Prec594@marathonoil.com	
H&P 480	HES Advisor	Hp480hes@marathonoil.com	
H&P 498	HES Advisor	Hp498hes@marathonoil.com	
H&P 441	HES Advisor	Hp441hes@marathonoil.com	
Precision 582	HES Advisor	prec582@marathonoil.com	
Precision 594	HES Advisor	Prec594hes@marathonoil.com	

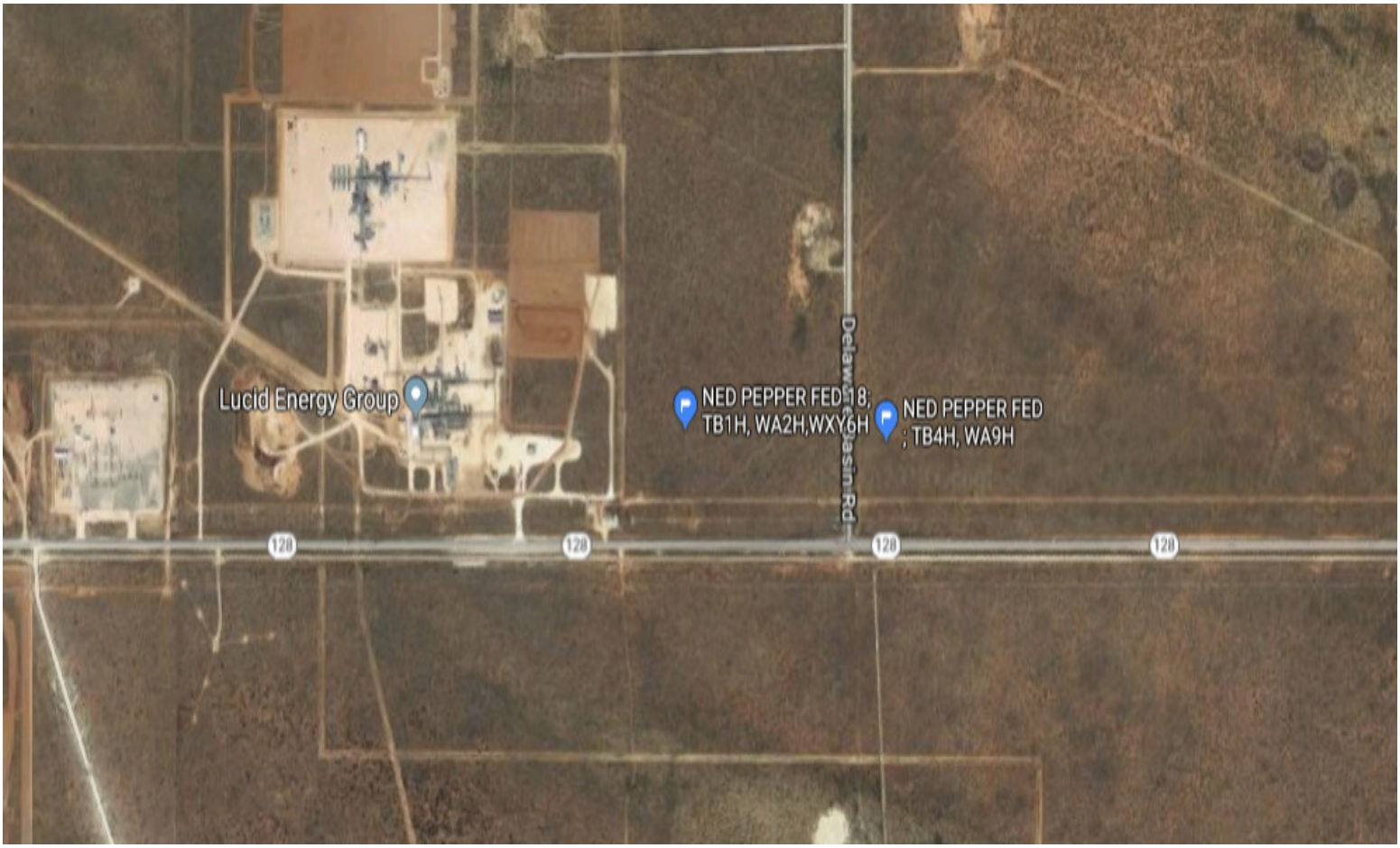
Emergency Services Area Numbers: Or Call 911			
Sheriff (Eddy County, NM)	**575-887-7551**	**New Mexico Poison Control**	**800-222-1222**
Sheriff (Lea County, NM)	**575-396-3611**	**Border Patrol (Las Cruces, NM)**	**575-528-6600**
New Mexico State Police	**575-392-5580/5588**	**Energy Minerals & Natural 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**

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

RESIDENTS AND LANDOWNERS

THERE ARE NO RESIDENCE WITHIN 1 MILE RADIUS OF WELL LOCATION.

- THERE IS LUCID GAS PLANT 1,332’ TO THE WEST OF THE WELL.
- THERE IS HIGHWAY 128 683’ TO THE SOUTH OF THE WELL.
- THERE IS DELAWARE BASIN RD 1,440’ TO THE EAST OF THE WELL.



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). It's 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 I 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 conscious ness and unconsciousness, and between unconsciousness and death.

Where high concentrations cause respiratory paralysis, spontaneous breathing does not return unless artificial respiration is applies. 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 FOLOWED 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:

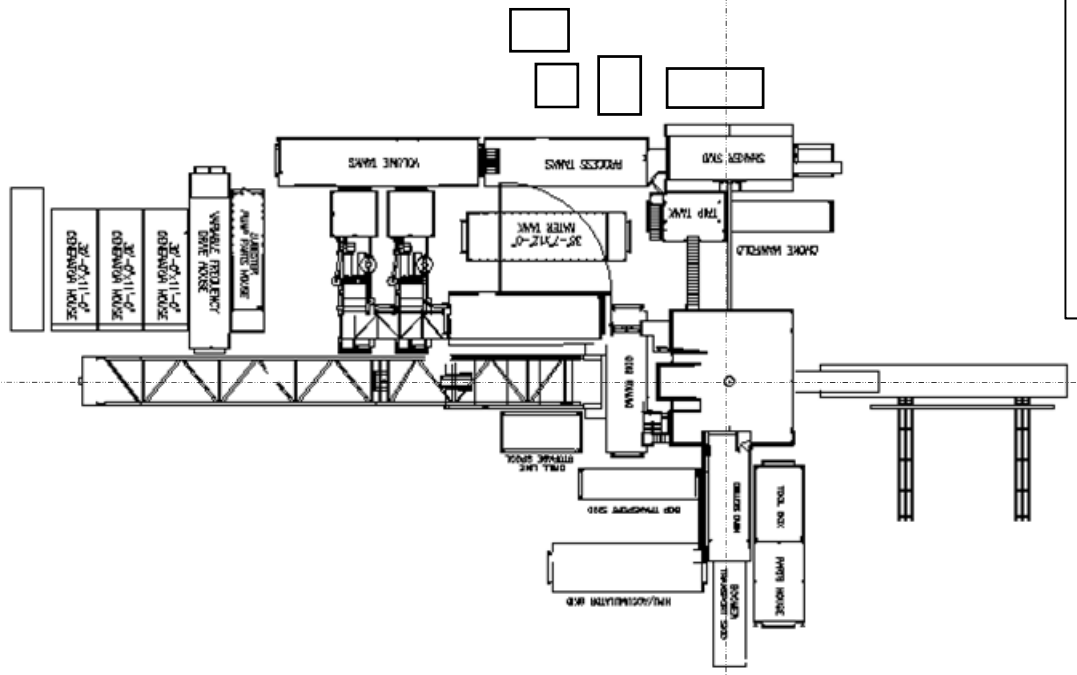
1. Be absolutely sure all concerned are familiar with the hazards concerning H2S and how to avoid it.
2. All employees should know how to operate and maintain respiration equipment.
3. Be able to give and demonstrate artificial respiration.
4. Post areas where there is poisonous gas with suitable warning 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 Conjunctivities; respiratory tract irritation			
0.010 (100) 0.015 (150)		Coughing; irritation of eyes; loss of sense of smell	Disturbed respiration; pain in eyes; sleepiness	Throat	Salivation & mucous discharge; sharp pain in eyes; coughing	Increased symptoms*	Hemorrhage & death*
0.015 (150) 0.020 (200)		Loss of sense of smell	Throat & eye irritation	Throat & eye irritation	Difficult breathing; blurred vision; light & shy	Serious irritating effects	Hemorrhage & death*
0.025 (250) 0.035 (350)	Irritation of eyes; loss of sense of smell	Irritation of eyes	Painful secretion of tears; weariness	Light & shy; nasal catarrh; pain in eyes; difficult breathing	Hemorrhage & death		
0.035 (350)		Irritation of eyes; loss of sense of smell	Difficult respiration coughing; irritation of eyes	Increased irritation of eyes and nasal tract; dull pain head; weariness; light shy	Dizziness weakness; increased irritation; death	Death*	
0.050 (500)	Coughing collapse & unconsciousness	Respiratory disturbances; irritation of eyes; collapse	Serious eye irritation; palpitation of heart; few cases of death*	Severe pain in eyes and head dizziness; trembling of extreities; great weakness & death*			
0.060 (600) 0.070 (700) 0.808 (800) 0.100 (1000) 0.150 (1500)	Collapse * unconsciousness; death*	Collapse* unconsciousness; death*					

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

MARATHON OIL - **H2S Preparedness and Contingency Plan Summary**



H2S Sensors
- Cellar
- Rig Floor
- Shaker Skid
- Bell Nipple

Wind Sock
- Dog house
- Company Rep Trailer

ELSA Escape Packs
- Pits
- Trip Tanks
- Accumulator
- 4 Rig Floor

30 Min. SCBA
- 3 Briefing area
- 3 Alternate briefing area

North

Access road

H2S Condition Sign

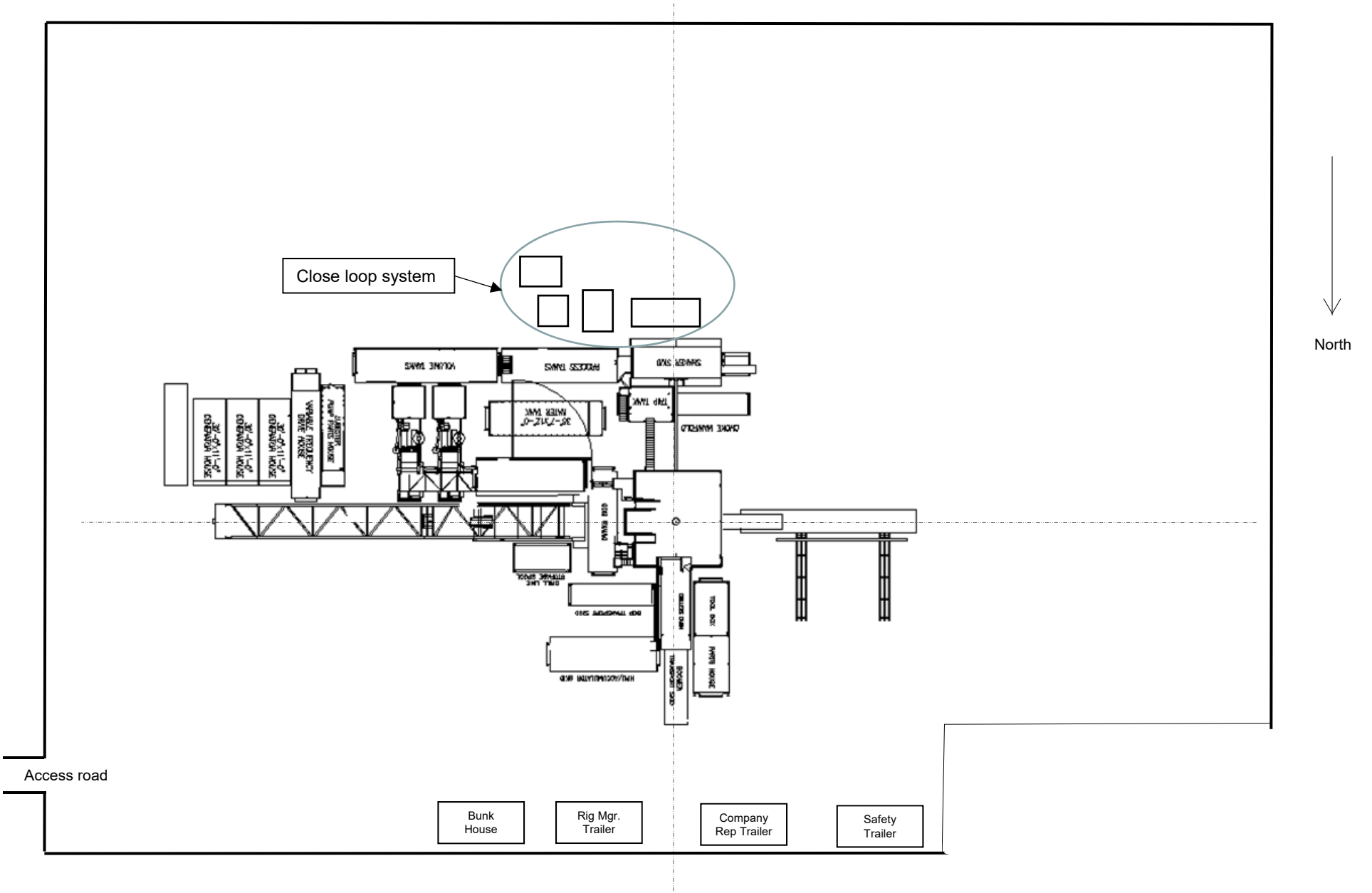
Bunk House

Rig Mgr. Trailer

Company Rep Trailer

Safety Trailer

MARATHON OIL - FLEX III PAD (Closed Loop System)



Marathon Oil
Lea County, NM
Ned Pepper 18
WA Fed Com #2H
Prelim Plan A
GL: 3567' + KB: 25' (PD594)

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

RKB Elevation: Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))

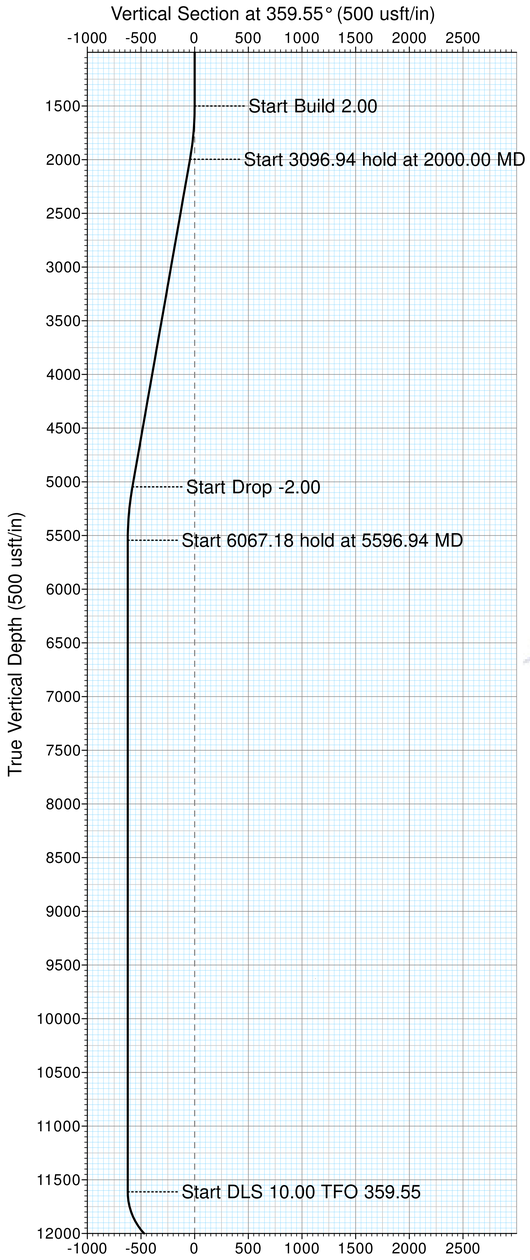
+N/-S	+E/-W	Northing	Easting	Latittude	Longitude	Slot
0.00	0.00	441871.23	753079.71	32.212173	-103.515055	

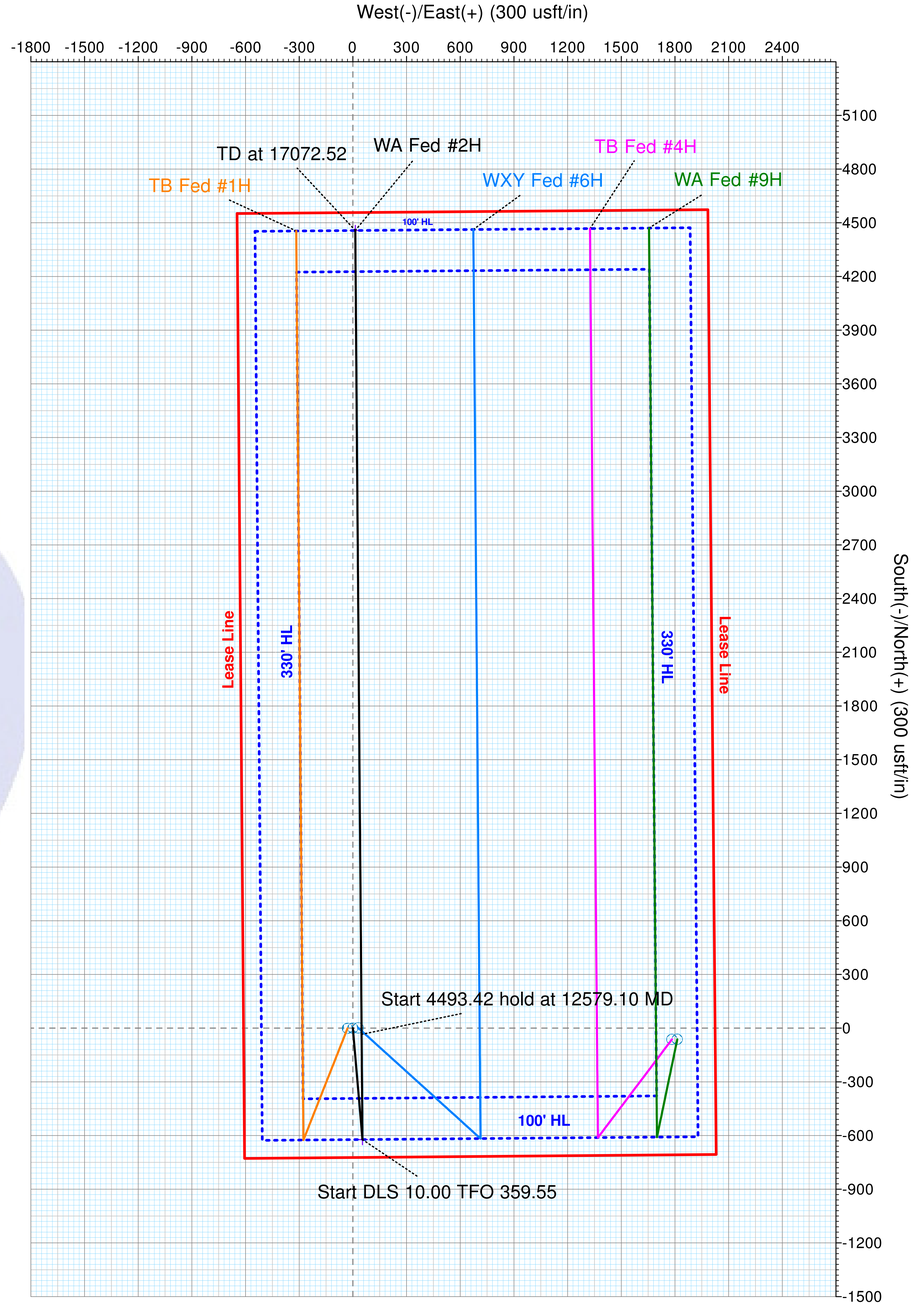
SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	1500.00	0.00	0.00	1500.00	0.00	0.00	0.00	0.00
3	2000.00	10.00	175.09	1997.47	-43.36	3.73	2.00	-43.39
4	5096.94	10.00	175.09	5047.36	-579.17	49.76	0.00	-579.54
5	5596.94	0.00	0.00	5544.82	-622.53	53.49	2.00	-622.93
6	11664.12	0.00	0.00	11612.00	-622.53	53.49	0.00	-622.93
7	12579.10	91.50	359.55	12184.76	-34.61	48.84	10.00	-34.99
8	17072.52	91.50	359.55	12067.29	4457.13	13.29	0.00	4456.89

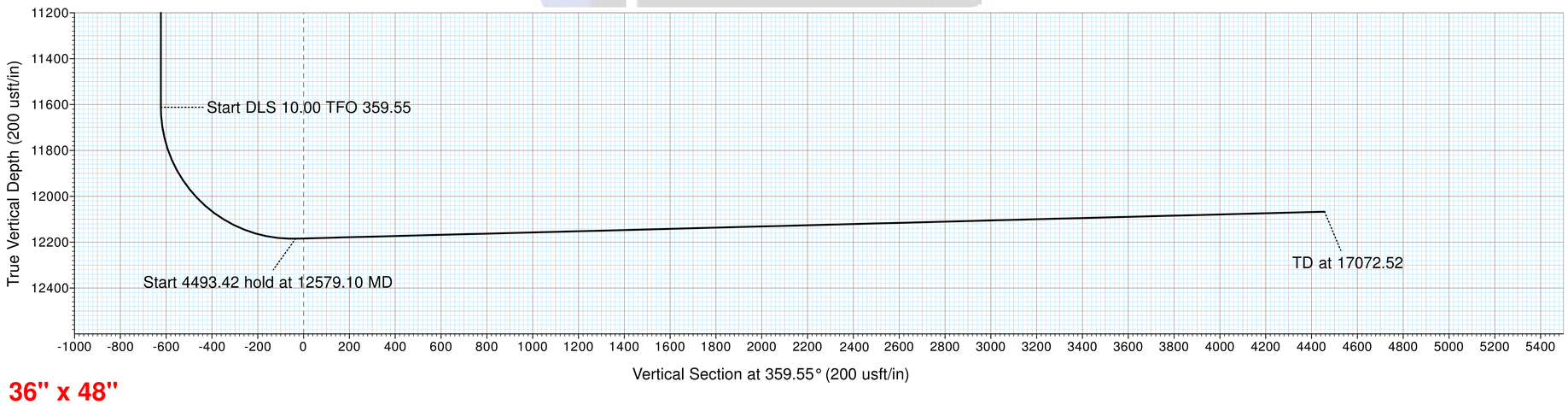
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

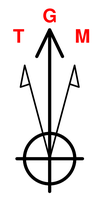
Name	TVD	+N/-S	+E/-W	Northing	Easting
[NedPep18#2H]KOP/FTP	11612.00	-622.53	53.49	441248.70	753133.20
[NedPep18#2H]LTP/BHL	12067.29	4457.13	13.29	446328.36	753093.00





Target Line: 12184' TVD @ 0' VS :: 91.5° INC





Azimuths to Grid North
True North: -0.44°
Magnetic North: 6.23°

Magnetic Field
Strength: 47925.8snT
Dip Angle: 59.88°
Date: 2/13/2019
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.23°

Declination (M to T): 6.67° East

36" x 48"

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Project Lea County, NM

Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site Ned Pepper 18

Site Position:		**Northing:**	441,808.55 usft	**Latitude:**	32.211962
From:	Map	**Easting:**	754,892.89 usft	**Longitude:**	-103.509195
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.44 °

Well WA Fed Com #2H

Well Position	**+N/-S**	0.00 usft	**Northing:**	441,871.23 usft	**Latitude:**	32.212173
	+E/-W	0.00 usft	**Easting:**	753,079.71 usft	**Longitude:**	-103.515056
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,567.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	2/13/2019	6.67	59.88	47,925.80

Design Prelim Plan A

Audit Notes:

Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	359.55

Survey Tool Program **Date** 2/13/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	17,072.52	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
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

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	2.00	175.09	1,599.98	-1.74	0.15	-1.74	2.00	2.00	0.00
1,700.00	4.00	175.09	1,699.84	-6.95	0.60	-6.96	2.00	2.00	0.00
1,800.00	6.00	175.09	1,799.45	-15.64	1.34	-15.65	2.00	2.00	0.00
1,900.00	8.00	175.09	1,898.70	-27.78	2.39	-27.80	2.00	2.00	0.00
2,000.00	10.00	175.09	1,997.47	-43.36	3.73	-43.39	2.00	2.00	0.00
2,100.00	10.00	175.09	2,095.95	-60.66	5.21	-60.70	0.00	0.00	0.00
2,200.00	10.00	175.09	2,194.43	-77.96	6.70	-78.02	0.00	0.00	0.00
2,300.00	10.00	175.09	2,292.91	-95.27	8.19	-95.33	0.00	0.00	0.00
2,400.00	10.00	175.09	2,391.39	-112.57	9.67	-112.64	0.00	0.00	0.00
2,500.00	10.00	175.09	2,489.87	-129.87	11.16	-129.95	0.00	0.00	0.00
2,600.00	10.00	175.09	2,588.35	-147.17	12.65	-147.26	0.00	0.00	0.00
2,700.00	10.00	175.09	2,686.83	-164.47	14.13	-164.58	0.00	0.00	0.00
2,800.00	10.00	175.09	2,785.31	-181.77	15.62	-181.89	0.00	0.00	0.00
2,900.00	10.00	175.09	2,883.79	-199.07	17.11	-199.20	0.00	0.00	0.00
3,000.00	10.00	175.09	2,982.27	-216.37	18.59	-216.51	0.00	0.00	0.00
3,100.00	10.00	175.09	3,080.75	-233.67	20.08	-233.83	0.00	0.00	0.00
3,200.00	10.00	175.09	3,179.23	-250.98	21.56	-251.14	0.00	0.00	0.00
3,300.00	10.00	175.09	3,277.72	-268.28	23.05	-268.45	0.00	0.00	0.00
3,400.00	10.00	175.09	3,376.20	-285.58	24.54	-285.76	0.00	0.00	0.00
3,500.00	10.00	175.09	3,474.68	-302.88	26.02	-303.07	0.00	0.00	0.00
3,600.00	10.00	175.09	3,573.16	-320.18	27.51	-320.39	0.00	0.00	0.00
3,700.00	10.00	175.09	3,671.64	-337.48	29.00	-337.70	0.00	0.00	0.00
3,800.00	10.00	175.09	3,770.12	-354.78	30.48	-355.01	0.00	0.00	0.00
3,900.00	10.00	175.09	3,868.60	-372.08	31.97	-372.32	0.00	0.00	0.00
4,000.00	10.00	175.09	3,967.08	-389.38	33.46	-389.63	0.00	0.00	0.00
4,100.00	10.00	175.09	4,065.56	-406.69	34.94	-406.95	0.00	0.00	0.00
4,200.00	10.00	175.09	4,164.04	-423.99	36.43	-424.26	0.00	0.00	0.00
4,300.00	10.00	175.09	4,262.52	-441.29	37.92	-441.57	0.00	0.00	0.00
4,400.00	10.00	175.09	4,361.00	-458.59	39.40	-458.88	0.00	0.00	0.00
4,500.00	10.00	175.09	4,459.48	-475.89	40.89	-476.20	0.00	0.00	0.00
4,600.00	10.00	175.09	4,557.97	-493.19	42.38	-493.51	0.00	0.00	0.00
4,700.00	10.00	175.09	4,656.45	-510.49	43.86	-510.82	0.00	0.00	0.00
4,800.00	10.00	175.09	4,754.93	-527.79	45.35	-528.13	0.00	0.00	0.00
4,900.00	10.00	175.09	4,853.41	-545.09	46.84	-545.44	0.00	0.00	0.00
5,000.00	10.00	175.09	4,951.89	-562.39	48.32	-562.76	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,096.94	10.00	175.09	5,047.36	-579.17	49.76	-579.54	0.00	0.00	0.00
5,100.00	9.94	175.09	5,050.37	-579.69	49.81	-580.07	2.00	-2.00	0.00
5,200.00	7.94	175.09	5,149.15	-595.17	51.14	-595.56	2.00	-2.00	0.00
5,300.00	5.94	175.09	5,248.41	-607.21	52.17	-607.60	2.00	-2.00	0.00
5,400.00	3.94	175.09	5,348.04	-615.79	52.91	-616.18	2.00	-2.00	0.00
5,500.00	1.94	175.09	5,447.90	-620.90	53.35	-621.30	2.00	-2.00	0.00
5,596.94	0.00	0.00	5,544.83	-622.53	53.49	-622.93	2.00	-2.00	0.00
5,600.00	0.00	0.00	5,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
5,700.00	0.00	0.00	5,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
5,800.00	0.00	0.00	5,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
5,900.00	0.00	0.00	5,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,000.00	0.00	0.00	5,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,100.00	0.00	0.00	6,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,200.00	0.00	0.00	6,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,300.00	0.00	0.00	6,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,400.00	0.00	0.00	6,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,500.00	0.00	0.00	6,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,600.00	0.00	0.00	6,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,700.00	0.00	0.00	6,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,800.00	0.00	0.00	6,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
6,900.00	0.00	0.00	6,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,000.00	0.00	0.00	6,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,100.00	0.00	0.00	7,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,200.00	0.00	0.00	7,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,300.00	0.00	0.00	7,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,400.00	0.00	0.00	7,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,500.00	0.00	0.00	7,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,600.00	0.00	0.00	7,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,700.00	0.00	0.00	7,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,800.00	0.00	0.00	7,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
7,900.00	0.00	0.00	7,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,000.00	0.00	0.00	7,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,100.00	0.00	0.00	8,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,200.00	0.00	0.00	8,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,300.00	0.00	0.00	8,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,400.00	0.00	0.00	8,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,500.00	0.00	0.00	8,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,600.00	0.00	0.00	8,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,700.00	0.00	0.00	8,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,800.00	0.00	0.00	8,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
8,900.00	0.00	0.00	8,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,000.00	0.00	0.00	8,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,100.00	0.00	0.00	9,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,200.00	0.00	0.00	9,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,300.00	0.00	0.00	9,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,400.00	0.00	0.00	9,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,500.00	0.00	0.00	9,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,600.00	0.00	0.00	9,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,700.00	0.00	0.00	9,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,800.00	0.00	0.00	9,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
9,900.00	0.00	0.00	9,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,000.00	0.00	0.00	9,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,100.00	0.00	0.00	10,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,200.00	0.00	0.00	10,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,300.00	0.00	0.00	10,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,400.00	0.00	0.00	10,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,500.00	0.00	0.00	10,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,600.00	0.00	0.00	10,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,700.00	0.00	0.00	10,647.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,800.00	0.00	0.00	10,747.88	-622.53	53.49	-622.93	0.00	0.00	0.00
10,900.00	0.00	0.00	10,847.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,000.00	0.00	0.00	10,947.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,100.00	0.00	0.00	11,047.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,200.00	0.00	0.00	11,147.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,300.00	0.00	0.00	11,247.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,400.00	0.00	0.00	11,347.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,500.00	0.00	0.00	11,447.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,600.00	0.00	0.00	11,547.88	-622.53	53.49	-622.93	0.00	0.00	0.00
11,664.12	0.00	0.00	11,612.00	-622.53	53.49	-622.93	0.00	0.00	0.00
[NedPep18#2H]KOP/FTP									
11,700.00	3.59	359.55	11,647.86	-621.41	53.48	-621.81	10.00	10.00	0.00
11,750.00	8.59	359.55	11,697.56	-616.11	53.44	-616.51	10.00	10.00	0.00
11,800.00	13.59	359.55	11,746.61	-606.49	53.36	-606.89	10.00	10.00	0.00
11,850.00	18.59	359.55	11,794.64	-592.64	53.25	-593.04	10.00	10.00	0.00
11,900.00	23.59	359.55	11,841.27	-574.66	53.11	-575.06	10.00	10.00	0.00
11,950.00	28.59	359.55	11,886.17	-552.68	52.94	-553.08	10.00	10.00	0.00
12,000.00	33.59	359.55	11,928.97	-526.87	52.73	-527.27	10.00	10.00	0.00
12,050.00	38.59	359.55	11,969.36	-497.43	52.50	-497.83	10.00	10.00	0.00
12,100.00	43.59	359.55	12,007.04	-464.58	52.24	-464.97	10.00	10.00	0.00
12,150.00	48.59	359.55	12,041.70	-428.57	51.96	-428.97	10.00	10.00	0.00
12,200.00	53.59	359.55	12,073.10	-389.68	51.65	-390.07	10.00	10.00	0.00
12,250.00	58.59	359.55	12,100.99	-348.20	51.32	-348.59	10.00	10.00	0.00
12,300.00	63.59	359.55	12,125.15	-304.45	50.97	-304.84	10.00	10.00	0.00
12,350.00	68.59	359.55	12,145.41	-258.75	50.61	-259.14	10.00	10.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,400.00	73.59	359.55	12,161.61	-211.47	50.24	-211.86	10.00	10.00	0.00
12,450.00	78.59	359.55	12,173.63	-162.95	49.85	-163.34	10.00	10.00	0.00
12,500.00	83.59	359.55	12,181.37	-113.57	49.46	-113.96	10.00	10.00	0.00
12,550.00	88.59	359.55	12,184.78	-63.71	49.07	-64.09	10.00	10.00	0.00
12,579.10	91.50	359.55	12,184.76	-34.61	48.84	-34.99	10.00	10.00	0.00
12,600.00	91.50	359.55	12,184.22	-13.72	48.67	-14.10	0.00	0.00	0.00
12,700.00	91.50	359.55	12,181.60	86.24	47.88	85.87	0.00	0.00	0.00
12,800.00	91.50	359.55	12,178.99	186.21	47.09	185.83	0.00	0.00	0.00
12,900.00	91.50	359.55	12,176.37	286.17	46.30	285.80	0.00	0.00	0.00
13,000.00	91.50	359.55	12,173.76	386.13	45.51	385.76	0.00	0.00	0.00
13,100.00	91.50	359.55	12,171.14	486.09	44.72	485.73	0.00	0.00	0.00
13,200.00	91.50	359.55	12,168.53	586.06	43.93	585.69	0.00	0.00	0.00
13,300.00	91.50	359.55	12,165.92	686.02	43.13	685.66	0.00	0.00	0.00
13,400.00	91.50	359.55	12,163.30	785.98	42.34	785.63	0.00	0.00	0.00
13,500.00	91.50	359.55	12,160.69	885.95	41.55	885.59	0.00	0.00	0.00
13,600.00	91.50	359.55	12,158.07	985.91	40.76	985.56	0.00	0.00	0.00
13,700.00	91.50	359.55	12,155.46	1,085.87	39.97	1,085.52	0.00	0.00	0.00
13,800.00	91.50	359.55	12,152.84	1,185.83	39.18	1,185.49	0.00	0.00	0.00
13,900.00	91.50	359.55	12,150.23	1,285.80	38.39	1,285.45	0.00	0.00	0.00
14,000.00	91.50	359.55	12,147.62	1,385.76	37.60	1,385.42	0.00	0.00	0.00
14,100.00	91.50	359.55	12,145.00	1,485.72	36.81	1,485.39	0.00	0.00	0.00
14,200.00	91.50	359.55	12,142.39	1,585.68	36.01	1,585.35	0.00	0.00	0.00
14,300.00	91.50	359.55	12,139.77	1,685.65	35.22	1,685.32	0.00	0.00	0.00
14,400.00	91.50	359.55	12,137.16	1,785.61	34.43	1,785.28	0.00	0.00	0.00
14,500.00	91.50	359.55	12,134.54	1,885.57	33.64	1,885.25	0.00	0.00	0.00
14,600.00	91.50	359.55	12,131.93	1,985.53	32.85	1,985.22	0.00	0.00	0.00
14,700.00	91.50	359.55	12,129.32	2,085.50	32.06	2,085.18	0.00	0.00	0.00
14,800.00	91.50	359.55	12,126.70	2,185.46	31.27	2,185.15	0.00	0.00	0.00
14,900.00	91.50	359.55	12,124.09	2,285.42	30.48	2,285.11	0.00	0.00	0.00
15,000.00	91.50	359.55	12,121.47	2,385.39	29.69	2,385.08	0.00	0.00	0.00
15,100.00	91.50	359.55	12,118.86	2,485.35	28.89	2,485.04	0.00	0.00	0.00
15,200.00	91.50	359.55	12,116.24	2,585.31	28.10	2,585.01	0.00	0.00	0.00
15,300.00	91.50	359.55	12,113.63	2,685.27	27.31	2,684.98	0.00	0.00	0.00
15,400.00	91.50	359.55	12,111.02	2,785.24	26.52	2,784.94	0.00	0.00	0.00
15,500.00	91.50	359.55	12,108.40	2,885.20	25.73	2,884.91	0.00	0.00	0.00
15,600.00	91.50	359.55	12,105.79	2,985.16	24.94	2,984.87	0.00	0.00	0.00
15,700.00	91.50	359.55	12,103.17	3,085.12	24.15	3,084.84	0.00	0.00	0.00
15,800.00	91.50	359.55	12,100.56	3,185.09	23.36	3,184.81	0.00	0.00	0.00
15,900.00	91.50	359.55	12,097.94	3,285.05	22.57	3,284.77	0.00	0.00	0.00
16,000.00	91.50	359.55	12,095.33	3,385.01	21.77	3,384.74	0.00	0.00	0.00
16,100.00	91.50	359.55	12,092.71	3,484.98	20.98	3,484.70	0.00	0.00	0.00
16,200.00	91.50	359.55	12,090.10	3,584.94	20.19	3,584.67	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA Fed #2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Site:	Ned Pepper 18	**MD Reference:**	Well @ 3592.00usft (GL: 3567' + KB: 25' (PD594))
Well:	WA Fed Com #2H	**North Reference:**	Grid
Wellbore:	OH	**Survey Calculation Method:**	Minimum Curvature
Design:	Prelim Plan A	**Database:**	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,300.00	91.50	359.55	12,087.49	3,684.90	19.40	3,684.63	0.00	0.00	0.00
16,400.00	91.50	359.55	12,084.87	3,784.86	18.61	3,784.60	0.00	0.00	0.00
16,500.00	91.50	359.55	12,082.26	3,884.83	17.82	3,884.57	0.00	0.00	0.00
16,600.00	91.50	359.55	12,079.64	3,984.79	17.03	3,984.53	0.00	0.00	0.00
16,700.00	91.50	359.55	12,077.03	4,084.75	16.24	4,084.50	0.00	0.00	0.00
16,800.00	91.50	359.55	12,074.41	4,184.71	15.45	4,184.46	0.00	0.00	0.00
16,900.00	91.50	359.55	12,071.80	4,284.68	14.65	4,284.43	0.00	0.00	0.00
17,000.00	91.50	359.55	12,069.19	4,384.64	13.86	4,384.40	0.00	0.00	0.00
17,072.52	91.50	359.55	12,067.29	4,457.13	13.29	4,456.89	0.00	0.00	0.00
[NedPep18#2H]LTP/BHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[NedPep18#2H]KOP/FT - plan hits target center - Point	0.00	0.00	11,612.00	-622.53	53.49	441,248.70	753,133.20	32.210461	-103.514898
[NedPep18#2H]LTP/BHL - plan hits target center - Point	0.00	0.00	12,067.29	4,457.13	13.29	446,328.36	753,093.00	32.224424	-103.514903

Checked By: _____ Approved By: _____ Date: _____

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

WELL NAME / NUMBER: NED PEPPER 18 WA FEDERAL COM 2H
STATE: NEW MEXICO **COUNTY:** LEA

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	TWSP	Range	Section	Aliquot/Lot/Trac	Latitude (NAD 83)	Longitude (NAD 83)	County	State	Meridian	Lease Type	Lease Number	Elevation (ft SS)	MD (RKB	TVD (RKB)
SHL	723	FSL	611	FWL	24S	34E	18	SWSW	32.21229686	-103.5155314	LEA	NM	NMP			3567	0	0
KOP/FTP	100	FSL	660	FWL	24S	34E	18	SWSW	32.21058457	-103.5153737	LEA	NM	NMP			-8350	11985	11917
EXIT	1320	FNL	660	FWL	24S	34E	18	NWNW	32.22119450	-103.5153781	LEA	NM	NMP			-8601	13211	12168
ENTER	1320	FNL	660	FWL	24S	34E	18	NWNW	32.22119450	-103.5153781	LEA	NM	NMP	F	NMNM123528	-8601	13211	12168
LTP/BHL	100	FNL	660	FWL	24S	34E	18	NWNW	32.22454789	-103.5153795	LEA	NM	NMP	F	NMNM123528	-8500	17073	12067

1. GEOLOGIC NAME OF SURFACE FORMATION

a. Permian/Quatenary Alluvium

2. ESTIMATED TOPS OF GEOLOGICAL MARKERS & DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS

Formation	True Vertical Depth (ft)	Measured Depth (ft)	Lithologies	Mineral Resources	Producing Formation
Rustler	1254.0	1254.0	Anhydrite/Dolomite	BRINE	N
Salado	1824.0	1824.7	Salt/Anhydrite	BRINE	N
Castile	3797.0	3827.3	Base Salt	BRINE	N
Lamar	5214.0	5265.4	Limy Sands	BRINE	N
Bell Canyon	5301.0	5352.8	Sand/Shales	OIL	Y
Cherry Canyon	6448.0	6500.1	Sands/Shale	OIL	Y
Brushy Canyon	7627.0	7679.1	Sands/Carbonates	OIL	Y
Bone Spring	9054.0	9106.1	Sands/Carbonates	OIL	Y
Wolfcamp	11917.0	11985.8	Carbonates/Shales/Sands	OIL	Y

DEEPEST EXPECTED FRESH WATER: 450’ TVD

ANTICIPATED BOTTOM HOLE PRESSURE: 7,286 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 195°F

ANTICIPATED ABNORMAL PRESSURE: N

ANTICIPATED ABNORMAL TEMPERATURE: N

3. CASING PROGRAM

String Type	Hole Size	Csg Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Weight (lbs/ft)	Grade	Conn.	SF Collapse	SF Burst	SF Tension
Surface	17 1/2	13 3/8	0	1270	0	1270	54.5	J55	STC	5.52	2.5	2.5
Intermediate I	12 1/4	9 5/8	0	5300	0	5300	36	J55	LTC	1.74	1.15	2.19
Intermediate II	8 3/4	7	0	11200	0	11148	29	P110	BTC	2.21	1.18	1.9
Production Liner	6 1/8	4 1/2	10900	17072	10848	15754	13.5	P110	BTC	1.33	1.56	1.88

Minimum safety factors: Burst 1.125 Collapse 1.125 Tension 1.8 Wet/1.6 Dry

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

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

4. CEMENT PROGRAM:

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity (sks)	Yield (ft3/sks)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	--	0	1016	816	1.73	13.5	1412	100	Class C	3 lbm/sk granular LCM + 0.1250 lbm/sk Poly-E-Flake
Surface	Tail	--	1016	1270	265	1.33	14.8	353	100	Class C	N/A
Intermediate I	Lead	--	0	4300	1066	2.21	12.8	2357	75	Class C	0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator
Intermediate I	Tail	--	4300	5300	353	1.33	14.8	470	50	Class C	0.3 % Retarder
Intermediate II	Lead	--	5000	10200	414	3.21	11	1329	70	Class C	0.85% retarder + 10% extender + 0.02 gal/sk defoamer + 2.0% Extender + 0.15% Viscosifier
Intermediate II	Tail	--	10200	11200	170	1.15	13.8	195	30	Class H	3% extender + 0.15% Dispersant + 0.03 gal/sk retarder
Production Liner	Tail	--	10900	17072	619	1.22	14.5	756	30	Class H	0.1% retarder + 3.5% extender + 0.3% fluid loss + 0.1% Dispersant

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

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

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

Attach plugging procedure for pilot hole.

N/A

5. PRESSURE CONTROL EQUIPMENT

BOP installed and tested before drilling	Size?	Min. Required WP	Type	✓	Tested to:

which hole?					
12 ¼"	13 5/8	10000	Annular	x	50% of working pressure
			Blind Ram		10000
			Pipe Ram	x	
			Double Ram	x	
			Other*		
8 ¾"	13 5/8	10000	Annular	x	50% of working pressure
			Blind Ram		10000
			Pipe Ram	x	
			Double Ram	x	
			Other *		
6 1/8"	13 5/8	10000	Annular	x	50% of working pressure
			Blind Ram		10000
			Pipe Ram	x	
			Double Ram	x	
			Other *		

*Specify if additional ram is utilized.

BOP/BOPE will be tested by an independent service company to 250 psi low and the high pressure indicated above per Onshore Order 2 requirements. The System may be upgraded to a higher pressure but still tested to the working pressure listed in the table above. If the system is upgraded all the components installed will be functional and tested.

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

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

6. MUD PROGRAM:

Top Depth	Bottom Depth	Mud Type	Min. Weight (ppg)	Max. Weight (ppg)	Additional Characteristics

0	1270	Water Based Mud	8.4	8.8	
1270	5300	Brine	9.9	10.2	
5300	11200	Cut Brine	8.8	9.4	
11200	17072	Oil Based mud	11.5	13.0	

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

7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT

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

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

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

8. LOGGING / CORING AND TESTING PROGRAM:

A. Mud Logger: None.

B. DST's: None.

C. Open Hole Logs: GR while drilling from Intermediate casing shoe to TD.

9. POTENTIAL HAZARDS:

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

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

C. No losses are anticipated at this time.

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

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

10. 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.

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 nippled 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.

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Marathon Oil Permian LLC**
LEASE NO.:	**NMNM123528**
WELL NAME & NO.:	**Ned Pepper 18 Federal Com 1H, 2H, 4H, 6H, 9H**
LOCATION:	**Section 18, T 24S, R 34E, NMPM**
COUNTY:	**Lea County, New Mexico**

H2S	(•) Yes	( ) No	
Potash	(•) None	( ) Secretary	( ) R-111-P
Cave/Karst Potential	( ) Low	(•) Medium	( ) High
Variance	( ) None	(•) Flex Hose	( ) Other
Wellhead	( ) Conventional	(•) Multibowl	( ) Both
Other	[ ] 4 String Area	[ ] Capitan Reef	[ ] WIPP
Other	[x] Fluid Filled	[ ] Cement Squeeze	[ ] Pilot Hole
Special Requirements	[ ] Water Disposal	[ ] COM	[ ] Unit

A. HYDROGEN SULFIDE

1. A Hydrogen Sulfide (H2S) Drilling Plan shall be activated **500 feet** prior to drilling into the **Bone Spring** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8"** surface casing shall be set at approximately **1325'** to protect possible fresh water anticipated to 1300' and shall be cement to surface.
   a. **If cement does not circulate to 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 **6 hours** after pumping cement, ideally between 8-10 hours after.
   b. WOC time for a primary cement job will be a minimum of **8 hours** or **500 psi** compressive strength, whichever is greater. This is to include the lead cement.
   c. If cement falls back, remedial cementing will be done prior to drilling out the shoe.
   d. WOC time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 psi compressive strength, whichever is greater.
2. The **9-5/8"** intermediate casing shall be set cemented to surface.
   a. **If cement does not circulate to surface,** see B.1.a, c & d.

b. This casing must be kept at least 1/3 full at all times in order to meet BLM collapse requirements.

3. The **7"** production casing shall be cemented with at least **200' tie-back** into the previous casing. Operator shall provide method of verification.

   a. In Potash & Medium or High Cave/Karst & Capitan Reef Areas, if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

4. The **4-1/2"** production liner shall be cemented with at least **100' tie-back** into the previous casing. Operator shall provide method of verification.

C. PRESSURE CONTROL

1. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **10,000 (10M)** psi. **Variance approved to use a 5M annular. This annular must be tested to 70% of its rated pressure (5000 psi).**
3. Required safety valves, with appropriate wrenches and subs for the drill string being utilized, will be in the open position and accessible on the rig floor.

D. SPECIAL REQUIREMENTS

1. Submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, 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.

   a. The well sign on location shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

DR 7/7/2020

GENERAL REQUIREMENTS

1. The BLM is to be notified in advance for a representative to witness:
   a. Spudding the well (minimum of 24 hours)
   b. Setting and/or Cementing of all casing strings (minimum of 4 hours)
   c. BOP/BOPE tests (minimum of 4 hours)

      ☒ Eddy County: Call the Carlsbad Field Office, (575) 361-2822

      ☒ Lea County: Call the Hobbs Field Station, (575) 393-3612
2. 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:
      i. Notify the BLM when moving in and removing the Spudder Rig.
      ii. 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.
      iii. BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
3. 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.

4. 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 available upon request. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well-specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On the portion of well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.
7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. If the operator has proposed a multi-bowl wellhead assembly in the APD, it must meet or exceed the pressure rating of the BOP system. Additionally, 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. 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 Onshore Order 2 III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the BOP/BOPE tests.
    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
    b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the

cement has had a minimum of 24 hours setup time, except the casing pressure test which can be initiated immediately after bumping the plug (only applies to single-stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be made available upon request.

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 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. This test shall be performed prior to the test at full stack pressure.

f. BOP/BOPE must be tested within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

1. 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

1. 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.
2. Porto-johns and trash containers will be on-location during fracturing operations or any other crew-intensive operations.

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

OCD – HOBBS
07/21/2020
RECEIVED

WELL LOCATION AND ACREAGE DEDICATION PLAT

[1] API Number	[2] Pool Code	[3] Pool Name
30-025-47478	98135	WC-025 G-09 S243310P;UPPER WOLFCAMP

[4] Property Code	[5] Property Name	[6] Well Number
328913	NED PEPPER 18 WA FED COM	2H

[7] OGRID No.	[8] Operator Name	[9] Elevation
372098	MARATHON OIL PERMIAN, LLC	3,567'

[10] Surface Location

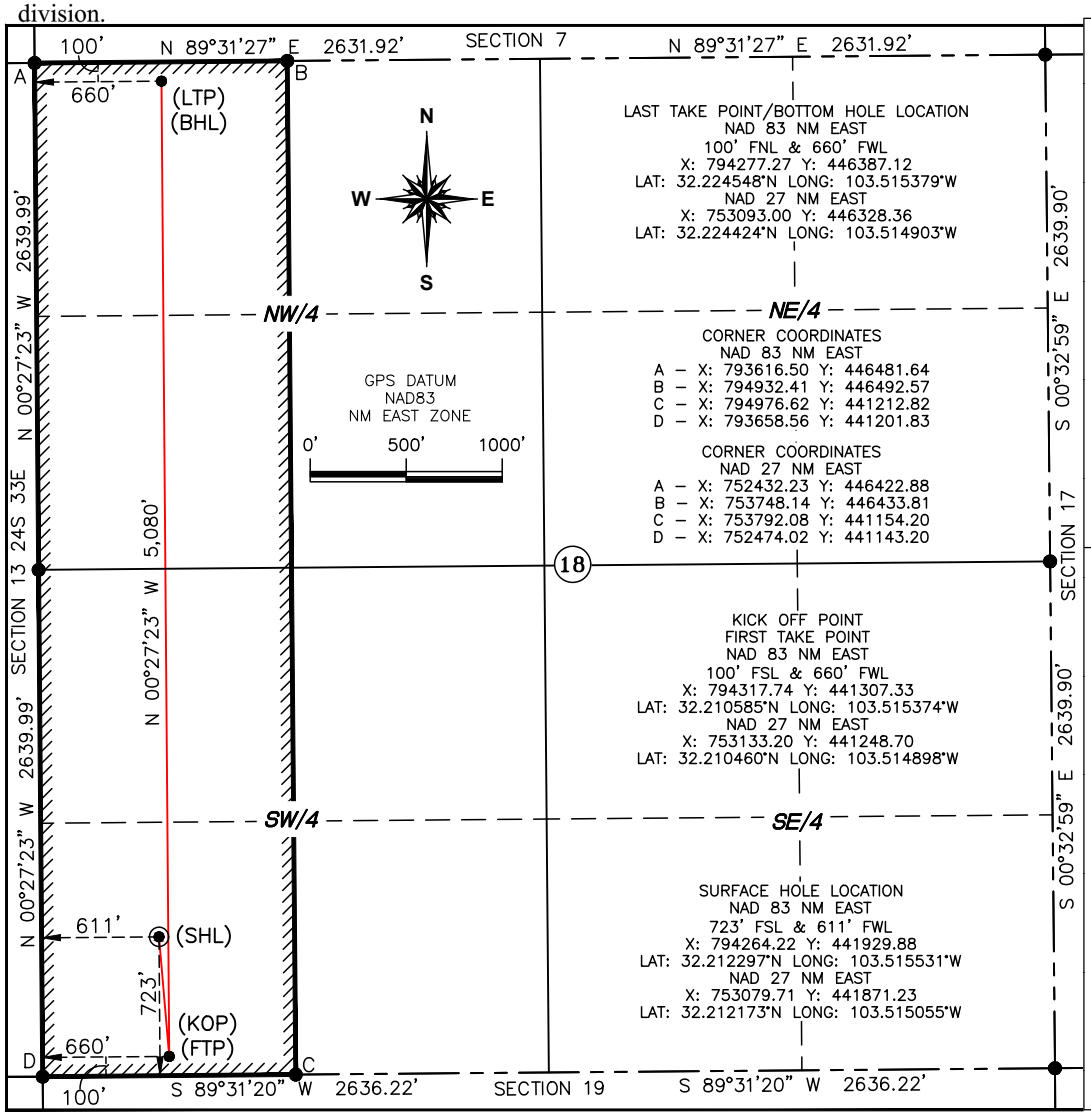
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
4	18	24-S	34-E		723'	SOUTH	611'	WEST	LEA

[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
1	18	24-S	34-E		100'	NORTH	660'	WEST	LEA

[12] Dedicated Acres	[13] Joint or Infill	[14] Consolidation Code	[15] Order No.
158.4			

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division.



[17] OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

03/10/2020
Signature Date

MELISSA SZUDERA
Printed Name

MSZUDERA@MARATHONOIL.COM
E-mail Address

[18] SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

4/9/19
Date of Survey

Signature and Seal of Professional Surveyor:

MATTHEW C. BISSETT
NEW MEXICO
20450
PROFESSIONAL SURVEYOR

20450
Certificate Number

District I
1625 N. French Dr., Hobbs, NM 88240
District II
811 S. First St., Artesia, NM 88210
District III
1000 Rio Brazos Road, Aztec, NM 87410
District IV
1220 S. St. Francis Dr., Santa Fe, NM 87505

State of New Mexico
Energy, Minerals and Natural Resources Department

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

Submit Original
to Appropriate
District Office

OCD – HOBBS
07/21/2020
RECEIVED

GAS CAPTURE PLAN

Date: April 2, 2019

☒ Original
☐ Amended - Reason for Amendment:

Operator & OGRID No.: MARATHON OIL PERMIAN, LLC
OGRID: 372098

This Gas Capture Plan outlines actions to be taken by the Operator to reduce well/production facility flaring/venting for new completion (new drill, recomplete to new zone, re-frac) activity.

Note: Form C-129 must be submitted and approved prior to exceeding 60 days allowed by Rule (Subsection A of 19.15.18.12 NMAC).

Well(s)/Production Facility – Name of facility

The well(s) that will be located at the production facility are shown in the table below.

Well Name	API	Well Location (ULSTR)	Footages	Expected MCF/D	Flared or Vented	Comment
Ned Pepper 18 TB Fed 1H		M-18-T24S-R34E	722' FSL 581' FWL	1750	Flared	
Ned Pepper 18 WA Fed 2H	**30-025-47478**	M-18-T24S-R34E	723' FSL 611' FWL	2450	Flared	
Ned Pepper 18 WXY Fed 6H		M-18-T24S-R34E	724' FSL 641' FWL	2450	Flared	
Ned Pepper 18 TB Fed 4H		N-18-T24S-R34E	645' FSL 2394' FWL	1750	Flared	
Ned pepper 18 WA Fed 9H		N-18-T24S-R34E	645' FSL 2424' FWL	2450	Flared	

Gathering System and Pipeline Notification

Well(s) will be connected to a production facility after flowback operations are complete, if gas transporter system is in place. The gas produced from production facility is dedicated to Lucid and will be connected to Lucid's low pressure gathering system located in Lea County, New Mexico. It will require about 1 mile of pipeline to connect the facility to low pressure gathering system. Marathon provides (periodically) to Lucid a drilling, completion and estimated first production date for wells that are scheduled to be drilled in the foreseeable future. In addition, Marathon and Lucid have periodic conference calls to discuss changes to drilling and completion schedules. Gas from these wells will be processed at Red Hills Processing Plant located in Sec.13, Twn. 24S, Rng. 33E, Lea County, New Mexico. The actual flow of the gas will be based on compression operating parameters and gathering system pressures.

Flowback Strategy

After the fracture treatment/completion operations, well(s) will be produced to temporary production tanks and gas will be flared or vented. During flowback, the fluids and sand content will be monitored. When the produced fluids contain minimal sand, the wells will be turned to production facilities. Gas sales should start as soon as the wells start flowing through the production facilities, unless there are operational issues on Lucid system at that time. Based on current information, it is Marathon's belief the system can take this gas upon completion of the well(s).

Safety requirements during cleanout operations from the use of underbalanced air cleanout systems may necessitate that sand and non-pipeline quality gas be vented and/or flared rather than sold on a temporary basis.

Alternatives to Reduce Flaring

Below are alternatives considered from a conceptual standpoint to reduce the amount of gas flared.

- Power Generation – On lease
  - Only a portion of gas is consumed operating the generator, remainder of gas will be flared
- Compressed Natural Gas – On lease
  - Gas flared would be minimal, but might be uneconomical to operate when gas volume declines
- NGL Removal – On lease
  - Plants are expensive, residue gas is still flared, and uneconomical to operate when gas volume declines