

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**SUNDRY NOTICES AND REPORTS ON WELLS**
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*5. Lease Serial No.
NMNM86024

6. If Indian, Allottee or Tribe Name

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

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other2. Name of Operator
MARATHON OIL PERMIAN LLCContact: MELISSA SZUDERA
E-Mail: mszudera@marathonoil.com8. Well Name and No.
BLUE STEEL 21 WD FEE 3H9. API Well No.
30-015-45892-00-X13a. Address
5555 SAN FELIPE ST
HOUSTON, TX 770563b. Phone No. (include area code)
Ph: 713-296-317910. Field and Pool or Exploratory Area
PURPLE SAGE-WOLFCAMP (GAS)

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 28 T23S R29E NWNW 270FNL 1135FWL
32.282478 N Lat, 103.994804 W Lon

11. County or Parish, State

EDDY COUNTY, NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
☒ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original A
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

Marathon Oil respectfully requests to make the following changes to this well:

- Target Formation: FROM Purple Sage Wolfcamp TO Laguna Salado Bone Spring
- Well Name: FROM Blue Steel 21 WD Fee 3H TO Blue Steel 21 FB Fee 25H

Please see updated well attachments: C-102, Drill Plan, Directional, BOP, Well Head, and Casing Strings.

NOTE: This well is a FEE lease with SHL located on Federal Lease NMNM086024, at the request of the BLM and OCD the permits were submitted to the BLM through AFMSS II.

RECEIVED

JUN 13 2019

DISTRICT II-ARTESIA O.C.D.

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #464923 verified by the BLM Well Information System
For MARATHON OIL PERMIAN LLC, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 05/13/2019 (19PP2024SE)

Name (Printed/Typed) MELISSA SZUDERA

Title REGULATORY COMPLIANCE REP

Signature (Electronic Submission)

Date 05/10/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZQIA STEVENS

Title PETROLEUM ENGINEER

Date 06/06/2019

Conditions of approval, if any, are attached. Approval of this notice 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.

Office Carlsbad

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.

(Instructions on page 2)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

Revisions to Operator-Submitted EC Data for Sundry Notice #464923

	Operator Submitted	BLM Revised (AFMSS)
Sundry Type:	APDCH NOI	APDCH NOI
Lease:	NMNM119272	NMNM86024
Agreement:		
Operator:	MARATHON OIL PERMIAN 5555 SAN FELIPE STREET HOUSTON, TX 77056 Ph: 713-296-3179	MARATHON OIL PERMIAN LLC 5555 SAN FELIPE ST HOUSTON, TX 77056 Ph: 713.629 6600
Admin Contact:	MELISSA SZUDERA ADV REGULATORY COMPLIANCE REP E-Mail: mszudera@marathonoil.com Ph: 713-296-3179	MELISSA SZUDERA REGULATORY COMPLIANCE REP E-Mail: mszudera@marathonoil.com Ph: 713-296-3179
Tech Contact:	MELISSA SZUDERA ADV REGULATORY COMPLIANCE REP E-Mail: mszudera@marathonoil.com Ph: 713-296-3179	MELISSA SZUDERA REGULATORY COMPLIANCE REP E-Mail: mszudera@marathonoil.com Ph: 713-296-3179
Location:		
State:	NM	NM
County:	EDDY	EDDY
Field/Pool:	PURPLESAGE; WOLFCAMP	PURPLE SAGE-WOLFCAMP (GAS)
Well/Facility:	BLUE STEEL 21 WD FEE 3H Sec 28 T23S R29E Mer 5PM NWNW 270FNL 1135FWL 32.282478 N Lat, 103.994807 W Lon	BLUE STEEL 21 WD FEE 3H Sec 28 T23S R29E NWNW 270FNL 1135FWL 32.282478 N Lat, 103.994804 W Lon

PECOS DISTRICT DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	MARATHON OIL PERMIAN LLC
LEASE NO.:	NMNM086024
WELL NAME & NO.:	BLUE STEEL 21 FB FEE 25H
SURFACE HOLE FOOTAGE:	270' FNL & 1135' FWL
BOTTOM HOLE FOOTAGE:	100' FNL & 1993' FWL
LOCATION:	Section 28, T. 23 S., R 29 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

All previous COAs still apply expect the following:

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	☐ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☒ COM	☐ Unit

A. HYDROGEN SULFIDE

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** inch surface casing shall be set at approximately **325** feet (a minimum of 70 feet (Eddy County) into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **24 hours in the Potash Area** or 500 pounds compressive strength, whichever

is greater. (This is to include the lead cement)

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

2. The minimum required fill of cement behind the 9-5/8 inch intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above.

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

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

3. The minimum required fill of cement behind the 5-1/2 inch production casing is:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Additional cement maybe required. Excess calculates to 24%.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - a. 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.
 - b. Manufacturer representative shall install the test plug for the initial BOP test.
 - c. 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.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

ZS 060619

MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

WELL NAME / NUMBER: BLUE STEEL 21 FB FEE 25H

STATE: NEW MEXICO

COUNTY: EDDY

	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	MD	TVD
SHL	270	FNL	1135	FWL	23S	29E	28	NWNW	32.28247880	-103.99480756	EDDY	NM	NMP	F	NMNM086024	3001	0	0
KOP	50	FSL	1994	FWL	23S	29E	21	SESW	32.28335266	-103.99203179	EDDY	NM	NMP	Fee		-4194	7287	7195
PPPI	100	FSL	1994	FWL	23S	29E	21	SESW	32.28349010	-103.99203107	EDDY	NM	NMP	Fee		-4767	7526	7428
BHL	100	FNL	1993	FWL	23S	29E	21	NESW	32.29757396	-103.99195813	EDDY	NM	NMP	Fee		-4767	12788	7768

1. GEOLOGIC NAME OF SURFACE FORMATION

a. Permian

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
Salado	374.0	374.0	Salt/Anhydrite	BRINE	N
Base of Salt	2964.0	2987.8	Base Salt	BRINE	N
Lamar	3010.0	3034.8	Sand/Shale	OIL	Y
Bell Canyon	3045.0	3070.6	Sand/Shale	OIL	Y
Cherry Canyon	3918.0	3963.1	Sand/Carbonate	OIL	Y
Brushy Canyon	5075.0	5145.9	Sand/Carbonate	OIL	Y
Bone Spring	6704.0	6795.7	Sand/Carbonate/Shale	OIL	Y

DEEPEST EXPECTED FRESH WATER: 275' TVD

ANTICIPATED BOTTOM HOLE PRESSURE: 3,935 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 144 °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	400	0	400	54.5	J55	STC	5.22	1.81	3.42
Intermediate	12 1/4	9 5/8	0	3020	0	2996	36	J55	LTC	2.26	2.01	2.51
Production csg	8 3/4	5 1/2	0	12788	0	7768	20	P110	BTC	2.48	1.23	2.58

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 3 rd 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 2 nd 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 (sx)	Yield (ft3/sx)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	--	0	0	0	1.747	13.5	0	100	Class C	
Surface	Tail	--	0	400	407	1.364	14.8	556	100	Class C	0.02 Gal/Sk Defoamer + 0.5% Extender + 1% Accelerator
Intermediate I	Lead	--	0	2000	634	1.73	12.8	1096	75	Class C	0.02 Gal/Sx Defoamer + 0.5% Extender + 1% Accelerator
Intermediate I	Tail	--	2000	3020	360	1.33	14.8	479	50	Class C	0.07 % Retarder
Production	Lead	--	2720	7280	725	2.807	11	1958	70	Class H	0.1% viscofier + 0.25 lb/sx defoamer + 5% retarder
Production	Tail	--	7280	12788	1659	1.223	14.5	1809	30	Class H	2% extender + 0.25% defoamer + 0.5% fluid loss + 0.2% 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.

5. PRESSURE CONTROL EQUIPMENT

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12 ¼"	13 5/8	5000	Annular	x	70% of working pressure
			Blind Ram	x	5000
			Pipe Ram	x	
			Double Ram	x	
			Other*		
8 ¾"	13 5/8	5000	5M Annular	x	70% of working pressure
			Blind Ram	x	5000
			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
<u>0</u>	<u>400</u>	<u>Water Based Mud</u>	<u>8.4</u>	<u>8.8</u>	
<u>400</u>	<u>3020</u>	<u>Brine</u>	<u>9.9</u>	<u>10.2</u>	
<u>3020</u>	<u>12788</u>	<u>Cut Brine / Oil Based Mud</u>	<u>9.0</u>	<u>9.8</u>	

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 9 5/8" Intermediate casing shoe to TD.

9. POTENTIAL HAZARDS:

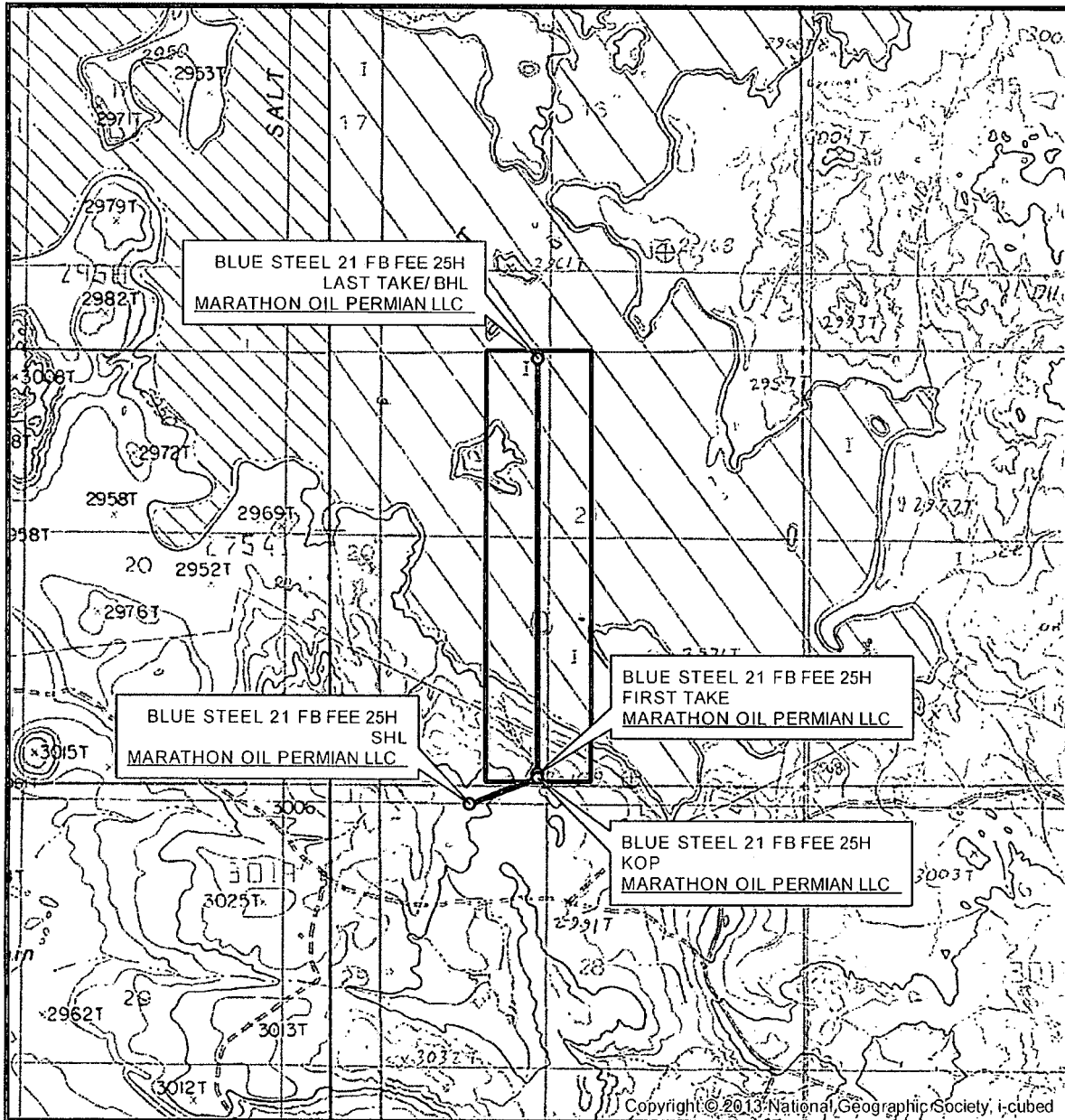
- A. H2S detection equipment will be in operation after drilling out the surface casing shoe until the production casing has been cemented. Breathing equipment will be on location from drilling out the surface shoe until production casing is cemented. If H2S is encountered the operator will comply with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

LOCATION VERIFICATION MAP



SEC. 28 TWP. 23-S RGE. 29-E
 SURVEY: N.M.P.M.
 COUNTY: EDDY
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 270' FNL & 1135' FWL
 ELEVATION: 3001'
 LEASE: BLUE STEEL 21 FEE
 U.S.G.S. TOPOGRAPHIC MAP: REMUDA BASIN, NM.

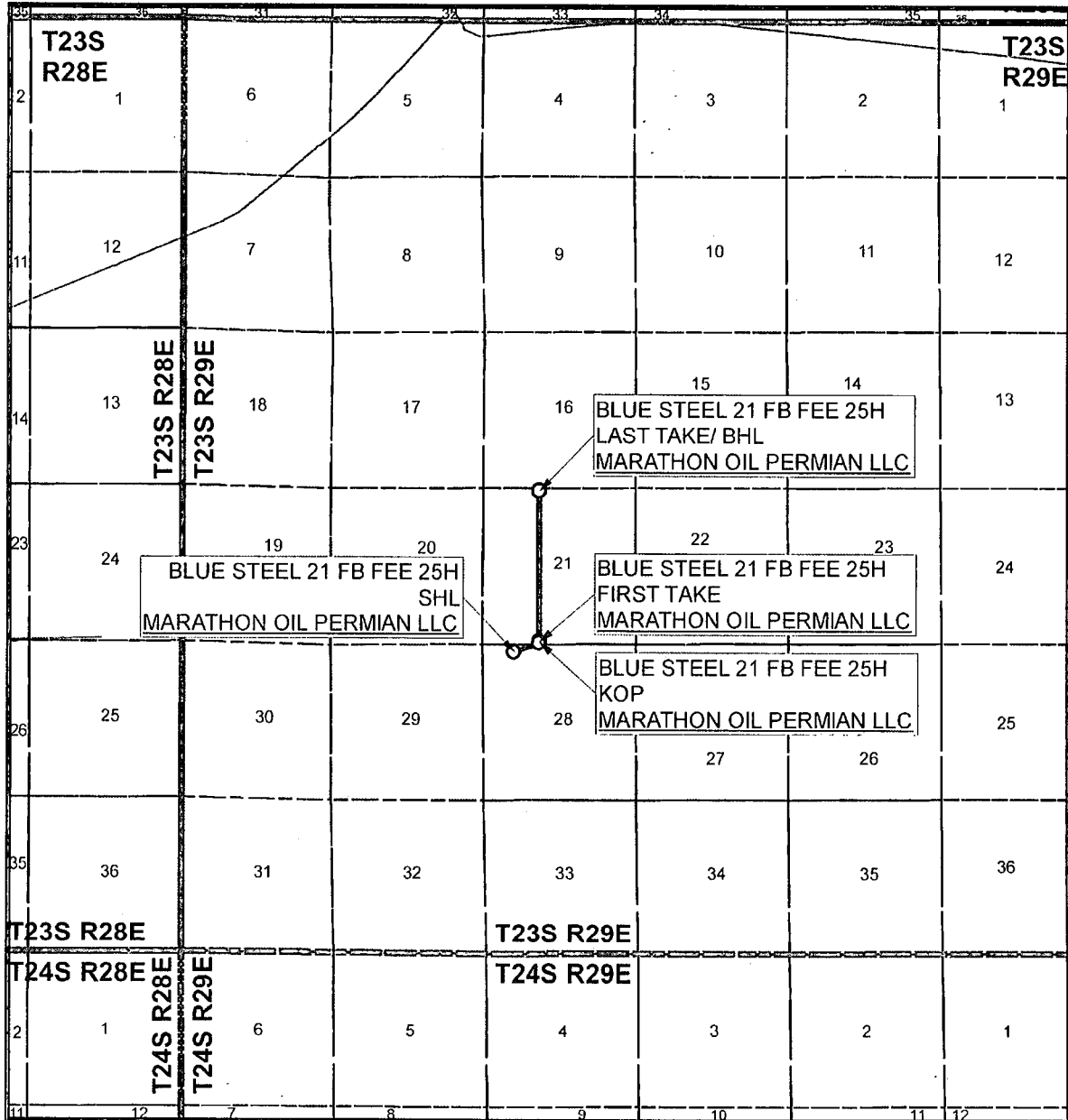
1" = 2,000'
 CONTOUR INTERVAL = 20'



SHEET 2 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R3942_016

VICINITY MAP



SEC. 28 TWP. 23-S RGE. 29-E
 SURVEY: N.M.P.M.
 COUNTY: EDDY
 OPERATOR: MARATHON OIL PERMIAN LLC
 DESCRIPTION: 270' FNL & 1135' FWL
 ELEVATION: 3001'
 LEASE: BLUE STEEL 21 FEE
 U.S.G.S. TOPOGRAPHIC MAP: REMUDA BASIN, NM.

1" = 1 MILE



SHEET 3 OF 3

PREPARED BY:
 R-SQUARED GLOBAL, LLC
 1309 LOUISVILLE AVENUE, MONROE, LA 71201
 318-323-6900 OFFICE
 JOB No. R3942_016



Marathon Oil
Eddy County, NM
Blue Steel 21 FB Fee #25H
Prelim Plan A
GL: 3001' + KB:
27' (PD582)

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

RKB Elevation: Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	466604.24	604770.42	32.282357	-103.994316	

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	2100.00	12.00	69.48	2095.62	21.94	58.63	2.00	22.01
4	5897.89	12.00	69.48	5810.52	298.67	798.18	0.00	299.65
5	6497.89	0.00	0.00	6406.14	320.61	856.81	2.00	321.68
6	7286.75	0.00	0.00	7195.00	320.61	856.81	0.00	321.68
7	8186.74	90.00	0.07	7767.86	893.56	857.52	10.00	894.61
8	12787.28	90.00	0.07	7768.00	5494.10	863.26	0.00	5495.15

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[BlueSteelFeeFB#25H]FTP	0.00	370.61	856.88	466974.85	605627.30
[BlueSteelFeeFB#25H]KOP	7195.00	320.61	856.81	466924.85	605627.23
[BlueSteelFeeFB#25H]LTP/BHL	7768.00	5494.10	863.26	472098.34	605633.68



PRODIRECTIONAL



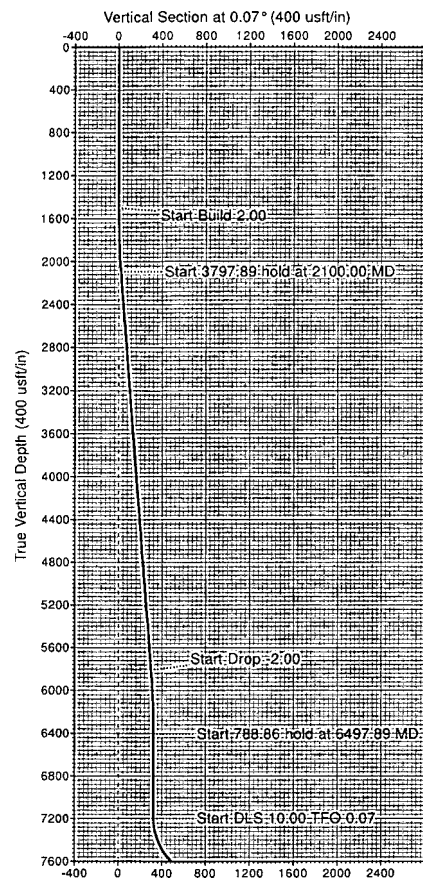
Azimuths to Grid North
True North: -0.18°
Magnetic North: 6.94°

Magnetic Field
Strength: 47887.0nT
Dip Angle: 60.07°
Date: 9/25/2018
Model: HDGM

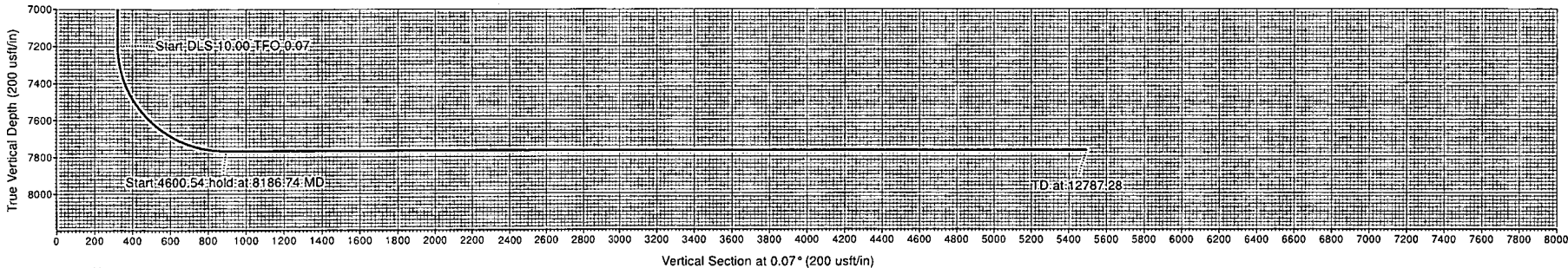
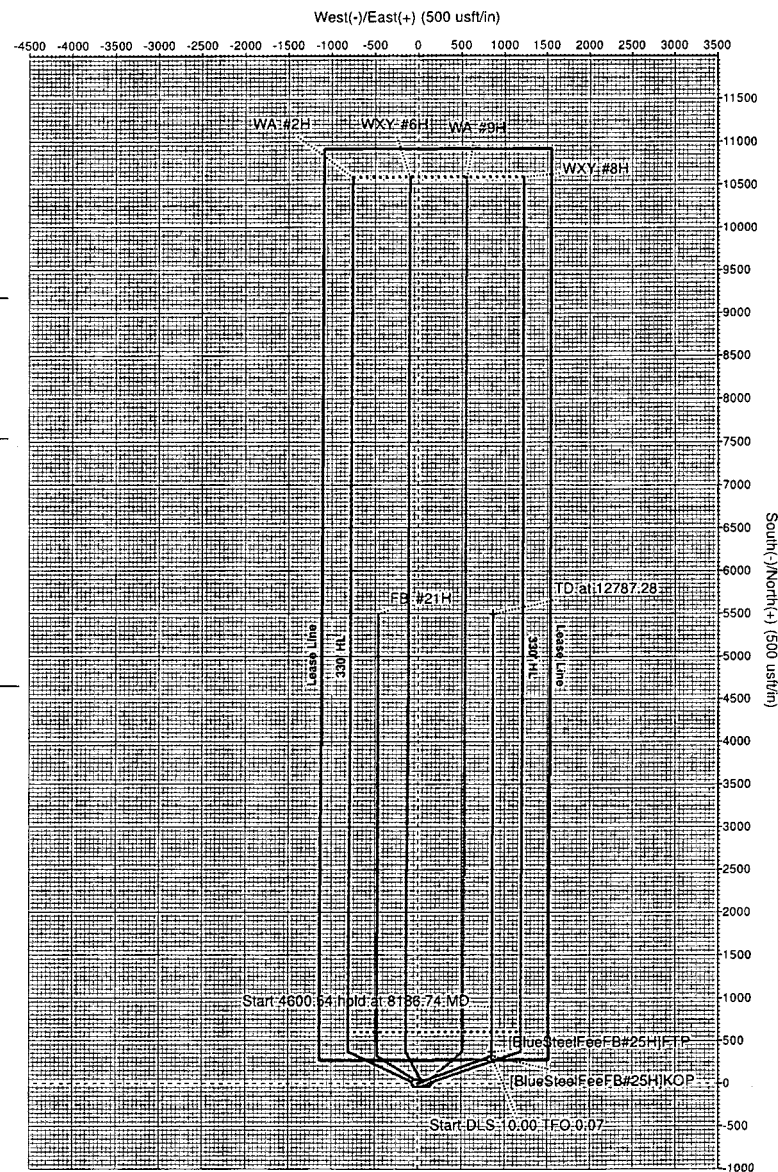
Azimuth Corrections

Total Magnetic Corr. (M to G): 6.94°

Declination (M to T): 7.12° East



Target Line: 7768' TVD @ 0' VS: 90° INC



36" x 48"

Company:	Marathon Oil	Local Co-ordinate Reference:	Well FB #25H
Project:	Eddy County, NM	TVD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Site:	Blue Steel 21 FB Fee	MD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Well:	#25H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

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

Site	Blue Steel 21 FB Fee 25H			
Site Position:		Northing:	466,604.25 usft	Latitude: 32.282356
From:	Map	Easting:	604,860.40 usft	Longitude: -103.994025
Position Uncertainty:	0.00 usft	Slot Radius:	13-3/16 "	Grid Convergence: 0.18 °

Well	FB #25H			
Well Position	+N/-S	0.00 usft	Northing:	466,604.24 usft
	+E/-W	0.00 usft	Easting:	604,770.42 usft
Position Uncertainty	0.00 usft		Wellhead Elevation:	usft
			Ground Level:	3,001.00 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	HDGM	9/25/2018	7.12	60.07	47,987.00

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	0.07

Survey Tool Program	Date	5/9/2019		
From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,850.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
1,850.00	5,400.00	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
5,400.00	7,277.49	Prelim Plan A (OH)	MWD+IFR1	OWSG MWD + IFR1
10,000.00	12,787.28	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
[BlueSteelFeeFB#25H]FTP									
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well FB #25H
Project:	Eddy County, NM	TVD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Site:	Blue Steel 21 FB Fee	MD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Well:	#25H	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)
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	2.00	69.48	1,599.98	0.61	1.63	0.61	2.00	2.00	0.00
1,700.00	4.00	69.48	1,699.84	2.45	6.54	2.45	2.00	2.00	0.00
1,800.00	6.00	69.48	1,799.45	5.50	14.70	5.52	2.00	2.00	0.00
1,900.00	8.00	69.48	1,898.70	9.77	26.11	9.80	2.00	2.00	0.00
2,000.00	10.00	69.48	1,997.47	15.25	40.76	15.30	2.00	2.00	0.00
2,100.00	12.00	69.48	2,095.62	21.94	58.63	22.01	2.00	2.00	0.00
2,200.00	12.00	69.48	2,193.44	29.23	78.10	29.32	0.00	0.00	0.00
2,300.00	12.00	69.48	2,291.25	36.51	97.58	36.63	0.00	0.00	0.00
2,400.00	12.00	69.48	2,389.07	43.80	117.05	43.94	0.00	0.00	0.00
2,500.00	12.00	69.48	2,486.88	51.09	136.52	51.25	0.00	0.00	0.00
2,600.00	12.00	69.48	2,584.70	58.37	155.99	58.56	0.00	0.00	0.00
2,700.00	12.00	69.48	2,682.51	65.66	175.47	65.87	0.00	0.00	0.00
2,800.00	12.00	69.48	2,780.33	72.94	194.94	73.18	0.00	0.00	0.00
2,900.00	12.00	69.48	2,878.14	80.23	214.41	80.49	0.00	0.00	0.00
3,000.00	12.00	69.48	2,975.96	87.52	233.89	87.80	0.00	0.00	0.00
3,100.00	12.00	69.48	3,073.77	94.80	253.36	95.11	0.00	0.00	0.00
3,200.00	12.00	69.48	3,171.59	102.09	272.83	102.42	0.00	0.00	0.00
3,300.00	12.00	69.48	3,269.40	109.38	292.30	109.73	0.00	0.00	0.00
3,400.00	12.00	69.48	3,367.22	116.66	311.78	117.04	0.00	0.00	0.00
3,500.00	12.00	69.48	3,465.03	123.95	331.25	124.35	0.00	0.00	0.00
3,600.00	12.00	69.48	3,562.84	131.24	350.72	131.66	0.00	0.00	0.00
3,700.00	12.00	69.48	3,660.66	138.52	370.19	138.97	0.00	0.00	0.00
3,800.00	12.00	69.48	3,758.47	145.81	389.67	146.29	0.00	0.00	0.00
3,900.00	12.00	69.48	3,856.29	153.10	409.14	153.60	0.00	0.00	0.00
4,000.00	12.00	69.48	3,954.10	160.38	428.61	160.91	0.00	0.00	0.00
4,100.00	12.00	69.48	4,051.92	167.67	448.08	168.22	0.00	0.00	0.00
4,200.00	12.00	69.48	4,149.73	174.95	467.56	175.53	0.00	0.00	0.00
4,300.00	12.00	69.48	4,247.55	182.24	487.03	182.84	0.00	0.00	0.00
4,400.00	12.00	69.48	4,345.36	189.53	506.50	190.15	0.00	0.00	0.00
4,500.00	12.00	69.48	4,443.18	196.81	525.97	197.46	0.00	0.00	0.00
4,600.00	12.00	69.48	4,540.99	204.10	545.45	204.77	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well FB #25H
Project:	Eddy County, NM	TVD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Site:	Blue Steel 21 FB Fee	MD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Well:	#25H	North Reference:	Grid
Wellbore:	OH	Survey Calculation Method:	Minimum Curvature
Design:	Prelim Plan A	Database:	WellPlanner1

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.00	12.00	69.48	4,638.81	211.39	564.92	212.08	0.00	0.00	0.00
4,800.00	12.00	69.48	4,736.62	218.67	584.39	219.39	0.00	0.00	0.00
4,900.00	12.00	69.48	4,834.44	225.96	603.86	226.70	0.00	0.00	0.00
5,000.00	12.00	69.48	4,932.25	233.25	623.34	234.01	0.00	0.00	0.00
5,100.00	12.00	69.48	5,030.07	240.53	642.81	241.32	0.00	0.00	0.00
5,200.00	12.00	69.48	5,127.88	247.82	662.28	248.63	0.00	0.00	0.00
5,300.00	12.00	69.48	5,225.70	255.11	681.75	255.94	0.00	0.00	0.00
5,400.00	12.00	69.48	5,323.51	262.39	701.23	263.25	0.00	0.00	0.00
5,500.00	12.00	69.48	5,421.33	269.68	720.70	270.56	0.00	0.00	0.00
5,600.00	12.00	69.48	5,519.14	276.97	740.17	277.87	0.00	0.00	0.00
5,700.00	12.00	69.48	5,616.95	284.25	759.64	285.18	0.00	0.00	0.00
5,800.00	12.00	69.48	5,714.77	291.54	779.12	292.49	0.00	0.00	0.00
5,897.89	12.00	69.48	5,810.52	298.67	798.18	299.65	0.00	0.00	0.00
5,900.00	11.96	69.48	5,812.58	298.82	798.59	299.80	2.00	-2.00	0.00
6,000.00	9.96	69.48	5,910.76	305.49	816.39	306.48	2.00	-2.00	0.00
6,100.00	7.96	69.48	6,009.53	310.94	830.97	311.96	2.00	-2.00	0.00
6,200.00	5.96	69.48	6,108.79	315.19	842.32	316.22	2.00	-2.00	0.00
6,300.00	3.96	69.48	6,208.41	318.22	850.41	319.25	2.00	-2.00	0.00
6,400.00	1.96	69.48	6,308.27	320.02	855.24	321.07	2.00	-2.00	0.00
6,497.89	0.00	0.00	6,406.14	320.61	856.81	321.66	2.00	-2.00	0.00
6,500.00	0.00	0.00	6,408.25	320.61	856.81	321.66	0.00	0.00	0.00
6,600.00	0.00	0.00	6,508.25	320.61	856.81	321.66	0.00	0.00	0.00
6,700.00	0.00	0.00	6,608.25	320.61	856.81	321.66	0.00	0.00	0.00
6,800.00	0.00	0.00	6,708.25	320.61	856.81	321.66	0.00	0.00	0.00
6,900.00	0.00	0.00	6,808.25	320.61	856.81	321.66	0.00	0.00	0.00
7,000.00	0.00	0.00	6,908.25	320.61	856.81	321.66	0.00	0.00	0.00
7,100.00	0.00	0.00	7,008.25	320.61	856.81	321.66	0.00	0.00	0.00
7,200.00	0.00	0.00	7,108.25	320.61	856.81	321.66	0.00	0.00	0.00
7,286.75	0.00	0.00	7,195.00	320.61	856.81	321.66	0.00	0.00	0.00
[BlueSteelFeeFB#25H]KOP									
7,300.00	1.33	0.07	7,208.25	320.76	856.81	321.81	10.00	10.00	0.00
7,350.00	6.33	0.07	7,258.13	324.10	856.81	325.14	10.00	10.00	0.00
7,400.00	11.33	0.07	7,307.52	331.77	856.82	332.81	10.00	10.00	0.00
7,450.00	16.33	0.07	7,356.05	343.71	856.84	344.76	10.00	10.00	0.00
7,500.00	21.33	0.07	7,403.36	359.84	856.86	360.89	10.00	10.00	0.00
7,550.00	26.33	0.07	7,449.09	380.03	856.88	381.08	10.00	10.00	0.00
7,600.00	31.33	0.07	7,492.88	404.13	856.91	405.18	10.00	10.00	0.00
7,650.00	36.33	0.07	7,534.40	431.95	856.95	433.00	10.00	10.00	0.00
7,700.00	41.33	0.07	7,573.34	463.29	856.99	464.34	10.00	10.00	0.00
7,750.00	46.33	0.07	7,609.40	497.90	857.03	498.95	10.00	10.00	0.00
7,800.00	51.33	0.07	7,642.31	535.53	857.08	536.57	10.00	10.00	0.00
7,850.00	56.33	0.07	7,671.82	575.88	857.13	576.92	10.00	10.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well FB #25H
Project:	Eddy County, NM	TVD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Site:	Blue Steel 21 FB Fee	MD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Well:	#25H	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)
7,900.00	61.33	0.07	7,697.69	618.64	857.18	619.69	10.00	10.00	0.00
7,950.00	66.33	0.07	7,719.74	663.50	857.24	664.55	10.00	10.00	0.00
8,000.00	71.33	0.07	7,737.79	710.11	857.30	711.16	10.00	10.00	0.00
8,050.00	76.33	0.07	7,751.72	758.12	857.36	759.16	10.00	10.00	0.00
8,100.00	81.33	0.07	7,761.40	807.15	857.42	808.20	10.00	10.00	0.00
8,150.00	86.33	0.07	7,766.78	856.85	857.48	857.89	10.00	10.00	0.00
8,186.74	90.00	0.07	7,767.96	893.56	857.52	894.61	10.00	10.00	0.00
8,200.00	90.00	0.07	7,767.96	906.82	857.54	907.87	0.00	0.00	0.00
8,300.00	90.00	0.07	7,767.96	1,006.82	857.67	1,007.87	0.00	0.00	0.00
8,400.00	90.00	0.07	7,767.96	1,106.82	857.79	1,107.87	0.00	0.00	0.00
8,500.00	90.00	0.07	7,767.96	1,206.82	857.91	1,207.87	0.00	0.00	0.00
8,600.00	90.00	0.07	7,767.96	1,306.82	858.04	1,307.87	0.00	0.00	0.00
8,700.00	90.00	0.07	7,767.96	1,406.82	858.16	1,407.87	0.00	0.00	0.00
8,800.00	90.00	0.07	7,767.96	1,506.82	858.29	1,507.87	0.00	0.00	0.00
8,900.00	90.00	0.07	7,767.96	1,606.82	858.41	1,607.87	0.00	0.00	0.00
9,000.00	90.00	0.07	7,767.97	1,706.82	858.54	1,707.87	0.00	0.00	0.00
9,100.00	90.00	0.07	7,767.97	1,806.82	858.66	1,807.87	0.00	0.00	0.00
9,200.00	90.00	0.07	7,767.97	1,906.82	858.79	1,907.87	0.00	0.00	0.00
9,300.00	90.00	0.07	7,767.97	2,006.82	858.91	2,007.87	0.00	0.00	0.00
9,400.00	90.00	0.07	7,767.97	2,106.82	859.04	2,107.87	0.00	0.00	0.00
9,500.00	90.00	0.07	7,767.97	2,206.82	859.16	2,207.87	0.00	0.00	0.00
9,600.00	90.00	0.07	7,767.97	2,306.82	859.29	2,307.87	0.00	0.00	0.00
9,700.00	90.00	0.07	7,767.97	2,406.82	859.41	2,407.87	0.00	0.00	0.00
9,800.00	90.00	0.07	7,767.97	2,506.82	859.54	2,507.87	0.00	0.00	0.00
9,900.00	90.00	0.07	7,767.97	2,606.82	859.66	2,607.87	0.00	0.00	0.00
10,000.00	90.00	0.07	7,767.97	2,706.82	859.79	2,707.87	0.00	0.00	0.00
10,100.00	90.00	0.07	7,767.98	2,806.82	859.91	2,807.87	0.00	0.00	0.00
10,200.00	90.00	0.07	7,767.98	2,906.82	860.03	2,907.87	0.00	0.00	0.00
10,300.00	90.00	0.07	7,767.98	3,006.82	860.16	3,007.87	0.00	0.00	0.00
10,400.00	90.00	0.07	7,767.98	3,106.82	860.28	3,107.87	0.00	0.00	0.00
10,500.00	90.00	0.07	7,767.98	3,206.82	860.41	3,207.87	0.00	0.00	0.00
10,600.00	90.00	0.07	7,767.98	3,306.82	860.53	3,307.87	0.00	0.00	0.00
10,700.00	90.00	0.07	7,767.98	3,406.82	860.66	3,407.87	0.00	0.00	0.00
10,800.00	90.00	0.07	7,767.98	3,506.82	860.78	3,507.87	0.00	0.00	0.00
10,900.00	90.00	0.07	7,767.98	3,606.82	860.91	3,607.87	0.00	0.00	0.00
11,000.00	90.00	0.07	7,767.98	3,706.82	861.03	3,707.87	0.00	0.00	0.00
11,100.00	90.00	0.07	7,767.98	3,806.82	861.16	3,807.87	0.00	0.00	0.00
11,200.00	90.00	0.07	7,767.99	3,906.82	861.28	3,907.87	0.00	0.00	0.00
11,300.00	90.00	0.07	7,767.99	4,006.82	861.41	4,007.87	0.00	0.00	0.00
11,400.00	90.00	0.07	7,767.99	4,106.82	861.53	4,107.87	0.00	0.00	0.00
11,500.00	90.00	0.07	7,767.99	4,206.82	861.66	4,207.87	0.00	0.00	0.00
11,600.00	90.00	0.07	7,767.99	4,306.82	861.78	4,307.87	0.00	0.00	0.00

Company:	Marathon Oil	Local Co-ordinate Reference:	Well FB #25H
Project:	Eddy County, NM	TVD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Site:	Blue Steel 21 FB Fee	MD Reference:	Well @ 3028.00usft (GL: 3001' + KB: 27' (PD582))
Well:	#25H	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)	
11,700.00	90.00	0.07	7,767.99	4,406.82	861.90	4,407.87	0.00	0.00	0.00	
11,800.00	90.00	0.07	7,767.99	4,506.82	862.03	4,507.87	0.00	0.00	0.00	
11,900.00	90.00	0.07	7,767.99	4,606.82	862.15	4,607.87	0.00	0.00	0.00	
12,000.00	90.00	0.07	7,767.99	4,706.82	862.28	4,707.87	0.00	0.00	0.00	
12,100.00	90.00	0.07	7,767.99	4,806.82	862.40	4,807.87	0.00	0.00	0.00	
12,200.00	90.00	0.07	7,767.99	4,906.82	862.53	4,907.87	0.00	0.00	0.00	
12,300.00	90.00	0.07	7,768.00	5,006.82	862.65	5,007.87	0.00	0.00	0.00	
12,400.00	90.00	0.07	7,768.00	5,106.82	862.78	5,107.87	0.00	0.00	0.00	
12,500.00	90.00	0.07	7,768.00	5,206.82	862.90	5,207.87	0.00	0.00	0.00	
12,600.00	90.00	0.07	7,768.00	5,306.82	863.03	5,307.87	0.00	0.00	0.00	
12,700.00	90.00	0.07	7,768.00	5,406.82	863.15	5,407.87	0.00	0.00	0.00	
12,787.28	90.00	0.07	7,768.00	5,494.10	863.26	5,495.15	0.00	0.00	0.00	
[BlueSteelFeeFB#25H]LTP/BHL										

Design Targets										
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude	
[BlueSteelFeeFB#25H]F - hit/miss target - Shape	0.00	0.00	0.00	370.61	856.88	466,974.85	605,627.30	32.283368	-103.991540	
- plan misses target center by 933.59usft at 0.00usft MD (0.00 TVD, 0.00 N, 0.00 E)										
- Point										
[BlueSteelFeeFB#25H]K - plan hits target center - Point	0.00	0.00	7,195.00	320.61	856.81	466,924.85	605,627.23	32.283231	-103.991541	
[BlueSteelFeeFB#25H]L - plan hits target center - Point	0.00	0.00	7,768.00	5,494.10	863.26	472,098.34	605,633.68	32.297452	-103.991467	

Checked By: _____	Approved By: _____	Date: _____
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