Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

OCD Hobbs

FORM 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.

SUBMIT IN TRIPLICATE - Other instructions on page 2

HOBBS OCD
OCT 21 2019
RECEIVED

5. Lease Serial No.
NMNM113970

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☒ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No.
MAMMOTH FED COM 26 34 1 WA 2H

2. Name of Operator
MARATHON OIL PERMIAN LLC
Contact: MELISSA SZUDERA
E-Mail: mszudera@marathonoil.com

9. API Well No.
30-025-46130-00-X1

3a. Address
5555 SAN FELIPE STREET
HOUSTON, TX 77056

3b. Phone No. (include area code)
Ph: 713-296-3179

10. Field and Pool or Exploratory Area
WC025G09S253402N-WOLFCAMP
WOLFCAMP

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 1 T26S R34E SESW 448FSL 1509FWL
32.066395 N Lat, 103.427307 W Lon

11. County or Parish, State
LEA 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 to Original APD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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 recomplete 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 recompletion 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 the approved APD:
(1) Well Name (Mammoth Federal Com 26 34 1 WA 2H to Mammoth 1 WA Fed Com 2H)
(2) SHL change (448 FSL 1509' FWL to 448' FSL 1479' FWL, swapping SHL with the Mammoth 1H).
Please see attached updated drill plan, drilling directional and C-102 plat.

Surface fine. NM. 10/18/2019. Some stipulations apply.

14. I hereby certify that the foregoing is true and correct.
Electronic Submission #486360 verified by the BLM Well Information System
For MARATHON OIL PERMIAN LLC, sent to the Hobbs
Committed to AFMSS for processing by PRISCILLA PEREZ on 10/03/2019 (20PP0038SE)

Name *(Printed/Typed)* MELISSA SZUDERA — Title REGULATORY COMPLIANCE REP

Signature (Electronic Submission) — Date 10/03/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By Dylan Rossmango — Title Petroleum Engineer — Date 10/18/19

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.

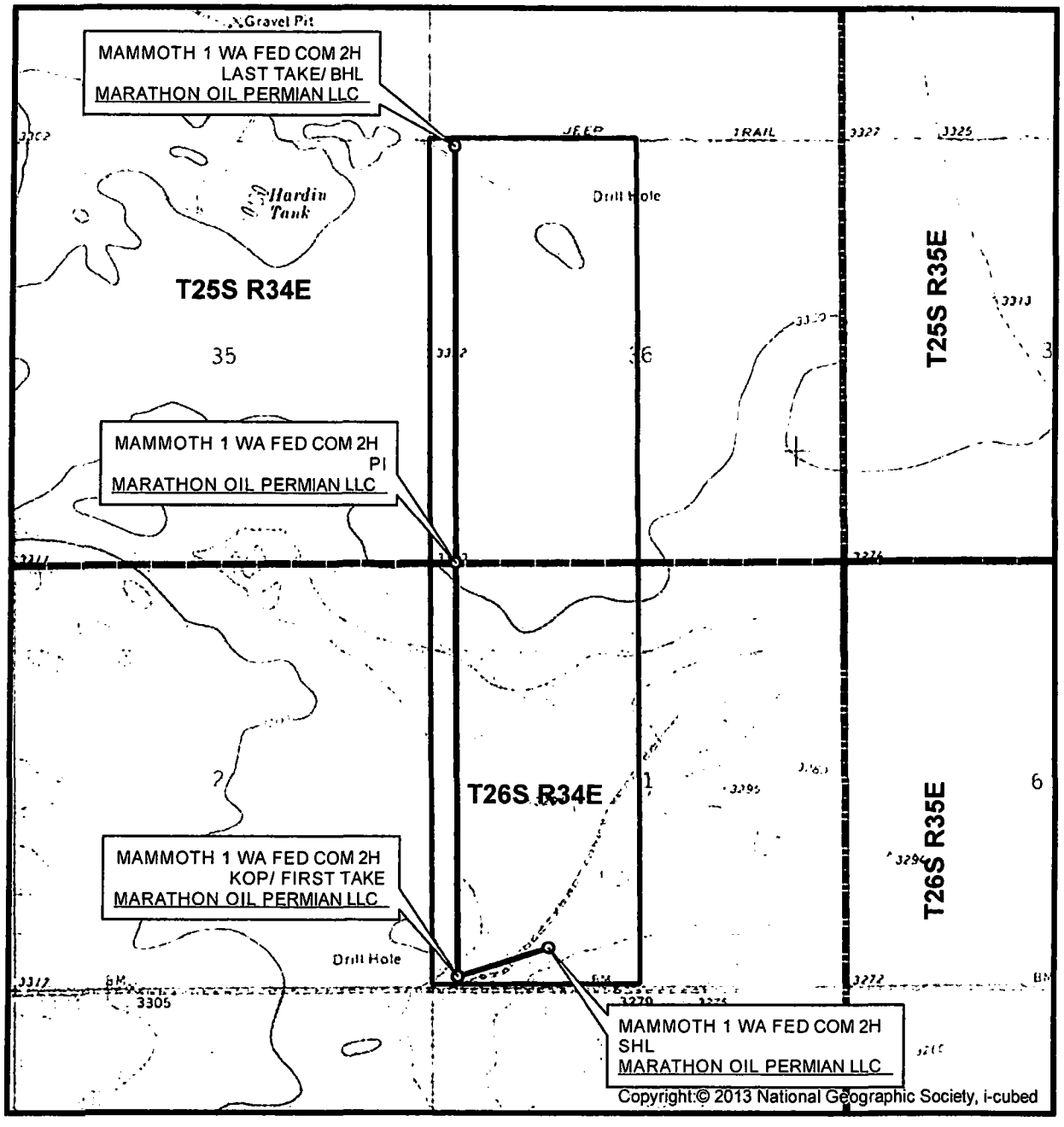
Office CFO

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 ****

LOCATION VERIFICATION MAP



SEC. 1 TWP. 26-S RGE. 34-E
SURVEY: N.M.P.M.
COUNTY: LEA
OPERATOR: MARATHON OIL PERMIAN LLC
DESCRIPTION: 448' FSL & 1479' FWL
ELEVATION: 3281'
LEASE: MAMMOTH 1 FED COM
U.S.G.S. TOPOGRAPHIC MAP: ANDREWS PLACE, NM,TX.

1 " = 2,000 '
CONTOUR INTERVAL = 10'

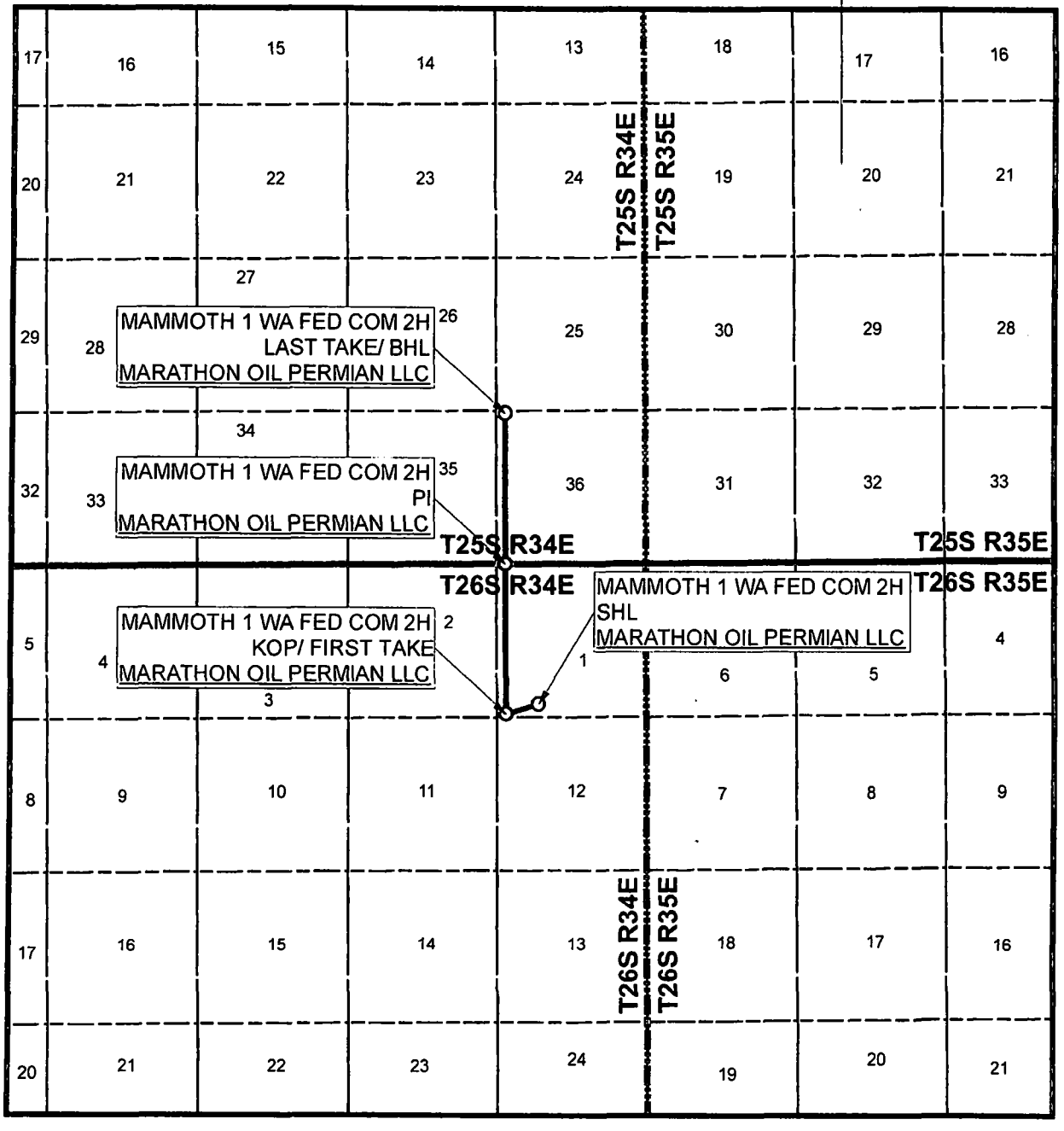
R-SQUARED GLOBAL LLC

SHEET 2 OF 3

PREPARED BY:
R-SQUARED GLOBAL, LLC
1309 LOUISVILLE AVENUE, MONROE, LA 71201
318-323-6900 OFFICE

JOB No. R3762_009

VICINITY MAP



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SHEET 3 OF 3

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MARATHON OIL PERMIAN LLC

DRILLING AND OPERATIONS PLAN

WELL NAME / NUMBER: MAMMOTH 1 WA FED COM WA 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	448	FSL	[redacted]	FWL	26S	34E	1	SESW	[redacted]	[redacted]	Lea	NM	NMP	F	NMNM 113970	3281	0	0
KOP	[redacted]	FSL	[redacted]	FWL	26S	34E	1	SWSW	[redacted]	[redacted]	Lea	NM	NMP	F	NMNM 113970	[redacted]		
PPP	[redacted]	FSL	330	FWL	26S	34E	1	SWSW	[redacted]	[redacted]	Lea	NM	NMP	F	NMNM 113970			
EXIT	0	FNL	330	FWL	26S	34E	1	NWNW	[redacted]	[redacted]	Lea	NM	NMP	F	NMNM 113970			
PPP	0	FSL	330	FWL	25S	34E	36	SWSW	[redacted]	[redacted]	Lea	NM	NMP	S	State			
BHL	[redacted]	FNL	330	FWL	25S	34E	36	NWNW	[redacted]	[redacted]	Lea	NM	NMP	S	State			

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	1116	1116	Anhydrite/Dolomite	BRINE	N
Salado	1555	1555	Salt/Anhydrite	BRINE	N
Castile	3593	3617	Base Salt	BRINE	N
Base of Salt	5149	5221	Limy Sands	BRINE	N
Lamar	5415	5495	Sand/Shales	OIL	N
Bell Canyon	5443	5524	Sands/Shale	OIL	N
Brushy Canyon	8051	8168	Sands/Carbonates	OIL	N
Bone Spring	9342	9459	Sands/Carbonates	OIL	N
1st Bone Spring Sand	10463	10580	Sands/Carbonates	OIL	N
2nd Bone Spring Sand	11012	12215	Sands/Carbonates	OIL	N
3rd Bone Spring Sand	12097	12215	Sands/Carbonates	OIL	N
Wolfcamp	12524	12671	Carbonates/Shales/Sands	OIL	Y
Wolfcamp X	12544	12697	Carbonates/Shales/Sands	OIL	Y
Wolfcamp Y	12602	12781	Carbonates/Shales/Sands	OIL	Y

DEEPEST EXPECTED FRESH WATER: 400' TVD

ANTICIPATED BOTTOM HOLE PRESSURE: 8,890 psi

ANTICIPATED BOTTOM HOLE TEMPERATURE: 195°F

ANTICIPATED ABNORMAL PRESSURE: N

ANTICIPATED ABNORMAL TEMPERATURE: N

3. CASING PROGRAM: REMOVED INTERMEDIATE I

String Type	Hole Size	Casing Size	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Weight (lbs/ft)	Grade	Connection	SF Collapse	SF Burst	SF Tension
Surface	17 1/2	13 3/8	0	1130	0	1130	3281	2151	54.5	J55	STC	3.37	1.71	2.93
Intermediate	9 7/8	7 5/8	0	[illegible]	0	12180	3281	-8899	29.7	P110	BTC	2.21	1.18	1.9
Production	6 3/4	5 1/2	0	[illegible]	0	[illegible]	3281	[illegible]	23	P110	Wedge	1.73	1.2	2.09

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 (sx)	Yield (ft3/sx)	Density (ppg)	Slurry Volume (ft3)	Excess (%)	Cement Type	Additives
Surface	Lead	N/A	0	904	907	1.73	13.5	1570	150	Class C	LCM
Surface	Tail	N/A	904	1130	236	1.33	14.8	314	100	Class C	Accelerator
Intermediate	Lead	N/A	0	11100	1915	2.49	11.0	4768	100	Class C	Extender, Accelerator, 50/50 Poz C
Intermediate	Tail	N/A	11100	[redacted]	236	1.28	13.8	302	30	Class H	Retarder, 35/65 Poz H
Production	Lead	N/A	9680	10180	47	1.29	14.5	60	30	Class H	Viscosifier, Retarder
Production	Tail	N/A	10180	[redacted]	1295	1.09	14.5	1411	30	Class H	Extender, Fluid Loss, 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 which hole?	Size?	Min. Required WP	Type	✓	Tested to:
12 ¼"	13 5/8	10000	Annular	x	100% of working pressure
			Blind Ram	x	10000
			Pipe Ram		
			Double Ram	x	
			Other*		
8 ¾"	13 5/8	10000	Annular	x	100% of working pressure
			Blind Ram	x	10000
			Pipe Ram		
			Double Ram	x	
			Other *		
6 1/8"	13 5/8	10000	Annular	x	100% of working pressure
			Blind Ram	x	10000
			Pipe Ram		
			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	1130	Water Based Mud	8.4	8.8	
1130	[redacted]	Oil Based mud	8.4	10.0	
[redacted]	[redacted]	Oil Based mud	11.5	13.5	

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

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.

Marathon Oil Corporation

Marathon Oil
Lea County, NM
Mammoth 1 (1-2-7-10-11)
WA No. 2H
Prelim Plan A
GL: 3281' + 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 @ 3306.00usft (GL: 3281' + KB: 25' (PD594))

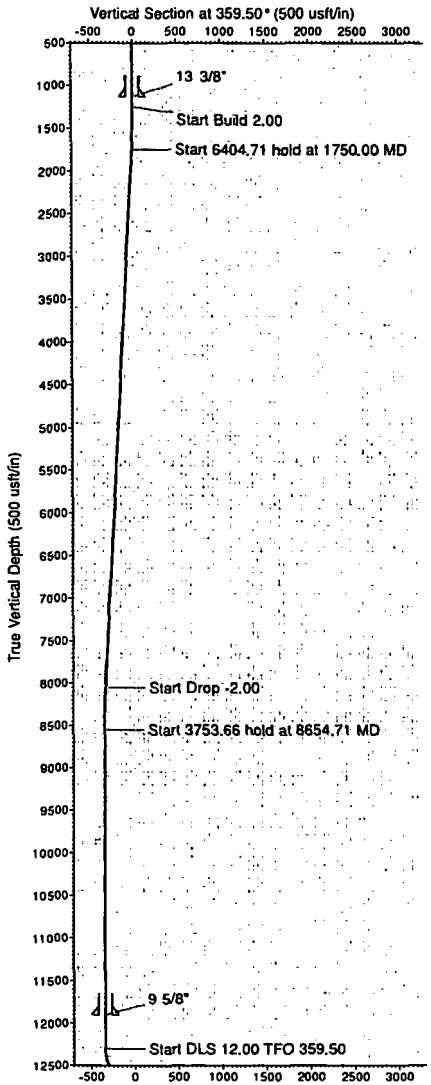
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude	Slot
0.00	0.00	389012.16	780779.29	32.066268	-103.426942	

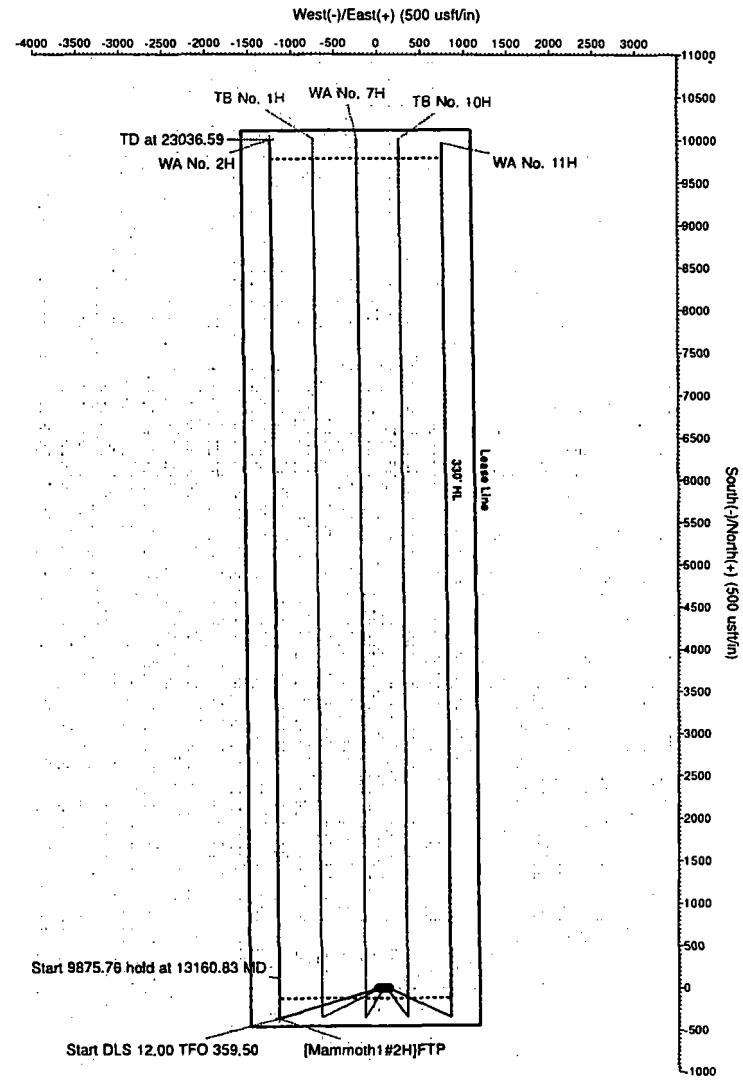
SECTION DETAILS

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	1250.00	0.00	0.00	1250.00	0.00	0.00	0.00	0.00
3	1750.00	10.00	252.81	1747.47	-12.86	-41.58	2.00	-12.50
4	8154.71	10.00	252.81	8054.88	-341.60	-1104.05	0.00	-331.95
5	8654.71	0.00	0.00	8552.34	-354.46	-1145.63	2.00	-344.45
6	12408.37	0.00	0.00	12306.00	-354.46	-1145.63	0.00	-344.45
7	13160.83	90.30	359.50	12783.46	125.45	-1149.85	12.00	135.48
8	23036.59	90.30	359.50	12732.58	10000.69	-1236.67	0.00	10011.10

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
[Mammoth1#2H]FTP	12306.00	-354.46	-1145.63	388657.70	779633.66
[Mammoth1#2H]LTP/BHL	12732.58	10000.69	-1236.67	399012.85	779542.62





PRODIRECTIONAL

Azimuths to Grid North
True North: -0.48°
Magnetic North: 6.07°

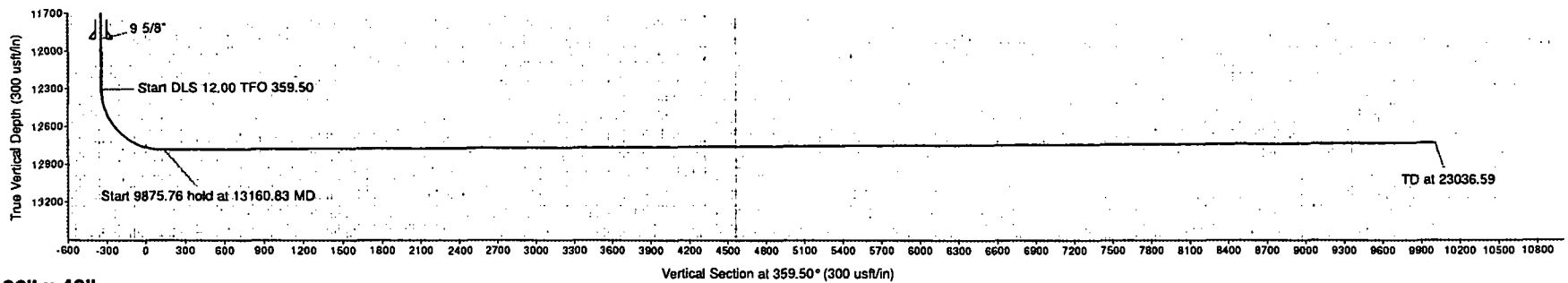
Magnetic Field
Strength: 47673.2snT
Dip Angle: 59.67°
Date: 9/30/2019
Model: HDGM

Azimuth Corrections

Total Magnetic Corr. (M to G): 6.07°

Declination (M to T): 6.55° East

Target Line: 12785' TVD @ 0' VS :: 90.3° INC



36" x 48"

Marathon Oil

Pro Directional
Survey Report

PRODIRECTIONAL

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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	Mammoth 1 (1-2-7-10-11)				
Site Position:		**Northing:**	389,012.20 usft	**Latitude:**	32.066268
From:	Map	**Easting:**	780,809.21 usft	**Longitude:**	-103.426846
Position Uncertainty:	0.00 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.48 °

Well	WA No. 2H					
Well Position	**+N/-S**	0.00 usft	**Northing:**	389,012.16 usft	**Latitude:**	32.066268
	+E/-W	0.00 usft	**Easting:**	780,779.29 usft	**Longitude:**	-103.426943
Position Uncertainty		0.00 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,281.00 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	HDGM	9/30/2019	6.55	59.67	47,673.20

Design	Prelim Plan A				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	359.50	

Survey Tool Program **Date** 9/30/2019

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	1,130.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
1,130.00	11,900.00	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM
11,900.00	23,036.59	Prelim Plan A (OH)	MWD+HDGM	OWSG MWD + HRGM

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
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
1,130.00	0.00	0.00	1,130.00	0.00	0.00	0.00	0.00	0.00	0.00
13 3/8"									
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,250.00	0.00	0.00	1,250.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	1.00	252.81	1,300.00	-0.13	-0.42	-0.13	2.00	2.00	0.00
1,400.00	3.00	252.81	1,399.93	-1.16	-3.75	-1.13	2.00	2.00	0.00
1,500.00	5.00	252.81	1,499.68	-3.22	-10.41	-3.13	2.00	2.00	0.00
1,600.00	7.00	252.81	1,599.13	-6.31	-20.40	-6.13	2.00	2.00	0.00
1,700.00	9.00	252.81	1,698.15	-10.43	-33.69	-10.13	2.00	2.00	0.00
1,750.00	10.00	252.81	1,747.47	-12.86	-41.58	-12.50	2.00	2.00	0.00
1,800.00	10.00	252.81	1,796.71	-15.43	-49.87	-14.99	0.00	0.00	0.00
1,900.00	10.00	252.81	1,895.19	-20.56	-66.46	-19.98	0.00	0.00	0.00
2,000.00	10.00	252.81	1,993.67	-25.70	-83.05	-24.97	0.00	0.00	0.00
2,100.00	10.00	252.81	2,092.15	-30.83	-99.64	-29.96	0.00	0.00	0.00
2,200.00	10.00	252.81	2,190.63	-35.96	-116.23	-34.95	0.00	0.00	0.00
2,300.00	10.00	252.81	2,289.11	-41.09	-132.82	-39.93	0.00	0.00	0.00
2,400.00	10.00	252.81	2,387.59	-46.23	-149.41	-44.92	0.00	0.00	0.00
2,500.00	10.00	252.81	2,486.07	-51.36	-165.99	-49.91	0.00	0.00	0.00
2,600.00	10.00	252.81	2,584.55	-56.49	-182.58	-54.90	0.00	0.00	0.00
2,700.00	10.00	252.81	2,683.03	-61.62	-199.17	-59.88	0.00	0.00	0.00
2,800.00	10.00	252.81	2,781.51	-66.76	-215.76	-64.87	0.00	0.00	0.00
2,900.00	10.00	252.81	2,879.99	-71.89	-232.35	-69.86	0.00	0.00	0.00
3,000.00	10.00	252.81	2,978.48	-77.02	-248.94	-74.85	0.00	0.00	0.00
3,100.00	10.00	252.81	3,076.96	-82.16	-265.53	-79.83	0.00	0.00	0.00
3,200.00	10.00	252.81	3,175.44	-87.29	-282.12	-84.82	0.00	0.00	0.00
3,300.00	10.00	252.81	3,273.92	-92.42	-298.71	-89.81	0.00	0.00	0.00
3,400.00	10.00	252.81	3,372.40	-97.55	-315.30	-94.80	0.00	0.00	0.00
3,500.00	10.00	252.81	3,470.88	-102.69	-331.88	-99.79	0.00	0.00	0.00
3,600.00	10.00	252.81	3,569.36	-107.82	-348.47	-104.77	0.00	0.00	0.00
3,700.00	10.00	252.81	3,667.84	-112.95	-365.06	-109.76	0.00	0.00	0.00
3,800.00	10.00	252.81	3,766.32	-118.08	-381.65	-114.75	0.00	0.00	0.00
3,900.00	10.00	252.81	3,864.80	-123.22	-398.24	-119.74	0.00	0.00	0.00
4,000.00	10.00	252.81	3,963.28	-128.35	-414.83	-124.72	0.00	0.00	0.00
4,100.00	10.00	252.81	4,061.76	-133.48	-431.42	-129.71	0.00	0.00	0.00
4,200.00	10.00	252.81	4,160.24	-138.61	-448.01	-134.70	0.00	0.00	0.00
4,300.00	10.00	252.81	4,258.73	-143.75	-464.60	-139.69	0.00	0.00	0.00
4,400.00	10.00	252.81	4,357.21	-148.88	-481.18	-144.67	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
4,500.00	10.00	252.81	4,455.69	-154.01	-497.77	-149.66	0.00	0.00	0.00
4,600.00	10.00	252.81	4,554.17	-159.14	-514.36	-154.65	0.00	0.00	0.00
4,700.00	10.00	252.81	4,652.65	-164.28	-530.95	-159.64	0.00	0.00	0.00
4,800.00	10.00	252.81	4,751.13	-169.41	-547.54	-164.63	0.00	0.00	0.00
4,900.00	10.00	252.81	4,849.61	-174.54	-564.13	-169.61	0.00	0.00	0.00
5,000.00	10.00	252.81	4,948.09	-179.68	-580.72	-174.60	0.00	0.00	0.00
5,100.00	10.00	252.81	5,046.57	-184.81	-597.31	-179.59	0.00	0.00	0.00
5,200.00	10.00	252.81	5,145.05	-189.94	-613.90	-184.58	0.00	0.00	0.00
5,300.00	10.00	252.81	5,243.53	-195.07	-630.49	-189.56	0.00	0.00	0.00
5,400.00	10.00	252.81	5,342.01	-200.21	-647.07	-194.55	0.00	0.00	0.00
5,500.00	10.00	252.81	5,440.49	-205.34	-663.66	-199.54	0.00	0.00	0.00
5,600.00	10.00	252.81	5,538.98	-210.47	-680.25	-204.53	0.00	0.00	0.00
5,700.00	10.00	252.81	5,637.46	-215.60	-696.84	-209.51	0.00	0.00	0.00
5,800.00	10.00	252.81	5,735.94	-220.74	-713.43	-214.50	0.00	0.00	0.00
5,900.00	10.00	252.81	5,834.42	-225.87	-730.02	-219.49	0.00	0.00	0.00
6,000.00	10.00	252.81	5,932.90	-231.00	-746.61	-224.48	0.00	0.00	0.00
6,100.00	10.00	252.81	6,031.38	-236.13	-763.20	-229.47	0.00	0.00	0.00
6,200.00	10.00	252.81	6,129.86	-241.27	-779.79	-234.45	0.00	0.00	0.00
6,300.00	10.00	252.81	6,228.34	-246.40	-796.37	-239.44	0.00	0.00	0.00
6,400.00	10.00	252.81	6,326.82	-251.53	-812.96	-244.43	0.00	0.00	0.00
6,500.00	10.00	252.81	6,425.30	-256.67	-829.55	-249.42	0.00	0.00	0.00
6,600.00	10.00	252.81	6,523.78	-261.80	-846.14	-254.40	0.00	0.00	0.00
6,700.00	10.00	252.81	6,622.26	-266.93	-862.73	-259.39	0.00	0.00	0.00
6,800.00	10.00	252.81	6,720.74	-272.06	-879.32	-264.38	0.00	0.00	0.00
6,900.00	10.00	252.81	6,819.23	-277.20	-895.91	-269.37	0.00	0.00	0.00
7,000.00	10.00	252.81	6,917.71	-282.33	-912.50	-274.35	0.00	0.00	0.00
7,100.00	10.00	252.81	7,016.19	-287.46	-929.09	-279.34	0.00	0.00	0.00
7,200.00	10.00	252.81	7,114.67	-292.59	-945.68	-284.33	0.00	0.00	0.00
7,300.00	10.00	252.81	7,213.15	-297.73	-962.26	-289.32	0.00	0.00	0.00
7,400.00	10.00	252.81	7,311.63	-302.86	-978.85	-294.31	0.00	0.00	0.00
7,500.00	10.00	252.81	7,410.11	-307.99	-995.44	-299.29	0.00	0.00	0.00
7,600.00	10.00	252.81	7,508.59	-313.12	-1,012.03	-304.28	0.00	0.00	0.00
7,700.00	10.00	252.81	7,607.07	-318.26	-1,028.62	-309.27	0.00	0.00	0.00
7,800.00	10.00	252.81	7,705.55	-323.39	-1,045.21	-314.26	0.00	0.00	0.00
7,900.00	10.00	252.81	7,804.03	-328.52	-1,061.80	-319.24	0.00	0.00	0.00
8,000.00	10.00	252.81	7,902.51	-333.65	-1,078.39	-324.23	0.00	0.00	0.00
8,100.00	10.00	252.81	8,000.99	-338.79	-1,094.98	-329.22	0.00	0.00	0.00
8,154.72	10.00	252.81	8,054.88	-341.60	-1,104.05	-331.95	0.00	0.00	0.00
8,200.00	9.09	252.81	8,099.54	-343.82	-1,111.23	-334.11	2.00	-2.00	0.00
8,300.00	7.09	252.81	8,198.53	-347.98	-1,124.68	-338.15	2.00	-2.00	0.00
8,400.00	5.09	252.81	8,297.96	-351.12	-1,134.82	-341.20	2.00	-2.00	0.00
8,500.00	3.09	252.81	8,397.70	-353.23	-1,141.64	-343.25	2.00	-2.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
8,600.00	1.09	252.81	8,497.63	-354.31	-1,145.13	-344.30	2.00	-2.00	0.00
8,654.72	0.00	0.00	8,552.34	-354.46	-1,145.63	-344.45	2.00	-2.00	0.00
8,700.00	0.00	0.00	8,597.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
8,800.00	0.00	0.00	8,697.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
8,900.00	0.00	0.00	8,797.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,000.00	0.00	0.00	8,897.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,100.00	0.00	0.00	8,997.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,200.00	0.00	0.00	9,097.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,300.00	0.00	0.00	9,197.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,400.00	0.00	0.00	9,297.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,500.00	0.00	0.00	9,397.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,600.00	0.00	0.00	9,497.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,700.00	0.00	0.00	9,597.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,800.00	0.00	0.00	9,697.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9,900.00	0.00	0.00	9,797.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,000.00	0.00	0.00	9,897.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,100.00	0.00	0.00	9,997.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,200.00	0.00	0.00	10,097.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,300.00	0.00	0.00	10,197.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,400.00	0.00	0.00	10,297.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,500.00	0.00	0.00	10,397.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,600.00	0.00	0.00	10,497.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,700.00	0.00	0.00	10,597.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,800.00	0.00	0.00	10,697.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
10,900.00	0.00	0.00	10,797.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,000.00	0.00	0.00	10,897.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,100.00	0.00	0.00	10,997.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,200.00	0.00	0.00	11,097.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,300.00	0.00	0.00	11,197.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,400.00	0.00	0.00	11,297.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,500.00	0.00	0.00	11,397.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,600.00	0.00	0.00	11,497.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,700.00	0.00	0.00	11,597.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,800.00	0.00	0.00	11,697.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
11,900.00	0.00	0.00	11,797.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
12,000.00	0.00	0.00	11,897.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
12,002.37	0.00	0.00	11,900.00	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
9 5/8"									
12,100.00	0.00	0.00	11,997.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
12,200.00	0.00	0.00	12,097.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
12,300.00	0.00	0.00	12,197.63	-354.46	-1,145.63	-344.45	0.00	0.00	0.00
12,408.37	0.00	0.00	12,306.00	-354.46	-1,145.63	-344.45	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
[Mammoth1#2H]FTP									
12,425.00	2.00	359.50	12,322.63	-354.17	-1,145.63	-344.16	12.00	12.00	0.00
12,450.00	5.00	359.50	12,347.58	-352.65	-1,145.65	-342.64	12.00	12.00	0.00
12,475.00	8.00	359.50	12,372.41	-349.82	-1,145.67	-339.81	12.00	12.00	0.00
12,500.00	11.00	359.50	12,397.07	-345.70	-1,145.71	-335.68	12.00	12.00	0.00
12,525.00	14.00	359.50	12,421.47	-340.29	-1,145.75	-330.28	12.00	12.00	0.00
12,550.00	17.00	359.50	12,445.56	-333.61	-1,145.81	-323.60	12.00	12.00	0.00
12,575.00	20.00	359.50	12,469.27	-325.68	-1,145.88	-315.67	12.00	12.00	0.00
12,600.00	23.00	359.50	12,492.53	-316.52	-1,145.96	-306.51	12.00	12.00	0.00
12,625.00	26.00	359.50	12,515.27	-306.16	-1,146.05	-296.14	12.00	12.00	0.00
12,650.00	29.00	359.50	12,537.45	-294.62	-1,146.16	-284.60	12.00	12.00	0.00
12,675.00	32.00	359.50	12,558.99	-281.93	-1,146.27	-271.92	12.00	12.00	0.00
12,700.00	35.00	359.50	12,579.83	-268.14	-1,146.39	-258.12	12.00	12.00	0.00
12,725.00	38.00	359.50	12,599.93	-253.27	-1,146.52	-243.26	12.00	12.00	0.00
12,750.00	41.00	359.50	12,619.22	-237.37	-1,146.66	-227.36	12.00	12.00	0.00
12,775.00	44.00	359.50	12,637.65	-220.49	-1,146.81	-210.47	12.00	12.00	0.00
12,800.00	47.00	359.50	12,655.17	-202.66	-1,146.96	-192.64	12.00	12.00	0.00
12,825.00	50.00	359.50	12,671.74	-183.94	-1,147.13	-173.92	12.00	12.00	0.00
12,850.00	53.00	359.50	12,687.30	-164.38	-1,147.30	-154.36	12.00	12.00	0.00
12,875.00	56.00	359.50	12,701.82	-144.03	-1,147.48	-134.01	12.00	12.00	0.00
12,900.00	59.00	359.50	12,715.25	-122.95	-1,147.67	-112.93	12.00	12.00	0.00
12,925.00	62.00	359.50	12,727.56	-101.19	-1,147.86	-91.17	12.00	12.00	0.00
12,950.00	65.00	359.50	12,738.71	-78.83	-1,148.05	-68.80	12.00	12.00	0.00
12,975.00	68.00	359.50	12,748.68	-55.90	-1,148.25	-45.88	12.00	12.00	0.00
13,000.00	71.00	359.50	12,757.44	-32.49	-1,148.46	-22.47	12.00	12.00	0.00
13,025.00	74.00	359.50	12,764.96	-8.65	-1,148.67	1.37	12.00	12.00	0.00
13,050.00	77.00	359.50	12,771.22	15.55	-1,148.88	25.57	12.00	12.00	0.00
13,075.00	80.00	359.50	12,776.20	40.04	-1,149.10	50.07	12.00	12.00	0.00
13,100.00	83.00	359.50	12,779.90	64.76	-1,149.32	74.79	12.00	12.00	0.00
13,125.00	86.00	359.50	12,782.30	89.64	-1,149.53	99.67	12.00	12.00	0.00
13,150.00	89.00	359.50	12,783.39	114.62	-1,149.75	124.64	12.00	12.00	0.00
13,160.83	90.30	359.50	12,783.46	125.45	-1,149.85	135.48	12.00	12.00	0.00
13,200.00	90.30	359.50	12,783.26	164.61	-1,150.19	174.64	0.00	0.00	0.00
13,300.00	90.30	359.50	12,782.74	264.61	-1,151.07	274.64	0.00	0.00	0.00
13,400.00	90.30	359.50	12,782.23	364.60	-1,151.95	374.64	0.00	0.00	0.00
13,500.00	90.30	359.50	12,781.71	464.60	-1,152.83	474.64	0.00	0.00	0.00
13,600.00	90.30	359.50	12,781.20	564.59	-1,153.71	574.64	0.00	0.00	0.00
13,700.00	90.30	359.50	12,780.68	664.59	-1,154.59	674.64	0.00	0.00	0.00
13,800.00	90.30	359.50	12,780.17	764.58	-1,155.47	774.64	0.00	0.00	0.00
13,900.00	90.30	359.50	12,779.65	864.58	-1,156.35	874.63	0.00	0.00	0.00
14,000.00	90.30	359.50	12,779.14	964.57	-1,157.23	974.63	0.00	0.00	0.00
14,100.00	90.30	359.50	12,778.62	1,064.57	-1,158.11	1,074.63	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
14,200.00	90.30	359.50	12,778.11	1,164.56	-1,158.98	1,174.63	0.00	0.00	0.00
14,300.00	90.30	359.50	12,777.59	1,264.56	-1,159.86	1,274.63	0.00	0.00	0.00
14,400.00	90.30	359.50	12,777.07	1,364.55	-1,160.74	1,374.63	0.00	0.00	0.00
14,500.00	90.30	359.50	12,776.56	1,464.55	-1,161.62	1,474.63	0.00	0.00	0.00
14,600.00	90.30	359.50	12,776.04	1,564.54	-1,162.50	1,574.63	0.00	0.00	0.00
14,700.00	90.30	359.50	12,775.53	1,664.54	-1,163.38	1,674.62	0.00	0.00	0.00
14,800.00	90.30	359.50	12,775.01	1,764.53	-1,164.26	1,774.62	0.00	0.00	0.00
14,900.00	90.30	359.50	12,774.50	1,864.52	-1,165.14	1,874.62	0.00	0.00	0.00
15,000.00	90.30	359.50	12,773.98	1,964.52	-1,166.02	1,974.62	0.00	0.00	0.00
15,100.00	90.30	359.50	12,773.47	2,064.51	-1,166.90	2,074.62	0.00	0.00	0.00
15,200.00	90.30	359.50	12,772.95	2,164.51	-1,167.78	2,174.62	0.00	0.00	0.00
15,300.00	90.30	359.50	12,772.44	2,264.50	-1,168.66	2,274.62	0.00	0.00	0.00
15,400.00	90.30	359.50	12,771.92	2,364.50	-1,169.53	2,374.61	0.00	0.00	0.00
15,500.00	90.30	359.50	12,771.41	2,464.49	-1,170.41	2,474.61	0.00	0.00	0.00
15,600.00	90.30	359.50	12,770.89	2,564.49	-1,171.29	2,574.61	0.00	0.00	0.00
15,700.00	90.30	359.50	12,770.38	2,664.48	-1,172.17	2,674.61	0.00	0.00	0.00
15,800.00	90.30	359.50	12,769.86	2,764.48	-1,173.05	2,774.61	0.00	0.00	0.00
15,900.00	90.30	359.50	12,769.35	2,864.47	-1,173.93	2,874.61	0.00	0.00	0.00
16,000.00	90.30	359.50	12,768.83	2,964.47	-1,174.81	2,974.61	0.00	0.00	0.00
16,100.00	90.30	359.50	12,768.32	3,064.46	-1,175.69	3,074.61	0.00	0.00	0.00
16,200.00	90.30	359.50	12,767.80	3,164.46	-1,176.57	3,174.60	0.00	0.00	0.00
16,300.00	90.30	359.50	12,767.29	3,264.45	-1,177.45	3,274.60	0.00	0.00	0.00
16,400.00	90.30	359.50	12,766.77	3,364.45	-1,178.33	3,374.60	0.00	0.00	0.00
16,500.00	90.30	359.50	12,766.26	3,464.44	-1,179.20	3,474.60	0.00	0.00	0.00
16,600.00	90.30	359.50	12,765.74	3,564.44	-1,180.08	3,574.60	0.00	0.00	0.00
16,700.00	90.30	359.50	12,765.23	3,664.43	-1,180.96	3,674.60	0.00	0.00	0.00
16,800.00	90.30	359.50	12,764.71	3,764.43	-1,181.84	3,774.60	0.00	0.00	0.00
16,900.00	90.30	359.50	12,764.20	3,864.42	-1,182.72	3,874.59	0.00	0.00	0.00
17,000.00	90.30	359.50	12,763.68	3,964.42	-1,183.60	3,974.59	0.00	0.00	0.00
17,100.00	90.30	359.50	12,763.16	4,064.41	-1,184.48	4,074.59	0.00	0.00	0.00
17,200.00	90.30	359.50	12,762.65	4,164.41	-1,185.36	4,174.59	0.00	0.00	0.00
17,300.00	90.30	359.50	12,762.13	4,264.40	-1,186.24	4,274.59	0.00	0.00	0.00
17,400.00	90.30	359.50	12,761.62	4,364.40	-1,187.12	4,374.59	0.00	0.00	0.00
17,500.00	90.30	359.50	12,761.10	4,464.39	-1,188.00	4,474.59	0.00	0.00	0.00
17,600.00	90.30	359.50	12,760.59	4,564.38	-1,188.88	4,574.59	0.00	0.00	0.00
17,700.00	90.30	359.50	12,760.07	4,664.38	-1,189.75	4,674.58	0.00	0.00	0.00
17,800.00	90.30	359.50	12,759.56	4,764.37	-1,190.63	4,774.58	0.00	0.00	0.00
17,900.00	90.30	359.50	12,759.04	4,864.37	-1,191.51	4,874.58	0.00	0.00	0.00
18,000.00	90.30	359.50	12,758.53	4,964.36	-1,192.39	4,974.58	0.00	0.00	0.00
18,100.00	90.30	359.50	12,758.01	5,064.36	-1,193.27	5,074.58	0.00	0.00	0.00
18,200.00	90.30	359.50	12,757.50	5,164.35	-1,194.15	5,174.58	0.00	0.00	0.00
18,300.00	90.30	359.50	12,756.98	5,264.35	-1,195.03	5,274.58	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
18,400.00	90.30	359.50	12,756.47	5,364.34	-1,195.91	5,374.58	0.00	0.00	0.00
18,500.00	90.30	359.50	12,755.95	5,464.34	-1,196.79	5,474.57	0.00	0.00	0.00
18,600.00	90.30	359.50	12,755.44	5,564.33	-1,197.67	5,574.57	0.00	0.00	0.00
18,700.00	90.30	359.50	12,754.92	5,664.33	-1,198.55	5,674.57	0.00	0.00	0.00
18,800.00	90.30	359.50	12,754.41	5,764.32	-1,199.42	5,774.57	0.00	0.00	0.00
18,900.00	90.30	359.50	12,753.89	5,864.32	-1,200.30	5,874.57	0.00	0.00	0.00
19,000.00	90.30	359.50	12,753.38	5,964.31	-1,201.18	5,974.57	0.00	0.00	0.00
19,100.00	90.30	359.50	12,752.86	6,064.31	-1,202.06	6,074.57	0.00	0.00	0.00
19,200.00	90.30	359.50	12,752.35	6,164.30	-1,202.94	6,174.56	0.00	0.00	0.00
19,300.00	90.30	359.50	12,751.83	6,264.30	-1,203.82	6,274.56	0.00	0.00	0.00
19,400.00	90.30	359.50	12,751.32	6,364.29	-1,204.70	6,374.56	0.00	0.00	0.00
19,500.00	90.30	359.50	12,750.80	6,464.29	-1,205.58	6,474.56	0.00	0.00	0.00
19,600.00	90.30	359.50	12,750.29	6,564.28	-1,206.46	6,574.56	0.00	0.00	0.00
19,700.00	90.30	359.50	12,749.77	6,664.28	-1,207.34	6,674.56	0.00	0.00	0.00
19,800.00	90.30	359.50	12,749.25	6,764.27	-1,208.22	6,774.56	0.00	0.00	0.00
19,900.00	90.30	359.50	12,748.74	6,864.27	-1,209.10	6,874.56	0.00	0.00	0.00
20,000.00	90.30	359.50	12,748.22	6,964.26	-1,209.97	6,974.55	0.00	0.00	0.00
20,100.00	90.30	359.50	12,747.71	7,064.25	-1,210.85	7,074.55	0.00	0.00	0.00
20,200.00	90.30	359.50	12,747.19	7,164.25	-1,211.73	7,174.55	0.00	0.00	0.00
20,300.00	90.30	359.50	12,746.68	7,264.24	-1,212.61	7,274.55	0.00	0.00	0.00
20,400.00	90.30	359.50	12,746.16	7,364.24	-1,213.49	7,374.55	0.00	0.00	0.00
20,500.00	90.30	359.50	12,745.65	7,464.23	-1,214.37	7,474.55	0.00	0.00	0.00
20,600.00	90.30	359.50	12,745.13	7,564.23	-1,215.25	7,574.55	0.00	0.00	0.00
20,700.00	90.30	359.50	12,744.62	7,664.22	-1,216.13	7,674.54	0.00	0.00	0.00
20,800.00	90.30	359.50	12,744.10	7,764.22	-1,217.01	7,774.54	0.00	0.00	0.00
20,900.00	90.30	359.50	12,743.59	7,864.21	-1,217.89	7,874.54	0.00	0.00	0.00
21,000.00	90.30	359.50	12,743.07	7,964.21	-1,218.77	7,974.54	0.00	0.00	0.00
21,100.00	90.30	359.50	12,742.56	8,064.20	-1,219.64	8,074.54	0.00	0.00	0.00
21,200.00	90.30	359.50	12,742.04	8,164.20	-1,220.52	8,174.54	0.00	0.00	0.00
21,300.00	90.30	359.50	12,741.53	8,264.19	-1,221.40	8,274.54	0.00	0.00	0.00
21,400.00	90.30	359.50	12,741.01	8,364.19	-1,222.28	8,374.54	0.00	0.00	0.00
21,500.00	90.30	359.50	12,740.50	8,464.18	-1,223.16	8,474.53	0.00	0.00	0.00
21,600.00	90.30	359.50	12,739.98	8,564.18	-1,224.04	8,574.53	0.00	0.00	0.00
21,700.00	90.30	359.50	12,739.47	8,664.17	-1,224.92	8,674.53	0.00	0.00	0.00
21,800.00	90.30	359.50	12,738.95	8,764.17	-1,225.80	8,774.53	0.00	0.00	0.00
21,900.00	90.30	359.50	12,738.44	8,864.16	-1,226.68	8,874.53	0.00	0.00	0.00
22,000.00	90.30	359.50	12,737.92	8,964.16	-1,227.56	8,974.53	0.00	0.00	0.00
22,100.00	90.30	359.50	12,737.41	9,064.15	-1,228.44	9,074.53	0.00	0.00	0.00
22,200.00	90.30	359.50	12,736.89	9,164.15	-1,229.32	9,174.52	0.00	0.00	0.00
22,300.00	90.30	359.50	12,736.38	9,264.14	-1,230.19	9,274.52	0.00	0.00	0.00
22,400.00	90.30	359.50	12,735.86	9,364.14	-1,231.07	9,374.52	0.00	0.00	0.00
22,500.00	90.30	359.50	12,735.34	9,464.13	-1,231.95	9,474.52	0.00	0.00	0.00

Company:	Marathon Oil	**Local Co-ordinate Reference:**	Well WA No. 2H
Project:	Lea County, NM	**TVD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Site:	Mammoth 1 (1-2-7-10-11)	**MD Reference:**	Well @ 3306.00usft (GL: 3281' + KB: 25' (PD594))
Well:	WA No. 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)
22,600.00	90.30	359.50	12,734.83	9,564.13	-1,232.83	9,574.52	0.00	0.00	0.00
22,700.00	90.30	359.50	12,734.31	9,664.12	-1,233.71	9,674.52	0.00	0.00	0.00
22,800.00	90.30	359.50	12,733.80	9,764.11	-1,234.59	9,774.52	0.00	0.00	0.00
22,900.00	90.30	359.50	12,733.28	9,864.11	-1,235.47	9,874.52	0.00	0.00	0.00
23,000.00	90.30	359.50	12,732.77	9,964.10	-1,236.35	9,974.51	0.00	0.00	0.00
23,036.59	90.30	359.50	12,732.58	10,000.69	-1,236.67	10,011.10	0.00	0.00	0.00
[Mammoth1#2H]LTP/BHL									

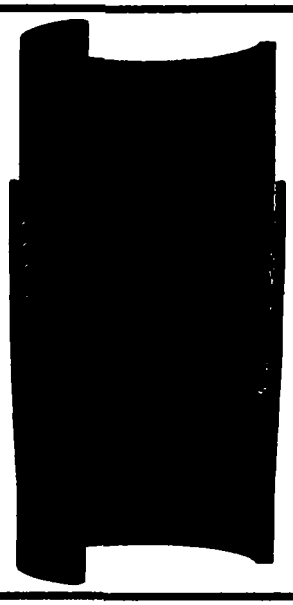
Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
[Mammoth1#2H]FTP	0.00	0.00	12,306.00	-354.46	-1,145.63	388,657.70	779,633.66	32.065321	-103.430650
- plan hits target center - Point									
[Mammoth1#2H]LTP/BH	0.00	0.00	12,732.58	10,000.69	-1,236.67	399,012.85	779,542.62	32.093786	-103.430664
- plan hits target center - Point									

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
1,130.00	1,130.00	13 3/8"	13-3/8	17-1/2
12,002.37	11,900.00	9 5/8"	9-5/8	12-1/4

Checked By: _____ Approved By: _____ Date: _____



TEC-LOCK WEDGE

5.500" 23 LB/FT (.415"Wall)
BENTELER P110 CY

Pipe Body Data

Nominal OD:	5.500	in
Nominal Wall:	.415	in
Nominal Weight:	23.00	lb/ft
Plain End Weight:	22.56	lb/ft
Material Grade:	P110 CY	
Mill/Specification:	BENTELER	
Yield Strength:	125,000	psi
Tensile Strength:	130,000	psi
Nominal ID:	4.670	in
API Drift Diameter:	4.545	in
Special Drift Diameter:	None	in
RBW:	87.5 %	
Body Yield:	829,000	lbf
Burst:	16,510	psi
Collapse:	16,910	psi

Connection Data

Standard OD:	5.950	in
Pin Bored ID:	4.670	in
Critical Section Area:	6.457	in^2
Tensile Efficiency:	97.4 %	
Compressive Efficiency:	100 %	
Longitudinal Yield Strength:	807,000	lbf
Compressive Limit:	829,000	lbf
Internal Pressure Rating:	16,510	psi
External Pressure Rating:	16,910	psi
Maximum Bend:	101.5	°/100ft

Operational Data

Minimum Makeup Torque:	16,400	ft*lbf
Optimum Makeup Torque:	20,500	ft*lbf
Maximum Makeup Torque:	44,300	ft*lbf
Minimum Yield:	49,200	ft*lbf
Makeup Loss:	5.97	in

Notes

Operational Torque is equivalent to the Maximum Make-Up Torque

HUNTING

Generated on Mar 12, 2019

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL for EC486360

OPERATOR'S NAME:	**Marathon Oil Permian LLC**
LEASE NO.:	**NMNM113970**
WELL NAME & NO.:	**Mammoth 1 WA Fed Com 2H**
SURFACE HOLE FOOTAGE:	**448' FSL & 1479' FWL**
BOTTOM HOLE FOOTAGE	**100' FNL & 330' FWL**
LOCATION:	**Section 1, T 26S, 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	☑ Fluid Filled	☐ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

All other previous Conditions of Approval still apply.

A. CASING

1. The **13-3/8"** surface casing shall be set at approximately **1130'** (a minimum of 25' into the Rustler Anhydrite and above the salt) and cemented 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 completing the cement job.
   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 that string.
   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 **7-5/8"** intermediate casing shall be 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 **5-1/2"** production casing shall be cemented with at least 500' tie-back into the previous casing.

10/18/2019 DR