Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM132946

6. If Indian, Allotee or Tribe Name

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

8. Lease Name and Well No.
VIKING HELMET FEDERAL COM
601H

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

2. Name of Operator
COG OPERATING LLC

9. API Well No.
30-025-52081

3a. Address 600 West Illinois Ave, Midland, TX 79701	3b. Phone No. *(include area code)* (432) 683-7443	10. Field and Pool, or Exploratory WC-025 G-09 S243532M/WOLFBONE

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface SWSW / 295 FSL / 585 FWL / LAT 32.196566 / LONG -103.396169
At proposed prod. zone SWSW / 50 FSL / 1000 FWL / LAT 32.166862 / LONG -103.394804

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 20/T24S/R35E/NMP

14. Distance in miles and direction from nearest town or post office* 11 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) 50 feet	16. No of acres in lease	17. Spacing Unit dedicated to this well 640.0
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 30 feet	19. Proposed Depth 12277 feet / 22802 feet	20. BLM/BIA Bond No. in file FED: NMB000215
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3314 feet	22. Approximate date work will start* 10/01/2023	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)* MAYTE REYES / Ph: (432) 683-7443	Date 05/10/2023
Title Regulatory Analyst		
Approved by *(Signature)* (Electronic Submission)	Name *(Printed/Typed)* CODY LAYTON / Ph: (575) 234-5959	Date 09/28/2023
Title Assistant Field Manager Lands & Minerals	Office Carlsbad Field Office	

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

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

KZ
10/13/2023

APPROVED WITH CONDITIONS

Approval Date: 09/28/2023

(Continued on page 2)

*(Instructions on page 2)

DISTRICT I
1625 N. FRENCH DR., HOBBS, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

DISTRICT II
811 S. FIRST ST., ARTESIA, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720

DISTRICT III
1000 RIO BRAZOS RD., AZTEC, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170

DISTRICT IV
1220 S. ST. FRANCIS DR., SANTA FE, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 SOUTH ST. FRANCIS DR.
Santa Fe, New Mexico 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate
District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-52081	98098	WC-025 G-09 S243532M; WOLFBONE

Property Code	Property Name	Well Number
334796	VIKING HELMET FEDERAL COM	601H

OGRID No.	Operator Name	Elevation
229137	COG OPERATING, LLC	3313.8'

Surface Location

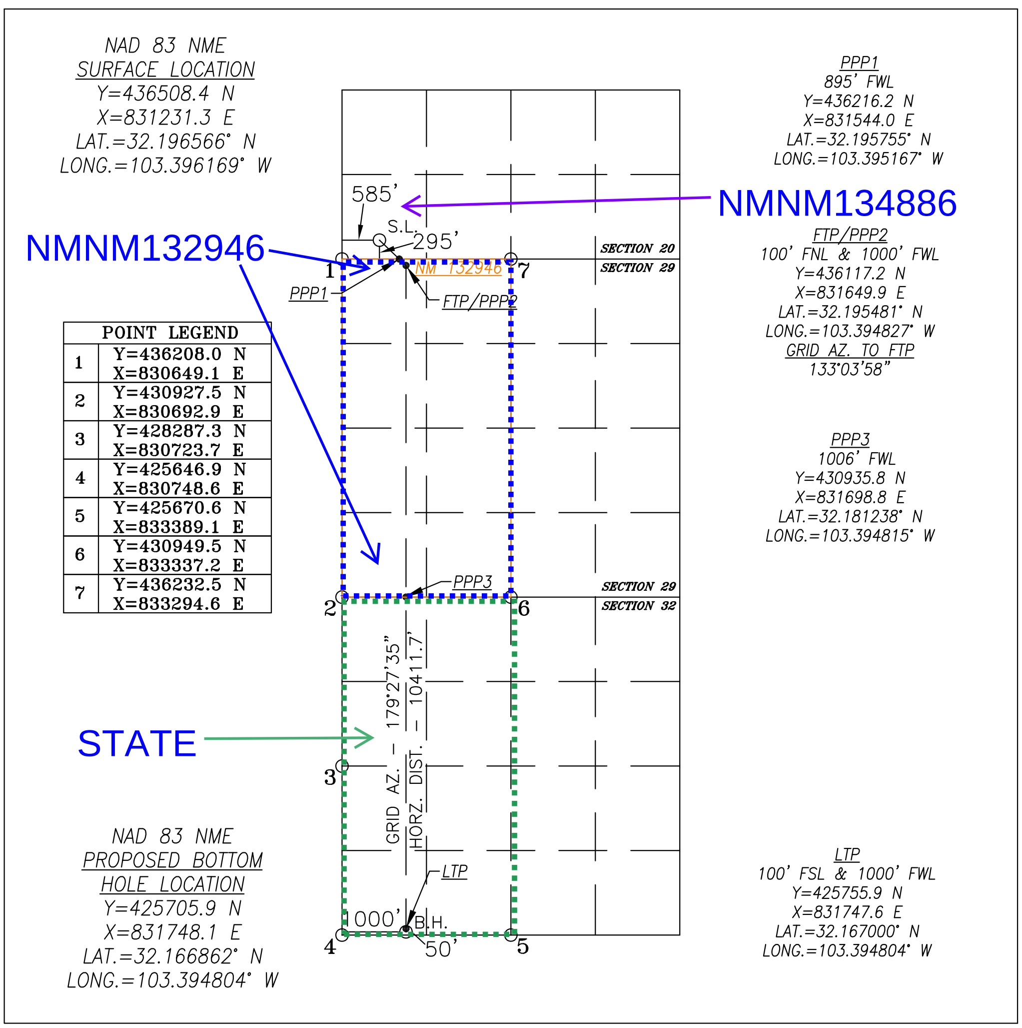
UL or lot No.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	24-S	35-E		295	SOUTH	585	WEST	LEA

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
M	32	24-S	35-E		50	SOUTH	1000	WEST	LEA

Dedicated Acres	Joint or Infill	Consolidation Code	Order No.
640			

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



POINT LEGEND	
1	Y=436208.0 N X=830649.1 E
2	Y=430927.5 N X=830692.9 E
3	Y=428287.3 N X=830723.7 E
4	Y=425646.9 N X=830748.6 E
5	Y=425670.6 N X=833389.1 E
6	Y=430949.5 N X=833337.2 E
7	Y=436232.5 N X=833294.6 E

OPERATOR CERTIFICATION

I hereby certify that the information 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 mineral or working interest, or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Mayte Reyes 5/2/2023
Signature Date

Mayte Reyes
Printed Name

mayte.x.reyes@cop.com
E-mail Address

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.

MARCH 31, 2023
Date of Survey

Signature & Seal of Professional Surveyor

CHAD L. HARCROW
NEW MEXICO
17777
LICENSED PROFESSIONAL SURVEYOR

Chad Harcrow 4/6/23

Certificate No. CHAD HARCROW 17777

W.O. #23-227 DRAWN BY: WN

State of New Mexico
Energy, Minerals and Natural Resources Department

Submit Electronically
Via E-permitting

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

NATURAL GAS MANAGEMENT PLAN

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

Section 1 – Plan Description
Effective May 25, 2021

I. Operator: COG Operating LLC **OGRID:** 229137 **Date:** 5 / 8 / 23

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

If Other, please describe: ______

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

Well Name	API	ULSTR	Footages	Anticipated Oil BBL/D	Anticipated Gas MCF/D	Anticipated Produced Water BBL/D
Viking Helmet Fed Com 601H	30-025-	D-20-24S-35E	295 FSL & 585 FWL	± 2135	± 2686	± 4309

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

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

Well Name	API	Spud Date	TD Reached Date	Completion Commencement Date	Initial Flow Back Date	First Production Date
Viking Helmet Fed Com 601H	Pending	3/31/2024	± 25 days from spud	7/19/2024	7/29/2024	8/3/2024

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

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

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

Section 2 – Enhanced Plan
EFFECTIVE APRIL 1, 2022

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

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

IX. Anticipated Natural Gas Production:

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

X. Natural Gas Gathering System (NGGS):

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

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

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

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

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

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

Section 3 - Certifications

Effective May 25, 2021

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

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

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

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

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

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

Section 4 - Notices

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

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

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

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

VI. Separation Equipment

How Operator will size separation equipment to optimize gas capture:

All ConocoPhillips production facility equipment will be sized per industry standards (API 12J) with adequate retention time to effectively separate all phases of production. Each project will take into consideration the number of wells and type curves for each formation pool to ensure adequate facility capacity. Design considerations will also include review of all piping, tanks, VRU's and associated equipment to ensure optimized gas capture minimized risk of release.

VII. Operational Practices

Actions Operator will take to comply with the requirements below:

B. Drilling Operations

- During drilling, flare stacks will be located a minimum of 100 feet from the nearest surface hole location. All gas is captured or combusted. If an emergency or malfunction occurs, gas will be flared or vented for public health, safety, and the environment and be properly reported to the NMOCD pursuant to 19.15.27.8.G.
- Measure or estimate the volume of natural gas that is vented, flared or beneficially used during drilling, completion and production operations, regardless of the reason or authorization for such venting or flaring.

C. Completion Operations

- During completion operations, operator does not produce oil or gas but maintains adequate well control through completion operations.
- Individual well test separators will be set to properly separate gas and liquids. A temporary test separator will be utilized initially to process volumes. In addition, separators will be tied into flowback tanks which will be tied into the gas processing equipment for sales down a pipeline.

D. Venting and flaring during production operations

- During each phase of well life (drilling, completion and production) of a ConocoPhillips well, COP personnel will follow all necessary procedures to ensure both the operation and the equipment are within the NMAC 19.15.27.8 Subsection D guidelines.
- During well operations that require unloading of the well to atmospheric pressure, all reasonable actions will be taken to minimize vented gas
- Through the life of the well all flaring shall be measured, and venting events quantified using the data available and industry best practice.

E. Performance standards for separation, storage tank and flare equipment

- All storage tanks and separation equipment are designed minimize risk of liquid or vapor release and optimize gas capture. This includes automation for automatic gauging and pressure monitoring.

- All flare stacks are equipped with auto ignition devices and/or continuous pilots and are designed to operate at maximum combustion efficiency pursuant NMAC 19.15.27.8 Subsection E. Flares will follow COP spacing guidelines to ensure they are a safe distance from combustibles and operations equipment.
- COP personnel will conduct routine AVO inspections on a regular basis per NMAC 19.15.27.8 Subsection E guidelines.

F. Measurement of vented and flared natural gas.

- Measurement equipment will be installed to quantify gas flared during drilling, completion and production of the well.
- All measurement devices installed will meet accuracy ratings per AGA and API standards.
- Measurement devices will be installed without manifolds that allow diversion of gas around the metering element, except for the sole purpose of inspection of servicing the measurement device.

VIII. Best Management Practices

- Operator will curtail or shut in production, within reasonable limits, during upset conditions to minimize venting and flaring.
- When feasible, Operator will use equipment to capture gas that would otherwise be vented or flared.
- During completions and production operations Operator will minimize blowdowns to atmosphere
- When feasible, Operator will use electric or air actuated equipment to reduce bleed emissions

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

Signature:	Mayte Reyes
Printed Name:	Mayte Reyes
Title:	Sr. Regulatory Coodinator
E-mail Address:	mayte.x.reyes@conocophillips.com
Date:	5/8/2023
Phone:	575-748-6945

OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:

AFMSS
U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data
10/04/2023

APD ID: 10400092106
Submission Date: 05/10/2023

Highlighted data reflects the most recent changes
Show Final Text

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM
Well Number: 601H

Well Type: OIL WELL
Well Work Type: Drill

Section 1 - General

APD ID: 10400092106
Tie to previous NOS?
Submission Date: 05/10/2023

BLM Office: Carlsbad
User: MAYTE REYES
Title: Regulatory Analyst

Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM132946
Lease Acres:

Surface access agreement in place?
Allotted?
Reservation:

Agreement in place? NO
Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? Y

Permitting Agent? NO
APD Operator: COG OPERATING LLC

Operator letter of

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: ONE CONCHO CENTER 600 W ILLINOIS AVENUE
Zip: 79701-4287

Operator PO Box:

Operator City: MIDLAND
State: TX

Operator Phone: (432)685-4342

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? EXISTING
Master Development Plan name: No

Well in Master SUPO?
Master SUPO name:

Well in Master Drilling Plan?
Master Drilling Plan name:

Well Name: VIKING HELMET FEDERAL COM
Well Number: 601H
Well API Number:

Field/Pool or Exploratory? Field and Pool
Field Name: WC-025 G-09 S243532M
Pool Name: WOLFBONE

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** N **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** VIKING HELMET FEDERAL COM **Number:** 601H, 602H, 701H, 702H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 11 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 50 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: COG_Viking_Helmet_601H_C102_20230510192627.pdf

Well work start Date: 10/01/2023 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: **Reference Datum:** GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
SHL Leg #1	295	FSL	585	FWL	24S	35E	20	Aliquot SWSW	32.196566	-103.396169	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 134886	3314	0	0	Y
KOP Leg #1	295	FSL	585	FWL	24S	35E	20	Aliquot SWSW	32.196566	-103.396169	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 134886	3314	0	0	Y

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
PPP Leg #1-1	100	FNL	1000	FWL	24S	35E	29	Aliquot NWNW	32.195481	-103.394827	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 132946	-8918	12402	12232	Y
EXIT Leg #1	100	FSL	1000	FWL	24S	35E	32	Aliquot SWSW	32.167	-103.394804	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-8963	22752	12277	Y
BHL Leg #1	50	FSL	1000	FWL	24S	35E	32	Aliquot SWSW	32.166862	-103.394804	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-8963	22802	12277	Y

AFMSS
U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Drilling Plan Data Report

10/04/2023

APD ID: 10400092106

Submission Date: 05/10/2023

Highlighted data reflects the most recent changes

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM

Well Number: 601H

Well Type: OIL WELL

Well Work Type: Drill

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
12218158	UNKNOWN	3314	0	0	ALLUVIUM	NONE	N
12218159	RUSTLER	2363	951	951	GYPSUM	NONE	N
12218160	TOP SALT	2054	1260	1260	SALT	NONE	N
12218161	BOTTOM SALT	-1728	5042	5042	ANHYDRITE, SALT	NONE	N
12218162	LAMAR	-2179	5493	5493	LIMESTONE	NATURAL GAS, OIL	N
12218163	BELL CANYON	-2233	5547	5547	SANDSTONE	NATURAL GAS, OIL	N
12218164	CHERRY CANYON	-3078	6392	6392	SANDSTONE	NATURAL GAS, OIL	N
12218165	BRUSHY CANYON	-4681	7995	7995	SANDSTONE	NATURAL GAS, OIL	N
12218166	BONE SPRING LIME	-5907	9221	9221	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
12218169	BONE SPRING 1ST	-7235	10549	10549	HALITE, SANDSTONE	NATURAL GAS, OIL	N
12218170	BONE SPRING 2ND	-7615	10929	10929	HALITE, SANDSTONE	NATURAL GAS, OIL	N
12218171	BONE SPRING 3RD	-8740	12054	12054	HALITE, SANDSTONE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M

Rating Depth: 12277

Equipment: Accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.

Requesting Variance? YES

Variance request: Request a 5M annular variance on a 10M system. (5M variance attached in section 8). A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Testing Procedure: 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.

Choke Diagram Attachment:

COG_Viking_Helmet_10M_Choke_20230504135810.pdf

BOP Diagram Attachment:

COG_Viking_Helmet_10M_BOP_20230504135821.pdf

COG_Viking_Helmet_Flex_Hose_Variance_20230913105343.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 11600

Equipment: Annular, Blind Ram, Pipe Ram. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: 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.

Choke Diagram Attachment:

COG_Viking_Helmet_5M_Choke_20230504135127.pdf

BOP Diagram Attachment:

COG_Viking_Helmet_5M_BOP_20230504135139.pdf

COG_Viking_Helmet_Flex_Hose_Variance_20230913105310.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	14.75	10.75	NEW	API	N	0	1150	0	1150	3314	2164	1150	J-55	45.5	OTHER - BTC	3.97	1.22	DRY	15.21	DRY	13.66
2	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	11600	0	11600	3697	-8286	11600	OTHER	29.7	OTHER - W513	1.23	1.4	DRY	1.62	DRY	2.73

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
3	PRODUCTION	6.75	5.5	NEW	API	Y	0	22802	0	12277	3697	-8963	22802	OTHER	23	OTHER - W441	1.82	2.15	DRY	2.34	DRY	2.58

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140128.pdf

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

COG_Viking_Helmet_601H_Casing_Program_20230504140244.pdf

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140323.pdf

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Casing Attachments

Casing ID: 3 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

COG_Viking_Helmet_601H_Casing_Program_20230504135945.pdf

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140029.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1150	548	1.75	13.5	959	50	Class C + 4% Gel	1% CaCl2
SURFACE	Tail		0	1150	250	1.34	14.8	335	50	Class C	2% CaCl2
INTERMEDIATE	Lead		0	11600	810	3.3	10.3	2673	50	Halliburton tunded light	As needed
INTERMEDIATE	Tail		0	11600	250	1.35	14.8	337	50	Tail: Class H	As needed
PRODUCTION	Lead		12277	22802	515	2	12.7	1030	35	Lead: 50:50:10 H Blend	As needed
PRODUCTION	Tail		12277	22802	1104	1.24	14.4	1368	35	Tail: 50:50:2 Class H Blend	As needed

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1150	11600	OTHER : Brine Diesel Emulsion	8.4	9							Brine Diesel Emulsion
11600	22802	OTHER : OBM	9.6	12.5							OBM
0	1150	OTHER : FW Gel	8.6	8.8							FW Gel

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

None planned

List of open and cased hole logs run in the well:

CEMENT BOND LOG,COMPENSATED NEUTRON LOG,GAMMA RAY LOG,

Coring operation description for the well:

None planned

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7985 **Anticipated Surface Pressure:** 5284

Anticipated Bottom Hole Temperature(F): 180

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

COG_Viking_Helmet_H2S_SUP_20230504141217.pdf

COG_Viking_Helmet_H2S_Schem_20230508122249.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

COG_Viking_Helmet_601H_AC_RPT_20230504141252.pdf

COG_Viking_Helmet_601H_Directional_Plan_20230504141252.pdf

Other proposed operations facets description:

Drilling program attached.
GCP attached.
Cement program attached.

Other proposed operations facets attachment:

API_BTC_Special_Clearance_10.750_0.400_J55_Casing_10042022_20230504141334.pdf

API_BTC_7.625_0.375_L80_ICY_04112022_20230504141332.pdf

Wedge_441_5.500_0.415_P110_CY_09212021_20230504141334.pdf

TXP_BTC_5.500_0.415_P110_CY_09212021_20230504141334.pdf

Wedge_513_7.625_0.375_P110_ICY_04112022_20230504141334.pdf

COG_Viking_Helmet_601H_Casing_Program_20230504141726.pdf

COG_Viking_Helmet_601H_Drilling_Program_20230504141726.pdf

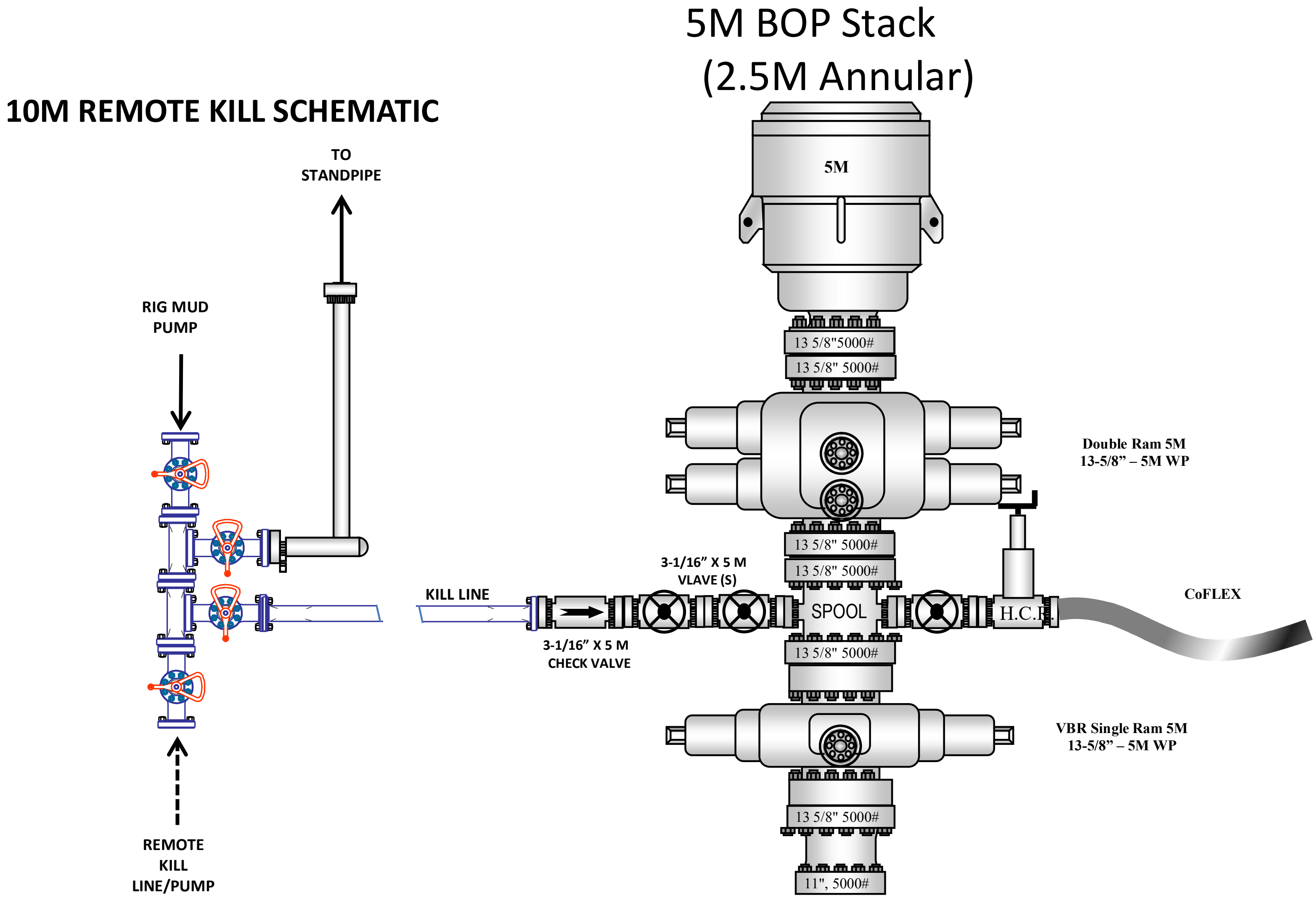
COG_Viking_Helmet_601H_Cement_Program_20230504141727.pdf

COG_Viking_Helmet_601H_GCP_20230510145406.pdf

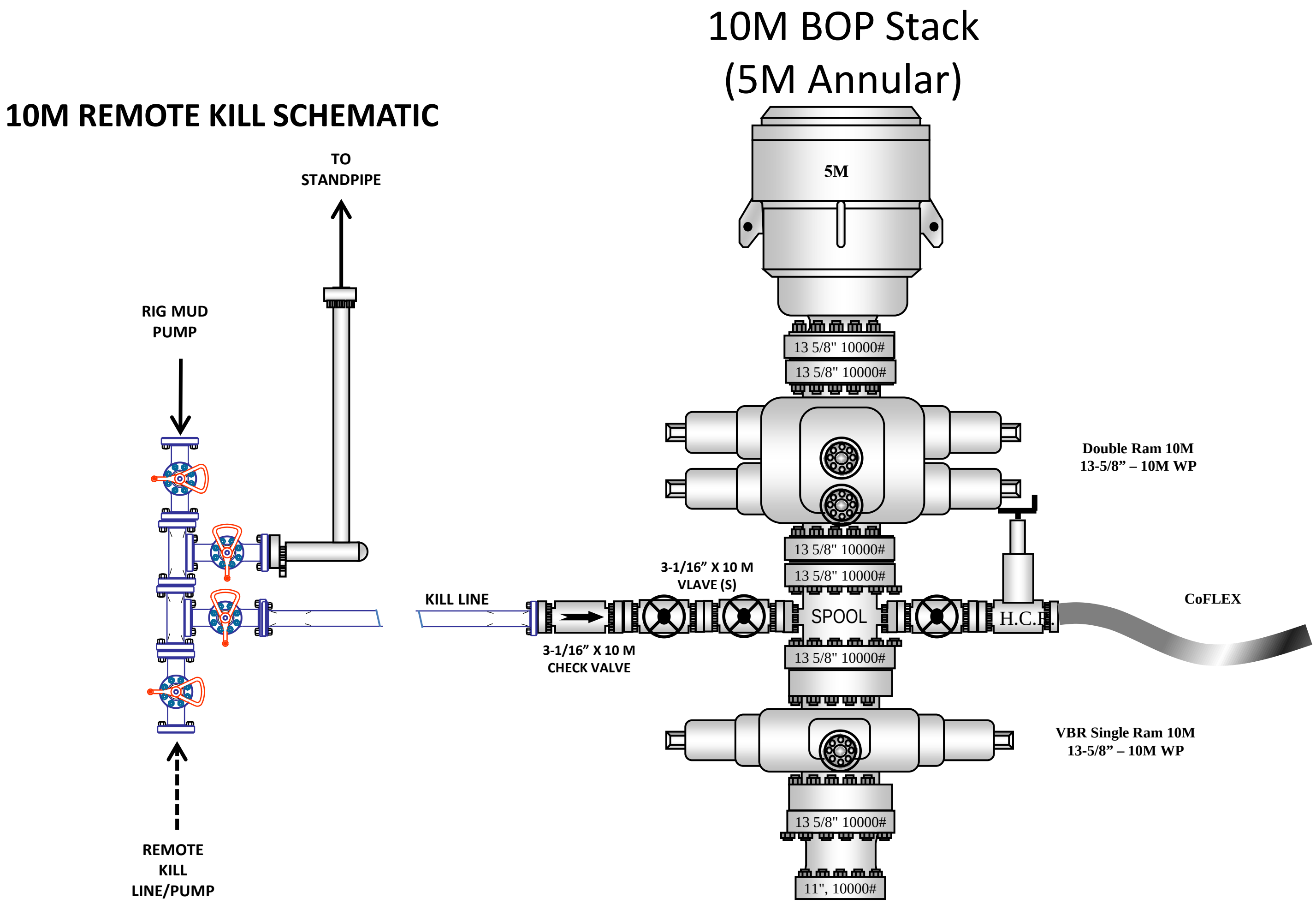
Other Variance attachment:

5M_Variance_Well_Plan_20200925152216.pdf

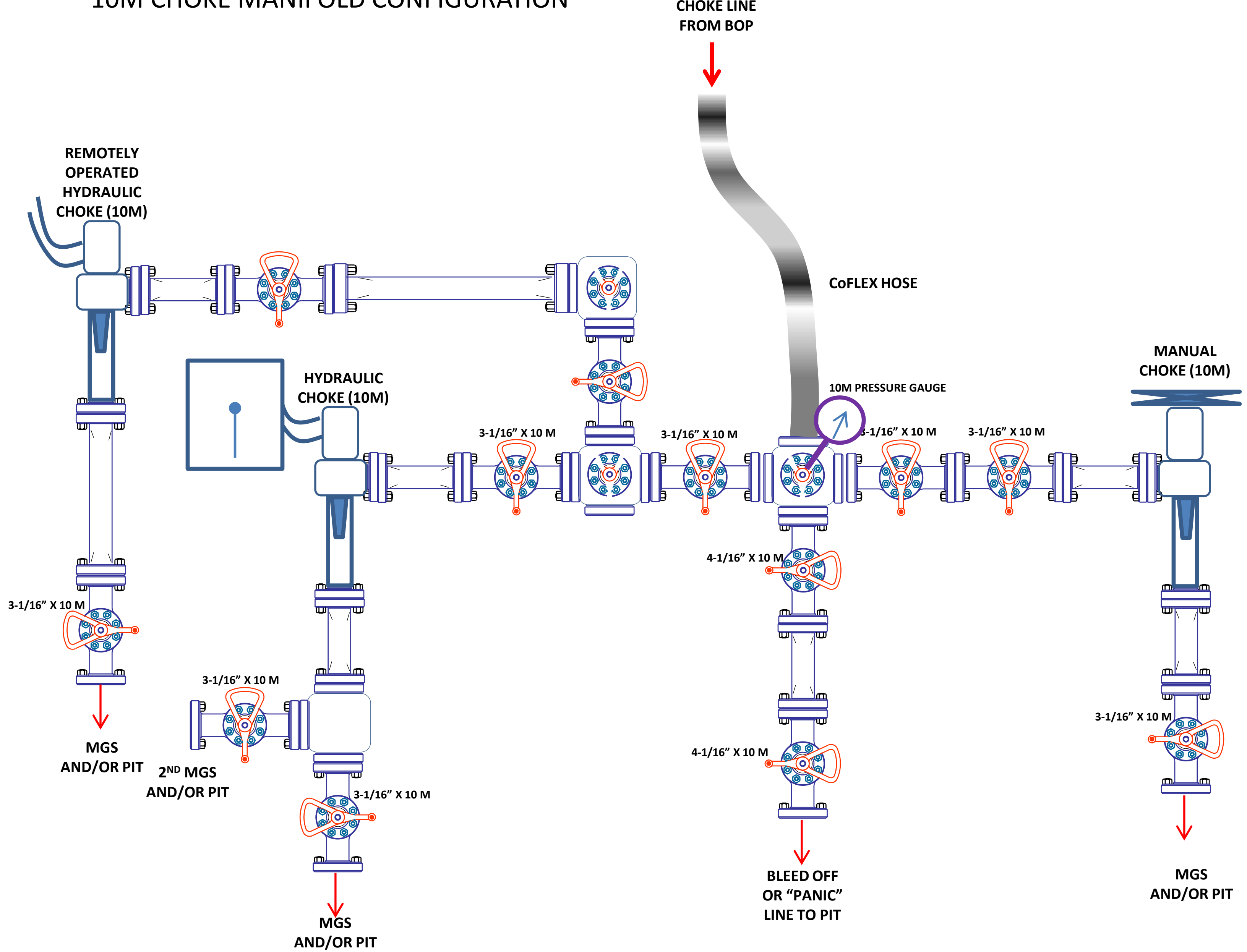
5M BOP Stack


5M BOP Stack
(2.5M Annular)
10M REMOTE KILL SCHEMATIC
TO
STANDPIPE
RIG MUD
PUMP
REMOTE
KILL
LINE/PUMP
KILL LINE
3-1/16" X 5 M
CHECK VALVE
3-1/16" X 5 M
VLAVE (S)
5M
13 5/8"5000#
13 5/8" 5000#
Double Ram 5M
13-5/8" – 5M WP
13 5/8" 5000#
13 5/8" 5000#
SPOOL
H.C.R.
CoFLEX
13 5/8" 5000#
VBR Single Ram 5M
13-5/8" – 5M WP
13 5/8" 5000#
11", 5000#

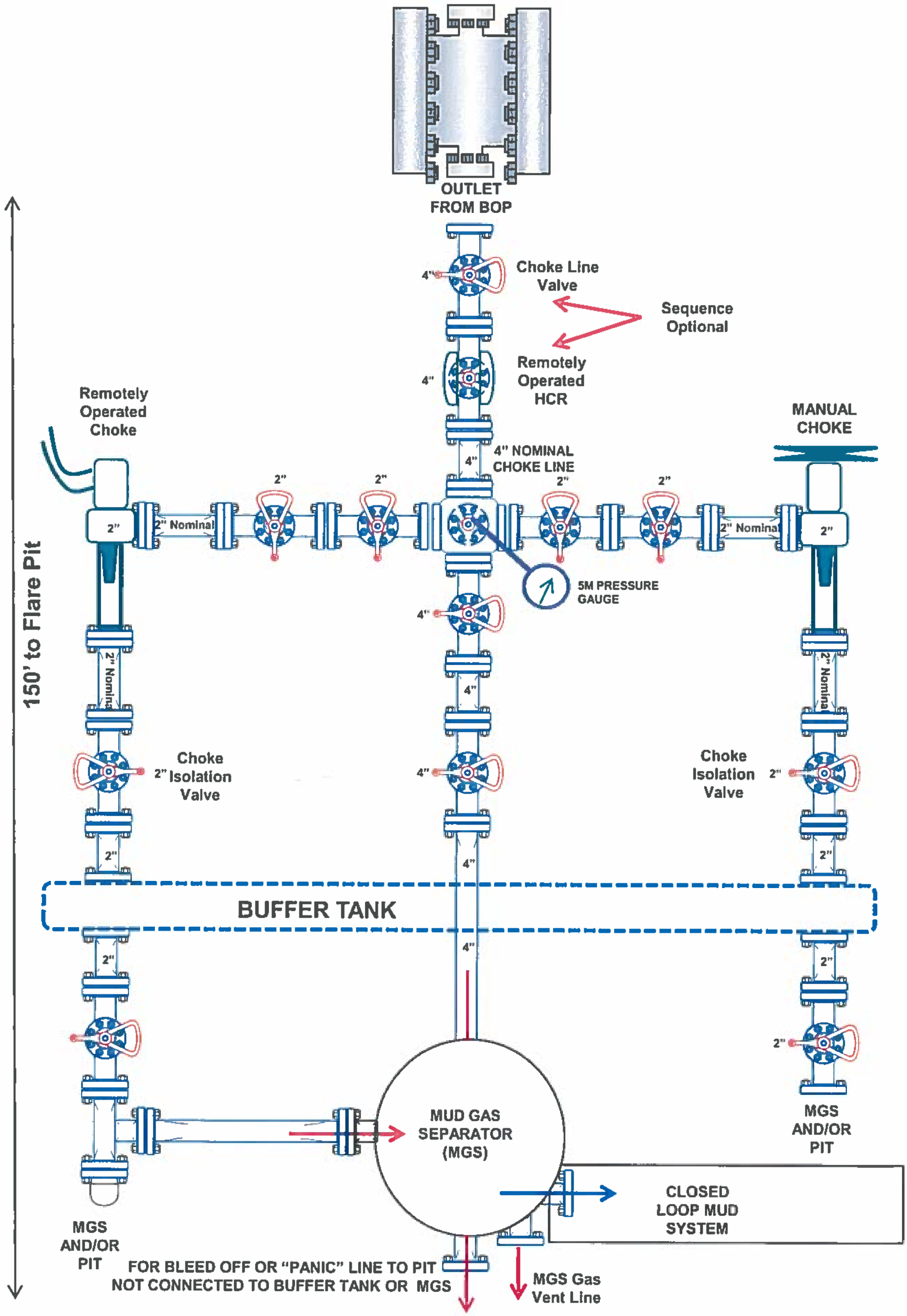
10M BOP Stack



10M CHOKE MANIFOLD CONFIGURATION



5M Choke Manifold Equipment (WITH MGS + CLOSED LOOP)



DELAWARE BASIN EAST

BULLDOG PROSPECT (NM-E)
VIKING HELMET PROJECT
VIKING HELMET FEDERAL COM #601H

OWB

Plan: PWP1

Standard Planning Report

03 May, 2023

ConocoPhillips
Planning Report

Database:	EDT 17 Central Planning Prod	**Local Co-ordinate Reference:**	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	**TVD Reference:**	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

Project	BULLDOG PROSPECT (NM-E)		
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	VIKING HELMET PROJECT				
Site Position:		**Northing:**	430,904.55 usft	**Latitude:**	32° 10' 51.991 N
From:	Map	**Easting:**	793,805.83 usft	**Longitude:**	103° 23' 1.334 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "		

Well	VIKING HELMET FEDERAL COM #601H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	436,449.60 usft	**Latitude:**	32° 11' 47.186 N
	+E/-W	0.0 usft	**Easting:**	790,045.80 usft	**Longitude:**	103° 23' 44.518 W
Position Uncertainty		3.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,313.8 usft
Grid Convergence:		0.50 °				

Wellbore OWB

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	BGGM2023	3/1/2024	6.19	59.75	47,364.60061601

Design PWP1

Audit Notes:

Version:	**Phase:** PLAN	**Tie On Depth:**	0.0

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.0	0.0	0.0	177.26

Plan Survey Tool Program **Date** 5/3/2023

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	1,500.0	PWP1 (OWB)	r.5 SDI_KPR_WL_NS-CT SDI Keeper Wireline Gyrocomp	
2	1,500.0	11,731.4	PWP1 (OWB)	r.5 MWD+IFR1 OWSG MWD + IFR1 rev.5	
3	11,731.4	22,802.3	PWP1 (OWB)	r.5 MWD+IFR1+MS OWSG MWD + IFR1 + Multi-St	

ConocoPhillips

Planning Report

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Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,533.3	8.00	120.00	2,531.6	-18.6	32.2	1.50	1.50	0.00	120.00	
2,763.5	8.00	95.00	2,759.6	-28.0	62.0	1.50	0.00	-10.86	-102.38	
4,902.7	8.00	95.00	4,878.0	-53.9	358.6	0.00	0.00	0.00	0.00	
5,702.7	0.00	0.00	5,675.4	-58.8	414.2	1.00	-1.00	0.00	180.00	
11,731.4	0.00	0.00	11,704.0	-58.8	414.2	0.00	0.00	0.00	0.00	
12,631.4	90.00	179.46	12,277.0	-631.7	419.6	10.00	10.00	19.94	179.46	
22,752.4	90.00	179.46	12,277.0	-10,752.3	515.8	0.00	0.00	0.00	0.00	
22,802.3	90.00	179.46	12,277.0	-10,802.2	516.3	0.00	0.00	0.00	0.00	

ConocoPhillips
Planning Report

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Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
Start Build 1.50									
2,100.0	1.50	120.00	2,100.0	-0.7	1.1	0.7	1.50	1.50	0.00
2,200.0	3.00	120.00	2,199.9	-2.6	4.5	2.8	1.50	1.50	0.00
2,300.0	4.50	120.00	2,299.7	-5.9	10.2	6.4	1.50	1.50	0.00
2,400.0	6.00	120.00	2,399.3	-10.5	18.1	11.3	1.50	1.50	0.00
2,500.0	7.50	120.00	2,498.6	-16.3	28.3	17.7	1.50	1.50	0.00
2,533.3	8.00	120.00	2,531.6	-18.6	32.2	20.1	1.50	1.50	0.00
Start Turn -10.86									
2,600.0	7.85	112.83	2,597.6	-22.7	40.4	24.6	1.50	-0.23	-10.76
2,700.0	7.85	101.83	2,696.7	-26.7	53.4	29.2	1.50	0.00	-11.00
2,763.5	8.00	95.00	2,759.6	-28.0	62.0	30.9	1.50	0.24	-10.75
Start 2139.2 hold at 2763.5 MD									
2,800.0	8.00	95.00	2,795.7	-28.4	67.1	31.6	0.00	0.00	0.00
2,900.0	8.00	95.00	2,894.8	-29.6	81.0	33.5	0.00	0.00	0.00
3,000.0	8.00	95.00	2,993.8	-30.9	94.8	35.4	0.00	0.00	0.00
3,100.0	8.00	95.00	3,092.8	-32.1	108.7	37.2	0.00	0.00	0.00
3,200.0	8.00	95.00	3,191.8	-33.3	122.5	39.1	0.00	0.00	0.00
3,300.0	8.00	95.00	3,290.9	-34.5	136.4	41.0	0.00	0.00	0.00
3,400.0	8.00	95.00	3,389.9	-35.7	150.3	42.8	0.00	0.00	0.00
3,500.0	8.00	95.00	3,488.9	-36.9	164.1	44.7	0.00	0.00	0.00
3,600.0	8.00	95.00	3,588.0	-38.1	178.0	46.6	0.00	0.00	0.00
3,700.0	8.00	95.00	3,687.0	-39.4	191.9	48.5	0.00	0.00	0.00
3,800.0	8.00	95.00	3,786.0	-40.6	205.7	50.3	0.00	0.00	0.00
3,900.0	8.00	95.00	3,885.0	-41.8	219.6	52.2	0.00	0.00	0.00
4,000.0	8.00	95.00	3,984.1	-43.0	233.5	54.1	0.00	0.00	0.00
4,100.0	8.00	95.00	4,083.1	-44.2	247.3	56.0	0.00	0.00	0.00
4,200.0	8.00	95.00	4,182.1	-45.4	261.2	57.8	0.00	0.00	0.00
4,300.0	8.00	95.00	4,281.1	-46.6	275.1	59.7	0.00	0.00	0.00
4,400.0	8.00	95.00	4,380.2	-47.8	288.9	61.6	0.00	0.00	0.00
4,500.0	8.00	95.00	4,479.2	-49.1	302.8	63.5	0.00	0.00	0.00
4,600.0	8.00	95.00	4,578.2	-50.3	316.6	65.3	0.00	0.00	0.00
4,700.0	8.00	95.00	4,677.3	-51.5	330.5	67.2	0.00	0.00	0.00

ConocoPhillips

Planning Report

Database:	EDT 17 Central Planning Prod	**Local Co-ordinate Reference:**	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	**TVD Reference:**	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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)
4,800.0	8.00	95.00	4,776.3	-52.7	344.4	69.1	0.00	0.00	0.00
4,902.7	8.00	95.00	4,878.0	-53.9	358.6	71.0	0.00	0.00	0.00
Start Drop -1.00									
5,000.0	7.03	95.00	4,974.4	-55.1	371.3	72.7	1.00	-1.00	0.00
5,100.0	6.03	95.00	5,073.8	-56.0	382.6	74.2	1.00	-1.00	0.00
5,200.0	5.03	95.00	5,173.3	-56.9	392.2	75.5	1.00	-1.00	0.00
5,300.0	4.03	95.00	5,273.0	-57.6	400.1	76.6	1.00	-1.00	0.00
5,400.0	3.03	95.00	5,372.8	-58.1	406.2	77.4	1.00	-1.00	0.00
5,500.0	2.03	95.00	5,472.7	-58.5	410.6	78.0	1.00	-1.00	0.00
5,600.0	1.03	95.00	5,572.7	-58.7	413.2	78.4	1.00	-1.00	0.00
5,702.7	0.00	0.00	5,675.4	-58.8	414.2	78.5	1.00	-1.00	0.00
Start 6028.6 hold at 5702.7 MD									
5,800.0	0.00	0.00	5,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
5,900.0	0.00	0.00	5,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,000.0	0.00	0.00	5,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,100.0	0.00	0.00	6,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,200.0	0.00	0.00	6,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,300.0	0.00	0.00	6,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,400.0	0.00	0.00	6,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,500.0	0.00	0.00	6,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,600.0	0.00	0.00	6,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,700.0	0.00	0.00	6,672.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,800.0	0.00	0.00	6,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
6,900.0	0.00	0.00	6,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,000.0	0.00	0.00	6,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,100.0	0.00	0.00	7,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,200.0	0.00	0.00	7,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,300.0	0.00	0.00	7,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,400.0	0.00	0.00	7,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,500.0	0.00	0.00	7,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,600.0	0.00	0.00	7,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,700.0	0.00	0.00	7,672.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,800.0	0.00	0.00	7,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
7,900.0	0.00	0.00	7,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,000.0	0.00	0.00	7,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,100.0	0.00	0.00	8,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,200.0	0.00	0.00	8,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,300.0	0.00	0.00	8,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,400.0	0.00	0.00	8,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,500.0	0.00	0.00	8,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,600.0	0.00	0.00	8,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,700.0	0.00	0.00	8,672.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,800.0	0.00	0.00	8,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
8,900.0	0.00	0.00	8,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,000.0	0.00	0.00	8,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,100.0	0.00	0.00	9,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,200.0	0.00	0.00	9,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,300.0	0.00	0.00	9,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,400.0	0.00	0.00	9,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,500.0	0.00	0.00	9,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,600.0	0.00	0.00	9,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,700.0	0.00	0.00	9,672.7	-58.8	414.2	78.5	0.00	0.00	0.00

ConocoPhillips
Planning Report

Database:	EDT 17 Central Planning Prod	**Local Co-ordinate Reference:**	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	**TVD Reference:**	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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)
9,800.0	0.00	0.00	9,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
9,900.0	0.00	0.00	9,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,000.0	0.00	0.00	9,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,100.0	0.00	0.00	10,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,200.0	0.00	0.00	10,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,300.0	0.00	0.00	10,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,400.0	0.00	0.00	10,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,500.0	0.00	0.00	10,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,600.0	0.00	0.00	10,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,700.0	0.00	0.00	10,672.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,800.0	0.00	0.00	10,772.7	-58.8	414.2	78.5	0.00	0.00	0.00
10,900.0	0.00	0.00	10,872.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,000.0	0.00	0.00	10,972.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,100.0	0.00	0.00	11,072.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,200.0	0.00	0.00	11,172.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,300.0	0.00	0.00	11,272.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,400.0	0.00	0.00	11,372.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,500.0	0.00	0.00	11,472.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,600.0	0.00	0.00	11,572.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,700.0	0.00	0.00	11,672.7	-58.8	414.2	78.5	0.00	0.00	0.00
11,731.4	0.00	0.00	11,704.0	-58.8	414.2	78.5	0.00	0.00	0.00
Start DLS 10.00 TFO 179.46									
11,750.0	1.86	179.46	11,722.7	-59.1	414.2	78.8	10.00	10.00	0.00
11,800.0	6.86	179.46	11,772.5	-62.9	414.2	82.6	10.00	10.00	0.00
11,850.0	11.86	179.46	11,821.8	-71.0	414.3	90.7	10.00	10.00	0.00
11,900.0	16.86	179.46	11,870.3	-83.4	414.4	103.1	10.00	10.00	0.00
11,950.0	21.86	179.46	11,917.4	-100.0	414.6	119.7	10.00	10.00	0.00
12,000.0	26.86	179.46	11,962.9	-120.6	414.8	140.3	10.00	10.00	0.00
12,050.0	31.86	179.46	12,006.5	-145.1	415.0	164.8	10.00	10.00	0.00
12,100.0	36.86	179.46	12,047.8	-173.4	415.3	193.0	10.00	10.00	0.00
12,150.0	41.86	179.46	12,086.4	-205.1	415.6	224.7	10.00	10.00	0.00
12,200.0	46.86	179.46	12,122.1	-240.0	415.9	259.6	10.00	10.00	0.00
12,250.0	51.86	179.46	12,154.7	-277.9	416.2	297.5	10.00	10.00	0.00
12,300.0	56.86	179.46	12,183.8	-318.6	416.6	338.1	10.00	10.00	0.00
12,350.0	61.86	179.46	12,209.3	-361.6	417.0	381.1	10.00	10.00	0.00
12,400.0	66.86	179.46	12,230.9	-406.6	417.5	426.1	10.00	10.00	0.00
12,450.0	71.86	179.46	12,248.5	-453.4	417.9	472.8	10.00	10.00	0.00
12,500.0	76.86	179.46	12,262.0	-501.5	418.4	520.9	10.00	10.00	0.00
12,550.0	81.86	179.46	12,271.2	-550.7	418.8	570.0	10.00	10.00	0.00
12,600.0	86.86	179.46	12,276.1	-600.4	419.3	619.7	10.00	10.00	0.00
12,631.4	90.00	179.46	12,277.0	-631.7	419.6	651.0	10.00	10.00	0.00
Start 10121.0 hold at 12631.4 MD									
12,700.0	90.00	179.46	12,277.0	-700.4	420.3	719.6	0.00	0.00	0.00
12,800.0	90.00	179.46	12,277.0	-800.4	421.2	819.6	0.00	0.00	0.00
12,900.0	90.00	179.46	12,277.0	-900.4	422.2	919.5	0.00	0.00	0.00
13,000.0	90.00	179.46	12,277.0	-1,000.4	423.1	1,019.4	0.00	0.00	0.00
13,100.0	90.00	179.46	12,277.0	-1,100.4	424.1	1,119.3	0.00	0.00	0.00
13,200.0	90.00	179.46	12,277.0	-1,200.3	425.0	1,219.3	0.00	0.00	0.00
13,300.0	90.00	179.46	12,277.0	-1,300.3	426.0	1,319.2	0.00	0.00	0.00
13,400.0	90.00	179.46	12,277.0	-1,400.3	426.9	1,419.1	0.00	0.00	0.00
13,500.0	90.00	179.46	12,277.0	-1,500.3	427.9	1,519.1	0.00	0.00	0.00
13,600.0	90.00	179.46	12,277.0	-1,600.3	428.8	1,619.0	0.00	0.00	0.00
13,700.0	90.00	179.46	12,277.0	-1,700.3	429.8	1,718.9	0.00	0.00	0.00

ConocoPhillips
Planning Report

Database:	EDT 17 Central Planning Prod	**Local Co-ordinate Reference:**	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	**TVD Reference:**	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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)
13,800.0	90.00	179.46	12,277.0	-1,800.3	430.7	1,818.8	0.00	0.00	0.00
13,900.0	90.00	179.46	12,277.0	-1,900.3	431.7	1,918.8	0.00	0.00	0.00
14,000.0	90.00	179.46	12,277.0	-2,000.3	432.6	2,018.7	0.00	0.00	0.00
14,100.0	90.00	179.46	12,277.0	-2,100.3	433.6	2,118.6	0.00	0.00	0.00
14,200.0	90.00	179.46	12,277.0	-2,200.3	434.5	2,218.5	0.00	0.00	0.00
14,300.0	90.00	179.46	12,277.0	-2,300.3	435.5	2,318.5	0.00	0.00	0.00
14,400.0	90.00	179.46	12,277.0	-2,400.3	436.4	2,418.4	0.00	0.00	0.00
14,500.0	90.00	179.46	12,277.0	-2,500.3	437.4	2,518.3	0.00	0.00	0.00
14,600.0	90.00	179.46	12,277.0	-2,600.3	438.3	2,618.2	0.00	0.00	0.00
14,700.0	90.00	179.46	12,277.0	-2,700.3	439.3	2,718.2	0.00	0.00	0.00
14,800.0	90.00	179.46	12,277.0	-2,800.3	440.2	2,818.1	0.00	0.00	0.00
14,900.0	90.00	179.46	12,277.0	-2,900.3	441.2	2,918.0	0.00	0.00	0.00
15,000.0	90.00	179.46	12,277.0	-3,000.3	442.1	3,018.0	0.00	0.00	0.00
15,100.0	90.00	179.46	12,277.0	-3,100.3	443.1	3,117.9	0.00	0.00	0.00
15,200.0	90.00	179.46	12,277.0	-3,200.3	444.0	3,217.8	0.00	0.00	0.00
15,300.0	90.00	179.46	12,277.0	-3,300.3	445.0	3,317.7	0.00	0.00	0.00
15,400.0	90.00	179.46	12,277.0	-3,400.2	445.9	3,417.7	0.00	0.00	0.00
15,500.0	90.00	179.46	12,277.0	-3,500.2	446.9	3,517.6	0.00	0.00	0.00
15,600.0	90.00	179.46	12,277.0	-3,600.2	447.8	3,617.5	0.00	0.00	0.00
15,700.0	90.00	179.46	12,277.0	-3,700.2	448.8	3,717.4	0.00	0.00	0.00
15,800.0	90.00	179.46	12,277.0	-3,800.2	449.7	3,817.4	0.00	0.00	0.00
15,900.0	90.00	179.46	12,277.0	-3,900.2	450.7	3,917.3	0.00	0.00	0.00
16,000.0	90.00	179.46	12,277.0	-4,000.2	451.6	4,017.2	0.00	0.00	0.00
16,100.0	90.00	179.46	12,277.0	-4,100.2	452.6	4,117.1	0.00	0.00	0.00
16,200.0	90.00	179.46	12,277.0	-4,200.2	453.5	4,217.1	0.00	0.00	0.00
16,300.0	90.00	179.46	12,277.0	-4,300.2	454.5	4,317.0	0.00	0.00	0.00
16,400.0	90.00	179.46	12,277.0	-4,400.2	455.4	4,416.9	0.00	0.00	0.00
16,500.0	90.00	179.46	12,277.0	-4,500.2	456.4	4,516.9	0.00	0.00	0.00
16,600.0	90.00	179.46	12,277.0	-4,600.2	457.3	4,616.8	0.00	0.00	0.00
16,700.0	90.00	179.46	12,277.0	-4,700.2	458.3	4,716.7	0.00	0.00	0.00
16,800.0	90.00	179.46	12,277.0	-4,800.2	459.2	4,816.6	0.00	0.00	0.00
16,900.0	90.00	179.46	12,277.0	-4,900.2	460.2	4,916.6	0.00	0.00	0.00
17,000.0	90.00	179.46	12,277.0	-5,000.2	461.1	5,016.5	0.00	0.00	0.00
17,100.0	90.00	179.46	12,277.0	-5,100.2	462.1	5,116.4	0.00	0.00	0.00
17,200.0	90.00	179.46	12,277.0	-5,200.2	463.0	5,216.3	0.00	0.00	0.00
17,300.0	90.00	179.46	12,277.0	-5,300.2	464.0	5,316.3	0.00	0.00	0.00
17,400.0	90.00	179.46	12,277.0	-5,400.2	464.9	5,416.2	0.00	0.00	0.00
17,500.0	90.00	179.46	12,277.0	-5,500.2	465.9	5,516.1	0.00	0.00	0.00
17,600.0	90.00	179.46	12,277.0	-5,600.1	466.8	5,616.1	0.00	0.00	0.00
17,700.0	90.00	179.46	12,277.0	-5,700.1	467.8	5,716.0	0.00	0.00	0.00
17,800.0	90.00	179.46	12,277.0	-5,800.1	468.7	5,815.9	0.00	0.00	0.00
17,900.0	90.00	179.46	12,277.0	-5,900.1	469.7	5,915.8	0.00	0.00	0.00
18,000.0	90.00	179.46	12,277.0	-6,000.1	470.6	6,015.8	0.00	0.00	0.00
18,100.0	90.00	179.46	12,277.0	-6,100.1	471.6	6,115.7	0.00	0.00	0.00
18,200.0	90.00	179.46	12,277.0	-6,200.1	472.5	6,215.6	0.00	0.00	0.00
18,300.0	90.00	179.46	12,277.0	-6,300.1	473.5	6,315.5	0.00	0.00	0.00
18,400.0	90.00	179.46	12,277.0	-6,400.1	474.4	6,415.5	0.00	0.00	0.00
18,500.0	90.00	179.46	12,277.0	-6,500.1	475.4	6,515.4	0.00	0.00	0.00
18,600.0	90.00	179.46	12,277.0	-6,600.1	476.3	6,615.3	0.00	0.00	0.00
18,700.0	90.00	179.46	12,277.0	-6,700.1	477.3	6,715.2	0.00	0.00	0.00
18,800.0	90.00	179.46	12,277.0	-6,800.1	478.2	6,815.2	0.00	0.00	0.00
18,900.0	90.00	179.46	12,277.0	-6,900.1	479.2	6,915.1	0.00	0.00	0.00
19,000.0	90.00	179.46	12,277.0	-7,000.1	480.1	7,015.0	0.00	0.00	0.00

ConocoPhillips

Planning Report

Database:	EDT 17 Central Planning Prod	Local Co-ordinate Reference:	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	TVD Reference:	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	MD Reference:	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	North Reference:	Grid
Well:	VIKING HELMET FEDERAL COM #601H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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)
19,100.0	90.00	179.46	12,277.0	-7,100.1	481.1	7,115.0	0.00	0.00	0.00
19,200.0	90.00	179.46	12,277.0	-7,200.1	482.0	7,214.9	0.00	0.00	0.00
19,300.0	90.00	179.46	12,277.0	-7,300.1	483.0	7,314.8	0.00	0.00	0.00
19,400.0	90.00	179.46	12,277.0	-7,400.1	483.9	7,414.7	0.00	0.00	0.00
19,500.0	90.00	179.46	12,277.0	-7,500.1	484.9	7,514.7	0.00	0.00	0.00
19,600.0	90.00	179.46	12,277.0	-7,600.1	485.8	7,614.6	0.00	0.00	0.00
19,700.0	90.00	179.46	12,277.0	-7,700.1	486.8	7,714.5	0.00	0.00	0.00
19,800.0	90.00	179.46	12,277.0	-7,800.0	487.7	7,814.4	0.00	0.00	0.00
19,900.0	90.00	179.46	12,277.0	-7,900.0	488.7	7,914.4	0.00	0.00	0.00
20,000.0	90.00	179.46	12,277.0	-8,000.0	489.6	8,014.3	0.00	0.00	0.00
20,100.0	90.00	179.46	12,277.0	-8,100.0	490.6	8,114.2	0.00	0.00	0.00
20,200.0	90.00	179.46	12,277.0	-8,200.0	491.5	8,214.1	0.00	0.00	0.00
20,300.0	90.00	179.46	12,277.0	-8,300.0	492.5	8,314.1	0.00	0.00	0.00
20,400.0	90.00	179.46	12,277.0	-8,400.0	493.4	8,414.0	0.00	0.00	0.00
20,500.0	90.00	179.46	12,277.0	-8,500.0	494.4	8,513.9	0.00	0.00	0.00
20,600.0	90.00	179.46	12,277.0	-8,600.0	495.3	8,613.9	0.00	0.00	0.00
20,700.0	90.00	179.46	12,277.0	-8,700.0	496.3	8,713.8	0.00	0.00	0.00
20,800.0	90.00	179.46	12,277.0	-8,800.0	497.2	8,813.7	0.00	0.00	0.00
20,900.0	90.00	179.46	12,277.0	-8,900.0	498.2	8,913.6	0.00	0.00	0.00
21,000.0	90.00	179.46	12,277.0	-9,000.0	499.1	9,013.6	0.00	0.00	0.00
21,100.0	90.00	179.46	12,277.0	-9,100.0	500.1	9,113.5	0.00	0.00	0.00
21,200.0	90.00	179.46	12,277.0	-9,200.0	501.0	9,213.4	0.00	0.00	0.00
21,300.0	90.00	179.46	12,277.0	-9,300.0	502.0	9,313.3	0.00	0.00	0.00
21,400.0	90.00	179.46	12,277.0	-9,400.0	502.9	9,413.3	0.00	0.00	0.00
21,500.0	90.00	179.46	12,277.0	-9,500.0	503.9	9,513.2	0.00	0.00	0.00
21,600.0	90.00	179.46	12,277.0	-9,600.0	504.8	9,613.1	0.00	0.00	0.00
21,700.0	90.00	179.46	12,277.0	-9,700.0	505.8	9,713.1	0.00	0.00	0.00
21,800.0	90.00	179.46	12,277.0	-9,800.0	506.7	9,813.0	0.00	0.00	0.00
21,900.0	90.00	179.46	12,277.0	-9,900.0	507.7	9,912.9	0.00	0.00	0.00
22,000.0	90.00	179.46	12,277.0	-10,000.0	508.6	10,012.8	0.00	0.00	0.00
22,100.0	90.00	179.46	12,277.0	-10,099.9	509.6	10,112.8	0.00	0.00	0.00
22,200.0	90.00	179.46	12,277.0	-10,199.9	510.6	10,212.7	0.00	0.00	0.00
22,300.0	90.00	179.46	12,277.0	-10,299.9	511.5	10,312.6	0.00	0.00	0.00
22,400.0	90.00	179.46	12,277.0	-10,399.9	512.5	10,412.5	0.00	0.00	0.00
22,500.0	90.00	179.46	12,277.0	-10,499.9	513.4	10,512.5	0.00	0.00	0.00
22,600.0	90.00	179.46	12,277.0	-10,599.9	514.4	10,612.4	0.00	0.00	0.00
22,700.0	90.00	179.46	12,277.0	-10,699.9	515.3	10,712.3	0.00	0.00	0.00
22,752.4	90.00	179.46	12,277.0	-10,752.3	515.8	10,764.7	0.00	0.00	0.00
Start 49.9 hold at 22752.4 MD									
22,802.3	90.00	179.46	12,277.0	-10,802.2	516.3	10,814.5	0.00	0.00	0.00
TD at 22802.3									

ConocoPhillips
Planning Report

Database:	EDT 17 Central Planning Prod	**Local Co-ordinate Reference:**	Well VIKING HELMET FEDERAL COM #601H
Company:	DELAWARE BASIN EAST	**TVD Reference:**	KB=26ft @ 3339.8usft
Project:	BULLDOG PROSPECT (NM-E)	**MD Reference:**	KB=26ft @ 3339.8usft
Site:	VIKING HELMET PROJECT	**North Reference:**	Grid
Well:	VIKING HELMET FEDERAL COM #601H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	PWP1		

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
(601H)TNGNT LIMITER	8.00	275.00	4,556.8	-54.2	358.6	436,395.39	790,404.39	32° 11' 46.619 N	103° 23' 40.350 W
- plan misses target center by 44.7usft at 4584.6usft MD (4563.0 TVD, -50.1 N, 314.5 E) - Rectangle (sides W40.0 H50.0 D2,120.0)									
(601H) KOP BOX: 50' N	0.00	359.46	11,704.0	-58.8	414.2	436,390.80	790,459.96	32° 11' 46.569 N	103° 23' 39.704 W
- plan hits target center - Rectangle (sides W100.0 H100.0 D6,028.6)									
FTP (VIKING HELMET F	0.00	0.00	12,277.0	-391.3	418.6	436,058.30	790,464.40	32° 11' 43.278 N	103° 23' 39.686 W
- plan misses target center by 48.5usft at 12401.9usft MD (12231.7 TVD, -408.4 N, 417.5 E) - Circle (radius 50.0)									
PBHL (VIKING HELMET	0.00	359.46	12,277.0	-10,802.2	516.3	425,647.40	790,562.10	32° 10' 0.253 N	103° 23' 39.607 W
- plan hits target center - Rectangle (sides W100.0 H10,411.1 D20.0)									
LTP (VIKING HELMET F	90.00	0.00	12,277.0	-10,752.3	515.8	425,697.30	790,561.60	32° 10' 0.746 N	103° 23' 39.608 W
- plan hits target center - Circle (radius 50.0)									

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	+E/-W (usft)	Comment
2,000.0	2,000.0	0.0	0.0	Start Build 1.50
2,533.3	2,531.6	-18.6	32.2	Start Turn -10.86
2,763.5	2,759.6	-28.0	62.0	Start 2139.2 hold at 2763.5 MD
4,902.7	4,878.0	-53.9	358.6	Start Drop -1.00
5,702.7	5,675.4	-58.8	414.2	Start 6028.6 hold at 5702.7 MD
11,731.4	11,704.0	-58.8	414.2	Start DLS 10.00 TFO 179.46
12,631.4	12,277.0	-631.7	419.6	Start 10121.0 hold at 12631.4 MD
22,752.4	12,277.0	-10,752.3	515.8	Start 49.9 hold at 22752.4 MD
22,802.3	12,277.0	-10,802.2	516.3	TD at 22802.3

ConocoPhillips

Project: BULLDOG PROSPECT (NM-E)
Site: VIKING HELMET PROJECT
Well: VIKING HELMET FEDERAL COM #601H
Wellbore: OWB
Design: PWP1
GL: 3313.8
KB=26ft @ 3339.8usft

WELL DETAILS: VIKING HELMET FEDERAL COM #601H

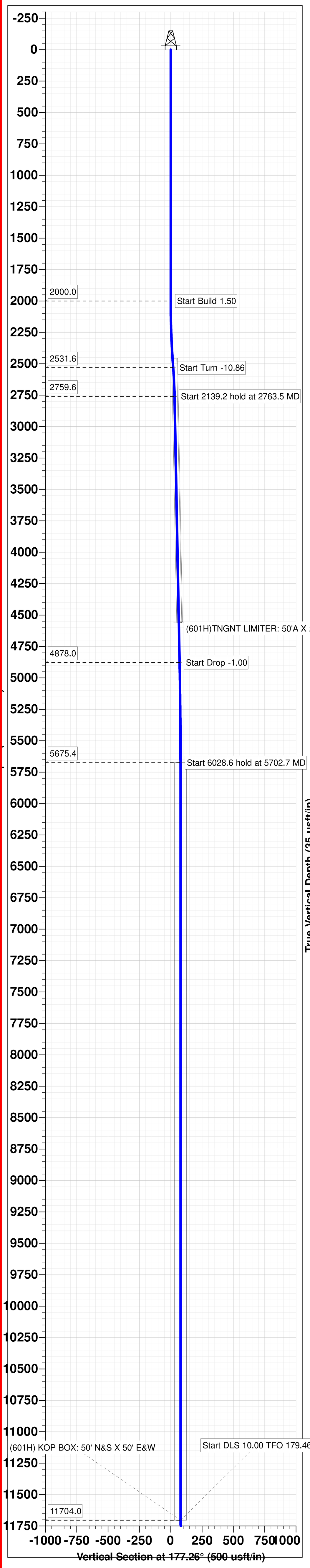
+N/-S	+E/-W	Northing	Easting	Latittude	Longitude
0.0	0.0	436449.60	790045.80	32° 11' 47.186 N	103° 23' 44.518 W

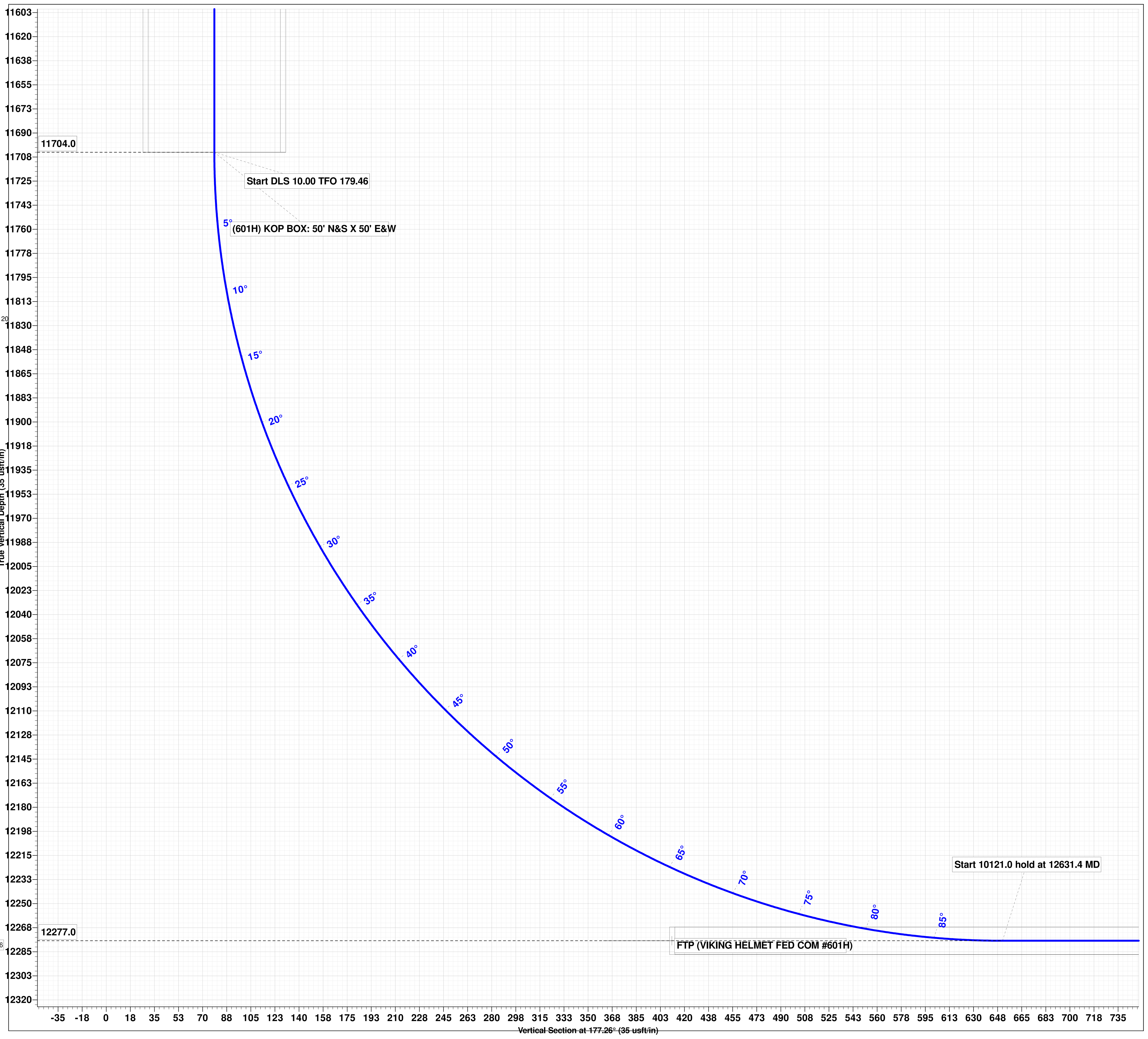
DESIGN TARGET DETAILS

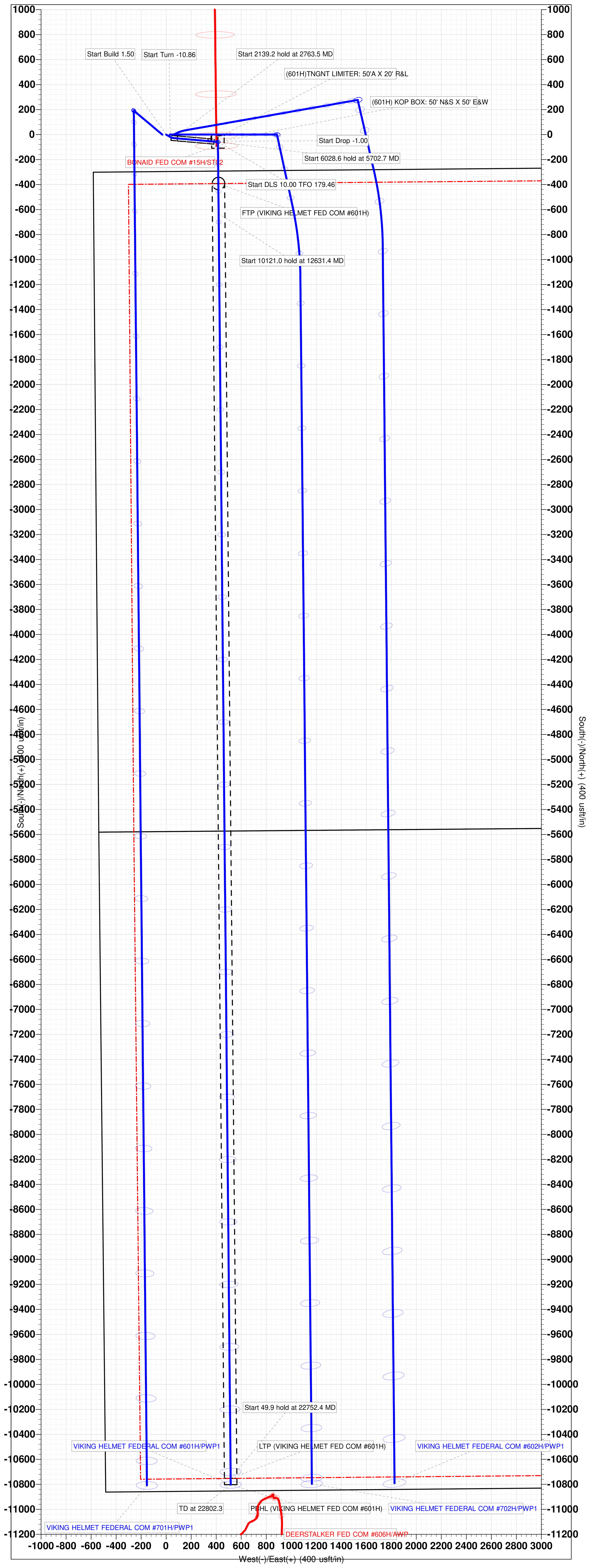
Name	TVD	+N/-S	+E/-W	Northing	Easting
(601H)TNGNT LIMITER: 50'A X 20' R&L	4556.8	-54.2	358.6	436395.39	790404.39
(601H) KOP BOX: 50' N&S X 50' E&W	11704.0	-58.8	414.2	436390.80	790459.96
FTP (VIKING HELMET FED COM #601H)	12277.0	-391.3	418.6	436058.30	790464.40
LTP (VIKING HELMET FED COM #601H)	12277.0	-10752.3	515.8	425697.30	790561.60
PBHL (VIKING HELMET FED COM #601H)	12277.0	-10802.2	516.3	425647.40	790562.10

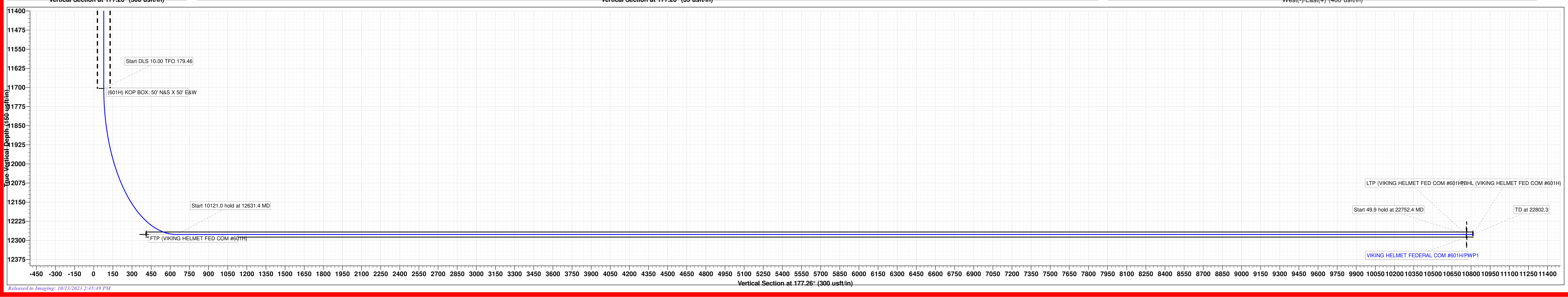
SECTION DETAILS

MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0
2000.0	0.00	0.00	2000.0	0.0	0.0	0.00	0.00	0.0
2533.3	8.00	120.00	2531.6	-18.6	32.2	1.50	120.00	20.1
2763.5	8.00	95.00	2759.6	-28.0	62.0	1.50	-102.38	30.9
4902.7	8.00	95.00	4878.0	-53.9	358.6	0.00	0.00	71.0
5702.7	0.00	0.00	5675.4	-58.8	414.2	1.00	180.00	78.5
11731.4	0.00	0.00	11704.0	-58.8	414.2	0.00	0.00	78.5
12631.4	90.00	179.46	12277.0	-631.7	419.6	10.00	179.46	651.0
22752.4	90.00	179.46	12277.0	-10752.3	515.8	0.00	0.00	10764.7
22802.3	90.00	179.46	12277.0	-10802.2	516.3	0.00	0.00	10814.5









PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	COG
LEASE NO.:	**NMNM132946**
LOCATION:	Section 20, T.24 S, R.35 E., NMPM
COUNTY:	Lea County, New Mexico
WELL NAME & NO.:	Viking Helmet Fed Com 601H
SURFACE HOLE FOOTAGE:	295'/S & 585'/W
BOTTOM HOLE FOOTAGE:	50'/S & 1000'/W

COA

H_2S	○ Yes	● No		
Potash / WIPP	● None	○ Secretary	○ R-111-P	☐ WIPP
Cave / Karst	● Low	○ Medium	○ High	○ Critical
Wellhead	○ Conventional	● Multibowl	○ Both	○ Diverter
Cementing	☐ Primary Squeeze	☐ Cont. Squeeze	☐ EchoMeter	☐ DV Tool
Special Req	☐ Break Testing	☐ Water Disposal	☑ COM	☐ Unit
Variance	☑ Flex Hose	☐ Casing Clearance	☐ Pilot Hole	☐ Capitan Reef
Variance	☐ Four-String	☐ Offline Cementing	☐ Fluid-Filled	☐ Open Annulus
☐ **Batch APD / Sundry**				

A. HYDROGEN SULFIDE

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area must meet all requirements from **43 CFR 3176**, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **10-3/4** inch surface casing shall be set at approximately **920** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.

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

    b. Wait on cement (WOC) time for a primary cement job will be a minimum of **<u>8 hours</u>** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

Approval Date: 09/28/2023

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 **7-5/8** inch intermediate casing is:
   - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Excess calculates to 20%. Additional cement maybe required.**

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

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

C. PRESSURE CONTROL

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

2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the casing shoe shall be **10,000 (10M)** psi. **Variance is approved to use a 5000 (5M) Annular which shall be tested to 5000 (5M) psi.**

   a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
   b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
   c. Manufacturer representative shall install the test plug for the initial BOP test.
   d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
   e. Whenever any seal subject to test pressure is broken, all the tests in 43 CFR 3172 must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

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

Approval Date: 09/28/2023

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

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

GENERAL REQUIREMENTS

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

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

☒ Eddy County
Email **or** call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, **BLM_NM_CFO_DrillingNotifications@BLM.GOV**
(575) 361-2822

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

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

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per **43 CFR part 3170 Subpart 3172** as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

2. <u>Wait on cement (WOC) for Potash Areas:</u> 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 <u>24 hours</u>. 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. <u>Wait on cement (WOC) for Water Basin:</u> 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 <u>8 hours</u>. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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

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

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

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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

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

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

   a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
   b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
   c. Manufacturer representative shall install the test plug for the initial BOP test.

d. Whenever any seal subject to test pressure is broken, all the tests in **43 CFR part 3170 Subpart 3172** must be followed.
e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

   a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead cement), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

   b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the cement plug. The BOPE test can be initiated after bumping the cement plug with the casing valve open. (only applies to single stage cement jobs, prior to the cement setting up.)

   c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer and can be initiated immediately with the casing valve open. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to **43 CFR part 3170 Subpart 3172** with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).

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

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

   f. All tests are required to be recorded on a calibrated test chart. A copy of the

BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

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

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per **43 CFR part 3170 Subpart 3172**.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

ZS 9/21/2023

COG OPERATING LLC
HYDROGEN SULFIDE DRILLING OPERATIONS PLAN

1. HYDROGEN SULFIDE TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

a. The hazards and characteristics of hydrogen sulfide (H_2S).
b. The proper use and maintenance of personal protective equipment and life support systems.
c. The proper use of H_2S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
d. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

a. The effects of H2S on metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
b. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
c. The contents and requirements of the H_2S Drilling Operations Plan and the Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H_2S SAFETY EQUIPMENT AND SYSTEMS

Note: All H_2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H2S. If H2S greater than 100 ppm is encountered in the gas stream we will shut in and install H2S equipment.

a. Well Control Equipment:
   Flare line.
   Choke manifold with remotely operated choke.
   Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
   Auxiliary equipment to include: annular preventer, mud-gas separator, rotating head.

b. Protective equipment for essential personnel:
Mark II Surviveair 30-minute units located in the dog house and at briefing areas.

c. H2S detection and monitoring equipment:
2 - portable H2S monitor positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.

d. Visual warning systems:
Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached.

e. Mud Program:
The mud program has been designed to minimize the volume of H2S circulated to the surface.

f. Metallurgy:
All drill strings, casings, tubing, wellhead, blowout preventers, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H2S service.

g. Communication:
Company vehicles equipped with cellular telephone.

COG OPERATING LLC has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal. H2S concentrations of wells in this area from surface to TD are low enough; therefore, we do not believe that an H2S contingency plan is necessary.

W A R N I N G

YOU ARE ENTERING AN H_2S AREA
AUTHORIZED PERSONNEL ONLY

1. ***BEARDS OR CONTACT LENSES NOT ALLOWED***
2. ***HARD HATS REQUIRED***
3. ***SMOKING IN DESIGNATED AREAS ONLY***
4. ***BE WIND CONSCIOUS AT ALL TIMES***
5. ***CK WITH COG OPERATING LLC FOREMAN AT MAIN OFFICE***

COG OPERATING LLC

1-575-748-6940

EMERGENCY CALL LIST

	OFFICE
COG OPERATING LLC OFFICE	575-748-6940
CHAD GREGORY	432-894-5590

EMERGENCY RESPONSE NUMBERS

	OFFICE
STATE POLICE	575-748-9718
EDDY COUNTY SHERIFF	575-746-2701
EMERGENCY MEDICAL SERVICES (AMBULANCE)	911 or 575-746-2701
EDDY COUNTY EMERGENCY MANAGEMENT (HARRY BURGESS)	575-887-9511
STATE EMERGENCY RESPONSE CENTER (SERC)	575-476-9620
CARLSBAD POLICE DEPARTMENT	575-885-2111
CARLSBAD FIRE DEPARTMENT	575-885-3125
NEW MEXICO OIL CONSERVATION DIVISION	575-748-1283
INDIAN FIRE & SAFETY	800-530-8693
HALLIBURTON SERVICES	800-844-8451

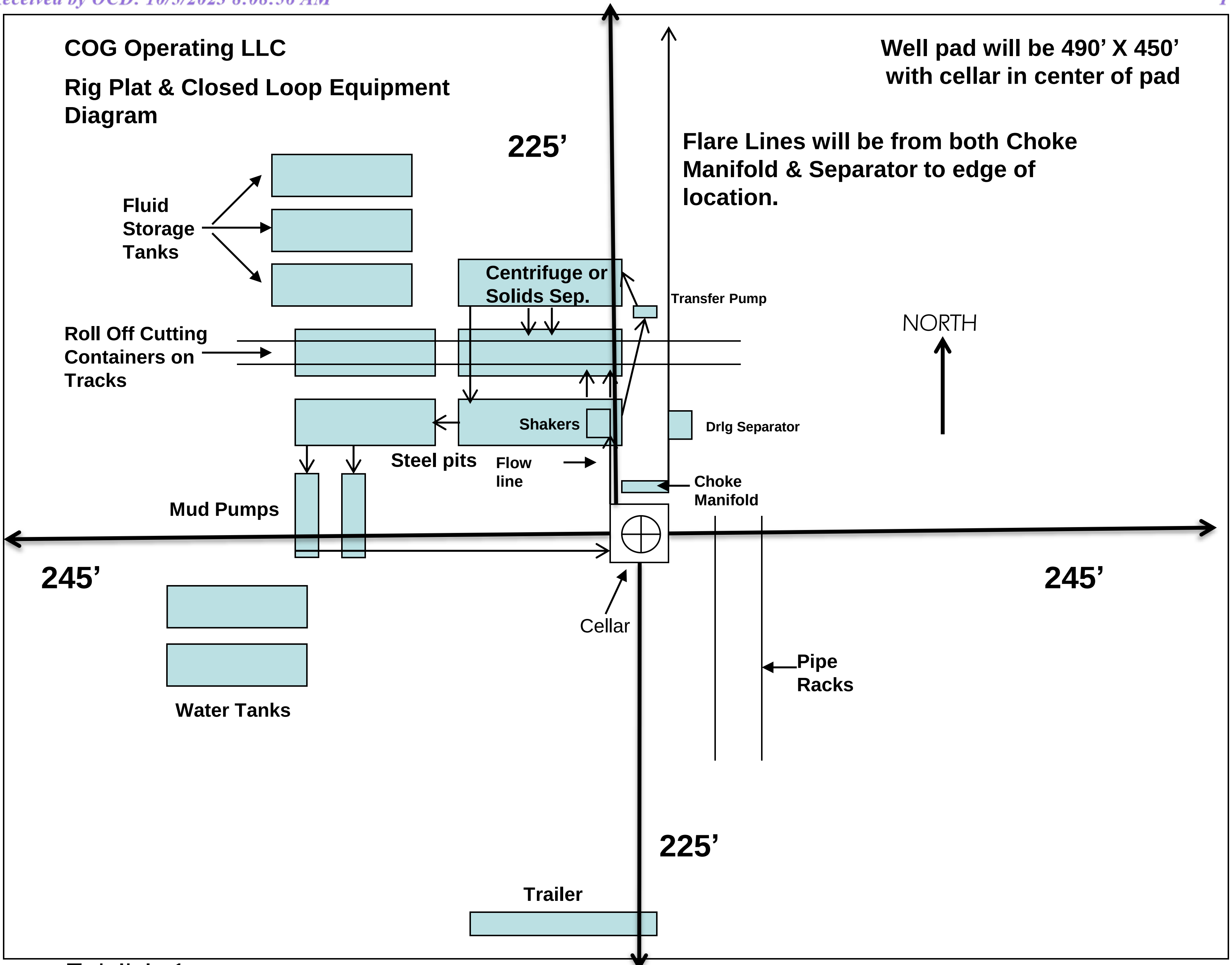


Exhibit 1

" I further certify that COG will comply with Rule 19.15.17 NMAC by using a Closed Loop System."

COG Operating, LLC - Viking Helmet Federal Com 601H

1. Geologic Formations

TVD of target	12,277' EOL	Pilot hole depth	NA
MD at TD:	22,802'	Deepest expected fresh water:	380'

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Quaternary Fill	Surface	Water	
Rustler	951	Water	
Top of Salt	1260	Salt	
Base of Salt	5042	Salt	
Lamar	5493	Salt Water	
Bell Canyon	5547	Salt Water	
Cherry Canyon	6392	Oil/Gas	
Brushy Canyon	7995	Oil/Gas	
Bone Spring Lime	9221	Oil/Gas	
1st Bone Spring Sand	10549	Oil/Gas	
2nd Bone Spring Sand	10929	Oil/Gas	
3rd Bone Spring Sand	12054	Oil/Gas	
Wolfcamp	0	Not Penetrated	
Wolfcamp C	0	Not Penetrated	
	0	Not Penetrated	

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (lbs)	Grade	Conn.	SF Collapse	SF Burst	SF Body	SF Joint
	From	To								
14.75"	0	1150	10.75"	45.5	J55	BTC	3.97	1.22	13.66	15.21
9.875"	0	8000	7.625"	29.7	HCL80	BTC	1.66	1.02	2.87	3.03
8.750"	8000	11600	7.625"	29.7	HCP110	W513	1.23	1.40	2.73	1.62
6.75"	0	11100	5.5"	23	P110	TXP BTC	2.02	2.38	2.86	2.86
6.75"	11100	22,802	5.5"	23	P110	W441	1.82	2.15	2.58	2.34
			BLM Minimum Safety Factor				1.125	1	1.6 Dry 1.8 Wet	1.6 Dry 1.8 Wet

Intermediate casing will be kept at least 1/3 full while running casing.to mitigate collapse. Surface burst based on 0.7 frac gradient at the shoe with Gas Gradient 0.1 psi/ft to surface and
All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h

The 5 1/2" talon casing will be run back 200’ into the intermediate casing to ensure the coupling OD clearance is greater than .422” for the cement bond tie in.

COG Operating, LLC - Viking Helmet Federal Com 601H

	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.	Y
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?	

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3. Cementing Program

Casing	# Sks	Wt. lb/ gal	Yld ft3/ sack	H_20 gal/sk	500# Comp. Strength (hours)	Slurry Description
Surf.	548	13.5	1.75	9	12	Lead: Class C + 4% Gel + 1% CaCl2
	250	14.8	1.34	6.34	8	Tail: Class C + 2% CaCl2
Inter. Stage 1	810	10.3	3.3	22	24	Halliburton tunded light
	250	14.8	1.35	6.6	8	Tail: Class H
Prod	515	12.7	2	10.7	72	Lead: 50:50:10 H Blend
	1104	14.4	1.24	5.7	19	Tail: 50:50:2 Class H Blend

If losses are encountered in the intermediate section a DV/ECP tool will be run ~50' above the Lamar Lime top, cement will be adjusted accordingly if this contingency is necessary.

Volumes Subject to Observed Hole Conditions and/or Fluid Caliper Results
Lab reports with the 500 psi compressive strength time for the cement will be onsite for review.

Casing String	TOC	% Excess
Surface	0’	50%
1st Intermediate	0’	50%
Production	11,100'	35% OH in Lateral (KOP to EOL)

4. Pressure Control Equipment

N	A variance is requested for the use of a diverter on the surface casing. See attached for schematic.

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type		x	Tested to:
9-7/8"	13-5/8"	5M	Annular		x	2500psi
			Blind Ram			5000psi
			Pipe Ram		x	
			Double Ram		x	
			Other*			
6-3/4"	13-5/8"	10M	5M Annular		x	5000psi
			Blind Ram			10000psi
			Pipe Ram		x	
			Double Ram		x	
			Other*			

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 and floor 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.

COG Operating, LLC - Viking Helmet Federal Com 601H

5. Mud Program

Depth		Type	Weight (ppg)	Viscosity	Water Loss
From	To				
0	Surf. Shoe	FW Gel	8.6 - 8.8	28-34	N/C
Surf csg	7-5/8" Int shoe	Brine Diesel Emulsion	8.4 - 9	28-34	N/C
7-5/8" Int shoe	Lateral TD	OBM	9.6 - 12.5	35-45	<20

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
Y	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
Y	No Logs are planned based on well control or offset log information.
N	Drill stem test? If yes, explain.
N	Coring? If yes, explain.

Additional logs planned		Interval
N	Resistivity	Pilot Hole TD to ICP
N	Density	Pilot Hole TD to ICP
Y	CBL	Production casing (If cement not circulated to surface)
Y	Mud log	Intermediate shoe to TD
N	PEX	

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	7985 psi at 12277' TVD
Abnormal Temperature	NO 180 Deg. F.

No abnormal pressure or temperature conditions are anticipated. Sufficient mud materials to maintain mud properties and weight increase requirements will be kept on location at all times.

Sufficient supplies of Paper/LCM for periodic sweeps to control seepage and losses will be maintained on location.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other Facets of Operation

Y	Is it a walking operation?
Y	Is casing pre-set?

x	H2S Plan.
x	BOP & Choke Schematics.
x	Directional Plan

AFMSS
U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

APD Print Report
10/04/2023

APD ID: 10400092106
Submission Date: 05/10/2023
Highlighted data reflects the most recent changes
Show Final Text

Operator Name: COG OPERATING LLC
Federal/Indian APD: FED

Well Name: VIKING HELMET FEDERAL COM
Well Number: 601H

Well Type: OIL WELL
Well Work Type: Drill

Application

Section 1 - General

APD ID: 10400092106
Tie to previous NOS?
Submission Date: 05/10/2023

BLM Office: Carlsbad
User: MAYTE REYES
Title: Regulatory Analyst

Federal/Indian APD: FED
Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM132946
Lease Acres:

Surface access agreement in place?
Allotted?
Reservation:

Agreement in place? NO
Federal or Indian agreement:

Agreement number:

Agreement name:

Keep application confidential? Y

Permitting Agent? NO
APD Operator: COG OPERATING LLC

Operator letter of

Operator Info

Operator Organization Name: COG OPERATING LLC

Operator Address: ONE CONCHO CENTER 600 W ILLINOIS AVENUE
Zip: 79701-4287

Operator PO Box:

Operator City: MIDLAND
State: TX

Operator Phone: (432)685-4342

Operator Internet Address:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 2 - Well Information

Well in Master Development Plan? EXISTING

Master Development Plan name: No

Well in Master SUPO?

Master SUPO name:

Well in Master Drilling Plan?

Master Drilling Plan name:

Well Name: VIKING HELMET FEDERAL COM

Well Number: 601H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: WC-025 G-09 S243532M

Pool Name: WOLFBONE

Is the proposed well in an area containing other mineral resources? NATURAL GAS,OIL

Is the proposed well in a Helium production area? N

Use Existing Well Pad? N

New surface disturbance?

Type of Well Pad: MULTIPLE WELL

Multiple Well Pad Name: VIKING HELMET FEDERAL COM

Number: 601H, 602H, 701H, 702H

Well Class: HORIZONTAL

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 11 Miles

Distance to nearest well: 30 FT

Distance to lease line: 50 FT

Reservoir well spacing assigned acres Measurement: 640 Acres

Well plat: COG_Viking_Helmet_601H_C102_20230510192627.pdf

Well work start Date: 10/01/2023

Duration: 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum: GROUND LEVEL

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this
SHL Leg #1	295	FSL	585	FWL	24S	35E	20	Aliquot SWSW	32.196566	-103.396169	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 134886	3314	0	0	Y
KOP Leg #1	295	FSL	585	FWL	24S	35E	20	Aliquot SWSW	32.196566	-103.396169	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 134886	3314	0	0	Y
PPP Leg #1-1	100	FNL	1000	FWL	24S	35E	29	Aliquot NWNW	32.195481	-103.394827	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 132946	-8918	12402	12232	Y
EXIT Leg #1	100	FSL	1000	FWL	24S	35E	32	Aliquot SWSW	32.167	-103.394804	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-8963	22752	12277	Y
BHL Leg #1	50	FSL	1000	FWL	24S	35E	32	Aliquot SWSW	32.166862	-103.394804	LEA	NEW MEXICO	NEW MEXICO	S	STATE	-8963	22802	12277	Y

Drilling Plan

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
12218158	UNKNOWN	3314	0	0	ALLUVIUM	NONE	N
12218159	RUSTLER	2363	951	951	GYPSUM	NONE	N
12218160	TOP SALT	2054	1260	1260	SALT	NONE	N
12218161	BOTTOM SALT	-1728	5042	5042	ANHYDRITE, SALT	NONE	N
12218162	LAMAR	-2179	5493	5493	LIMESTONE	NATURAL GAS, OIL	N
12218163	BELL CANYON	-2233	5547	5547	SANDSTONE	NATURAL GAS, OIL	N
12218164	CHERRY CANYON	-3078	6392	6392	SANDSTONE	NATURAL GAS, OIL	N
12218165	BRUSHY CANYON	-4681	7995	7995	SANDSTONE	NATURAL GAS, OIL	N

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Formation ID	Formation Name	Elevation	True Vertical	Measured Depth	Lithologies	Mineral Resources	Producing Formatio
12218166	BONE SPRING LIME	-5907	9221	9221	LIMESTONE, SANDSTONE	NATURAL GAS, OIL	N
12218169	BONE SPRING 1ST	-7235	10549	10549	HALITE, SANDSTONE	NATURAL GAS, OIL	N
12218170	BONE SPRING 2ND	-7615	10929	10929	HALITE, SANDSTONE	NATURAL GAS, OIL	N
12218171	BONE SPRING 3RD	-8740	12054	12054	HALITE, SANDSTONE	NATURAL GAS, OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 10M **Rating Depth:** 12277

Equipment: Accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold.
Requesting Variance? YES

Variance request: Request a 5M annular variance on a 10M system. (5M variance attached in section 8). A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: 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.

Choke Diagram Attachment:

COG_Viking_Helmet_10M_Choke_20230504135810.pdf

BOP Diagram Attachment:

COG_Viking_Helmet_10M_BOP_20230504135821.pdf

COG_Viking_Helmet_Flex_Hose_Variance_20230913105343.pdf

Pressure Rating (PSI): 5M **Rating Depth:** 11600

Equipment: Annular, Blind Ram, Pipe Ram. Other accessories to the BOP equipment will include a Kelly cock and floor safety valve (inside BOP) and choke lines and choke manifold
Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP to the choke manifold. See attached for specs and hydrostatic test chart.
Testing Procedure: 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.

Choke Diagram Attachment:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

COG_Viking_Helmet_5M_Choke_20230504135127.pdf

BOP Diagram Attachment:

COG_Viking_Helmet_5M_BOP_20230504135139.pdf

COG_Viking_Helmet_Flex_Hose_Variance_20230913105310.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	14.75	10.75	NEW	API	N	0	1150	0	1150	3314	2164	1150	J-55	45.5	OTHER - BTC	3.97	1.22	DRY	15.21	DRY	13[illegible]6
2	INTERMEDIATE	8.75	7.625	NEW	API	Y	0	11600	0	11600	3697	-8286	11600	OTHER	29.7	OTHER - W513	1.23	1.4	DRY	1.62	DRY	2.[illegible]
3	PRODUCTION	6.75	5.5	NEW	API	Y	0	22802	0	12277	3697	-8963	22802	OTHER	23	OTHER - W441	1.82	2.15	DRY	2.34	DRY	2.[illegible]

Casing Attachments

Casing ID: 1 **String** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140128.pdf

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Casing Attachments

Casing ID: 2 **String** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

COG_Viking_Helmet_601H_Casing_Program_20230504140244.pdf

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140323.pdf

Casing ID: 3 **String** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

COG_Viking_Helmet_601H_Casing_Program_20230504135945.pdf

Casing Design Assumptions and Worksheet(s):

COG_Viking_Helmet_601H_Casing_Program_20230504140029.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	1150	548	1.75	13.5	959	50	Class C + 4% Gel	1% CaCl2
SURFACE	Tail		0	1150	250	1.34	14.8	335	50	Class C	2% CaCl2
INTERMEDIATE	Lead		0	11600	810	3.3	10.3	2673	50	Halliburton tunded light	As needed
INTERMEDIATE	Tail		0	11600	250	1.35	14.8	337	50	Tail: Class H	As needed

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead		12277	22802	515	2	12.7	1030	35	Lead: 50:50:10 H Blend	As needed
PRODUCTION	Tail		12277	22802	1104	1.24	14.4	1368	35	Tail: 50:50:2 Class H Blend	As needed

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
1150	11600	OTHER : Brine Diesel Emulsion	8.4	9							Brine Diesel Emulsion
11600	22802	OTHER : OBM	9.6	12.5							OBM
0	1150	OTHER : FW Gel	8.6	8.8							FW Gel

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

None planned

List of open and cased hole logs run in the well:

CEMENT BOND LOG,COMPENSATED NEUTRON LOG,GAMMA RAY LOG,

Coring operation description for the well:

None planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 7985 **Anticipated Surface Pressure:** 5284

Anticipated Bottom Hole Temperature(F): 180

Anticipated abnormal pressures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations

COG_Viking_Helmet_H2S_SUP_20230504141217.pdf

COG_Viking_Helmet_H2S_Schem_20230508122249.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

COG_Viking_Helmet_601H_AC_RPT_20230504141252.pdf

COG_Viking_Helmet_601H_Directional_Plan_20230504141252.pdf

Other proposed operations facets description:

Drilling program attached.
GCP attached.
Cement program attached.

Other proposed operations facets attachment:

API_BTC_Special_Clearance_10.750_0.400_J55_Casing_10042022_20230504141334.pdf

API_BTC_7.625_0.375_L80_ICY_04112022_20230504141332.pdf

Wedge_441_5.500_0.415_P110_CY_09212021_20230504141334.pdf

TXP_BTC_5.500_0.415_P110_CY_09212021_20230504141334.pdf

Wedge_513_7.625_0.375_P110_ICY_04112022_20230504141334.pdf

COG_Viking_Helmet_601H_Casing_Program_20230504141726.pdf

COG_Viking_Helmet_601H_Drilling_Program_20230504141726.pdf

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

COG_Viking_Helmet_601H_Cement_Program_20230504141727.pdf

COG_Viking_Helmet_601H_GCP_20230510145406.pdf

Other Variance attachment:

5M_Variance_Well_Plan_20200925152216.pdf

SUPO

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

COG_Viking_Helmet_Existing_Road_20230508122756.pdf

Existing Road Purpose: ACCESS **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

COG_Viking_Helmet_Road_Plats_20230508122851.pdf

New road type: RESOURCE

Length: 470 Feet **Width (ft.):** 30

Max slope (%): 33 **Max grade (%):** 1

Army Corp of Engineers (ACOE) permit required? N

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns.
New road access plan or profile prepared? N

New road access plan

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Access road engineering design? N

Access road engineering design

Turnout? N

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Blading

Access other construction information: No turnouts are planned

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: None necessary

Road Drainage Control Structures (DCS) description: None needed

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

COG_Viking_Helmet_601H_1_Mile_Data_20230508123000.pdf

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Viking Helmet Federal 29 D CTB. This CTB will be built to accommodate the Viking Helmet Fed #601H, #602, #701H, #702H. We plan to install (1) buried 4" FP 601HT production flowline from each wellhead to the inlet manifold of the proposed CTB (4 lines total); the route for these flowlines will follow the flowlines route as shown in the diagram below. We will install (1) buried 6" gas lines for gas lift supply from the CTB common to each well pad (1 lines total); the route for the gas lift lines will follow the gas lift route as shown in the attached layout.

Production Facilities map:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

COG_Viking_Helmet_Powerline_20230508123102.pdf

COG_Viking_Helment_Fed_29_D_CTB_20230627104345.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source type: OTHER

Describe type: Brine Water

Water source use type: INTERMEDIATE/PRODUCTION CASING

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Water source transport method: TRUCKING

Source land ownership: COMMERCIAL

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 30000 **Source volume (acre-feet):** 3.86679289

Source volume (gal): 1260000

Water source type: OTHER

Describe type: Fresh Water

Water source use type: SURFACE CASING

ICE PAD CONSTRUCTION & MAINTENANCE

Source latitude: **Source longitude:**

Source datum:

Water source permit type: PRIVATE CONTRACT

Water source transport method: PIPELINE

Source land ownership: PRIVATE

Source transportation land ownership: PRIVATE

Water source volume (barrels): 450000 **Source volume (acre-feet):** 58.00189335

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Source volume (gal): 18900000

Water source and transportation

COG_Viking_Helmet__H2O_Brine_20230508123157.pdf

COG_Viking_Helmet_Fresh_H2O_20230508123157.pdf

Water source comments: See attached maps.

New water well? N

New Water Well Info

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

New water well casing? **Used casing source:**

Drilling method: **Drill material:**

Grout material: **Grout depth:**

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Using any construction materials: YES

Construction Materials description: Caliche will be obtained from the actual well site if available. If not available onsite, caliche will be hauled from the Tomahawk caliche pit located in section 6. T25S. R35E. SENW

Construction Materials source location

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 7 - Methods for Handling

Waste type: DRILLING

Waste content description: Drilling fluids and produced oil and water during drilling and completion operations

Amount of waste: 6000 barrels

Waste disposal frequency : One Time Only

Safe containment description: All drilling waste will be stored safely and disposed of properly

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: SEWAGE

Waste content description: Human waste and gray water

Amount of waste: 250 gallons

Waste disposal frequency : Weekly

Safe containment description: Waste will be properly contained and disposed of properly at a state approved disposal facility

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Waste type: GARBAGE

Waste content description: Garbage and trash produced during drilling and completion operations

Amount of waste: 125 pounds

Waste disposal frequency : Weekly

Safe containment description: Garbage and trash produced during drilling and completion operations will be collected in a trash container and disposed of properly at a state approved disposal facility

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL

Disposal type description:

Disposal location description: Trucked to an approved disposal facility

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit? NO

Reserve pit length (ft.) **Reserve pit width (ft.)**

Reserve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? Y

Description of cuttings location Roll off cuttings containers on tracks

Cuttings area length (ft.) **Cuttings area width (ft.)**

Cuttings area depth (ft.) **Cuttings area volume (cu. yd.)**

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary

Are you requesting any Ancillary Facilities?: N

Ancillary Facilities

Comments:

Section 9 - Well Site

Well Site Layout Diagram:

COG_Viking_Helmet_Layout_20230627104652.pdf

Comments:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 10 - Plans for Surface

Type of disturbance: No New Surface Disturbance **Multiple Well Pad Name:** VIKING HELMET FEDERAL COM

Multiple Well Pad Number: 601H, 602H, 701H, 702H

Recontouring

COG_Viking_Helmet_Reclamation_20230508124011.pdf

Drainage/Erosion control construction: Immediately following construction, straw waddles will be placed as necessary at the well site to reduce sediment impacts to fragile/sensitive soils.
Drainage/Erosion control reclamation: North, Northwest. 80'

Well pad proposed disturbance (acres):	**Well pad interim reclamation (acres):** 0	**Well pad long term disturbance (acres):** 0
Road proposed disturbance (acres):	**Road interim reclamation (acres):** 0	**Road long term disturbance (acres):** 0
Powerline proposed disturbance (acres):	**Powerline interim reclamation (acres):** 0	**Powerline long term disturbance (acres):** 0
Pipeline proposed disturbance (acres):	**Pipeline interim reclamation (acres):** 0	**Pipeline long term disturbance (acres):** 0
Other proposed disturbance (acres):	**Other interim reclamation (acres):** 0	**Other long term disturbance (acres):** 0
Total proposed disturbance: 0	**Total interim reclamation:** 0	**Total long term disturbance:** 0

Disturbance Comments:

Reconstruction method: If needed, portions of the pad not needed for production operations will be re-contoured to its original state as much as possible. The caliche that is removed will be reused. The stockpiled topsoil will be spread out over reclaimed area and reseeded with BLM approved seed mixture.
Topsoil redistribution: North, Northwest. 80'

Soil treatment: None

Existing Vegetation at the well pad: Shinnery Oak/Mesquite grassland

Existing Vegetation at the well pad

Existing Vegetation Community at the road: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the road

Existing Vegetation Community at the pipeline: Shinnery Oak/Mesquite grassland

Existing Vegetation Community at the pipeline

Existing Vegetation Community at other disturbances: N/A

Existing Vegetation Community at other disturbances

Non native seed used? N

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? N

Seedling transplant description

Will seed be harvested for use in site reclamation? N

Seed harvest description:

Seed harvest description attachment:

Seed

Seed Table

Seed Summary

Seed Type	Pounds/Acre

Total pounds/Acre:

Seed reclamation

Operator Contact/Responsible Official

First Name: **Last Name:**

Phone: **Email:**

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? N

Existing invasive species treatment description:

Existing invasive species treatment

Weed treatment plan description: N/A

Weed treatment plan

Monitoring plan description: N/A

Monitoring plan

Success standards: N/A

Pit closure description: N/A

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Pit closure attachment:

COG_Viking_Helmet_Closed_Loop_20230508124510.pdf

Section 11 - Surface

Disturbance type: WELL PAD

Describe:

Surface Owner: PRIVATE OWNERSHIP

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Surface use plan certification: NO

Surface use plan certification document:

Surface access agreement or bond: AGREEMENT

Surface Access Agreement Need description: Quail Ranch LLC 600 W. Illinois Ave. Midland, TX 79701 (432) 683-7443

Surface Access Bond BLM or Forest Service:

BLM Surface Access Bond number:

USFS Surface access bond number:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 12 - Other

Right of Way needed? N **Use APD as ROW?**

ROW Type(s):

ROW

SUPO Additional Information: Private Surface. On-site was done by Zane Kirsch (BLM) and Gerald Herrera (COG) on March 30th, 2023.

Use a previously conducted onsite? N

Previous Onsite information:

Other SUPO

COG_Viking_Helmet_601H_1_Mile_Data_20230510131236.pdf

COG_Viking_Helmet_Closed_Loop_20230510131241.pdf

COG_Viking_Helmet_Powerline_20230510131242.pdf

COG_Viking_Helmet_Reclamation_20230510131242.pdf

COG_Viking_Helmet_Existing_Road_20230510131244.pdf

COG_Viking_Helmet__H2O_Brine_20230510131245.pdf

COG_Viking_Helmet_Road_Plats_20230510131250.pdf

COG_Viking_Helmet_601H_C102_20230510192732.pdf

COG_Viking_Helmet_SUP_20230627105252.pdf

COG_Viking_Helment_Fed_29_D_CTB_20230627105408.pdf

COG_Viking_Helmet_Layout_20230627105408.pdf

PWD

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined

Would you like to utilize Lined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit

Pit liner description:

Pit liner manufacturers

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule

Lined pit reclamation description:

Lined pit reclamation

Leak detection system description:

Leak detection system

Lined pit Monitor description:

Lined pit Monitor

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Lined pit bond number:

Lined pit bond amount:

Additional bond information

Section 3 - Unlined

Would you like to utilize Unlined Pit PWD options? N

Produced Water Disposal (PWD) Location:

PWD disturbance (acres): **PWD surface owner:**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule

Unlined pit reclamation description:

Unlined pit reclamation

Unlined pit Monitor description:

Unlined pit Monitor

Do you propose to put the produced water to beneficial use?

Beneficial use user

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic

State

Unlined Produced Water Pit Estimated

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Additional bond information

Section 4 -

Would you like to utilize Injection PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number:

Injection well name:

Assigned injection well API number?

Injection well API number:

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection

Underground Injection Control (UIC) Permit?

UIC Permit

Section 5 - Surface

Would you like to utilize Surface Discharge PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 -

Would you like to utilize Other PWD options? N

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Other PWD discharge volume (bbl/day):

Other PWD type description:

Operator Name: COG OPERATING LLC

Well Name: VIKING HELMET FEDERAL COM **Well Number:** 601H

Other PWD type

Have other regulatory requirements been met?

Other regulatory requirements

Bond Info

Bond

Federal/Indian APD: FED

BLM Bond number: NMB000215

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information

Operator Certification

Payment Info

Payment

APD Fee Payment Method: PAY.GOV

pay.gov Tracking ID: 275C7U6S

District I
1625 N. French Dr., Hobbs, NM 88240
Phone:(575) 393-6161 Fax:(575) 393-0720
District II
811 S. First St., Artesia, NM 88210
Phone:(575) 748-1283 Fax:(575) 748-9720
District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 272672

CONDITIONS

Operator: COG OPERATING LLC 600 W Illinois Ave Midland, TX 79701	OGRID: 229137
	Action Number: 272672
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

CONDITIONS

Created By	Condition	Condition Date
pkautz	Will require a File As Drilled C-102 and a Directional Survey with the C-104	10/13/2023
pkautz	Once the well is spud, to prevent ground water contamination through whole or partial conduits from the surface, the operator shall drill without interruption through the fresh water zone or zones and shall immediately set in cement the water protection string	10/13/2023
pkautz	Oil base muds are not to be used until fresh water zones are cased and cemented providing isolation from the oil or diesel. This includes synthetic oils. Oil based mud, drilling fluids and solids must be contained in a steel closed loop system	10/13/2023
pkautz	Cement is required to circulate on both surface and intermediate1 strings of casing	10/13/2023
pkautz	If cement does not circulate on any string, a CBL is required for that string of casing	10/13/2023