

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

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		5. Lease Serial No. 6. If Indian, Allottee or Tribe Name 7. If Unit or CA Agreement, Name and No. 8. Lease Name and Well No.	
2. Name of Operator		9. API Well No. 30 015 48759	
3a. Address		3b. Phone No. (include area code)	
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface At proposed prod. zone		10. Field and Pool, or Exploratory 11. Sec., T. R. M. or Blk. and Survey or Area	
14. Distance in miles and direction from nearest town or post office*		12. County or Parish	
13. State			
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)		16. No of acres in lease	
17. Spacing Unit dedicated to this well			
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.		19. Proposed Depth	
20. BLM/BIA Bond No. in file			
21. Elevations (Show whether DF, KDB, RT, GL, etc.)		22. Approximate date work will start*	
23. Estimated duration			
24. Attachments			
The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)			
1. Well plat certified by a registered surveyor. 2. A Drilling Plan. 3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).		4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). 5. Operator certification. 6. Such other site specific information and/or plans as may be requested by the BLM.	
25. Signature		Name (Printed/Typed)	
Title		Date	
Approved by (Signature)		Name (Printed/Typed)	
Title		Office	
Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon. Conditions of approval, if any, are attached.			
Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.			

(Continued on page 2)

*(Instructions on page 2)



Approval Date: 06/18/2021

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 30-015-		Pool Code 97860	Pool Name JENNINGS; BONE SPRING, WEST
Property Code	Property Name PHANTOM DRAW 20 FED UNIT		Well Number 501H
OGRID No. 7377	Operator Name EOG RESOURCES, INC.		Elevation 3174'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
P	20	26 S	31 E		260	SOUTH	537	EAST	EDDY

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
A	20	26 S	31 E		100	NORTH	797	EAST	EDDY

Dedicated Acres	Joint or Infill	Consolidated Code	Order No.
320.00			

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

State of New Mexico
Energy, Minerals and Natural Resources Department

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: EOG Resources, Inc. **OGRID:** 7377 **Date:** 07/22/2021

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
PHANTOM DRAW 20 FED UNIT 501H		P-20-26S-31E	260' FSL & 537' FEL	+/- 1000	+/- 3500	+/- 3000

IV. Central Delivery Point Name: Magnolia 15 Fed Com CTB [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
PHANTOM DRAW 20 FED UNIT 501H		5/1/23	5/16/23	7/16/23	8/16/23	9/16/23

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.

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

Signature: <i>Craig Richardson</i>
Printed Name: Craig Richardson
Title: Regulatory Specialist
E-mail Address: craig_richardson@eogresources.com
Date: 7/22/2021
Phone: (432) 425.7736
OIL CONSERVATION DIVISION (Only applicable when submitted as a standalone form)
Approved By:
Title:
Approval Date:
Conditions of Approval:

Natural Gas Management Plan

Items VI-VIII

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

- Separation equipment will be sized to provide adequate separation for anticipated rates.
- Adequate separation relates to retention time for Liquid – Liquid separation and velocity for Gas-Liquid separation.
- Collection systems are appropriately sized to handle facility production rates on all (3) phases.
- Ancillary equipment and metering is selected to be serviced without flow interruptions or the need to release gas from the well.

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

Drilling Operations

- All flare stacks will be properly sized. The flare stacks will be located at a minimum 100' from the nearest surface hole location on the pad.
- All natural gas produced during drilling operations will be flared, unless there is an equipment malfunction and/or to avoid risk of an immediate and substantial adverse impact on safety and the environment, at which point the gas will be vented.

Completions/Recompletions Operations

- New wells will not be flowed back until they are connected to a properly sized gathering system.
- The facility will be built/sized for maximum anticipated flowrates and pressures to minimize waste.
- For flowback operations, multiple stages of separation will be used as well as excess VRU and blowers to make sure waste is minimized off the storage tanks and facility.
- During initial flowback, the well stream will be routed to separation equipment.
- At an existing facility, when necessary, post separation natural gas will be flared until it meets pipeline specifications, at which point it will be turned into a collection system.
- At a new facility, post separation natural gas will be vented until storage tanks can safely function, at which point it will be flared until it meets pipeline spec.

Production Operations

- Weekly AVOs will be performed on all facilities.
- All flares will be equipped with auto-ignition systems and continuous pilot operations.
- After a well is stabilized from liquid unloading, the well will be turned back into the collection system.
- All plunger lift systems will be optimized to limit the amount of waste.
- All tanks will have automatic gauging equipment installed.
- Leaking thief hatches found during AVOs will be cleaned and properly re-sealed.

Performance Standards

- Production equipment will be designed to handle maximum anticipated rates and pressure.

- All flared gas will be combusted in a flare stack that is properly sized and designed to ensure proper combustion.
- Weekly AVOs will be performed on all wells and facilities that produce more than 60 Mcfd.

Measurement & Estimation

- All volume that is flared or vented that is not measured will be estimated.
- All measurement equipment for flared volumes will conform to API 14.10.
- No meter bypasses will be installed.
- When metering is not practical due to low pressure/low rate, the vented or flared volume will be estimated.

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

- During downhole well maintenance, EOG will use best management practices to vent as minimally as possible.
- After downhole well maintenance, natural gas will be flared until it reaches pipeline specification.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

1. GEOLOGIC NAME OF SURFACE FORMATION:

Permian

2. ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1,075'
Tamarisk Anhydrite	1,117'
Top of Salt	1,330'
Base of Salt	3,720'
Lamar	3,920'
Bell Canyon	3,947'
Cherry Canyon	4,848'
Brushy Canyon	6,188'
Bone Spring Lime	7,857'
Leonard Shale	7,944'
1 st Bone Spring Sand	8,828'
2 nd Bone Spring Shale	9,067'
2 nd Bone Spring Sand	9,412'
TD	9,464'

3. ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	4,848'	Oil
Brushy Canyon	6,188'	Oil
Leonard Shale	7,944'	Oil
1 st Bone Spring Sand	8,828'	Oil
2 nd Bone Spring Shale	9,067'	Oil
2 nd Bone Spring Sand	9,412'	Oil

No other Formations are expected to give up oil, gas or fresh water in measurable quantities. Surface fresh water sands will be protected by setting 13.375" casing at 1,145' and circulating cement back to surface.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

4. CASING PROGRAM - NEW

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF _{min} Collapse	DF _{min} Burst	DF _{min} Tension
17.5"	0' – 1,145'	13.375"	54.5#	J-55	STC	1.125	1.25	1.60
12.25"	0' – 3,820'	9.625"	40#	J-55	LTC	1.125	1.25	1.60
8.75"	0' – 9,744'	5.5"	17#	HCP-110	LTC	1.125	1.25	1.60
8.5"	9,744' – 14,444'	5.5"	17#	HCP-110	LTC	1.125	1.25	1.60

Variance is requested to waive the centralizer requirements for the 9-5/8" casing in the 12-1/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 12-1/4" hole interval to maximize cement bond and zonal isolation.

Variance is also requested to waive any centralizer requirements for the 5-1/2" casing in the 8-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 8-3/4" hole interval to maximize cement bond and zonal isolation.

Cementing Program:

Depth	No. Sacks	Wt. ppg	Yld Ft ³ /sk	Slurry Description
1,145'	500	13.5	1.73	Lead: Class C + 4.0% Bentonite + 0.5% CaCl ₂ + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	160	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 945')
3,820'	560	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	250	14.8	1.32	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 3,060')
14,444'	580	11.0	3.21	Lead: Class C + 3% CaCl ₂ + 3% Microbond (TOC @ 3,320')
	1,350	14.4	1.2	Tail: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 8,994')

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

Additive	Purpose
Bentonite Gel	Lightweight/Lost circulation prevention
Calcium Chloride	Accelerator
Cello-flake	Lost circulation prevention
Sodium Metasilicate	Accelerator
MagOx	Expansive agent
Sodium Chloride	Accelerator
FL-62	Fluid loss control
Halad-344	Fluid loss control
Halad-9	Fluid loss control
HR-601	Retarder
Microbond	Expansive Agent

Cement integrity tests will be performed immediately following plug bump.

Note: Cement volumes based on bit size plus at least 25% excess in the open hole plus 10% excess in the cased-hole overlap section.

5. MINIMUM SPECIFICATIONS FOR PRESSURE CONTROL:

Variance is requested to use a co-flex line between the BOP and choke manifold (instead of using a 4" OD steel line).

The minimum blowout preventer equipment (BOPE) shown in Exhibit #1 will consist of a single ram, mud cross and double ram-type (10,000 psi WP) preventer and an annular preventer (5,000-psi WP). Both units will be hydraulically operated and the ram-type will be equipped with blind rams on bottom and drill pipe rams on top. All BOPE will be tested in accordance with Onshore Oil & Gas order No. 2.

EOG will utilize wing unions on BOPE connections that can be isolated from wellbore pressure through means of a choke. All wing unions will be rated to a pressure that meets or exceeds the pressure rating of the BOPE system.

Variance is requested to use a 5,000 psi annular BOP with the 10,000 psi BOP stack.

Before drilling out of the surface casing, the ram-type BOP and accessory equipment will be tested to 10,000/ 250 psig and the annular preventer to 5,000/ 250 psig.

Pipe rams and blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

A hydraulically operated choke will be installed prior to drilling out of the intermediate casing shoe.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

6. TYPES AND CHARACTERISTICS OF THE PROPOSED MUD SYSTEM:

During this procedure we plan to use a Closed-Loop System and haul contents to the required disposal.

The applicable depths and properties of the drilling fluid systems are as follows.

Depth	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,145'	Fresh - Gel	8.6-8.8	28-34	N/c
1,145' – 3,820'	Brine	8.6-8.8	28-34	N/c
3,820' – 14,444'	Oil Base	8.8-9.5	58-68	N/c - 6

An electronic pit volume totalizer (PVT) will be utilized on the circulating system, to monitor pit volume, flow rate, pump pressure and stroke rate.

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

7. AUXILIARY WELL CONTROL AND MONITORING EQUIPMENT:

- (A) A kelly cock will be kept in the drill string at all times.
- (B) A full opening drill pipe-stabbing valve (inside BOP) with proper drill pipe connections will be on the rig floor at all times.
- (C) H₂S monitoring and detection equipment will be utilized from surface casing point to TD.

8. LOGGING, TESTING AND CORING PROGRAM:

Open-hole logs are not planned for this well.

GR-CCL Will be run in cased hole during completions phase of operations.

9. ABNORMAL CONDITIONS, PRESSURES, TEMPERATURES AND POTENTIAL HAZARDS:

The estimated bottom-hole temperature (BHT) at TD is 165 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 4,675 psig and a maximum anticipated surface pressure of 2,593 psig (based on 9.5 ppg MW). No hydrogen sulfide or other hazardous gases or fluids have been encountered, reported or are known to exist at this depth in this area. Severe loss circulation is expected from 6,188' to TD.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

10. ANTICIPATED STARTING DATE AND DURATION OF OPERATIONS:

The drilling operation should be finished in approximately one month. If the well is productive, an additional 60-90 days will be required for completion and testing before a decision is made to install permanent facilities.

(A) EOG Resources requests the option to contract a Surface Rig to drill, set surface casing, and cement on the subject well. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so the wellhead can be installed. A welder will cut the casing to the proper height and weld on the wellhead (both "A" and "B" sections). The weld will be tested to 1000 psi. All valves will be closed and a wellhead cap will be installed (diagram attached). If the timing between rigs is such that EOG Resources would not be able to preset the surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

11. WELLHEAD:

A multi-bowl wellhead system will be utilized.

After running the 13-3/8" surface casing, a 13-3/8" BOP/BOPE system with a minimum working pressure of 10,000 psi will be installed on the wellhead system and will be pressure tested to 250 psi low followed by a 10,000 psi pressure test. This pressure test will be repeated at least every 30 days, as per Onshore Order No. 2

The minimum working pressure of the BOP and related BOPE required for drilling below the surface casing shoe shall be 10,000 psi.

The multi-bowl wellhead will be installed by vendor's representative(s). A copy of the installation instructions for the Cameron Multi-Bowl WH system has been sent to the NM BLM office in Carlsbad, NM.

The wellhead will be installed by a third party welder while being monitored by WH vendor's representative.

All BOP equipment will be tested utilizing a conventional test plug. Not a cup or J-packer type. EOG Resources reserves the option to conduct BOPE testing during wait on cement periods provided a test plug is utilized.

A solid steel body pack-off will be utilized after running and cementing the intermediate casing. After installation the pack-off and lower flange will be pressure tested to 5000 psi.

Casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

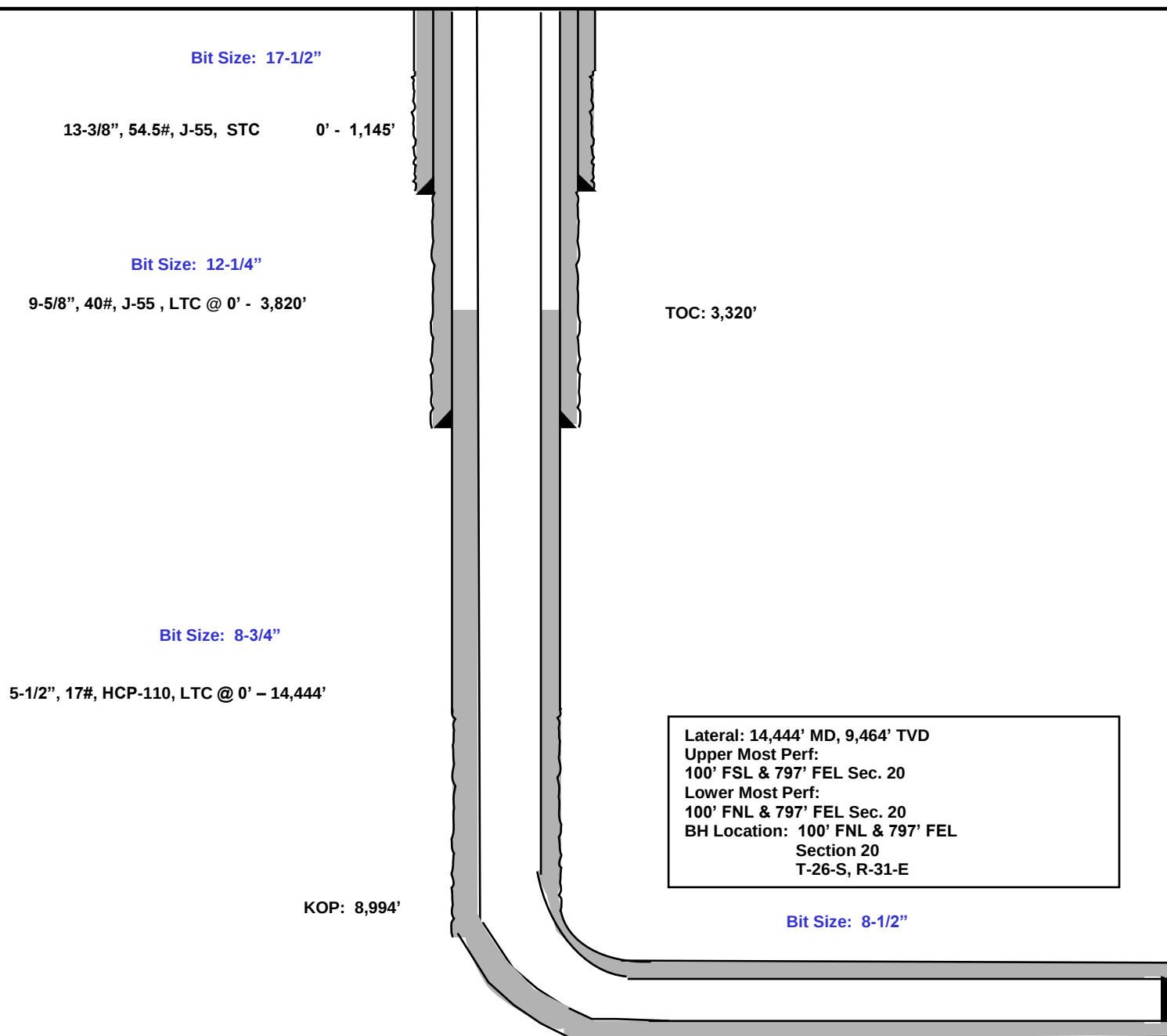
EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H

260' FSL
537' FEL
Section 20
T-26-S, R-31-E

Proposed Wellbore

API: 30-015-*****

KB: 3,199'
GL: 3,174'





EOG Resources - Midland

Eddy County, NM (NAD 83 NME)

Phantom Draw 20 Fed Unit

#501H

OH

Plan: Plan #0.1 RT

Standard Planning Report

09 July, 2020



EOG Resources

Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well #501H
Company:	EOG Resources - Midland	TVD Reference:	kb = 25' @ 3199.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 25' @ 3199.0usft
Site:	Phantom Draw 20 Fed Unit	North Reference:	Grid
Well:	#501H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

Project	Eddy County, NM (NAD 83 NME)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site		Phantom Draw 20 Fed Unit			
Site Position:		Northing:	371,925.00 usft	Latitude:	32.0213542°N
From:	Map	Easting:	708,555.00 usft	Longitude:	103.7937797°W
Position Uncertainty:	0.0 usft	Slot Radius:	13-3/16 "	Grid Convergence:	0.29 °

Well	#501H					
Well Position	+N/-S	61.0 usft	Northing:	371,986.00 usft	Latitude:	32.0215207°N
	+E/-W	90.0 usft	Easting:	708,645.00 usft	Longitude:	103.7934883°W
Position Uncertainty		0.0 usft	Wellhead Elevation:		Ground Level:	3,174.0 usft

Wellbore	OH				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	7/8/2020	6.74	59.71	47,450.08419127

Design	Plan #0.1 RT			
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	356.51

Plan Survey Tool Program	Date	7/9/2020		
Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	14,443.5 Plan #0.1 RT (OH)	EOG MWD+IFR1	
			MWD + IFR1	

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	
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,324.8	2.50	230.83	1,324.8	-1.7	-2.1	2.00	2.00	0.00	230.83	
8,868.9	2.50	230.83	8,861.7	-209.3	-256.9	0.00	0.00	0.00	0.00	
8,993.7	0.00	0.00	8,986.5	-211.0	-259.0	2.00	-2.00	0.00	180.00	KOP(Phantom Draw 2
9,214.2	26.46	0.00	9,199.2	-161.0	-259.0	12.00	12.00	0.00	0.00	FTP(Phantom Draw 2
9,743.7	90.00	359.50	9,463.9	266.5	-261.6	12.00	12.00	-0.10	-0.56	
14,443.5	90.00	359.50	9,464.0	4,966.0	-303.0	0.00	0.00	0.00	0.00	PBHL(Phantom Draw



EOG Resources

Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well #501H
Company:	EOG Resources - Midland	TVD Reference:	kb = 25' @ 3199.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 25' @ 3199.0usft
Site:	Phantom Draw 20 Fed Unit	North Reference:	Grid
Well:	#501H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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	2.00	230.83	1,300.0	-1.1	-1.4	-1.0	2.00	2.00	0.00
1,324.8	2.50	230.83	1,324.8	-1.7	-2.1	-1.6	2.00	2.00	0.00
1,400.0	2.50	230.83	1,399.9	-3.8	-4.6	-3.5	0.00	0.00	0.00
1,500.0	2.50	230.83	1,499.8	-6.5	-8.0	-6.0	0.00	0.00	0.00
1,600.0	2.50	230.83	1,599.7	-9.3	-11.4	-8.6	0.00	0.00	0.00
1,700.0	2.50	230.83	1,699.6	-12.0	-14.8	-11.1	0.00	0.00	0.00
1,800.0	2.50	230.83	1,799.5	-14.8	-18.2	-13.7	0.00	0.00	0.00
1,900.0	2.50	230.83	1,899.4	-17.5	-21.5	-16.2	0.00	0.00	0.00
2,000.0	2.50	230.83	1,999.3	-20.3	-24.9	-18.7	0.00	0.00	0.00
2,100.0	2.50	230.83	2,099.2	-23.0	-28.3	-21.3	0.00	0.00	0.00
2,200.0	2.50	230.83	2,199.1	-25.8	-31.7	-23.8	0.00	0.00	0.00
2,300.0	2.50	230.83	2,299.0	-28.5	-35.0	-26.4	0.00	0.00	0.00
2,400.0	2.50	230.83	2,398.9	-31.3	-38.4	-28.9	0.00	0.00	0.00
2,500.0	2.50	230.83	2,498.8	-34.1	-41.8	-31.4	0.00	0.00	0.00
2,600.0	2.50	230.83	2,598.8	-36.8	-45.2	-34.0	0.00	0.00	0.00
2,700.0	2.50	230.83	2,698.7	-39.6	-48.6	-36.5	0.00	0.00	0.00
2,800.0	2.50	230.83	2,798.6	-42.3	-51.9	-39.1	0.00	0.00	0.00
2,900.0	2.50	230.83	2,898.5	-45.1	-55.3	-41.6	0.00	0.00	0.00
3,000.0	2.50	230.83	2,998.4	-47.8	-58.7	-44.1	0.00	0.00	0.00
3,100.0	2.50	230.83	3,098.3	-50.6	-62.1	-46.7	0.00	0.00	0.00
3,200.0	2.50	230.83	3,198.2	-53.3	-65.4	-49.2	0.00	0.00	0.00
3,300.0	2.50	230.83	3,298.1	-56.1	-68.8	-51.8	0.00	0.00	0.00
3,400.0	2.50	230.83	3,398.0	-58.8	-72.2	-54.3	0.00	0.00	0.00
3,500.0	2.50	230.83	3,497.9	-61.6	-75.6	-56.8	0.00	0.00	0.00
3,600.0	2.50	230.83	3,597.8	-64.3	-78.9	-59.4	0.00	0.00	0.00
3,700.0	2.50	230.83	3,697.7	-67.1	-82.3	-61.9	0.00	0.00	0.00
3,800.0	2.50	230.83	3,797.6	-69.8	-85.7	-64.5	0.00	0.00	0.00
3,900.0	2.50	230.83	3,897.5	-72.6	-89.1	-67.0	0.00	0.00	0.00
4,000.0	2.50	230.83	3,997.4	-75.3	-92.5	-69.6	0.00	0.00	0.00
4,100.0	2.50	230.83	4,097.3	-78.1	-95.8	-72.1	0.00	0.00	0.00
4,200.0	2.50	230.83	4,197.2	-80.8	-99.2	-74.6	0.00	0.00	0.00
4,300.0	2.50	230.83	4,297.1	-83.6	-102.6	-77.2	0.00	0.00	0.00
4,400.0	2.50	230.83	4,397.0	-86.3	-106.0	-79.7	0.00	0.00	0.00
4,500.0	2.50	230.83	4,496.9	-89.1	-109.3	-82.3	0.00	0.00	0.00
4,600.0	2.50	230.83	4,596.9	-91.8	-112.7	-84.8	0.00	0.00	0.00
4,700.0	2.50	230.83	4,696.8	-94.6	-116.1	-87.3	0.00	0.00	0.00
4,800.0	2.50	230.83	4,796.7	-97.3	-119.5	-89.9	0.00	0.00	0.00
4,900.0	2.50	230.83	4,896.6	-100.1	-122.9	-92.4	0.00	0.00	0.00
5,000.0	2.50	230.83	4,996.5	-102.8	-126.2	-95.0	0.00	0.00	0.00
5,100.0	2.50	230.83	5,096.4	-105.6	-129.6	-97.5	0.00	0.00	0.00
5,200.0	2.50	230.83	5,196.3	-108.3	-133.0	-100.0	0.00	0.00	0.00

EOG Resources

Planning Report



Database:	EDM	Local Co-ordinate Reference:	Well #501H
Company:	EOG Resources - Midland	TVD Reference:	kb = 25' @ 3199.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 25' @ 3199.0usft
Site:	Phantom Draw 20 Fed Unit	North Reference:	Grid
Well:	#501H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

Planned Survey									
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,300.0	2.50	230.83	5,296.2	-111.1	-136.4	-102.6	0.00	0.00	0.00
5,400.0	2.50	230.83	5,396.1	-113.8	-139.7	-105.1	0.00	0.00	0.00
5,500.0	2.50	230.83	5,496.0	-116.6	-143.1	-107.7	0.00	0.00	0.00
5,600.0	2.50	230.83	5,595.9	-119.3	-146.5	-110.2	0.00	0.00	0.00
5,700.0	2.50	230.83	5,695.8	-122.1	-149.9	-112.7	0.00	0.00	0.00
5,800.0	2.50	230.83	5,795.7	-124.8	-153.2	-115.3	0.00	0.00	0.00
5,900.0	2.50	230.83	5,895.6	-127.6	-156.6	-117.8	0.00	0.00	0.00
6,000.0	2.50	230.83	5,995.5	-130.3	-160.0	-120.4	0.00	0.00	0.00
6,100.0	2.50	230.83	6,095.4	-133.1	-163.4	-122.9	0.00	0.00	0.00
6,200.0	2.50	230.83	6,195.3	-135.9	-166.8	-125.4	0.00	0.00	0.00
6,300.0	2.50	230.83	6,295.2	-138.6	-170.1	-128.0	0.00	0.00	0.00
6,400.0	2.50	230.83	6,395.1	-141.4	-173.5	-130.5	0.00	0.00	0.00
6,500.0	2.50	230.83	6,495.0	-144.1	-176.9	-133.1	0.00	0.00	0.00
6,600.0	2.50	230.83	6,595.0	-146.9	-180.3	-135.6	0.00	0.00	0.00
6,700.0	2.50	230.83	6,694.9	-149.6	-183.6	-138.1	0.00	0.00	0.00
6,800.0	2.50	230.83	6,794.8	-152.4	-187.0	-140.7	0.00	0.00	0.00
6,900.0	2.50	230.83	6,894.7	-155.1	-190.4	-143.2	0.00	0.00	0.00
7,000.0	2.50	230.83	6,994.6	-157.9	-193.8	-145.8	0.00	0.00	0.00
7,100.0	2.50	230.83	7,094.5	-160.6	-197.2	-148.3	0.00	0.00	0.00
7,200.0	2.50	230.83	7,194.4	-163.4	-200.5	-150.8	0.00	0.00	0.00
7,300.0	2.50	230.83	7,294.3	-166.1	-203.9	-153.4	0.00	0.00	0.00
7,400.0	2.50	230.83	7,394.2	-168.9	-207.3	-155.9	0.00	0.00	0.00
7,500.0	2.50	230.83	7,494.1	-171.6	-210.7	-158.5	0.00	0.00	0.00
7,600.0	2.50	230.83	7,594.0	-174.4	-214.0	-161.0	0.00	0.00	0.00
7,700.0	2.50	230.83	7,693.9	-177.1	-217.4	-163.6	0.00	0.00	0.00
7,800.0	2.50	230.83	7,793.8	-179.9	-220.8	-166.1	0.00	0.00	0.00
7,900.0	2.50	230.83	7,893.7	-182.6	-224.2	-168.6	0.00	0.00	0.00
8,000.0	2.50	230.83	7,993.6	-185.4	-227.5	-171.2	0.00	0.00	0.00
8,100.0	2.50	230.83	8,093.5	-188.1	-230.9	-173.7	0.00	0.00	0.00
8,200.0	2.50	230.83	8,193.4	-190.9	-234.3	-176.3	0.00	0.00	0.00
8,300.0	2.50	230.83	8,293.3	-193.6	-237.7	-178.8	0.00	0.00	0.00
8,400.0	2.50	230.83	8,393.2	-196.4	-241.1	-181.3	0.00	0.00	0.00
8,500.0	2.50	230.83	8,493.1	-199.1	-244.4	-183.9	0.00	0.00	0.00
8,600.0	2.50	230.83	8,593.1	-201.9	-247.8	-186.4	0.00	0.00	0.00
8,700.0	2.50	230.83	8,693.0	-204.6	-251.2	-189.0	0.00	0.00	0.00
8,800.0	2.50	230.83	8,792.9	-207.4	-254.6	-191.5	0.00	0.00	0.00
8,868.9	2.50	230.83	8,861.7	-209.3	-256.9	-193.2	0.00	0.00	0.00
8,900.0	1.87	230.83	8,892.8	-210.0	-257.8	-193.9	2.00	-2.00	0.00
8,993.7	0.00	0.00	8,986.5	-211.0	-259.0	-194.8	2.00	-2.00	0.00
KOP(Phantom Draw 20 Fed Unit #501H)									
9,000.0	0.75	0.00	8,992.8	-211.0	-259.0	-194.8	12.00	12.00	0.00
9,025.0	3.75	0.00	9,017.7	-210.0	-259.0	-193.8	12.00	12.00	0.00
9,050.0	6.75	0.00	9,042.6	-207.7	-259.0	-191.5	12.00	12.00	0.00
9,075.0	9.75	0.00	9,067.4	-204.1	-259.0	-187.9	12.00	12.00	0.00
9,100.0	12.75	0.00	9,091.9	-199.2	-259.0	-183.1	12.00	12.00	0.00
9,125.0	15.75	0.00	9,116.1	-193.1	-259.0	-176.9	12.00	12.00	0.00
9,150.0	18.75	0.00	9,140.0	-185.7	-259.0	-169.5	12.00	12.00	0.00
9,175.0	21.75	0.00	9,163.4	-177.0	-259.0	-160.9	12.00	12.00	0.00
9,200.0	24.75	0.00	9,186.4	-167.1	-259.0	-151.0	12.00	12.00	0.00
9,214.2	26.46	0.00	9,199.2	-161.0	-259.0	-144.9	12.00	12.00	0.00
FTP(Phantom Draw 20 Fed Unit #501H)									
9,225.0	27.75	359.97	9,208.8	-156.1	-259.0	-140.0	12.00	12.00	-0.25
9,250.0	30.75	359.92	9,230.6	-143.9	-259.0	-127.8	12.00	12.00	-0.22

EOG Resources

Planning Report



Database:	EDM	Local Co-ordinate Reference:	Well #501H
Company:	EOG Resources - Midland	TVD Reference:	kb = 25' @ 3199.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 25' @ 3199.0usft
Site:	Phantom Draw 20 Fed Unit	North Reference:	Grid
Well:	#501H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

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)
9,275.0	33.75	359.87	9,251.8	-130.5	-259.0	-114.5	12.00	12.00	-0.19
9,300.0	36.75	359.83	9,272.2	-116.1	-259.1	-100.1	12.00	12.00	-0.16
9,325.0	39.75	359.80	9,291.8	-100.6	-259.1	-84.6	12.00	12.00	-0.14
9,350.0	42.75	359.77	9,310.6	-84.1	-259.2	-68.2	12.00	12.00	-0.12
9,375.0	45.75	359.74	9,328.5	-66.7	-259.3	-50.8	12.00	12.00	-0.11
9,400.0	48.75	359.72	9,345.5	-48.3	-259.4	-32.4	12.00	12.00	-0.10
9,425.0	51.75	359.69	9,361.5	-29.1	-259.5	-13.3	12.00	12.00	-0.09
9,450.0	54.75	359.67	9,376.4	-9.1	-259.6	6.7	12.00	12.00	-0.08
9,475.0	57.75	359.65	9,390.3	11.7	-259.7	27.5	12.00	12.00	-0.08
9,500.0	60.75	359.64	9,403.1	33.2	-259.8	48.9	12.00	12.00	-0.07
9,525.0	63.75	359.62	9,414.7	55.3	-260.0	71.0	12.00	12.00	-0.07
9,550.0	66.75	359.60	9,425.2	78.0	-260.1	93.7	12.00	12.00	-0.06
9,575.0	69.75	359.59	9,434.4	101.2	-260.3	116.9	12.00	12.00	-0.06
9,600.0	72.75	359.57	9,442.5	124.9	-260.5	140.5	12.00	12.00	-0.06
9,625.0	75.75	359.56	9,449.3	149.0	-260.6	164.6	12.00	12.00	-0.06
9,650.0	78.75	359.55	9,454.8	173.3	-260.8	188.9	12.00	12.00	-0.06
9,675.0	81.75	359.53	9,459.0	198.0	-261.0	213.5	12.00	12.00	-0.05
9,700.0	84.75	359.52	9,461.9	222.8	-261.2	238.3	12.00	12.00	-0.05
9,725.0	87.75	359.51	9,463.6	247.7	-261.4	263.2	12.00	12.00	-0.05
9,743.7	90.00	359.50	9,463.9	266.5	-261.6	281.9	12.00	12.00	-0.05
9,800.0	90.00	359.50	9,463.9	322.7	-262.1	338.1	0.00	0.00	0.00
9,900.0	90.00	359.50	9,463.9	422.7	-263.0	438.0	0.00	0.00	0.00
10,000.0	90.00	359.50	9,464.0	522.7	-263.9	537.8	0.00	0.00	0.00
10,100.0	90.00	359.50	9,464.0	622.7	-264.7	637.7	0.00	0.00	0.00
10,200.0	90.00	359.50	9,464.0	722.7	-265.6	737.5	0.00	0.00	0.00
10,300.0	90.00	359.50	9,464.0	822.7	-266.5	837.4	0.00	0.00	0.00
10,400.0	90.00	359.50	9,464.0	922.7	-267.4	937.3	0.00	0.00	0.00
10,500.0	90.00	359.50	9,464.0	1,022.7	-268.3	1,037.1	0.00	0.00	0.00
10,600.0	90.00	359.50	9,464.0	1,122.7	-269.1	1,137.0	0.00	0.00	0.00
10,700.0	90.00	359.50	9,464.0	1,222.7	-270.0	1,236.9	0.00	0.00	0.00
10,800.0	90.00	359.50	9,464.0	1,322.7	-270.9	1,336.7	0.00	0.00	0.00
10,900.0	90.00	359.50	9,464.0	1,422.7	-271.8	1,436.6	0.00	0.00	0.00
11,000.0	90.00	359.50	9,464.0	1,522.7	-272.7	1,536.5	0.00	0.00	0.00
11,100.0	90.00	359.50	9,464.0	1,622.7	-273.6	1,636.3	0.00	0.00	0.00
11,200.0	90.00	359.50	9,464.0	1,722.7	-274.4	1,736.2	0.00	0.00	0.00
11,300.0	90.00	359.50	9,464.0	1,822.7	-275.3	1,836.1	0.00	0.00	0.00
11,400.0	90.00	359.50	9,464.0	1,922.7	-276.2	1,935.9	0.00	0.00	0.00
11,500.0	90.00	359.50	9,464.0	2,022.7	-277.1	2,035.8	0.00	0.00	0.00
11,600.0	90.00	359.50	9,464.0	2,122.7	-278.0	2,135.6	0.00	0.00	0.00
11,700.0	90.00	359.50	9,464.0	2,222.7	-278.8	2,235.5	0.00	0.00	0.00
11,800.0	90.00	359.50	9,464.0	2,322.7	-279.7	2,335.4	0.00	0.00	0.00
11,900.0	90.00	359.50	9,464.0	2,422.6	-280.6	2,435.2	0.00	0.00	0.00
12,000.0	90.00	359.50	9,464.0	2,522.6	-281.5	2,535.1	0.00	0.00	0.00
12,100.0	90.00	359.50	9,464.0	2,622.6	-282.4	2,635.0	0.00	0.00	0.00
12,200.0	90.00	359.50	9,464.0	2,722.6	-283.2	2,734.8	0.00	0.00	0.00
12,300.0	90.00	359.50	9,464.0	2,822.6	-284.1	2,834.7	0.00	0.00	0.00
12,400.0	90.00	359.50	9,464.0	2,922.6	-285.0	2,934.6	0.00	0.00	0.00
12,500.0	90.00	359.50	9,464.0	3,022.6	-285.9	3,034.4	0.00	0.00	0.00
12,600.0	90.00	359.50	9,464.0	3,122.6	-286.8	3,134.3	0.00	0.00	0.00
12,700.0	90.00	359.50	9,464.0	3,222.6	-287.6	3,234.2	0.00	0.00	0.00
12,800.0	90.00	359.50	9,464.0	3,322.6	-288.5	3,334.0	0.00	0.00	0.00
12,900.0	90.00	359.50	9,464.0	3,422.6	-289.4	3,433.9	0.00	0.00	0.00
13,000.0	90.00	359.50	9,464.0	3,522.6	-290.3	3,533.7	0.00	0.00	0.00
13,100.0	90.00	359.50	9,464.0	3,622.6	-291.2	3,633.6	0.00	0.00	0.00



EOG Resources

Planning Report

Database:	EDM	Local Co-ordinate Reference:	Well #501H
Company:	EOG Resources - Midland	TVD Reference:	kb = 25' @ 3199.0usft
Project:	Eddy County, NM (NAD 83 NME)	MD Reference:	kb = 25' @ 3199.0usft
Site:	Phantom Draw 20 Fed Unit	North Reference:	Grid
Well:	#501H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1 RT		

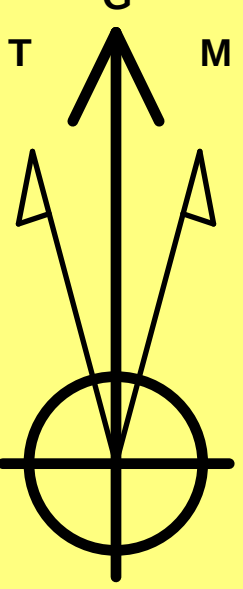
Planned Survey										
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	
13,200.0	90.00	359.50	9,464.0	3,722.6	-292.0	3,733.5	0.00	0.00	0.00	
13,300.0	90.00	359.50	9,464.0	3,822.6	-292.9	3,833.3	0.00	0.00	0.00	
13,400.0	90.00	359.50	9,464.0	3,922.6	-293.8	3,933.2	0.00	0.00	0.00	
13,500.0	90.00	359.50	9,464.0	4,022.6	-294.7	4,033.1	0.00	0.00	0.00	
13,600.0	90.00	359.50	9,464.0	4,122.6	-295.6	4,132.9	0.00	0.00	0.00	
13,700.0	90.00	359.50	9,464.0	4,222.6	-296.5	4,232.8	0.00	0.00	0.00	
13,800.0	90.00	359.50	9,464.0	4,322.6	-297.3	4,332.7	0.00	0.00	0.00	
13,900.0	90.00	359.50	9,464.0	4,422.6	-298.2	4,432.5	0.00	0.00	0.00	
14,000.0	90.00	359.50	9,464.0	4,522.6	-299.1	4,532.4	0.00	0.00	0.00	
14,100.0	90.00	359.50	9,464.0	4,622.6	-300.0	4,632.3	0.00	0.00	0.00	
14,200.0	90.00	359.50	9,464.0	4,722.6	-300.9	4,732.1	0.00	0.00	0.00	
14,300.0	90.00	359.50	9,464.0	4,822.6	-301.7	4,832.0	0.00	0.00	0.00	
14,400.0	90.00	359.50	9,464.0	4,922.6	-302.6	4,931.8	0.00	0.00	0.00	
14,443.5	90.00	359.50	9,464.0	4,966.0	-303.0	4,975.2	0.00	0.00	0.00	
PBHL(Phantom Draw 20 Fed Unit #501H)										

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
KOP(Phantom Draw 20 - plan hits target center - Point	0.00	0.00	8,986.5	-211.0	-259.0	371,775.00	708,386.00	32.0209442°N	103.7943274°W
FTP(Phantom Draw 20 f - plan hits target center - Point	0.00	0.01	9,199.2	-161.0	-259.0	371,825.00	708,386.00	32.0210816°N	103.7943266°W
PBHL(Phantom Draw 20 - plan hits target center - Point	0.00	0.00	9,464.0	4,966.0	-303.0	376,952.00	708,342.00	32.0351757°N	103.7943860°W

Eddy County, NM (NAD 83 NME)

Phantom Draw 20 Fed Unit #501H

Plan #0.1 RT



Azimuths to Grid North
True North: -0.29°
Magnetic North: 6.46°

Magnetic Field
Strength: 47450.1nT
Dip Angle: 59.71°
Date: 7/8/2020
Model: IGRF2020

To convert a Magnetic Direction to a Grid Direction, Add 6.46°
To convert a Magnetic Direction to a True Direction, Add 6.74° East
To convert a True Direction to a Grid Direction, Subtract 0.29°

PROJECT DETAILS: Eddy County, NM (NAD 83 NME)

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

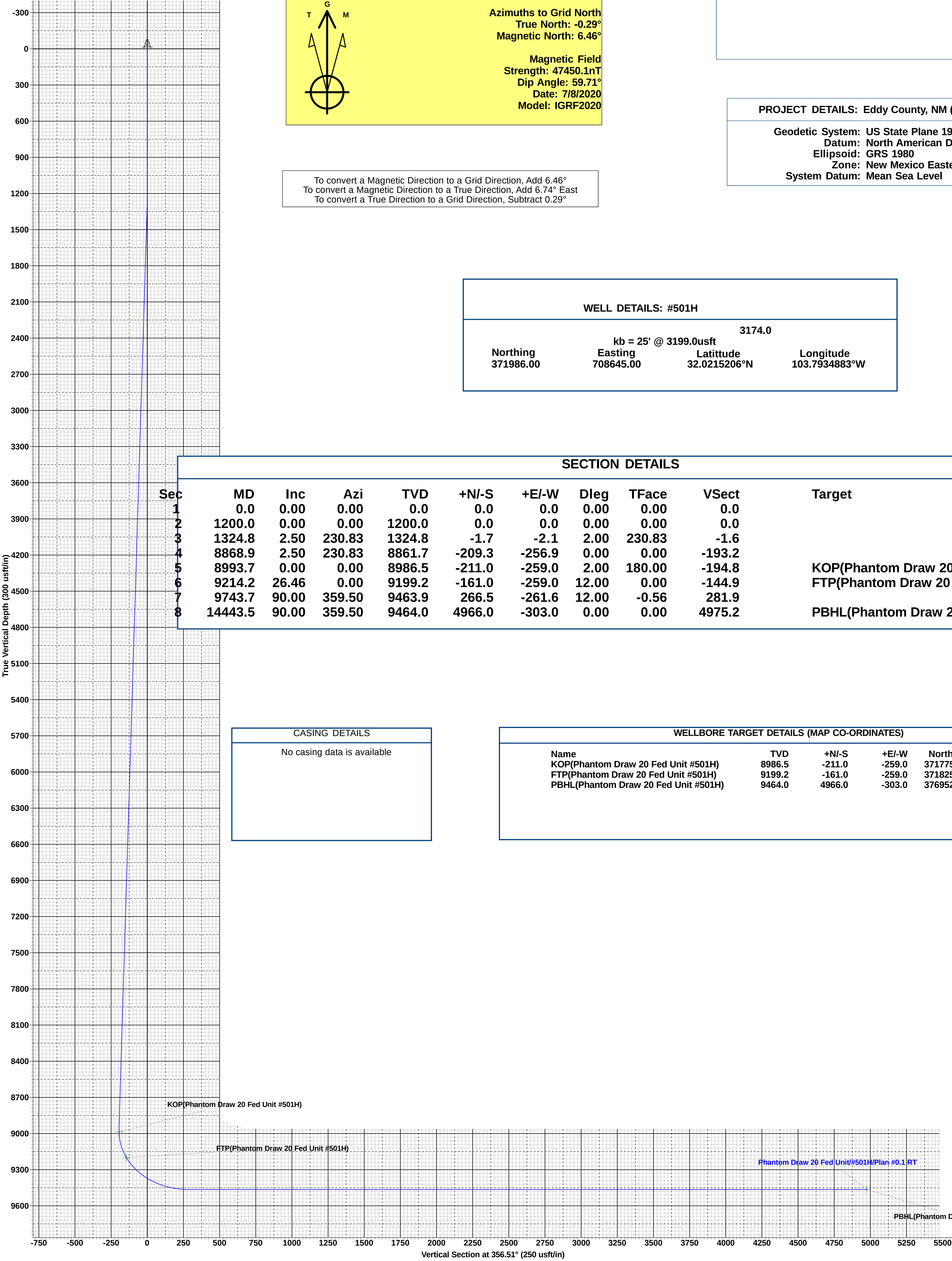
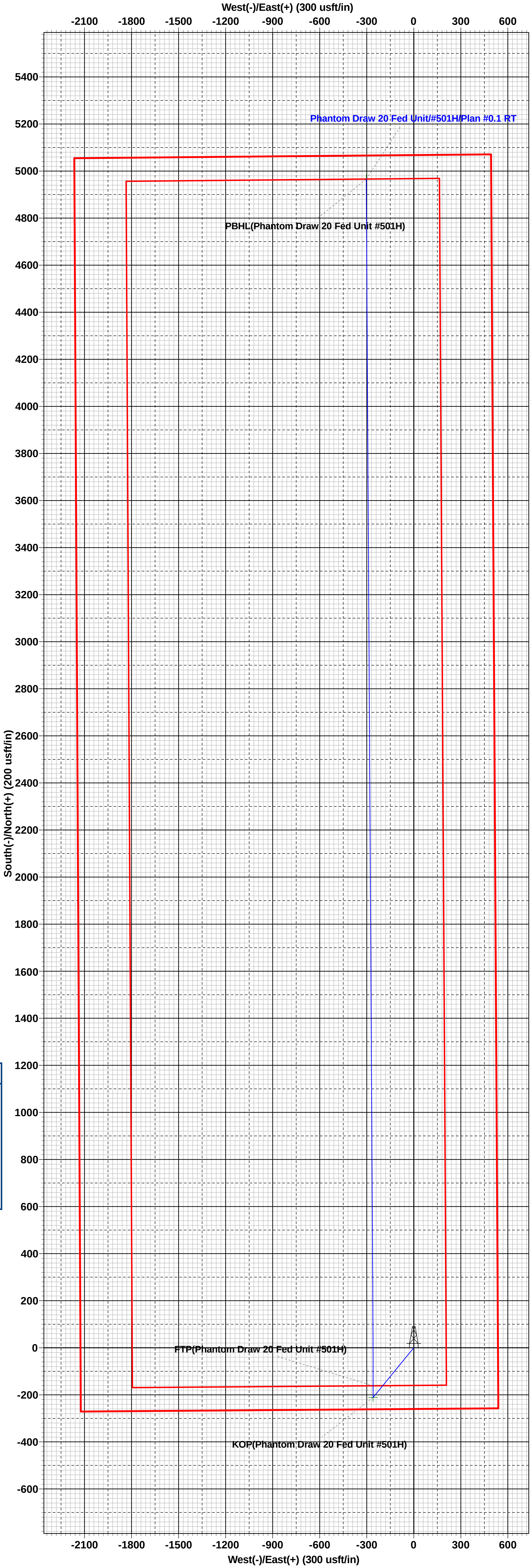
WELL DETAILS: #501H			
kb = 25' @ 3199.0usft			
3174.0			
Northing	Easting	Latitude	Longitude
371986.00	708645.00	32.0215206°N	103.7934883°W

SECTION DETAILS										
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1200.0	0.00	0.00	1200.0	0.0	0.0	0.00	0.00	0.0	
3	1324.8	2.50	230.83	1324.8	-1.7	-2.1	2.00	230.83	-1.6	
4	8868.9	2.50	230.83	8861.7	-209.3	-256.9	0.00	0.00	-193.2	
5	8993.7	0.00	0.00	8986.5	-211.0	-259.0	2.00	180.00	-194.8	KOP(Phantom Draw 20 Fed Unit #501H)
6	9214.2	26.46	0.00	9199.2	-161.0	-259.0	12.00	0.00	-144.9	FTP(Phantom Draw 20 Fed Unit #501H)
7	9743.7	90.00	359.50	9463.9	266.5	-261.6	12.00	-0.56	281.9	
8	14443.5	90.00	359.50	9464.0	4966.0	-303.0	0.00	0.00	4975.2	PBHL(Phantom Draw 20 Fed Unit #501H)

CASING DETAILS

No casing data is available

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)					
Name	TVD	+N/-S	+E/-W	Northing	Easting
KOP(Phantom Draw 20 Fed Unit #501H)	8986.5	-211.0	-259.0	371775.00	708386.00
FTP(Phantom Draw 20 Fed Unit #501H)	9199.2	-161.0	-259.0	371825.00	708386.00
PBHL(Phantom Draw 20 Fed Unit #501H)	9464.0	4966.0	-303.0	376952.00	708342.00



**PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL**

OPERATOR'S NAME:	EOG RESOURCES INCORPORATED
WELL NAME & NO.:	PHANTOM DRAW 20 FED UNIT 501H
SURFACE HOLE FOOTAGE:	260'/S & 537'/E
BOTTOM HOLE FOOTAGE:	100'/N & 797'/E
LOCATION:	Section 20, T.26 S., R.31 E., NMP
COUNTY:	Eddy County, New Mexico

OPERATOR'S NAME:	EOG RESOURCES INCORPORATED
WELL NAME & NO.:	PHANTOM DRAW 20 FED UNIT 502H
SURFACE HOLE FOOTAGE:	548'/S & 2471'/E
BOTTOM HOLE FOOTAGE:	100'/N & 1732'/E
LOCATION:	Section 20, T.26 S., R.31 E., NMP
COUNTY:	Eddy County, New Mexico

OPERATOR'S NAME:	EOG RESOURCES INCORPORATED
WELL NAME & NO.:	PHANTOM DRAW 20 FED UNIT 503H
SURFACE HOLE FOOTAGE:	554'/S & 2515'/E
BOTTOM HOLE FOOTAGE:	100'/N & 2630'/E
LOCATION:	Section 20, T.26 S., R.31 E., NMP
COUNTY:	Eddy County, New Mexico

OPERATOR'S NAME:	EOG RESOURCES INCORPORATED
WELL NAME & NO.:	PHANTOM DRAW 20 FED UNIT 504H
SURFACE HOLE FOOTAGE:	668'/S & 1956'/W
BOTTOM HOLE FOOTAGE:	100'/N & 1732'/W
LOCATION:	Section 20, T.26 S., R.31 E., NMP
COUNTY:	Eddy County, New Mexico

OPERATOR'S NAME:	EOG RESOURCES INCORPORATED
WELL NAME & NO.:	PHANTOM DRAW 20 FED UNIT 505H
SURFACE HOLE FOOTAGE:	348'/S & 310'/W
BOTTOM HOLE FOOTAGE:	100'/N & 797'/W
LOCATION:	Section 20, T.26 S., R.31 E., NMP
COUNTY:	Eddy County, New Mexico

COA

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

A. Hydrogen Sulfide

1. 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 shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1,145** feet (a minimum of **25 feet (Lea County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:
 - Cement to surface. If cement does not circulate see B.1.a, c-d above.

- ❖ In **Medium/High Cave/Karst Areas** if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.
- 3. The minimum required fill of cement behind the 5-1/2 inch production casing is:
 - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification. **Excess cement calculates to 23%, additional cement might be required.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'
2. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) psi**.
 - 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 OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Unit Wells

The well sign for a unit well shall include the unit number in addition to the surface and bottom hole lease numbers. This also applies to participating area numbers. If a participating area has not been established, the operator can use the general unit designation, but will replace the unit number with the participating area number when the sign is replaced.

Commercial Well Determination

A commercial well determination shall be submitted after production has been established for at least six months.

JJP05132021

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

Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220,
(575) 361-2822

☒ Lea County

Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575)
393-3612

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 Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.
3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

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

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 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 OOGO2.III.A.2.i 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 when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 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 Onshore Order No. 2.

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.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

Hydrogen Sulfide Plan Summary

- A. All personnel shall receive proper H₂S training in accordance with Onshore Order III.C.3.a.
- B. Briefing Area: two perpendicular areas will be designated by signs and readily accessible.
- C. Required Emergency Equipment:

- Well control equipment
 - a. Flare line 150' from wellhead to be ignited by flare gun.
 - b. Choke manifold with a remotely operated choke.
 - c. Mud/gas separator
- Protective equipment for essential personnel.

Breathing apparatus:

- a. Rescue Packs (SCBA) — 1 unit shall be placed at each breathing area, 2 shall be stored in the safety trailer.
- b. Work/Escapes packs — 4 packs shall be stored on the rig floor with sufficient air hose not to restrict work activity.
- c. Emergency Escape Packs — 4 packs shall be stored in the doghouse for emergency evacuation.

Auxiliary Rescue Equipment:

- a. Stretcher
- b. Two OSHA full body harness
- c. 100 ft 5/8 inch OSHA approved rope
- d. 1-20# class ABC fire extinguisher

- H₂S detection and monitoring equipment:

The stationary detector with three sensors will be placed in the upper dog house if equipped, set to visually alarm @ 10 ppm and audible @ 14 ppm. Calibrate a minimum of every 30 days or as needed. The sensors will be placed in the following places: Rig floor / Bell nipple / End of flow line or where well bore fluid is being discharged.

(Gas sample tubes will be stored in the safety trailer)

- Visual warning systems.
 - a. One color code condition sign will be placed at the entrance to the site reflecting the possible conditions at the site.
 - b. A colored condition flag will be on display, reflecting the current condition at the site at the time.
 - c. Two wind socks will be placed in strategic locations, visible from all angles.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

- **Mud program:**
The mud program has been designed to minimize the volume of H₂S circulated to surface. The operator will have the necessary mud products to minimize hazards while drilling in H₂S bearing zones.
- **Metallurgy:**
All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H₂S service.
- **Communication:**
Communication will be via cell phones and land lines where available.

**EOG RESOURCES, INC.
PHANTOM DRAW 20 FED UNIT #501H**

Emergency Assistance Telephone List

PUBLIC SAFETY: **911 or**

Lea County Sheriff's Department	(575) 396-3611
Rod Coffman	
Fire Department:	
Carlsbad	(575) 885-3125
Artesia	(575) 746-5050
Hospitals:	
Carlsbad	(575) 887-4121
Artesia	(575) 748-3333
Hobbs	(575) 392-1979
Dept. of Public Safety/Carlsbad	(575) 748-9718
Highway Department	(575) 885-3281
New Mexico Oil Conservation	(575) 476-3440
U.S. Dept. of Labor	(575) 887-1174

EOG Resources, Inc.

EOG / Midland	Office (432) 686-3600
---------------	-----------------------

Company Drilling Consultants:

Jett Dueitt	Cell (432) 230-4840
Blake Burney	

Drilling Engineer

Steve Munsell	Office (432) 686-3609
	Cell (432) 894-1256

Drilling Manager

Aj Dach	Office (432) 686-3751
	Cell (817) 480-1167

Drilling Superintendent

Jason Townsend	Office (432) 848-9209
	Cell (210) 776-5131

H&P Drilling

H&P Drilling	Office (432) 563-5757
H&P 415 Drilling Rig	Rig (432) 230-4840

Tool Pusher:

Johnathan Craig	Cell (817) 760-6374
Brad Garrett	

Safety

Brian Chandler (HSE Manager)	Office (432) 686-3695
	Cell (817) 239-0251

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

COMMENTS

Action 37536

COMMENTS

Operator: EOG RESOURCES INC P.O. Box 2267 Midland, TX 79702	OGRID: 7377
	Action Number: 37536
	Action Type: [C-101] BLM - Federal/Indian Land Lease (Form 3160-3)

COMMENTS

Created By	Comment	Comment Date
kpickford	KP GEO Review 7/27/2021	7/27/2021

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CONDITIONS

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CONDITIONS

Created By	Condition	Condition Date
kpickford	Notify OCD 24 hours prior to casing & cement	7/27/2021
kpickford	Will require a File As Drilled C-102 and a Directional Survey with the C-104	7/27/2021
kpickford	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	7/27/2021
kpickford	Cement is required to circulate on both surface and intermediate1 strings of casing	7/27/2021
kpickford	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	7/27/2021