Form 3160-3
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

*OCD – HOBBS
03/24/2020
RECEIVED*

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

5. Lease Serial No.

6. If Indian, Allotee or Tribe Name

1a. Type of work:	☐ DRILL	☐ REENTER
1b. Type of Well:	☐ Oil Well ☐ Gas Well	☐ Other
1c. Type of Completion:	☐ Hydraulic Fracturing	☐ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.

[316102]

2. Name of Operator   [7377]

9. API Well No.   30-025-47127

| 3a. Address | 3b. Phone No. *(include area code)* | 10. Field and Pool, or Exploratory [7280] |

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface

At proposed prod. zone

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 drlg. 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)* | Date |
| Title | | |

| Approved by *(Signature)* | Name *(Printed/Typed)* | Date |
| 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.

GCP Rec 04/24/2020

*Kz
05/01/2020*

SL

(Continued on page 2)

APPROVED WITH CONDITIONS

Approval Date: 04/20/2020

*(Instructions on page 2)

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**EOG RESOURCES, INC.**
WELL NAME & NO.:	**ORRTANNA 20 FED 504H**
SURFACE HOLE FOOTAGE:	**694'/S & 1542'/E**
BOTTOM HOLE FOOTAGE	**100'/N & 2179'/E**
LOCATION:	**Section 20, T.26 S., R.33 E., NMPM**
COUNTY:	**Lea County, New Mexico**

COA

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

A. HYDROGEN SULFIDE

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

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **945** 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

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include the lead cement)

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

    d. If cement falls back, remedial cementing will be done prior to drilling out that string.

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

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.**

- ❖ In <u>Medium Cave/Karst Areas</u> 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.

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 **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 OOGO2.III.A.2.i must be followed.

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.

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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 intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

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

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

6. On 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.

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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.

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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.
JJP04152020

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EOG RESOURCES, INC.
ORRTANNA 20 FED #504H

1. **GEOLOGIC NAME OF SURFACE FORMATION**:
   Permian

2. **ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:**

Rustler	749'
Tamarisk Anhydrite	919'
Top of Salt	1,100'
Base of Salt	4,671'
Lamar	4,911'
Bell Canyon	4,951'
Cherry Canyon	5,952'
Brushy Canyon	8,684'
Bone Spring Lime	9,078'
1st Bone Spring Sand	10,027'
2nd Bone Spring Shale	10,320'
2nd Bone Spring Sand	10,641'
TD	10,696'

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

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	5,952'	Oil
Brushy Canyon	8,684'	Oil
1st Bone Spring Sand	10,027'	Oil
2nd Bone Spring Shale	10,320'	Oil
2nd Bone Spring Sand	10,641'	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 945' and circulating cement back to surface.

4. CASING PROGRAM - NEW

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF_{min} Collapse	DF_{min} Burst	DF_{min} Tension
17.5"	0' – 945'	13.375"	54.5#	J-55	STC	1.125	1.25	1.60
12.25"	0' – 4,000'	9.625"	40#	J-55	LTC	1.125	1.25	1.60
12.25"	4,000' – 4,775'	9.625"	40#	HCK-55	LTC	1.125	1.25	1.60
8.75"	0'– 11,072'	5.5"	17#	HCP-110	LTC	1.125	1.25	1.60
8.5"	11,072'– 15,627'	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" FJ 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" FJ 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 Ft³/sk	Slurry Description
945'	540	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 @ 745')
4,775'	490	9.0	3.5	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	330	14.4	1.20	Tail: Class C + 10% NaCl + 3% MagOx (TOC @ 3,820')
15,627'	600	11.0	3.21	Lead: Class C + 3% CaCl2 + 3% Microbond (TOC @ 4,275')
	1,440	14.4	1.2	Tail: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 10,172')

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

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.

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.

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 – 945'	Fresh - Gel	8.6-8.8	28-34	N/c
945' – 4,775'	Brine	8.6-8.8	28-34	N/c
4,775' – 15,627'	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) H_2S 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 177 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 5,284 psig and a maximum anticipated surface pressure of 2,931 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.

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.

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.
ORRTANNA 20 FED #504H

694' FSL
1542' FEL
Section 20
T-26-S, R-33-E

Proposed Wellbore

API: 30-025-***

KB: 3,289'
GL: 3,264'

Bit Size: 17-1/2"

13-3/8", 54.5#, J-55, STC   0' - 945'

Bit Size: 12-1/4"

9-5/8", 40#, J-55 , LTC @ 0' - 4,000'
9-5/8", 40#, HCK-55 , LTC @ 4,000' - 4,775'

TOC: 4,275'

Bit Size: 8-3/4"

5-1/2", 17#, HCP-110, LTC @ 0' – 15,627'

Lateral: 15,627' MD, 10,696' TVD
Upper Most Perf:
100' FSL & 2179' FEL Sec. 20
Lower Most Perf:
100' FNL & 2178' FEL Sec. 20
BH Location: 100' FNL & 2178' FEL
Section 20
T-26-S, R-33-E

KOP: 10,172'

Bit Size: 8-1/2"

6.
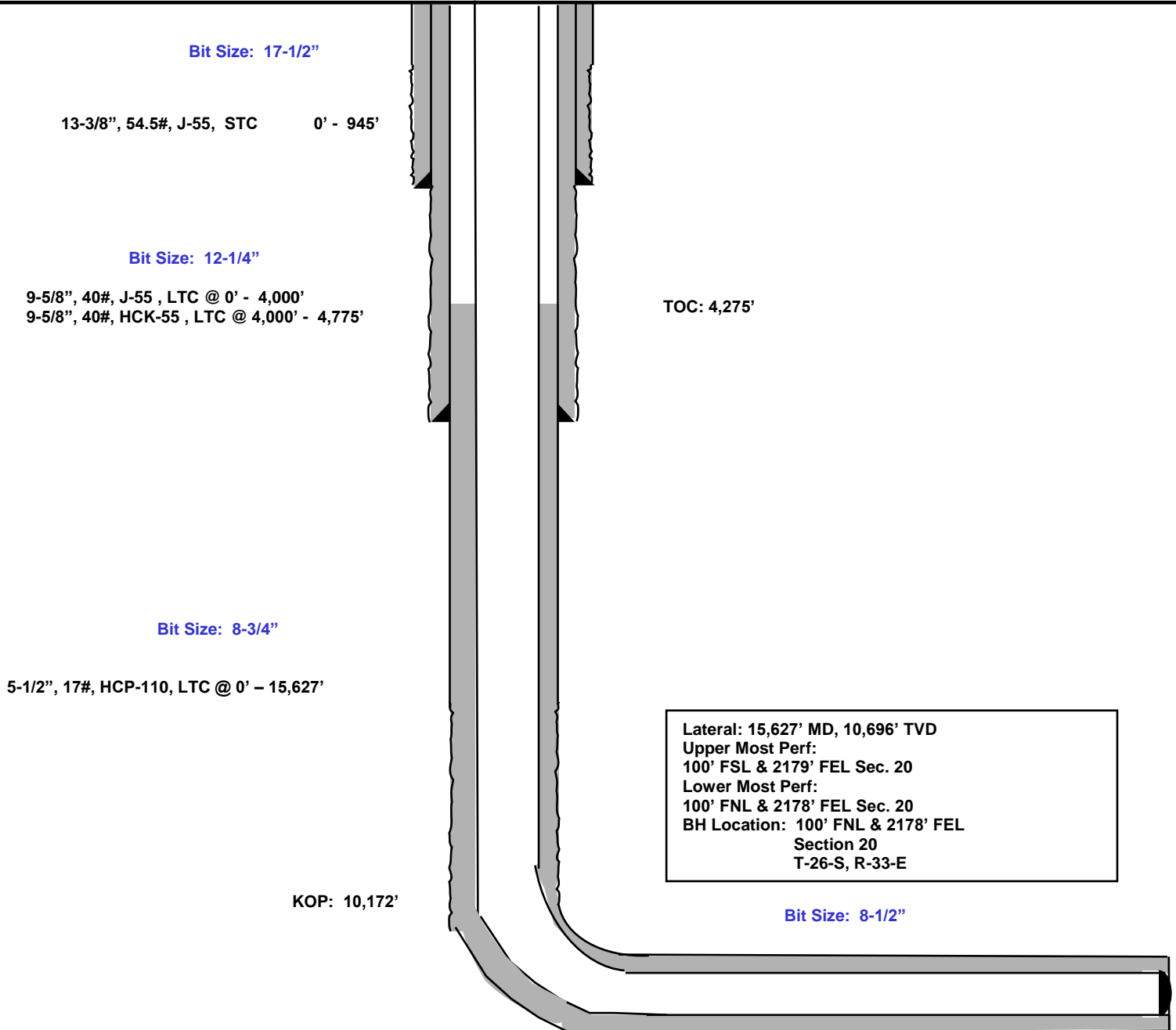
EOG Resources - Midland

Lea County, NM (NAD 83 NME)
Orrtanna 20 Fed
#504H

OH

Plan: Plan #0.1

Standard Planning Report

13 November, 2019

Planning Report

Database:	EDM	
Company:	EOG Resources - Midland	
Project:	Lea County, NM (NAD 83 NME)	
Site:	Orrtanna 20 Fed	
Well:	#504H	
Wellbore:	OH	
Design:	Plan #0.1	

Local Co-ordinate Reference:	Well #504H
TVD Reference:	KB = 25' @ 3289.0usft
MD Reference:	KB = 25' @ 3289.0usft
North Reference:	Grid
Survey Calculation Method:	Minimum Curvature

Project	Lea 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	Orrtanna 20 Fed				
Site Position:		**Northing:**	373,025.00 usft	**Latitude:**	32.0233684°N
From:	Map	**Easting:**	770,593.00 usft	**Longitude:**	103.5935924°W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.39 °

Well	#504H				
Well Position	**+N/-S**	117.0 usft	**Northing:**	373,142.00 usft	**Latitude:**	32.0236732°N
	+E/-W	890.0 usft	**Easting:**	771,483.00 usft	**Longitude:**	103.5907182°W
Position Uncertainty	0.0 usft		**Wellhead Elevation:**		**Ground Level:**	3,264.0 usft

Wellbore	OH			
Magnetics	**Model Name**	**Sample Date**	**Declination** (°)	**Dip Angle** (°)	**Field Strength** (nT)
	IGRF2015	10/16/2019	6.69	59.84	47,579.16884827

Design	Plan #0.1			
Audit Notes:				
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD)** (usft)	**+N/-S** (usft)	**+E/-W** (usft)	**Direction** (°)
	3.0	0.0	0.0	351.48

Plan Survey Tool Program   **Date**   11/13/2019

	Depth From (usft)	**Depth To** (usft)	**Survey (Wellbore)**	**Tool Name**	**Remarks**
1	0.0	15,626.8	Plan #0.1 (OH)	MWD	
				OWSG MWD - Standard	

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	
1,503.0	0.00	0.00	1,503.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,814.1	6.22	224.24	1,813.5	-12.1	-11.8	2.00	2.00	0.00	224.24	
9,860.5	6.22	224.24	9,812.5	-636.9	-620.2	0.00	0.00	0.00	0.00	
10,171.6	0.00	0.00	10,123.0	-649.0	-632.0	2.00	-2.00	0.00	180.00	KOP(Orrtanna 20 Fed
11,071.6	90.00	359.56	10,696.0	-76.1	-636.4	10.00	10.00	-0.05	359.56	
15,626.8	90.00	359.56	10,696.0	4,479.0	-671.0	0.00	0.00	0.00	0.00	PBHL(Orrtanna 20 Fe

Database:	EDM	Local Co-ordinate Reference:	Well #504H
Company:	EOG Resources - Midland	TVD Reference:	KB = 25' @ 3289.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB = 25' @ 3289.0usft
Site:	Orrtanna 20 Fed	North Reference:	Grid
Well:	#504H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1		

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
1,503.0	0.00	0.00	1,503.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	1.94	224.24	1,600.0	-1.2	-1.1	-1.0	2.00	2.00	0.00
1,700.0	3.94	224.24	1,699.8	-4.9	-4.7	-4.1	2.00	2.00	0.00
1,800.0	5.94	224.24	1,799.5	-11.0	-10.7	-9.3	2.00	2.00	0.00
1,814.1	6.22	224.24	1,813.5	-12.1	-11.8	-10.2	2.00	2.00	0.00
1,900.0	6.22	224.24	1,898.9	-18.8	-18.3	-15.8	0.00	0.00	0.00
2,000.0	6.22	224.24	1,998.3	-26.5	-25.8	-22.4	0.00	0.00	0.00
2,100.0	6.22	224.24	2,097.7	-34.3	-33.4	-29.0	0.00	0.00	0.00
2,200.0	6.22	224.24	2,197.1	-42.1	-41.0	-35.5	0.00	0.00	0.00
2,300.0	6.22	224.24	2,296.5	-49.8	-48.5	-42.1	0.00	0.00	0.00
2,400.0	6.22	224.24	2,395.9	-57.6	-56.1	-48.6	0.00	0.00	0.00
2,500.0	6.22	224.24	2,495.3	-65.4	-63.6	-55.2	0.00	0.00	0.00
2,600.0	6.22	224.24	2,594.8	-73.1	-71.2	-61.8	0.00	0.00	0.00
2,700.0	6.22	224.24	2,694.2	-80.9	-78.8	-68.3	0.00	0.00	0.00
2,800.0	6.22	224.24	2,793.6	-88.6	-86.3	-74.9	0.00	0.00	0.00
2,900.0	6.22	224.24	2,893.0	-96.4	-93.9	-81.4	0.00	0.00	0.00
3,000.0	6.22	224.24	2,992.4	-104.2	-101.4	-88.0	0.00	0.00	0.00
3,100.0	6.22	224.24	3,091.8	-111.9	-109.0	-94.6	0.00	0.00	0.00
3,200.0	6.22	224.24	3,191.2	-119.7	-116.6	-101.1	0.00	0.00	0.00
3,300.0	6.22	224.24	3,290.6	-127.5	-124.1	-107.7	0.00	0.00	0.00
3,400.0	6.22	224.24	3,390.0	-135.2	-131.7	-114.2	0.00	0.00	0.00
3,500.0	6.22	224.24	3,489.5	-143.0	-139.3	-120.8	0.00	0.00	0.00
3,600.0	6.22	224.24	3,588.9	-150.8	-146.8	-127.4	0.00	0.00	0.00
3,700.0	6.22	224.24	3,688.3	-158.5	-154.4	-133.9	0.00	0.00	0.00
3,800.0	6.22	224.24	3,787.7	-166.3	-161.9	-140.5	0.00	0.00	0.00
3,900.0	6.22	224.24	3,887.1	-174.1	-169.5	-147.0	0.00	0.00	0.00
4,000.0	6.22	224.24	3,986.5	-181.8	-177.1	-153.6	0.00	0.00	0.00
4,100.0	6.22	224.24	4,085.9	-189.6	-184.6	-160.1	0.00	0.00	0.00
4,200.0	6.22	224.24	4,185.3	-197.4	-192.2	-166.7	0.00	0.00	0.00
4,300.0	6.22	224.24	4,284.7	-205.1	-199.8	-173.3	0.00	0.00	0.00
4,400.0	6.22	224.24	4,384.2	-212.9	-207.3	-179.8	0.00	0.00	0.00
4,500.0	6.22	224.24	4,483.6	-220.7	-214.9	-186.4	0.00	0.00	0.00
4,600.0	6.22	224.24	4,583.0	-228.4	-222.4	-192.9	0.00	0.00	0.00
4,700.0	6.22	224.24	4,682.4	-236.2	-230.0	-199.5	0.00	0.00	0.00
4,800.0	6.22	224.24	4,781.8	-244.0	-237.6	-206.1	0.00	0.00	0.00
4,900.0	6.22	224.24	4,881.2	-251.7	-245.1	-212.6	0.00	0.00	0.00
5,000.0	6.22	224.24	4,980.6	-259.5	-252.7	-219.2	0.00	0.00	0.00
5,100.0	6.22	224.24	5,080.0	-267.2	-260.2	-225.7	0.00	0.00	0.00
5,200.0	6.22	224.24	5,179.4	-275.0	-267.8	-232.3	0.00	0.00	0.00

eog resources

Database:	EDM	Local Co-ordinate Reference:	Well #504H
Company:	EOG Resources - Midland	TVD Reference:	KB = 25' @ 3289.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB = 25' @ 3289.0usft
Site:	Orrtanna 20 Fed	North Reference:	Grid
Well:	#504H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1		

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	6.22	224.24	5,278.9	-282.8	-275.4	-238.9	0.00	0.00	0.00
5,400.0	6.22	224.24	5,378.3	-290.5	-282.9	-245.4	0.00	0.00	0.00
5,500.0	6.22	224.24	5,477.7	-298.3	-290.5	-252.0	0.00	0.00	0.00
5,600.0	6.22	224.24	5,577.1	-306.1	-298.1	-258.5	0.00	0.00	0.00
5,700.0	6.22	224.24	5,676.5	-313.8	-305.6	-265.1	0.00	0.00	0.00
5,800.0	6.22	224.24	5,775.9	-321.6	-313.2	-271.7	0.00	0.00	0.00
5,900.0	6.22	224.24	5,875.3	-329.4	-320.7	-278.2	0.00	0.00	0.00
6,000.0	6.22	224.24	5,974.7	-337.1	-328.3	-284.8	0.00	0.00	0.00
6,100.0	6.22	224.24	6,074.1	-344.9	-335.9	-291.3	0.00	0.00	0.00
6,200.0	6.22	224.24	6,173.6	-352.7	-343.4	-297.9	0.00	0.00	0.00
6,300.0	6.22	224.24	6,273.0	-360.4	-351.0	-304.4	0.00	0.00	0.00
6,400.0	6.22	224.24	6,372.4	-368.2	-358.5	-311.0	0.00	0.00	0.00
6,500.0	6.22	224.24	6,471.8	-376.0	-366.1	-317.6	0.00	0.00	0.00
6,600.0	6.22	224.24	6,571.2	-383.7	-373.7	-324.1	0.00	0.00	0.00
6,700.0	6.22	224.24	6,670.6	-391.5	-381.2	-330.7	0.00	0.00	0.00
6,800.0	6.22	224.24	6,770.0	-399.3	-388.8	-337.2	0.00	0.00	0.00
6,900.0	6.22	224.24	6,869.4	-407.0	-396.4	-343.8	0.00	0.00	0.00
7,000.0	6.22	224.24	6,968.8	-414.8	-403.9	-350.4	0.00	0.00	0.00
7,100.0	6.22	224.24	7,068.2	-422.6	-411.5	-356.9	0.00	0.00	0.00
7,200.0	6.22	224.24	7,167.7	-430.3	-419.0	-363.5	0.00	0.00	0.00
7,300.0	6.22	224.24	7,267.1	-438.1	-426.6	-370.0	0.00	0.00	0.00
7,400.0	6.22	224.24	7,366.5	-445.8	-434.2	-376.6	0.00	0.00	0.00
7,500.0	6.22	224.24	7,465.9	-453.6	-441.7	-383.2	0.00	0.00	0.00
7,600.0	6.22	224.24	7,565.3	-461.4	-449.3	-389.7	0.00	0.00	0.00
7,700.0	6.22	224.24	7,664.7	-469.1	-456.9	-396.3	0.00	0.00	0.00
7,800.0	6.22	224.24	7,764.1	-476.9	-464.4	-402.8	0.00	0.00	0.00
7,900.0	6.22	224.24	7,863.5	-484.7	-472.0	-409.4	0.00	0.00	0.00
8,000.0	6.22	224.24	7,962.9	-492.4	-479.5	-416.0	0.00	0.00	0.00
8,100.0	6.22	224.24	8,062.4	-500.2	-487.1	-422.5	0.00	0.00	0.00
8,200.0	6.22	224.24	8,161.8	-508.0	-494.7	-429.1	0.00	0.00	0.00
8,300.0	6.22	224.24	8,261.2	-515.7	-502.2	-435.6	0.00	0.00	0.00
8,400.0	6.22	224.24	8,360.6	-523.5	-509.8	-442.2	0.00	0.00	0.00
8,500.0	6.22	224.24	8,460.0	-531.3	-517.3	-448.8	0.00	0.00	0.00
8,600.0	6.22	224.24	8,559.4	-539.0	-524.9	-455.3	0.00	0.00	0.00
8,700.0	6.22	224.24	8,658.8	-546.8	-532.5	-461.9	0.00	0.00	0.00
8,800.0	6.22	224.24	8,758.2	-554.6	-540.0	-468.4	0.00	0.00	0.00
8,900.0	6.22	224.24	8,857.6	-562.3	-547.6	-475.0	0.00	0.00	0.00
9,000.0	6.22	224.24	8,957.1	-570.1	-555.2	-481.5	0.00	0.00	0.00
9,100.0	6.22	224.24	9,056.5	-577.9	-562.7	-488.1	0.00	0.00	0.00
9,200.0	6.22	224.24	9,155.9	-585.6	-570.3	-494.7	0.00	0.00	0.00
9,300.0	6.22	224.24	9,255.3	-593.4	-577.8	-501.2	0.00	0.00	0.00
9,400.0	6.22	224.24	9,354.7	-601.1	-585.4	-507.8	0.00	0.00	0.00
9,500.0	6.22	224.24	9,454.1	-608.9	-593.0	-514.3	0.00	0.00	0.00
9,600.0	6.22	224.24	9,553.5	-616.7	-600.5	-520.9	0.00	0.00	0.00
9,700.0	6.22	224.24	9,652.9	-624.4	-608.1	-527.5	0.00	0.00	0.00
9,800.0	6.22	224.24	9,752.3	-632.2	-615.6	-534.0	0.00	0.00	0.00
9,860.5	6.22	224.24	9,812.5	-636.9	-620.2	-538.0	0.00	0.00	0.00
9,900.0	5.43	224.24	9,851.8	-639.8	-623.0	-540.4	2.00	-2.00	0.00
10,000.0	3.43	224.24	9,951.5	-645.3	-628.4	-545.1	2.00	-2.00	0.00
10,100.0	1.43	224.24	10,051.4	-648.4	-631.4	-547.7	2.00	-2.00	0.00
10,171.6	0.00	0.00	10,123.0	-649.0	-632.0	-548.2	2.00	-2.00	0.00
10,200.0	2.84	359.56	10,151.4	-648.3	-632.0	-547.5	10.00	10.00	0.00
10,250.0	7.84	359.56	10,201.1	-643.6	-632.0	-542.9	10.00	10.00	0.00
10,300.0	12.84	359.56	10,250.3	-634.7	-632.1	-534.0	10.00	10.00	0.00

Planning Report

eog resources

Database:	EDM	Local Co-ordinate Reference:	Well #504H
Company:	EOG Resources - Midland	TVD Reference:	KB = 25' @ 3289.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB = 25' @ 3289.0usft
Site:	Orrtanna 20 Fed	North Reference:	Grid
Well:	#504H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1		

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)
10,350.0	17.84	359.56	10,298.5	-621.5	-632.2	-520.9	10.00	10.00	0.00
10,400.0	22.84	359.56	10,345.4	-604.1	-632.3	-503.7	10.00	10.00	0.00
10,450.0	27.84	359.56	10,390.6	-582.7	-632.5	-482.6	10.00	10.00	0.00
10,500.0	32.84	359.56	10,433.7	-557.5	-632.7	-457.6	10.00	10.00	0.00
10,550.0	37.84	359.56	10,474.5	-528.5	-632.9	-428.9	10.00	10.00	0.00
10,600.0	42.84	359.56	10,512.6	-496.2	-633.2	-396.9	10.00	10.00	0.00
10,650.0	47.84	359.56	10,547.7	-460.6	-633.4	-361.7	10.00	10.00	0.00
10,700.0	52.84	359.56	10,579.6	-422.2	-633.7	-323.6	10.00	10.00	0.00
10,750.0	57.84	359.56	10,608.0	-381.0	-634.0	-282.9	10.00	10.00	0.00
10,800.0	62.84	359.56	10,632.8	-337.6	-634.4	-239.9	10.00	10.00	0.00
10,850.0	67.84	359.56	10,653.6	-292.2	-634.7	-194.9	10.00	10.00	0.00
10,900.0	72.84	359.56	10,670.4	-245.1	-635.1	-148.3	10.00	10.00	0.00
10,950.0	77.84	359.56	10,683.1	-196.8	-635.4	-100.5	10.00	10.00	0.00
11,000.0	82.84	359.56	10,691.5	-147.5	-635.8	-51.7	10.00	10.00	0.00
11,050.0	87.84	359.56	10,695.5	-97.7	-636.2	-2.3	10.00	10.00	0.00
11,071.6	90.00	359.56	10,696.0	-76.1	-636.4	19.1	10.00	10.00	0.00
11,100.0	90.00	359.56	10,696.0	-47.7	-636.6	47.2	0.00	0.00	0.00
11,200.0	90.00	359.56	10,696.0	52.3	-637.3	146.2	0.00	0.00	0.00
11,300.0	90.00	359.56	10,696.0	152.3	-638.1	245.2	0.00	0.00	0.00
11,400.0	90.00	359.56	10,696.0	252.3	-638.9	344.2	0.00	0.00	0.00
11,500.0	90.00	359.56	10,696.0	352.3	-639.6	443.2	0.00	0.00	0.00
11,600.0	90.00	359.56	10,696.0	452.3	-640.4	542.2	0.00	0.00	0.00
11,700.0	90.00	359.56	10,696.0	552.3	-641.1	641.2	0.00	0.00	0.00
11,800.0	90.00	359.56	10,696.0	652.3	-641.9	740.2	0.00	0.00	0.00
11,900.0	90.00	359.56	10,696.0	752.3	-642.7	839.2	0.00	0.00	0.00
12,000.0	90.00	359.56	10,696.0	852.3	-643.4	938.2	0.00	0.00	0.00
12,100.0	90.00	359.56	10,696.0	952.3	-644.2	1,037.2	0.00	0.00	0.00
12,200.0	90.00	359.56	10,696.0	1,052.3	-644.9	1,136.2	0.00	0.00	0.00
12,300.0	90.00	359.56	10,696.0	1,152.3	-645.7	1,235.2	0.00	0.00	0.00
12,400.0	90.00	359.56	10,696.0	1,252.3	-646.5	1,334.2	0.00	0.00	0.00
12,500.0	90.00	359.56	10,696.0	1,352.3	-647.2	1,433.2	0.00	0.00	0.00
12,600.0	90.00	359.56	10,696.0	1,452.3	-648.0	1,532.2	0.00	0.00	0.00
12,700.0	90.00	359.56	10,696.0	1,552.3	-648.7	1,631.3	0.00	0.00	0.00
12,800.0	90.00	359.56	10,696.0	1,652.3	-649.5	1,730.3	0.00	0.00	0.00
12,900.0	90.00	359.56	10,696.0	1,752.3	-650.3	1,829.3	0.00	0.00	0.00
13,000.0	90.00	359.56	10,696.0	1,852.3	-651.0	1,928.3	0.00	0.00	0.00
13,100.0	90.00	359.56	10,696.0	1,952.3	-651.8	2,027.3	0.00	0.00	0.00
13,200.0	90.00	359.56	10,696.0	2,052.3	-652.5	2,126.3	0.00	0.00	0.00
13,300.0	90.00	359.56	10,696.0	2,152.3	-653.3	2,225.3	0.00	0.00	0.00
13,400.0	90.00	359.56	10,696.0	2,252.2	-654.1	2,324.3	0.00	0.00	0.00
13,500.0	90.00	359.56	10,696.0	2,352.2	-654.8	2,423.3	0.00	0.00	0.00
13,600.0	90.00	359.56	10,696.0	2,452.2	-655.6	2,522.3	0.00	0.00	0.00
13,700.0	90.00	359.56	10,696.0	2,552.2	-656.3	2,621.3	0.00	0.00	0.00
13,800.0	90.00	359.56	10,696.0	2,652.2	-657.1	2,720.3	0.00	0.00	0.00
13,900.0	90.00	359.56	10,696.0	2,752.2	-657.9	2,819.3	0.00	0.00	0.00
14,000.0	90.00	359.56	10,696.0	2,852.2	-658.6	2,918.3	0.00	0.00	0.00
14,100.0	90.00	359.56	10,696.0	2,952.2	-659.4	3,017.3	0.00	0.00	0.00
14,200.0	90.00	359.56	10,696.0	3,052.2	-660.1	3,116.3	0.00	0.00	0.00
14,300.0	90.00	359.56	10,696.0	3,152.2	-660.9	3,215.4	0.00	0.00	0.00
14,400.0	90.00	359.56	10,696.0	3,252.2	-661.7	3,314.4	0.00	0.00	0.00
14,500.0	90.00	359.56	10,696.0	3,352.2	-662.4	3,413.4	0.00	0.00	0.00
14,600.0	90.00	359.56	10,696.0	3,452.2	-663.2	3,512.4	0.00	0.00	0.00
14,700.0	90.00	359.56	10,696.0	3,552.2	-664.0	3,611.4	0.00	0.00	0.00
14,800.0	90.00	359.56	10,696.0	3,652.2	-664.7	3,710.4	0.00	0.00	0.00

Database:	EDM	Local Co-ordinate Reference:	Well #504H
Company:	EOG Resources - Midland	TVD Reference:	KB = 25' @ 3289.0usft
Project:	Lea County, NM (NAD 83 NME)	MD Reference:	KB = 25' @ 3289.0usft
Site:	Orrtanna 20 Fed	North Reference:	Grid
Well:	#504H	Survey Calculation Method:	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,900.0	90.00	359.56	10,696.0	3,752.2	-665.5	3,809.4	0.00	0.00	0.00
15,000.0	90.00	359.56	10,696.0	3,852.2	-666.2	3,908.4	0.00	0.00	0.00
15,100.0	90.00	359.56	10,696.0	3,952.2	-667.0	4,007.4	0.00	0.00	0.00
15,200.0	90.00	359.56	10,696.0	4,052.2	-667.8	4,106.4	0.00	0.00	0.00
15,300.0	90.00	359.56	10,696.0	4,152.2	-668.5	4,205.4	0.00	0.00	0.00
15,400.0	90.00	359.56	10,696.0	4,252.2	-669.3	4,304.4	0.00	0.00	0.00
15,500.0	90.00	359.56	10,696.0	4,352.2	-670.0	4,403.4	0.00	0.00	0.00
15,600.0	90.00	359.56	10,696.0	4,452.2	-670.8	4,502.4	0.00	0.00	0.00
15,626.8	90.00	359.56	10,696.0	4,479.0	-671.0	4,529.0	0.00	0.00	0.00

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
KOP(Orrtanna 20 Fed #! - plan hits target center - Point	0.00	0.00	10,123.0	-649.0	-632.0	372,493.00	770,851.00	32.0219012°N	103.5927717°W
FTP(Orrtanna 20 Fed #5 - plan misses target center by 202.8usft at 10650.0usft MD (10547.7 TVD, -460.6 N, -633.4 E) - Point	0.00	0.00	10,696.0	-599.0	-632.0	372,543.00	770,851.00	32.0220386°N	103.5927706°W
PBHL(Orrtanna 20 Fed # - plan hits target center - Point	0.00	0.00	10,696.0	4,479.0	-671.0	377,621.00	770,812.00	32.0359976°N	103.5927841°W

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/Escape 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.

- 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.
ORRTANNA 20 FED #504H

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