

**EOG RESOURCES, INC.**  
**RUBY 2 FED COM NO. 703H**

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

Permian

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

Rustler	889'
Top of Salt	1,433'
Base of Salt / Top Anhydrite	4,011'
Base Anhydrite	5,354'
Lamar	5,354'
Bell Canyon	5,386'
Cherry Canyon	6,358'
Brushy Canyon	7,810'
Bone Spring Lime	9,469'
1 <sup>st</sup> Bone Spring Sand	10,498'
2 <sup>nd</sup> Bone Spring Shale	10,680'
2 <sup>nd</sup> Bone Spring Sand	11,079'
3 <sup>rd</sup> Bone Spring Carb	11,611'
3 <sup>rd</sup> Bone Spring Sand	12,140'
Wolfcamp	12,580'
TD	12,785'

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

Upper Permian Sands	0- 400'	Fresh Water
Cherry Canyon	6,358'	Oil
Brushy Canyon	7,810'	Oil
1 <sup>st</sup> Bone Spring Sand	10,498'	Oil
2 <sup>nd</sup> Bone Spring Shale	10,680'	Oil
2 <sup>nd</sup> Bone Spring Sand	11,079'	Oil
3 <sup>rd</sup> Bone Spring Carb	11,611'	Oil
3 <sup>rd</sup> Bone Spring Sand	12,140'	Oil
Wolfcamp	12,580'	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 10.75" casing at 915' and circulating cement back to surface.

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**4. CASING PROGRAM - NEW**

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF <sub>min</sub> Collapse	DF <sub>min</sub> Burst	DF <sub>min</sub> Tension
14.75"	0 - 915' <del>965'</del>	10.75"	40.5#	J55	STC	1.125	1.25	1.60
9.875"	0 - 1,000'	7.625"	29.7#	HCP-110	LTC	1.125	1.25	1.60
9.875"	1,000' - 3,000'	7.625"	29.7#	P-110EC	SLIJ II	1.125	1.25	1.60
8.75"	3,000' - 11,700'	7.625"	29.7#	HCP-110	FlushMax III	1.125	1.25	1.60
6.75"	0' - 11,200'	5.5"	20#	P-110EC	DWC/C-IS MS	1.125	1.25	1.60
6.75"	11,200' - 22,868'	5.5"	20#	P-110EC	VAM SFC	1.125	1.25	1.60

Variance is requested to wave the centralizer requirements for the 7-5/8" 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.

Variance is also requested to wave any centralizer requirements for the 5-1/2" FJ casing in the 6-3/4" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 6-3/4" hole interval to maximize cement bond and zonal isolation.

**Cementing Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft <sup>3</sup> /ft	Mix Water Gal/sk	Slurry Description
10-3/4" <del>915'</del> <del>965'</del>	325	13.5	1.73	9.13	Class C + 4.0% Bentonite + 0.6% CD-32 + 0.5% CaCl <sub>2</sub> + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	200	14.8	1.34	6.34	Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate
7-5/8" 11,700'	250	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead (TOC @ Surface)
	2200	14.8	1.38	6.48	Class C + 5% Gypsum + 3% CaCl <sub>2</sub> pumped via Bradenhead
	550	14.4	1.20	4.81	50:50 Class H:Poz + 0.25% CPT20A + 0.40% CPT49 + 0.20% CPT35 + 0.80% CPT16A + 0.25% CPT503P pumped Conventionally
5-1/2" 22,868'	1000	14.1	1.26	5.80	Class H + 0.1% C-20 + 0.05% CSA-1000 + 0.20% C-49 + 0.40% C-17 (TOC @ 11,200')

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.

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**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 (10,000-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.

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. The surface casing will be tested to 1500 psi for 30 minutes.

Before drilling out of the intermediate 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. The intermediate casing will be tested to 2000 psi for 30 minutes.

Pipe rams will be operationally checked each 24-hour period. Blind rams will be operationally checked on each trip out of the hole. These checks will be noted on the daily tour sheets.

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 - 915' <del>915' - 11,700'</del>	Fresh - Gel	8.6-8.8	28-34	N/c
<del>915'</del> - 11,700'	Brine	8.8-10.0	28-34	N/c
11,700' - 22,868' Lateral	Oil Base	10.0-14.0	58-68	3 - 6

The highest mud weight needed to balance formation is expected to be 11.5 ppg. In order to maintain hole stability, mud weights up to 14.0 ppg may be utilized.

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



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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<sub>2</sub>S 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 181 degrees F with an estimated maximum bottom-hole pressure (BHP) at TD of 7645 psig (based on 11.5 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 7,300' to Intermediate casing point.

**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. 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.

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**11. WELLHEAD:**

A multi-bowl wellhead system will be utilized.

After running the 10-3/4" surface casing, a 13-5/8" 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 Stream Flo FBD100 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.

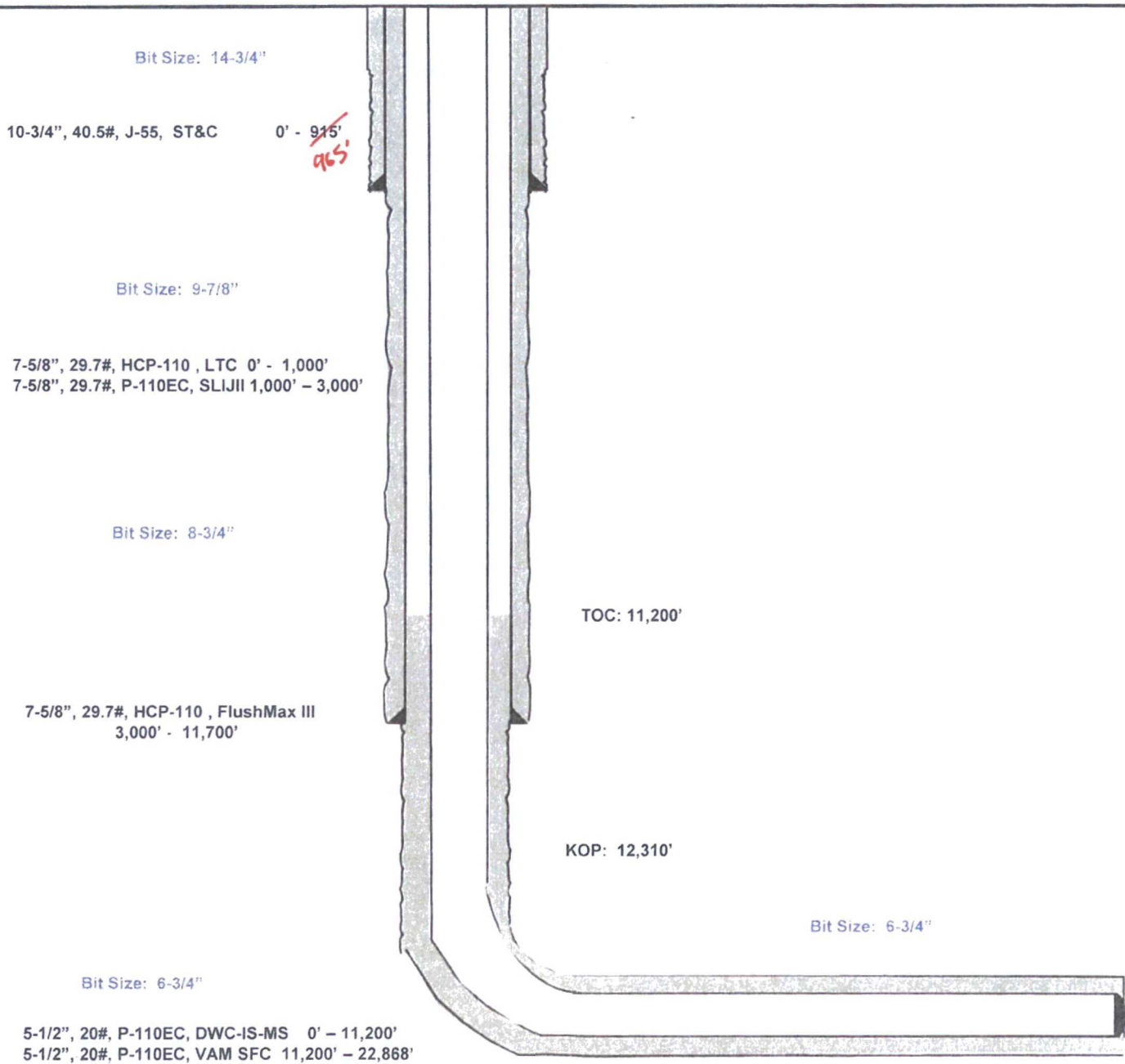
Both the surface and intermediate casing strings will be tested as per Onshore Order No. 2 to at least 0.22 psi/ft or 1500 psi, whichever is greater.

Ruby 2 Fed Com #703H

220' FNL  
1213' FWL  
Section 2  
T-26-S, R-34-E

Lea County, New Mexico  
Proposed Wellbore  
Revised 7/12/17  
API: 30-025-\*\*\*\*\*

KB: 3,330'  
GL: 3,305'



Lateral: 22,868' MD, 12,785' TVD  
Upper Most Perf:  
330' FNL & 1653' FWL Sec. 2  
Lower Most Perf:  
330' FSL & 1654' FWL Sec. 11  
BH Location: 230' FSL & 1654' FWL  
Section 11  
T-26-S, R-34-E

## EOG Resources Surface Casing Option Request

### 1. Request for variance for the option to preset surface casing with surface rig:

- a) EOG Requests the option to contract a Surface Rig to drill, set surface casing, and cement on the following subject wells. After WOC 8 hours or 500 psi compressive strength (whichever is greater), the Surface Rig will move off so that 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. See attached wellhead diagram below. If the timing between rigs is such that EOG Resources would not be able to preset surface, the Primary Rig will MIRU and drill the well in its entirety per the APD.

*Bum needs to be contacted and notified 24 hrs. prior to commencing the spudder rig operation & before the larger rig moves back on the pre-set location. The larger rig needs to move back in within 90 days.*

#### Wellname

ANTIETAM 9 FED COM #701H  
ANTIETAM 9 FED COM #702H  
ANTIETAM 9 FED COM #703H  
ANTIETAM 9 FED COM #704H  
COLGROVE FED COM #707H  
COLGROVE FED COM #708H  
ENDURANCE 36 STATE COM #707H  
ENDURANCE 36 STATE COM #708H  
HOUND 30 FED #701H  
HOUND 30 FED #702H  
HOUND 30 FED #703H  
HOUND 30 FED #704H  
LUCKY 13 FED COM #8H  
LUCKY 13 FED COM #9H  
TRIGG 5 FED #1