

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT

**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*

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

5. Lease Serial No.  
NMNM122619

6. If Indian, Allottee or Tribe Name

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

8. Well Name and No.  
Multiple-See Attached

9. API Well No.  
Multiple-See Attached

10. Field and Pool or Exploratory Area  
RED HILLS

11. County or Parish, State  
LEA COUNTY, NM

SUBMIT IN TRIPLICATE - Other instructions on page 2

1. Type of Well

☒ Oil Well ☐ Gas Well ☐ Other

2. Name of Operator  
EOG RESOURCES INCORPORATED  
Contact: STAR L HARRELL  
E-Mail: Star\_Harrell@eogresources.com

3a. Address  
PO BOX 2267  
MIDLAND, TX 79702

3b. Phone No. (include area code)  
Ph: 432-848-9161  
Fx: 432-848-9161

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)  
Multiple-See Attached

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Hydraulic Fracturing	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	Change to Original A
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	PD

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.

EOG Resources, Inc. respectfully requests to, on multiple wells, amend the cementing & casing program.

Please find supporting documentation attached.

OCD Hobbs

SEE ATTACHED FOR  
CONDITIONS OF APPROVAL

All Previous COAs still Apply, Except For the Following:

14. I hereby certify that the foregoing is true and correct.

Electronic Submission #458612 verified by the BLM Well Information System  
For EOG RESOURCES INCORPORATED, sent to the Hobbs  
Committed to AFMSS for processing by PRISCILLA PEREZ on 03/20/2019 (19PP1383SE)

Name (Printed/Typed) STAR L HARRELL

Title SR REGULATORY SPECIALIST

Signature (Electronic Submission)

Date 03/19/2019

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By JEROMY PORTER

Title PETROLEUM ENGINEER

Date 03/26/2019

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

Office Hobbs

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

(Instructions on page 2)

\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\*

Kz



**Revised Permit Information 3/19/2019**

Abstract: Amend the cementing program and add bradenhead squeeze stage. Amend the casing program and revise annulus clearance criteria.

EOG requests that these amendments be applied to the following wells:

Well Name	API No.	Lease No.
Dauntless 7 Fed #701H	30-025-45590	NMNM122619
Dauntless 7 Fed #703H	30-025-45592	NMNM122619
Dauntless 7 Fed #705H	30-025-45594	NMNM122619
Dauntless 7 Fed #707H	30-025-45596	NMNM122619
Dauntless 7 Fed #709H	30-025-45598	NMNM122619
Dauntless 7 Fed #724H	30-025-45593	NMNM122619
Dauntless 7 Fed #726H	30-025-45595	NMNM122619
Dauntless 7 Fed #728H	30-025-45597	NMNM122619

### **Cement**

EOG requests a variance from the minimum standards to pump a two stage cement job on the 7-5/8" intermediate casing string with the first stage being pumped conventionally with the calculated TOC @ the Brushy Canyon and the second stage performed as a bradenhead squeeze with planned cement from the Brushy Canyon to surface. A top out stage will be performed as a contingency.

#### **Cementing Program:**

##### **Primary Plans For 7-5/8" cement Job:**

<b>Casing</b>		<b>Slurry</b>	<b>#Sks</b>	<b>Wt. (ppg)</b>	<b>Yld (ft3/sack)</b>	<b>H2O gal/sk</b>	<b>500# Comp. Strength</b>	<b>Slurry Discription</b>
Intermediate 1 <sup>st</sup> stage		Tail	404	14.2	1.11	4.47	4:11 Hrs	Class C Cement, Salt
<b>Intermediate 2<sup>nd</sup> Stage (Tail Slurry) to be pumped as bradenhead Squeeze from surface, down the Intermediate annulus</b>								
Intermediate 2 <sup>nd</sup> stage	Min Density Option	Tail	400	12.7	2.30	12.91	7:00 Hrs	Class C cement, Salt, Gel, Expansive Agent
	Max Density Option		617	14.8	1.49	7.05	4:39 Hrs	
Displacement		Fresh Water	Maximum 5 bbls	8.4	N/A	N/A	N/A	N/A
<b>Intermediate Contingency Stage to be pumped as a top out down the intermediate annulus</b>								
Contingency: Top Out	Min Density Option	Tail	72	12.7	2.30	12.91	7:00 Hrs	Class C cement, Salt, Gel, Expansive Agent
	Max Density Option		112	14.8	1.49	7.05	4:39 Hrs	

EOG also requests variance for the option to perform this cement procedure on previously permitted 4 string designs in the 7-5/8" 2<sup>nd</sup> Intermediate casing string as a contingency plan.

EOG will include the final fluid top verified by Echo-meter and the volume of displacement fluid above the cement slurry in the annulus in all post-drill sundries on wells utilizing this cement program.

EOG will report to the BLM the volume of fluid (limited to 5 bbls) used to flush intermediate casing valves following backside cementing procedures.

### **Casing**

EOG requests the option to use a 3 string design implemented to the following parameters:

#### **Surface Casing**

- Casing shoe will be set at a minimum of 25' below the Tamarisk Anhydrite formation and a minimum of 25' above the Top Salt
- Casing string will consist of 9-5/8" 40 lb/ft J-55 casing with LTC connections
- Cement will be brought to surface

#### **Intermediate Casing**

- Casing shoe will be set 100' below the top of the Third Bone Spring Carbonate
- Casing string will consist of 7-5/8" 29.7 lb/ft HCP-110 casing with FXL connections (spec sheet attached)
- Cement will be brought to surface according to the program outlined above

#### **Production Casing**

- Casing string will consist of 3 segments:
  - o 5-1/2" 20 lb/ft ECP-110 casing with DWC/C-IS MS connections from surface to 500' above the 7-5/8" casing shoe
  - o 5-1/2" 20 lb/ft ECP-110 casing with VAM SFC connections covering a 500' section above the 7-5/8" intermediate shoe
  - o 5-1/2" 20 lb/ft ECP-110 casing with DWC/C-IS MS connections from the 7-5/8" intermediate shoe to target depth
- Cement will tie back 500' above the 7-5/8" casing shoe

EOG also requests to retain the option to utilize previously permitted 4 string designs, if applicable

### **Annulus Clearance**

EOG requests variance to allow deviation from the 0.422" annulus clearance requirement from Onshore Order #2 under the following conditions:

- Annular clearance to meet or exceed 0.422" between intermediate casing ID and production casing coupling only on the first 500' overlap between both casing strings.
- Annular clearance less than 0.422" is acceptable for the curve and lateral portions of the production open hole section.

**Revised Permit Information 3/26/2019:**

The casing design below applies to the following wells as Design A:

Well Name	API No.	Lease No.
Dauntless 7 Fed #701H	30-025-45590	NMNM122619
Dauntless 7 Fed #703H	30-025-45592	NMNM122619
Dauntless 7 Fed #705H	30-025-45594	NMNM122619
Dauntless 7 Fed #707H	30-025-45596	NMNM122619
Dauntless 7 Fed #709H	30-025-45598	NMNM122619
Dauntless 7 Fed #724H	30-025-45593	NMNM122619
Dauntless 7 Fed #726H	30-025-45595	NMNM122619
Dauntless 7 Fed #728H	30-025-45597	NMNM122619

**Casing Program:**

Hole Size	Interval	Csg OD	Weight	Grade	Conn	DF <sub>min</sub> Collapse	DF <sub>min</sub> Burst	DF <sub>min</sub> Tension
12.25"	0' – 1,135'	9.625"	40#	J-55	LTC	1.125	1.25	1.60
8.75"	0' – 11,300'	7.625"	29.7#	HCP-110	FXL	1.125	1.25	1.60
6.75"	0' – 10,800'	5.5"	20#	P-110EC	DWC/C-IS MS	1.125	1.25	1.60
6.75"	10,800'–11,300'	5.5"	20#	P-110EC	VAM SFC	1.125	1.25	1.60
6.75"	11,300' – TD	5.5"	20#	P-110EC	DWC/C-IS MS	1.125	1.25	1.60

**Cement Program:**

Depth	No. Sacks	Wt. ppg	Yld Ft <sup>3</sup> /sk	Slurry Description
1,135' 9-5/8"	990	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl <sub>2</sub> + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	100	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 935')
11,300' 7-5/8"	500	14.2	1.11	1 <sup>st</sup> Stage (Tail): Class C + 0.6% Halad-9 + 0.45% HR-601 + 3% Microbond (TOC @ 7,000')
	1,000	12.7	2.30	2 <sup>nd</sup> Stage (Bradenhead squeeze): Class C + 3% Salt + 1% PreMag-M + 6% Bentonite Gel (TOC @ surface)
TD 5-1/2"	940	14.2	1.31	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 10,800')

<b>Additive</b>	<b>Purpose</b>
Bentonite Gel	Lightweight/Lost circulation prevention
Calcium Chloride	Accelerator
Cello-flake	Lost circulation prevention
Sodium Metasilicate	Accelerator
MagOx	Expansive agent
Pre-Mag-M	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

**Mud Program:**

<b>Depth</b>	<b>Type</b>	<b>Weight (ppg)</b>	<b>Viscosity</b>	<b>Water Loss</b>
0 – 1,135'	Fresh - Gel	8.6-8.8	28-34	N/c
1,135' – 11,300'	Brine	10.0-10.2	28-34	N/c
11,300' – KOP	Oil Base	8.7-9.4	58-68	N/c - 6
KOP – TD Lateral	Oil Base	10.0-14.0	58-68	3 - 6

# TECHNICAL SPECIFICATIONS

These specifications are furnished for general information only and are not intended for design purposes. This information is preliminary and may change subject to a final design by VAM-USA Engineering. This is not a controlled document.

**DWC/C-IS MS**  
standard

**Casing**

**5.500" O.D. 20.00 lb./ft.**

**VST P-110EC**

## Material

VST P-110EC  
125,000  
135,000

Grade  
Minimum Yield Strength (psi.)  
Minimum Ultimate Strength (psi.)



## Pipe Dimensions

5.500 Nominal Pipe Body OD (in.)  
4.778 Nominal Pipe Body ID (in.)  
0.361 Nominal Wall Thickness (in.)  
20.00 Nominal Weight (lbs./ft.)  
19.83 Plain End Weight (lbs./ft.)  
5.828 Nominal Pipe Body Area (sq. in.)

VAM-USA  
4424 W. Sam Houston Pkwy, Suite 150  
Houston, TX 77041  
Phone: (713) 479-3200  
Fax: (713) 479-3234  
E-mail: VAMUSAsales@na.vallourec.com

## Pipe Body Performance Properties

729,000 Minimum Pipe Body Yield Strength (lbs.)  
12,090 Minimum Collapse Pressure (psi.)  
14,360 Minimum Internal Yield Pressure (psi.)  
13,100 Hydrostatic Test Pressure (psi.)

## Connection Dimensions

6.115 Connection OD (in.)  
4.778 Connection ID (in.)  
4.653 Connection Drift Diameter (in.)  
4.13 Make-up Loss (in.)  
5.828 Critical Area (sq. in.)  
100.0 Joint Efficiency (%)

## Connection Performance Properties

729,000 (1) Joint Strength (lbs.)  
26,040 (2) Reference String Length (ft.) 1.4 Design Factor  
728,000 (3) API Joint Strength (lbs.)  
729,000 Compression Rating (lbs.)  
12,090 API Collapse Pressure Rating (psi.)  
14,360 (4) API Internal Pressure Resistance (psi.)  
104.2 Maximum Uniaxial Bend Rating (degrees/100 ft.)

## Approximated Field End Torque Values

16,600 (5) Minimum Final Torque (ft.-lbs.)  
19,100 (5) Maximum Final Torque (ft.-lbs.)  
21,600 (6) Connection Yield Torque (ft.-lbs.)

- (1) Joint Strength is the minimum pipe body yield strength multiplied by the connection critical area.
- (2) Reference String Length is the joint strength divided by both the weight in air and the design factor.
- (3) API Joint Strength is for reference only. It is calculated from Formulas 42 and 43 in the API Bulletin 5C3.
- (4) API Internal Pressure Resistance is calculated from Formulas 31, 32, and 35 in the API Bulletin 5C3.
- (5) Torque values are approximated and may be affected by field conditions.
- (6) Connection yield torque is not to be exceeded.

Connection specifications within the control of VAM-USA were correct as of the date printed. Specifications are subject to change without notice. Certain connection specifications are dependent on the mechanical properties of the pipe. Mechanical properties of mill proprietary pipe grades obtained from mill publications and are subject to change. Properties of mill proprietary grades should be confirmed with the mill. Users are advised to obtain current connection specifications and verify pipe mechanical properties for each application.

Metal One Corp.  Metal One	MO-FXL  Connection Data Sheet	Page	MCTP
		Date	3-Nov-16
		Rev.	0

### Geometry

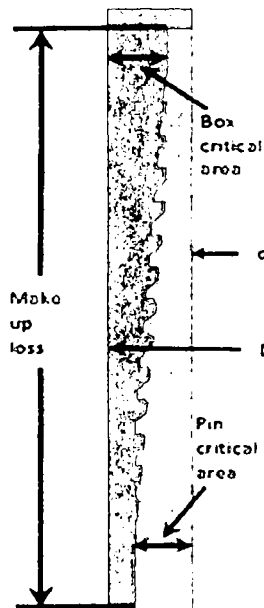
Imperial

S.I.

#### Pipe Body

Grade	P110HC *1		P110HC *1	
Pipe OD ( D )	7 5/8	in	193.68	mm
Weight	29.70	lb/ft	44.25	kg/m
Actual weight	29.04		43.26	kg/m
Wall Thickness ( t )	0.375	in	9.53	mm
Pipe ID ( d )	6.875	in	174.63	mm
Pipe body cross section	8.637	in <sup>2</sup>	5.508	mm <sup>2</sup>
Drift Dia.	6.750	in	171.45	mm

MO-FXL



#### Connection

Box OD ( W )	7.625	in	193.68	mm
PIN ID	6.875	in	174.63	mm
Make up Loss	4.219	in	107.16	mm
Box Critical Area	6.710	in <sup>2</sup>	3686	mm <sup>2</sup>
Joint load efficiency	70	%	70	%
Thread Taper	1 / 10 ( 1 2" per ft )			
Number of Threads	5 TPI			

#### Performance Properties for Pipe Body

M.I.Y.P. *1	10,760	psi	74.21	MPa
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Note S.M.Y.S. = Specified Minimum YIELD Strength of Pipe body  
M.I.Y.P. = Minimum Internal Yield Pressure of Pipe body  
\*1 Based on VSB P110HC (YS= 125~140ksi)

#### Performance Properties for Connection

Min. Compression Yield	747 kips ( 70% of S.M.Y.S. )
External Pressure	100% of Collapse Strength

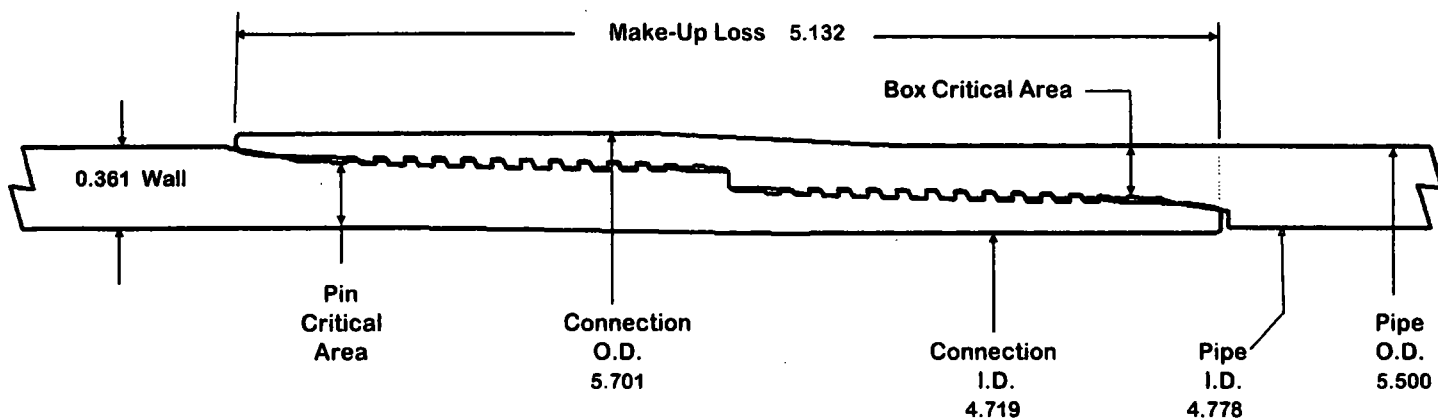
#### Recommended Torque

Opti.	17,200	ft-lb	23,300	N-m
Operational Max.	23,600	ft-lb	32,000	N-m

Note : Operational Max. torque can be applied for high torque application



# VAM® SFC



O.D.  
5.500

WEIGHT  
20.00

WALL  
0.361

GRADE  
VST P110EC

DRIFT  
4.653

## PIPE BODY PROPERTIES

Material Grade	VST P110EC
Min. Yield Strength	125 ksi
Min. Tensile Strength	135 ksi
Outside Diameter	5.500 in
Inside Diameter	4.778 in
Nominal Area	5.828 sq.in.
Yield Strength	729 kips
Ultimate Strength	787 kips
Min Internal Yield	14,360 psi
*High Collapse	12,090 psi

Contact: [tech.support@vam-usa.com](mailto:tech.support@vam-usa.com)  
 Ref. Drawing: SI-PD 100414 Rev.B  
 Date: 14-Jun-16  
 Time: 2:31 PM

## CONNECTION PROPERTIES

Connection OD	5.701 in
Connection ID	4.719 in
Make up Loss	5.132 in
Box Critical Area	4.083 sq.in.
%PB Section Area	70.1%
Pin Critical Area	4.123 sq.in.
%PB Section Area	70.7%
Yield Strength	510 kips
Parting Load	551 kips
Min Internal Yield	14,360 psi
*High Collapse	12,090 psi
Wk Compression	357 kips
Max Pure Bending	20 °/100 ft

## TORQUE DATA ft-lb

min	opt	max
8,700	9,700	10,700



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# PECOS DISTRICT

## DRILLING CONDITIONS OF APPROVAL

<b>OPERATOR'S NAME:</b>	<b>EOG RESOURCES, INC.</b>
<b>LEASE NO.:</b>	<b>NMNM122619</b>
<b>WELL NAME &amp; NO.:</b>	<b>DAUNTLESS 7 FED 726H</b>
<b>SURFACE HOLE FOOTAGE:</b>	<b>250'/S &amp; 1681'/E</b>
<b>BOTTOM HOLE FOOTAGE:</b>	<b>100'/N &amp; 1980'/E</b>
<b>LOCATION:</b>	<b>Section 7, T.25 S., R.33 E., NMPM</b>
<b>COUNTY:</b>	<b>Lea County, New Mexico</b>

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input checked="" type="radio"/> Low	<input type="radio"/> Medium	<input type="radio"/> High
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input checked="" type="radio"/> Multibowl	<input type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP

**All previous COAs still apply, except for the following:**

### A. CASING

1. The 9-5/8 inch surface casing shall be set at approximately 1,135 feet (a minimum of 25 feet 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 7-5/8 inch intermediate casing is:

- Cement to surface. If cement does not circulate see B.1.a, c-d above.

**In case of lost circulation, operator has proposed to pump down 9 5/8" X 7 5/8" annulus. Operator must include final fluid top verified by Echo-meter and the volume of displacement fluid above the cement slurry in the annulus. Submit results to the BLM.**

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 the previous casing. Operator shall provide method of verification.

## **B. 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 approved to use a 5M annular. The annular must be tested to full working pressure (5000 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.

**JJP03272019**

## 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)

☒ Chaves and Roosevelt Counties

Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.

During office hours call (575) 627-0272.

After office hours call (575)

☒ 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

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

- f. 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. This test shall be performed prior to the test at full stack pressure.
- g. 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.