Form 3160-5
(June 2019)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: October 31, 2021

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.

SUBMIT IN TRIPLICATE *- Other instructions on page 2*

5. Lease Serial No. NMNM110838

6. If Indian, Allottee or Tribe Name

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

1. Type of Well
☑ Oil Well ☐ Gas Well ☐ Other

8. Well Name and No. ICY 18 FED/211H

2. Name of Operator EOG RESOURCES INCORPORATED

9. API Well No. 30-025-52219

3a. Address 1111 BAGBY SKY LOBBY 2, HOUSTON, TX 770

3b. Phone No. *(include area code)* (713) 651-7000

10. Field and Pool or Exploratory Area WC-025 G-06 S253329D; UPPER BONE SPRING

4. Location of Well *(Footage, Sec., T.,R.,M., or Survey Description)* SEC 18/T25S/R33E/NMP

11. Country or Parish, State LEA/NM

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

TYPE OF SUBMISSION	TYPE OF ACTION			
☑ Notice of Intent	☐ Acidize	☐ Deepen	☐ Production (Start/Resume)	☐ Water Shut-Off
	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Subsequent Report	☐ Casing Repair	☐ New Construction	☐ Recomplete	☐ Other
	☑ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
☐ Final Abandonment Notice	☐ Convert to Injection	☐ Plug Back	☐ Water Disposal	

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 recomplete 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 perfonned 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 recompletion 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 detennined that the site is ready for final inspection.)

EOG respectfully requests an amendment to our approved APD for this well to reflectthe following changes:

Icy 18 Fed 110H (FKA 211H) API #: 30-025-52219

Change name from Icy 18 Fed 211H to Icy 18 Fed 110H.

Change BHL from T-25-S, R-33-E, Sec 19, 2539' FNL, 1650' FEL, Lea Co., NM,
to T-25-S, R-33-E, Sec 19, 2539' FNL, 1500' FEL, Lea Co., N.M.

Change target formation to Leonard A.

Update casing and cement program to current design.

14. I hereby certify that the foregoing is true and correct. Name *(Printed/Typed)* STAR HARRELL / Ph: (432) 848-9161

Title Regulatory Specialist

Signature (Electronic Submission)

Date 12/04/2023

THE SPACE FOR FEDERAL OR STATE OFICE USE

Approved by KEITH P IMMATTY / Ph: (575) 988-4722 / Approved

Title ENGINEER

Date 01/04/2024

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 CARLSBAD

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)

GENERAL INSTRUCTIONS

This form is designed for submitting proposals to perform certain well operations and reports of such operations when completed as indicated on Federal and Indian lands pursuant to applicable Federal law and regulations. Any necessary special instructions concerning the use of this form and the number of copies to be submitted, particularly with regard to local area or regional procedures and practices, are either shown below, will be issued by or may be obtained from the local Federal office.

SPECIFIC INSTRUCTIONS

Item 4 - Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult the local Federal office for specific instructions.

Item 13: Proposals to abandon a well and subsequent reports of abandonment should include such special information as is required by the local Federal office. In addition, such proposals and reports should include reasons for the abandonment; data on any former or present productive zones or other zones with present significant fluid contents not sealed off by cement or otherwise; depths (top and bottom) and method of placement of cement plugs; mud or other material placed below, between and above plugs; amount, size, method of parting of any casing, liner or tubing pulled and the depth to the top of any tubing left in the hole; method of closing top of well and date well site conditioned for final inspection looking for approval of the abandonment. If the proposal will involve **hydraulic fracturing operations**, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The privacy Act of 1974 and the regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.
AUTHORITY: 30 U.S.C. 181 et seq., 351 et seq., 25 U.S.C. 396; 43 CFR 3160.
PRINCIPAL PURPOSE: The information is used to: (1) Evaluate, when appropriate, approve applications, and report completion of subsequent well operations, on a Federal or Indian lease; and (2) document for administrative use, information for the management, disposal and use of National Resource lands and resources, such as: (a) evaluating the equipment and procedures to be used during a proposed subsequent well operation and reviewing the completed well operations for compliance with the approved plan; (b) requesting and granting approval to perform those actions covered by 43 CFR 3162.3-2, 3162.3-3, and 3162.3-4; (c) reporting the beginning or resumption of production, as required by 43 CFR 3162.4-1(c)and (d) analyzing future applications to drill or modify operations in light of data obtained and methods used.
ROUTINE USES: Information from the record and/or the record will be transferred to appropriate Federal, State, local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecutions in connection with congressional inquiries or to consumer reporting agencies to facilitate collection of debts owed the Government.
EFFECT OF NOT PROVIDING THE INFORMATION: Filing of this notice and report and disclosure of the information is mandatory for those subsequent well operations specified in 43 CFR 3162.3-2, 3162.3-3, 3162.3-4.

The Paperwork Reduction Act of 1995 requires us to inform you that:
The BLM collects this information to evaluate proposed and/or completed subsequent well operations on Federal or Indian oil and gas leases.
Response to this request is mandatory.
The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

BURDEN HOURS STATEMENT: Public reporting burden for this form is estimated to average 8 hours per response, including the time for reviewing instructions, gathering and maintaining data, and completing and reviewing the form. Direct comments regarding the burden estimate or any other aspect ofthis form to U.S. Department ofthe Interior, Bureau ofLand Management (1004-0137), Bureau Information Collection Clearance Officer (WO-630), 1849 C St., N.W., Mail Stop 401 LS, Washington, D.C. 20240

Additional Information

Location of Well

0. SHL: TR B / 245 FNL / 1941 FEL / TWSP: 25S / RANGE: 33E / SECTION: 18 / LAT: 32.1371862 / LONG: -103.6091087 (TVD: 0 feet, MD: 0 feet)

PPP: TR B / 100 FNL / 1650 FEL / TWSP: 25S / RANGE: 33E / SECTION: 18 / LAT: 32.1375845 / LONG: -103.6081684 (TVD: 10012 feet, MD: 10030 feet)

BHL: TR G / 2539 FNL / 1650 FEL / TWSP: 25S / RANGE: 33E / SECTION: 19 / LAT: 32.1163639 / LONG: -103.6081719 (TVD: 10277 feet, MD: 17852 feet)

DISTRICT I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720
DISTRICT II
811 S. First St., Artesia, NM 88210
Phone: (575) 748-1283 Fax: (575) 748-9720
DISTRICT III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone: (505) 334-6178 Fax: (505) 334-6170
DISTRICT IV
1220 S. St. Francis Dr., Santa Fe, NM 87505
Phone: (505) 476-3460 Fax: (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, New Mexico 87505

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

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

API Number	Pool Code	Pool Name
30-025-52219	97994	WC-025 G-06 S253329D; Upper Bone Spring

Property Code	Property Name	Well Number
326336	ICY 18 FED	110H

OGRID No.	Operator Name	Elevation
7377	EOG RESOURCES, INC.	3487'

Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
B	18	25-S	33-E	-	245'	NORTH	1941'	EAST	LEA

Bottom Hole Location If Different From Surface

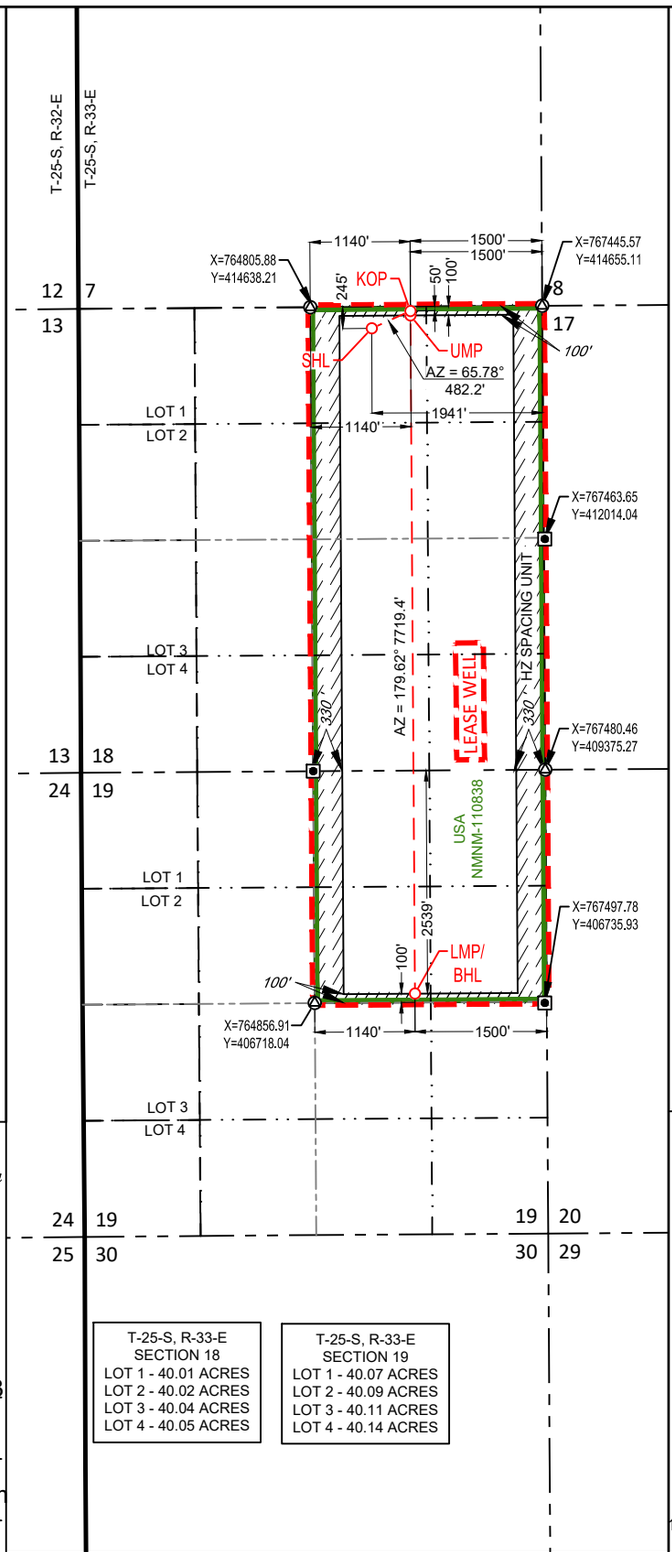
UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
G	19	25-S	33-E	-	2539'	NORTH	1500'	EAST	LEA

Dedicated Acres	Joint or Infill	Consolidated Code	Order No.
480.00			LEASE WELL

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.

SURFACE LOCATION (SHL)
NEW MEXICO EAST
NAD 1983
X=765506 Y=414398
LAT.: N 32.1371862
LONG.: W 103.6091087
NAD 1927
X=724321 Y=414340
LAT.: N 32.1370617
LONG.: W 103.6086347
245' FNL 1941' FEL

KICK OFF POINT (KOP)
NEW MEXICO EAST
NAD 1983
X=765946 Y=414596
LAT.: N 32.1377218
LONG.: W 103.6076838
NAD 1927
X=724760 Y=414537
LAT.: N 32.1375974
LONG.: W 103.6072098
50' FNL 1500' FEL



T-25-S, R-33-E
SECTION 18
LOT 1 - 40.01 ACRES
LOT 2 - 40.02 ACRES
LOT 3 - 40.04 ACRES
LOT 4 - 40.05 ACRES

T-25-S, R-33-E
SECTION 19
LOT 1 - 40.07 ACRES
LOT 2 - 40.09 ACRES
LOT 3 - 40.11 ACRES
LOT 4 - 40.14 ACRES

UPPER MOST PERF. (UMP)
NEW MEXICO EAST
NAD 1983
X=765946 Y=414543
LAT.: N 32.1375781
LONG.: W 103.6076838
NAD 1927
X=724761 Y=414485
LAT.: N 32.1374537
LONG.: W 103.6072098
100' FNL 1500' FEL

LOWER MOST PERF. (LMP)
BOTTOM HOLE LOCATION (BHL)
NEW MEXICO EAST
NAD 1983
X=765997 Y=406826
LAT.: N 32.1163652
LONG.: W 103.6076874
NAD 1927
X=724811 Y=406768
LAT.: N 32.1162406
LONG.: W 103.6072147
2539' FNL 1500' FEL

OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest, or to voluntary pooling agreement or a compulsory pooling order heretofore entered by the division.

Star L Harrell 12/4/23
Signature Date

Star L Harrell
Print Name

star_harrell@eogresources.com
E-mail Address

SURVEYORS CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision, and that the same is true and correct to the best of my belief.

11/19/2023
Date of Survey
Signature and Seal of Professional Surveyor:

RAMON DOMINGUEZ
NEW MEXICO
24508
PROFESSIONAL SURVEYOR

11/29/2023 8:21:53 AM

S:\SURVEY\EOG_MIDLAND\ICY_18_FED\FINAL_PRODUCTS\ICY_18_FED_110H.dwg ANDREW.HALL 11/29/2023 8:21 AM

eog resources

Icy 18 Fed 110H

Revised Permit Information 11/15/2023:

Well Name: Icy 18 Fed 110H

Location: SHL: 245' FNL & 1941' FEL, Section 18, T-25-S, R-33-E, Lea Co., N.M.
BHL: 2539' FNL & 1500' FEL, Section 19, T-25-S, R-33-E, Lea Co., N.M.

1. CASING PROGRAM A:

Hole Size	Interval MD From (ft)	Interval MD To (ft)	Interval TVD From (ft)	Interval TVD To (ft)	Csg OD	Weight	Grade	Conn
16"	0	1,130	0	1,130	13-3/8"	54.5#	J-55	STC
11"	0	4,815	0	4,790	9-5/8"	40#	J-55	LTC
6-3/4"	0	16,749	0	9,172	5-1/2"	17#	HCP-110	LTC

Variance is requested to waive the centralizer requirements for the 9-5/8" casing in the 11" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 11" 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 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.

EOG requests permission to allow deviation from the 0.422'' annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.

2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,130' 13-3/8''	300	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 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 @ 930')
4,790' 9-5/8''	460	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	100	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 3,830')
16,749' 5-1/2''	260	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,290')
	570	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 8720')

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Icy 18 Fed 110H

Additive	Purpose
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

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.

3. MUD PROGRAM:

Depth (TVD)	Type	Weight (ppg)	Viscosity	Water Loss
0 – 1,130'	Fresh - Gel	8.6-8.8	28-34	N/c
1,130' – 4,790'	Brine	8.6-8.8	28-34	N/c
4,790’ – 16,749’	Oil Base	8.8-9.5	58-68	N/c - 6

4. VARIANCE REQUESTS:

EOG requests the additional variance(s) in the attached document(s):

- Break-test BOP and Offline Cementing
- Salt Section Annular Clearance

5. TUBING REQUIREMENTS

EOG respectively requests an exception to the following NMOCD rule:

- 19.15.16.10 Casing AND TUBING RQUIREMENTS:
  J (3): "The operator shall set tubing as near the bottom as practical and tubing perforations shall not be more than 250 feet above top of pay zone."

With horizontal flowing and gas lifted wells an end of tubing depth placed at or slightly above KOP is a conservative way to ensure the tubing stays clean from debris, plugging, and allows for fewer well interventions post offset completion. The deeper the tubulars are run into the curve, the higher the probability is that the tubing will become stuck in sand and or well debris as the well produces over time. An additional consideration for EOT placement during artificial lift installations is avoiding the high dog leg severity and inclinations found in the curve section of the wellbore to help improve reliability and performance. Dog leg severity and inclinations tend not to hamper gas lifted or flowing wells, but they do effect other forms of artificial lift like rod pump or ESP (electric submersible pump). Keeping the EOT above KOP is an industry best practice for those respective forms of artificial lift.

eog resources

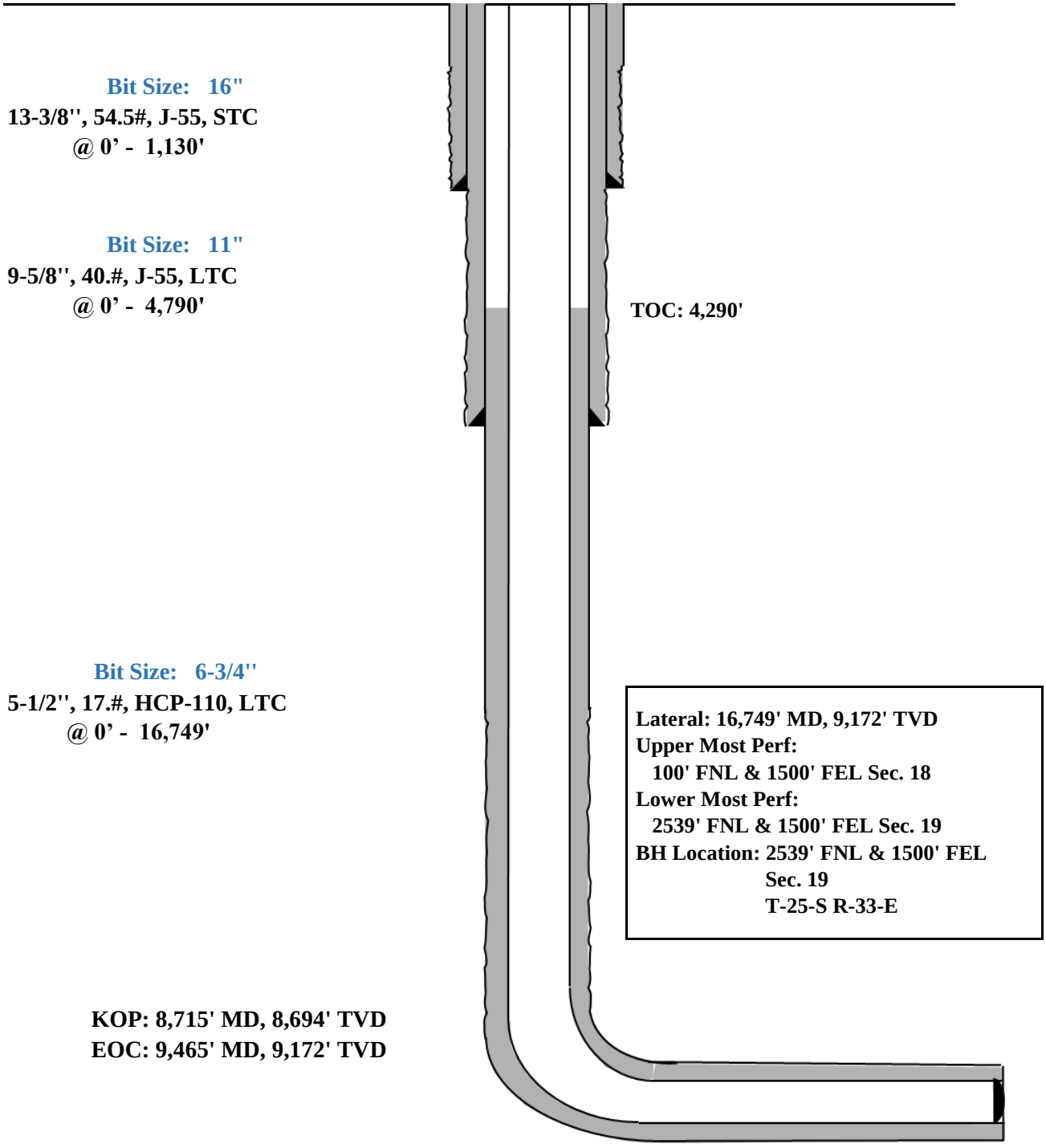
Icy 18 Fed 110H

245' FNL
1941' FEL
Section 18
T-25-S, R-33-E

Revised Wellbore A:

API: 30-025-52219

KB: 3512'
GL: 3487'



eog resources

Icy 18 Fed 110H

Revised Permit Information 11/15/2023:

Well Name: Icy 18 Fed 110H

Location: SHL: 245' FNL & 1941' FEL, Section 18, T-25-S, R-33-E, Lea Co., N.M.
BHL: 2539' FNL & 1500' FEL, Section 19, T-25-S, R-33-E, Lea Co., N.M.

1. CASING PROGRAM B:

Hole Size	Interval MD From (ft)	Interval MD To (ft)	Interval TVD From (ft)	Interval TVD To (ft)	Csg OD	Weight	Grade	Conn
13-1/2"	0	1,130	0	1,130	10-3/4"	40.5#	J-55	STC
9-7/8"	0	4,815	0	4,790	8-5/8"	32#	J-55	BTC-SC
6-3/4"	0	16,749	0	9,172	5-1/2"	17#	HCP-110	LTC

Variance is requested to waive the centralizer requirements for the 8-5/8" casing in the 9-7/8" hole size. An expansion additive will be utilized, in the cement slurry, for the entire length of the 9-7/8" 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 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.

EOG requests permission to allow deviation from the 0.422'' annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues.

2. CEMENTING PROGRAM:

Depth	No. Sacks	Wt. ppg	Yld Ft3/sk	Slurry Description
1,130' 10-3/4''	370	13.5	1.73	Lead: Class C + 4.0% Bentonite Gel + 0.5% CaCl2 + 0.25 lb/sk Cello-Flake (TOC @ Surface)
	110	14.8	1.34	Tail: Class C + 0.6% FL-62 + 0.25 lb/sk Cello-Flake + 0.2% Sodium Metasilicate (TOC @ 930')
4,790' 8-5/8''	380	12.7	2.22	Lead: Class C + 10% NaCl + 6% Bentonite Gel + 3% MagOx (TOC @ Surface)
	610	14.8	1.32	Tail: Class C + 10% NaCL + 3% MagOx (TOC @ 3,830')
16,749' 5-1/2''	430	10.5	3.21	Lead: Class H + 0.4% Halad-344 + 0.35% HR-601 + 3% Microbond (TOC @ 4,290')
	800	13.2	1.52	Tail: Class H + 5% NEX-020 + 0.2% NAC-102 + 0.15% NAS-725 + 0.5% NFL-549 + 0.2% NFP-703 + 1% NBE-737 + 0.3% NRT-241 (TOC @ 8720')

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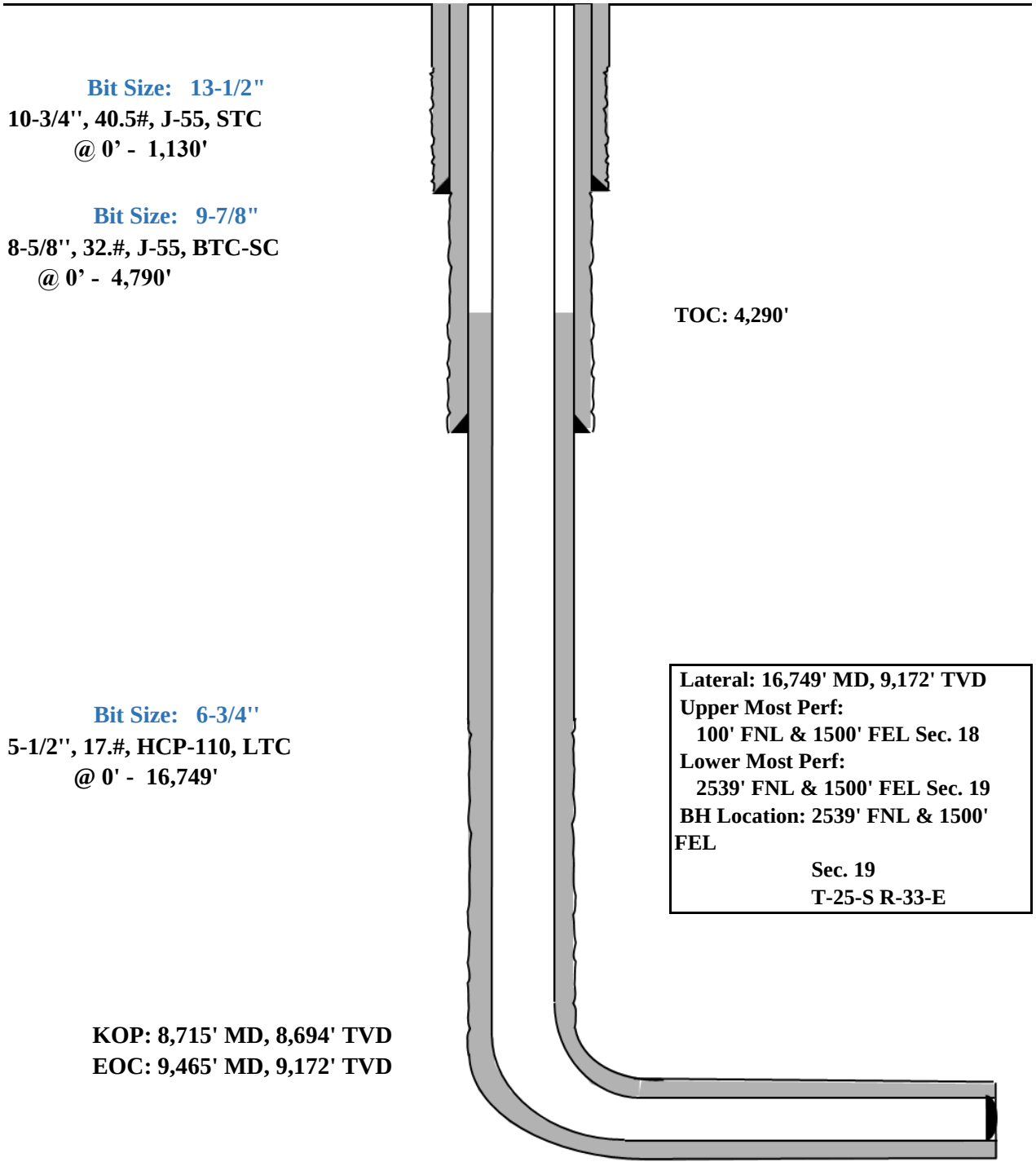
Icy 18 Fed 110H

245'
1941'
Section 18
T-25-S, R-33-E

Revised Wellbore B:

API: 30-025-52219

KB: 3512'
GL: 3487'



Bit Size: 13-1/2"
10-3/4'', 40.5#, J-55, STC
@ 0' - 1,130'

Bit Size: 9-7/8"
8-5/8'', 32.#, J-55, BTC-SC
@ 0' - 4,790'

TOC: 4,290'

Bit Size: 6-3/4''
5-1/2'', 17.#, HCP-110, LTC
@ 0' - 16,749'

Lateral: 16,749' MD, 9,172' TVD
Upper Most Perf:
100' FNL & 1500' FEL Sec. 18
Lower Most Perf:
2539' FNL & 1500' FEL Sec. 19
BH Location: 2539' FNL & 1500' FEL
Sec. 19
T-25-S R-33-E

KOP: 8,715' MD, 8,694' TVD
EOC: 9,465' MD, 9,172' TVD

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Icy 18 Fed 110H

GEOLOGIC NAME OF SURFACE FORMATION:

Permian

ESTIMATED TOPS OF IMPORTANT GEOLOGICAL MARKERS:

Rustler	1,004'
Tamarisk Anhydrite	1,107'
Top of Salt	1,229'
Base of Salt	4,694'
Lamar	4,931'
Bell Canyon	4,957'
Cherry Canyon	5,860'
Brushy Canyon	7,512'
Bone Spring Lime	9,059'
Leonard (Avalon) Shale	5,141'
1st Bone Spring Sand	10,061'
2nd Bone Spring Shale	10,261'
2nd Bone Spring Sand	10,620'
3rd Bone Spring Carb	11,135'
3rd Bone Spring Sand	11,771'
Wolfcamp	12,234'
TD	9,172'

ESTIMATED DEPTHS OF ANTICIPATED FRESH WATER, OIL OR GAS:

Upper Permian Sands	0- 400’	Fresh Water
Bell Canyon	4,957'	Oil
Cherry Canyon	5,860'	Oil
Brushy Canyon	7,512'	Oil
Leonard (Avalon) Shale	5,141'	Oil
1st Bone Spring Sand	10,061'	Oil
2nd Bone Spring Shale	10,261'	Oil
2nd Bone Spring Sand	10,620'	Oil

Midland

Lea County, NM (NAD 83 NME)
Icy 18 Fed
#110H

OH

Plan: Plan #0.2

Standard Planning Report

04 December, 2023

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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 Icy 18 Fed

Site Position:		**Northing:**	414,414.00 usft	**Latitude:**	32° 8' 14.217 N
From:	Map	**Easting:**	762,703.00 usft	**Longitude:**	103° 37' 5.391 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "		

Well #110H

Well Position	**+N/-S**	0.0 usft	**Northing:**	414,398.00 usft	**Latitude:**	32° 8' 13.873 N
	+E/-W	0.0 usft	**Easting:**	765,506.00 usft	**Longitude:**	103° 36' 32.794 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	3,487.0 usft
Grid Convergence:		0.39 °				

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2020	6/28/2022	6.43	59.78	47,330.44414367

Design Plan #0.2

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	176.29

Plan Survey Tool Program **Date** 12/4/2023

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.0	16,748.8	Plan #0.2 (OH)	EOG MWD+IFR1	
				MWD + IFR1	

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.00	0.00	0.00	0.00	
1,947.8	4.96	65.77	1,947.5	4.4	9.8	2.00	2.00	0.00	65.77	
7,284.8	4.96	65.77	7,264.5	193.6	430.2	0.00	0.00	0.00	0.00	
7,532.6	0.00	0.00	7,512.0	198.0	440.0	2.00	-2.00	0.00	180.00	
8,715.1	0.00	0.00	8,694.5	198.0	440.0	0.00	0.00	0.00	0.00	KOP(Icy 18 Fed #211
8,936.5	27.98	180.00	8,907.2	145.0	440.0	12.64	12.64	81.30	180.00	FTP(Icy 18 Fed #211H
9,452.5	89.91	179.61	9,160.6	-275.9	441.9	12.00	12.00	-0.07	-0.44	
16,748.8	89.91	179.61	9,172.0	-7,572.0	491.0	0.00	0.00	0.00	0.00	PBHL(Icy 18 Fed #21

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	2.00	65.77	1,800.0	0.7	1.6	-0.6	2.00	2.00	0.00
1,900.0	4.00	65.77	1,899.8	2.9	6.4	-2.4	2.00	2.00	0.00
1,947.8	4.96	65.77	1,947.5	4.4	9.8	-3.8	2.00	2.00	0.00
2,000.0	4.96	65.77	1,999.5	6.2	13.9	-5.3	0.00	0.00	0.00
2,100.0	4.96	65.77	2,099.1	9.8	21.8	-8.4	0.00	0.00	0.00
2,200.0	4.96	65.77	2,198.7	13.3	29.6	-11.4	0.00	0.00	0.00
2,300.0	4.96	65.77	2,298.4	16.9	37.5	-14.4	0.00	0.00	0.00
2,400.0	4.96	65.77	2,398.0	20.4	45.4	-17.4	0.00	0.00	0.00
2,500.0	4.96	65.77	2,497.6	24.0	53.3	-20.5	0.00	0.00	0.00
2,600.0	4.96	65.77	2,597.3	27.5	61.1	-23.5	0.00	0.00	0.00
2,700.0	4.96	65.77	2,696.9	31.1	69.0	-26.5	0.00	0.00	0.00
2,800.0	4.96	65.77	2,796.5	34.6	76.9	-29.6	0.00	0.00	0.00
2,900.0	4.96	65.77	2,896.1	38.2	84.8	-32.6	0.00	0.00	0.00
3,000.0	4.96	65.77	2,995.8	41.7	92.7	-35.6	0.00	0.00	0.00
3,100.0	4.96	65.77	3,095.4	45.2	100.5	-38.6	0.00	0.00	0.00
3,200.0	4.96	65.77	3,195.0	48.8	108.4	-41.7	0.00	0.00	0.00
3,300.0	4.96	65.77	3,294.6	52.3	116.3	-44.7	0.00	0.00	0.00
3,400.0	4.96	65.77	3,394.3	55.9	124.2	-47.7	0.00	0.00	0.00
3,500.0	4.96	65.77	3,493.9	59.4	132.1	-50.8	0.00	0.00	0.00
3,600.0	4.96	65.77	3,593.5	63.0	139.9	-53.8	0.00	0.00	0.00
3,700.0	4.96	65.77	3,693.1	66.5	147.8	-56.8	0.00	0.00	0.00
3,800.0	4.96	65.77	3,792.8	70.1	155.7	-59.8	0.00	0.00	0.00
3,900.0	4.96	65.77	3,892.4	73.6	163.6	-62.9	0.00	0.00	0.00
4,000.0	4.96	65.77	3,992.0	77.2	171.4	-65.9	0.00	0.00	0.00
4,100.0	4.96	65.77	4,091.6	80.7	179.3	-68.9	0.00	0.00	0.00
4,200.0	4.96	65.77	4,191.3	84.2	187.2	-72.0	0.00	0.00	0.00
4,300.0	4.96	65.77	4,290.9	87.8	195.1	-75.0	0.00	0.00	0.00
4,400.0	4.96	65.77	4,390.5	91.3	203.0	-78.0	0.00	0.00	0.00
4,500.0	4.96	65.77	4,490.1	94.9	210.8	-81.0	0.00	0.00	0.00
4,600.0	4.96	65.77	4,589.8	98.4	218.7	-84.1	0.00	0.00	0.00
4,700.0	4.96	65.77	4,689.4	102.0	226.6	-87.1	0.00	0.00	0.00
4,800.0	4.96	65.77	4,789.0	105.5	234.5	-90.1	0.00	0.00	0.00
4,900.0	4.96	65.77	4,888.7	109.1	242.4	-93.1	0.00	0.00	0.00
5,000.0	4.96	65.77	4,988.3	112.6	250.2	-96.2	0.00	0.00	0.00
5,100.0	4.96	65.77	5,087.9	116.1	258.1	-99.2	0.00	0.00	0.00
5,200.0	4.96	65.77	5,187.5	119.7	266.0	-102.2	0.00	0.00	0.00

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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	4.96	65.77	5,287.2	123.2	273.9	-105.3	0.00	0.00	0.00
5,400.0	4.96	65.77	5,386.8	126.8	281.7	-108.3	0.00	0.00	0.00
5,500.0	4.96	65.77	5,486.4	130.3	289.6	-111.3	0.00	0.00	0.00
5,600.0	4.96	65.77	5,586.0	133.9	297.5	-114.3	0.00	0.00	0.00
5,700.0	4.96	65.77	5,685.7	137.4	305.4	-117.4	0.00	0.00	0.00
5,800.0	4.96	65.77	5,785.3	141.0	313.3	-120.4	0.00	0.00	0.00
5,900.0	4.96	65.77	5,884.9	144.5	321.1	-123.4	0.00	0.00	0.00
6,000.0	4.96	65.77	5,984.5	148.1	329.0	-126.5	0.00	0.00	0.00
6,100.0	4.96	65.77	6,084.2	151.6	336.9	-129.5	0.00	0.00	0.00
6,200.0	4.96	65.77	6,183.8	155.1	344.8	-132.5	0.00	0.00	0.00
6,300.0	4.96	65.77	6,283.4	158.7	352.6	-135.5	0.00	0.00	0.00
6,400.0	4.96	65.77	6,383.0	162.2	360.5	-138.6	0.00	0.00	0.00
6,500.0	4.96	65.77	6,482.7	165.8	368.4	-141.6	0.00	0.00	0.00
6,600.0	4.96	65.77	6,582.3	169.3	376.3	-144.6	0.00	0.00	0.00
6,700.0	4.96	65.77	6,681.9	172.9	384.2	-147.7	0.00	0.00	0.00
6,800.0	4.96	65.77	6,781.5	176.4	392.0	-150.7	0.00	0.00	0.00
6,900.0	4.96	65.77	6,881.2	180.0	399.9	-153.7	0.00	0.00	0.00
7,000.0	4.96	65.77	6,980.8	183.5	407.8	-156.7	0.00	0.00	0.00
7,100.0	4.96	65.77	7,080.4	187.1	415.7	-159.8	0.00	0.00	0.00
7,200.0	4.96	65.77	7,180.1	190.6	423.6	-162.8	0.00	0.00	0.00
7,284.8	4.96	65.77	7,264.5	193.6	430.2	-165.4	0.00	0.00	0.00
7,300.0	4.65	65.77	7,279.7	194.1	431.4	-165.8	2.00	-2.00	0.00
7,400.0	2.65	65.77	7,379.5	196.7	437.2	-168.0	2.00	-2.00	0.00
7,500.0	0.65	65.77	7,479.4	197.9	439.8	-169.0	2.00	-2.00	0.00
7,532.6	0.00	0.00	7,512.0	198.0	440.0	-169.1	2.00	-2.00	0.00
7,600.0	0.00	0.00	7,579.4	198.0	440.0	-169.1	0.00	0.00	0.00
7,700.0	0.00	0.00	7,679.4	198.0	440.0	-169.1	0.00	0.00	0.00
7,800.0	0.00	0.00	7,779.4	198.0	440.0	-169.1	0.00	0.00	0.00
7,900.0	0.00	0.00	7,879.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,000.0	0.00	0.00	7,979.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,100.0	0.00	0.00	8,079.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,200.0	0.00	0.00	8,179.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,300.0	0.00	0.00	8,279.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,400.0	0.00	0.00	8,379.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,500.0	0.00	0.00	8,479.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,600.0	0.00	0.00	8,579.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,700.0	0.00	0.00	8,679.4	198.0	440.0	-169.1	0.00	0.00	0.00
8,715.1	0.00	0.00	8,694.5	198.0	440.0	-169.1	0.00	0.00	0.00
8,725.0	1.25	180.00	8,704.4	197.9	440.0	-169.0	12.64	12.64	0.00
8,750.0	4.41	180.00	8,729.4	196.7	440.0	-167.8	12.64	12.64	0.00
8,775.0	7.57	180.00	8,754.3	194.0	440.0	-165.2	12.64	12.64	0.00
8,800.0	10.73	180.00	8,778.9	190.1	440.0	-161.2	12.64	12.64	0.00
8,825.0	13.89	180.00	8,803.4	184.7	440.0	-155.9	12.64	12.64	0.00
8,850.0	17.05	180.00	8,827.4	178.1	440.0	-149.2	12.64	12.64	0.00
8,875.0	20.21	180.00	8,851.1	170.1	440.0	-141.3	12.64	12.64	0.00
8,900.0	23.37	180.00	8,874.3	160.8	440.0	-132.0	12.64	12.64	0.00
8,925.0	26.53	180.00	8,897.0	150.3	440.0	-121.5	12.64	12.64	0.00
8,936.5	27.98	180.00	8,907.2	145.0	440.0	-116.2	12.64	12.64	0.00
8,950.0	29.61	179.97	8,919.1	138.5	440.0	-109.7	12.00	12.00	-0.19
8,975.0	32.61	179.93	8,940.5	125.6	440.0	-96.8	12.00	12.00	-0.16
9,000.0	35.61	179.90	8,961.2	111.6	440.0	-82.8	12.00	12.00	-0.14
9,025.0	38.61	179.87	8,981.1	96.5	440.1	-67.8	12.00	12.00	-0.12
9,050.0	41.61	179.85	9,000.2	80.4	440.1	-51.7	12.00	12.00	-0.10
9,075.0	44.61	179.82	9,018.5	63.3	440.2	-34.7	12.00	12.00	-0.09

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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)
9,100.0	47.61	179.80	9,035.8	45.3	440.2	-16.7	12.00	12.00	-0.08
9,125.0	50.61	179.78	9,052.2	26.4	440.3	2.2	12.00	12.00	-0.08
9,150.0	53.61	179.77	9,067.5	6.6	440.4	21.9	12.00	12.00	-0.07
9,175.0	56.61	179.75	9,081.8	-13.9	440.4	42.3	12.00	12.00	-0.06
9,200.0	59.61	179.73	9,095.0	-35.1	440.5	63.5	12.00	12.00	-0.06
9,225.0	62.61	179.72	9,107.1	-57.0	440.6	85.4	12.00	12.00	-0.06
9,250.0	65.61	179.71	9,118.0	-79.5	440.8	107.8	12.00	12.00	-0.05
9,275.0	68.61	179.69	9,127.7	-102.5	440.9	130.8	12.00	12.00	-0.05
9,300.0	71.61	179.68	9,136.2	-126.0	441.0	154.3	12.00	12.00	-0.05
9,325.0	74.61	179.67	9,143.5	-149.9	441.1	178.1	12.00	12.00	-0.05
9,350.0	77.61	179.66	9,149.5	-174.2	441.3	202.4	12.00	12.00	-0.05
9,375.0	80.61	179.65	9,154.2	-198.7	441.4	226.9	12.00	12.00	-0.04
9,400.0	83.61	179.64	9,157.7	-223.5	441.6	251.6	12.00	12.00	-0.04
9,425.0	86.61	179.63	9,159.8	-248.4	441.7	276.4	12.00	12.00	-0.04
9,450.0	89.61	179.62	9,160.6	-273.4	441.9	301.4	12.00	12.00	-0.04
9,452.5	89.91	179.61	9,160.6	-275.9	441.9	303.9	12.00	12.00	-0.04
9,500.0	89.91	179.61	9,160.7	-323.4	442.2	351.3	0.00	0.00	0.00
9,600.0	89.91	179.61	9,160.9	-423.4	442.9	451.1	0.00	0.00	0.00
9,700.0	89.91	179.61	9,161.0	-523.4	443.6	551.0	0.00	0.00	0.00
9,800.0	89.91	179.61	9,161.2	-623.4	444.3	650.8	0.00	0.00	0.00
9,900.0	89.91	179.61	9,161.3	-723.4	444.9	750.6	0.00	0.00	0.00
10,000.0	89.91	179.61	9,161.5	-823.3	445.6	850.5	0.00	0.00	0.00
10,100.0	89.91	179.61	9,161.6	-923.3	446.3	950.3	0.00	0.00	0.00
10,200.0	89.91	179.61	9,161.8	-1,023.3	447.0	1,050.1	0.00	0.00	0.00
10,300.0	89.91	179.61	9,162.0	-1,123.3	447.6	1,150.0	0.00	0.00	0.00
10,400.0	89.91	179.61	9,162.1	-1,223.3	448.3	1,249.8	0.00	0.00	0.00
10,500.0	89.91	179.61	9,162.3	-1,323.3	449.0	1,349.6	0.00	0.00	0.00
10,600.0	89.91	179.61	9,162.4	-1,423.3	449.6	1,449.4	0.00	0.00	0.00
10,700.0	89.91	179.61	9,162.6	-1,523.3	450.3	1,549.3	0.00	0.00	0.00
10,800.0	89.91	179.61	9,162.7	-1,623.3	451.0	1,649.1	0.00	0.00	0.00
10,900.0	89.91	179.61	9,162.9	-1,723.3	451.7	1,748.9	0.00	0.00	0.00
11,000.0	89.91	179.61	9,163.0	-1,823.3	452.3	1,848.8	0.00	0.00	0.00
11,100.0	89.91	179.61	9,163.2	-1,923.3	453.0	1,948.6	0.00	0.00	0.00
11,200.0	89.91	179.61	9,163.4	-2,023.3	453.7	2,048.4	0.00	0.00	0.00
11,300.0	89.91	179.61	9,163.5	-2,123.3	454.4	2,148.3	0.00	0.00	0.00
11,400.0	89.91	179.61	9,163.7	-2,223.3	455.0	2,248.1	0.00	0.00	0.00
11,500.0	89.91	179.61	9,163.8	-2,323.3	455.7	2,347.9	0.00	0.00	0.00
11,600.0	89.91	179.61	9,164.0	-2,423.3	456.4	2,447.8	0.00	0.00	0.00
11,700.0	89.91	179.61	9,164.1	-2,523.3	457.0	2,547.6	0.00	0.00	0.00
11,800.0	89.91	179.61	9,164.3	-2,623.3	457.7	2,647.4	0.00	0.00	0.00
11,900.0	89.91	179.61	9,164.4	-2,723.3	458.4	2,747.3	0.00	0.00	0.00
12,000.0	89.91	179.61	9,164.6	-2,823.3	459.1	2,847.1	0.00	0.00	0.00
12,100.0	89.91	179.61	9,164.8	-2,923.3	459.7	2,946.9	0.00	0.00	0.00
12,200.0	89.91	179.61	9,164.9	-3,023.3	460.4	3,046.8	0.00	0.00	0.00
12,300.0	89.91	179.61	9,165.1	-3,123.3	461.1	3,146.6	0.00	0.00	0.00
12,400.0	89.91	179.61	9,165.2	-3,223.3	461.8	3,246.4	0.00	0.00	0.00
12,500.0	89.91	179.61	9,165.4	-3,323.3	462.4	3,346.2	0.00	0.00	0.00
12,600.0	89.91	179.61	9,165.5	-3,423.3	463.1	3,446.1	0.00	0.00	0.00
12,700.0	89.91	179.61	9,165.7	-3,523.3	463.8	3,545.9	0.00	0.00	0.00
12,800.0	89.91	179.61	9,165.8	-3,623.3	464.4	3,645.7	0.00	0.00	0.00
12,900.0	89.91	179.61	9,166.0	-3,723.3	465.1	3,745.6	0.00	0.00	0.00
13,000.0	89.91	179.61	9,166.2	-3,823.3	465.8	3,845.4	0.00	0.00	0.00
13,100.0	89.91	179.61	9,166.3	-3,923.3	466.5	3,945.2	0.00	0.00	0.00
13,200.0	89.91	179.61	9,166.5	-4,023.3	467.1	4,045.1	0.00	0.00	0.00

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

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)
13,300.0	89.91	179.61	9,166.6	-4,123.3	467.8	4,144.9	0.00	0.00	0.00
13,400.0	89.91	179.61	9,166.8	-4,223.3	468.5	4,244.7	0.00	0.00	0.00
13,500.0	89.91	179.61	9,166.9	-4,323.3	469.1	4,344.6	0.00	0.00	0.00
13,600.0	89.91	179.61	9,167.1	-4,423.3	469.8	4,444.4	0.00	0.00	0.00
13,700.0	89.91	179.61	9,167.2	-4,523.3	470.5	4,544.2	0.00	0.00	0.00
13,800.0	89.91	179.61	9,167.4	-4,623.3	471.2	4,644.1	0.00	0.00	0.00
13,900.0	89.91	179.61	9,167.6	-4,723.3	471.8	4,743.9	0.00	0.00	0.00
14,000.0	89.91	179.61	9,167.7	-4,823.3	472.5	4,843.7	0.00	0.00	0.00
14,100.0	89.91	179.61	9,167.9	-4,923.3	473.2	4,943.6	0.00	0.00	0.00
14,200.0	89.91	179.61	9,168.0	-5,023.2	473.9	5,043.4	0.00	0.00	0.00
14,300.0	89.91	179.61	9,168.2	-5,123.2	474.5	5,143.2	0.00	0.00	0.00
14,400.0	89.91	179.61	9,168.3	-5,223.2	475.2	5,243.0	0.00	0.00	0.00
14,500.0	89.91	179.61	9,168.5	-5,323.2	475.9	5,342.9	0.00	0.00	0.00
14,600.0	89.91	179.61	9,168.7	-5,423.2	476.5	5,442.7	0.00	0.00	0.00
14,700.0	89.91	179.61	9,168.8	-5,523.2	477.2	5,542.5	0.00	0.00	0.00
14,800.0	89.91	179.61	9,169.0	-5,623.2	477.9	5,642.4	0.00	0.00	0.00
14,900.0	89.91	179.61	9,169.1	-5,723.2	478.6	5,742.2	0.00	0.00	0.00
15,000.0	89.91	179.61	9,169.3	-5,823.2	479.2	5,842.0	0.00	0.00	0.00
15,100.0	89.91	179.61	9,169.4	-5,923.2	479.9	5,941.9	0.00	0.00	0.00
15,200.0	89.91	179.61	9,169.6	-6,023.2	480.6	6,041.7	0.00	0.00	0.00
15,300.0	89.91	179.61	9,169.7	-6,123.2	481.3	6,141.5	0.00	0.00	0.00
15,400.0	89.91	179.61	9,169.9	-6,223.2	481.9	6,241.4	0.00	0.00	0.00
15,500.0	89.91	179.61	9,170.1	-6,323.2	482.6	6,341.2	0.00	0.00	0.00
15,600.0	89.91	179.61	9,170.2	-6,423.2	483.3	6,441.0	0.00	0.00	0.00
15,700.0	89.91	179.61	9,170.4	-6,523.2	483.9	6,540.9	0.00	0.00	0.00
15,800.0	89.91	179.61	9,170.5	-6,623.2	484.6	6,640.7	0.00	0.00	0.00
15,900.0	89.91	179.61	9,170.7	-6,723.2	485.3	6,740.5	0.00	0.00	0.00
16,000.0	89.91	179.61	9,170.8	-6,823.2	486.0	6,840.4	0.00	0.00	0.00
16,100.0	89.91	179.61	9,171.0	-6,923.2	486.6	6,940.2	0.00	0.00	0.00
16,200.0	89.91	179.61	9,171.1	-7,023.2	487.3	7,040.0	0.00	0.00	0.00
16,300.0	89.91	179.61	9,171.3	-7,123.2	488.0	7,139.8	0.00	0.00	0.00
16,400.0	89.91	179.61	9,171.5	-7,223.2	488.7	7,239.7	0.00	0.00	0.00
16,500.0	89.91	179.61	9,171.6	-7,323.2	489.3	7,339.5	0.00	0.00	0.00
16,600.0	89.91	179.61	9,171.8	-7,423.2	490.0	7,439.3	0.00	0.00	0.00
16,700.0	89.91	179.61	9,171.9	-7,523.2	490.7	7,539.2	0.00	0.00	0.00
16,748.8	89.91	179.61	9,172.0	-7,572.0	491.0	7,587.9	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(Icy 18 Fed #211H) - plan hits target center - Point	0.00	0.00	8,694.5	198.0	440.0	414,596.00	765,946.00	32° 8' 15.803 N	103° 36' 27.661 W
FTP(Icy 18 Fed #211H) - plan hits target center - Point	0.00	0.00	8,907.2	145.0	440.0	414,543.00	765,946.00	32° 8' 15.279 N	103° 36' 27.665 W
PBHL(Icy 18 Fed #211H - plan hits target center - Point	0.00	0.00	9,172.0	-7,572.0	491.0	406,826.00	765,997.00	32° 6' 58.912 N	103° 36' 27.676 W

eog resources

Planning Report

Database:	PEDM	**Local Co-ordinate Reference:**	Well #110H
Company:	Midland	**TVD Reference:**	kb = 26' @ 3513.0usft
Project:	Lea County, NM (NAD 83 NME)	**MD Reference:**	kb = 26' @ 3513.0usft
Site:	Icy 18 Fed	**North Reference:**	Grid
Well:	#110H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #0.2		

eog resources

Lea County, NM (NAD 83 NME)

Icy 18 Fed #110H

Plan #0.2

G
T M

Azimuths to Grid North
True North: -0.39°
Magnetic North: 6.05°

Magnetic Field
Strength: 47330.4nT
Dip Angle: 59.78°
Date: 6/28/2022
Model: IGRF2020

To convert a Magnetic Direction to a Grid Direction, Add 6.05°
To convert a Magnetic Direction to a True Direction, Add 6.43° East
To convert a True Direction to a Grid Direction, Subtract 0.39°

PROJECT DETAILS: Lea 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: #110H

3487.0
kb = 26' @ 3513.0usft

Northing	Easting	Latittude	Longitude
414398.00	765506.00	32° 8' 13.873 N	103° 36' 32.794 W

SECTION DETAILS

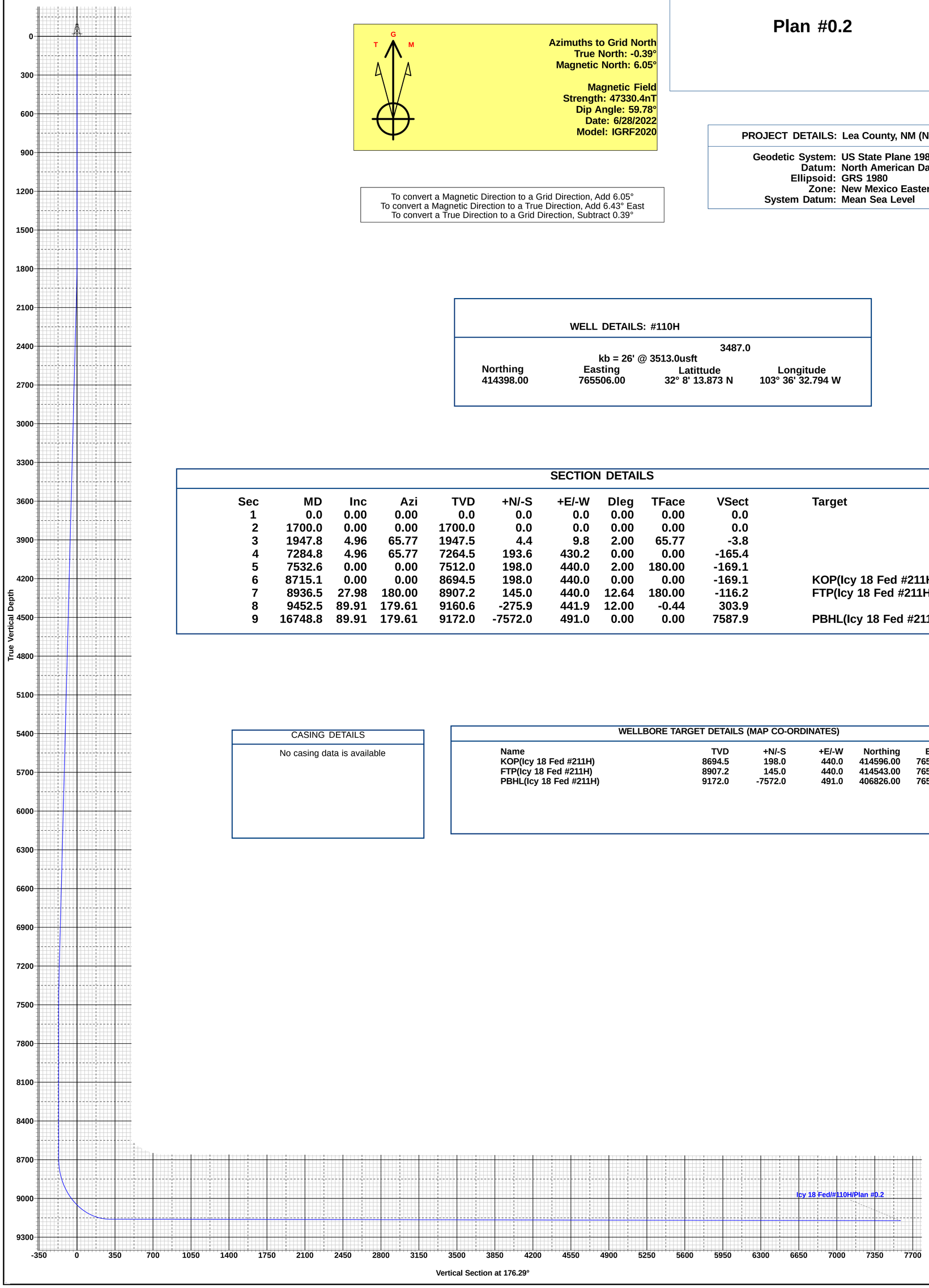
Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.0	
2	1700.0	0.00	0.00	1700.0	0.0	0.0	0.00	0.00	0.0	
3	1947.8	4.96	65.77	1947.5	4.4	9.8	2.00	65.77	-3.8	
4	7284.8	4.96	65.77	7264.5	193.6	430.2	0.00	0.00	-165.4	
5	7532.6	0.00	0.00	7512.0	198.0	440.0	2.00	180.00	-169.1	
6	8715.1	0.00	0.00	8694.5	198.0	440.0	0.00	0.00	-169.1	KOP(Icy 18 Fed #211H)
7	8936.5	27.98	180.00	8907.2	145.0	440.0	12.64	180.00	-116.2	FTP(Icy 18 Fed #211H)
8	9452.5	89.91	179.61	9160.6	-275.9	441.9	12.00	-0.44	303.9	
9	16748.8	89.91	179.61	9172.0	-7572.0	491.0	0.00	0.00	7587.9	PBHL(Icy 18 Fed #211H)

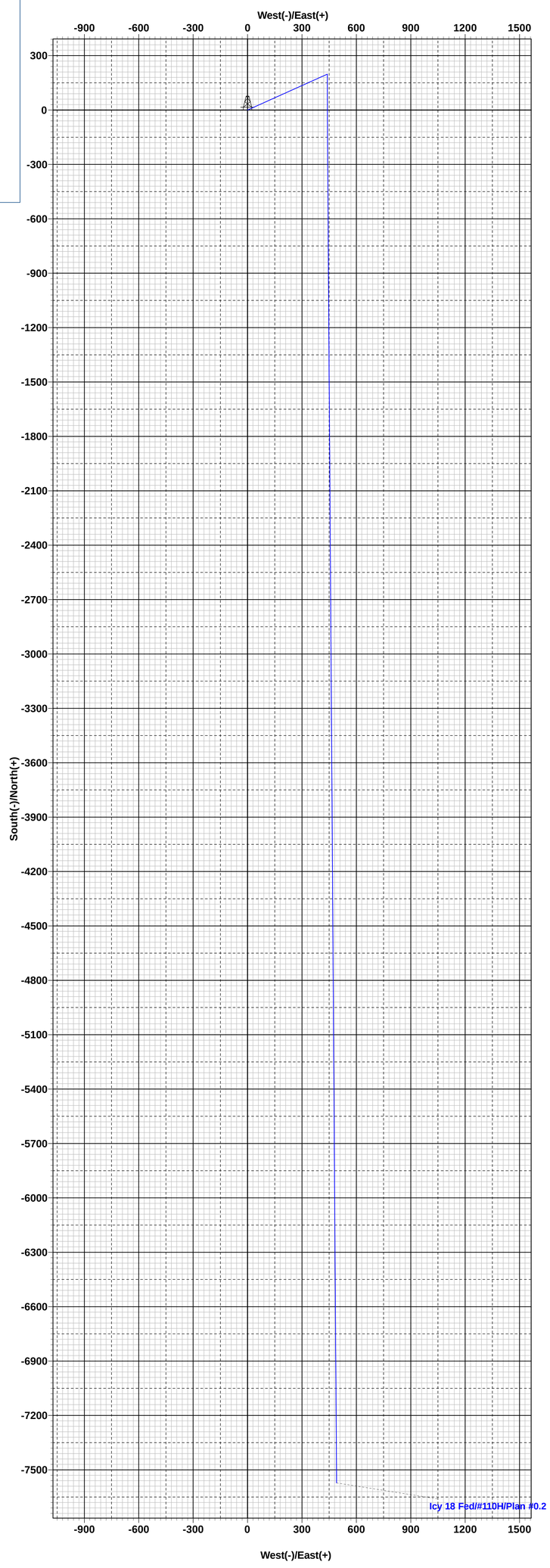
CASING DETAILS

No casing data is available

WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

Name	TVD	+N/-S	+E/-W	Northing	Easting
KOP(Icy 18 Fed #211H)	8694.5	198.0	440.0	414596.00	765946.00
FTP(Icy 18 Fed #211H)	8907.2	145.0	440.0	414543.00	765946.00
PBHL(Icy 18 Fed #211H)	9172.0	-7572.0	491.0	406826.00	765997.00





Lea County, NM (NAD 83 NME)
Icy 18 Fed
#110H
OH
Plan #0.2
8:53, December 04 2023

Page 1 of 2

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	EOG Resources Incorporated
WELL NAME & NO.:	ICY 18 FED 110H
SURFACE HOLE FOOTAGE:	245'/N & 1941'/E
BOTTOM HOLE FOOTAGE	2539'/N & 1500'/E
LOCATION:	Section 18, T.25 S., R.33 E.
COUNTY:	Lea County, New Mexico

All previous COAs still apply

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
Wellhead Variance	( ) Diverter		
Other	[ ] 4 String	[ ] Capitan Reef	[ ] WIPP
Other	[ ] Fluid Filled	[ ] Pilot Hole	[ ] Open Annulus
Cementing	[ ] Contingency Cement Squeeze	[ ] EchoMeter	[ ] Primary Cement Squeeze
Special Requirements	[ ] Water Disposal	[ ] COM	[ ] Unit
Special Requirements	[ ] Batch Sundry		
Special Requirements Variance	[x] Break Testing	[x] Offline Cementing	[x] Casing Clearance

A. CASING

Primary Casing Design:

1. The **13-3/8** inch surface casing shall be set at approximately **1,130** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.

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

b. Wait on cement (WOC) time for a primary cement job will be a minimum of **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 **9-5/8** inch intermediate casing shall be set at approximately **4,790** feet **TVD**. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

Option 1 (Single Stage):

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

3. The **5-1/2** inch production casing shall be set at approximately **16,749** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

Alternative Design:

1. The **10-3/4** inch surface casing shall be set at approximately **1,130** feet (a minimum of 25 feet (Lea County) into the Rustler Anhydrite, above the salt, and below usable fresh water) and cemented to the surface.

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

4. The **8-5/8** inch intermediate casing shall be set at approximately **4,790** feet **TVD**. The minimum required fill of cement behind the **8-5/8** inch intermediate casing is:

Option 1 (Single Stage):

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

5. The **5-1/2** inch production casing shall be set at approximately **16,749** feet. The minimum required fill of cement behind the **5-1/2** inch production casing is:

Option 1 (Single Stage):

- Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.

B. SPECIAL REQUIREMENT (S)

(Note: For a minimum 5M BOPE or less (Utilizing a 10M BOPE system)
BOPE Break Testing Variance

- BOPE Break Testing is ONLY permitted for 5M BOPE or less. **(Annular preventer must be tested to a minimum of 70% of BOPE working pressure and shall be higher than the MASP)**
- BOPE Break Testing is NOT permitted to drilling the production hole section.
- Variance only pertains to the intermediate hole-sections and no deeper than the Bone Springs formation.
- While in transfer between wells, the BOPE shall be secured by the hydraulic carrier or cradle.
- Any well control event while drilling require notification to the BLM Petroleum Engineer **(575-706-2779)** prior to the commencement of any BOPE Break Testing operations.
- A full BOPE test is required prior to drilling the first deep intermediate hole section. If any subsequent hole interval is deeper than the first, a full BOPE test will be required. (200' TVD tolerance between intermediate shoes is allowable).
- The BLM is to be contacted (575-689-5981 Lea County) 4 hours prior to BOPE tests.
- As a minimum, a full BOPE test shall be performed at 21-day intervals.
- In the event any repairs or replacement of the BOPE is required, the BOPE shall test as per Onshore Oil and Gas Order No. 2.
- If in the event break testing is not utilized, then a full BOPE test would be conducted.

Offline Cementing
Approved for surface and intermediate intervals. Notify the BLM prior to the commencement of any offline cementing procedure.

Casing Clearance:

- Overlap clearance OK for production casing
- Annular clearance variance in place for salt interval
- Operator aware of risks with <1" clearance for surface interval

Operator shall clean up cycles until wellbore is clear of cuttings and any large debris, ensure cutting sizes are adequate "coffee ground or less" before cementing.

GENERAL REQUIREMENTS

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

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

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

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

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

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

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

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as

well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

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

2. 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 intergrity 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 **43 CFR part 3170 Subpart 3172** and **API STD 53 Sec. 5.3**.

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

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

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

    a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
    b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
    c. Manufacturer representative shall install the test plug for the initial BOP test.
    d. Whenever any seal subject to test pressure is broken, all the tests in **43 CFR part 3170 Subpart 3172** must be followed.
    e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.

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

    a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been

done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead cement), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).

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

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

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

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

f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.

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

h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test

does not exclude the test prior to drilling out the casing shoe as per **43 CFR part 3170 Subpart 3172**.

C. DRILLING MUD

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

D. WASTE MATERIAL AND FLUIDS

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

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

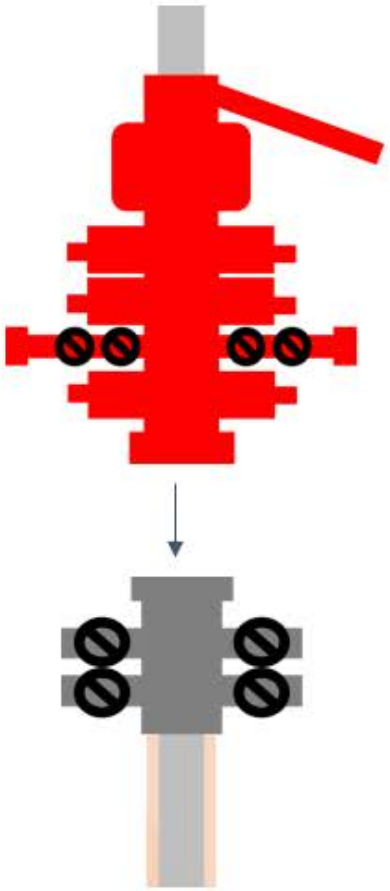
KPI 1/3/2024

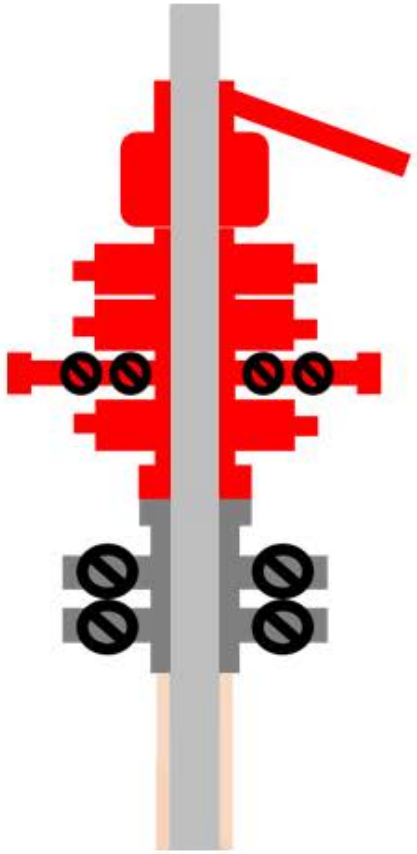
Break-test BOP & Offline Cementing:

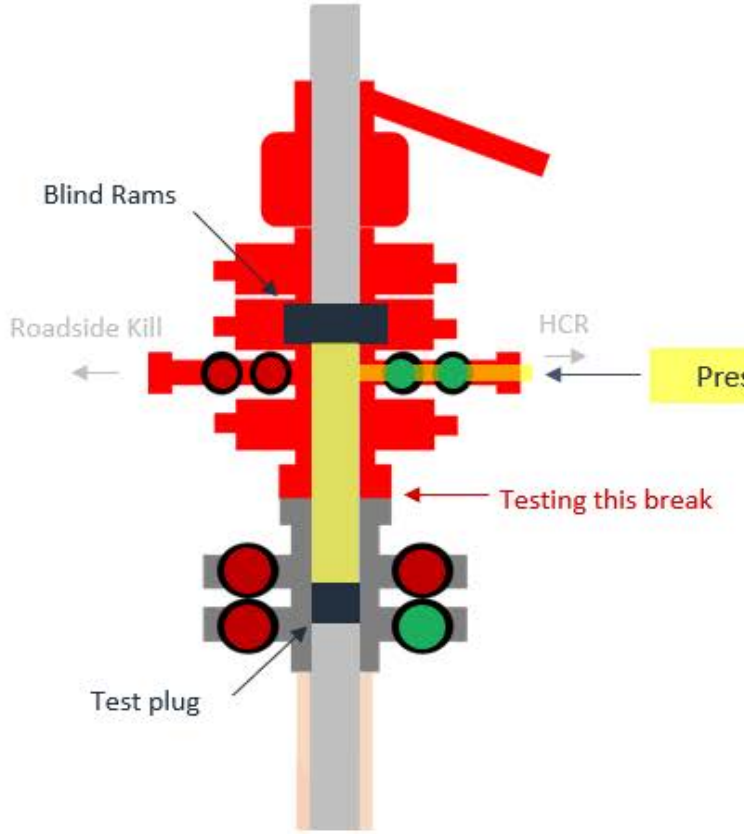
EOG Resources Inc. (EOG) respectfully requests a variance from the minimum standards for well control equipment testing of ECFR Title 43 Part 3172.6(b)(9)(iv) to allow a testing schedule of the blow out preventer (BOP) and blow out prevention equipment (BOPE) along with Batch Drilling & Offline cement operations to include the following:

- Full BOPE test at first installation on the pad.
- Full BOPE test every 21 days.
- This test will be conducted for 5M rated hole intervals only.
- Each rig requesting the break-test variance is capable of picking up the BOP without damaging components using winches, following API Standard 53, Well Control Equipment Systems for Drilling Wells (Fifth edition, December 2018, Annex C. Table C.4) which recognizes break testing as an acceptable practice.
- Function tests will be performed on the following BOP elements:
    - Annular à during each full BOPE test
    - Upper Pipe Rams à On trip ins where FIT required
    - Blind Rams à Every trip
    - Lower Pipe Rams à during each full BOPE test
- Break testing BOP and BOPE coupled with batch drilling operations and option to offline cement and/or remediate (if needed) any surface or intermediate sections, according to attached offline cementing support documentation.
- After the well section is secured, the BOP will be disconnected from the wellhead and walked with the rig to another well on the pad.
- TA cap will also be installed per Wellhead vendor procedure and pressure inside the casing will be monitored via the valve on the TA cap as per standard batch drilling ops.

Break Test Diagram (HCR valve)



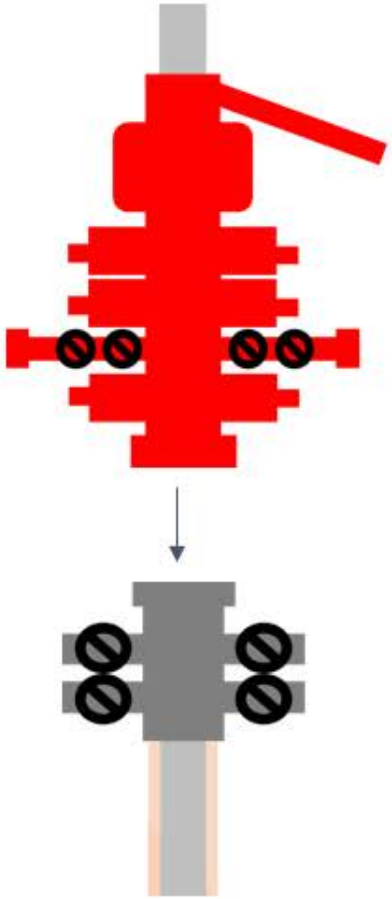


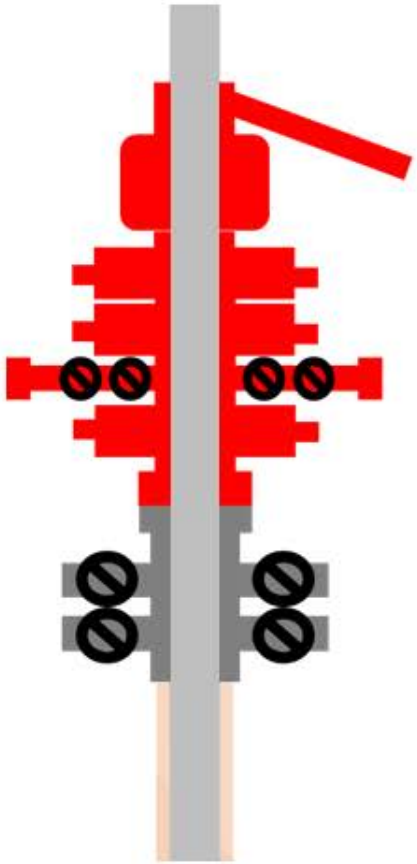


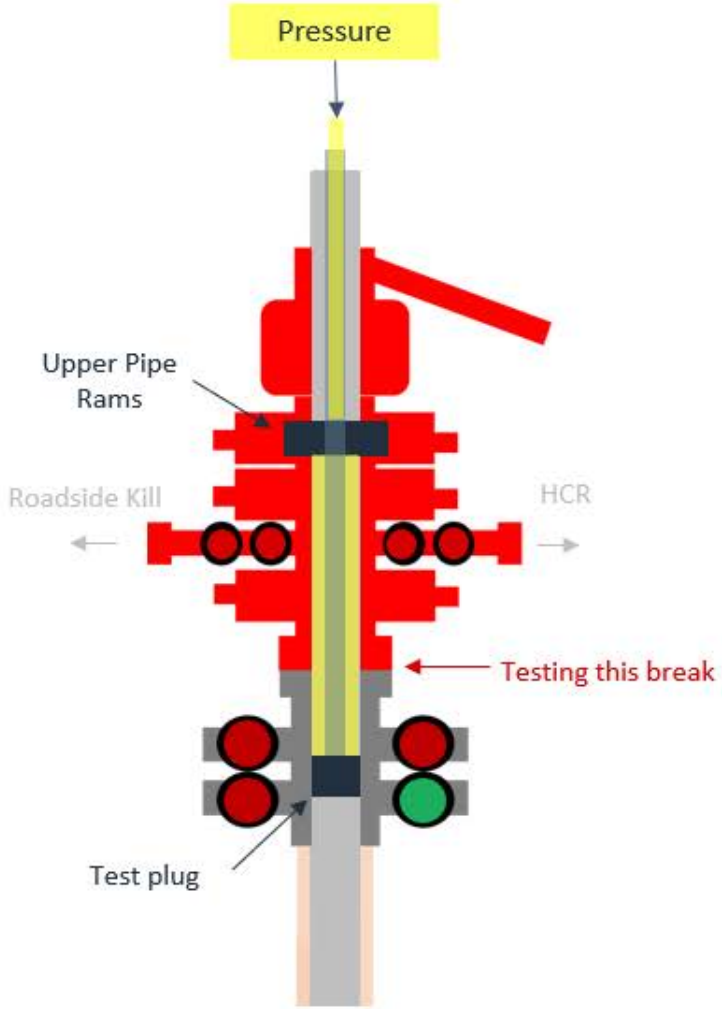
Steps

1. Set plug in wellhead (lower barrier)
2. Close Blind Rams (upper barrier)
3. Close roadside kill
4. Open HCR (pressure application)
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to main choke manifold crown valve
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit

Break Test Diagram (Test Joint)







Steps

1. Set plug in with test joint wellhead (lower barrier)
2. Close Upper Pipe Rams (upper barrier)
3. Close roadside kill
4. Close HCR
5. Open wellhead valves below test plug to ensure if leak past test plug, pressure won't be applied to wellbore
6. Tie BOP testers high pressure line to top of test joint
7. Pressure up to test break
8. Bleed test pressure from BOP testing unit

eog resources

Offline Intermediate Cementing Procedure 2/24/2022

Cement Program

1. No changes to the cement program will take place for offline cementing.

Summarized Operational Procedure for Intermediate Casing

1. Run casing as per normal operations. While running casing, conduct negative pressure test and confirm integrity of the float equipment back pressure valves.
    a. Float equipment is equipped with two back pressure valves rated to a minimum of 5,000 psi.
2. Land production casing on mandrel hanger through BOP.
    a. If casing is unable to be landed with a mandrel hanger, then the **casing will be cemented online**.
3. Break circulation and confirm no restrictions.
    a. Ensure no blockage of float equipment and appropriate annular returns.
    b. Perform flow check to confirm well is static.
4. Set pack-off
    a. If utilizing a fluted/ported mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid, remove landing joint, and set annular packoff through BOP. Pressure test to 5,000 psi for 10 min.
    b. If utilizing a solid mandrel hanger, ensure well is static on the annulus and inside the casing by filling the pipe with kill weight fluid. Pressure test seals to 5,000 psi for 10 min. Remove landing joint through BOP.
5. After confirmation of both annular barriers and the two casing barriers, install TA plug and pressure test to 5,000 psi for 10 min. Notify the BLM with intent to proceed with nipple down and offline cementing.
    a. Minimum 4 hrs notice.
6. With the well secured and BLM notified, nipple down BOP and secure on hydraulic carrier or cradle.
    a. **Note, if any of the barriers fail to test, the BOP stack will not be nippled down until after the cement job has concluded and both lead and tail slurry have reached 500 psi.**
7. Skid/Walk rig off current well.
8. Confirm well is static before removing TA Plug.
    a. Cementing operations will not proceed until well is under control. (If well is not static, notify BLM and proceed to kill)
    b. Casing outlet valves will provide access to both the casing ID and annulus. Rig or third party pump truck will kill well prior to cementing.
    c. Well control plan can be seen in Section B, Well Control Procedures.
    d. If need be, rig can be moved back over well and BOP nippled back up for any further remediation.

e. Diagram for rig positioning relative to offline cementing can be seen in Figure 4.

9. Rig up return lines to take returns from wellhead to pits and rig choke.
    a. Test all connections and lines from wellhead to choke manifold to 5,000 psi high for 10 min.
    b. If either test fails, perform corrections and retest before proceeding.
    c. Return line schematics can be seen in Figure 3.
10. Remove TA Plug from the casing.
11. Install offline cement tool.
    a. Current offline cement tool schematics can be seen in Figure 1 (Cameron) and Figure 2 (Cactus).
12. Rig up cement head and cementing lines.
    a. Pressure test cement lines against cement head to 80% of casing burst for 10 min.
13. Break circulation on well to confirm no restrictions.
    a. If gas is present on circulation, well will be shut in and returns rerouted through gas buster.
    b. Max anticipated time before circulating with cement truck is 6 hrs.
14. Pump cement job as per plan.
    a. At plug bump, test casing to 0.22 psi/ft or 1500 psi, whichever is greater.
    b. If plug does not bump on calculated, shut down and wait 8 hrs or 500 psi compressive strength, whichever is greater before testing casing.
15. Confirm well is static and floats are holding after cement job.
    a. With floats holding and backside static:
        i. Remove cement head.
    b. If floats are leaking:
        i. Shut-in well and WOC (Wait on Cement) until tail slurry reaches 500 psi compressive strength and the casing is static prior to removing cement head.
    c. If there is flow on the backside:
        i. Shut in well and WOC until tail slurry reaches 500 psi compressive strength. Ensure that the casing is static prior to removing cement head.
16. Remove offline cement tool.
17. Install night cap with pressure gauge for monitoring.
18. Test night cap to 5,000 psi for 10 min.

Example Well Control Plan Content

A. Well Control Component Table

The table below, which covers the cementing of the **5M MASP (Maximum Allowable Surface Pressure) portion of the well**, outlines the well control component rating in use. This table, combined with the mud program, documents that two barriers to flow can be maintained at all times, independent of the BOP nippled up to the wellhead.

Intermediate hole section, 5M requirement

Component	RWP
Pack-off	10M
Casing Wellhead Valves	10M
Annular Wellhead Valves	5M
TA Plug	10M
Float Valves	5M
2” 1502 Lo-Torque Valves	15M

B. Well Control Procedures

Well control procedures are specific to the rig equipment and the operation at the time the kick occurs. Below are the minimal high-level tasks prescribed to assure a proper shut-in while circulating and cementing through the Offline Cement Adapter.

General Procedure While Circulating

1. Sound alarm (alert crew).
2. Shut down pumps.
3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
4. Confirm shut-in.
5. Notify tool pusher/company representative.

6. Read and record the following:
    a. SICP (Shut in Casing Pressure) and AP (Annular Pressure)
    b. Pit gain
    c. Time
    d. Regroup and identify forward plan to continue circulating out kick via rig choke and mud/gas separator. Circulate and adjust mud density as needed to control well.

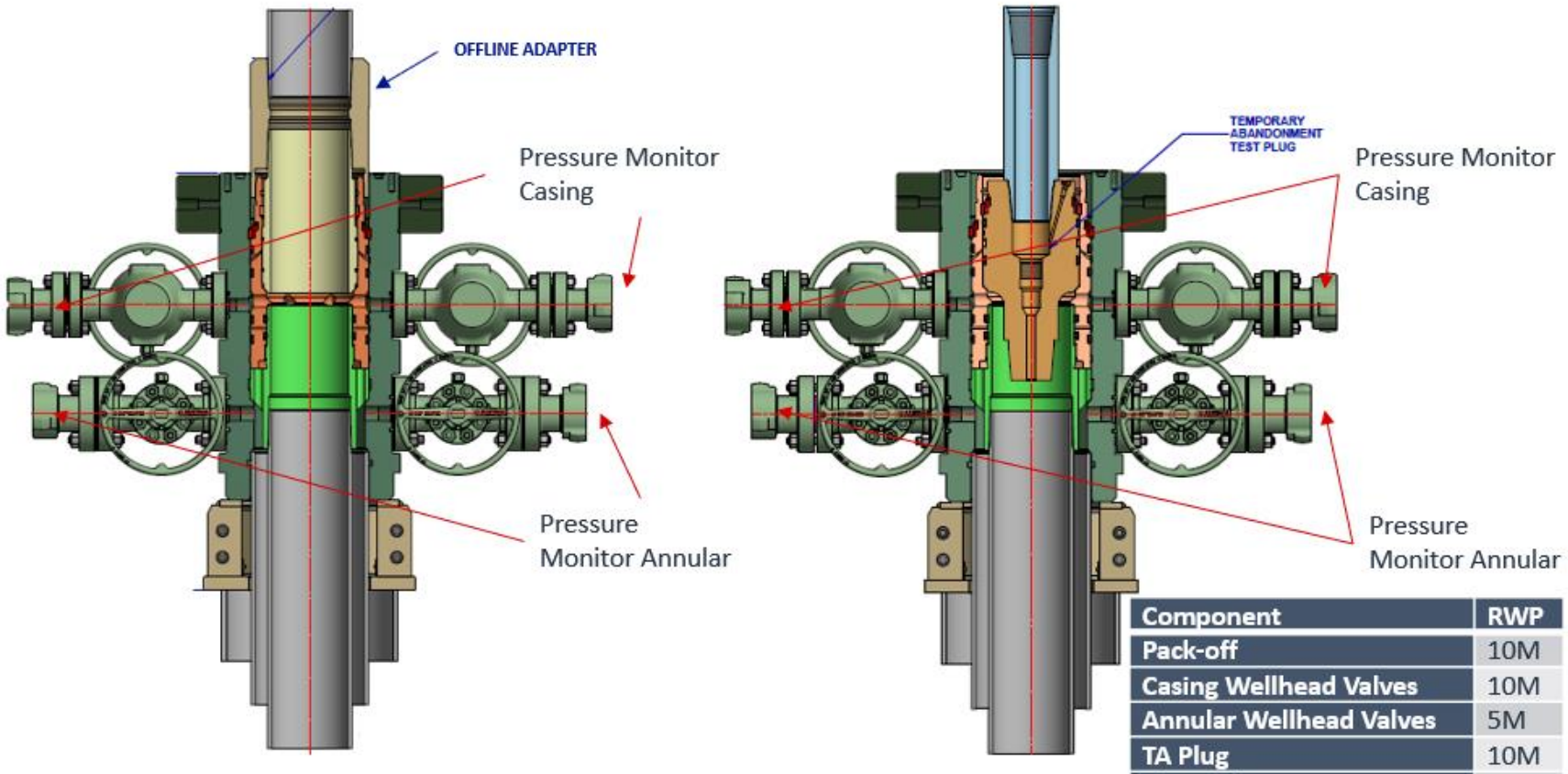
General Procedure While Cementing

1. Sound alarm (alert crew).
2. Shut down pumps.
3. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
4. Confirm shut-in.
5. Notify tool pusher/company representative.
6. Open rig choke and begin pumping again taking returns through choke manifold and mud/gas separator.
7. Continue to place cement until plug bumps.
8. At plug bump close rig choke and cement head.
9. Read and record the following
    a. SICP and AP
    b. Pit gain
    c. Time
    d. Shut-in annulus valves on wellhead

General Procedure After Cementing

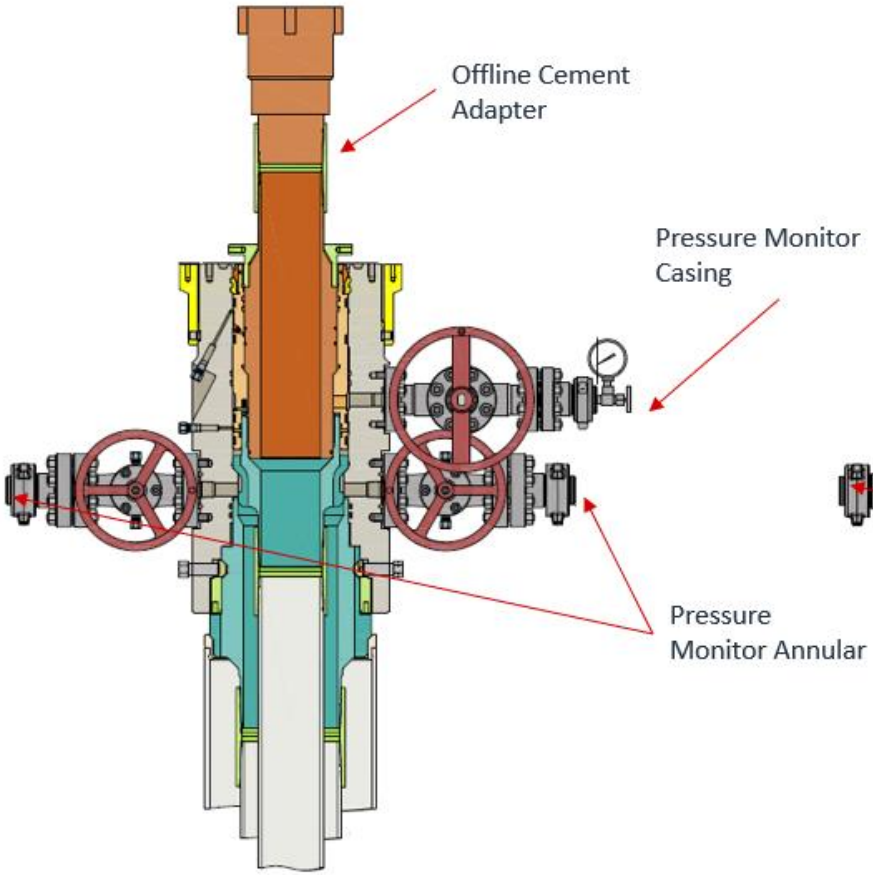
1. Sound alarm (alert crew).
2. Shut-in Well (close valves to rig pits and open valve to rig choke line. Rig choke will already be in the closed position).
3. Confirm shut-in.
4. Notify tool pusher/company representative.
5. Read and record the following:
    a. SICP and AP
    b. Pit gain
    c. Time
    d. Shut-in annulus valves on wellhead

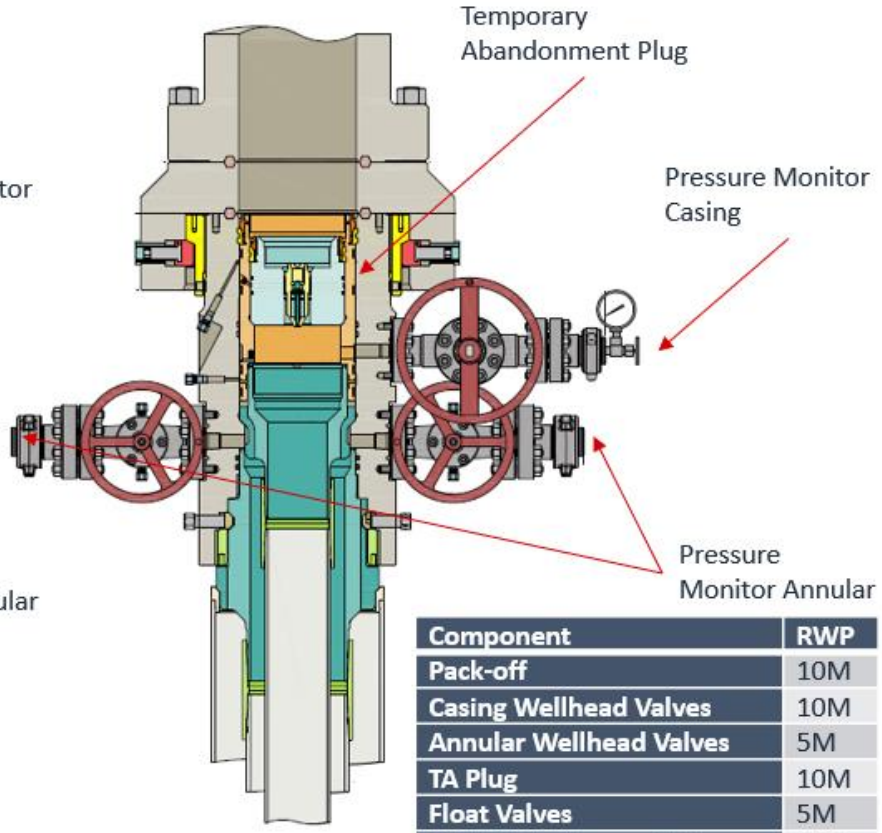
Figure 1: Cameron TA Plug and Offline Adapter Schematic



Component	RWP
Pack-off	10M
Casing Wellhead Valves	10M
Annular Wellhead Valves	5M
TA Plug	10M
Float Valves	5M
2" 1502 Lo-Torque Valves	15M

Figure 2: Cactus TA Plug and Offline Adapter Schematic





Component	RWP
Pack-off	10M
Casing Wellhead Valves	10M
Annular Wellhead Valves	5M
TA Plug	10M
Float Valves	5M
2" 1502 Lo-Torque Valves	15M

Figure 3: Back Yard Rig Up

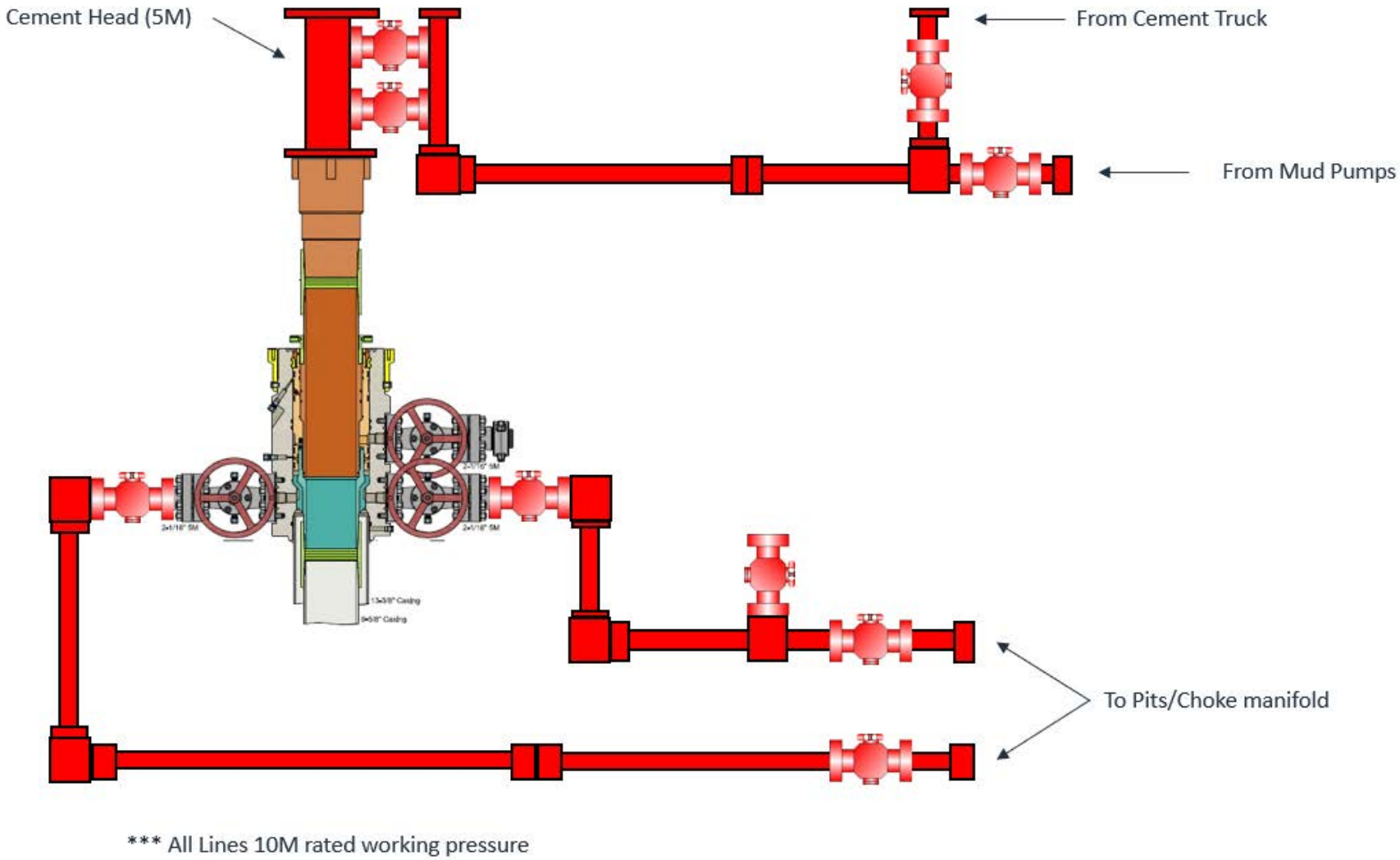
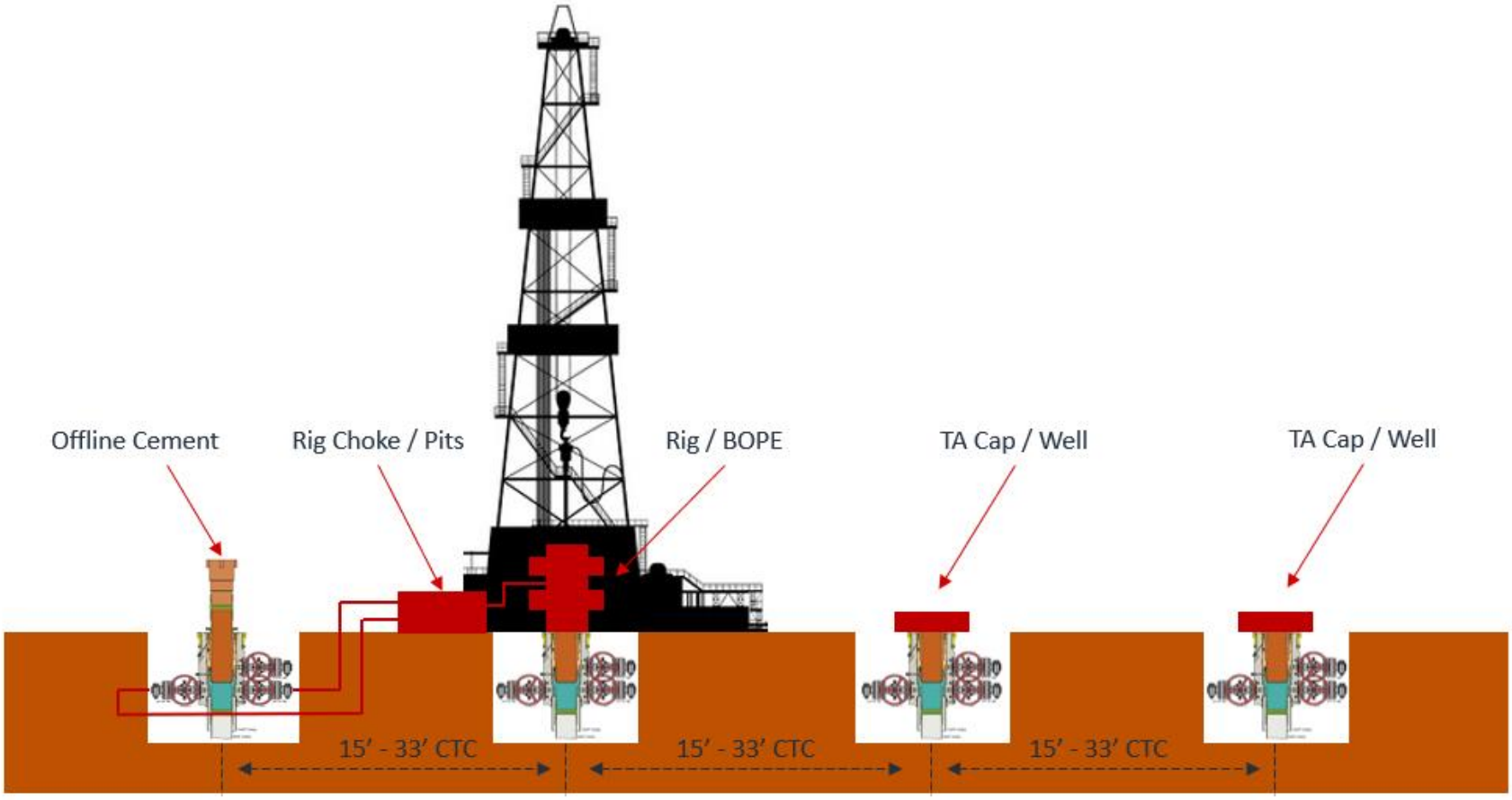


Figure 4: Rig Placement Diagram



Salt Section Annular Clearance Variance Request

Daniel Moose

Current Design (Salt Strings)

0.422” Annular clearance requirement

> - Casing collars shall have a minimum clearance of 0.422 inches on all sides in the hole/casing annulus, with recognition that variances can be granted for justified exceptions.

- 12.25” Hole x 9.625”40# J55/HCK55 LTC Casing
  - 1.3125” Clearance to casing OD
  - 0.8125” Clearance to coupling OD
- 9.875” Hole x 8.75” 38.5# P110 Sprint-SF Casing
  - 0.5625” Clearance to casing OD
  - 0.433” Clearance to coupling OD

Annular Clearance Variance Request

EOG request permission to allow deviation from the 0.422” annulus clearance requirement for the intermediate (salt) section from Onshore Order #2 under the following conditions:

- The variance is not applicable within the Potash Boundaries or Capitan Reef areas.
- Operator takes responsibility to get casing to set point in the event that the clearance causes stuck pipe issues

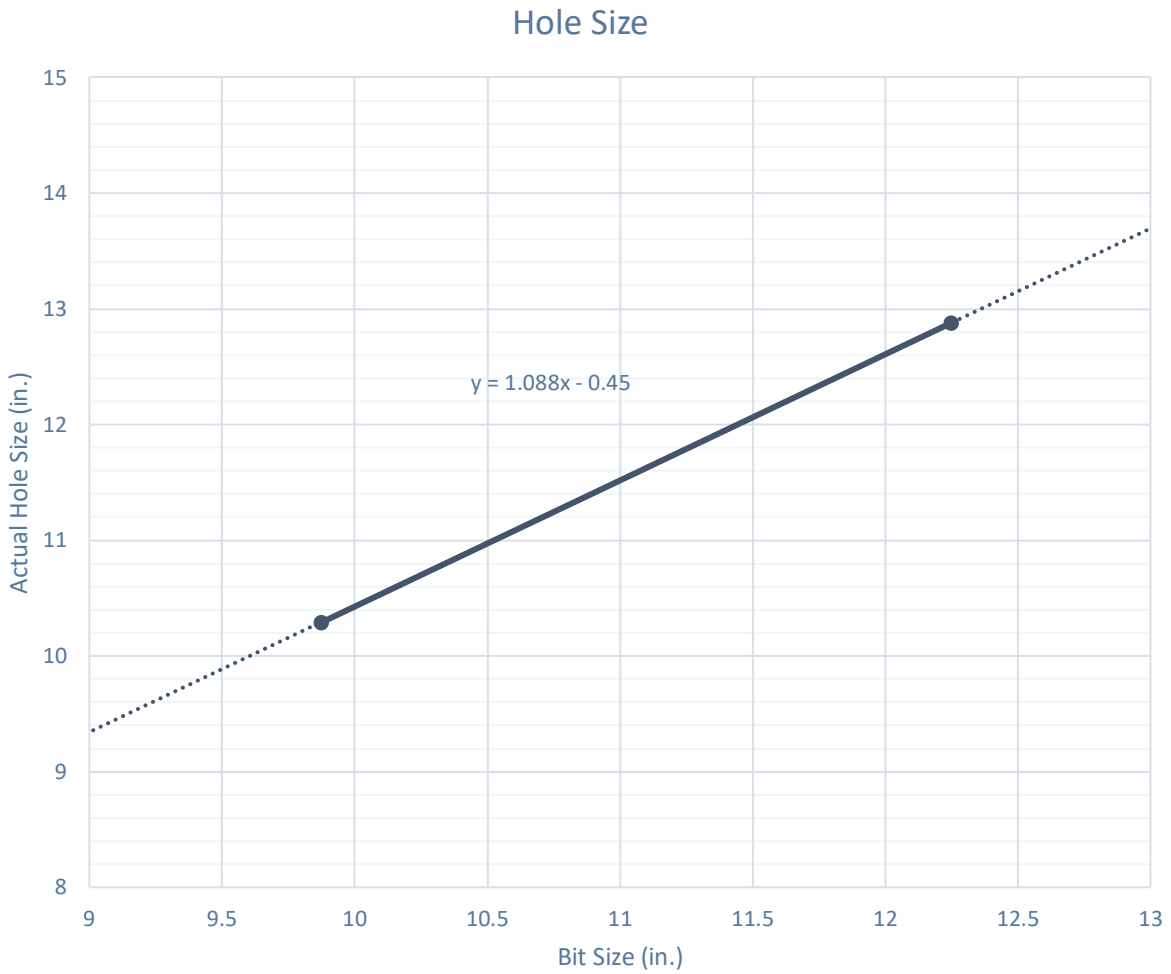
Volumetric Hole Size Calculation

Hole Size Calculations Off Cement Volumes

- Known volume of cement pumped
- Known volume of cement returned to surface
- Must not have had any losses
- Must have bumped plug

Average Hole Size

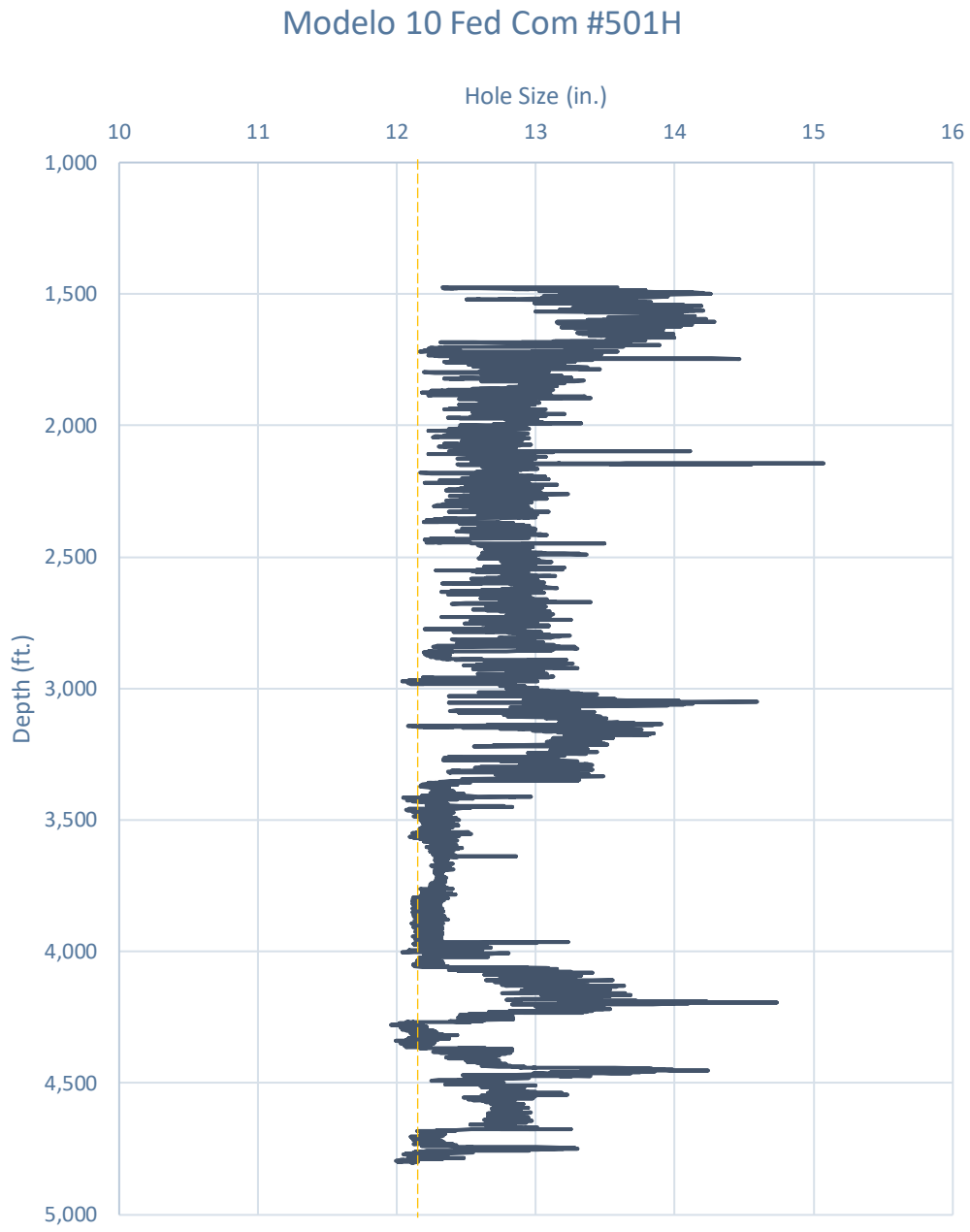
- 12.25” Hole
  - 12.88” Hole
    - 5.13% diameter increase
    - 10.52% area increase
  - 0.63” Average enlargement
  - 0.58” Median enlargement
  - 179 Well Count
- 9.875” Hole
  - 10.30” Hole
    - 4.24% diameter increase
    - 9.64% area increase
  - 0.42” Average enlargement
  - 0.46” Median enlargement
  - 11 Well Count



Caliper Hole Size (12.25”)

Average Hole Size

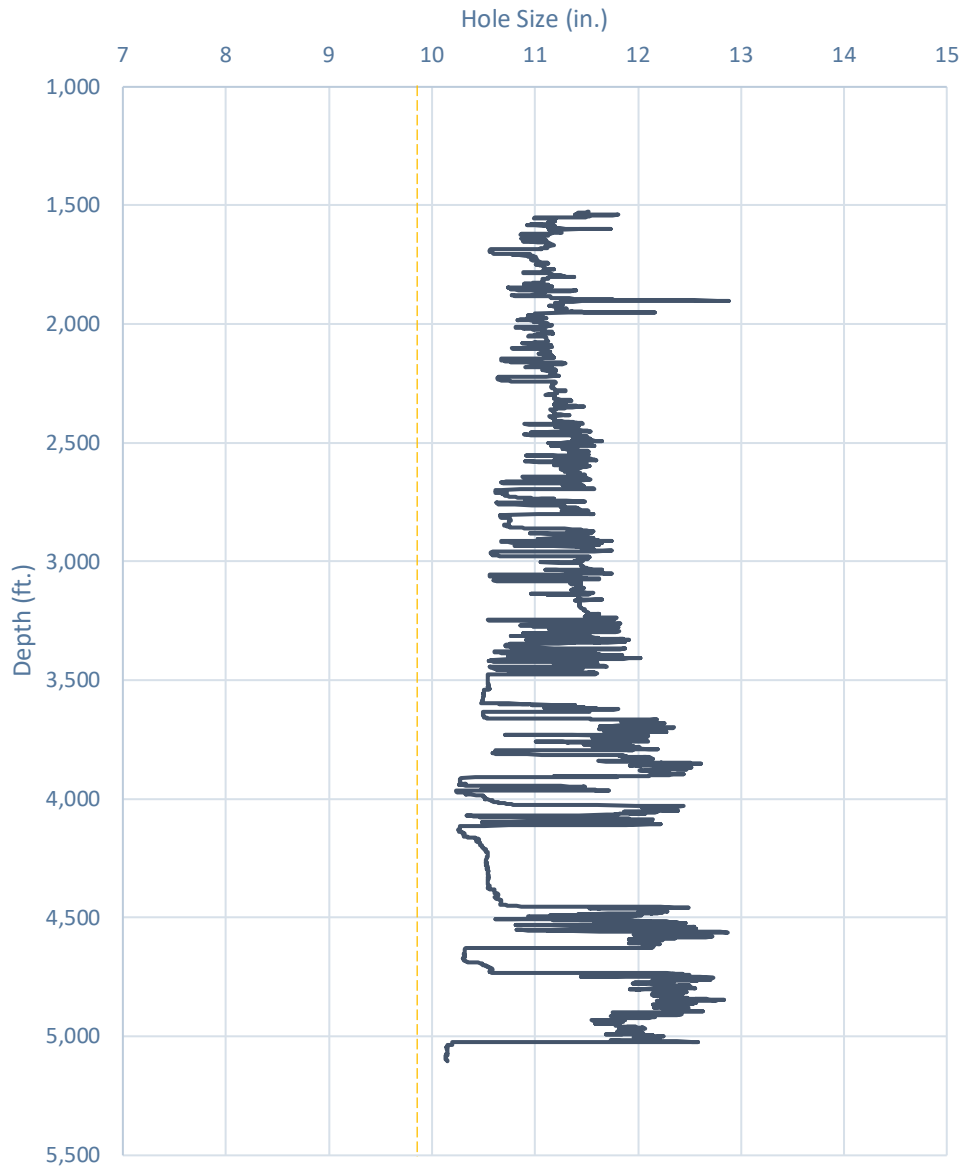
- 12.25” Bit
  - 12.76” Hole
    - 4.14% diameter increase
    - 8.44% area increase
  - 0.51” Average enlargement
  - 0.52” Median enlargement
  - Brine



Caliper Hole Size (9.875”)

Average Hole Size

- 9.875” Hole
  - 11.21” Hole
    - 13.54% diameter increase
    - 28.92% area increase
  - 1.33” Average enlargement
  - 1.30” Median enlargement
  - EnerLite



Design A

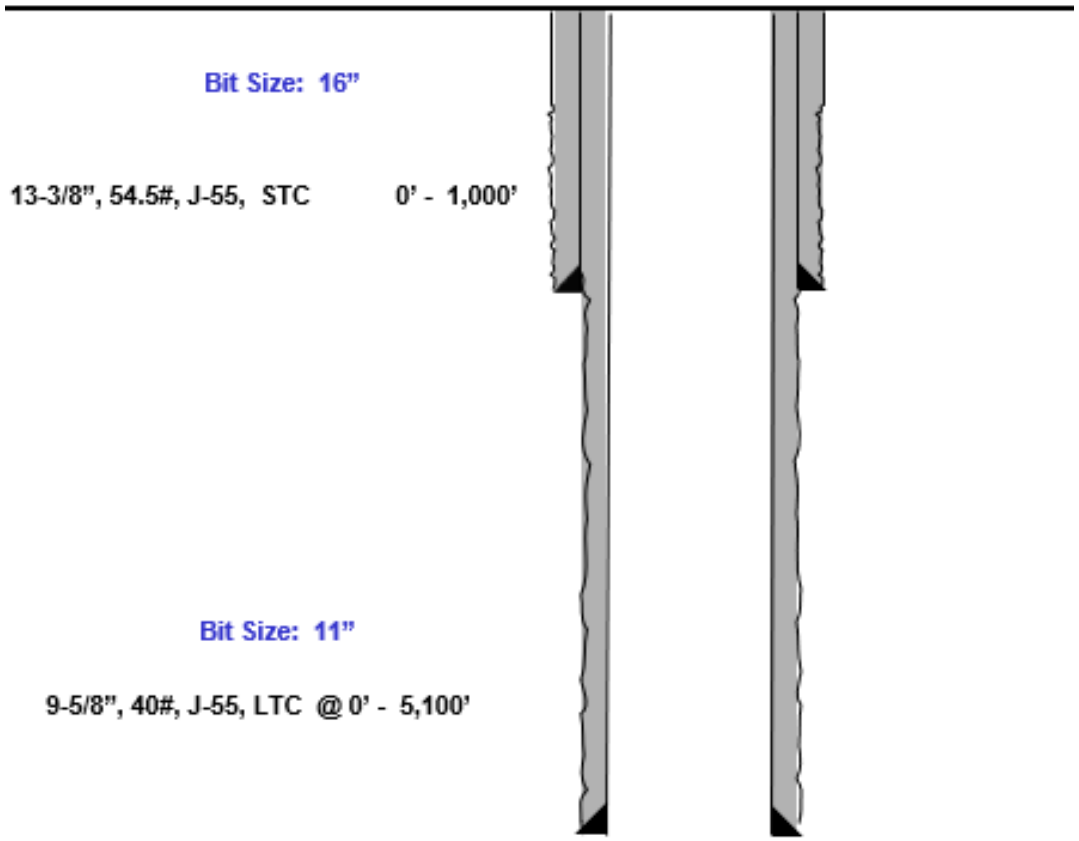
Proposed 11” Hole with 9.625” 40# J55/HCK55 LTC Casing

- 11” Bit + 0.52” Average hole enlargement = 11.52” Hole Size
  - 0.9475” Clearance to casing OD

    $= \frac{11.52 - 9.625}{2}$
  - 0.4475” Clearance to coupling OD

    $= \frac{11.52 - 10.625}{2}$
- Previous Shoe – 13.375” 54.5# J55 STC
  - 0.995” Clearance to coupling OD (~1,200’ overlap)

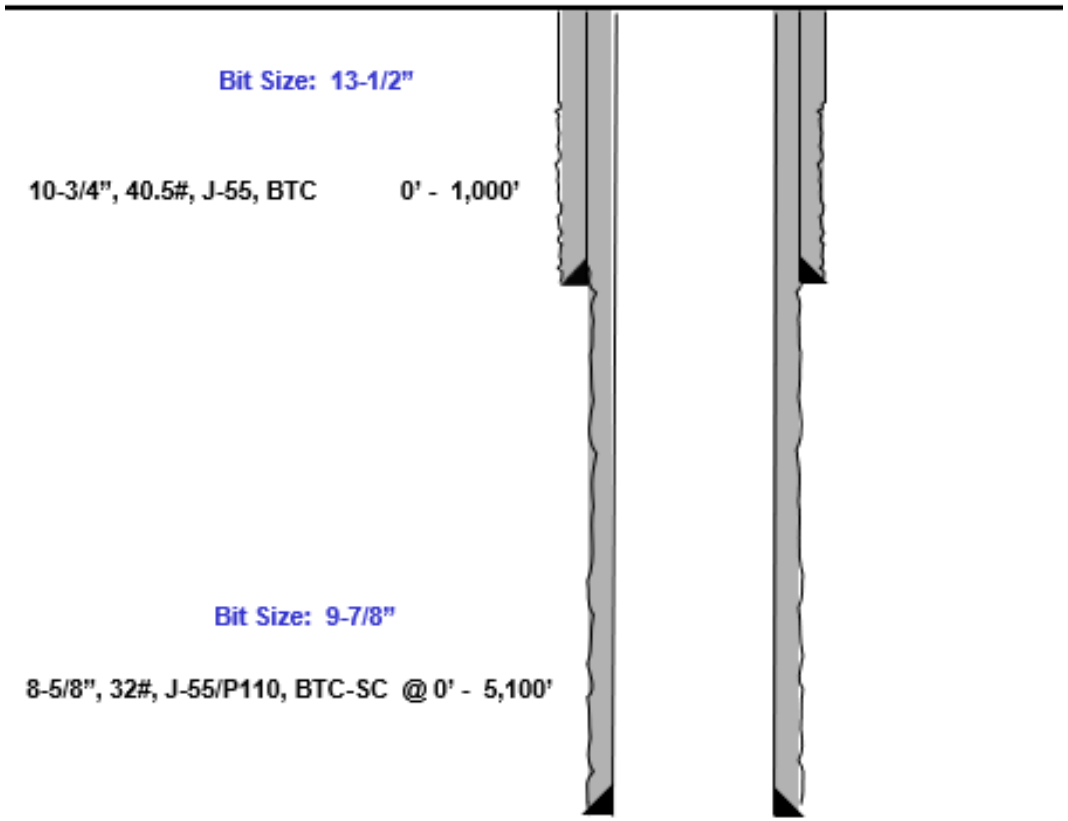
    $= \frac{12.615 - 10.625}{2}$



Design B

Proposed 9.875” Hole with 8.625” 32# J55/P110 BTC-SC Casing

- 9.875” Bit + 0.42” Average hole enlargement = 10.295” Hole Size
  - 0.835” Clearance to casing OD
    $$= \frac{10.295 - 8.625}{2}$$
  - 0.585” Clearance to coupling OD
    $$= \frac{10.295 - 9.125}{2}$$
- Previous Shoe – 10.75” 40.5# J55 STC
  - 0.4625” Clearance to coupling OD (~1,200’ overlap)
    $$= \frac{10.05 - 9.125}{2}$$



Index

Casing Spec Sheets

PERFORMANCE DATA

API LTC 9.625 in 40.00 lbs/ft K55 HC
Technical Data Sheet

Tubular Parameters

Size	9.625	in	Minimum Yield	55	ksi
Nominal Weight	40.00	lbs/ft	Minimum Tensile	95	ksi
Grade	K55 HC		Yield Load	629	kips
PE Weight	38.94	lbs/ft	Tensile Load	1088	kips
Wall Thickness	0.395	in	Min. Internal Yield Pressure	3,950	psi
Nominal ID	8.835	in	Collapse Pressure	3600	psi
Drift Diameter	8.750	in			
Nom. Pipe Body Area	11.454	in²			

Connection Parameters

Connection OD	10.625	in
Coupling Length	10.500	in
Threads Per Inch	8	tpi
Standoff Thread Turns	3.50	turns
Make-Up Loss	4.750	in
Min. Internal Yield Pressure	3,950	psi

Pipe Body and API Connections Performance Data

13.375 54.50/0.380 J55 PDF

New Search »

« Back to Previous List

USC Metric

6/8/2015 10:04:37 AM

Mechanical Properties	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
Dimensions	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.380	--	--	--	in.
Inside Diameter	12.615	12.615	--	12.615	in.
Standard Drift	12.459	12.459	--	12.459	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	54.50	--	--	--	lbs/ft
Plain End Weight	52.79	--	--	--	lbs/ft
Performance	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,130	1,130	--	1,130	psi
Minimum Internal Yield Pressure	2,740	2,740	--	2,740	psi
Minimum Pipe Body Yield Strength	853.00	--	--	--	1000 lbs
Joint Strength	--	909	--	514	1000 lbs
Reference Length	--	11,125	--	6,290	ft
Make-Up Data	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	3,860	ft-lbs
Maximum Make-Up Torque	--	--	--	6,430	ft-lbs

Casing Spec Sheets

Pipe Body and API Connections Performance Data

10.750 40.50/0.350 J55 PDF

New Search »

« Back to Previous List

USC Metric

6/8/2015 10:14:05 AM

Mechanical Properties	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
Dimensions	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	10.750	11.750	--	11.750	in.
Wall Thickness	0.350	--	--	--	in.
Inside Diameter	10.050	10.050	--	10.050	in.
Standard Drift	9.894	9.894	--	9.894	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	40.50	--	--	--	lbs/ft
Plain End Weight	38.91	--	--	--	lbs/ft
Performance	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,580	1,580	--	1,580	psi
Minimum Internal Yield Pressure	3,130	3,130	--	3,130	psi
Minimum Pipe Body Yield Strength	629.00	--	--	--	1000 lbs
Joint Strength	--	700	--	420	1000 lbs
Reference Length	--	11,522	--	6,915	ft
Make-Up Data	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	3,150	ft-lbs
Maximum Make-Up Torque	--	--	--	5,250	ft-lbs

VALLOUREC STAR 8.625 32# J55 S S2L2 DA 7.875 W/O# SLN # PO# MADE IN USA FT LB

vallourec

API 5CT, 10th Ed. Connection Data Sheet

O.D. (in)	WEIGHT (lb/ft)	WALL (in)	GRADE	*API DRIFT (in)	RBW %
8.625	Nominal: 32.00 Plain End: 31.13	0.352	J55	7.796	87.5

Material Properties (PE)	
Pipe	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi
Coupling	
Minimum Yield Strength:	55 ksi
Maximum Yield Strength:	80 ksi
Minimum Tensile Strength:	75 ksi

Pipe Body Data (PE)	
Geometry	
Nominal ID:	7.92 inch
Nominal Area:	9.149 in^2
*Special/Alt. Drift:	7.875 inch
Performance	
Pipe Body Yield Strength:	503 kips
Collapse Resistance:	2,530 psi
Internal Yield Pressure: (API Historical)	3,930 psi

API Connection Data Coupling OD: 9.625"	
STC Performance	
STC Internal Pressure:	3,930 psi
STC Joint Strength:	372 kips
LTC Performance	
LTC Internal Pressure:	3,930 psi
LTC Joint Strength:	417 kips
SC-BTC Performance - Cplg OD = 9.125"	
BTC Internal Pressure:	3,930 psi
BTC Joint Strength:	503 kips

API Connection Torque					
STC Torque (ft-lbs)					
Min:	2,793	Opti:	3,724	Max:	4,655
LTC Torque (ft-lbs)					
Min:	3,130	Opti:	4,174	Max:	5,217
BTC Torque (ft-lbs)					
follow API guidelines regarding positional make up					

*Alt. Drift will be used unless API Drift is specified on order.

**If above API connections do not suit your needs, VAM® premium connections are available up to 100% of pipe body ratings.

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Phone:(575) 393-6161 Fax:(575) 393-0720
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District III
1000 Rio Brazos Rd., Aztec, NM 87410
Phone:(505) 334-6178 Fax:(505) 334-6170
District IV
1220 S. St Francis Dr., Santa Fe, NM 87505
Phone:(505) 476-3470 Fax:(505) 476-3462

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

CONDITIONS

Action 300051

CONDITIONS

Operator: EOG RESOURCES INC 5509 Champions Drive Midland, TX 79706	OGRID: 7377
	Action Number: 300051
	Action Type: [C-103] NOI Change of Plans (C-103A)

CONDITIONS

Created By	Condition	Condition Date
pkautz	None	2/6/2024