Form 3160-5
(June 2015)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

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

SUNDRY NOTICES AND REPORTS ON WELLS NM OIL CONSERVATION

Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals. ARTESIA DISTRICT

NOV 29 2018

SUBMIT IN TRIPLICATE - Other instructions on page 2

RECEIVED

5. Lease Serial No.
NMLC068408

6. If Indian, Allottee or Tribe Name

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

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

8. Well Name and No.
BIG EDDY UNIT DI4B 273H

2. Name of Operator
BOPCO LP

Contact: KELLY KARDOS
E-Mail: kelly_kardos@xtoenergy.com

9. API Well No.
30-015-43646-00-X1

3a. Address
6401 HOLIDAY HILL RD BLDG 5 SUITE 200
MIDLAND, TX 79707

3b. Phone No. (include area code)
Ph: 432-620-4374

10. Field and Pool or Exploratory Area
WILLIAMS SINK

4. Location of Well *(Footage, Sec., T., R., M., or Survey Description)*
Sec 5 T20S R31E SWSE 720FSL 2105FEL

11. County or Parish, State
EDDY COUNTY, 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
☐ Subsequent Report	☐ Alter Casing	☐ Hydraulic Fracturing	☐ Reclamation	☐ Well Integrity
☐ Final Abandonment Notice	☐ Casing Repair	☐ New Construction	☐ Recomplete	☒ Other Change to Original A PD
	☐ Change Plans	☐ Plug and Abandon	☐ Temporarily Abandon	
	☐ 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 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 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 determined that the site is ready for final inspection.

BOPCO, L.P. requests permission to make the following changes to the approved APD:

1. Change BHL from 660?FSL & 330?FWL to 660?FSL & 200?FWL
2. Drilling Program
3. Directional Program

Attachments:
1. C-102 & Supplement
2. Drilling Program
3. Directional Survey
4. BOP/CM/FH

Carlsbad Field Office
OCD Artesia

Accepted For Record
NMOCD 12-11-18

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

Electronic Submission #436413 verified by the BLM Well Information System
For BOPCO LP, sent to the Carlsbad
Committed to AFMSS for processing by PRISCILLA PEREZ on 09/27/2018 (18PP2748SE)

Name *(Printed/Typed)* KELLY KARDOS — Title REGULATORY COORDINATOR

Signature (Electronic Submission) — Date 09/21/2018

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By MUSTAFA HAQUE — Title PETROLEUM ENGINEER — Date 11/28/2018

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)

**** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ** BLM REVISED ****

RWP 12-7-18

DRILLING PLAN: BLM COMPLIANCE
(Supplement to BLM 3160-3)

XTO Energy Inc.
Big Eddy Unit DI 4B 273H
Projected TD: 16952' MD / 8946' TVD
SHL: 720' FSL & 2105' FEL , Section 5, T20S, R31E
BHL: 660' FSL & 200' FEL , Section 6, T20S, R31E
Eddy County, NM

1. Geologic Name of Surface Formation

A. Quaternary

2. Estimated Tops of Geological Markers & Depths of Anticipated Fresh Water, Oil or Gas:

Formation	Well Depth (TVD)	Water/Oil/Gas
Rustler	564'	Water
Top of Salt	810'	Water
Base of Salt	2306'	Water
Capitan	2912'	Water
Delaware	4225'	Water
Bone Spring	6972'	Water/Oil/Gas
1st Bone Spring Ss	8197'	Water/Oil/Gas
2nd Bone Spring Ss	8823'	Water/Oil/Gas
Target/Land Curve	8946'	Water/Oil/Gas

*** Hydrocarbons @ Brushy Canyon
*** Groundwater depth 40' (per NM State Engineers Office).

SEE COA

No other formations are expected to yield oil, gas or fresh water in measurable volumes. The surface fresh water sands will be protected by setting 16 inch casing @ 780' (30' above the salt) and circulating cement back to surface. The salt will be isolated by setting 11-3/4 inch casing at 2330' and circulating cement to surface. 8-5/8 inch intermediate casing will be set at 4325'. A 7-7/8 inch curve and lateral hole will be drilled to TD, where 5-1/2 inch casing will be set and cemented ~~back up to the 8-5/8 inch casing shoe~~. 50' on top of Capitan Reef Top

3. Casing Design

Hole Size	Depth	OD Csg	Weight	Collar	Grade	New/Used	SF Burst	SF Collapse	SF Tension
20"	0' – 780'	16"	75	STC	J-55	New	3.64	3.91	12.14
14-3/4"	0' – 2330'	11-3/4"	42	STC	H40	New	1.64	1.46	3.14
10-5/8"	0' – 4325'	8-5/8"	32	STC	J-55	New	1.85	2.06	2.69
7-7/8"	0' – 16952'	5-1/2"	20	LTC	P-110	New	1.33	2.71	2.27

- XTO requests to utilize centralizers only in the curve after the KOP and only a minimum of one every other joint.
- 16" Collapse analyzed using 75% evacuation. Casing to be filled while running.
- 11-3/4" & 8-5/8" Collapse analyzed using 50% evacuation based on regional experience.
- 5-1/2" tension calculated using vertical hanging weight plus the lateral weight multiplied by a friction factor of 0.35

WELLHEAD:

Temporary Wellhead

- 16" SOW bottom x 16-3/4" 3M top flange.

Permanent Wellhead – GE RSH Multibowl System

A. Starting Head: 13-5/8" 5M top flange x 11-3/4" SOW bottom
B. Tubing Head: 13-5/8" 5M bottom flange x 7" 10M top flange
- Wellhead will be installed by manufacturer's representatives.
- Manufacturer will monitor welding process to ensure appropriate temperature of seal.
- Operator will test the 8-5/8" casing per BLM Onshore Order 2
- Wellhead manufacturer representative will not be present for BOP test plug installation

Mark E Lee PE Agent
Nov 27, 2018 1350 hrs.

4. Cement Program

Surface Casing: 16", 75 New J-55, STC casing to be set at +/- 780'

Lead: 930 sxs Class C + Salt (mixed at 12.8 ppg, 1.88 ft3/sx, 11.45 gal/sx water)
Tail: 190 sxs Class C (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)
Compressives: 12-hr = 1000 psi 24 hr = 2000 psi

1st Intermediate Casing: 11-3/4", 42 New H40, STC casing to be set at +/- 2330'

Lead: 930 sxs Class C + Poz + Fluid Loss FL-25 + Retarder R-3 + Salt + Bentonite (mixed at 12.8 ppg, 1.88 ft3/sx, 9.93 gal/sx water)
Tail: 190 sxs Class C + Retarder R-3 (mixed at 14.8 ppg, 1.33 ft3/sx, 6.30 gal/sx water)
Compressives: 12-hr = 1000 psi 24 hr = 2000 psi

2nd Intermediate Casing: 8-5/8", 32 New J-55, STC casing to be set at +/- 4325'
ECP/DV Tool to be set at 2430'
1st Stage

Lead 1: 510 sxs Class C + Glass Beads + integraSeal + Bonding Agent BA-90 + Foam Preventer FP-6L + Sodium Metasilicate A-2 + Anti Settling ASA-301 + Retarder R-21 + Extender LW-5E (mixed at 9.5 ppg, 3.8 ft3/sx, 18.7 gal/sx water)

Lead 2: 210 sxs Class C + Poz + IntegraSeal Cello + IntegraSeal Kol + Salt + Sodium Metasilicate A-2 + Retarder R-21 + Fluid Loss FL-52 + Bentonite (mixed at 11.5 ppg, 2.68 ft3/sx, 15.46 gal/sx water)
Tail: 150 sxs Class C + Foam Preventer FP-6L + Retarder R-21 + Fluid Loss FL-52 (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)
Compressives: 12-hr = 1000 psi 24 hr = 2000 psi

2nd Stage

Lead: 430 sxs Class C + Poz + IntegraSeal Cello + IntegraSeal Kol + Salt + Retarder R-3 + Sodium Metasilicate A-2 + Fluid Loss FL-52 + Bentonite (mixed at 12.8 ppg, 1.88 ft3/sx, 9.61 gal/sx water)
Tail: 150 sxs Class C + Fluid Loss FL-52 (mixed at 14.8 ppg, 1.33 ft3/sx, 6.39 gal/sx water)
Compressives: 12-hr = 1000 psi 24 hr = 2000 psi

Production Casing: 5-1/2", 20 New P-110, LTC casing to be set at +/- 16952'

Lead 1: 10 sxs Class C + Glass Beads + IntegraSeal Kol + Bonding Agent BA-90 + Foam Preventer FP-6L + Sodium Metasilicate A-2 + Anti Settling ASA-301 + Retarder R-21 + Bentonite (mixed at 9.5 ppg, 3.8 ft3/sx, 18.7 gal/sx water)
Lead 2: 340 sxs Class C + Poz + IntegraSeal Cello + IntegraSeal Kol + Foam Preventer FP-6L + Salt + Sodium Metasilicate A-2 + Bentonite (mixed at 11.5 ppg, 2.72 ft3/sx, 15.9 gal/sx water)
Tail: 1250 sxs Class C + IntegraSeal Kol + Foam Preventer FP-6L + Salt + Fluid Loss FL-52 + Dispersant CS-32 + Retarder R-21 + Bonding Agent BA-90 (mixed at 13.2 ppg, 1.61 ft3/sx, 9.36 gal/sx water)
Compressives: 12-hr = 9 psi 24 hr = 1800 psi

5. Pressure Control Equipment

The blow out preventer equipment (BOP) on surface casing/temp. wellhead will consist of a 20" minimum 2M Hydril. MASP should not exceed 723 psi.

Once the permanent WH is installed on the 11-3/4" casing, the blow out preventer equipment (BOP) will consist of a 13-5/8" minimum 5M Hydril and a 13-5/8"" minimum 3M 2-Ram BOP. MASP should not exceed 2126 psi.

All BOP testing will be done by an independent service company. Annular pressure tests will be limited to 50% of the working pressure. When nippling up on the 13-5/8" 3M bradenhead and flange, the BOP test will be limited to 3000 psi. Since a multibowl system will be used, subsequent BOP pressure tests will be performed as necessary based on required testing schedule (i.e., at least every 30 days). All BOP tests will include a low pressure test as per BLM regulations. The 3M BOP diagrams are attached. Blind rams will be functioned tested each trip, pipe rams will be functioned tested each day.

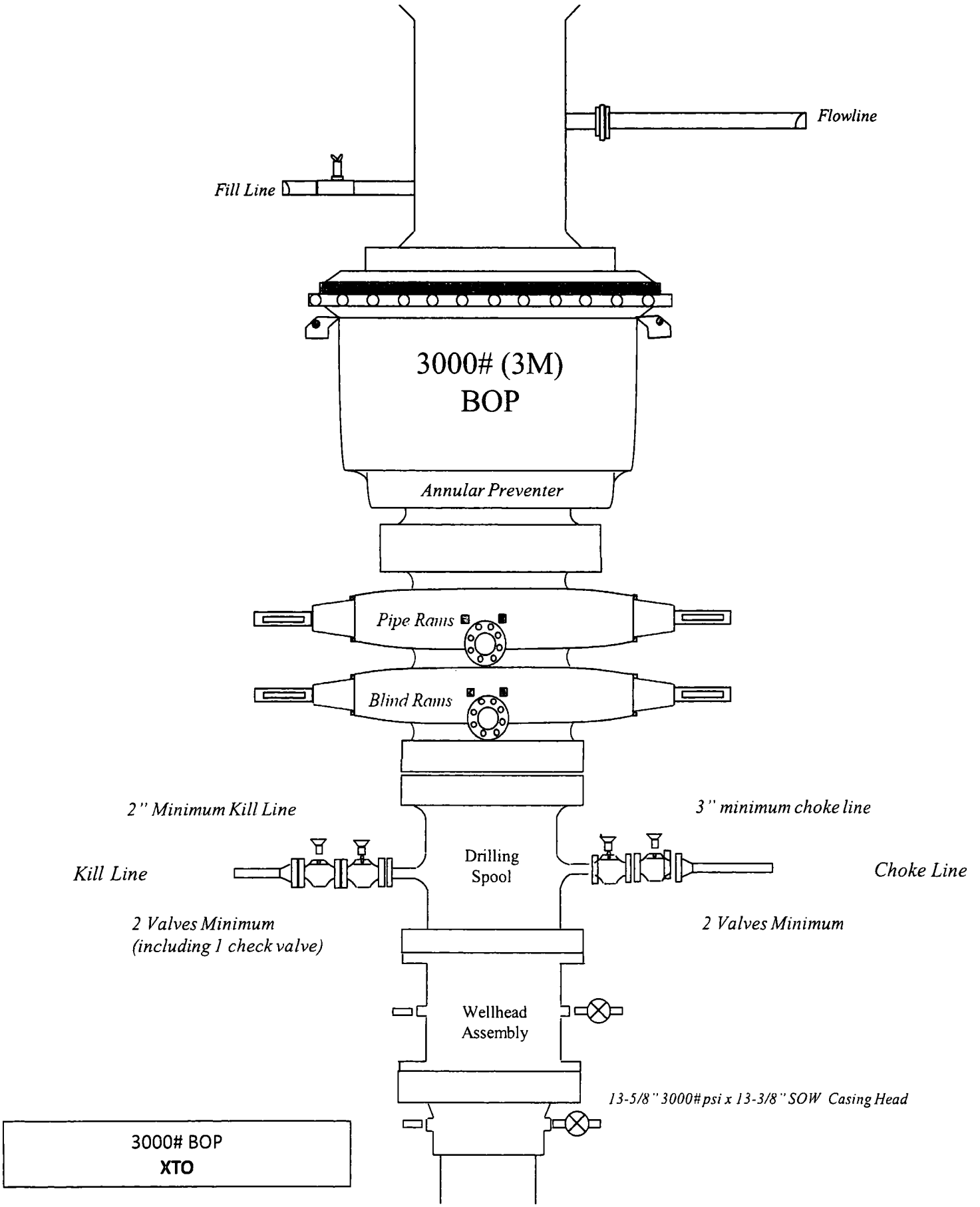
A variance is requested to allow use of a flex hose as the choke line from the BOP to the Choke Manifold. If this hose is used, a copy of the manufacturer's certification and pressure test chart will be kept on the rig. Attached is an example of a certification and pressure test chart. The manufacturer does not require anchors.

6. Proposed Mud Circulation System

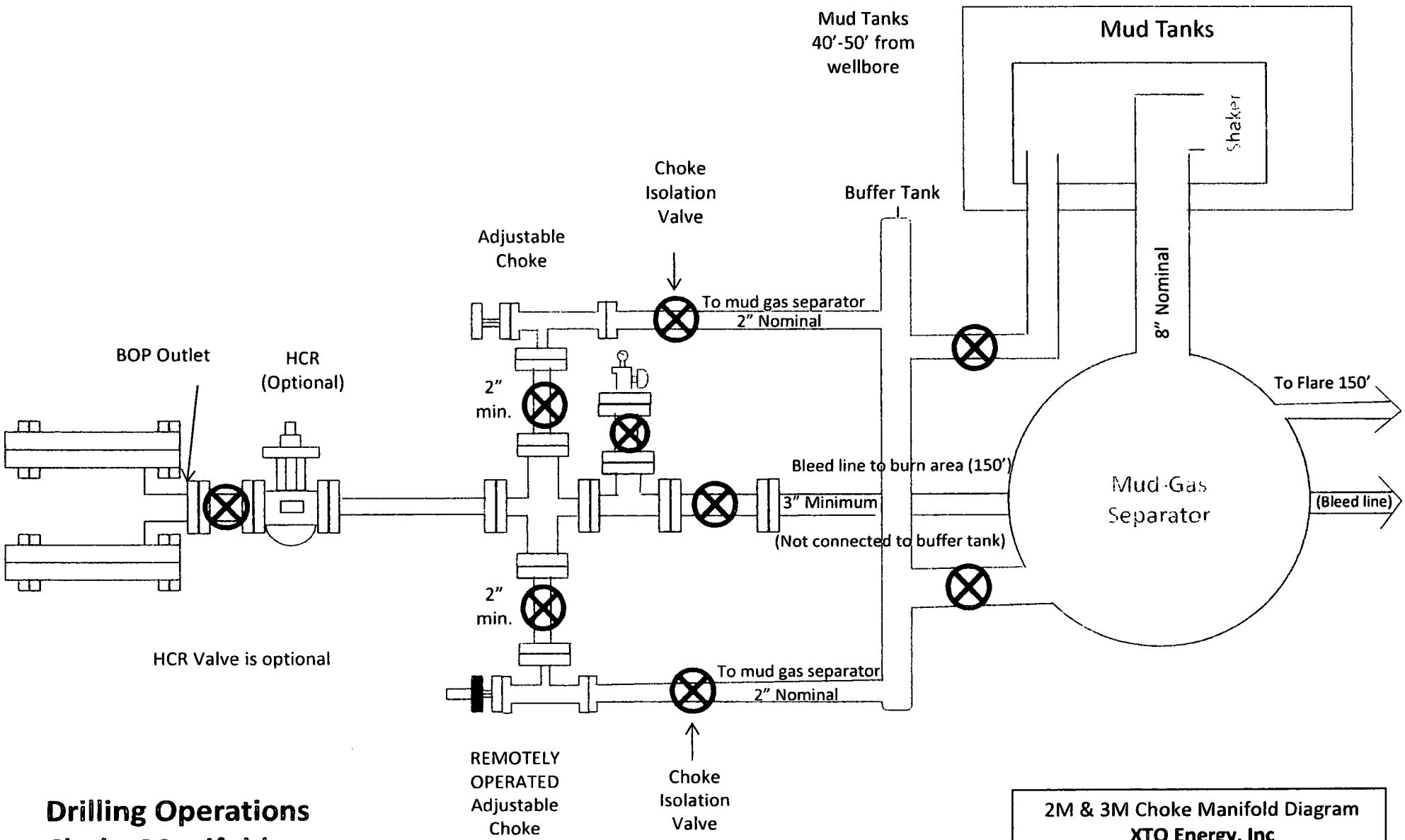
INTERVAL	Hole Size	Mud Type	MW (ppg)	Viscosity (sec/qt)	Fluid Loss (cc)
0' - 780'	20"	FW/Native	8.3-9.5	35-50	NC
780' - 2330'	14-3/4"	Brine	9.5-10.2	30-35	NC
2330' to 4325'	10-5/8"	FW	8.3-9.5	30-32	NC
4325' to 16952'	7-7/8"	FW / Cut Brine / Polymer	8.6-9.4	29-32	NC - 20

The necessary mud products for weight addition and fluid loss control will be on location at all times.

Spud with fresh water/native mud. Drill out from under 16" surface casing with brine solution. A 9.5ppg-10.2ppg brine mud will be used while drilling through the salt formation. Use fibrous materials as needed to control seepage and lost circulation. Pump viscous sweeps as needed for hole cleaning. Pump speed will be recorded on a daily drilling report after mudding up. A Pason or Totco will be used to detect changes in loss or gain of mud volume. A mud test will be performed every 24 hours to determine: density, viscosity, strength, filtration and pH as necessary. Use available solids controls equipment to help keep mud weight down after mud up. Rig up solids control equipment to operate as a closed loop system.


Flowline
Fill Line
3000# (3M)
BOP
Annular Preventer
Pipe Rams
Blind Rams
2" Minimum Kill Line
3" minimum choke line
Kill Line
Drilling
Spool
Choke Line
2 Valves Minimum
(including 1 check valve)
2 Valves Minimum
Wellhead
Assembly
13-5/8" 3000#psi x 13-3/8" SOW Casing Head

3000# BOP
XTO



Drilling Operations
Choke Manifold
2M & 3M Service

2M & 3M Choke Manifold Diagram
XTO Energy, Inc

GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
CORPUS CHRISTI, TEXAS 78405

PHONE: 361-887-9807
FAX: 361-887-0812
EMAIL: crpe&s@gates.com
WEB: www.gates.com

GRADE D PRESSURE TEST CERTIFICATE

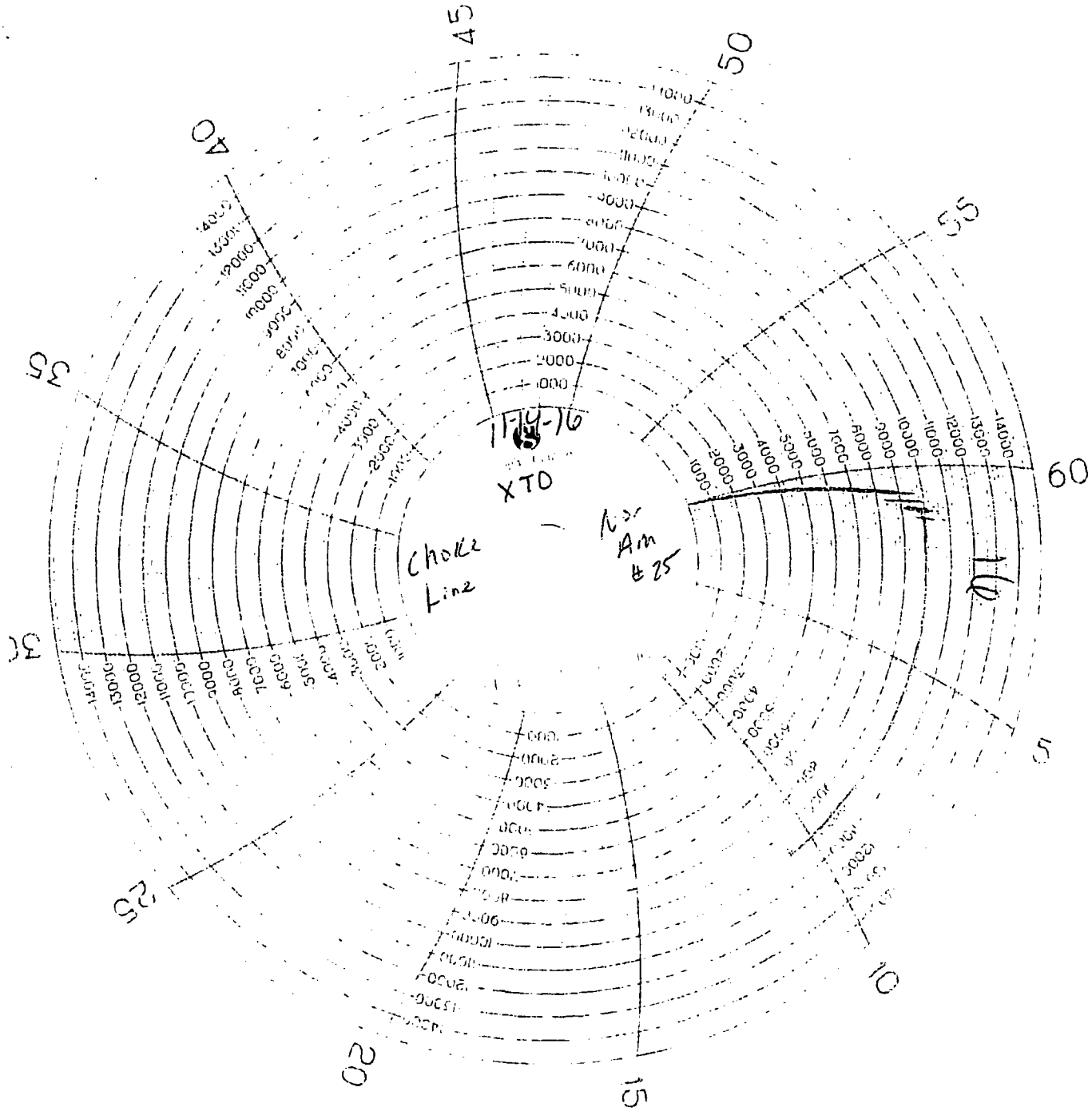
Customer	AUSTIN DISTRIBUTING	Test Date	6/8/2014
Customer Ref.	PENDING	Hose Serial No.	D-060814-1
Invoice No.	201709	Created By.	NORMA

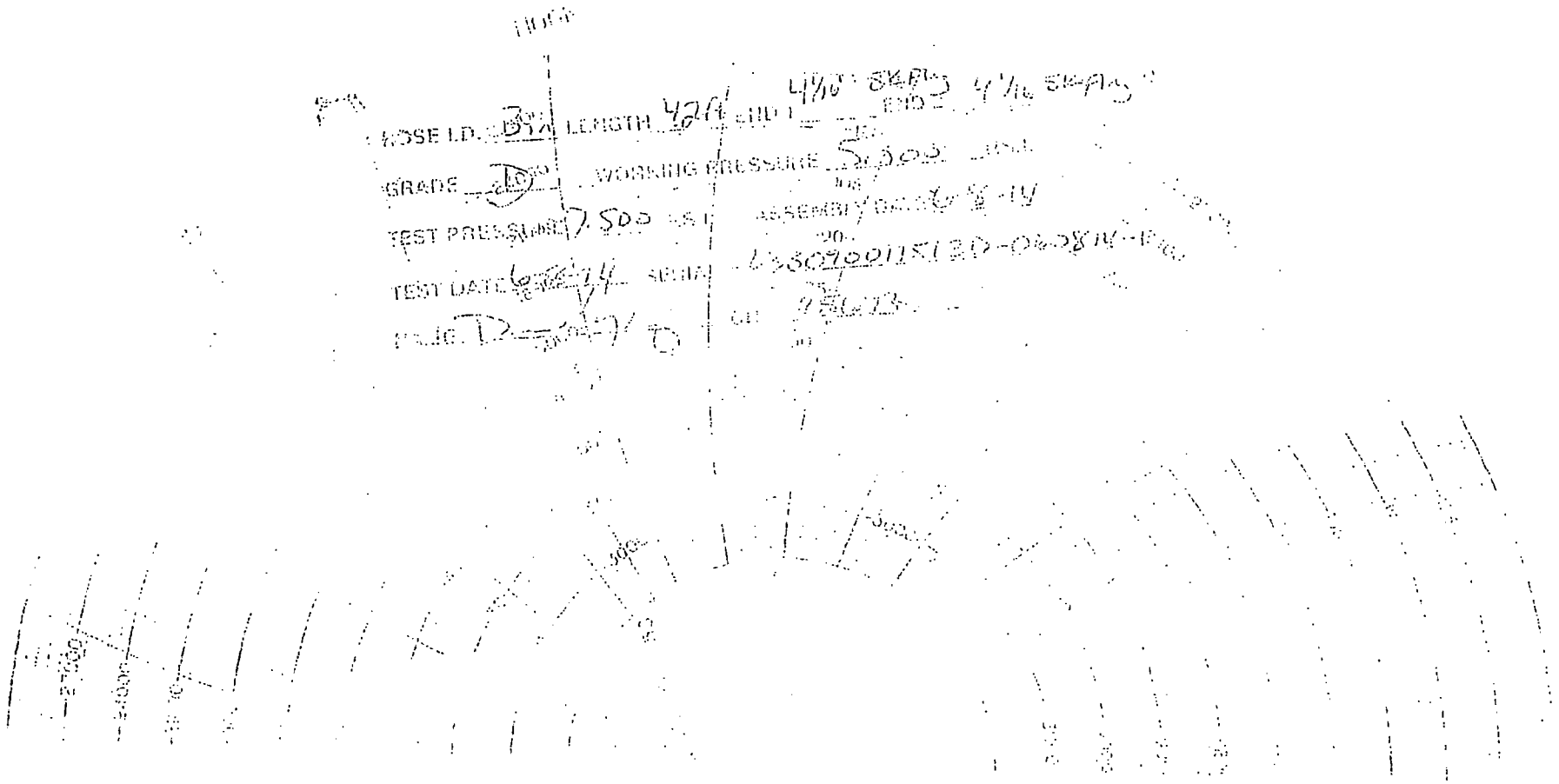
Product Description:	FD3.0-2.0R41/16.5KFLGE,E LE

End Fitting 1	4 1/16 in.5K FLG	End Fitting 2	4 1/16 in.5K FLG
Gates Part No.	4774-6001	Assembly Code	L33090011513D-060814-1
Working Pressure	5,000 PSI	Test Pressure	7,500 PSI

Gates E & S North America, Inc. certifies that the following hose assembly has been tested to the Gates Oilfield Roughneck Agreement/Specification requirements and passed the 15 minute hydrostatic test per API Spec 7K/Q1, Fifth Edition, June 2010, Test pressure 9.6.7 and per Table 9 to 7,500 psi in accordance with this product number. Hose burst pressure 9.6.7.2 exceeds the minimum of 2.5 times the working pressure per Table 9.

Quality	QUALITY	Technical Supervisor	PRODUCTION
Date	6/8/2014	Date	6/8/2014
Signature		Signature	


45
50
55
60
40
35
30
25
20
15
10
5
1000
2000
3000
4000
5000
6000
7000
8000
9000
10000
11000
12000
13000
14000
11-14-16
XTO
Choke Line
Kill Line


HOSE I.D.
LENGTH
GRADE
WORKING PRESSURE
TEST PRESSURE
TEST DATE
PROJ. ID
END
ASSEMBLY

XTO ENERGY, INC.

Eddy County, NM
Sec 5, T25S, R29E (TRUE NORTH)
Big Eddy Unit DI4B #273H

Wellbore #1

Plan: Design #1

QES Well Planning Report

05 September, 2018

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	Eddy County, NM		
Map System:	US State Plane 1927 (Exact solution)	**System Datum:**	Mean Sea Level
Geo Datum:	NAD 1927 (NADCON CONUS)		
Map Zone:	New Mexico East 3001		

Site	Sec 5, T25S, R29E (TRUE NORTH)				
Site Position:		**Northing:**	581,215.60 usft	**Latitude:**	32° 35' 49.493 N
From:	Map	**Easting:**	636,818.40 usft	**Longitude:**	103° 53' 20.670 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.24 °

Well	Big Eddy Unit DI4B #273H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	581,215.60 usft	**Latitude:**	32° 35' 49.493 N
	+E/-W	0.0 usft	**Easting:**	636,818.40 usft	**Longitude:**	103° 53' 20.670 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,464.0 usft

Wellbore	Wellbore #1			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	9/5/2018	7.00	60.34	47,999.62276682

Design	Design #1				
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	269.59	

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	
8,506.6	0.00	0.00	8,506.6	0.0	0.0	0.00	0.00	0.00	0.00	
9,417.4	91.08	269.59	9,079.5	-4.2	-583.7	10.00	10.00	-9.93	269.59	
16,951.6	91.08	269.59	8,937.5	-57.8	-8,116.4	0.00	0.00	0.00	0.00	PBHL - BEU DI4B #2

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
Rustler									
555.5	0.00	0.00	555.5	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
Salado									
801.5	0.00	0.00	801.5	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
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1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Salt									
2,297.5	0.00	0.00	2,297.5	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
Capitan									
2,903.5	0.00	0.00	2,903.5	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
Delaware Sand									
4,216.5	0.00	0.00	4,216.5	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Manzanita [Lower Cherry Canyon]									
4,469.5	0.00	0.00	4,469.5	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
Brushy Canyon									
5,379.5	0.00	0.00	5,379.5	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
Basal Brushy Canyon									
6,684.5	0.00	0.00	6,684.5	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
Base Brushy Canyon Sands / Leonard Shale									
6,950.5	0.00	0.00	6,950.5	0.0	0.0	0.0	0.00	0.00	0.00
Bone Spring									
6,963.5	0.00	0.00	6,963.5	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
Avalon Sand/Upper Avalon Shale									
7,134.5	0.00	0.00	7,134.5	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
Lower Avalon Shale									
7,718.5	0.00	0.00	7,718.5	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
First Bone Spring Sand									

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
8,188.5	0.00	0.00	8,188.5	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
Second Bone Spring Shale									
8,412.5	0.00	0.00	8,412.5	0.0	0.0	0.0	0.00	0.00	0.00
Build 10°/100'									
8,506.6	0.00	0.00	8,506.6	0.0	0.0	0.0	0.00	0.00	0.00
8,550.0	4.34	269.59	8,550.0	0.0	-1.6	1.6	10.00	10.00	0.00
8,600.0	9.34	269.59	8,599.6	-0.1	-7.6	7.6	10.00	10.00	0.00
8,650.0	14.34	269.59	8,648.5	-0.1	-17.9	17.9	10.00	10.00	0.00
8,700.0	19.34	269.59	8,696.3	-0.2	-32.3	32.3	10.00	10.00	0.00
8,750.0	24.34	269.59	8,742.7	-0.4	-50.9	50.9	10.00	10.00	0.00
8,800.0	29.34	269.59	8,787.3	-0.5	-73.5	73.5	10.00	10.00	0.00
Second Bone Spring Sand									
8,831.7	32.51	269.59	8,814.5	-0.6	-89.8	89.8	10.00	10.00	0.00
8,850.0	34.34	269.59	8,829.8	-0.7	-99.9	99.9	10.00	10.00	0.00
8,900.0	39.34	269.59	8,869.8	-0.9	-129.8	129.8	10.00	10.00	0.00
8,950.0	44.34	269.59	8,907.0	-1.2	-163.2	163.2	10.00	10.00	0.00
9,000.0	49.34	269.59	8,941.2	-1.4	-199.6	199.6	10.00	10.00	0.00
Second Bone Spring "A' Sand									
9,030.5	52.39	269.59	8,960.5	-1.6	-223.3	223.3	10.00	10.00	0.00
9,050.0	54.34	269.59	8,972.1	-1.7	-238.9	238.9	10.00	10.00	0.00
9,100.0	59.34	269.59	8,999.5	-2.0	-280.8	280.8	10.00	10.00	0.00
9,150.0	64.34	269.59	9,023.1	-2.3	-324.8	324.8	10.00	10.00	0.00
Second Bone Spring "B" Sand									
9,165.3	65.87	269.59	9,029.5	-2.4	-338.7	338.7	10.00	10.00	0.00
9,200.0	69.34	269.59	9,042.7	-2.6	-370.8	370.8	10.00	10.00	0.00
9,250.0	74.34	269.59	9,058.3	-3.0	-418.3	418.3	10.00	10.00	0.00
9,300.0	79.34	269.59	9,069.7	-3.3	-467.0	467.0	10.00	10.00	0.00
9,350.0	84.34	269.59	9,076.8	-3.7	-516.4	516.4	10.00	10.00	0.00
9,400.0	89.34	269.59	9,079.5	-4.0	-566.3	566.4	10.00	10.00	0.00
EOC @ 91.08° Inc / 269.59° Azm / 9079.5' TVD									
9,417.4	91.08	269.59	9,079.5	-4.2	-583.7	583.8	10.00	10.00	0.00
9,500.0	91.08	269.59	9,077.9	-4.7	-666.3	666.3	0.00	0.00	0.00
9,600.0	91.08	269.59	9,076.0	-5.5	-766.3	766.3	0.00	0.00	0.00
9,700.0	91.08	269.59	9,074.1	-6.2	-866.3	866.3	0.00	0.00	0.00
9,800.0	91.08	269.59	9,072.2	-6.9	-966.3	966.3	0.00	0.00	0.00
9,900.0	91.08	269.59	9,070.4	-7.6	-1,066.2	1,066.3	0.00	0.00	0.00
10,000.0	91.08	269.59	9,068.5	-8.3	-1,166.2	1,166.3	0.00	0.00	0.00
10,100.0	91.08	269.59	9,066.6	-9.0	-1,266.2	1,266.2	0.00	0.00	0.00
10,200.0	91.08	269.59	9,064.7	-9.7	-1,366.2	1,366.2	0.00	0.00	0.00
10,300.0	91.08	269.59	9,062.8	-10.4	-1,466.2	1,466.2	0.00	0.00	0.00
10,400.0	91.08	269.59	9,060.9	-11.2	-1,566.1	1,566.2	0.00	0.00	0.00
10,500.0	91.08	269.59	9,059.1	-11.9	-1,666.1	1,666.2	0.00	0.00	0.00
10,600.0	91.08	269.59	9,057.2	-12.6	-1,766.1	1,766.1	0.00	0.00	0.00
10,700.0	91.08	269.59	9,055.3	-13.3	-1,866.1	1,866.1	0.00	0.00	0.00
10,800.0	91.08	269.59	9,053.4	-14.0	-1,966.1	1,966.1	0.00	0.00	0.00
10,900.0	91.08	269.59	9,051.5	-14.7	-2,066.0	2,066.1	0.00	0.00	0.00
11,000.0	91.08	269.59	9,049.6	-15.4	-2,166.0	2,166.1	0.00	0.00	0.00
11,100.0	91.08	269.59	9,047.8	-16.1	-2,266.0	2,266.1	0.00	0.00	0.00
11,200.0	91.08	269.59	9,045.9	-16.8	-2,366.0	2,366.0	0.00	0.00	0.00
11,300.0	91.08	269.59	9,044.0	-17.6	-2,466.0	2,466.0	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
11,400.0	91.08	269.59	9,042.1	-18.3	-2,565.9	2,566.0	0.00	0.00	0.00
11,500.0	91.08	269.59	9,040.2	-19.0	-2,665.9	2,666.0	0.00	0.00	0.00
11,600.0	91.08	269.59	9,038.3	-19.7	-2,765.9	2,766.0	0.00	0.00	0.00
11,700.0	91.08	269.59	9,036.4	-20.4	-2,865.9	2,866.0	0.00	0.00	0.00
11,800.0	91.08	269.59	9,034.6	-21.1	-2,965.9	2,965.9	0.00	0.00	0.00
11,900.0	91.08	269.59	9,032.7	-21.8	-3,065.8	3,065.9	0.00	0.00	0.00
12,000.0	91.08	269.59	9,030.8	-22.5	-3,165.8	3,165.9	0.00	0.00	0.00
12,100.0	91.08	269.59	9,028.9	-23.3	-3,265.8	3,265.9	0.00	0.00	0.00
12,200.0	91.08	269.59	9,027.0	-24.0	-3,365.8	3,365.9	0.00	0.00	0.00
12,300.0	91.08	269.59	9,025.1	-24.7	-3,465.8	3,465.8	0.00	0.00	0.00
12,400.0	91.08	269.59	9,023.3	-25.4	-3,565.7	3,565.8	0.00	0.00	0.00
12,500.0	91.08	269.59	9,021.4	-26.1	-3,665.7	3,665.8	0.00	0.00	0.00
12,600.0	91.08	269.59	9,019.5	-26.8	-3,765.7	3,765.8	0.00	0.00	0.00
12,700.0	91.08	269.59	9,017.6	-27.5	-3,865.7	3,865.8	0.00	0.00	0.00
12,800.0	91.08	269.59	9,015.7	-28.2	-3,965.7	3,965.8	0.00	0.00	0.00
12,900.0	91.08	269.59	9,013.8	-28.9	-4,065.6	4,065.7	0.00	0.00	0.00
13,000.0	91.08	269.59	9,012.0	-29.7	-4,165.6	4,165.7	0.00	0.00	0.00
13,100.0	91.08	269.59	9,010.1	-30.4	-4,265.6	4,265.7	0.00	0.00	0.00
13,200.0	91.08	269.59	9,008.2	-31.1	-4,365.6	4,365.7	0.00	0.00	0.00
13,300.0	91.08	269.59	9,006.3	-31.8	-4,465.6	4,465.7	0.00	0.00	0.00
13,400.0	91.08	269.59	9,004.4	-32.5	-4,565.5	4,565.7	0.00	0.00	0.00
13,500.0	91.08	269.59	9,002.5	-33.2	-4,665.5	4,665.6	0.00	0.00	0.00
13,600.0	91.08	269.59	9,000.6	-33.9	-4,765.5	4,765.6	0.00	0.00	0.00
13,700.0	91.08	269.59	8,998.8	-34.6	-4,865.5	4,865.6	0.00	0.00	0.00
13,800.0	91.08	269.59	8,996.9	-35.4	-4,965.5	4,965.6	0.00	0.00	0.00
13,900.0	91.08	269.59	8,995.0	-36.1	-5,065.4	5,065.6	0.00	0.00	0.00
14,000.0	91.08	269.59	8,993.1	-36.8	-5,165.4	5,165.5	0.00	0.00	0.00
14,100.0	91.08	269.59	8,991.2	-37.5	-5,265.4	5,265.5	0.00	0.00	0.00
14,200.0	91.08	269.59	8,989.3	-38.2	-5,365.4	5,365.5	0.00	0.00	0.00
14,300.0	91.08	269.59	8,987.5	-38.9	-5,465.4	5,465.5	0.00	0.00	0.00
14,400.0	91.08	269.59	8,985.6	-39.6	-5,565.3	5,565.5	0.00	0.00	0.00
14,500.0	91.08	269.59	8,983.7	-40.3	-5,665.3	5,665.5	0.00	0.00	0.00
14,600.0	91.08	269.59	8,981.8	-41.1	-5,765.3	5,765.4	0.00	0.00	0.00
14,700.0	91.08	269.59	8,979.9	-41.8	-5,865.3	5,865.4	0.00	0.00	0.00
14,800.0	91.08	269.59	8,978.0	-42.5	-5,965.3	5,965.4	0.00	0.00	0.00
14,900.0	91.08	269.59	8,976.2	-43.2	-6,065.2	6,065.4	0.00	0.00	0.00
15,000.0	91.08	269.59	8,974.3	-43.9	-6,165.2	6,165.4	0.00	0.00	0.00
15,100.0	91.08	269.59	8,972.4	-44.6	-6,265.2	6,265.3	0.00	0.00	0.00
15,200.0	91.08	269.59	8,970.5	-45.3	-6,365.2	6,365.3	0.00	0.00	0.00
15,300.0	91.08	269.59	8,968.6	-46.0	-6,465.1	6,465.3	0.00	0.00	0.00
15,400.0	91.08	269.59	8,966.7	-46.7	-6,565.1	6,565.3	0.00	0.00	0.00
15,500.0	91.08	269.59	8,964.9	-47.5	-6,665.1	6,665.3	0.00	0.00	0.00
15,600.0	91.08	269.59	8,963.0	-48.2	-6,765.1	6,765.3	0.00	0.00	0.00
15,700.0	91.08	269.59	8,961.1	-48.9	-6,865.1	6,865.2	0.00	0.00	0.00
15,800.0	91.08	269.59	8,959.2	-49.6	-6,965.0	6,965.2	0.00	0.00	0.00
15,900.0	91.08	269.59	8,957.3	-50.3	-7,065.0	7,065.2	0.00	0.00	0.00
16,000.0	91.08	269.59	8,955.4	-51.0	-7,165.0	7,165.2	0.00	0.00	0.00
16,100.0	91.08	269.59	8,953.5	-51.7	-7,265.0	7,265.2	0.00	0.00	0.00
16,200.0	91.08	269.59	8,951.7	-52.4	-7,365.0	7,365.2	0.00	0.00	0.00
16,300.0	91.08	269.59	8,949.8	-53.2	-7,464.9	7,465.1	0.00	0.00	0.00
16,400.0	91.08	269.59	8,947.9	-53.9	-7,564.9	7,565.1	0.00	0.00	0.00
16,500.0	91.08	269.59	8,946.0	-54.6	-7,664.9	7,665.1	0.00	0.00	0.00
16,600.0	91.08	269.59	8,944.1	-55.3	-7,764.9	7,765.1	0.00	0.00	0.00
16,700.0	91.08	269.59	8,942.2	-56.0	-7,864.9	7,865.1	0.00	0.00	0.00

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well Big Eddy Unit DI4B #273H
Company:	XTO ENERGY, INC.	**TVD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Project:	Eddy County, NM	**MD Reference:**	RKB @ 3480.5usft (Trinidad #445)
Site:	Sec 5, T25S, R29E (TRUE NORTH)	**North Reference:**	True
Well:	Big Eddy Unit DI4B #273H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
16,800.0	91.08	269.59	8,940.4	-56.7	-7,964.8	7,965.0	0.00	0.00	0.00
16,900.0	91.08	269.59	8,938.5	-57.4	-8,064.8	8,065.0	0.00	0.00	0.00
TD @ 16951.6' MD / 8937.5' TVD									
16,951.6	91.08	269.59	8,937.5	-57.8	-8,116.4	8,116.6	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
PBHL - BEU DI4B #273I - plan hits target center - Rectangle (sides W100.0 H7,534.2 D0.0)	-1.08	269.59	8,937.5	-57.8	-8,116.4	581,123.90	628,702.30	32° 35' 48.911 N	103° 54' 55.545 W

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
555.5	555.5	Rustler			
801.5	801.5	Salado			
2,297.5	2,297.5	Base Salt			
2,903.5	2,903.5	Capitan			
4,216.5	4,216.5	Delaware Sand			
4,469.5	4,469.5	Base Manzanita [Lower Cherry Canyon]			
5,379.5	5,379.5	Brushy Canyon			
6,684.5	6,684.5	Basal Brushy Canyon			
6,950.5	6,950.5	Base Brushy Canyon Sands / Leonard S			
6,963.5	6,963.5	Bone Spring			
7,134.5	7,134.5	Avalon Sand/Upper Avalon Shale			
7,718.5	7,718.5	Lower Avalon Shale			
8,188.5	8,188.5	First Bone Spring Sand			
8,412.5	8,412.5	Second Bone Spring Shale			
8,831.7	8,814.5	Second Bone Spring Sand			
9,030.5	8,960.5	Second Bone Spring "A" Sand			
9,165.3	9,029.5	Second Bone Spring "B" Sand			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
8,506.6	8,506.6	0.0	0.0	Build 10°/100'
9,417.4	9,079.5	-4.2	-583.7	EOC @ 91.08° Inc / 269.59° Azm / 9079.5' TVD
16,951.6	8,937.5	-57.8	-8,116.4	TD @ 16951.6' MD / 8937.5' TVD

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**BOPCO LP**
LEASE NO.:	**NMLC068408**
WELL NAME & NO.:	**BIG EDDY UNIT DI4B 273H**
SURFACE HOLE FOOTAGE:	**720' FSL & 2105' FEL**
BOTTOM HOLE FOOTAGE	**660' FSL & 200' FWL**
LOCATION:	**Section 5, T. 20S., R. 31E., NMPM**
COUNTY:	**Eddy County, New Mexico**

COA

H2S	◉ Yes	○ No	
Potash	○ None	◉ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☑ 4 String Area	☑ Capitan Reef	☐ WIPP

All Previous COAs still apply.

A. CASING

1. The **16** inch surface casing shall be set at approximately **780** 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 **24 hours in the Potash Area** 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 **11-3/4** inch first intermediate casing is:

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

      Casing shall be kept at a minimum 1/3 full of 9.5 ppg fluid.

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

   Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

   a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

   b. Second stage above DV tool:

      - Cement to surface. If cement does not circulate, contact the appropriate BLM office. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef and Potash.**

   ❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

   - Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

   - Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

4. The minimum required fill of cement behind the **5-1/2** inch production casing is:

    - Cement should tie-back at least **50** feet on top of **Capitan Reef**. 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. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.

3. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **11-3/4** intermediate casing shoe shall be **3000 (3M)** psi.

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

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

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

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.