

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENTFORM APPROVED
OMB NO. 1004-0137
Expires: January 31, 2018**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**

1. Type of Well ☒ Oil Well ☐ Gas Well ☐ Other	5. Lease Serial No. NMNM05039A
2. Name of Operator BOPCO LP	6. If Indian, Allottee or Tribe Name
3a. Address 6401 HOLIDAY HILL RD BLDG 5 SUITE 200 MIDLAND, TX 79707	7. If Unit or CA/Agreement, Name and/or No.
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 27 T25S R30E NESE 1980FSL 980FEL	8. Well Name and No. POKER LAKE UNIT 474H
Contact: KELLY KARDOS E-Mail: kelly_kardos@xtoenergy.com	9. API Well No. 30-015-43425-00-X1
10. Field and Pool or Exploratory Area CORRAL CANYON Purple Sage WMP	11. County or Parish, State 98220 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 Plans	☐ Plug and Abandon	☐ Temporarily Abandon	Change to Original APD
	☐ 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 recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or 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, LP requests approval of the following changes to the original APD:

Formation Target: Corral Canyon (Delaware) South to Purple Sage; Wolfcamp

Well Type: Oil to Conventional Gas

Bottomhole Location:

Old: 1980' FSL & 10' FWL, S28, T25S, R30E

New: 2440' FNL & 990' FEL, S10, T26S, R30E

Please see attached revisions:

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**
BLM OIL CONSERVATION
ARTESIA DISTRICT

MAR 05 2018

14. I hereby certify that the foregoing is true and correct.	
Electronic Submission #404049 verified by the BLM Well Information System For BOPCO LP, sent to the Carlsbad Committed to AFMSS for processing by ZOTA STEVENS on 02/16/2018 (18ZS0029SE)	
Name (Printed/Typed) KELLY KARDOS	Title REGULATORY COORDINATOR
Signature (Electronic Submission)	Date 02/09/2018

RECEIVED

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By ZOTA STEVENS	Title PETROLEUM ENGINEER	Date 02/27/2018
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 ****NSP.
KWB-9-18.

Additional data for EC transaction #404049 that would not fit on the form

32. Additional remarks, continued

C102
Drilling Program
BOP/Choke Design
Directional Drill Plan
Flex Hose Variance

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

BOPCO, LP
Poker Lake Unit 474H
Projected TD: 26266' MD / 11500' TVD
SHL: 1980' FSL & 980' FEL , Section 27, T25S, R30E
BHL: 2440' FNL & 990' FEL , Section 10, T26S, R30E
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	867'	Water
Top of Salt	1202'	Water
Base of Salt	3699'	Water
Delaware	3897'	Water
Bone Spring	7749'	Water/Oil/Gas
1st Bone Spring Ss	8684'	Water/Oil/Gas
2nd Bone Spring Ss	9428'	Water/Oil/Gas
3rd Bone Spring Ss	10655'	Water/Oil/Gas
Wolfcamp A	11175'	Water/Oil/Gas
Target/Land Curve	11500'	Water/Oil/Gas

*** Hydrocarbons @ Brushy Canyon

*** Groundwater depth 40' (per NM State Engineers Office).

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 13-3/8 inch casing @ 1180' (25' above top of salt) and circulating cement back to surface. The salt will be isolated by setting 9-5/8 inch casing at 10605' with a DV tool @ 1280', and cement will be circulated to surface. An 8-3/4 inch curve and 8-1/2 inch lateral hole will be drilled to TD, where 5-1/2 inch casing will be set and cemented 500 feet into the previous casing.

3. Casing Design

Hole Size	Depth	OD Csg	Weight	Collar	Grade	New/Used	SF Burst	SF Collapse	SF Tension
17-1/2"	0' – 1180'	13-3/8"	68	STC	J-55	New	1.07	3.61	8.41
12-1/4"	0' – 10605'	9-5/8"	40	LTC	HCL-80	New	1.24	1.29	1.97
8-3/4" x 8-1/2"	0' – 26266'	5-1/2"	20	BTC	P-110	New	1.33	1.54	1.90

- XTO requests to utilize centralizers only in the curve after the KOP and only a minimum of one every other joint.
- 9-5/8" 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:

Permanent Wellhead – GE RSH Multibowl System

A. Starting Head: 13-5/8" 5M top flange x 13-3/8" SOW bottom

B. Tubing Head: 13-5/8" 5M bottom flange x 7-1/16" 10M top flange

- Wellhead will be installed by manufacturer's representatives.
- Manufacturer will monitor welding process to ensure appropriate temperature of seal
- Manufacturer will witness installation of test plug for initial test.
- Operator will test the 9-5/8" casing to 70% of casing burst before drilling out.

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 Road, 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

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

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

RECEIVED
☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

¹ API Number 30-045-43425	² Pool Code 98820	³ Pool Name Purple Sage; Wolfcamp
⁴ Property Code	⁵ Property Name POKER LAKE UNIT	
⁷ OGRID No. 260737	⁸ Operator Name BOPCO, LP	⁶ Well Number 474H ⁹ Elevation 3290'

¹⁰ Surface Location

UL or lot no.	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
I	27	25 S	30 E		1,980	SOUTH	980	EAST	EDDY

¹¹ 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
H	10	26 S	30 E		2,440	NORTH	990	EAST	EDDY

¹² Dedicated Acres 960	¹³ Joint or Infill	¹⁴ Consolidation Code	¹⁵ Order No.
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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.

¹⁶	SURFACE LOCATION NAD 27 NME Y= 400,116.8 X= 645,607.5 LAT.= 32.099164°N LONG.= 103.863119°W FIRST TAKE POINT NAD 27 NME Y= 399,517.0 X= 645,598.6 LAT.= 32.097515°N LONG.= 103.863156°W SURFACE LOCATION NAD 83 NME Y= 400,174.8 X= 686,792.8 LAT.= 32.099289°N LONG.= 103.863600°W FIRST TAKE POINT NAD 83 NME Y= 399,574.9 X= 686,783.9 LAT.= 32.097640°N LONG.= 103.863637°W CORNER COORDINATES TABLE NAD 27 NME <table style="width: 100%; font-size: small;"> <tr><td>A - Y= 400,798.8 N, X= 645,259.5 E</td><td>A - Y= 400,856.8 N, X= 686,444.7 E</td></tr> <tr><td>B - Y= 400,813.2 N, X= 646,586.3 E</td><td>B - Y= 400,871.2 N, X= 687,771.6 E</td></tr> <tr><td>C - Y= 398,133.4 N, X= 645,262.0 E</td><td>C - Y= 398,191.3 N, X= 686,447.3 E</td></tr> <tr><td>D - Y= 398,146.7 N, X= 646,590.5 E</td><td>D - Y= 398,204.6 N, X= 687,775.9 E</td></tr> <tr><td>E - Y= 395,463.8 N, X= 645,261.4 E</td><td>E - Y= 395,521.7 N, X= 686,446.8 E</td></tr> <tr><td>F - Y= 395,474.6 N, X= 646,586.6 E</td><td>F - Y= 395,532.5 N, X= 687,772.0 E</td></tr> <tr><td>G - Y= 392,801.4 N, X= 645,260.9 E</td><td>G - Y= 392,859.2 N, X= 686,446.4 E</td></tr> <tr><td>H - Y= 392,811.8 N, X= 646,591.0 E</td><td>H - Y= 392,869.6 N, X= 687,776.5 E</td></tr> <tr><td>I - Y= 390,141.4 N, X= 645,276.5 E</td><td>I - Y= 390,199.1 N, X= 686,462.1 E</td></tr> <tr><td>J - Y= 390,151.1 N, X= 646,608.4 E</td><td>J - Y= 390,208.8 N, X= 687,794.0 E</td></tr> <tr><td>K - Y= 387,484.8 N, X= 645,292.0 E</td><td>K - Y= 387,542.5 N, X= 686,477.7 E</td></tr> <tr><td>L - Y= 387,498.4 N, X= 646,624.8 E</td><td>L - Y= 387,556.1 N, X= 687,810.5 E</td></tr> <tr><td>M - Y= 384,820.9 N, X= 645,311.8 E</td><td>M - Y= 384,878.5 N, X= 686,497.6 E</td></tr> <tr><td>N - Y= 384,829.8 N, X= 646,646.7 E</td><td>N - Y= 384,887.4 N, X= 687,832.5 E</td></tr> </table>	A - Y= 400,798.8 N, X= 645,259.5 E	A - Y= 400,856.8 N, X= 686,444.7 E	B - Y= 400,813.2 N, X= 646,586.3 E	B - Y= 400,871.2 N, X= 687,771.6 E	C - Y= 398,133.4 N, X= 645,262.0 E	C - Y= 398,191.3 N, X= 686,447.3 E	D - Y= 398,146.7 N, X= 646,590.5 E	D - Y= 398,204.6 N, X= 687,775.9 E	E - Y= 395,463.8 N, X= 645,261.4 E	E - Y= 395,521.7 N, X= 686,446.8 E	F - Y= 395,474.6 N, X= 646,586.6 E	F - Y= 395,532.5 N, X= 687,772.0 E	G - Y= 392,801.4 N, X= 645,260.9 E	G - Y= 392,859.2 N, X= 686,446.4 E	H - Y= 392,811.8 N, X= 646,591.0 E	H - Y= 392,869.6 N, X= 687,776.5 E	I - Y= 390,141.4 N, X= 645,276.5 E	I - Y= 390,199.1 N, X= 686,462.1 E	J - Y= 390,151.1 N, X= 646,608.4 E	J - Y= 390,208.8 N, X= 687,794.0 E	K - Y= 387,484.8 N, X= 645,292.0 E	K - Y= 387,542.5 N, X= 686,477.7 E	L - Y= 387,498.4 N, X= 646,624.8 E	L - Y= 387,556.1 N, X= 687,810.5 E	M - Y= 384,820.9 N, X= 645,311.8 E	M - Y= 384,878.5 N, X= 686,497.6 E	N - Y= 384,829.8 N, X= 646,646.7 E	N - Y= 384,887.4 N, X= 687,832.5 E	¹⁷ 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 a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division. Signature: <u>Kelly Kardos</u> Date: <u>2/9/18</u> Printed Name: <u>Kelly Kardos</u> E-mail Address: <u>kelly_kardos@xtoenergy.com</u> ¹⁸ SURVEYOR 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. Date of Survey: <u>06-02-2017</u> Signature and Seal of Professional Surveyor: MARK DILLON HARP 23786 Certificate Number: <u>RR</u> 2017050738
A - Y= 400,798.8 N, X= 645,259.5 E	A - Y= 400,856.8 N, X= 686,444.7 E																													
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NSP.
RWP 3-9-18

4. Cement Program

Surface Casing: 13-3/8", 68 New J-55, STC casing to be set at +/- 1180'

Lead: 650 sxs EconoCem-HLTRRC (mixed at 12.9 ppg, 1.87 ft³/sx, 10.13 gal/sx water)

Tail: 300 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.35 ft³/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

Intermediate Casing: 9-5/8", 40 New HCL-80, LTC casing to be set at +/- 10605'

First Stage

Lead: 2940 sxs Halcem-C + 2% CaCl (mixed at 12.9 ppg, 1.88 ft³/sx, 9.61 gal/sx water)

Tail: 230 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.33 ft³/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

If losses are severe, a DV tool will be set @ 1280' (100' below the surface shoe).

Second Stage

Lead: 430 sxs Halcem-C + 2% CaCl (mixed at 12.9 ppg, 1.87 ft³/sx, 9.61 gal/sx water)

Tail: 180 sxs Halcem-C + 2% CaCl (mixed at 14.8 ppg, 1.33 ft³/sx, 6.39 gal/sx water)

Compressives: 12-hr = 900 psi 24 hr = 1500 psi

Production Casing: 5-1/2", 20 New P-110, BTC casing to be set at +/- 26266'

Lead: 30 sxs NeoCem (mixed at 10.5 ppg, 2.69 ft³/sx, 12.26 gal/sx water)

Tail: 2960 sxs VersaCem (mixed at 13.2 ppg, 1.61 ft³/sx, 8.38 gal/sx water)

Compressives: 12-hr = 1375 psi 24 hr = 2285 psi

5. Pressure Control Equipment

The blow out preventer equipment (BOP) for this well consists of a 13-5/8" minimum 5M Hydril and a 13-5/8" minimum 5M Double Ram BOP. MASP should not exceed 4646 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 nipping up on the 13-5/8" 5M bradenhead and flange, the BOP test will be limited to 5000 psi. When nipping up on the 9-5/8", the BOP will be tested to a minimum of 5000 psi. All BOP tests will include a low pressure test as per BLM regulations. The 5M 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' to 1180'	17-1/2"	FW/Native	8.4-8.8	35-40	NC
1180' to 10605'	12-1/4"	Brine/Gel Sweeps	9.8-10.2	30-32	NC
10605' to 26266'	8-3/4" x 8-1/2"	FW / Cut Brine / Polymer	11.7 - 12	28-40	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 13-3/8" surface casing with brine solution. A 9.8ppg-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.

7. Auxiliary Well Control and Monitoring Equipment

- A. A Kelly cock will be in the drill string at all times.
- B. A full opening drill pipe stabbing valve having appropriate connections will be on the rig floor at all times.
- C. H2S monitors will be on location when drilling below the 13-3/8" casing.

8. Logging, Coring and Testing Program

Mud Logger: Mud Logging Unit (2 man) below intermediate casing.

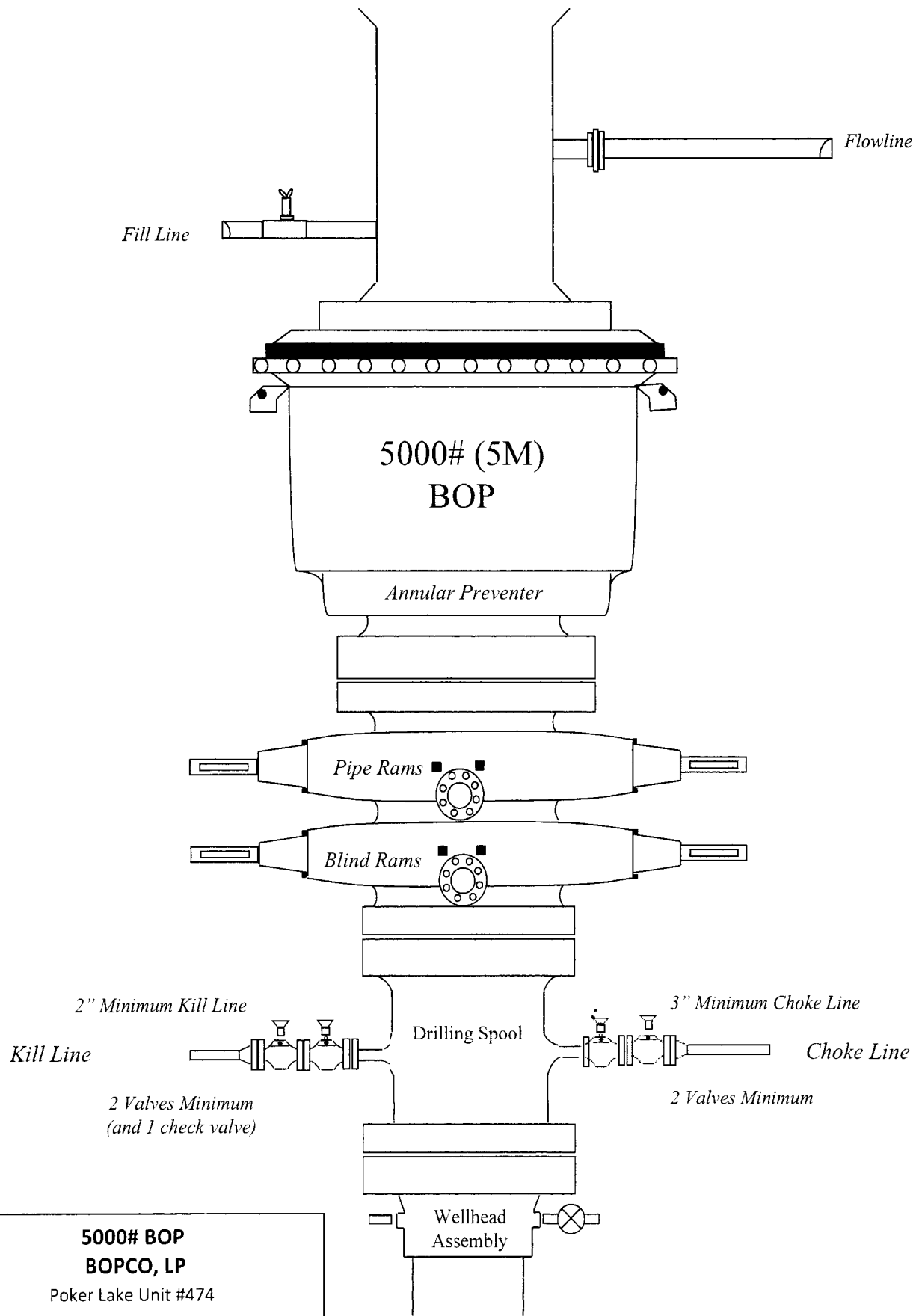
Open hole logging will include quad combo.

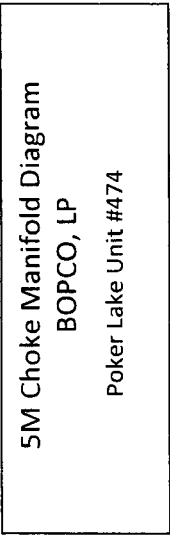
9. Abnormal Pressures and Temperatures / Potential Hazards

None Anticipated. BHT of 155 to 175 F is anticipated. No H2S is expected but monitors will be in place to detect any H2S occurrences. Should these circumstances be encountered the operator and drilling contractor are prepared to take all necessary steps to ensure safety of all personnel and environment. Lost circulation could occur but is not expected to be a serious problem in this area and hole seepage will be compensated for by additions of small amounts of LCM in the drilling fluid. The maximum anticipated bottom hole pressure for this well is 7176 psi.

10. Anticipated Starting Date and Duration of Operations

Road and location construction will begin after Santa Fe and BLM have approved the APD. Anticipated spud date will be as soon after Santa Fe and BLM approval and as soon as a rig will be available. Move in operations and drilling is expected to take 40 days. If production casing is run, an additional 30 days will be needed to complete well and construct surface facilities and/or lay flow lines in order to place well on production.





Drilling Operations Choke Manifold 5M Service



BUREAU OF LAND MANAGEMENT
ARTESIA DISTRICT

MAR 05 2018

RECEIVED

XTO Energy

Eddy County, NM (NAD-27)

Poker Lake Unit

#474H

OH

Plan: PERMIT

Standard Planning Report

24 January, 2018

WELL DETAILS: #474H

Rig Name:					
RKB = 25' @ 3315.00usft					
Ground Level: 3290.00					
+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	400116.80	645607.50	32.099164	-103.863119

DESIGN TARGET DETAILS

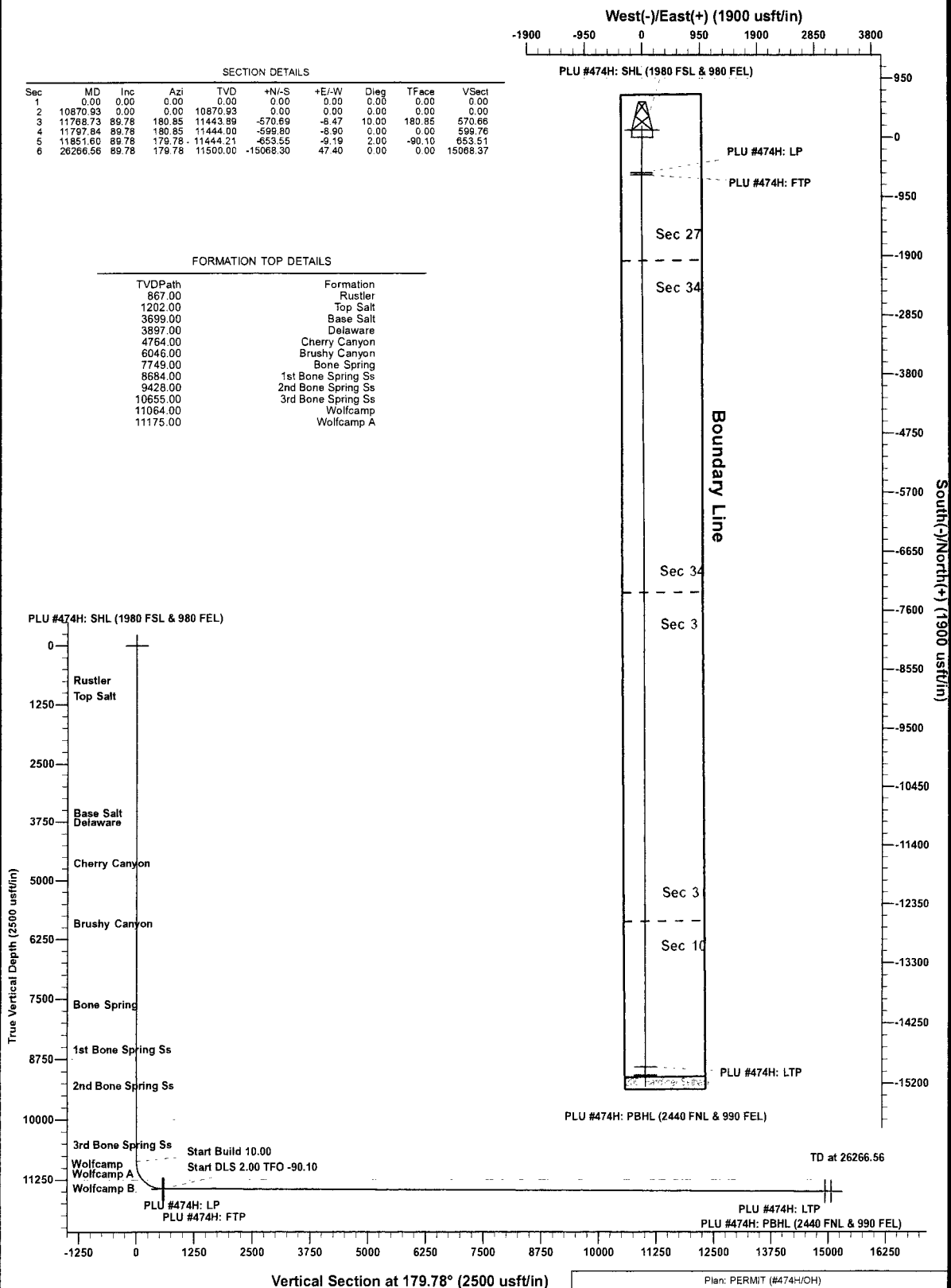
Name	TVD	+N-S	+E-W	Northing	Easting	Latitude	Longitude	Shape
PLU #474H: SHL (980 FSL & 980 FEL)	0.00	0.00	0.00	400116.88	645607.53	32 091964	-103 863119	Point
PLU #474H: FTP	14443.69	-570.69	-8.47	399546.11	645598.80	32 091956	-103 863155	Point
PLU #474H: FTP	14444.00	-599.80	-8.90	399517.00	645598.80	32 007316	-103 863166	Point
PLU #474H: LTP	14909.58	-14038.40	46.30	385178.40	645653.80	32 058099	-103 863180	Point
PLU #474H: PBHL (2440 FNL & 990 FEL)	11500.00	-15068.30	47.40	385048.50	645654.90	32 057742	-103 863178	Point

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/S	+E/W	Dieg	TFace	VSec
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	10870.93	0.00	0.00	10870.93	0.00	0.00	0.00	0.00	0.00
3	11767.83	89.78	180.85	11443.99	-570.69	-8.47	10.00	180.85	570.66
4	11797.84	89.78	180.85	11444.00	-599.80	-8.90	0.00	0.00	599.76
5	11851.60	89.78	179.78	11444.21	-653.55	-9.19	2.00	-90.10	653.51
6	26266.56	89.78	179.78	11500.00	-15068.30	47.40	0.00	0.00	15068.37

FORMATION TOP DETAIL S

TVDPath	Formation
867.00	Rustler
1202.00	Top Salt
3699.00	Base Salt
3897.00	Delaware
4764.00	Cherry Canyon
6046.00	Brushy Canyon
7749.00	Bone Spring
8684.00	1st Bone Spring Ss
9428.00	2nd Bone Spring Ss
10655.00	3rd Bone Spring Ss
11064.00	Wolfcamp
11175.00	Wolfcamp A



Note: All Plan details including boundary lines and offset well data is subject to customers approval

Created By: Matthew May Date: 9:41, January 24 2018



Database: EDM 5000.1 Single User Db
Company: XTO Energy
Project: Eddy County, NM (NAD-27)
Site: Poker Lake Unit
Well: #474H
Wellbore: OH
Design: PERMIT

Local Co-ordinate Reference: Well #474H
TVD Reference: RKB = 25' @ 3315.00usft
MD Reference: RKB = 25' @ 3315.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Project	Eddy County, NM (NAD-27)		
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 Poker Lake Unit

Site Position: Northing: 400,116.80 usft Latitude: 32.099164
From: Map Easting: 645,607.50 usft Longitude: -103.863119
Position Uncertainty: 0.00 usft Slot Radius: 13-3/16 " Grid Convergence: 0.25 °

Well #474H

Well Position +N/-S 0.00 usft Northing: 400,116.80 usft Latitude: 32.099164
 +E/-W 0.00 usft Easting: 645,607.50 usft Longitude: -103.863119
Position Uncertainty 0.00 usft Wellhead Elevation: 0.00 usft Ground Level: 3,290.00 usft

Wellbore OH

Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	1/24/2018	7.01	59.89	47,772

Design PERMIT

Audit Notes:

Version: Phase: PLAN Tie On Depth: 0.00

Vertical Section:	Depth From (TVD) (usft)	+N/-S (usft)	+E/-W (usft)	Direction (°)
	0.00	0.00	0.00	179.78

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
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
10,870.93	0.00	0.00	10,870.93	0.00	0.00	0.00	0.00	0.00	0.00	
11,768.73	89.78	180.85	11,443.89	-570.69	-8.47	10.00	10.00	0.00	180.85	
11,797.84	89.78	180.85	11,444.00	-599.80	-8.90	0.00	0.00	0.00	0.00	PLU #474H: FTP
11,851.60	89.78	179.78	11,444.21	-653.55	-9.19	2.00	0.00	-2.00	-90.10	
26,266.56	89.78	179.78	11,500.00	-15,068.30	47.40	0.00	0.00	0.00	0.00	PLU #474H: PBHL



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Company: XTO Energy
Project: Eddy County, NM (NAD-27)
Site: Poker Lake Unit
Well: #474H
Wellbore: OH
Design: PERMIT

Local Co-ordinate Reference: Well #474H
TVD Reference: RKB = 25' @ 3315.00usft
MD Reference: RKB = 25' @ 3315.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
500.00	0.00	0.00	500.00	0.00	0.00	0.00	0.00	0.00	0.00
600.00	0.00	0.00	600.00	0.00	0.00	0.00	0.00	0.00	0.00
700.00	0.00	0.00	700.00	0.00	0.00	0.00	0.00	0.00	0.00
800.00	0.00	0.00	800.00	0.00	0.00	0.00	0.00	0.00	0.00
900.00	0.00	0.00	900.00	0.00	0.00	0.00	0.00	0.00	0.00
1,000.00	0.00	0.00	1,000.00	0.00	0.00	0.00	0.00	0.00	0.00
1,100.00	0.00	0.00	1,100.00	0.00	0.00	0.00	0.00	0.00	0.00
1,200.00	0.00	0.00	1,200.00	0.00	0.00	0.00	0.00	0.00	0.00
1,300.00	0.00	0.00	1,300.00	0.00	0.00	0.00	0.00	0.00	0.00
1,400.00	0.00	0.00	1,400.00	0.00	0.00	0.00	0.00	0.00	0.00
1,500.00	0.00	0.00	1,500.00	0.00	0.00	0.00	0.00	0.00	0.00
1,600.00	0.00	0.00	1,600.00	0.00	0.00	0.00	0.00	0.00	0.00
1,700.00	0.00	0.00	1,700.00	0.00	0.00	0.00	0.00	0.00	0.00
1,800.00	0.00	0.00	1,800.00	0.00	0.00	0.00	0.00	0.00	0.00
1,900.00	0.00	0.00	1,900.00	0.00	0.00	0.00	0.00	0.00	0.00
2,000.00	0.00	0.00	2,000.00	0.00	0.00	0.00	0.00	0.00	0.00
2,100.00	0.00	0.00	2,100.00	0.00	0.00	0.00	0.00	0.00	0.00
2,200.00	0.00	0.00	2,200.00	0.00	0.00	0.00	0.00	0.00	0.00
2,300.00	0.00	0.00	2,300.00	0.00	0.00	0.00	0.00	0.00	0.00
2,400.00	0.00	0.00	2,400.00	0.00	0.00	0.00	0.00	0.00	0.00
2,500.00	0.00	0.00	2,500.00	0.00	0.00	0.00	0.00	0.00	0.00
2,600.00	0.00	0.00	2,600.00	0.00	0.00	0.00	0.00	0.00	0.00
2,700.00	0.00	0.00	2,700.00	0.00	0.00	0.00	0.00	0.00	0.00
2,800.00	0.00	0.00	2,800.00	0.00	0.00	0.00	0.00	0.00	0.00
2,900.00	0.00	0.00	2,900.00	0.00	0.00	0.00	0.00	0.00	0.00
3,000.00	0.00	0.00	3,000.00	0.00	0.00	0.00	0.00	0.00	0.00
3,100.00	0.00	0.00	3,100.00	0.00	0.00	0.00	0.00	0.00	0.00
3,200.00	0.00	0.00	3,200.00	0.00	0.00	0.00	0.00	0.00	0.00
3,300.00	0.00	0.00	3,300.00	0.00	0.00	0.00	0.00	0.00	0.00
3,400.00	0.00	0.00	3,400.00	0.00	0.00	0.00	0.00	0.00	0.00
3,500.00	0.00	0.00	3,500.00	0.00	0.00	0.00	0.00	0.00	0.00
3,600.00	0.00	0.00	3,600.00	0.00	0.00	0.00	0.00	0.00	0.00
3,700.00	0.00	0.00	3,700.00	0.00	0.00	0.00	0.00	0.00	0.00
3,800.00	0.00	0.00	3,800.00	0.00	0.00	0.00	0.00	0.00	0.00
3,900.00	0.00	0.00	3,900.00	0.00	0.00	0.00	0.00	0.00	0.00
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00
4,100.00	0.00	0.00	4,100.00	0.00	0.00	0.00	0.00	0.00	0.00
4,200.00	0.00	0.00	4,200.00	0.00	0.00	0.00	0.00	0.00	0.00
4,300.00	0.00	0.00	4,300.00	0.00	0.00	0.00	0.00	0.00	0.00
4,400.00	0.00	0.00	4,400.00	0.00	0.00	0.00	0.00	0.00	0.00
4,500.00	0.00	0.00	4,500.00	0.00	0.00	0.00	0.00	0.00	0.00
4,600.00	0.00	0.00	4,600.00	0.00	0.00	0.00	0.00	0.00	0.00
4,700.00	0.00	0.00	4,700.00	0.00	0.00	0.00	0.00	0.00	0.00
4,800.00	0.00	0.00	4,800.00	0.00	0.00	0.00	0.00	0.00	0.00
4,900.00	0.00	0.00	4,900.00	0.00	0.00	0.00	0.00	0.00	0.00
5,000.00	0.00	0.00	5,000.00	0.00	0.00	0.00	0.00	0.00	0.00
5,100.00	0.00	0.00	5,100.00	0.00	0.00	0.00	0.00	0.00	0.00
5,200.00	0.00	0.00	5,200.00	0.00	0.00	0.00	0.00	0.00	0.00
5,300.00	0.00	0.00	5,300.00	0.00	0.00	0.00	0.00	0.00	0.00



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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)
5,400.00	0.00	0.00	5,400.00	0.00	0.00	0.00	0.00	0.00	0.00
5,500.00	0.00	0.00	5,500.00	0.00	0.00	0.00	0.00	0.00	0.00
5,600.00	0.00	0.00	5,600.00	0.00	0.00	0.00	0.00	0.00	0.00
5,700.00	0.00	0.00	5,700.00	0.00	0.00	0.00	0.00	0.00	0.00
5,800.00	0.00	0.00	5,800.00	0.00	0.00	0.00	0.00	0.00	0.00
5,900.00	0.00	0.00	5,900.00	0.00	0.00	0.00	0.00	0.00	0.00
6,000.00	0.00	0.00	6,000.00	0.00	0.00	0.00	0.00	0.00	0.00
6,100.00	0.00	0.00	6,100.00	0.00	0.00	0.00	0.00	0.00	0.00
6,200.00	0.00	0.00	6,200.00	0.00	0.00	0.00	0.00	0.00	0.00
6,300.00	0.00	0.00	6,300.00	0.00	0.00	0.00	0.00	0.00	0.00
6,400.00	0.00	0.00	6,400.00	0.00	0.00	0.00	0.00	0.00	0.00
6,500.00	0.00	0.00	6,500.00	0.00	0.00	0.00	0.00	0.00	0.00
6,600.00	0.00	0.00	6,600.00	0.00	0.00	0.00	0.00	0.00	0.00
6,700.00	0.00	0.00	6,700.00	0.00	0.00	0.00	0.00	0.00	0.00
6,800.00	0.00	0.00	6,800.00	0.00	0.00	0.00	0.00	0.00	0.00
6,900.00	0.00	0.00	6,900.00	0.00	0.00	0.00	0.00	0.00	0.00
7,000.00	0.00	0.00	7,000.00	0.00	0.00	0.00	0.00	0.00	0.00
7,100.00	0.00	0.00	7,100.00	0.00	0.00	0.00	0.00	0.00	0.00
7,200.00	0.00	0.00	7,200.00	0.00	0.00	0.00	0.00	0.00	0.00
7,300.00	0.00	0.00	7,300.00	0.00	0.00	0.00	0.00	0.00	0.00
7,400.00	0.00	0.00	7,400.00	0.00	0.00	0.00	0.00	0.00	0.00
7,500.00	0.00	0.00	7,500.00	0.00	0.00	0.00	0.00	0.00	0.00
7,600.00	0.00	0.00	7,600.00	0.00	0.00	0.00	0.00	0.00	0.00
7,700.00	0.00	0.00	7,700.00	0.00	0.00	0.00	0.00	0.00	0.00
7,800.00	0.00	0.00	7,800.00	0.00	0.00	0.00	0.00	0.00	0.00
7,900.00	0.00	0.00	7,900.00	0.00	0.00	0.00	0.00	0.00	0.00
8,000.00	0.00	0.00	8,000.00	0.00	0.00	0.00	0.00	0.00	0.00
8,100.00	0.00	0.00	8,100.00	0.00	0.00	0.00	0.00	0.00	0.00
8,200.00	0.00	0.00	8,200.00	0.00	0.00	0.00	0.00	0.00	0.00
8,300.00	0.00	0.00	8,300.00	0.00	0.00	0.00	0.00	0.00	0.00
8,400.00	0.00	0.00	8,400.00	0.00	0.00	0.00	0.00	0.00	0.00
8,500.00	0.00	0.00	8,500.00	0.00	0.00	0.00	0.00	0.00	0.00
8,600.00	0.00	0.00	8,600.00	0.00	0.00	0.00	0.00	0.00	0.00
8,700.00	0.00	0.00	8,700.00	0.00	0.00	0.00	0.00	0.00	0.00
8,800.00	0.00	0.00	8,800.00	0.00	0.00	0.00	0.00	0.00	0.00
8,900.00	0.00	0.00	8,900.00	0.00	0.00	0.00	0.00	0.00	0.00
9,000.00	0.00	0.00	9,000.00	0.00	0.00	0.00	0.00	0.00	0.00
9,100.00	0.00	0.00	9,100.00	0.00	0.00	0.00	0.00	0.00	0.00
9,200.00	0.00	0.00	9,200.00	0.00	0.00	0.00	0.00	0.00	0.00
9,300.00	0.00	0.00	9,300.00	0.00	0.00	0.00	0.00	0.00	0.00
9,400.00	0.00	0.00	9,400.00	0.00	0.00	0.00	0.00	0.00	0.00
9,500.00	0.00	0.00	9,500.00	0.00	0.00	0.00	0.00	0.00	0.00
9,600.00	0.00	0.00	9,600.00	0.00	0.00	0.00	0.00	0.00	0.00
9,700.00	0.00	0.00	9,700.00	0.00	0.00	0.00	0.00	0.00	0.00
9,800.00	0.00	0.00	9,800.00	0.00	0.00	0.00	0.00	0.00	0.00
9,900.00	0.00	0.00	9,900.00	0.00	0.00	0.00	0.00	0.00	0.00
10,000.00	0.00	0.00	10,000.00	0.00	0.00	0.00	0.00	0.00	0.00
10,100.00	0.00	0.00	10,100.00	0.00	0.00	0.00	0.00	0.00	0.00
10,200.00	0.00	0.00	10,200.00	0.00	0.00	0.00	0.00	0.00	0.00
10,300.00	0.00	0.00	10,300.00	0.00	0.00	0.00	0.00	0.00	0.00
10,400.00	0.00	0.00	10,400.00	0.00	0.00	0.00	0.00	0.00	0.00
10,500.00	0.00	0.00	10,500.00	0.00	0.00	0.00	0.00	0.00	0.00
10,600.00	0.00	0.00	10,600.00	0.00	0.00	0.00	0.00	0.00	0.00
10,700.00	0.00	0.00	10,700.00	0.00	0.00	0.00	0.00	0.00	0.00



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10,800.00	0.00	0.00	10,800.00	0.00	0.00	0.00	0.00	0.00	0.00
10,870.93	0.00	0.00	10,870.93	0.00	0.00	0.00	0.00	0.00	0.00
10,900.00	2.91	180.85	10,899.99	-0.74	-0.01	0.74	10.00	10.00	0.00
10,950.00	7.91	180.85	10,949.75	-5.45	-0.08	5.45	10.00	10.00	0.00
11,000.00	12.91	180.85	10,998.91	-14.47	-0.21	14.47	10.00	10.00	0.00
11,050.00	17.91	180.85	11,047.10	-27.75	-0.41	27.75	10.00	10.00	0.00
11,100.00	22.91	180.85	11,093.95	-45.18	-0.67	45.17	10.00	10.00	0.00
11,150.00	27.91	180.85	11,139.10	-66.62	-0.99	66.62	10.00	10.00	0.00
11,200.00	32.91	180.85	11,182.21	-91.92	-1.36	91.91	10.00	10.00	0.00
11,250.00	37.91	180.85	11,222.95	-120.87	-1.79	120.86	10.00	10.00	0.00
11,300.00	42.91	180.85	11,261.01	-153.27	-2.27	153.26	10.00	10.00	0.00
11,350.00	47.91	180.85	11,296.10	-188.86	-2.80	188.85	10.00	10.00	0.00
11,400.00	52.91	180.85	11,327.96	-227.37	-3.37	227.36	10.00	10.00	0.00
11,450.00	57.91	180.85	11,356.33	-268.51	-3.98	268.50	10.00	10.00	0.00
11,500.00	62.91	180.85	11,381.02	-311.97	-4.63	311.95	10.00	10.00	0.00
11,550.00	67.91	180.85	11,401.82	-357.42	-5.30	357.40	10.00	10.00	0.00
11,600.00	72.91	180.85	11,418.58	-404.50	-6.00	404.48	10.00	10.00	0.00
11,650.00	77.91	180.85	11,431.18	-452.87	-6.72	452.84	10.00	10.00	0.00
11,700.00	82.91	180.85	11,439.51	-502.15	-7.45	502.12	10.00	10.00	0.00
11,750.00	87.91	180.85	11,443.51	-551.97	-8.19	551.93	10.00	10.00	0.00
11,768.73	89.78	180.85	11,443.89	-570.69	-8.47	570.66	10.00	10.00	0.00
11,797.84	89.78	180.85	11,444.00	-599.80	-8.90	599.76	0.00	0.00	0.00
11,800.00	89.78	180.81	11,444.01	-601.96	-8.93	601.92	2.00	0.00	-2.00
11,851.60	89.78	179.78	11,444.21	-653.55	-9.19	653.51	2.00	0.00	-2.00
11,900.00	89.78	179.78	11,444.39	-701.95	-9.00	701.91	0.00	0.00	0.00
12,000.00	89.78	179.78	11,444.78	-801.95	-8.61	801.91	0.00	0.00	0.00
12,100.00	89.78	179.78	11,445.17	-901.95	-8.22	901.91	0.00	0.00	0.00
12,200.00	89.78	179.78	11,445.56	-1,001.95	-7.83	1,001.91	0.00	0.00	0.00
12,300.00	89.78	179.78	11,445.94	-1,101.95	-7.43	1,101.91	0.00	0.00	0.00
12,400.00	89.78	179.78	11,446.33	-1,201.95	-7.04	1,201.91	0.00	0.00	0.00
12,500.00	89.78	179.78	11,446.72	-1,301.95	-6.65	1,301.91	0.00	0.00	0.00
12,600.00	89.78	179.78	11,447.10	-1,401.94	-6.26	1,401.91	0.00	0.00	0.00
12,700.00	89.78	179.78	11,447.49	-1,501.94	-5.86	1,501.91	0.00	0.00	0.00
12,800.00	89.78	179.78	11,447.88	-1,601.94	-5.47	1,601.91	0.00	0.00	0.00
12,900.00	89.78	179.78	11,448.27	-1,701.94	-5.08	1,701.91	0.00	0.00	0.00
13,000.00	89.78	179.78	11,448.65	-1,801.94	-4.68	1,801.91	0.00	0.00	0.00
13,100.00	89.78	179.78	11,449.04	-1,901.94	-4.29	1,901.91	0.00	0.00	0.00
13,200.00	89.78	179.78	11,449.43	-2,001.93	-3.90	2,001.90	0.00	0.00	0.00
13,300.00	89.78	179.78	11,449.81	-2,101.93	-3.51	2,101.90	0.00	0.00	0.00
13,400.00	89.78	179.78	11,450.20	-2,201.93	-3.11	2,201.90	0.00	0.00	0.00
13,500.00	89.78	179.78	11,450.59	-2,301.93	-2.72	2,301.90	0.00	0.00	0.00
13,600.00	89.78	179.78	11,450.97	-2,401.93	-2.33	2,401.90	0.00	0.00	0.00
13,700.00	89.78	179.78	11,451.36	-2,501.93	-1.94	2,501.90	0.00	0.00	0.00
13,800.00	89.78	179.78	11,451.75	-2,601.93	-1.54	2,601.90	0.00	0.00	0.00
13,900.00	89.78	179.78	11,452.14	-2,701.92	-1.15	2,701.90	0.00	0.00	0.00
14,000.00	89.78	179.78	11,452.52	-2,801.92	-0.76	2,801.90	0.00	0.00	0.00
14,100.00	89.78	179.78	11,452.91	-2,901.92	-0.37	2,901.90	0.00	0.00	0.00
14,200.00	89.78	179.78	11,453.30	-3,001.92	0.03	3,001.90	0.00	0.00	0.00
14,300.00	89.78	179.78	11,453.68	-3,101.92	0.42	3,101.90	0.00	0.00	0.00
14,400.00	89.78	179.78	11,454.07	-3,201.92	0.81	3,201.90	0.00	0.00	0.00
14,500.00	89.78	179.78	11,454.46	-3,301.91	1.20	3,301.90	0.00	0.00	0.00
14,600.00	89.78	179.78	11,454.85	-3,401.91	1.60	3,401.89	0.00	0.00	0.00
14,700.00	89.78	179.78	11,455.23	-3,501.91	1.99	3,501.89	0.00	0.00	0.00
14,800.00	89.78	179.78	11,455.62	-3,601.91	2.38	3,601.89	0.00	0.00	0.00



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Design: PERMIT

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TVD Reference: RKB = 25' @ 3315.00usft
MD Reference: RKB = 25' @ 3315.00usft
North Reference: Grid
Survey Calculation Method: Minimum Curvature

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
14,900.00	89.78	179.78	11,456.01	-3,701.91	2.77	3,701.89	0.00	0.00	0.00
15,000.00	89.78	179.78	11,456.39	-3,801.91	3.17	3,801.89	0.00	0.00	0.00
15,100.00	89.78	179.78	11,456.78	-3,901.91	3.56	3,901.89	0.00	0.00	0.00
15,200.00	89.78	179.78	11,457.17	-4,001.90	3.95	4,001.89	0.00	0.00	0.00
15,300.00	89.78	179.78	11,457.55	-4,101.90	4.35	4,101.89	0.00	0.00	0.00
15,400.00	89.78	179.78	11,457.94	-4,201.90	4.74	4,201.89	0.00	0.00	0.00
15,500.00	89.78	179.78	11,458.33	-4,301.90	5.13	4,301.89	0.00	0.00	0.00
15,600.00	89.78	179.78	11,458.72	-4,401.90	5.52	4,401.89	0.00	0.00	0.00
15,700.00	89.78	179.78	11,459.10	-4,501.90	5.92	4,501.89	0.00	0.00	0.00
15,800.00	89.78	179.78	11,459.49	-4,601.90	6.31	4,601.89	0.00	0.00	0.00
15,900.00	89.78	179.78	11,459.88	-4,701.89	6.70	4,701.88	0.00	0.00	0.00
16,000.00	89.78	179.78	11,460.26	-4,801.89	7.09	4,801.88	0.00	0.00	0.00
16,100.00	89.78	179.78	11,460.65	-4,901.89	7.49	4,901.88	0.00	0.00	0.00
16,200.00	89.78	179.78	11,461.04	-5,001.89	7.88	5,001.88	0.00	0.00	0.00
16,300.00	89.78	179.78	11,461.42	-5,101.89	8.27	5,101.88	0.00	0.00	0.00
16,400.00	89.78	179.78	11,461.81	-5,201.89	8.66	5,201.88	0.00	0.00	0.00
16,500.00	89.78	179.78	11,462.20	-5,301.88	9.06	5,301.88	0.00	0.00	0.00
16,600.00	89.78	179.78	11,462.59	-5,401.88	9.45	5,401.88	0.00	0.00	0.00
16,700.00	89.78	179.78	11,462.97	-5,501.88	9.84	5,501.88	0.00	0.00	0.00
16,800.00	89.78	179.78	11,463.36	-5,601.88	10.23	5,601.88	0.00	0.00	0.00
16,900.00	89.78	179.78	11,463.75	-5,701.88	10.63	5,701.88	0.00	0.00	0.00
17,000.00	89.78	179.78	11,464.13	-5,801.88	11.02	5,801.88	0.00	0.00	0.00
17,100.00	89.78	179.78	11,464.52	-5,901.88	11.41	5,901.88	0.00	0.00	0.00
17,200.00	89.78	179.78	11,464.91	-6,001.87	11.80	6,001.87	0.00	0.00	0.00
17,300.00	89.78	179.78	11,465.30	-6,101.87	12.20	6,101.87	0.00	0.00	0.00
17,400.00	89.78	179.78	11,465.68	-6,201.87	12.59	6,201.87	0.00	0.00	0.00
17,500.00	89.78	179.78	11,466.07	-6,301.87	12.98	6,301.87	0.00	0.00	0.00
17,600.00	89.78	179.78	11,466.46	-6,401.87	13.38	6,401.87	0.00	0.00	0.00
17,700.00	89.78	179.78	11,466.84	-6,501.87	13.77	6,501.87	0.00	0.00	0.00
17,800.00	89.78	179.78	11,467.23	-6,601.86	14.16	6,601.87	0.00	0.00	0.00
17,900.00	89.78	179.78	11,467.62	-6,701.86	14.55	6,701.87	0.00	0.00	0.00
18,000.00	89.78	179.78	11,468.00	-6,801.86	14.95	6,801.87	0.00	0.00	0.00
18,100.00	89.78	179.78	11,468.39	-6,901.86	15.34	6,901.87	0.00	0.00	0.00
18,200.00	89.78	179.78	11,468.78	-7,001.86	15.73	7,001.87	0.00	0.00	0.00
18,300.00	89.78	179.78	11,469.17	-7,101.86	16.12	7,101.87	0.00	0.00	0.00
18,400.00	89.78	179.78	11,469.55	-7,201.86	16.52	7,201.87	0.00	0.00	0.00
18,500.00	89.78	179.78	11,469.94	-7,301.85	16.91	7,301.87	0.00	0.00	0.00
18,600.00	89.78	179.78	11,470.33	-7,401.85	17.30	7,401.86	0.00	0.00	0.00
18,700.00	89.78	179.78	11,470.71	-7,501.85	17.69	7,501.86	0.00	0.00	0.00
18,800.00	89.78	179.78	11,471.10	-7,601.85	18.09	7,601.86	0.00	0.00	0.00
18,900.00	89.78	179.78	11,471.49	-7,701.85	18.48	7,701.86	0.00	0.00	0.00
19,000.00	89.78	179.78	11,471.88	-7,801.85	18.87	7,801.86	0.00	0.00	0.00
19,100.00	89.78	179.78	11,472.26	-7,901.84	19.26	7,901.86	0.00	0.00	0.00
19,200.00	89.78	179.78	11,472.65	-8,001.84	19.66	8,001.86	0.00	0.00	0.00
19,300.00	89.78	179.78	11,473.04	-8,101.84	20.05	8,101.86	0.00	0.00	0.00
19,400.00	89.78	179.78	11,473.42	-8,201.84	20.44	8,201.86	0.00	0.00	0.00
19,500.00	89.78	179.78	11,473.81	-8,301.84	20.83	8,301.86	0.00	0.00	0.00
19,600.00	89.78	179.78	11,474.20	-8,401.84	21.23	8,401.86	0.00	0.00	0.00
19,700.00	89.78	179.78	11,474.58	-8,501.84	21.62	8,501.86	0.00	0.00	0.00
19,800.00	89.78	179.78	11,474.97	-8,601.83	22.01	8,601.86	0.00	0.00	0.00
19,900.00	89.78	179.78	11,475.36	-8,701.83	22.40	8,701.85	0.00	0.00	0.00
20,000.00	89.78	179.78	11,475.75	-8,801.83	22.80	8,801.85	0.00	0.00	0.00
20,100.00	89.78	179.78	11,476.13	-8,901.83	23.19	8,901.85	0.00	0.00	0.00
20,200.00	89.78	179.78	11,476.52	-9,001.83	23.58	9,001.85	0.00	0.00	0.00



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North Reference: Grid
Survey Calculation Method: Minimum Curvature

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)
20,300.00	89.78	179.78	11,476.91	-9,101.83	23.98	9,101.85	0.00	0.00	0.00
20,400.00	89.78	179.78	11,477.29	-9,201.83	24.37	9,201.85	0.00	0.00	0.00
20,500.00	89.78	179.78	11,477.68	-9,301.82	24.76	9,301.85	0.00	0.00	0.00
20,600.00	89.78	179.78	11,478.07	-9,401.82	25.15	9,401.85	0.00	0.00	0.00
20,700.00	89.78	179.78	11,478.46	-9,501.82	25.55	9,501.85	0.00	0.00	0.00
20,800.00	89.78	179.78	11,478.84	-9,601.82	25.94	9,601.85	0.00	0.00	0.00
20,900.00	89.78	179.78	11,479.23	-9,701.82	26.33	9,701.85	0.00	0.00	0.00
21,000.00	89.78	179.78	11,479.62	-9,801.82	26.72	9,801.85	0.00	0.00	0.00
21,100.00	89.78	179.78	11,480.00	-9,901.81	27.12	9,901.85	0.00	0.00	0.00
21,200.00	89.78	179.78	11,480.39	-10,001.81	27.51	10,001.84	0.00	0.00	0.00
21,300.00	89.78	179.78	11,480.78	-10,101.81	27.90	10,101.84	0.00	0.00	0.00
21,400.00	89.78	179.78	11,481.16	-10,201.81	28.29	10,201.84	0.00	0.00	0.00
21,500.00	89.78	179.78	11,481.55	-10,301.81	28.69	10,301.84	0.00	0.00	0.00
21,600.00	89.78	179.78	11,481.94	-10,401.81	29.08	10,401.84	0.00	0.00	0.00
21,700.00	89.78	179.78	11,482.33	-10,501.81	29.47	10,501.84	0.00	0.00	0.00
21,800.00	89.78	179.78	11,482.71	-10,601.80	29.86	10,601.84	0.00	0.00	0.00
21,900.00	89.78	179.78	11,483.10	-10,701.80	30.26	10,701.84	0.00	0.00	0.00
22,000.00	89.78	179.78	11,483.49	-10,801.80	30.65	10,801.84	0.00	0.00	0.00
22,100.00	89.78	179.78	11,483.87	-10,901.80	31.04	10,901.84	0.00	0.00	0.00
22,200.00	89.78	179.78	11,484.26	-11,001.80	31.43	11,001.84	0.00	0.00	0.00
22,300.00	89.78	179.78	11,484.65	-11,101.80	31.83	11,101.84	0.00	0.00	0.00
22,400.00	89.78	179.78	11,485.03	-11,201.79	32.22	11,201.84	0.00	0.00	0.00
22,500.00	89.78	179.78	11,485.42	-11,301.79	32.61	11,301.84	0.00	0.00	0.00
22,600.00	89.78	179.78	11,485.81	-11,401.79	33.01	11,401.83	0.00	0.00	0.00
22,700.00	89.78	179.78	11,486.20	-11,501.79	33.40	11,501.83	0.00	0.00	0.00
22,800.00	89.78	179.78	11,486.58	-11,601.79	33.79	11,601.83	0.00	0.00	0.00
22,900.00	89.78	179.78	11,486.97	-11,701.79	34.18	11,701.83	0.00	0.00	0.00
23,000.00	89.78	179.78	11,487.36	-11,801.79	34.58	11,801.83	0.00	0.00	0.00
23,100.00	89.78	179.78	11,487.74	-11,901.78	34.97	11,901.83	0.00	0.00	0.00
23,200.00	89.78	179.78	11,488.13	-12,001.78	35.36	12,001.83	0.00	0.00	0.00
23,300.00	89.78	179.78	11,488.52	-12,101.78	35.75	12,101.83	0.00	0.00	0.00
23,400.00	89.78	179.78	11,488.91	-12,201.78	36.15	12,201.83	0.00	0.00	0.00
23,500.00	89.78	179.78	11,489.29	-12,301.78	36.54	12,301.83	0.00	0.00	0.00
23,600.00	89.78	179.78	11,489.68	-12,401.78	36.93	12,401.83	0.00	0.00	0.00
23,700.00	89.78	179.78	11,490.07	-12,501.78	37.32	12,501.83	0.00	0.00	0.00
23,800.00	89.78	179.78	11,490.45	-12,601.77	37.72	12,601.83	0.00	0.00	0.00
23,900.00	89.78	179.78	11,490.84	-12,701.77	38.11	12,701.82	0.00	0.00	0.00
24,000.00	89.78	179.78	11,491.23	-12,801.77	38.50	12,801.82	0.00	0.00	0.00
24,100.00	89.78	179.78	11,491.61	-12,901.77	38.89	12,901.82	0.00	0.00	0.00
24,200.00	89.78	179.78	11,492.00	-13,001.77	39.29	13,001.82	0.00	0.00	0.00
24,300.00	89.78	179.78	11,492.39	-13,101.77	39.68	13,101.82	0.00	0.00	0.00
24,400.00	89.78	179.78	11,492.78	-13,201.76	40.07	13,201.82	0.00	0.00	0.00
24,500.00	89.78	179.78	11,493.16	-13,301.76	40.46	13,301.82	0.00	0.00	0.00
24,600.00	89.78	179.78	11,493.55	-13,401.76	40.86	13,401.82	0.00	0.00	0.00
24,700.00	89.78	179.78	11,493.94	-13,501.76	41.25	13,501.82	0.00	0.00	0.00
24,800.00	89.78	179.78	11,494.32	-13,601.76	41.64	13,601.82	0.00	0.00	0.00
24,900.00	89.78	179.78	11,494.71	-13,701.76	42.03	13,701.82	0.00	0.00	0.00
25,000.00	89.78	179.78	11,495.10	-13,801.76	42.43	13,801.82	0.00	0.00	0.00
25,100.00	89.78	179.78	11,495.49	-13,901.75	42.82	13,901.82	0.00	0.00	0.00
25,200.00	89.78	179.78	11,495.87	-14,001.75	43.21	14,001.82	0.00	0.00	0.00
25,300.00	89.78	179.78	11,496.26	-14,101.75	43.61	14,101.81	0.00	0.00	0.00
25,400.00	89.78	179.78	11,496.65	-14,201.75	44.00	14,201.81	0.00	0.00	0.00
25,500.00	89.78	179.78	11,497.03	-14,301.75	44.39	14,301.81	0.00	0.00	0.00
25,600.00	89.78	179.78	11,497.42	-14,401.75	44.78	14,401.81	0.00	0.00	0.00



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Planned Survey

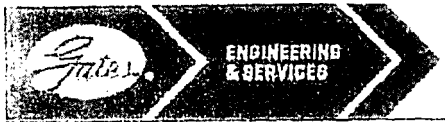
Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
25,700.00	89.78	179.78	11,497.81	-14,501.74	45.18	14,501.81	0.00	0.00	0.00
25,800.00	89.78	179.78	11,498.19	-14,601.74	45.57	14,601.81	0.00	0.00	0.00
25,900.00	89.78	179.78	11,498.58	-14,701.74	45.96	14,701.81	0.00	0.00	0.00
26,000.00	89.78	179.78	11,498.97	-14,801.74	46.35	14,801.81	0.00	0.00	0.00
26,100.00	89.78	179.78	11,499.36	-14,901.74	46.75	14,901.81	0.00	0.00	0.00
26,200.00	89.78	179.78	11,499.74	-15,001.74	47.14	15,001.81	0.00	0.00	0.00
26,266.56	89.78	179.78	11,500.00	-15,068.30	47.40	15,068.37	0.00	0.00	0.00

Design Targets

Target Name	- hit/miss target	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
PLU #474H: SHL (198	- plan hits target center	0.00	0.00	0.00	0.00	0.00	400,116.80	645,607.50	32.099164	-103.863119
	- Point									
PLU #474H: LP	- plan hits target center	0.00	0.00	11,443.89	-570.69	-8.47	399,546.10	645,599.04	32.097596	-103.863155
	- Point									
PLU #474H: FTP	- plan hits target center	0.00	0.00	11,444.00	-599.80	-8.90	399,517.00	645,598.60	32.097516	-103.863157
	- Point									
PLU #474H: LTP	- plan misses target center by 0.60usft at 26136.66usft MD (11499.50 TVD, -14938.40 N, 46.89 E)	0.00	0.00	11,499.58	-14,938.40	46.30	385,178.40	645,653.80	32.058099	-103.863180
	- Point									
PLU #474H: PBHL (2-	- plan hits target center	0.00	0.00	11,500.00	-15,068.30	47.40	385,048.50	645,654.90	32.057742	-103.863178
	- Point									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
867.00	867.00	Rustler			
1,202.00	1,202.00	Top Salt			
3,699.00	3,699.00	Base Salt			
3,897.00	3,897.00	Delaware			
4,764.00	4,764.00	Cherry Canyon			
6,046.00	6,046.00	Brushy Canyon			
7,749.00	7,749.00	Bone Spring			
8,684.00	8,684.00	1st Bone Spring Ss			
9,428.00	9,428.00	2nd Bone Spring Ss			
10,655.00	10,655.00	3rd Bone Spring Ss			
11,067.85	11,064.00	Wolfcamp			
11,191.46	11,175.00	Wolfcamp A			



GATES E & S NORTH AMERICA, INC
DU-TEX
134 44TH STREET
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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:	NOR14A
Product Description:	FDJ-042.0R41/16.5KFLGE/E LE		
End Fitting 1	4 1/16 in. SK FLG	End Fitting 2	4 1/16 in. SK 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	

1F14-76

XTO

choke
line

for
Am
#25

16

1000'

ROSE LN. 31/2 LENGTH 4214

GRADE 100' WORKING PRESSURE 50000 PSI

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

470' STAFF 4 1/2 STAFFS

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

GRADE 100'

TEST PRESSURE 7500 PSI

TEST DATE 6/26/14

TEST ON 4214

MAR 05 2018

**PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL**

RECEIVED

OPERATOR'S NAME:	BOPCO LP
LEASE NO.:	NMNM71016X
WELL NAME & NO.:	POKER LAKE UNIT 474H
SURFACE HOLE FOOTAGE:	1980' FSL & 980' FEL
BOTTOM HOLE FOOTAGE	2440' FNL & 990' FEL
LOCATION:	Section 27, T. 25 S., R 30 E., 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

A. Hydrogen Sulfide

Hydrogen Sulfide (H2S) monitors shall be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the Hydrogen Sulfide area shall meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **1190** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.
 - b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)

- c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
- d. If cement falls back, remedial cementing will be done prior to drilling out that string.

Operator shall filled 1/3rd casing with fluid while running intermediate casing to maintain collapse safety factor.

- 2. The minimum required fill of cement behind the 9-5/8 inch 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.

- 3. The minimum required fill of cement behind the 5-1/2 inch production casing is: Cement should tie-back at least 200 feet into previous casing string. Operator shall provide method of verification.

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

C. PRESSURE CONTROL

- 1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).
- 2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M) 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

1. Unless the production casing has been run and cemented or the well has been properly plugged, the drilling rig shall not be removed from over the hole without prior approval.
 - a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
 - b. When the operator proposes to set surface casing with Spudder Rig
 - Notify the BLM when moving in and removing the Spudder Rig.
 - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
 - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.
2. Floor controls are required for 3M or Greater systems. These controls will be on the rig floor, unobstructed, readily accessible to the driller and will be operational at all times during drilling and/or completion activities. Rig floor is defined as the area immediately around the rotary table; the area immediately above the substructure on which the draw works are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log run from TD to surface (horizontal well – vertical portion of hole) shall be submitted to the BLM office as well as all other logs run on the borehole 30 days from completion. If available, a digital copy of the logs is to be submitted in addition to the paper copies. The Rustler top and top and bottom of Salt are to be recorded on the Completion Report.

A. CASING

1. Changes to the approved APD casing program need prior approval if the items substituted are of lesser grade or different casing size or are Non-API. The Operator can exchange the components of the proposal with that of superior strength (i.e. changing from J-55 to N-80, or from 36# to 40#). Changes to the approved cement program need prior approval if the altered cement plan has less volume or strength or if the changes are substantial (i.e. Multistage tool, ECP, etc.). The initial wellhead installed on the well will remain on the well with spools used as needed.
2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
3. Wait on cement (WOC) for Water Basin: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi at the shoe, 2) until cement has been in place at least 8 hours. WOC time will be recorded in the driller's log. See individual casing strings for details regarding lead cement slurry requirements. The casing integrity test can be done (prior to the cement setting up) immediately after bumping the plug.
4. Provide compressive strengths including hours to reach required 500 pounds compressive strength prior to cementing each casing string. Have well specific cement details onsite prior to pumping the cement for each casing string.
5. No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.
6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.
8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API RP 53 Sec. 17.
2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.

- a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead when specified), whichever is greater. However, if the float does not hold, cut-off cannot be initiated until cement reaches 500 psi compressive strength (including lead when specified).
- b. In potash areas, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).
- c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- f. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes. This test shall be performed prior to the test at full stack pressure.
- g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

ZS 022718

Medium Cave Karst: two casing strings, both to circulate cement to surface.

13 3/8 Segment	surface csg in a #/ft	17 1/2 Grade	inch hole. Coupling	Joint	Design Factors		SURFACE		
"A"	54.50	J 55	ST&C	7.93	Collapse	Burst	Length	Weight	
"B"							0	0	
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,392			Tail Cmt	does not	circ to sfc.	Totals:	1,190	64,855	
Comparison of Proposed to Minimum Required Cement Volumes									
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
17 1/2	0.6946	950	1621	881	84	8.80	3286	5M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8 Segment	casing inside the #/ft	Grade	13 3/8	Coupling	Joint	Design Factors		INTERMEDIATE	
"A"	40.00	HCL 80		LT&C	1.97	Collapse	Burst	Length	Weight
"B"						0.75	0.8	10,605	424,200
w/8.4#/g mud, 30min Sfc Csg Test psig:								0	0
The cement volume(s) are intended to achieve a top of					0	ft from surface or a		10,605	424,200
						Totals:		10,605	424,200
						ft from surface or a		1190	overlap.
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
12 1/4	0.3132	look ↘	0	3399		10.20	4639	5M	0.81
D V Tool(s):			1280				sum of sx	Σ CuFt	Σ%excess
t by stage %		98	128				3780	6881	102
Class 'H' tail cmt yld > 1.20							MASP is within 10% of 5000psig, need		

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 0.54, b, c, d
<0.70 a Problem!!

ALT. COLLAPSE SF :0.75*1.5=1.125

Tail cmt					<u>Design Factors</u>		PRODUCTION		
5 1/2	casing inside the	9 5/8	-						
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight	
"A"	20.00	P 110	BUTT	2.79	1.64	1.76	10,870	217,400	
"B"	20.00	P 110	BUTT	7.84	1.43	1.76	15,396	307,920	
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,391						Totals:	26,266	525,320	
B	would be:			50.88	1.55	if it were a vertical wellbore.			
No Pilot Hole Planned		MTD	Max VTD	Csg VD	Curve KOP	Dogleg ^c	Severity ^a	MEOC	
		26266	11500	11500	10870	90	10	11769	
The cement volume(s) are intended to achieve a top of				10405	ft from surface or a		200	overlap.	
Hole	Annular	1 Stage	1 Stage	Min	1 Stage	Drilling	Calc	Req'd	Min Dist
Size	Volume	Cmt Sx	CuFt Cmt	Cu Ft	% Excess	Mud Wt	MASP	BOPE	Hole-Cplg
8 1/2	0.2291	2990	4846	3645	33	12.00			1.23
Setting Depths for D V Tool(s):									
% excess cmt by stage:									
Class 'H' tail cmt yld > 1.20									