Form 3160-3
(March 2012)

Carlsbad Field Office
OCD Hobbs

HOBBS OCD

FEB 20 2017

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FORM APPROVED
OMB No. 1004-0137
Expires October 31, 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No. NMNM97153

6. If Indian, Allotee or Tribe Name

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

1a. Type of work: ☑ DRILL ☐ REENTER

1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8. Lease Name and Well No. VACA DRAW 9418 10 FEDERAL 7H (317432)

2. Name of Operator BTA OIL PRODUCERS LLC (260297)

9. API Well No. 30-025-47612

3a. Address 104 S. Pecos Midland TX 79701

3b. Phone No. *(include area code)* (432)682-3753

10. Field and Pool, or Exploratory RED HILLS UPPER / BONE SPRING SHALE (97900)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface NWNE / 190 FNL / 2251 FEL / LAT 32.15181 / LONG -103.558932

At proposed prod. zone SESE / 50 FSL / 1300 FEL / LAT 32.137944 / LONG -103.555854

11. Sec., T. R. M. or Blk. and Survey or Area SEC 10 / T25S / R33E / NMP

14. Distance in miles and direction from nearest town or post office* 21 miles

12. County or Parish LEA

13. State NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drlg. unit line, if any) 50 feet

16. No. of acres in lease 640

17. Spacing Unit dedicated to this well 160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 30 feet

19. Proposed Depth 9457 feet / 14344 feet

20. BLM/BIA Bond No. on file FED: NMB000849

21. Elevations (Show whether DF, KDB, RT, GL, etc.) 3421 feet

22. Approximate date work will start* 12/19/2016

23. Estimated duration 30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No.1, must be attached to this form:

1. Well plat certified by a registered surveyor.
2. A Drilling Plan.
3. A Surface Use Plan (if the location is on National Forest System Lands, the SUPO must be filed with the appropriate Forest Service Office).
4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above).
5. Operator certification
6. Such other site specific information and/or plans as may be required by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Kayla McConnell / Ph: (432)682-3753	09/23/2016

Title: Regulatory Analyst

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	02/10/2017

Title	Office
Supervisor Multiple Resources	HOBBS

Application approval 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.
Conditions of approval, if any, are attached.

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.

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

KZ 02/20/17

REQUIRES ADMINISTRATIVE ORDER FOR NSL - CANNOT PRODUCE WITHOUT NSL

APD ID: 10400005176
Operator Name: BTA OIL PRODUCERS LLC
Well Name: VACA DRAW 9418 10 FEDERAL
Well Type: OIL WELL

Submission Date: 09/23/2016
Federal/Indian APD: FED
Well Number: 7H
Well Work Type: Drill

Highlight All Changes

Application

Section 1 - General

APD ID: 10400005176 **Tie to previous NOS?** 10400003656 **Submission Date:** 09/23/2016

BLM Office: HOBBS **User:** Kayla McConnell **Title:** Regulatory Analyst

Federal/Indian APD: FED **Is the first lease penetrated for production Federal or Indian?** FED

Lease number: NMNM97153 **Lease Acres:** 640

Surface access agreement in place? **Allotted?** **Reservation:**

Agreement in place? NO **Federal or Indian agreement:**

Agreement number:

Agreement name:

Keep application confidential? YES

Permitting Agent? NO **APD Operator:** BTA OIL PRODUCERS LLC

Operator letter of designation:

Keep application confidential? YES

Operator Info

Operator Organization Name: BTA OIL PRODUCERS LLC

Operator Address: 104 S. Pecos **Zip:** 79701

Operator PO Box:

Operator City: Midland **State:** TX

Operator Phone: (432)682-3753

Operator Internet Address: pinskeep@btaoil.com

Section 2 - Well Information

Well in Master Development Plan? NO **Mater Development Plan name:**

Well in Master SUPO? NO **Master SUPO name:**

Well in Master Drilling Plan? NO **Master Drilling Plan name:**

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** RED HILLS UPPER **Pool Name:** BONE SPRING

Is the proposed well in an area containing other mineral resources? USEABLE WATER

Describe other minerals:

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** YES **New surface disturbance?** Y

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** VACA DRAW 9418 10 FEDERAL **Number:** 1

Well Class: HORIZONTAL **Number of Legs:**

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: EXPLORATORY (WILDCAT)

Describe sub-type:

Distance to town: 21 Miles **Distance to nearest well:** 30 FT **Distance to lease line:** 50 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Vaca Draw 9418 10 Fed 7H C102_01-10-2017.pdf

Well work start Date: 12/19/2016 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NGVD29

Survey number:

	STATE: NEW MEXICO	**Meridian:** NEW MEXICO PRINCIPAL	**County:** LEA
	Latitude: 32.15181	**Longitude:** -103.558932	
SHL	**Elevation:** 3421	**MD:** 0	**TVD:** 0
Leg #: 1	**Lease Type:** FEDERAL	**Lease #:** NMNM97153	
	NS-Foot: 190	**NS Indicator:** FNL	
	EW-Foot: 2251	**EW Indicator:** FEL	
	Twsp: 25S	**Range:** 33E	**Section:** 10
	Aliquot: NWNE	**Lot:**	**Tract:**

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

	STATE: NEW MEXICO	**Meridian:** NEW MEXICO PRINCIPAL	**County:** LEA
	Latitude: 32.15181	**Longitude:** -103.558932	
KOP	**Elevation:** -5463	**MD:** 8884	**TVD:** 8884
Leg #: 1	**Lease Type:** FEDERAL	**Lease #:** NMNM97153	
	NS-Foot: 190	**NS Indicator:** FNL	
	EW-Foot: 2251	**EW Indicator:** FEL	
	Twsp: 25S	**Range:** 33E	**Section:** 10
	Aliquot: NWNE	**Lot:**	**Tract:**
	STATE: NEW MEXICO	**Meridian:** NEW MEXICO PRINCIPAL	**County:** LEA
	Latitude: 32.150766	**Longitude:** -103.5587	
PPP	**Elevation:** -6036	**MD:** 9784	**TVD:** 9457
Leg #: 1	**Lease Type:** FEDERAL	**Lease #:** NMNM97153	
	NS-Foot: 570	**NS Indicator:** FNL	
	EW-Foot: 2179	**EW Indicator:** FEL	
	Twsp: 25S	**Range:** 33E	**Section:** 10
	Aliquot: NWNE	**Lot:**	**Tract:**
	STATE: NEW MEXICO	**Meridian:** NEW MEXICO PRINCIPAL	**County:** LEA
	Latitude: 32.138713	**Longitude:** -103.556024	
EXIT	**Elevation:** -6036	**MD:** 14064	**TVD:** 9457
Leg #: 1	**Lease Type:** FEDERAL	**Lease #:** NMNM97153	
	NS-Foot: 330	**NS Indicator:** FSL	
	EW-Foot: 1352	**EW Indicator:** FEL	
	Twsp: 25S	**Range:** 33E	**Section:** 10
	Aliquot: SWSE	**Lot:**	**Tract:**
	STATE: NEW MEXICO	**Meridian:** NEW MEXICO PRINCIPAL	**County:** LEA
	Latitude: 32.137944	**Longitude:** -103.555854	
BHL	**Elevation:** -6036	**MD:** 14344	**TVD:** 9457
Leg #: 1	**Lease Type:** FEDERAL	**Lease #:** NMNM97153	
	NS-Foot: 50	**NS Indicator:** FSL	
	EW-Foot: 1300	**EW Indicator:** FEL	

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Twsp: 25S **Range:** 33E **Section:** 10

Aliquot: SESE **Lot:** **Tract:**

Drilling Plan

Section 1 - Geologic Formations

ID: Surface formation **Name:** UNKNOWN

Lithology(ies):

ALLUVIUM

Elevation: 3421 **True Vertical Depth:** 0 **Measured Depth:** 0

Mineral Resource(s):

OTHER - None

Is this a producing formation? N

ID: Formation 1 **Name:** RUSTLER

Lithology(ies):

Elevation: 2223 **True Vertical Depth:** 1198 **Measured Depth:** 1198

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 2 **Name:** BASE OF SALT

Lithology(ies):

Elevation: -1431 **True Vertical Depth:** 4852 **Measured Depth:** 4852

Mineral Resource(s):

NONE

Is this a producing formation? N

ID: Formation 3 **Name:** DELAWARE

Lithology(ies):

Elevation: -1681 **True Vertical Depth:** 5102 **Measured Depth:** 5102

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

ID: Formation 4 **Name:** BRUSHY CANYON

Lithology(ies):

Elevation: -4287 **True Vertical Depth:** 7708 **Measured Depth:** 7708

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

ID: Formation 5 **Name:** BONE SPRING

Lithology(ies):

Elevation: -5823 **True Vertical Depth:** 9244 **Measured Depth:** 9284

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? N

ID: Formation 6 **Name:** AVALON

Lithology(ies):

Elevation: -6036 **True Vertical Depth:** 9457 **Measured Depth:** 9784

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Mineral Resource(s):

NATURAL GAS

OIL

Is this a producing formation? Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 11000

Equipment: The blowout preventer equipment (BOP) shown in Exhibit A will consist of a (3M system) double ram type (3000 psi WP) preventer and a bag-type (Hydril) preventer (3000 psi WP). Both units will be hydraulically operated and the ram type preventer will be equipped with blind rams on top and 4-½" drill pipe rams on bottom. The BOP's will be installed on the 13 3/8" surface casing and utilized continuously until total depth is reached. All BOP's and associated equipment will be tested as per BLM drilling Operations Order No. 2. A 2" kill line and 3" choke line will be incorporated in the drilling spool below the ram-type BOP. Other accessory BOP equipment will include a Kelly cock, floor safety valve, choke lines, and choke manifold having a 3000 psi WP rating.

Requesting Variance? YES

Variance request: A Choke Hose variance is requested. See attached test chart and spec.

Testing Procedure: Pipe rams will be operated and checked each 24-hour period and each time the drill pipe is out of the hole. These functional tests will be documented on the daily driller's log.

Choke Diagram Attachment:

BLM 3k Choke_09-23-2016.pdf

Choke Hose - Test Chart and Specs_09-23-2016.pdf

BOP Diagram Attachment:

BLM 3k BOP_09-23-2016.pdf

Section 3 - Casing

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

String Type: INTERMEDIATE **Other String Type:**

Hole Size: 12.25

Top setting depth MD: 0 **Top setting depth TVD:** 0

Top setting depth MSL: 3421

Bottom setting depth MD: 5100 **Bottom setting depth TVD:** 5100

Bottom setting depth MSL: -1679

Calculated casing length MD: 5100

Casing Size: 9.625 **Other Size**

Grade: J-55 **Other Grade:**

Weight: 40

Joint Type: LTC **Other Joint Type:**

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 1.6 **Burst Design Safety Factor:** 2.4

Joint Tensile Design Safety Factor type: DRY **Joint Tensile Design Safety Factor:** 2.6

Body Tensile Design Safety Factor type: DRY **Body Tensile Design Safety Factor:** 3.1

Casing Design Assumptions and Worksheet(s):

Vaca Draw 9418 10 7H - Cassing Assumptions Worksheet_09-23-2016.pdf

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

String Type: SURFACE **Other String Type:**

Hole Size: 17.5

Top setting depth MD: 0 **Top setting depth TVD:** 0

Top setting depth MSL: 3421

Bottom setting depth MD: 1225 **Bottom setting depth TVD:** 1225

Bottom setting depth MSL: 2196

Calculated casing length MD: 1225

Casing Size: 13.375 **Other Size**

Grade: J-55 **Other Grade:**

Weight: 54.5

Joint Type: STC **Other Joint Type:**

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 3.3 **Burst Design Safety Factor:** 9.6

Joint Tensile Design Safety Factor type: DRY **Joint Tensile Design Safety Factor:** 14

Body Tensile Design Safety Factor type: DRY **Body Tensile Design Safety Factor:** 23

Casing Design Assumptions and Worksheet(s):

Vaca Draw 9418 10 7H - Cassing Assumptions Worksheet_09-23-2016.pdf

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

String Type: PRODUCTION **Other String Type:**

Hole Size: 8.75

Top setting depth MD: 0 **Top setting depth TVD:** 0

Top setting depth MSL: 3421

Bottom setting depth MD: 14344 **Bottom setting depth TVD:** 9457

Bottom setting depth MSL: -6036

Calculated casing length MD: 14344

Casing Size: 5.5 **Other Size**

Grade: P-110 **Other Grade:**

Weight: 17

Joint Type: OTHER **Other Joint Type:** BTC

Condition: NEW

Inspection Document:

Standard: API

Spec Document:

Tapered String?: N

Tapered String Spec:

Safety Factors

Collapse Design Safety Factor: 3.1 **Burst Design Safety Factor:** 4.3

Joint Tensile Design Safety Factor type: DRY **Joint Tensile Design Safety Factor:** 2.8

Body Tensile Design Safety Factor type: DRY **Body Tensile Design Safety Factor:** 3.4

Casing Design Assumptions and Worksheet(s):

Vaca Draw 9418 10 7H - Cassing Assumptions Worksheet_09-23-2016.pdf

Section 4 - Cement

Casing String Type: SURFACE

Stage Tool Depth:

Lead

Top MD of Segment: 0 **Bottom MD Segment:** 840 **Cement Type:** Class C
Additives: 4% Gel **Quantity (sks):** 665 **Yield (cu.ff./sk):** 1.75
Density: 13.5 **Volume (cu.ft.):** 1163 **Percent Excess:** 15

Tail

Top MD of Segment: 840 **Bottom MD Segment:** 1225 **Cement Type:** Class C
Additives: 2% CaCl2 **Quantity (sks):** 200 **Yield (cu.ff./sk):** 1.34
Density: 14.8 **Volume (cu.ft.):** 268 **Percent Excess:** 15

Casing String Type: INTERMEDIATE

Stage Tool Depth:

Lead

Top MD of Segment: 0 **Bottom MD Segment:** 4260 **Cement Type:** Class C
Additives: 6% Gel **Quantity (sks):** 802 **Yield (cu.ff./sk):** 2.08
Density: 12.9 **Volume (cu.ft.):** 1668 **Percent Excess:** 68

Tail

Top MD of Segment: 4260 **Bottom MD Segment:** 5100 **Cement Type:** Class C
Additives: 0.004 GPS cf-41L **Quantity (sks):** 250 **Yield (cu.ff./sk):** 1.33
Density: 14.8 **Volume (cu.ft.):** 332 **Percent Excess:** 68

Casing String Type: PRODUCTION

Stage Tool Depth:

Lead

Top MD of Segment: 4500 **Bottom MD Segment:** 9200 **Cement Type:** 50:50 H
Additives: 1/4 #/sk Cello Flake **Quantity (sks):** 310 **Yield (cu.ff./sk):** 4.41
Density: 10.5 **Volume (cu.ft.):** 1367 **Percent Excess:** 25

Tail

Top MD of Segment: 9200 **Bottom MD Segment:** 14344 **Cement Type:** 50:50 H
Additives: 50:50 Class H POZ 0.004 gps cf-41L **Quantity (sks):** 1200 **Yield (cu.ff./sk):** 1.22
Density: 14.4 **Volume (cu.ft.):** 1464 **Percent Excess:** 25

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Section 5 - Circulating Medium

Mud System Type: Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2:

Diagram of the equipment for the circulating system in accordance with Onshore Order #2:

Describe what will be on location to control well or mitigate other conditions: Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

Describe the mud monitoring system utilized: PVT/Pason/Visual Monitoring

Circulating Medium Table

Top Depth: 1225 **Bottom Depth:** 5100

Mud Type: SALT SATURATED

Min Weight (lbs./gal.): 9.8 **Max Weight (lbs./gal.):** 10

Density (lbs/cu.ft.): **Gel Strength (lbs/100 sq.ft.):**

PH: **Viscosity (CP):**

Filtration (cc): **Salinity (ppm):**

Additional Characteristics:

Top Depth: 0 **Bottom Depth:** 1225

Mud Type: SPUD MUD

Min Weight (lbs./gal.): 8.3 **Max Weight (lbs./gal.):** 8.4

Density (lbs/cu.ft.): **Gel Strength (lbs/100 sq.ft.):**

PH: **Viscosity (CP):**

Filtration (cc): **Salinity (ppm):**

Additional Characteristics:

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Top Depth: 5100 **Bottom Depth:** 14344

Mud Type: WATER-BASED MUD

Min Weight (lbs./gal.): 8.6 **Max Weight (lbs./gal.):** 8.9

Density (lbs/cu.ft.): **Gel Strength (lbs/100 sq.ft.):**

PH: **Viscosity (CP):**

Filtration (cc): **Salinity (ppm):**

Additional Characteristics:

Section 6 - Test, Logging, Coring

List of production tests including testing procedures, equipment and safety measures:

Drill Stem Tests will be based on geological sample shows.

List of open and cased hole logs run in the well:

CBL,GR,MUDLOG

Coring operation description for the well:

None Planned

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4375 **Anticipated Surface Pressure:** 2294.46

Anticipated Bottom Hole Temperature(F): 120

Anticipated abnormal proessures, temperatures, or potential geologic hazards? NO

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations plan:

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Vaca Draw 9418 10 Fed 7H - Directional Plan and Wall Plot_10-18-2016.pdf

Other proposed operations facets description:

A variance is requested for a Multi Bowl Wellhead. See the attached schematic and running procedure.

Note: The unknown surface formation is Quaternary.

Other proposed operations facets attachment:

Vaca Draw 9418 10 7H - H2S Emergancy Plan_01-12-2017.pdf

Vaca Draw 9418 10 7H - H2S Equipment Schematic_01-12-2017.pdf

Other Variance attachment:

Multi Bowl Wellhead Schematic_09-23-2016.pdf

Casing head running procedure_09-23-2016.pdf

SUPO

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Vaca Draw 9418 10 Federal 7H topographical and access rd_10-18-2016.pdf

Existing Road Purpose: ACCESS,FLUID TRANSPORT **Row(s) Exist?** NO

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? NO

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Vaca Draw 9418 10 7H - 1 Mile Radius Map and Well List_09-23-2016.pdf

Existing Wells description:

Section 4 - Location of Existing and/or Proposed Production Facilities

Submit or defer a Proposed Production Facilities plan? SUBMIT

Estimated Production Facilities description:

Production Facilities description: If well is productive, the production will be processed at the Central Tank Battery located on the Vaca Draw 9418 JV-P #4H well pad. A flow line to transport production from the proposed well to the existing facility will be installed. We plan to install a 3 inch steel flow line from the proposed well to the offsite production facility. The proposed length of the pipeline will be approximately 1003 feet and will follow the existing road to the existing production facility. The working pressure of the flow line will be about 200 psi. See the attached flow line plat. We plan to tie into the existing electric line as depicted on the well site - 600's plat. If any plans change regarding the production facility or other infrastructure, we will submit a sundry notice or right of way (if applicable) prior to installation or construction.

Production Facilities map:

Vaca Draw Central Tank Battery_09-23-2016.pdf

Vaca Draw 9418 10 Federal Proposed Flowline_01-26-2017.pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: DUST CONTROL, INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING

Water source type: OTHER

Describe type: Commercial

Source longitude: -103.71602

Source latitude: 31.999126

Source datum: NAD83

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Water source transport method: PIPELINE

Source transportation land ownership: COMMERCIAL

Water source volume (barrels): 100000 **Source volume (acre-feet):** 12.88931

Source volume (gal): 4200000

Water source and transportation map:

Vaca Draw 9418 10 Fed 7H Water Source and Transportation Map_09-23-2016.pdf

Water source comments:

New water well? NO

New Water Well Info

Well latitude: **Well Longitude:** **Well datum:**

Well target aquifer:

Est. depth to top of aquifer(ft): **Est thickness of aquifer:**

Aquifer comments:

Aquifer documentation:

Well depth (ft): **Well casing type:**

Well casing outside diameter (in.): **Well casing inside diameter (in.):**

New water well casing? **Used casing source:**

Drilling method: **Drill material:**

Grout material: **Grout depth:**

Casing length (ft.): **Casing top depth (ft.):**

Well Production type: **Completion Method:**

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: Caliche used for construction of the drilling pad and access road will be obtained from the closest existing caliche pit as approved by the BLM or from prevailing deposits found under the location. If there is not sufficient material available, caliche will be purchased from the nearest caliche pit located in Section 1 T25S R33E LeaCounty, NM. Alternative location if original location closes will be located in Sec 34 T24S R33E Lea County, NM.
Construction Materials source location attachment:

Section 7 - Methods for Handling Waste

Waste type: GARBAGE

Waste content description: Trash

Amount of waste: 500 pounds

Waste disposal frequency : One Time Only

Safe containment description: Trash produced during drilling and completion operations will be collected in a trash container and disposed of properly.
Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to an approved disposal facility.

Waste type: DRILLING

Waste content description: Drilling fluids and cuttings.

Amount of waste: 3990 barrels

Waste disposal frequency : One Time Only

Safe containment description: All drilling fluids will be stored safely and disposed of properly.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to an approved disposal facility.

Waste type: SEWAGE

Waste content description: Human waste and grey water.

Amount of waste: 1000 gallons

Waste disposal frequency : One Time Only

Safe containment description: Waste material will be stored safely and disposed of properly.

Safe containmant attachment:

Waste disposal type: HAUL TO COMMERCIAL FACILITY **Disposal location ownership:** COMMERCIAL
Disposal type description:

Disposal location description: Trucked to an approved disposal facility.

Reserve Pit

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft.) **Reserve pit width (ft.)**

Reserve pit depth (ft.) **Reserve pit volume (cu. yd.)**

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft.) **Cuttings area width (ft.)**

Cuttings area depth (ft.) **Cuttings area volume (cu. yd.)**

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments: It is possible that a mobile home will be used at the well site during drilling operations.

Section 9 - Well Site Layout

Well Site Layout Diagram:

Vaca Draw 9418 10 7H - Well Site 600s plat_09-23-2016.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: PAD EXPANSION

Recontouring attachment:

Vaca Draw 9418 10 7H - Reclaimed Area_09-23-2016.pdf

Drainage/Erosion control construction: During construction proper erosion control methods will be used to control erosion, runoff, and siltation of the surrounding area.
Drainage/Erosion control reclamation: Proper erosion control methods will be used on the area to control erosion, runoff, and siltation of the surrounding area.

Wellpad long term disturbance (acres): 2.31	**Wellpad short term disturbance (acres):** 2.77
Access road long term disturbance (acres): 0.012	**Access road short term disturbance (acres):** 0.012
Pipeline long term disturbance (acres): 0.000022497705	**Pipeline short term disturbance (acres):** 0.000022497705
Other long term disturbance (acres): 0	**Other short term disturbance (acres):** 0
Total long term disturbance: 2.3220224	**Total short term disturbance:** 2.7820225

Reconstruction method: The areas planned for interim reclamation will then be recontoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be recontoured to the above ratios during interim reclamation.
Topsoil redistribution: Topsoil will be evenly respread and aggressively revegetated over the entire disturbed area not needed for all-weather operations.
Soil treatment: To seed the area, the proper BLM seed mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting in order to break the soil crust and create seed germination micro-sites.
Existing Vegetation at the well pad: The historic climax plant community is a grassland dominated by black grama, dropseeds, and blue stems with sand sage and shinnery oak distributed evenly throughout. Current landscape displays mesquite, shinnery oak, yucca, desert sage, fourwing saltbush, snakeweed, and bunch grasses.
Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road: Refer to "Existing Vegetation at the well pad"

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline: Refer to "Existing Vegetation at the well pad"

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances: Refer to "Existing Vegetation at the well pad"

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Seed harvest description:

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: **Seed source:**

Seed name:

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre: **Proposed seeding season:**

Seed Summary

Total pounds/Acre:

Seed Type	Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Nick **Last Name:** Eaton

Phone: (432)682-3753 **Email:** neaton@btaoil.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: No invasive species present. Standard regular maintenance to maintain a clear location and road.

Weed treatment plan attachment:

Monitoring plan description: Identify areas supporting weeds prior to construction; prevent the introduction and spread of weeds from construction equipment during construction; and contain weed seeds and propagules by preventing segregated topsoil from being spread to adjacent areas. No invasive species present. Standard regular maintenance to maintain a clear location and road.

Monitoring plan attachment:

Success standards: To maintain all disturbed areas as per Gold Book standards.

Pit closure description: N/A

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: EXISTING ACCESS ROAD

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Section 12 - Other Information

Right of Way needed? YES **Use APD as ROW?** YES

ROW Type(s): 289001 ROW- O&G Well Pad

ROW Applications

SUPO Additional Information:

Use a previously conducted onsite? YES

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Previous Onsite information: Onsite was conducted Friday, August 26, 2016 by Jeffery Robertson.

Other SUPO Attachment

PWD

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

Lined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

Unlined pit: do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

Assigned injection well API number? **Injection well API number:**

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

Produced Water Disposal (PWD) Location:

PWD surface owner: **PWD disturbance (acres):**

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

Bond Info

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB000849

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment:

Operator Certification

Operator Certification

I hereby certify that I, or someone under my direct supervision, have inspected the drill site and access route proposed herein; that I am familiar with the conditions which currently exist; that I have full knowledge of state and Federal laws applicable to this operation; that the statements made in this APD package are, to the best of my knowledge, true and correct; and that the work associated with the operations proposed herein will be performed in conformity with this APD package and the terms and conditions under which it is approved. I also certify that I, or the company I represent, am responsible for the operations conducted under this application. These statements are subject to the provisions of 18 U.S.C. 1001 for the filing of false statements.

NAME: Kayla McConnell **Signed on:** 09/23/2016

Title: Regulatory Analyst

Street Address: 104 S. Pecos

Operator Name: BTA OIL PRODUCERS LLC

Well Name: VACA DRAW 9418 10 FEDERAL **Well Number:** 7H

City: Midland **State:** TX **Zip:** 79701

Phone: (432)682-3753

Email address: kmcconnell@btaoil.com

Field Representative

Representative Name: Nick Eaton

Street Address: 104 S. Pecos

City: Midland **State:** TX **Zip:** 79701

Phone: (432)682-3753

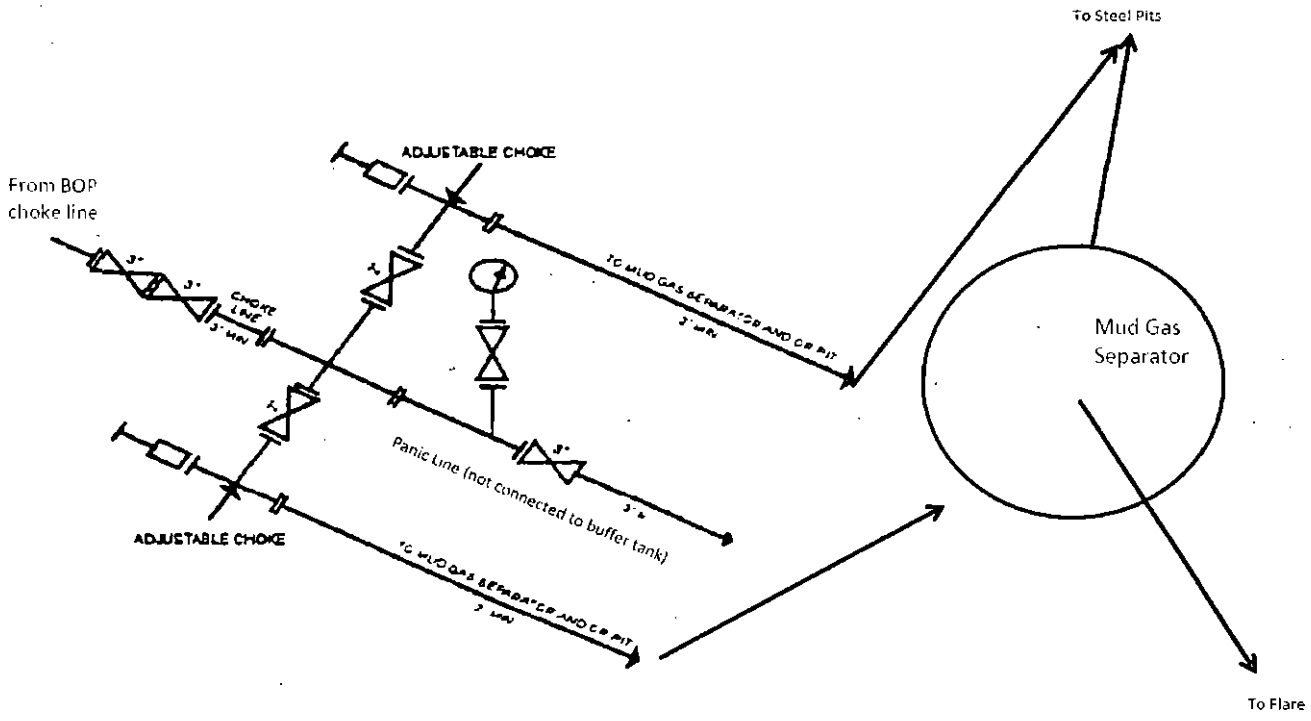
Email address: neaton@btaoil.com

Payment Info

Payment

APD Fee Payment Method: BLM DIRECT

CBS Receipt number: 3650642



3M choke manifold design

ContiTech

CONTITECH RUBBER Industrial Kft.	No:QC-DB-599/2014 Page: 16 / 176

Rig 94 Asset 24455

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE

CERT. Nº: 1592

PURCHASER:	ContiTech Oil & Marine Corp.			P.O. Nº:	4500461753
CONTITECH ORDER Nº:	539225	HOSE TYPE:	3" ID	Choke & Kill Hose	
HOSE SERIAL Nº:	68547	NOMINAL / ACTUAL LENGTH:		7,62 m / 7,66 m	
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi	Duration:	60 min.

Pressure test with water at ambient temperature

See attachment. (1 page)

→ 10 Min.

↑ 50 MPa

COUPLINGS Type	Serial Nº	Quality	Heat Nº
3" coupling with	2574 5533	AISI 4130	A1582N H8672
4 1/16" 10K API Swivel Flange end		AISI 4130	58855
Hub		AISI 4130	A1199N A1423N

Not Designed For Well Testing

API Spec 16 C

Fire Rated

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

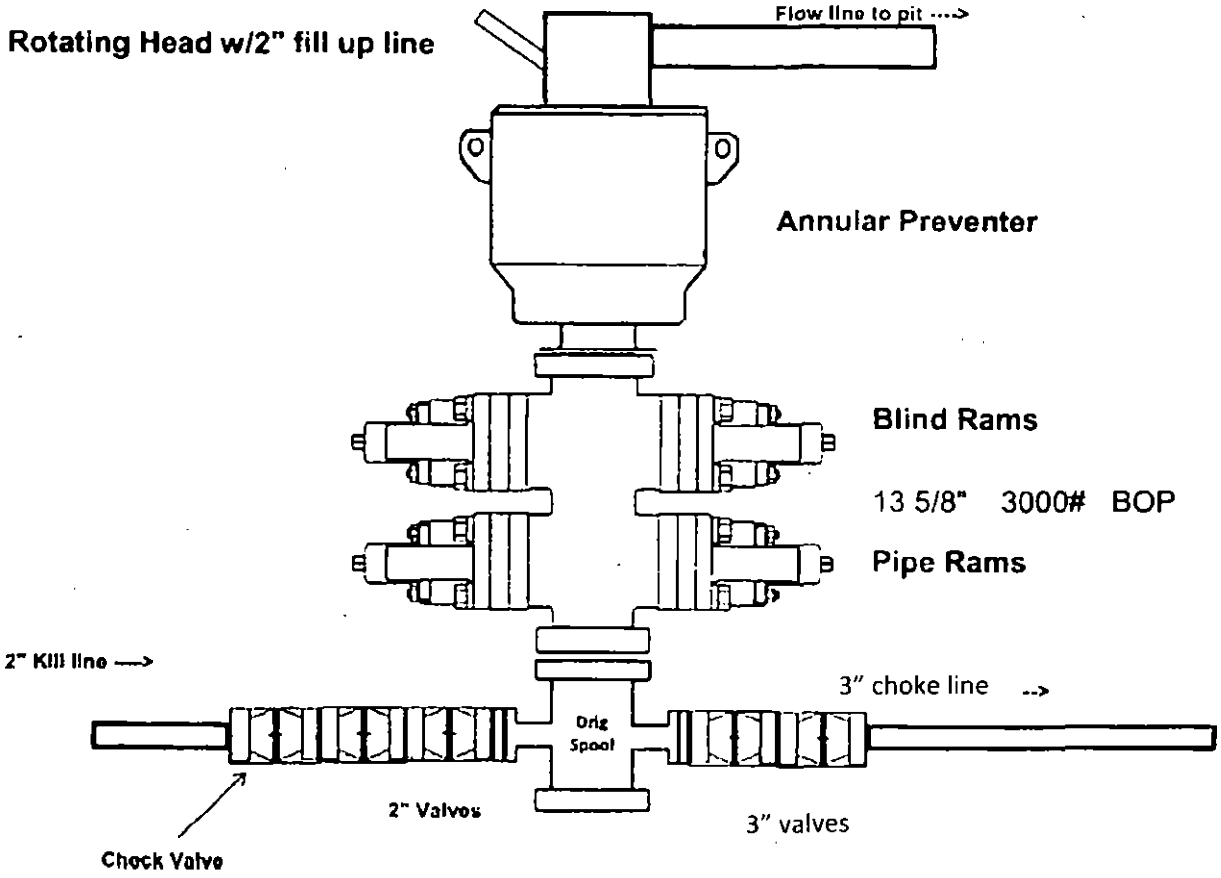
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

Date:	Inspector	Quality Control
04 September 2014.		ContiTech Rubber Industrial Kft. Quality Control Dept. [signature]

ContiTech Rubber Industrial Kft. | Budapest út 10. H-6728 Szeged | H-6701 Szeged, P.O.Box 152 Szeged, Hungary
Phone: +36 62 566 737 | Fax: +36 62 566 738 | e-mail: info@fluid.contitech.hu | Internet: www.contitech-rubber.hu; www.contitech.hu
The Court of Csongrád County as Registry Court | Registry Court No: Cg 06-09-002502 | EU VAT No: HU11087209
Bank data: Commerzbank Zrt., Budapest | 14220108-26830003

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE No: 1588, 1590, 1592

3,000 psi BOP Schematic



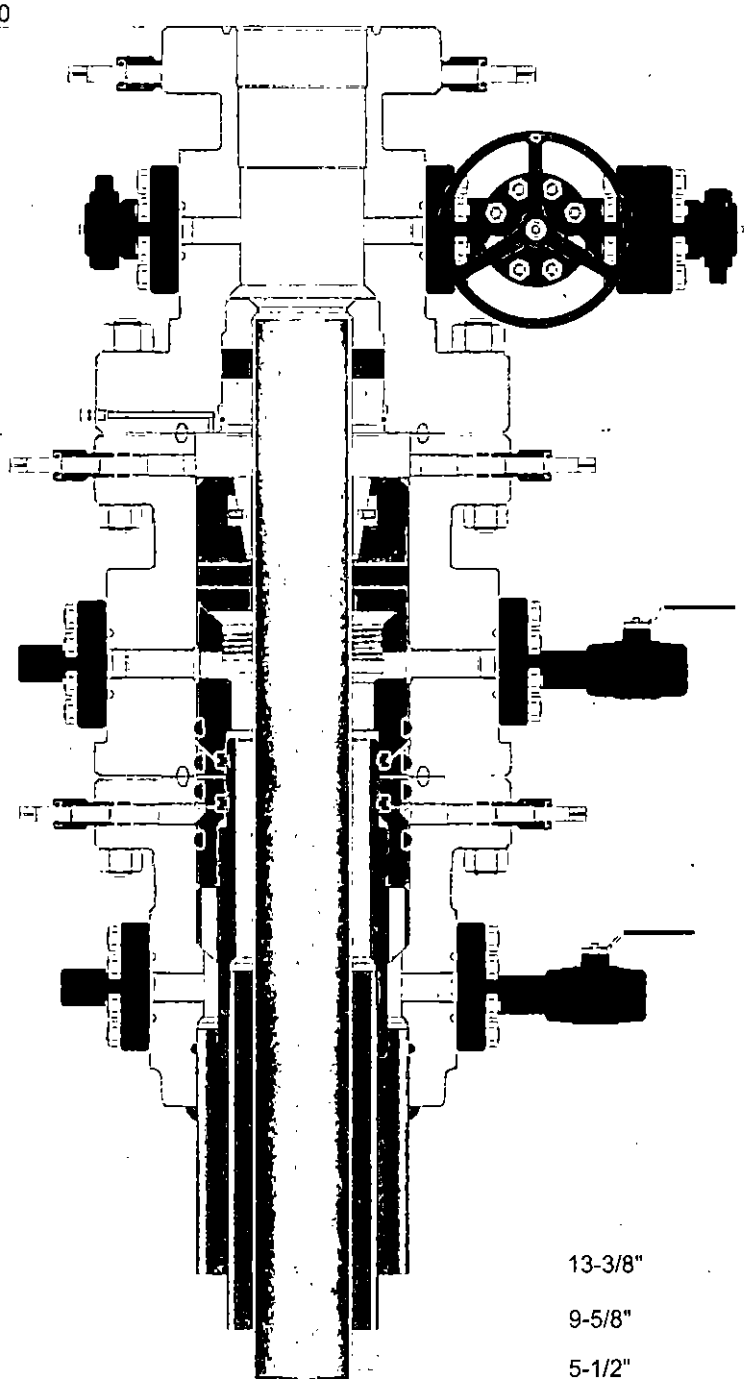
BTA Oil Producers, LLC

Well: Vaca Draw 9418 10 Fed #7H

Casing Assumption

Hole Size	Csg.Size	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/ Buoyant	Mud Weight (ppg)
17.500	13.375	0	1225	0	1225	No	54.5	J-55	STC	3.30	9.60	23.00	14.00	Dry	8.40
12.250	9.625	0	5100	0	5100	No	40.0	J-55	LTC	1.60	2.40	3.10	2.60	Dry	10.00
8.750	5.500	0	14344	0	9457	No	17.0	P-110	BTC	3.10	4.30	3.40	2.80	Dry	8.90

NOTE: THIS DRAWING IS NOT TO SCALE. THE DIMENSIONS REFLECTED ON THIS DRAWING ARE ESTIMATED DIMENSIONS AND ARE FOR REFERENCE ONLY.



Weatherford®

Customer:	BTA OIL PRODUCERS	Project No.:	146245	Quote No.:	291545 v2
Project Name:	WEST TEXAS	Date:	07/06/16	Drawn By:	JL

Weatherford®

WFT Casing Head (Slip on Weld with O-Ring) Running Procedure

Publication RP-001

October 21, 2010

Install the Casing Head

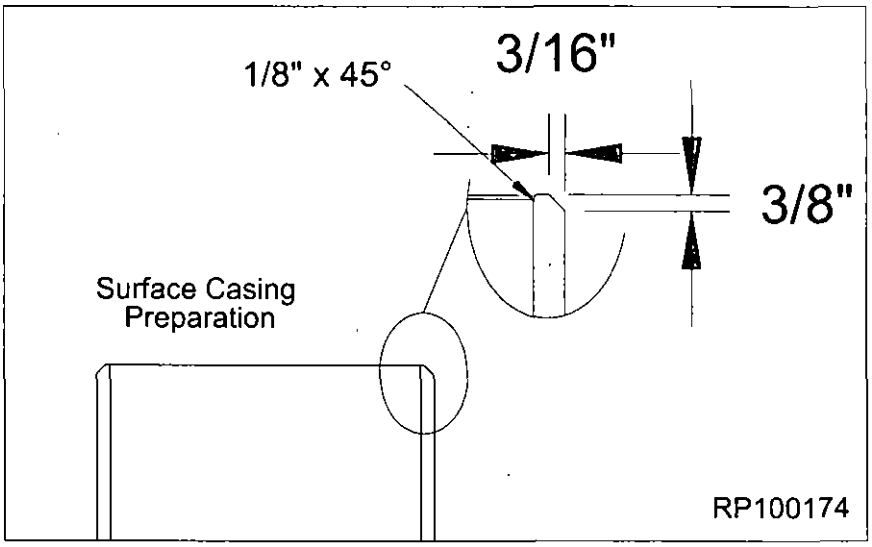
1. Examine the ***WFT Casing Head.*** Verify the following:
   - bore is clean and free of debris
   - seal areas, threads and ring grooves are clean and undamaged
   - o-ring is properly installed, clean and undamaged
   - all peripheral equipment is intact and undamaged
2. Measure the pocket depth of the Casing Head and record this dimension.
3. Run the surface casing and cement as required.
4. Determine the required elevation of the Casing Head as required by the Drilling Supervisor.
5. Use the following calulation to determine the correct final cut location of the surface casing.

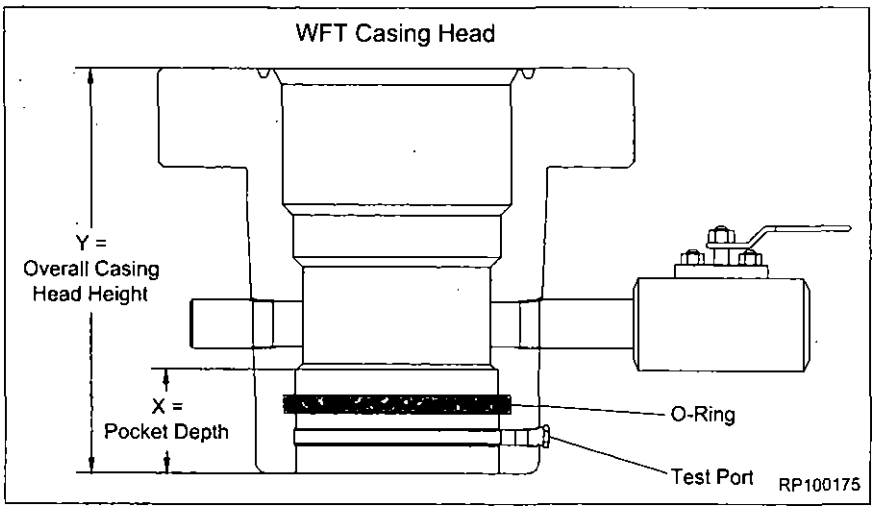
X = Pocket Depth

Y = Overall Casing Head Height

Y - X = Distance from correct elevation point to surface casing cutoff height.

6. Lift the riser assembly high enough to rough cut the surface casing a minimum of 12" above the anticipated final cut location, if applicable.
7. Remove the spent portion of surface casing and the riser assembly and set aside.
8. Determine the correct elevation for the wellhead assembly.
9. Rough cut the surface casing a minimum of 12" above the final cut location.
10. Cut the conductor pipe a comfortable level below the final cut location of the surface casing.





11. Final cut the surface casing at the correct elevation.

NOTE: Ensure the cut on the surface casing is level as this will determine the orientation of the remainder of the wellhead equipment.

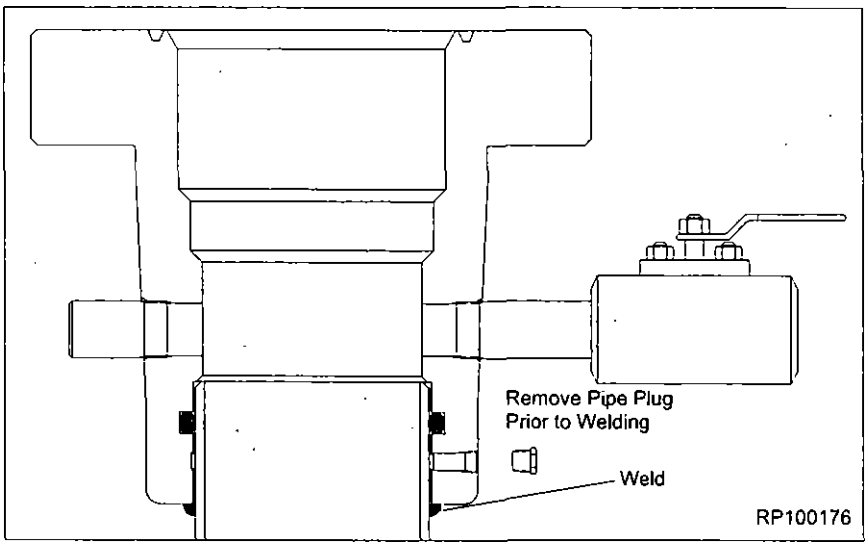
12. Bevel the surface casing with a 3/16" x 3/8" bevel and remove any sharp edges from the OD of the casing.
13. Break a 1/8" x 45° bevel on the ID of the surface casing.

Install the Casing Head

14. Wipe the ID of the o-ring of the Casing Head with a light coat of oil or grease.

NOTE: Excessive oil or grease will prevent a positive seal from forming.

15. Lower the Casing Head over the surface casing stub to a positive stop.
16. Remove the fitting from the test port and set aside.
17. Orient the Casing Head as per the Drilling Superintendents instructions ensuring the face of the Casing Head is level and two holed to the drilling rig substructure.
18. Weld and test the surface casing to the Casing Head as per the ***RECOMMENDED FIELD WELDING PROCEDURE*** located in the back of this manual.
19. Once all welding and testing is completed, replace the fitting into the open port and close the valve on the Casing Head.



Recommended Procedure for Field Welding Pipe to Wellhead Parts for Pressure Seal

1. **Introduction and Scope.** The following recommended procedure has been prepared with particular regard to attaining pressure-tight weld when attaching casing heads, flanges, etc., to casing. Although most of the high strength casing used (such as N-80) is not normally considered field weldable, some success may be obtained by using the following or similar procedures.

   Caution: In some wellheads, the seal weld is also a structural weld and can be subjected to high tensile stresses. Consideration must therefore be given by competent authority to the mechanical properties of the weld and its heat affected zone.

   a. The steels used in wellhead parts and in casing are high strength steels that are susceptible to cracking when welded. It is imperative that the finished weld and adjacent metal be free from cracks. The heat from welding also affects the mechanical properties. This is especially serious if the weld is subjected to service tension stresses.

   b. This procedure is offered only as a recommendation. The responsibility for welding lies with the user and results are largely governed by the welder's skill. Weldability of the several makes and grades of casing varies widely, thus placing added responsibility on the welder. Transporting a qualified welder to the job, rather than using a less-skilled man who may be at hand, will, in most cases, prove economical. The responsible operating representative should ascertain the welder's qualifications and, if necessary, assure himself by instruction or demonstration, that the welder is able to perform the work satisfactorily.

2. **Welding Conditions.** Unfavorable welding conditions must be avoided or minimized in every way possible, as even the most skilled welder cannot successfully weld steels that are susceptible to cracking under adverse working conditions, or when the work is rushed. Work above the welder on the drilling floor should be avoided> The weld should be protected from dripping mud, water, and oil and from wind, rain, or other adverse weather conditions. The drilling mud, water, or other fluids must be lowered in the casing and kept at a low level until the weld has properly cooled. It is the responsibility of the user to provide supervision that will assure favorable working conditions, adequate time, and the necessary cooperation of the rig personnel.

3. **Welding.** The welding should be done by the shielded metal-arc or other approved process.

4. **Filler Metal.** Filler Metals. For root pass. it's recommended to use E6010, E6011 (AC), E6019 or equivalent electrodes. The E7018 or E7018-A1 electrodes may also be used for root pass operations but has the tendency to trap slag in tight grooves. The E6010, E6011 and E6019 offer good penetration and weld deposit ductility with relatively high intrinsic hydrogen content. Since the E7018 and E7018-A1 are less susceptible to hydrogen induced cracking, it is recommended for use as the filler metal for completion of the weld groove after the root pass is completed. The E6010, E6011 (AC), E6019, E7018 and E7018-A1 are classified under one of the following codes AWS A5.1 (latest edition): Mild Steel covered electrodes or the AWS A5.5 (latest edition): Low Alloy Steel Covered Arc-Welding Electrodes. The low hydrogen electrodes, E7018 and E7018-A1, should not be exposed to the atmosphere until ready for use. It's recommended that hydrogen electrodes remain in their sealed containers. When a job arises, the container shall be opened and all unused remaining electrodes to be stored in heat electrode storage ovens. Low hydrogen electrodes exposed to the atmosphere, except water, for more than two hours should be dried 1 to 2 hours at 600°F to 700 °F (316°C to 371 °C) just before use. It's recommended for any low hydrogen electrode containing water on the surface should be scrapped.

5. **Preparation of Base Metal.** The area to be welded should be dry and free of any paint, grease/oil and dirt. All rust and heat-treat surface scale shall be ground to bright metal before welding.

6. **Preheating.** Prior to any heating, the wellhead member shall be inspected for the presence of any o-rings or other polymeric seals. If any o-rings or seals are identified then preheating requires close monitoring as noted in paragraph 6a. Before applying preheat, the fluid should be bailed out of the casing to a point several inches (>6" or 150 mm) below the weld joint/location. Preheat both the casing and wellhead member for a minimum distance of three (3) inches on each side of the weld joint using a suitable preheating torch in accordance with the temperatures shown below in a and b. The preheat temperature should be checked by the use of heat sensitive crayons. Special attention must be given to preheating the thick sections of wellhead parts to be welded, to insure uniform heating and expansion with respect to the relatively thin casing.

   a. Wellhead members containing o-rings and other polymeric seals have tight limits on the preheat and interpass temperatures. Those temperatures must be controlled at 200°F to 325°F or 93 °C to 160°C and closely monitored to prevent damage to the o-ring or seals.

   b. Wellhead members not containing o-rings and other polymeric seals should be maintained at a preheat and interpass temperature of 400°F to 600°F or 200°C to 300°C.

Recommended Procedure for Field Welding Pipe to Well-head Parts for Pressure Seal (continued)

7. **Welding Technique.** Use a 1/8 or 5/32-inch (3.2 or 4.0 mm) E6010 or E7018 electrode and step weld the first bead (root pass); that, weld approximately 2 to 4 inches (50 to 100 mm) and then move diametrically opposite this point and weld 2 to 4 inches (50 to 100 mm) halfway between the first two welds, move diametrically opposite this weld, and so on until the first pass is completed. This second pass should be made with a 5/32-inch (4.0 mm) low hydrogen electrode of the proper strength and may be continuous. The balance of the welding groove may then be filled with continuous passes without back stepping or lacing, using a 3/16-inch (4.8 mm) low hydrogen electrode. All beads should be stringer beads with good penetration. There should be no undercutting and weld shall be workmanlike in appearance.

   a. Test ports should be open when welding is performed to prevent pressure buildup within the test cavity.

   b. During welding the temperature of the base metal on either side of the weld should be maintained at 200 to 300°F (93 to 149°C).

   c. Care should be taken to insure that the welding cable is properly grounded to the casing, but ground wire should not be welded to the casing or the wellhead. Ground wire should be firmly clamped to the casing, the wellhead, or fixed in position between pipe slips. Bad contact may cause sparking, with resultant hard spots beneath which incipient cracks may develop. The welding cable should not be grounded to the steel derrick, nor to the rotary-table base.

8. **Cleaning.** All slag or flux remaining on any welding bead should be removed before laying the next bead. This also applies to the completed weld.

9. **Defects.** Any cracks or blow holes that appear on any bead should be removed to sound metal by chipping or grinding before depositing the next bead.

10. **Postheating.** Post-heating should be performed at the temperatures shown below and held at that temperature for no less than one hour followed by a slow cooling. The post-heating temperature should be in accordance with the following paragraphs.

    a. Wellhead members containing o-rings and other polymeric seals have tight limits on the post-heating temperatures. Those temperatures must be controlled at 250°F to 300°F or 120 °C to 150°C and closely monitored to prevent damage to the o-ring or seals.

    b. Wellhead members not containing o-rings and other polymeric seals should be post-heated at a temperature of 400°F to 600°F or 200°C to 300°C.

11. **Cooling. Rapid cooling must be avoided.** To assure slow cooling, welds should be protected from extreme weather conditions (cold, rain, high winds, etc.) by the use of suitable insulating material. (Specially designed insulating blankets are available at many welding supply stores.) Particular attention should be given to maintaining uniform cooling of the thick sections of the wellhead parts and the relatively thin casing, as the relatively thin casing will pull away from the head or hanger if allowed to cool more rapidly. The welds should cool in air to less than 200°F (93°C) (measured with a heat sensitive crayon) prior to permitting the mud to rise in the casing.

12. **Test the Weld.** After cooling, test the weld. The weld must be cool otherwise the test media will crack the weld. The test pressure should be no more than 80% of the casing collapse pressure.

Test Media	
Acceptable Medias	**Unacceptable Medias**
Water Water Soluable Oil Inert Gas •Nitrogen •Argon Gas	Oxygen Acetylene Hydraulic Oil Motor Oil Brake Fluid