

OCT 23 2019

UNITED STATES

OCT 23 2019

DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

1a. Type of work: <input checked="" type="checkbox"/> DRILL <input type="checkbox"/> REENTER		5. Lease Serial No. NMNM082886
1b. Type of Well: <input checked="" type="checkbox"/> Oil Well <input checked="" type="checkbox"/> Gas Well <input type="checkbox"/> Other		6. If Indian, Allottee or Tribe Name
1c. Type of Completion: <input type="checkbox"/> Hydraulic Fracturing <input checked="" type="checkbox"/> Single Zone <input type="checkbox"/> Multiple Zone		7. If Unit or CA Agreement, Name and No.
2. Name of Operator DEVON ENERGY PRODUCTION COMPANY LP		8. Lease Name and Well No. SPUD MUFFIN 31-30 FED COM 731H 3-22-920
3a. Address 333 West Sheridan Avenue Oklahoma City OK 73102	3b. Phone No. (include area code) (800)583-3866	9. API Well No. 30-015-46420
4. Location of Well (Report location clearly and in accordance with any State requirements. *) At surface LOT 4 / 120 FSL / 1245 FWL / LAT 32.2546175 / LONG -104.0283222 At proposed prod. zone LOT 1 / 20 FNL / 330 FWL / LAT 32.2835228 / LONG -104.0311794		10. Field and Pool, or Exploratory PURPLE SAGE-WOLFCAMP / WOLFCAMP
14. Distance in miles and direction from nearest town or post office*		11. Sec., T. R. M. or Blk. and Survey or Area SEC 31 / T23S / R29E / NMP
15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease 39.59	12. County or Parish EDDY
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 2040 feet	17. Spacing Unit dedicated to this well 632.38	13. State NM
19. Proposed Depth 10720 feet / 21136 feet	20. BLM/BIA Bond No. in file FED: NMB000801	
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2959 feet	22. Approximate date work will start* 12/05/2020	23. Estimated duration 45 days
24. Attachments		

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

- | | |
|--|---|
| 1. Well plat certified by a registered surveyor. | 4. Bond to cover the operations unless covered by an existing bond on file (see Item 20 above). |
| 2. A Drilling Plan. | 5. Operator certification. |
| 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). | 6. Such other site specific information and/or plans as may be requested by the BLM. |

25. Signature (Electronic Submission)	Name (Printed/Typed) Erin Workman / Ph: (405)552-7970	Date 12/31/2018
Title Regulatory Compliance Professional		
Approved by (Signature) (Electronic Submission)	Name (Printed/Typed) Cody Layton / Ph: (575)234-5959	Date 10/11/2019
Title Assistant Field Manager Lands & Minerals		
Office CARLSBAD		

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.

APPROVED WITH CONDITIONS
Approval Date: 10/11/2019

NSL

Required

*(Instructions on page 2)

RWP 10-28-19

INSTRUCTIONS

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

ITEM I: If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations. Consult applicable Federal regulations concerning subsequent work proposals or reports on the well.

ITEM 4: Locations on Federal or Indian land should be described in accordance with Federal requirements. Consult local Federal offices for specific instructions.

ITEM 14: Needed only when location of well cannot readily be found by road from the land or lease description. A plat, or plats, separate or on the reverse side, showing the roads to, and the surveyed location of, the well, and any other required information, should be furnished when required by Federal agency offices.

ITEMS 15 AND 18: If well is to be, or has been directionally drilled, give distances for subsurface location of hole in any present or objective productive zone.

ITEM 22: Consult applicable Federal regulations, or appropriate officials, concerning approval of the proposal before operations are started.

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

The BLM connects this information to an evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases. This information will be used to analyze and approve applications. Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease. The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number.

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

PECOS DISTRICT

DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company LP
LEASE NO.:	NMNM082886
WELL NAME & NO.:	Spud Muffin 31-30 Fed Com 731H
SURFACE HOLE FOOTAGE:	120'/S & 1245'/W
BOTTOM HOLE FOOTAGE:	230'/N & 330'/W
LOCATION:	Section 31, T.23 S., R.29 E., NMPM
COUNTY:	Eddy County, New Mexico

COA

H2S	<input type="radio"/> Yes	<input checked="" type="radio"/> No	
Potash	<input checked="" type="radio"/> None	<input type="radio"/> Secretary	<input type="radio"/> R-111-P
Cave/Karst Potential	<input type="radio"/> Low	<input checked="" type="radio"/> Medium	<input type="radio"/> High
Variance	<input type="radio"/> None	<input checked="" type="radio"/> Flex Hose	<input type="radio"/> Other
Wellhead	<input type="radio"/> Conventional	<input type="radio"/> Multibowl	<input checked="" type="radio"/> Both
Other	<input type="checkbox"/> 4 String Area	<input type="checkbox"/> Capitan Reef	<input type="checkbox"/> WIPP
Other	<input type="checkbox"/> Fluid Filled	<input checked="" type="checkbox"/> Cement Squeeze	<input type="checkbox"/> Pilot Hole
Special Requirements	<input type="checkbox"/> Water Disposal	<input checked="" type="checkbox"/> COM	<input type="checkbox"/> Unit

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

Primary Casing Design:

1. The 13-3/8 inch surface casing shall be set at approximately **400 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.
 - a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

- b. Wait on cement (WOC) time for a primary cement job will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
 - c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.
 - d. If cement falls back, remedial cementing will be done prior to drilling out that string.
2. The minimum required fill of cement behind the 7-5/8 inch intermediate casing is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
Cement excess is less than 25%, more cement might be required.
(22.21%)

Option 2:

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

- a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.
 - b. Second stage above DV tool:
 - Cement to surface. If cement does not circulate, contact the appropriate BLM office.
Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.
Cement excess is less than 25%, more cement might be required.
(22.21%)
- ❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Operator has proposed to pump down 13-3/8" X 7-5/8" annulus. Operator must run a CBL from TD of the 7-5/8" casing to surface. Submit results to BLM.

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

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

Alternate Casing Design:

4. The **13-3/8** inch surface casing shall be set at approximately **400 feet** (a minimum of **70 feet (Eddy County)** into the Rustler Anhydrite and above the salt) and cemented to the surface.

- e. 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.
- f. 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)
- g. 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.
- h. If cement falls back, remedial cementing will be done prior to drilling out that string.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

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

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Cement excess is less than 25%, more cement might be required. (17.59%)**

Option 2:

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.

c. 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.

d. Second stage above DV tool:

- Cement to surface. If cement does not circulate, contact the appropriate BLM office.

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

Cement excess is less than 25%, more cement might be required. (17.59%)

❖ In Medium Cave/Karst Areas if cement does not circulate to surface on the first two casing strings, the cement on the 3rd casing string must come to surface.

Operator has proposed to pump down 13-3/8" X 8-5/8" annulus. Operator must run a CBL from TD of the 8-5/8" casing to surface. Submit results to BLM.

The Operator is approved to drill 10.625" hole instead of 9.875" for intermediate 1 with a BTC connection.

6. 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.
Cement excess is less than 25%, more cement might be required. (9%)

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.

Option 1:

- a. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **3000 (3M)** psi.
- b. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the intermediate casing shoe shall be **5000 (5M)** psi.

Option 2:

1. Operator has proposed a multi-bowl wellhead assembly. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **5000 (5M)** psi.
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
 - e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

D. SPECIAL REQUIREMENT (S)

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

GENERAL REQUIREMENTS

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

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

☒ Eddy County

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: Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.
3. 5M or higher system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.
4. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
 - a. Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.
 - b. If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
 - c. Manufacturer representative shall install the test plug for the initial BOP test.
 - d. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.
 - e. If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.
5. The appropriate BLM office shall be notified a minimum of 4 hours in advance for a representative to witness the tests.
 - a. In a water basin, for all casing strings utilizing slips, these are to be set as soon as the crew and rig are ready and any fallback cement remediation has been done. The casing cut-off and BOP installation can be initiated four hours after installing the slips, which will be approximately six hours after bumping the plug. For those casing strings not using slips, the minimum wait time before cut-off is eight hours after bumping the plug. BOP/BOPE testing can begin after cut-off or once cement reaches 500 psi compressive strength (including lead 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 not a cup or J-packer. The operator also has the option of utilizing an independent tester to test without a plug (i.e. against the casing) pursuant to Onshore Order 2 with the pressure not to exceed 70% of the burst rating for the casing. Any test against the casing must meet the WOC time for water basin (8 hours) or potash (24 hours) or 500 pounds compressive strength, whichever is greater, prior to initiating the test (see casing segment as lead cement may be critical item).
- d. The test shall be run on a 5000 psi chart for a 2-3M BOP/BOP, on a 10000 psi chart for a 5M BOP/BOPE and on a 15000 psi chart for a 10M BOP/BOPE. If a linear chart is used, it shall be a one hour chart. A circular chart shall have a maximum 2 hour clock. If a twelve hour or twenty-four hour chart is used, tester shall make a notation that it is run with a two hour clock.
- e. The results of the test shall be reported to the appropriate BLM office.
- f. All tests are required to be recorded on a calibrated test chart. A copy of the BOP/BOPE test chart and a copy of independent service company test will be submitted to the appropriate BLM office.
- g. The BOP/BOPE test shall include a low pressure test from 250 to 300 psi. The test will be held for a minimum of 10 minutes if test is done with a test plug and 30 minutes without a test plug. This test shall be performed prior to the test at full stack pressure.
- h. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per 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.



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

10/17/2019

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: Erin Workman

Signed on: 12/31/2018

Title: Regulatory Compliance Professional

Street Address: 333 West Sheridan Avenue

City: Oklahoma City

State: OK

Zip: 73102

Phone: (405)552-7970

Email address: Erin.Workman@dvn.com

Field Representative

Representative Name: RAY VAZ

Street Address: 333 West Sheridan Ave

City: OKC

State: OK

Zip: 73102

Phone: (405)552-4902

Email address: Ray.vaz@dvn.com



U.S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Application Data Report

10/17/2019

APD ID: 10400036936

Submission Date: 12/31/2018

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

[Show Final Text](#)

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - General

APD ID: 10400036936

Tie to previous NOS? N

Submission Date: 12/31/2018

BLM Office: CARLSBAD

User: Erin Workman

Title: Regulatory Compliance
Professional

Federal/Indian APD: FED

Is the first lease penetrated for production Federal or Indian? FED

Lease number: NMNM082886

Lease Acres: 39.59

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: DEVON ENERGY PRODUCTION COMPANY LP

Operator letter of designation:

Operator Info

Operator Organization Name: DEVON ENERGY PRODUCTION COMPANY LP

Operator Address: 333 West Sheridan Avenue

Zip: 73102

Operator PO Box:

Operator City: Oklahoma City State: OK

Operator Phone: (800)583-3866

Operator Internet Address:

Section 2 - Well Information

Well in Master Development Plan? NO

Master Development Plan name:

Well in Master SUPO? NO

Master SUPO name:

Well in Master Drilling Plan? NO

Master Drilling Plan name:

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Well API Number:

Field/Pool or Exploratory? Field and Pool

Field Name: PURPLE SAGE-
WOLFCAMP

Pool Name: WOLFCAMP

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

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

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:

Number: 2H

Well Class: HORIZONTAL

HARROUN TRUST

Number of Legs: 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town:

Distance to nearest well: 2040 FT

Distance to lease line: 120 FT

Reservoir well spacing assigned acres Measurement: 632.38 Acres

Well plat: SPUD_MUFFIN_31_30_FED_COM_731H_SIGNATURE_R9_002_20190708083322.pdf

Well work start Date: 12/05/2020

Duration: 45 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83

Vertical Datum: NAVD88

Survey number:

Reference Datum:

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
SHL Leg #1	120	FSL	1245	FWL	23S	29E	31	Lot 4	32.2546175	-104.0283222	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 082886	2959	0	0	
KOP Leg #1	50	FSL	330	FWL	23S	29E	31	Lot 4	32.254432	-104.031283	EDD Y	NEW MEXI CO	NEW MEXI CO	F	NMNM 082886	-7188	10226	10147	
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	-104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	-7422	10467	10381	

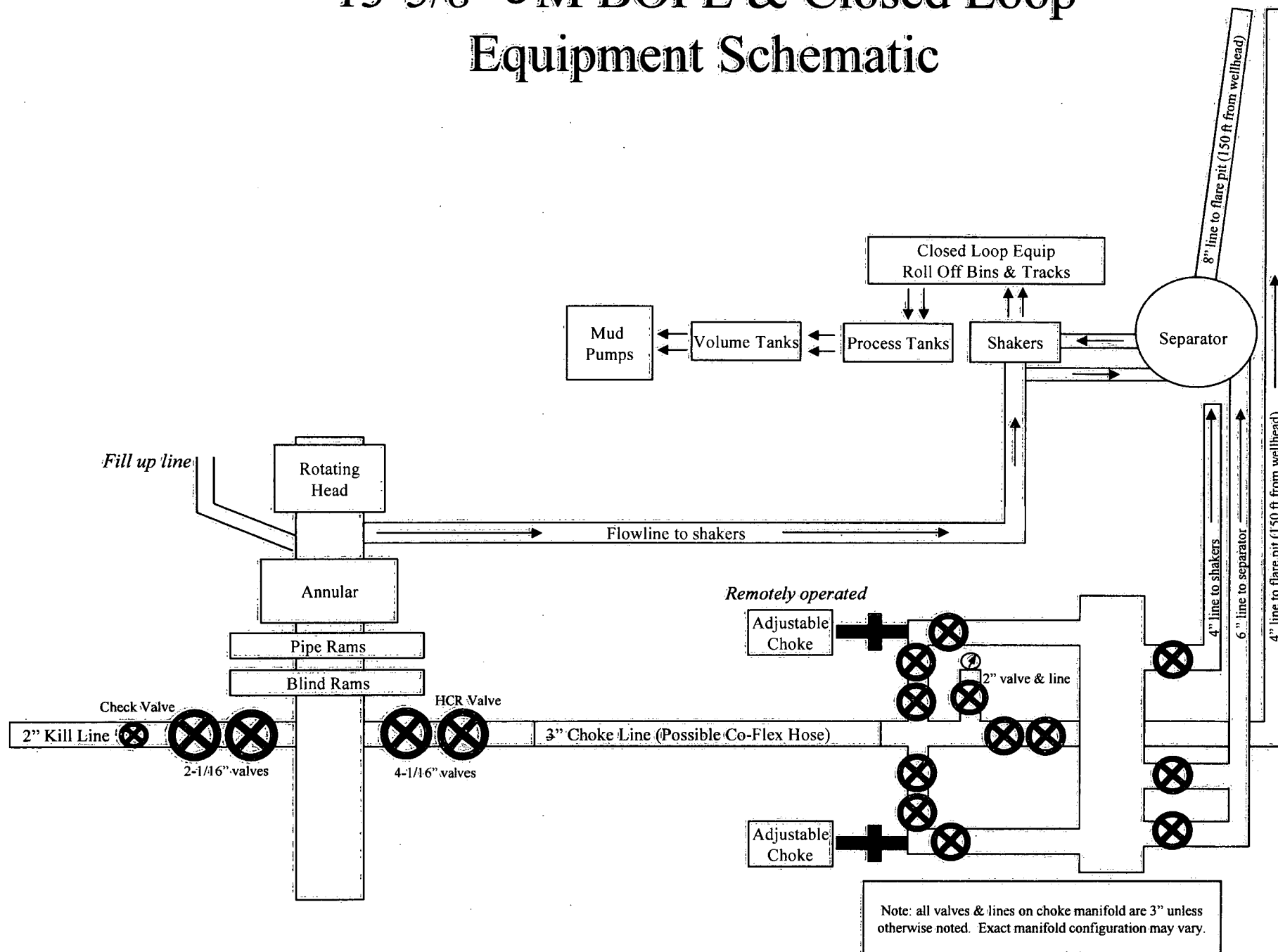
Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Wellbore	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD	Will this well produce from this lease?
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	- 104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7422	104 67	103 81	
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	- 104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7422	104 67	103 81	
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	- 104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7422	104 67	103 81	
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	- 104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7422	104 67	103 81	
PPP Leg #1	100	FSL	330	FWL	23S	29E	31	Lot 4	32.2545875	- 104.0312813	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7422	104 67	103 81	
EXIT Leg #1	100	FNL	330	FWL	23S	29E	30	Lot 1	32.2833028	- 104.0311796	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7761	210 56	107 20	
BHL Leg #1	20	FNL	330	FWL	23S	29E	30	Lot 1	32.2835228	- 104.0311794	EDD Y	NEW MEXI CO	NEW MEXI CO	F	FEE	- 7761	211 36	107 20	

13-5/8" 5M BOPE & Closed Loop Equipment Schematic



Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Devon_Spud_Muffin_31_30_731H_AC_Report_Permit_Plan_5_20190708075557.pdf

Devon_Spud_Muffin_31_30_731H_Permit_Plan_5_20190708075557.pdf

Devon_Spud_Muffin_31_30_731H_Plot_Permit_Plan_5_20190708093749.pdf

Other proposed operations facets description:

5M Verbiage
5M Wellhead
Spec sheets
GCP Form
Drilling Plan
Closed Loop Design Plan
Spudder Rig

Other proposed operations facets attachment:

Spud_Muffin_31_30_FC_731_Clsd_Loop_20181231091010.pdf

SPUD_MUFFIN_31_30_FC_731H_GCP2_20181231091012.pdf

5.5_17__P_110_BTC_20190617094652.pdf

5.5_20_P110_EC_VAMSG_20190617094653.pdf

8.625_32__P110EC__7.875_SD_20190617094653.pdf

13.375_48__H40_20190617094657.pdf

MB_Wellhd_5M_13.375_8.625_20190617124358.pdf

7.625_29.70_P110_Flushmax_20190708081020.pdf

8.625_32.00_P110HSCY_TLW_20190708081022.PDF

MB_Verb_5M_20190708081022.pdf

Spudder_Rig_Info_20190708081023.pdf

MB_WH_13_3.8_x7_5.8_x_5.5_20190708082329.pdf

Spud_Muffin_31_30_Fed_Com_731H_Permit_Plan_5_2_20190808092906.pdf

Other Variance attachment:

Spud_Muffin_31_30_FC_731_Co_flex_20181231091138.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
300	8615	SALT SATURATED	10	10.5							
8615	2113 6	OIL-BASED MUD	10	10.5							

Section 6 - Test, Logging, Coring

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

Logs (or some combination thereof depending on whether in vertical or horizontal section) will be run TD to surface, stated logs will be in the Completion Report and submitted to the BLM.

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

CBL,DS,GR,MWD

Coring operation description for the well:

NA

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5853

Anticipated Surface Pressure: 3494.6

Anticipated Bottom Hole Temperature(F): 150

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

Describe:

Contingency Plans geohazards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Spud_Muffin_31_30_Fed_Com_731H_H2S_20181231084414.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	300	633	1.44	13.2	911	50	C	Class C + adds

INTERMEDIATE	Lead		0	4615	398.5	3.27	9	1303	30	C	Class C + Adds
INTERMEDIATE	Tail		4615	8615	783	1.44	13.2	1127.6	30	C	Class C + Adds
PRODUCTION	Lead		8226	10226	200	3.27	9	654	10	Tuned	Class C + adds
PRODUCTION	Tail		10226	21136	696	1.44	13.2	1002.3	10	H	(50:50) Class H Cement: Poz (Fly Ash) + 0.5% bwoc HALAD-344 + 0.4% bwoc CFR-3 + 0.2% BWOC HR-601 + 2% bwoc Bentonite

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	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
0	300	WATER-BASED MUD	8.5	9							

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Spud_Muffin_31_30_Fed_Com_731_Surf_Csg_Ass_20181231081535.pdf

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Spud_Muffin_31_30_Fed_Com_731_Int_Csg_Ass_20181231081124.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Spud_Muffin_31_30_Fed_Com_731_Prod_Csg_Ass_20181231081427.pdf

Section 4 - Cement

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181218070520.pdf

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181218070535.pdf

Pressure Rating (PSI): 5M

Rating Depth: 10720

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below intermediate casing, a BOP/BOPE system with the above minimum rating will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

Choke Diagram Attachment:

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181217062935.pdf

BOP Diagram Attachment:

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181217062947.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	17.5	13.375	NEW	API	N	0	300	0	300			300	H-40	48	ST&C	1.125	1.25	BUOY	1.6	BUOY	1.6
2	INTERMEDIATE	9.875	7.625	NEW	API	N	0	8615	0	8615			8615	P-110	29.7	OTHER - Flushmax III	1.125	1.25	BUOY	1.6	BUOY	1.6
3	PRODUCTION	6.75	5.5	NEW	API	N	0	21136	0	10720			21136	P-110	20	OTHER - VAM SG	1.125	1.25	BUOY	1.6	BUOY	1.6

Casing Attachments



APD ID: 10400036936

Submission Date: 12/31/2018

Highlighted data
reflects the most
recent changes

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: SPUD MUFFIN 31-30 FED COM

Well Number: 731H

Show Final Text

Well Type: OIL WELL

Well Work Type: Drill

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	UNKNOWN	2959	0	0	ALLUVIUM	NONE	N
2	TOP SALT	2630	329	329	SALT	NONE	N
3	BASE OF SALT	209	2750	2750	SALT	NONE	N
4	BELL CANYON	181	2778	2778	SANDSTONE	NATURAL GAS,OIL	N
5	CHERRY CANYON	-671	3630	3630	SANDSTONE	NATURAL GAS,OIL	N
6	BRUSHY CANYON	-1912	4871	4871	SANDSTONE	NATURAL GAS,OIL	N
7	BONE SPRING	-3487	6446	6446	SANDSTONE	NATURAL GAS,OIL	N
8	WOLFCAMP	-6731	9690	9690	SHALE	NATURAL GAS,OIL	Y

Section 2 - Blowout Prevention

Pressure Rating (PSI): 5M

Rating Depth: 8615

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below surface casing, a BOP/BOPE system with the above minimum rating will be installed on the wellhead system. BOP/BOPE will be tested by an independent service company per Onshore Oil & Gas Order #2 requirements and MASP (Maximum Anticipated Surface Pressure) calculations. If the system is upgraded, all the components installed will be functional and tested.

Requesting Variance? YES

Variance request: A variance is requested for the use of a flexible choke line from the BOP stack to the choke manifold. See attached for specs for hydrostatic test chart.

Testing Procedure: A multibowl wellhead may be used. The BOP will be tested per Onshore Order #2 after installation on the surface casing which will cover testing requirements for a maximum of 30 days. If any seal subject to test pressure is broken the system must be tested.

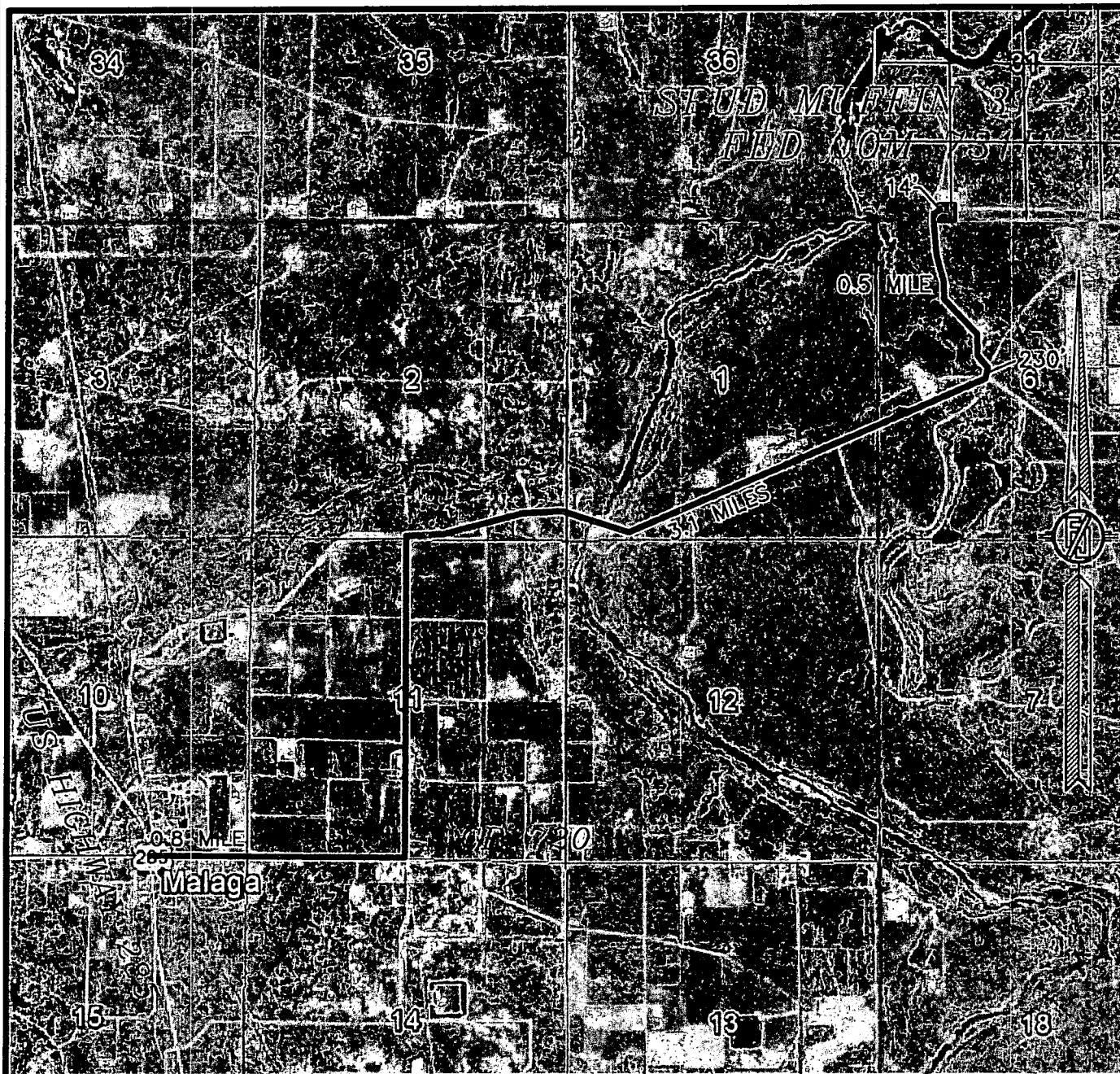
Choke Diagram Attachment:

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181218070520.pdf

BOP Diagram Attachment:

Spud_Muffin_31_30_Fed_Com_731_5M_BOPE__CK_20181218070535.pdf

SECTION 31, TOWNSHIP 23 SOUTH, RANGE 29 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 ACCESS AERIAL ROUTE MAP



NOT TO SCALE
 AERIAL PHOTO:
 GOOGLE EARTH
 NOVEMBER 2017

DEVON ENERGY PRODUCTION COMPANY, L.P.
SPUD MUFFIN 31-30 FED COM 731H
 LOCATED 120 FT. FROM THE SOUTH LINE
 AND 1245 FT. FROM THE WEST LINE OF
 SECTION 31, TOWNSHIP 23 SOUTH,
 RANGE 29 EAST, N.M.P.M.
 EDDY COUNTY, STATE OF NEW MEXICO
 LAND STATUS: BLM

DECEMBER 19, 2018

SURVEY NO. 5778H

MADRON SURVEYING, INC. 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO



**Devon Energy Center
333 West Sheridan Avenue
Oklahoma City, Oklahoma 73102-5015**

Hydrogen Sulfide (H₂S) Contingency Plan

For

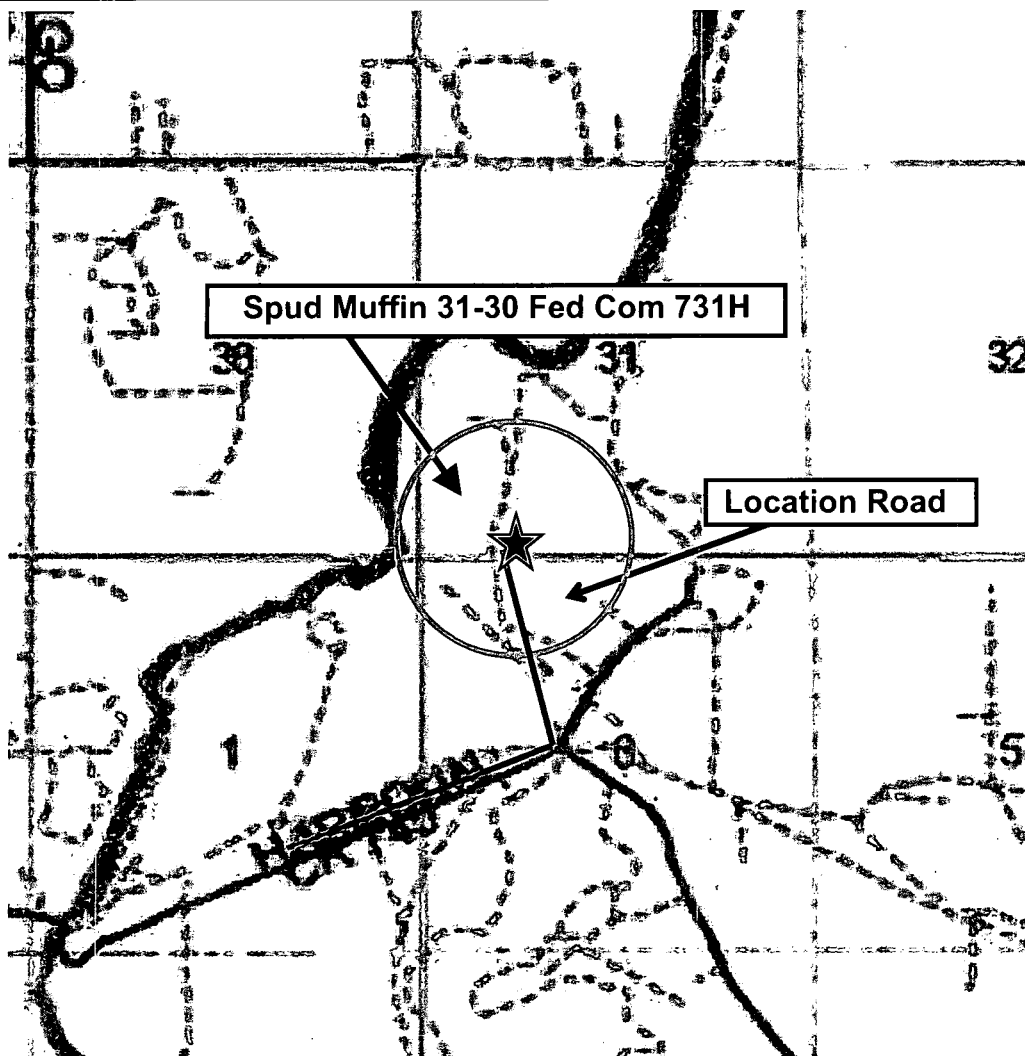
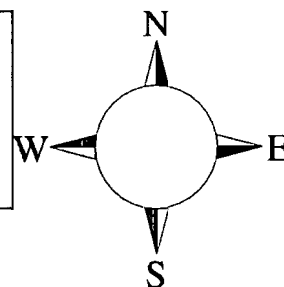
Spud Muffin 31-30 Fed Com 731H

**Sec-31 T-23S R-29E
120' FSL & 1245' FWL
LAT. = 32.2546175' N (NAD83)
LONG = 104.0283222' W**

Eddy County NM

Spud Muffin 31-30 Fed Com 731H

This is an open drilling site. H₂S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H₂S, including warning signs, wind indicators and H₂S monitor.



Assumed 100 ppm ROE = 3000' (Radius of Exposure)
100 ppm H₂S concentration shall trigger activation of this plan.

Escape

Crews shall escape upwind of escaping gas in the event of an emergency release of gas. Escape can be facilitated from the location entrance road. Crews should then block the entrance to the location from the lease road so as not to allow anyone traversing into a hazardous area. The blockade should be at a safe distance outside of the ROE. There are no homes or buildings in or near the ROE.

Assumed 100 ppm ROE = 3000'

100 ppm H₂S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H₂S, the first responder(s) must

- **Isolate the area and prevent entry by other persons into the 100 ppm ROE.**
- **Evacuate any public places encompassed by the 100 ppm ROE.**
- **Be equipped with H₂S monitors and air packs in order to control the release.**
- **Use the “buddy system” to ensure no injuries occur during the response**
- **Take precautions to avoid personal injury during this operation.**
- **Contact operator and/or local officials to aid in operation. See list of phone numbers attached.**
- **Have received training in the**
 - **Detection of H₂S, and**
 - **Measures for protection against the gas,**
 - **Equipment used for protection and emergency response.**

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO₂). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas

Characteristics of H₂S and SO₂

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H₂S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO₂	2.21 Air = 1	2 ppm	N/A	1000 ppm

Contacting Authorities

Devon Energy Corp. personnel must liaison with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available. The following call list of essential and potential responders has been prepared for use during a release. Devon Energy Corp. Company response must be in coordination with

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H₂S) TRAINING

All personnel, whether regularly assigned, contracted, or employed on an unscheduled basis, will receive training from a qualified instructor in the following areas prior to commencing drilling operations on this well:

1. The hazards and characteristics of hydrogen sulfide (H₂S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H₂S detectors, alarms, warning systems, briefing areas, evacuation procedures, and prevailing winds.
4. The proper techniques for first aid and rescue procedures.

In addition, supervisory personnel will be trained in the following areas:

1. The effects of H₂S metal components. If high tensile tubulars are to be used, personnel will be trained in their special maintenance requirements.
2. Corrective action and shut-in procedures when drilling or reworking a well and blowout prevention and well control procedures.
3. The contents and requirements of the H₂S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H₂S zone (within 3 days or 500 feet) and weekly H₂S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H₂S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H₂S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500 feet above, or three days prior to penetrating the first zone containing or reasonably expected to contain H₂S.

1. Well Control Equipment

- A. Flare line
- B. Choke manifold – Remotely Operated
- C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit
- D. Auxiliary equipment may include if applicable: annular preventer and rotating head.
- E. Mud/Gas Separator

2. Protective equipment for essential personnel:

30-minute SCBA units located at briefing areas, as indicated on well site diagram, with escape units available in the top doghouse. As it may be difficult to communicate audibly while wearing these units, hand signals shall be utilized.

3. H₂S detection and monitoring equipment:

Portable H₂S monitors positioned on location for best coverage and response. These units have warning lights which activate when H₂S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

- Bell nipple
- Possum Belly/Shale shaker
- Rig floor
- Choke manifold
- Cellar

Visual warning systems:

- A. Wind direction indicators as shown on well site diagram
- B. Caution/ Danger signs shall be posted on roads providing direct access to locations. Signs will be painted a high visibility yellow with black lettering of sufficient size to be reasonable distance from the immediate location. Bilingual signs will be used when appropriate.

4. Mud program:

The mud program has been designed to minimize the volume of H₂S circulated to surface. Proper mud weight, safe drilling practices and the use of H₂S scavengers will minimize hazards when penetrating H₂S bearing zones.

5. Metallurgy:

- A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H₂S trim.
- B. All elastomers used for packing and seals shall be H₂S trim.

6. Communication:

- A. Company personnel have/use cellular telephones in the field.
- B. Land line (telephone) communications at Office

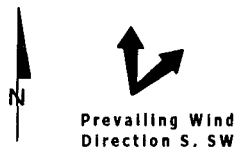
7. Well testing:

- A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safety and adequately conduct the test. The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H₂S environment will use the closed chamber method of testing.
- B. There will be no drill stem testing.

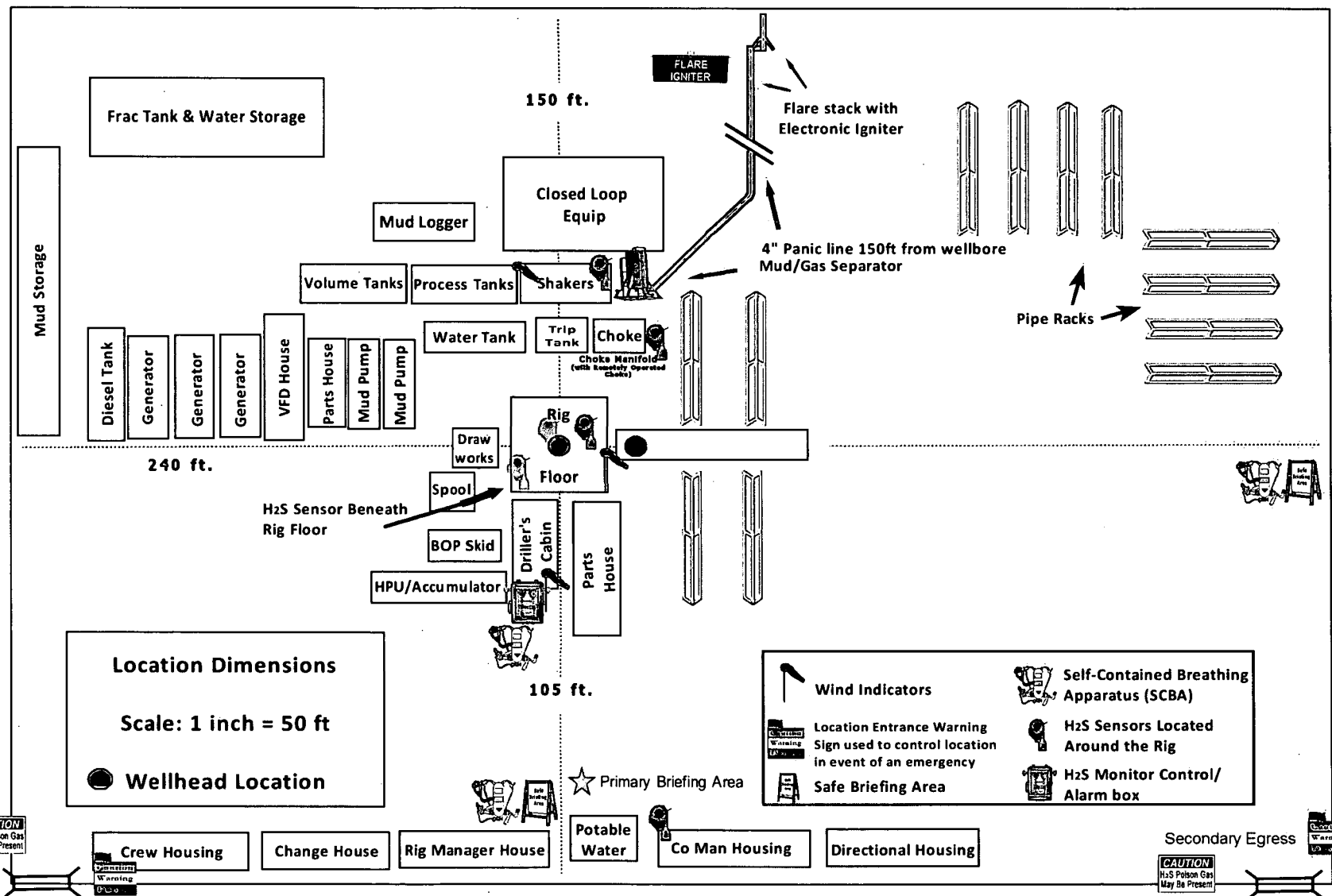
<u>Devon Energy Corp. Company Call List</u>		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
<u>Agency Call List</u>		
<u>Lea County (575)</u>	Hobbs	
	Lea County Communication Authority	393-3981
	State Police	392-5588
	City Police	397-9265
	Sheriff's Office	393-2515
	Ambulance	911
	Fire Department	397-9308
	LEPC (Local Emergency Planning Committee)	393-2870
	NMOCD	393-6161
	US Bureau of Land Management	393-3612
<u>Eddy County (575)</u>	Carlsbad	
	State Police	885-3137
	City Police	885-2111
	Sheriff's Office	887-7551
	Ambulance	911
	Fire Department	885-3125
	LEPC (Local Emergency Planning Committee)	887-3798
	US Bureau of Land Management	887-6544
	NM Emergency Response Commission (Santa Fe)	(505) 476-9600
	24 HR	(505) 827-9126
	National Emergency Response Center	(800) 424-8802
	National Pollution Control Center: Direct	(703) 872-6000
	For Oil Spills	(800) 280-7118
	Emergency Services	
	Wild Well Control	(281) 784-4700
	Cudd Pressure Control	(915) 699-0139 (915) 563-3356
	Halliburton	(575) 746-2757
	B. J. Services	(575) 746-3569
<u>Give GPS position:</u>	Native Air – Emergency Helicopter – Hobbs	(575) 392-6429
	Flight For Life - Lubbock, TX	(806) 743-9911
	Aerocare - Lubbock, TX	(806) 747-8923
	Med Flight Air Amb - Albuquerque, NM	(575) 842-4433
	Lifeguard Air Med Svc. Albuquerque, NM	(800) 222-1222
	Poison Control (24/7)	(575) 272-3115
	Oil & Gas Pipeline 24 Hour Service	(800) 364-4366
	NOAA – Website - www.nhc.noaa.gov	

Prepared in conjunction with
Dave Small





Devon Energy - Well Pad Rig Location Layout Safety Equipment Location



WCDSC Permian NM

Eddy County (NAD 83 NM Eastern)

Sec 31-T23S-R29E

Spud Muffin 31-30 Fed Com 731H

Wellbore #1

Plan: Permit Plan 5

Standard Planning Report - Geographic

28 June, 2019

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Project	Eddy County (NAD 83 NM Eastern)		
Map System:	US State Plane 1983	System Datum:	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Sec 31-T23S-R29E			
Site Position:		Northing:	467,039.80 usft	Latitude: 32.283608
From: Map		Easting:	634,382.44 usft	Longitude: -104.032247
Position Uncertainty:	0.00 ft	Slot Radius:	13-3/16 "	Grid Convergence: 0.16 °

Well	Spud Muffin 31-30 Fed Com 731H			
Well Position	+N/-S	0.00 ft	Northing:	456,497.05 usft
	+E/-W	0.00 ft	Easting:	635,625.29 usft
Position Uncertainty		0.50 ft	Wellhead Elevation:	Ground Level: 2,959.20 ft

Wellbore	Wellbore #1				
Magnetics	Model Name	Sample Date	Declination (°)	Dip Angle (°)	Field Strength (nT)
	IGRF2015	9/13/2018	7.03	60.00	47,783.55762886

Design	Permit Plan 5			
Audit Notes:				
Version:	Phase:	PROTOTYPE	Tie On Depth:	0.00
Vertical Section:	Depth From (TVD) (ft)	+N/-S (ft)	+E/-W (ft)	Direction (°)
	0.00	0.00	0.00	355.04

Plan Survey Tool Program	Date 6/27/2019			
Depth From (ft)	Depth To (ft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	21,135.73 Permit Plan 5 (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM

Plan Sections										
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	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	
4,000.00	0.00	0.00	4,000.00	0.00	0.00	0.00	0.00	0.00	0.00	
4,825.88	10.32	265.63	4,821.42	-5.66	-73.99	1.25	1.25	0.00	265.63	
9,187.55	10.32	265.63	9,112.48	-65.28	-853.35	0.00	0.00	0.00	0.00	
9,875.79	0.00	0.01	9,797.00	-70.00	-915.00	1.50	-1.50	0.00	180.00	
10,225.83	0.00	0.01	10,147.04	-70.00	-915.00	0.00	0.00	0.00	0.01	
11,125.83	90.00	0.01	10,720.00	502.96	-914.88	10.00	10.00	0.00	0.01	PBHL2 - Spud Muffin
21,135.73	90.00	0.01	10,720.00	10,512.86	-912.86	0.00	0.00	0.00	0.00	PBHL2 - Spud Muffin

Planning Report - Geographic

Database:	EDM r5000.141- Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid -
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.00	0.00	0.00	0.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
100.00	0.00	0.00	100.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
200.00	0.00	0.00	200.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
300.00	0.00	0.00	300.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
400.00	0.00	0.00	400.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
500.00	0.00	0.00	500.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
600.00	0.00	0.00	600.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
700.00	0.00	0.00	700.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
800.00	0.00	0.00	800.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
900.00	0.00	0.00	900.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,000.00	0.00	0.00	1,000.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,100.00	0.00	0.00	1,100.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,200.00	0.00	0.00	1,200.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,300.00	0.00	0.00	1,300.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,400.00	0.00	0.00	1,400.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,500.00	0.00	0.00	1,500.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,600.00	0.00	0.00	1,600.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,700.00	0.00	0.00	1,700.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,800.00	0.00	0.00	1,800.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
1,900.00	0.00	0.00	1,900.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,000.00	0.00	0.00	2,000.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,100.00	0.00	0.00	2,100.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,200.00	0.00	0.00	2,200.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,300.00	0.00	0.00	2,300.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,400.00	0.00	0.00	2,400.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,500.00	0.00	0.00	2,500.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,600.00	0.00	0.00	2,600.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,700.00	0.00	0.00	2,700.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,800.00	0.00	0.00	2,800.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
2,900.00	0.00	0.00	2,900.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,000.00	0.00	0.00	3,000.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,100.00	0.00	0.00	3,100.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,200.00	0.00	0.00	3,200.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,300.00	0.00	0.00	3,300.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,400.00	0.00	0.00	3,400.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,500.00	0.00	0.00	3,500.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,600.00	0.00	0.00	3,600.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,700.00	0.00	0.00	3,700.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,800.00	0.00	0.00	3,800.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
3,900.00	0.00	0.00	3,900.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
4,000.00	0.00	0.00	4,000.00	0.00	0.00	456,497.05	635,625.29	32.254618	-104.028322
4,100.00	1.25	265.63	4,099.99	-0.08	-1.09	456,496.97	635,624.21	32.254617	-104.028326
4,200.00	2.50	265.63	4,199.94	-0.33	-4.35	456,496.72	635,620.94	32.254617	-104.028337
4,300.00	3.75	265.63	4,299.79	-0.75	-9.79	456,496.30	635,615.51	32.254616	-104.028354
4,400.00	5.00	265.63	4,399.49	-1.33	-17.39	456,495.72	635,607.90	32.254614	-104.028379
4,500.00	6.25	265.63	4,499.01	-2.08	-27.16	456,494.97	635,598.13	32.254612	-104.028410
4,600.00	7.50	265.63	4,598.29	-2.99	-39.10	456,494.06	635,586.19	32.254610	-104.028449
4,700.00	8.75	265.63	4,697.28	-4.07	-53.19	456,492.98	635,572.10	32.254607	-104.028495
4,800.00	10.00	265.63	4,795.94	-5.31	-69.43	456,491.74	635,555.86	32.254604	-104.028547
4,825.88	10.32	265.63	4,821.42	-5.66	-73.99	456,491.39	635,551.31	32.254603	-104.028562
4,900.00	10.32	265.63	4,894.34	-6.67	-87.23	456,490.38	635,538.06	32.254600	-104.028605
5,000.00	10.32	265.63	4,992.72	-8.04	-105.10	456,489.01	635,520.20	32.254596	-104.028662
5,100.00	10.32	265.63	5,091.10	-9.41	-122.97	456,487.64	635,502.33	32.254593	-104.028720
5,200.00	10.32	265.63	5,189.48	-10.77	-140.83	456,486.28	635,484.46	32.254589	-104.028778
5,300.00	10.32	265.63	5,287.86	-12.14	-158.70	456,484.91	635,466.59	32.254585	-104.028836

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,400.00	10.32	265.63	5,386.24	-13.51	-176.57	456,483.54	635,448.72	32.254582	-104.028894
5,500.00	10.32	265.63	5,484.63	-14.88	-194.44	456,482.18	635,430.85	32.254578	-104.028952
5,600.00	10.32	265.63	5,583.01	-16.24	-212.31	456,480.81	635,412.99	32.254575	-104.029009
5,700.00	10.32	265.63	5,681.39	-17.61	-230.18	456,479.44	635,395.12	32.254571	-104.029067
5,800.00	10.32	265.63	5,779.77	-18.98	-248.04	456,478.07	635,377.25	32.254567	-104.029125
5,900.00	10.32	265.63	5,878.15	-20.34	-265.91	456,476.71	635,359.38	32.254564	-104.029183
6,000.00	10.32	265.63	5,976.53	-21.71	-283.78	456,475.34	635,341.51	32.254560	-104.029241
6,100.00	10.32	265.63	6,074.91	-23.08	-301.65	456,473.97	635,323.64	32.254557	-104.029298
6,200.00	10.32	265.63	6,173.29	-24.44	-319.52	456,472.61	635,305.78	32.254553	-104.029356
6,300.00	10.32	265.63	6,271.68	-25.81	-337.39	456,471.24	635,287.91	32.254549	-104.029414
6,400.00	10.32	265.63	6,370.06	-27.18	-355.26	456,469.87	635,270.04	32.254546	-104.029472
6,500.00	10.32	265.63	6,468.44	-28.54	-373.12	456,468.51	635,252.17	32.254542	-104.029530
6,600.00	10.32	265.63	6,566.82	-29.91	-390.99	456,467.14	635,234.30	32.254538	-104.029588
6,700.00	10.32	265.63	6,665.20	-31.28	-408.86	456,465.77	635,216.43	32.254535	-104.029645
6,800.00	10.32	265.63	6,763.58	-32.65	-426.73	456,464.40	635,198.57	32.254531	-104.029703
6,900.00	10.32	265.63	6,861.96	-34.01	-444.60	456,463.04	635,180.70	32.254528	-104.029761
7,000.00	10.32	265.63	6,960.34	-35.38	-462.47	456,461.67	635,162.83	32.254524	-104.029819
7,100.00	10.32	265.63	7,058.72	-36.75	-480.33	456,460.30	635,144.96	32.254520	-104.029877
7,200.00	10.32	265.63	7,157.11	-38.11	-498.20	456,458.94	635,127.09	32.254517	-104.029934
7,300.00	10.32	265.63	7,255.49	-39.48	-516.07	456,457.57	635,109.22	32.254513	-104.029992
7,400.00	10.32	265.63	7,353.87	-40.85	-533.94	456,456.20	635,091.36	32.254509	-104.030050
7,500.00	10.32	265.63	7,452.25	-42.21	-551.81	456,454.84	635,073.49	32.254506	-104.030108
7,600.00	10.32	265.63	7,550.63	-43.58	-569.68	456,453.47	635,055.62	32.254502	-104.030166
7,700.00	10.32	265.63	7,649.01	-44.95	-587.54	456,452.10	635,037.75	32.254499	-104.030223
7,800.00	10.32	265.63	7,747.39	-46.32	-605.41	456,450.73	635,019.88	32.254495	-104.030281
7,900.00	10.32	265.63	7,845.77	-47.68	-623.28	456,449.37	635,002.01	32.254491	-104.030339
8,000.00	10.32	265.63	7,944.15	-49.05	-641.15	456,448.00	634,984.15	32.254488	-104.030397
8,100.00	10.32	265.63	8,042.54	-50.42	-659.02	456,446.63	634,966.28	32.254484	-104.030455
8,200.00	10.32	265.63	8,140.92	-51.78	-676.89	456,445.27	634,948.41	32.254481	-104.030513
8,300.00	10.32	265.63	8,239.30	-53.15	-694.75	456,443.90	634,930.54	32.254477	-104.030570
8,400.00	10.32	265.63	8,337.68	-54.52	-712.62	456,442.53	634,912.67	32.254473	-104.030628
8,500.00	10.32	265.63	8,436.06	-55.88	-730.49	456,441.17	634,894.81	32.254470	-104.030686
8,600.00	10.32	265.63	8,534.44	-57.25	-748.36	456,439.80	634,876.94	32.254466	-104.030744
8,700.00	10.32	265.63	8,632.82	-58.62	-766.23	456,438.43	634,859.07	32.254462	-104.030802
8,800.00	10.32	265.63	8,731.20	-59.99	-784.10	456,437.06	634,841.20	32.254459	-104.030859
8,900.00	10.32	265.63	8,829.59	-61.35	-801.96	456,435.70	634,823.33	32.254455	-104.030917
9,000.00	10.32	265.63	8,927.97	-62.72	-819.83	456,434.33	634,805.46	32.254452	-104.030975
9,100.00	10.32	265.63	9,026.35	-64.09	-837.70	456,432.96	634,787.60	32.254448	-104.031033
9,187.55	10.32	265.63	9,112.48	-65.28	-853.35	456,431.77	634,771.95	32.254445	-104.031083
9,200.00	10.14	265.63	9,124.73	-65.45	-855.55	456,431.60	634,769.75	32.254444	-104.031091
9,300.00	8.64	265.63	9,223.39	-66.70	-871.81	456,430.35	634,753.48	32.254441	-104.031143
9,400.00	7.14	265.63	9,322.44	-67.74	-885.49	456,429.31	634,739.80	32.254438	-104.031187
9,500.00	5.64	265.63	9,421.82	-68.59	-896.58	456,428.46	634,728.71	32.254436	-104.031223
9,600.00	4.14	265.63	9,521.45	-69.24	-905.08	456,427.81	634,720.22	32.254434	-104.031251
9,700.00	2.64	265.63	9,621.27	-69.69	-910.97	456,427.36	634,714.33	32.254433	-104.031270
9,800.00	1.14	265.63	9,721.22	-69.94	-914.25	456,427.11	634,711.05	32.254432	-104.031281
9,875.79	0.00	0.01	9,797.00	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
9,900.00	0.00	0.00	9,821.21	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
10,000.00	0.00	0.00	9,921.21	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
10,100.00	0.00	0.00	10,021.21	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
10,200.00	0.00	0.00	10,121.21	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
10,225.83	0.00	0.00	10,147.04	-70.00	-915.00	456,427.05	634,710.30	32.254432	-104.031283
KOP @ 10226' MD, 50' FSL, 330' FWL									
10,300.00	7.42	0.01	10,221.01	-65.21	-915.00	456,431.84	634,710.30	32.254445	-104.031283

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
10,400.00	17.42	0.01	10,318.54	-43.73	-914.99	456,453.32	634,710.30	32.254504	-104.031283
10,466.97	24.11	0.01	10,381.13	-20.00	-914.99	456,477.05	634,710.31	32.254570	-104.031282
FTP @ 10467' MD, 100' FSL, 330' FWL									
10,500.00	27.42	0.01	10,410.87	-5.64	-914.99	456,491.41	634,710.31	32.254609	-104.031282
10,600.00	37.42	0.01	10,495.18	47.90	-914.98	456,544.95	634,710.32	32.254756	-104.031282
10,700.00	47.42	0.01	10,568.91	115.26	-914.96	456,612.31	634,710.33	32.254942	-104.031281
10,800.00	57.42	0.01	10,629.82	194.41	-914.95	456,691.46	634,710.35	32.255159	-104.031280
10,900.00	67.42	0.01	10,676.07	282.93	-914.93	456,779.98	634,710.37	32.255402	-104.031280
11,000.00	77.42	0.01	10,706.24	378.14	-914.91	456,875.19	634,710.39	32.255664	-104.031279
11,100.00	87.42	0.01	10,719.42	477.14	-914.89	456,974.19	634,710.41	32.255936	-104.031278
11,125.83	90.00	0.01	10,720.00	502.96	-914.88	457,000.01	634,710.41	32.256007	-104.031277
11,200.00	90.00	0.01	10,720.00	577.13	-914.87	457,074.18	634,710.43	32.256211	-104.031277
11,300.00	90.00	0.01	10,720.00	677.13	-914.85	457,174.18	634,710.45	32.256486	-104.031276
11,400.00	90.00	0.01	10,720.00	777.13	-914.83	457,274.18	634,710.47	32.256761	-104.031275
11,500.00	90.00	0.01	10,720.00	877.13	-914.81	457,374.18	634,710.49	32.257036	-104.031274
11,600.00	90.00	0.01	10,720.00	977.13	-914.79	457,474.18	634,710.51	32.257311	-104.031273
11,700.00	90.00	0.01	10,720.00	1,077.13	-914.77	457,574.18	634,710.53	32.257586	-104.031272
11,800.00	90.00	0.01	10,720.00	1,177.13	-914.75	457,674.18	634,710.55	32.257860	-104.031271
11,900.00	90.00	0.01	10,720.00	1,277.13	-914.73	457,774.18	634,710.57	32.258135	-104.031270
12,000.00	90.00	0.01	10,720.00	1,377.13	-914.71	457,874.18	634,710.59	32.258410	-104.031269
12,100.00	90.00	0.01	10,720.00	1,477.13	-914.69	457,974.18	634,710.61	32.258685	-104.031268
12,200.00	90.00	0.01	10,720.00	1,577.13	-914.67	458,074.18	634,710.63	32.258960	-104.031267
12,300.00	90.00	0.01	10,720.00	1,677.13	-914.65	458,174.18	634,710.65	32.259235	-104.031266
12,400.00	90.00	0.01	10,720.00	1,777.13	-914.63	458,274.18	634,710.67	32.259510	-104.031265
12,500.00	90.00	0.01	10,720.00	1,877.13	-914.61	458,374.18	634,710.69	32.259785	-104.031264
12,600.00	90.00	0.01	10,720.00	1,977.13	-914.59	458,474.18	634,710.71	32.260060	-104.031263
12,700.00	90.00	0.01	10,720.00	2,077.13	-914.57	458,574.18	634,710.73	32.260334	-104.031262
12,800.00	90.00	0.01	10,720.00	2,177.13	-914.55	458,674.18	634,710.75	32.260609	-104.031261
12,900.00	90.00	0.01	10,720.00	2,277.13	-914.53	458,774.18	634,710.77	32.260884	-104.031260
13,000.00	90.00	0.01	10,720.00	2,377.13	-914.51	458,874.18	634,710.79	32.261159	-104.031259
13,100.00	90.00	0.01	10,720.00	2,477.13	-914.49	458,974.17	634,710.81	32.261434	-104.031258
13,200.00	90.00	0.01	10,720.00	2,577.13	-914.47	459,074.17	634,710.83	32.261709	-104.031257
13,300.00	90.00	0.01	10,720.00	2,677.13	-914.44	459,174.17	634,710.85	32.261984	-104.031256
13,400.00	90.00	0.01	10,720.00	2,777.13	-914.42	459,274.17	634,710.87	32.262259	-104.031255
13,500.00	90.00	0.01	10,720.00	2,877.13	-914.40	459,374.17	634,710.89	32.262533	-104.031254
13,600.00	90.00	0.01	10,720.00	2,977.13	-914.38	459,474.17	634,710.91	32.262808	-104.031253
13,700.00	90.00	0.01	10,720.00	3,077.13	-914.36	459,574.17	634,710.93	32.263083	-104.031252
13,800.00	90.00	0.01	10,720.00	3,177.13	-914.34	459,674.17	634,710.95	32.263358	-104.031251
13,900.00	90.00	0.01	10,720.00	3,277.13	-914.32	459,774.17	634,710.97	32.263633	-104.031250
14,000.00	90.00	0.01	10,720.00	3,377.13	-914.30	459,874.17	634,710.99	32.263908	-104.031249
14,100.00	90.00	0.01	10,720.00	3,477.13	-914.28	459,974.17	634,711.01	32.264183	-104.031248
14,200.00	90.00	0.01	10,720.00	3,577.13	-914.26	460,074.17	634,711.03	32.264458	-104.031247
14,300.00	90.00	0.01	10,720.00	3,677.13	-914.24	460,174.17	634,711.05	32.264733	-104.031246
14,400.00	90.00	0.01	10,720.00	3,777.13	-914.22	460,274.17	634,711.07	32.265007	-104.031245
14,500.00	90.00	0.01	10,720.00	3,877.13	-914.20	460,374.17	634,711.09	32.265282	-104.031244
14,600.00	90.00	0.01	10,720.00	3,977.13	-914.18	460,474.17	634,711.11	32.265557	-104.031243
14,700.00	90.00	0.01	10,720.00	4,077.13	-914.16	460,574.17	634,711.13	32.265832	-104.031243
14,800.00	90.00	0.01	10,720.00	4,177.13	-914.14	460,674.17	634,711.15	32.266107	-104.031242
14,900.00	90.00	0.01	10,720.00	4,277.13	-914.12	460,774.17	634,711.17	32.266382	-104.031241
15,000.00	90.00	0.01	10,720.00	4,377.13	-914.10	460,874.17	634,711.19	32.266657	-104.031240
15,100.00	90.00	0.01	10,720.00	4,477.13	-914.08	460,974.17	634,711.21	32.266932	-104.031239
15,200.00	90.00	0.01	10,720.00	4,577.13	-914.06	461,074.17	634,711.23	32.267207	-104.031238
15,300.00	90.00	0.01	10,720.00	4,677.13	-914.04	461,174.17	634,711.26	32.267481	-104.031237
15,400.00	90.00	0.01	10,720.00	4,777.13	-914.02	461,274.17	634,711.28	32.267756	-104.031236

Planning Report - Geographic

Database:	EDM r5000.141_Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDSC Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD-83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N-S (ft)	+E-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
15,500.00	90.00	0.01	10,720.00	4,877.13	-914.00	461,374.17	634,711.30	32.268031	-104.031235
15,600.00	90.00	0.01	10,720.00	4,977.13	-913.98	461,474.17	634,711.32	32.268306	-104.031234
15,700.00	90.00	0.01	10,720.00	5,077.13	-913.96	461,574.17	634,711.34	32.268581	-104.031233
15,783.00	90.00	0.01	10,720.00	5,160.13	-913.94	461,657.17	634,711.35	32.268809	-104.031232
Cross Section @ 15783' MD, 0' FSL, 330' FWL									
15,800.00	90.00	0.01	10,720.00	5,177.13	-913.94	461,674.17	634,711.36	32.268856	-104.031232
15,900.00	90.00	0.01	10,720.00	5,277.13	-913.92	461,774.17	634,711.38	32.269131	-104.031231
16,000.00	90.00	0.01	10,720.00	5,377.13	-913.90	461,874.17	634,711.40	32.269406	-104.031230
16,100.00	90.00	0.01	10,720.00	5,477.13	-913.88	461,974.17	634,711.42	32.269680	-104.031229
16,200.00	90.00	0.01	10,720.00	5,577.13	-913.86	462,074.17	634,711.44	32.269955	-104.031228
16,300.00	90.00	0.01	10,720.00	5,677.13	-913.84	462,174.17	634,711.46	32.270230	-104.031227
16,400.00	90.00	0.01	10,720.00	5,777.13	-913.82	462,274.17	634,711.48	32.270505	-104.031226
16,500.00	90.00	0.01	10,720.00	5,877.13	-913.80	462,374.17	634,711.50	32.270780	-104.031225
16,600.00	90.00	0.01	10,720.00	5,977.13	-913.78	462,474.17	634,711.52	32.271055	-104.031224
16,700.00	90.00	0.01	10,720.00	6,077.13	-913.76	462,574.17	634,711.54	32.271330	-104.031223
16,800.00	90.00	0.01	10,720.00	6,177.13	-913.74	462,674.17	634,711.56	32.271605	-104.031222
16,900.00	90.00	0.01	10,720.00	6,277.13	-913.72	462,774.17	634,711.58	32.271880	-104.031221
17,000.00	90.00	0.01	10,720.00	6,377.13	-913.70	462,874.17	634,711.60	32.272154	-104.031220
17,100.00	90.00	0.01	10,720.00	6,477.13	-913.68	462,974.17	634,711.62	32.272429	-104.031219
17,200.00	90.00	0.01	10,720.00	6,577.13	-913.66	463,074.17	634,711.64	32.272704	-104.031218
17,300.00	90.00	0.01	10,720.00	6,677.13	-913.64	463,174.17	634,711.66	32.272979	-104.031217
17,400.00	90.00	0.01	10,720.00	6,777.13	-913.62	463,274.17	634,711.68	32.273254	-104.031216
17,500.00	90.00	0.01	10,720.00	6,877.13	-913.60	463,374.17	634,711.70	32.273529	-104.031215
17,600.00	90.00	0.01	10,720.00	6,977.13	-913.58	463,474.17	634,711.72	32.273804	-104.031214
17,700.00	90.00	0.01	10,720.00	7,077.13	-913.56	463,574.17	634,711.74	32.274079	-104.031213
17,800.00	90.00	0.01	10,720.00	7,177.13	-913.54	463,674.17	634,711.76	32.274354	-104.031212
17,900.00	90.00	0.01	10,720.00	7,277.13	-913.52	463,774.17	634,711.78	32.274628	-104.031211
18,000.00	90.00	0.01	10,720.00	7,377.13	-913.50	463,874.17	634,711.80	32.274903	-104.031210
18,100.00	90.00	0.01	10,720.00	7,477.13	-913.48	463,974.16	634,711.82	32.275178	-104.031209
18,200.00	90.00	0.01	10,720.00	7,577.13	-913.45	464,074.16	634,711.84	32.275453	-104.031208
18,300.00	90.00	0.01	10,720.00	7,677.13	-913.43	464,174.16	634,711.86	32.275728	-104.031207
18,400.00	90.00	0.01	10,720.00	7,777.13	-913.41	464,274.16	634,711.88	32.276003	-104.031206
18,500.00	90.00	0.01	10,720.00	7,877.13	-913.39	464,374.16	634,711.90	32.276278	-104.031205
18,600.00	90.00	0.01	10,720.00	7,977.13	-913.37	464,474.16	634,711.92	32.276553	-104.031204
18,700.00	90.00	0.01	10,720.00	8,077.13	-913.35	464,574.16	634,711.94	32.276827	-104.031203
18,800.00	90.00	0.01	10,720.00	8,177.13	-913.33	464,674.16	634,711.96	32.277102	-104.031202
18,900.00	90.00	0.01	10,720.00	8,277.13	-913.31	464,774.16	634,711.98	32.277377	-104.031202
19,000.00	90.00	0.01	10,720.00	8,377.13	-913.29	464,874.16	634,712.00	32.277652	-104.031201
19,100.00	90.00	0.01	10,720.00	8,477.13	-913.27	464,974.16	634,712.02	32.277927	-104.031200
19,200.00	90.00	0.01	10,720.00	8,577.13	-913.25	465,074.16	634,712.04	32.278202	-104.031199
19,300.00	90.00	0.01	10,720.00	8,677.13	-913.23	465,174.16	634,712.06	32.278477	-104.031198
19,400.00	90.00	0.01	10,720.00	8,777.13	-913.21	465,274.16	634,712.08	32.278752	-104.031197
19,500.00	90.00	0.01	10,720.00	8,877.13	-913.19	465,374.16	634,712.10	32.279027	-104.031196
19,600.00	90.00	0.01	10,720.00	8,977.13	-913.17	465,474.16	634,712.12	32.279301	-104.031195
19,700.00	90.00	0.01	10,720.00	9,077.13	-913.15	465,574.16	634,712.14	32.279576	-104.031194
19,800.00	90.00	0.01	10,720.00	9,177.13	-913.13	465,674.16	634,712.16	32.279851	-104.031193
19,900.00	90.00	0.01	10,720.00	9,277.13	-913.11	465,774.16	634,712.18	32.280126	-104.031192
20,000.00	90.00	0.01	10,720.00	9,377.13	-913.09	465,874.16	634,712.20	32.280401	-104.031191
20,100.00	90.00	0.01	10,720.00	9,477.13	-913.07	465,974.16	634,712.22	32.280676	-104.031190
20,200.00	90.00	0.01	10,720.00	9,577.13	-913.05	466,074.16	634,712.25	32.280951	-104.031189
20,300.00	90.00	0.01	10,720.00	9,677.13	-913.03	466,174.16	634,712.27	32.281226	-104.031188
20,400.00	90.00	0.01	10,720.00	9,777.13	-913.01	466,274.16	634,712.29	32.281500	-104.031187
20,500.00	90.00	0.01	10,720.00	9,877.13	-912.99	466,374.16	634,712.31	32.281775	-104.031186
20,600.00	90.00	0.01	10,720.00	9,977.13	-912.97	466,474.16	634,712.33	32.282050	-104.031185

Planning Report - Geographic

Database:	EDM r5000.141 Prod US	Local Co-ordinate Reference:	Well Spud Muffin 31-30 Fed Com 731H
Company:	WCDCS Permian NM	TVD Reference:	RKB @ 2984.20ft
Project:	Eddy County (NAD 83 NM Eastern)	MD Reference:	RKB @ 2984.20ft
Site:	Sec 31-T23S-R29E	North Reference:	Grid
Well:	Spud Muffin 31-30 Fed Com 731H	Survey Calculation Method:	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Permit Plan 5		

Planned Survey									
Measured Depth (ft)	Inclination (°)	Azimuth (°)	Vertical Depth (ft)	+N/-S (ft)	+E/-W (ft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
20,700.00	90.00	0.01	10,720.00	10,077.13	-912.95	466,574.16	634,712.35	32.282325	-104.031184
20,800.00	90.00	0.01	10,720.00	10,177.13	-912.93	466,674.16	634,712.37	32.282600	-104.031183
20,900.00	90.00	0.01	10,720.00	10,277.13	-912.91	466,774.16	634,712.39	32.282875	-104.031182
21,000.00	90.00	0.01	10,720.00	10,377.13	-912.89	466,874.16	634,712.41	32.283150	-104.031181
21,055.72	90.00	0.01	10,720.00	10,432.85	-912.88	466,929.88	634,712.42	32.283303	-104.031180
LTP @ 21056' MD, 100' FNL, 330' FWL									
21,100.00	90.00	0.01	10,720.00	10,477.13	-912.87	466,974.16	634,712.43	32.283425	-104.031180
21,135.72	90.00	0.01	10,720.00	10,512.85	-912.86	467,009.88	634,712.43	32.283523	-104.031180
PBHL; 20' FNL, 330' FWL									
21,135.73	90.00	0.01	10,720.00	10,512.86	-912.86	467,009.89	634,712.43	32.283523	-104.031180

Design Targets									
Target Name	Dip Angle (°)	Dip Dir. (°)	TVD (ft)	+N/-S (ft)	+E/-W (ft)	Northing (usft)	Easting (usft)	Latitude	Longitude
- hit/miss target									
- Shape									
PBHL2 - Spud Muffin 31	0.00	0.00	0.00	10,512.86	-912.86	467,009.89	634,712.43	32.283523	-104.031180
- plan misses target center by 10552.42ft at 0.00ft MD (0.00 TVD, 0.00 N, 0.00 E)									
- Point									

Plan Annotations				
Measured Depth (ft)	Vertical Depth (ft)	Local Coordinates		Comment
		+N/-S (ft)	+E/-W (ft)	
10,225.83	10,147.04	-70.00	-915.00	KOP @ 10226' MD, 50' FSL, 330' FWL
10,466.97	10,381.13	-20.00	-914.99	FTP @ 10467' MD, 100' FSL, 330' FWL
15,783.00	10,720.00	5,160.13	-913.94	Cross Section @ 15783' MD, 0' FSL, 330' FWL
21,055.72	10,720.00	10,432.85	-912.88	LTP @ 21056' MD, 100' FNL, 330' FWL
21,135.72	10,720.00	10,512.85	-912.86	PBHL; 20' FNL, 330' FWL

WCDSC Permian NM

WELL DETAILS: Spud Muffin 31-30 Fed Com 731H

RKB @ 2984.20ft
2959.20
Northing 456497.05 Easting 635625.29 Latitude 32.254618 Longitude -104.028322

SECTION DETAILS Permit Plan 5

	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSeet	Annotation
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	4000.00	0.00	0.00	4000.00	0.00	0.00	0.00	0.00	
	4825.88	10.32	265.63	4821.42	-5.66	-73.99	1.25	0.76	
	9187.55	10.32	265.63	9112.48	-65.28	-853.35	0.00	8.78	
5	9875.79	0.00	0.00	9797.00	-70.00	-915.00	1.50	9.42	
6	10225.83	0.00	0.00	10147.04	-70.00	-915.00	0.00	9.42	KOP @ 10226' MD, 50' FSL, 330' FWL
7	11125.83	90.00	0.01	10720.00	502.96	-914.88	10.00	580.22	
8	21135.73	90.00	0.01	10720.00	10512.86	-912.86	0.00	10552.42	PBHL: 20' FNL, 330' FWL

devon

