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Form 3160-3
(June 2015)

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

HOBBS OCD
MAY 15 2019
RECEIVED

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM0359295A

6. If Indian, Allotee or Tribe Name

1a. Type of work: ☑ DRILL ☐ REENTER

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

1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone

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

8. Lease Name and Well No.
HAFLINGER 27 22 FED COM
232H (325671)

2. Name of Operator
DEVON ENERGY PRODUCTION COMPANY LP (6137)

9. API Well No.
30-025-45975

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
333 West Sheridan Avenue Oklahoma City OK 73102	(800)583-3866	WC-025 G-08 S253235G / BONE SPRING

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

At surface SESW / 325 FSL / 1545 FWL / LAT 32.0950942 / LONG -103.6664791

At proposed prod. zone NENW / 20 FNL / 2310 FWL / LAT 32.123177 / LONG -103.6640258

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 27 / T25S / R32E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
	LEA	NM

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	17. Spacing Unit dedicated to this well
325 feet	880	320
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	**19. Proposed Depth**	**20. BLM/BIA Bond No. in file**
1955 feet	10670 feet / 20969 feet	FED: CO1104

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3366 feet	10/24/2019	30 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.
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 requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Jenny Harms / Ph: (405)552-6560	11/12/2018
Title: Regulatory Compliance Professional		
Approved by *(Signature)* (Electronic Submission)	Name *(Printed/Typed)* Cody Layton / Ph: (575)234-5959	Date 05/03/2019
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.

GCP Rec 05/15/19

APPROVED WITH CONDITIONS

KZ 05/15/19

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 05/03/2019

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 wen, 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 directionany 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 wen 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 win 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 conects this information to anow 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 Conection Clearance Officer (WO-630), 1849 C Street, N.W., Mail Stop 401 LS, Washington, D.C. 20240.

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Approval Date: 05/03/2019

Additional Operator Remarks

Location of Well

1. SHL: SESW / 325 FSL / 1545 FWL / TWSP: 25S / RANGE: 32E / SECTION: 27 / LAT: 32.0950942 / LONG: -103.6664791 (TVD: 0 feet, MD: 0 feet)
   PPP: SESW / 100 FSL / 2310 FWL / TWSP: 25S / RANGE: 32E / SECTION: 27 / LAT: 32.094463 / LONG: -103.664015 (TVD: 10331 feet, MD: 10388 feet)
   PPP: NWNW / 1320 FNL / 2310 FWL / TWSP: 25S / RANGE: 32E / SECTION: 27 / LAT: 32.105073 / LONG: -103.664019 (TVD: 10670 feet, MD: 14384 feet)
   BHL: NENW / 20 FNL / 2310 FWL / TWSP: 25S / RANGE: 32E / SECTION: 22 / LAT: 32.123177 / LONG: -103.6640258 (TVD: 10670 feet, MD: 20969 feet)

BLM Point of Contact

Name: Priscilla Perez
Title: Legal Instruments Examiner
Phone: 5752345934
Email: pperez@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company LP
LEASE NO.:	Haflinger 27-22 Fed Com 232H
WELL NAME & NO.:	325'/S & 1545'/W
SURFACE HOLE FOOTAGE:	20'/N & 2310'/W
BOTTOM HOLE FOOTAGE	Section 27, T.25 S., R.32 E., NMPM
LOCATION:	Lea County, New Mexico
COUNTY:	Devon Energy Production Company LP

COA

H2S	◉ Yes	○ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	○ Multibowl	◉ Both
Other	☐ 4 String Area	☐ Capitan Reef	☐ WIPP
Other	☑ Fluid Filled	☑ Cement Squeeze	☐ Pilot Hole
Special Requirements	☐ Water Disposal	☑ COM	☐ Unit

A. HYDROGEN SULFIDE

A Hydrogen Sulfide (H2S) Drilling Plan shall be activated 500 feet prior to drilling into the **North Paduca** formation. As a result, the Hydrogen Sulfide area must meet Onshore Order 6 requirements, which includes equipment and personnel/public protection items. If Hydrogen Sulfide is encountered, please provide measured values and formations to the BLM.

B. CASING

1. The **13-3/8** inch surface casing shall be set at approximately **864 feet** (a minimum of 25 feet (Lea 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.

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

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing shall be set at approximately **4709 feet** is:

Option 1 (Single Stage):

- Cement to surface. If cement does not circulate see B.1.a, c-d above. **Cement excess is less than 25%, more cement might be required.**

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

Operator has proposed to pump down 13-3/8" X 9-5/8" annulus. Operator must run a CBL from TD of the 9-5/8" 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.
  Cement excess is less than 25%, more cement might be required.

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 **2000 (2M)** 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)

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

☒ Eddy County
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

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

   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

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

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

A. CASING

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

2. Wait on cement (WOC) for Potash Areas: After cementing but before commencing any tests, the casing string shall stand cemented under pressure until both of the following conditions have been met: 1) cement reaches a minimum compressive strength of 500 psi for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log.

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.

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.

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.

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Devon Energy Production Company LP
WELL NAME & NO.:	Haflinger 27-22 Fed Com 232H
SURFACE HOLE FOOTAGE:	325'/S & 1545'/W
BOTTOM HOLE FOOTAGE	20'/N & 2310'/W
LOCATION:	Section 27, T.25 S., R.32 E., NMPM
COUNTY:	Lea County, New Mexico

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

Approval Date: 05/03/2019

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Build as you go No Grading full Pad only allowed to build subpad!!

Timing Limitation Stipulation / Condition of Approval for lesser prairie-chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 feet from the source of the noise.

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well. For more installation details, contact the Carlsbad Field Office at 575-234-5972.

- Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006. The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all power line structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. The holder without liability or expense shall make such modifications and/or additions to the United States.

Hydrology:

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the

fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Electric Lines: Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion.

Livestock Watering Requirement

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Fence Requirement

Where entry is granted across a fence line, the fence must be braced and tied off on both sides of the passageway with H-braces prior to cutting. Once the work is completed, the fence will be restored to its prior condition, or better. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fence(s).

The operator must contact the allotment holder prior to construction to identify the location of the pipeline. The operator must take measures to protect the pipeline from compression or other damages. If the pipeline is damaged or compromised in any way near the proposed project as a result of oil and gas activity, the operator is responsible for repairing the pipeline immediately. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

During construction, the proponent shall minimize disturbance to existing fences, water lines, troughs, windmills, and other improvements on public lands. The proponent is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the grazing permittee/allottee prior to disturbing any range improvement projects. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the Carlsbad Field Office at (575) 234-5909 at least 3 working days prior to commencing construction of the access road and/or well pad.

When construction operations are being conducted on this well, the operator shall have the approved APD and Conditions of Approval (COA) on the well site and they shall be made available upon request by the Authorized Officer.

B. TOPSOIL

The operator shall strip the top portion of the soil (root zone) from the entire well pad area and stockpile the topsoil along the edge of the well pad as depicted in the APD. The root zone is typically six (6) inches in depth. All the stockpiled topsoil will be redistributed over the interim reclamation areas. Topsoil shall not be used for berming the pad or facilities. For final reclamation, the topsoil shall be spread over the entire pad area for seeding preparation.

Other subsoil (below six inches) stockpiles must be completely segregated from the topsoil stockpile. Large rocks or subsoil clods (not evident in the surrounding terrain) must be buried within the approved area for interim and final reclamation.

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

The operator shall properly dispose of drilling contents at an authorized disposal site.

D. FEDERAL MINERAL MATERIALS PIT

Payment shall be made to the BLM prior to removal of any federal mineral materials. Call the Carlsbad Field Office at (575) 234-5972.

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

If the operator elects to surface the well pad, the surfacing material may be required to be removed at the time of reclamation. The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational needs.

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

Road Width
The access road shall have a driving surface that creates the smallest possible surface disturbance and does not exceed fourteen (14) feet in width. The maximum width of surface disturbance, when constructing the access road, shall not exceed twenty-five (25) feet.

Surfacing
Surfacing material is not required on the new access road driving surface. If the operator elects to surface the new access road or pad, the surfacing material may be required to be removed at the time of reclamation.

Where possible, no improvements should be made on the unsurfaced access road other than to remove vegetation as necessary, road irregularities, safety issues, or to fill low areas that may sustain standing water.

The Authorized Officer reserves the right to require surfacing of any portion of the access road at any time deemed necessary. Surfacing may be required in the event the road deteriorates, erodes, road traffic increases, or it is determined to be beneficial for future field development. The surfacing depth and type of material will be determined at the time of notification.

Crowning
Crowning shall be done on the access road driving surface. The road crown shall have a grade of approximately 2% (i.e., a 1" crown on a 14' wide road). The road shall conform to Figure 1; cross section and plans for typical road construction.

Ditching
Ditching shall be required on both sides of the road.

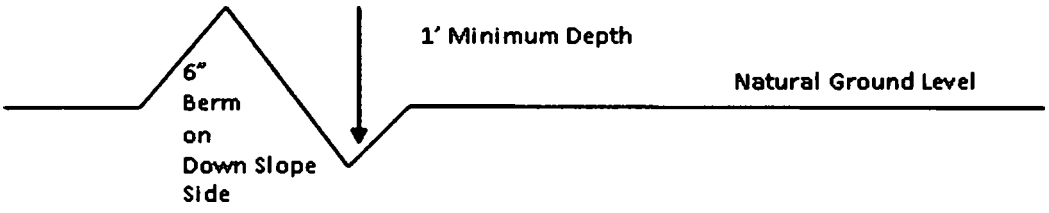
Turnouts
Vehicle turnouts shall be constructed on the road. Turnouts shall be intervisible with interval spacing distance less than 1000 feet. Turnouts shall conform to Figure 1; cross section and plans for typical road construction.

Drainage

Drainage control systems shall be constructed on the entire length of road (e.g. ditches, sidehill outsloping and insloping, lead-off ditches, culvert installation, and low water crossings).

A typical lead-off ditch has a minimum depth of 1 foot below and a berm of 6 inches above natural ground level. The berm shall be on the down-slope side of the lead-off ditch.

Cross Section of a Typical Lead-off Ditch



All lead-off ditches shall be graded to drain water with a 1 percent minimum to 3 percent maximum ditch slope. The spacing interval are variable for lead-off ditches and shall be determined according to the formula for spacing intervals of lead-off ditches, but may be amended depending upon existing soil types and centerline road slope (in %);

Formula for Spacing Interval of Lead-off Ditches

Example - On a 4% road slope that is 400 feet long, the water flow shall drain water into a lead-off ditch. Spacing interval shall be determined by the following formula:

400 foot road with 4% road slope: $\frac{400'}{4\%} + 100' = 200'$ lead-off ditch interval

Cattle guards

An appropriately sized cattle guard sufficient to carry out the project shall be installed and maintained at fence/road crossings. Any existing cattle guards on the access road route shall be repaired or replaced if they are damaged or have deteriorated beyond practical use. The operator shall be responsible for the condition of the existing cattle guards that are in place and are utilized during lease operations.

Fence Requirement

Where entry is granted across a fence line, the fence shall be braced and tied off on both sides of the passageway prior to cutting. The operator shall notify the private surface landowner or the grazing allotment holder prior to crossing any fences.

Public Access

Public access on this road shall not be restricted by the operator without specific written approval granted by the Authorized Officer.

Construction Steps

1. Salvage topsoil
2. Construct road
3. Redistribute topsoil
4. Revegetate slopes

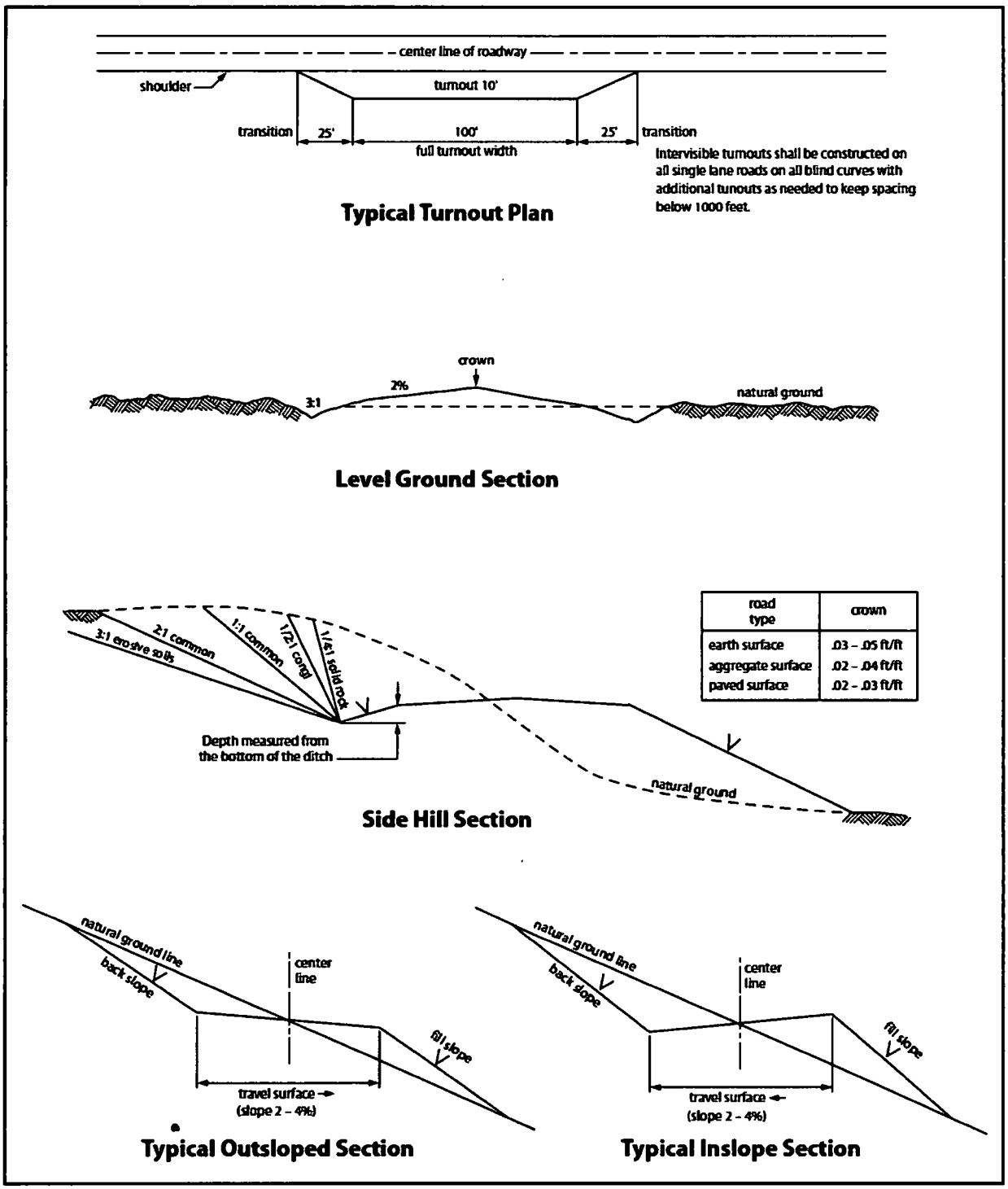


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

Placement of Production Facilities
Production facilities should be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location.

Exclosure Netting (Open-top Tanks)
Immediately following active drilling or completion operations, the operator will take actions necessary to prevent wildlife and livestock access, including avian wildlife, to all open-topped tanks that contain or have the potential to contain salinity sufficient to cause harm to wildlife or livestock, hydrocarbons, or Resource Conservation and Recovery Act of 1976-exempt hazardous substances. At a minimum, the operator will net, screen, or cover open-topped tanks to exclude wildlife and livestock and prevent mortality. If the operator uses netting, the operator will cover and secure the open portion of the tank to prevent wildlife entry. The operator will net, screen, or cover the tanks until the operator removes the tanks from the location or the tanks no longer contain substances that could be harmful to wildlife or livestock. Use a maximum netting mesh size of 1 ½ inches. The netting must not be in contact with fluids and must not have holes or gaps.

Chemical and Fuel Secondary Containment and Exclosure Screening
The operator will prevent all hazardous, poisonous, flammable, and toxic substances from coming into contact with soil and water. At a minimum, the operator will install and maintain an impervious secondary containment system for any tank or barrel containing hazardous, poisonous, flammable, or toxic substances sufficient to contain the contents of the tank or barrel and any drips, leaks, and anticipated precipitation. The operator will dispose of fluids within the containment system that do not meet applicable state or U. S. Environmental Protection Agency livestock water standards in accordance with state law; the operator must not drain the fluids to the soil or ground. The operator will design, construct, and maintain all secondary containment systems to prevent wildlife and livestock exposure to harmful substances. At a minimum, the operator will install effective wildlife and livestock exclosure systems such as fencing, netting, expanded metal mesh, lids, and grate covers. Use a maximum netting mesh size of 1 ½ inches.

Open-Vent Exhaust Stack Exclosures
The operator will construct, modify, equip, and maintain all open-vent exhaust stacks on production equipment to prevent birds and bats from entering, and to discourage perching, roosting, and nesting. (*Recommended exclosure structures on open-vent exhaust stacks are in the shape of a cone.*) Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers.

Containment Structures

Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement
All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

5. All construction and maintenance activity will be confined to the authorized right-of-way.

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

( ) seed mixture 1	( ) seed mixture 3
( ) seed mixture 2	( ) seed mixture 4
(X) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches that are not otherwise fenced, screened, or netted to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps, ladders, or

other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

19. Special Stipulations:

Lesser Prairie-Chicken

Oil and gas activities will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the

Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in "Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken: Oil and gas activities including 3-D geophysical exploration, and drilling will not be allowed in lesser prairie-chicken habitat during the period from March 1st through June 15th annually. During that period, other activities that produce noise or involve human activity, such as the maintenance of oil and gas facilities, geophysical exploration other than 3-D operations, and pipeline, road, and well pad construction, will be allowed except between 3:00 am and 9:00 am. The 3:00 am to 9:00 am restriction will not apply to normal, around-the-clock operations, such as venting, flaring, or pumping, which do not require a human presence during this period. Additionally, no new drilling will be allowed within up to 200 meters of leks known at the time of permitting. Normal vehicle use on existing roads will not be restricted. Exhaust noise from pump jack engines must be muffled or otherwise controlled so as not to exceed 75 db measured at 30 ft. from the source of the noise.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce

the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

After all disturbed areas have been satisfactorily prepared, these areas need to be revegetated with the seed mixture provided below. Seeding should be accomplished by drilling on the contour whenever practical or by other approved methods. Seeding may need to be repeated until revegetation is successful, as determined by the BLM.

Operators shall contact a BLM surface protection specialist prior to surface abandonment operations for site specific objectives (Jim Amos: 575-234-5909).

Ground-level Abandoned Well Marker to avoid raptor perching: Upon the plugging and subsequent abandonment of the well, the well marker will be installed at ground level on a plate containing the pertinent information for the plugged well.

Seed Mixture for LPC Sand/Shinnery Sites

Holder shall seed all disturbed areas with the seed mixture listed below. The seed mixture shall be planted in the amounts specified in pounds of pure live seed (PLS)* per acre. There shall be no primary or secondary noxious weeds in the seed mixture. Seed will be tested and the viability testing of seed shall be done in accordance with State law(s) and within nine (9) months prior to purchase. Commercial seed shall be either certified or registered seed. The seed container shall be tagged in accordance with State law(s) and available for inspection by the Authorized Officer.

Seed will be planted using a drill equipped with a depth regulator to ensure proper depth of planting where drilling is possible. The seed mixture will be evenly and uniformly planted over the disturbed area (smaller/heavier seeds have a tendency to drop the bottom of the drill and are planted first). Holder shall take appropriate measures to ensure this does not occur. Where drilling is not possible, seed will be broadcast and the area shall be raked or chained to cover the seed. When broadcasting the seed, the pounds per acre are to be doubled. Seeding shall be repeated until a satisfactory stand is established as determined by the Authorized Officer. Evaluation of growth may not be made before completion of at least one full growing season after seeding.

Species to be planted in pounds of pure live seed* per acre:

Species	lb/acre
Plains Bristlegrass	5lbs/A
Sand Bluestem	5lbs/A
Little Bluestem	3lbs/A
Big Bluestem	6lbs/A
Plains Coreopsis	2lbs/A
Sand Dropseed	1lbs/A

*Pounds of pure live seed:

Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed

AFMSS

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

Operator Certification Data Report

05/10/2019

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: Jenny Harms **Signed on:** 11/12/2018

Title: Regulatory Compliance Professional

Street Address: 333 W Sheridan Ave

City: Oklahoma City **State:** OK **Zip:** 73102

Phone: (405)552-6560

Email address: jenny.harms@dvn.com

Field Representative

Representative Name: Ray Vaz

Street Address: 333 West Sheridan Ave.

City: Oklahoma City **State:** OK **Zip:** 73102

Phone: (405)552-4902

Email address: ray.vaz@dvn.com

APD ID: 10400035836 **Submission Date:** 11/12/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Well Type: OIL WELL **Well Work Type:** Drill

[redacted]

Show Final Text

Section 1 - General

APD ID: 10400035836 **Tie to previous NOS?** **Submission Date:** 11/12/2018

BLM Office: CARLSBAD **User:** Jenny Harms **Title:** Regulatory Compliance Professional

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

Lease number: NMNM0359295A **Lease Acres:** 880

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: HAFLINGER 27-22 FED COM **Well Number:** 232H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** WC-025 G-08 S253235G **Pool Name:** BONE SPRING

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

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? Y **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad: MULTIPLE WELL **Multiple Well Pad Name:** HAFLINGER 27 WELLPAD **Number:** 1

Well Class: HORIZONTAL **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:** 1955 FT **Distance to lease line:** 325 FT

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: Haflinger_27_22_Fed_Com_232H_C_102_signed_20181102093151.pdf

Haflinger_27_22_Fed_Com_232H_Additional_points_20181102093211.pdf

Well work start Date: 10/24/2019 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 6621

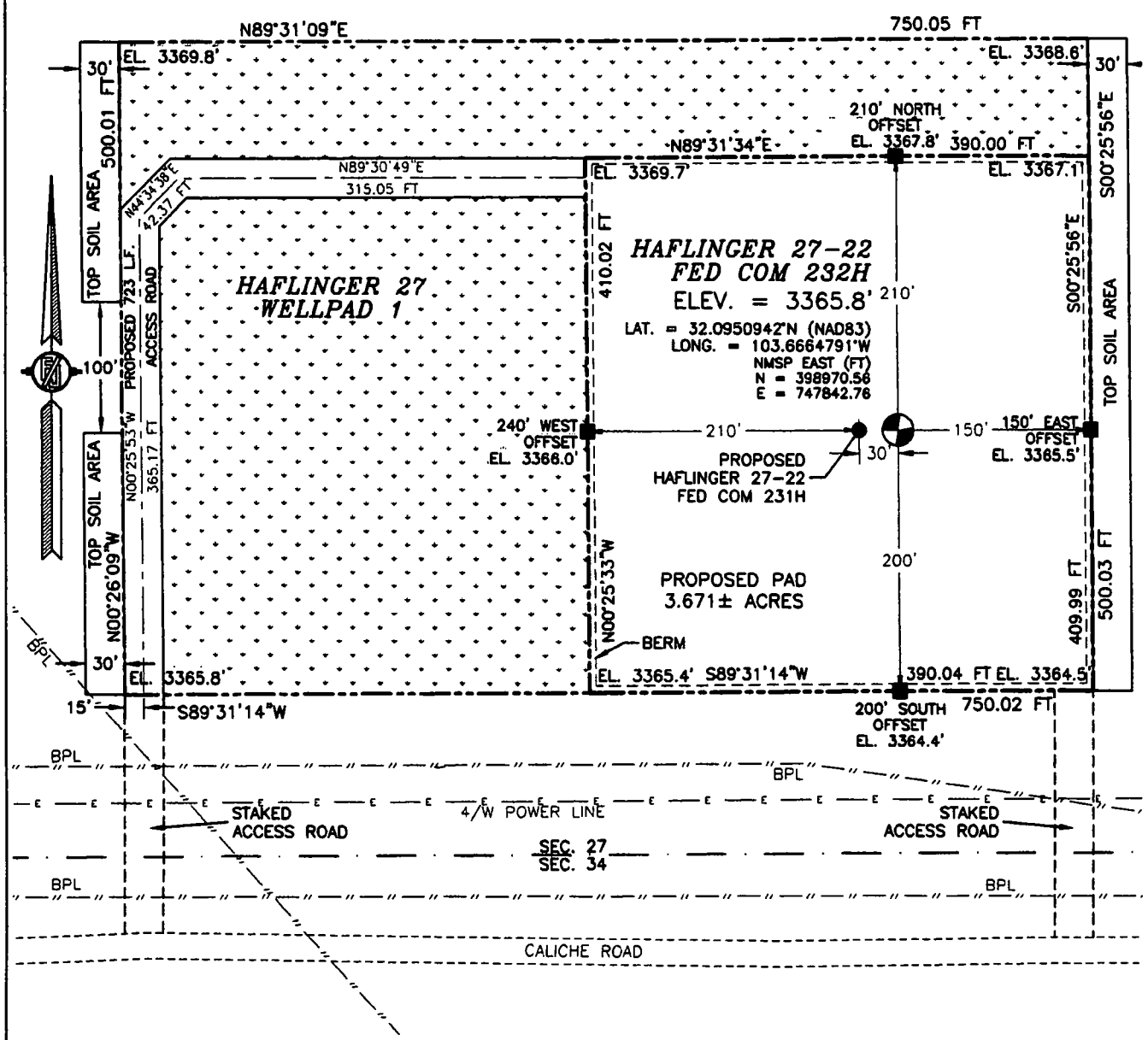
	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	325	FSL	1545	FWL	25S	32E	27	Aliquot SESW	32.095094	-103.6664791	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0359295A	3366	0	0
KOP Leg #1	50	FSL	2310	FWL	25S	32E	27	Aliquot SESW	32.094325	-103.664015	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0359295A	-6731	10146	10097
PPP Leg #1	100	FSL	2310	FWL	25S	32E	27	Aliquot SESW	32.094463	-103.664015	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 0359295A	-6965	10388	10331

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

	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
PPP Leg #1	1320	FNL	2310	FWL	25S	32E	27	Aliquot NWNW	32.105073	-103.664019	LEA	NEW MEXICO	NEW MEXICO	F	NMNM 115421	-7304	14384	10670
EXIT Leg #1	100	FNL	2310	FWL	25S	32E	22	Aliquot SESW	32.122957	-103.664026	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0 062300	-7304	20889	10670
BHL Leg #1	20	FNL	2310	FWL	25S	32E	22	Aliquot NENW	32.123177	-103.664258	LEA	NEW MEXICO	NEW MEXICO	F	NMLC0 062300	-7304	20969	10670

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
SITE MAP



012 60 120 240

SCALE 1" = 120'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HWY. 128 & COUNTY ROAD 1 (ORLA HWY.) GO SOUTH ON COUNTY ROAD 1 APPROX. 8.4 MILES TO A LEASE ROAD ON LEFT (EAST), TURN EAST GO APPROX. 0.20 MILE TO A ROAD SURVEY WITH RED & WHITE FLAGGING ON LEFT (NORTH) OF ROAD, GO NORTH APPROX. 183 FEET, THEN FOLLOW FLAGS NORTH 365', THEN NORTHEAST 42', THEN EAST 315' TO THE NORTHWEST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.

HAFLINGER 27-22 FED COM 232H

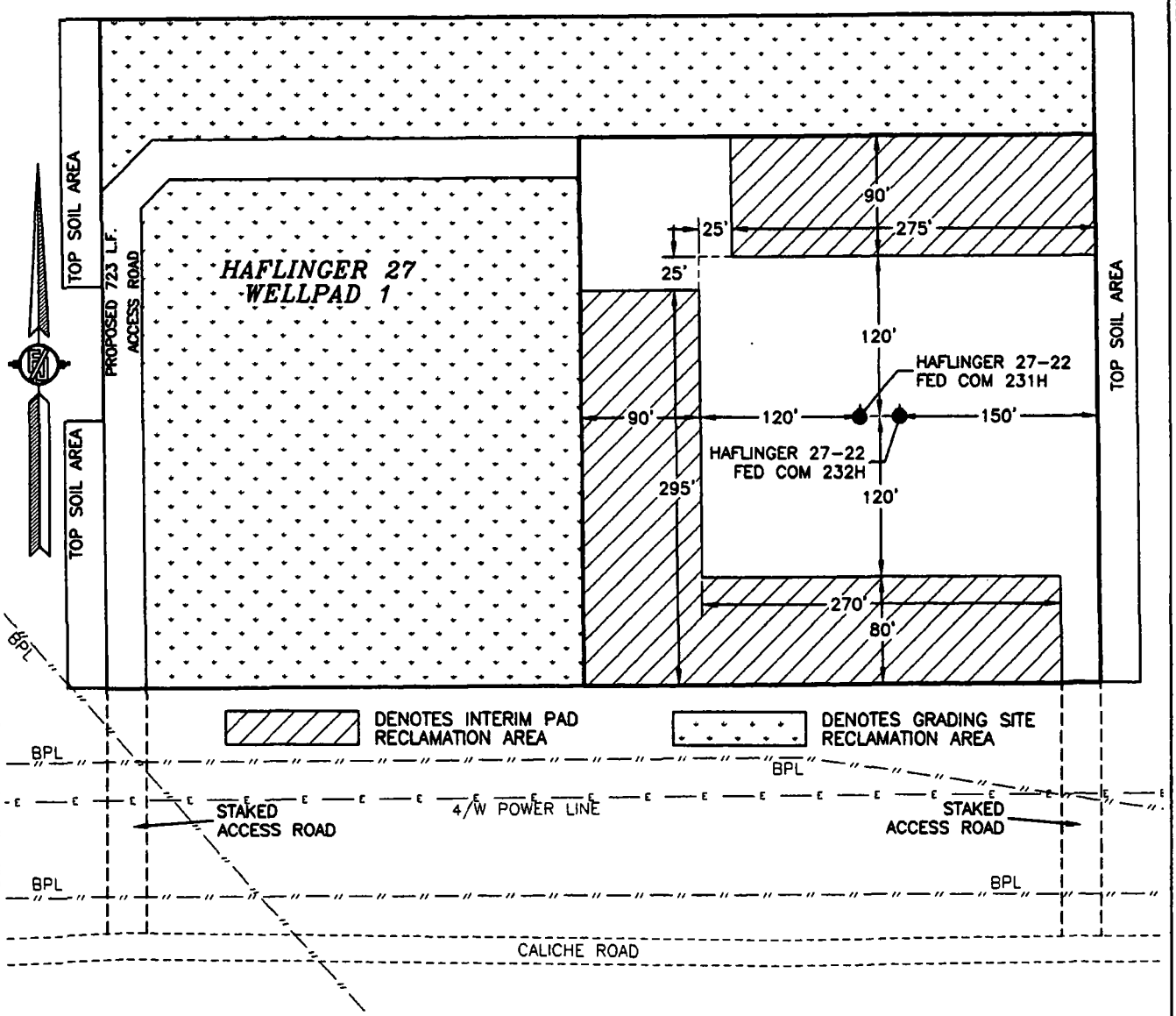
LOCATED 325 FT. FROM THE SOUTH LINE AND 1545 FT. FROM THE WEST LINE OF SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO

OCTOBER 16, 2018

SURVEY NO. 6621

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
INTERIM SITE BUILD PLAN



012 60 120 240
SCALE 1" = 120'

1.674± ACRES INTERIM PAD RECLAMATION AREA
4.441± ACRES GRADING SITE RECLAMATION AREA
2.495± ACRES NON-RECLAIMED AREA
8.610± ACRES HAFLINGER 27 WELLPAD 1

DEVON ENERGY PRODUCTION COMPANY, L.P.
HAFLINGER 27-22 FED COM 232H
LOCATED 325 FT. FROM THE SOUTH LINE AND 1545 FT. FROM THE WEST LINE OF SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M. LEA COUNTY, STATE OF NEW MEXICO

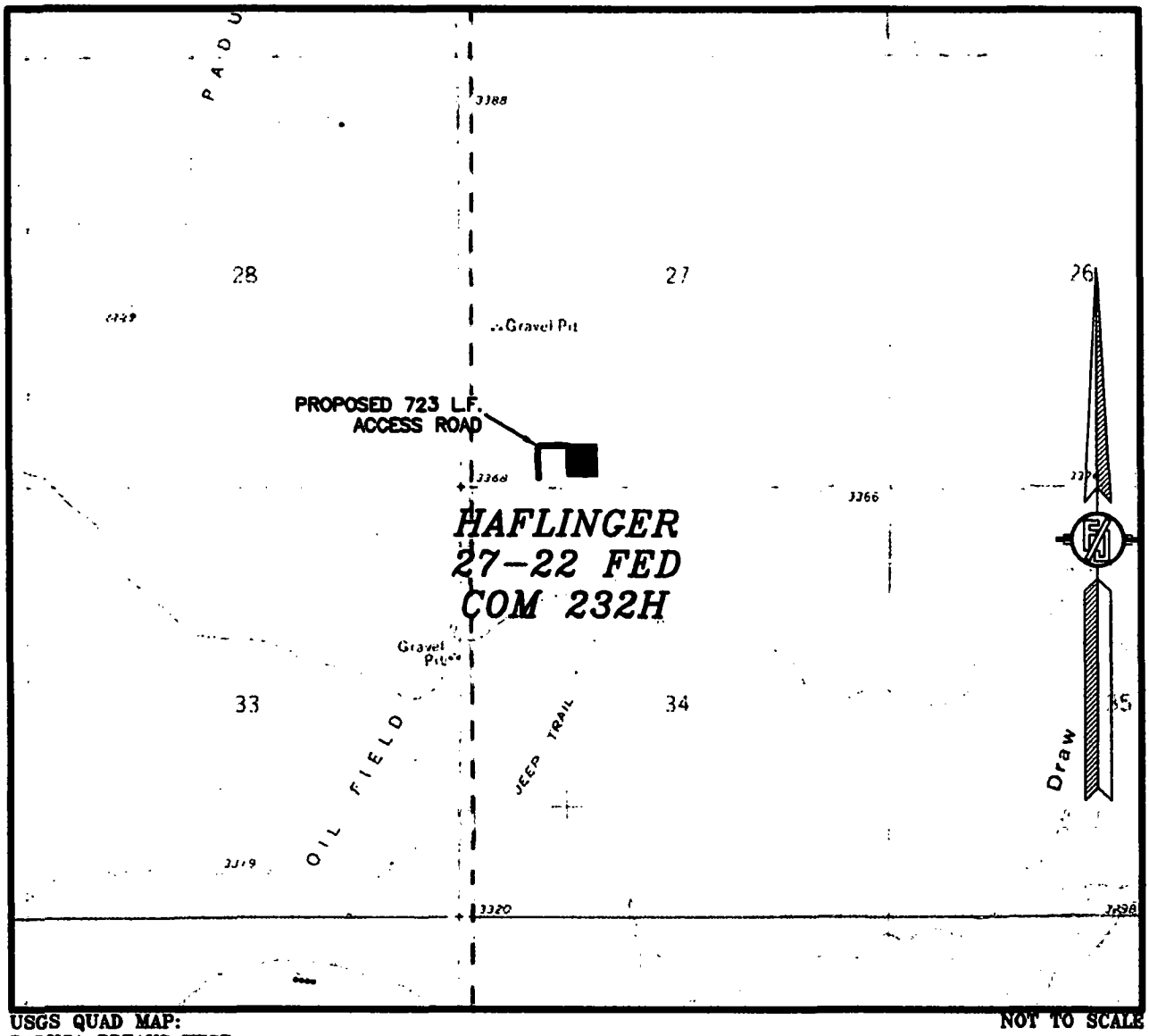
OCTOBER 16, 2018

SURVEY NO. 6621

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
PADUCA BREAKS WEST

NOT TO SCALE

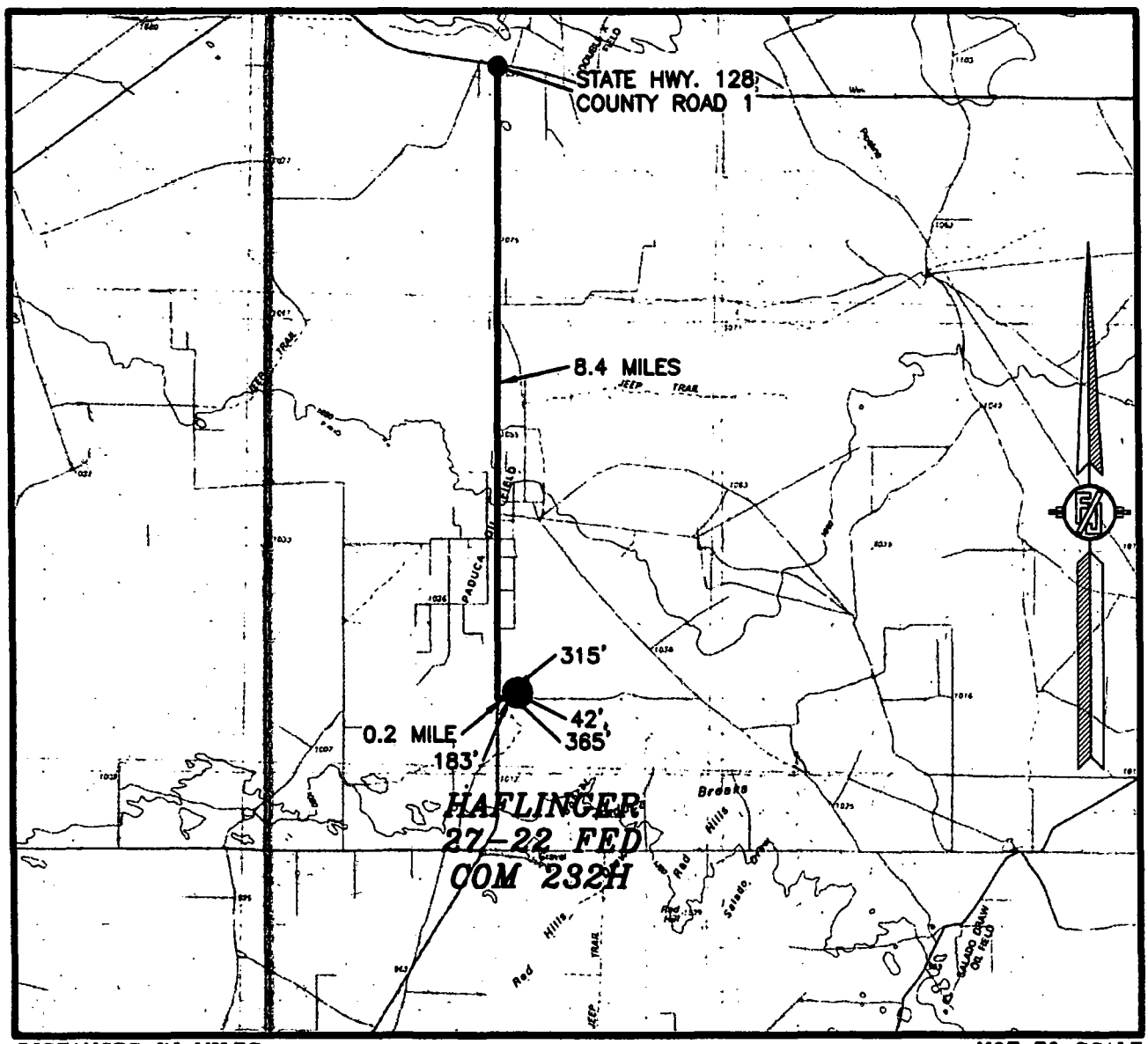
DEVON ENERGY PRODUCTION COMPANY, L.P.
HAFLINGER 27-22 FED COM 232H
LOCATED 325 FT. FROM THE SOUTH LINE
AND 1545 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

OCTOBER 16, 2018

SURVEY NO. 6621

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES *NOT TO SCALE*

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF STATE HWY. 128 & COUNTY ROAD 1 (ORLA HWY.) GO SOUTH ON COUNTY ROAD 1 APPROX. 8.4 MILES TO A LEASE ROAD ON LEFT (EAST), TURN EAST GO APPROX. 0.20 MILE TO A ROAD SURVEY WITH RED & WHITE FLAGGING ON LEFT (NORTH) OF ROAD, GO NORTH APPROX. 183 FEET, THEN FOLLOW FLAGS NORTH 365', THEN NORTHEAST 42', THEN EAST 315' TO THE NORTHWEST PAD CORNER FOR THIS LOCATION.

DEVON ENERGY PRODUCTION COMPANY, L.P.
HAFLINGER 27-22 FED COM 232H
LOCATED 325 FT. FROM THE SOUTH LINE AND 1545 FT. FROM THE WEST LINE OF SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

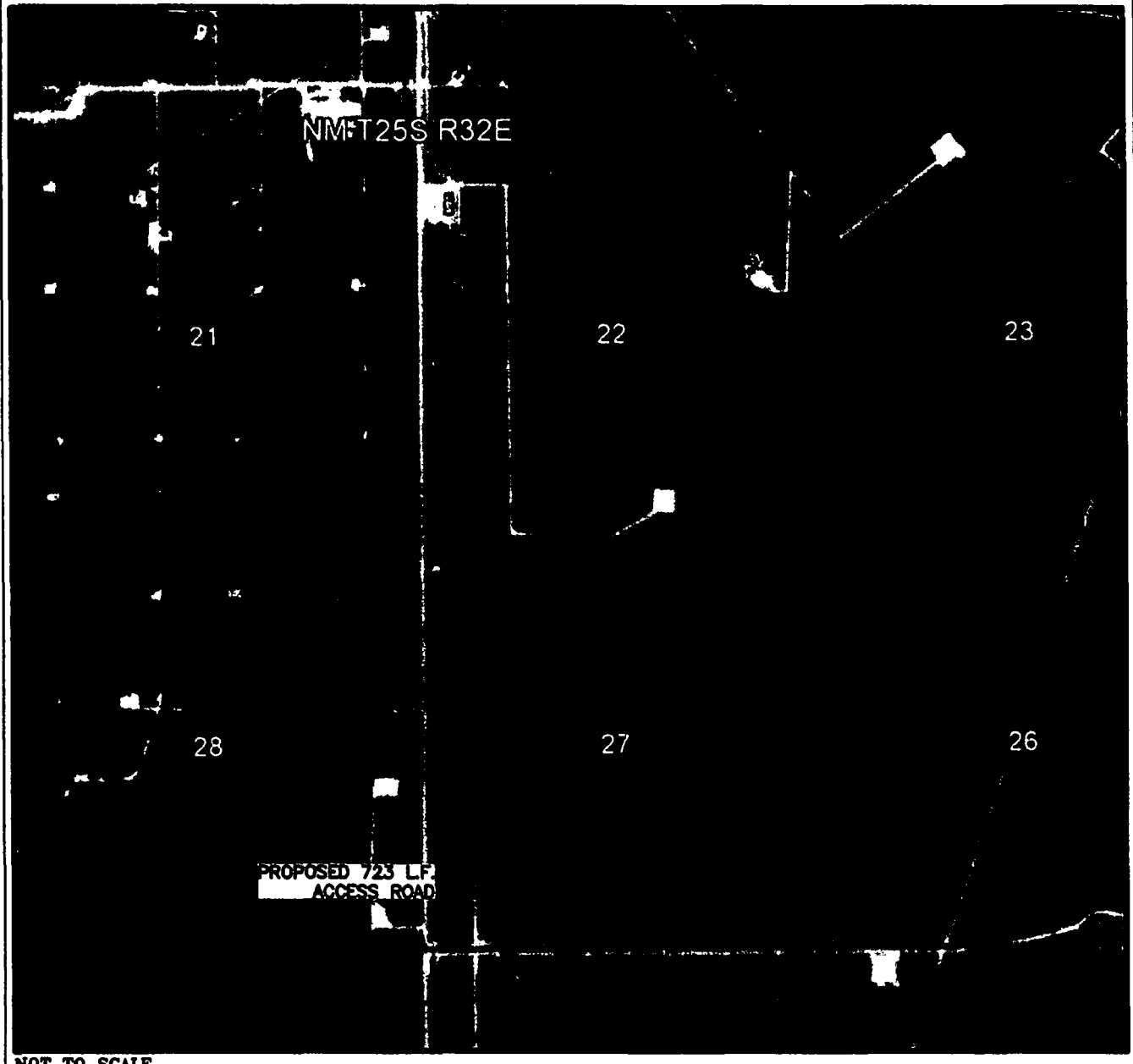
OCTOBER 16, 2018

SURVEY NO. 6621

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOV. 2015

DEVON ENERGY PRODUCTION COMPANY, L.P.
HAFLINGER 27-22 FED COM 232H
LOCATED 325 FT. FROM THE SOUTH LINE
AND 1545 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

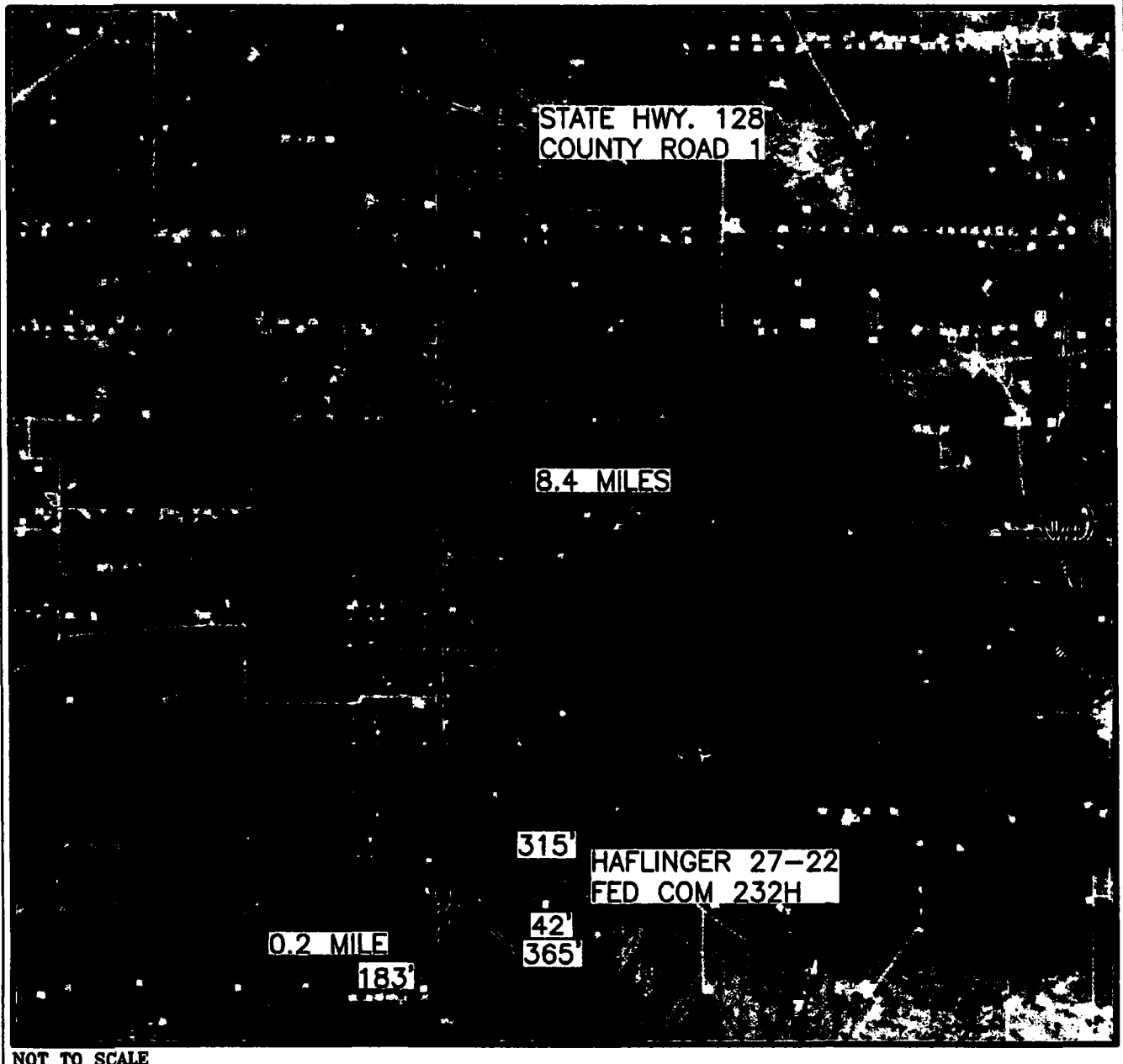
OCTOBER 16, 2018

SURVEY NO. 6621

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

SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

AERIAL ACCESS ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
NOV. 2015

DEVON ENERGY PRODUCTION COMPANY, L.P.

HAFLINGER 27-22 FED COM 232H

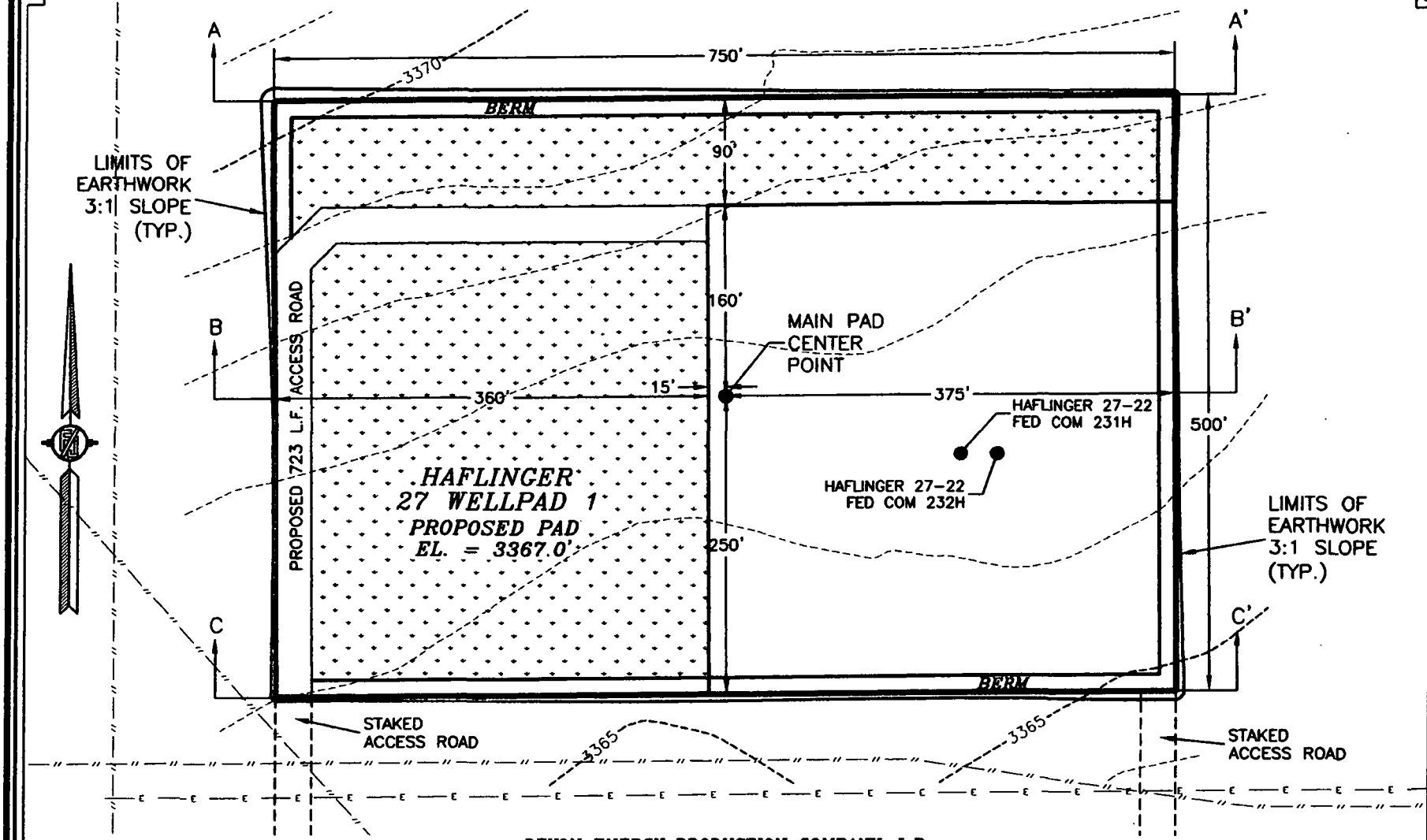
LOCATED 325 FT. FROM THE SOUTH LINE
AND 1545 FT. FROM THE WEST LINE OF
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

OCTOBER 16, 2018

SURVEY NO. 6621

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

PLAN VIEW



DEVON ENERGY PRODUCTION COMPANY, L.P.
PAD GRADING AND CROSS SECTIONS
FOR HAFLINGER 27-22 FED COM 231H & 232H
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
6299 CU. YD	7530 CU. YD	1231 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED

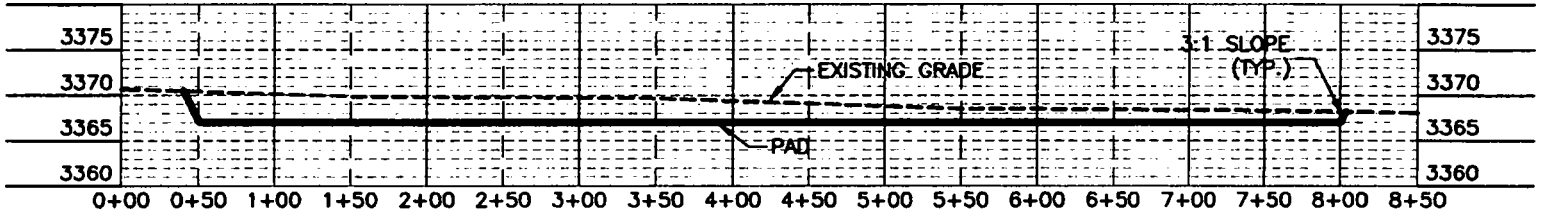
OCTOBER 16, 2018

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

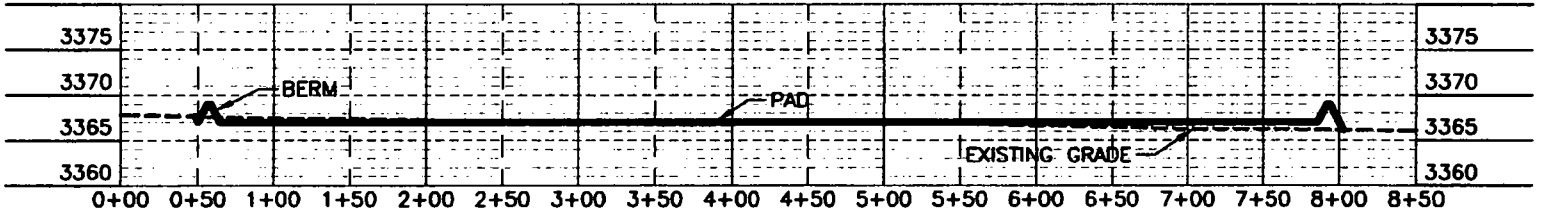
SHEET 1-2
SURVEY NO. 6621

CROSS-SECTIONS

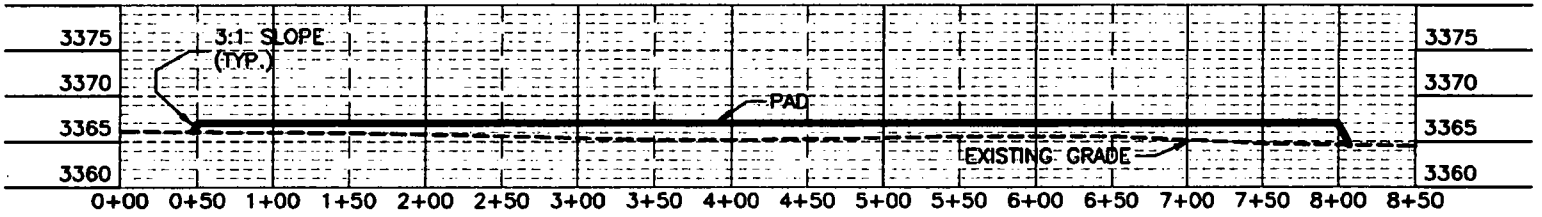
SECTION A-A'



SECTION B-B'



SECTION C-C'



012 60 120 240

SCALE 1" = 120' - 1" = 20' VER

DEVON ENERGY PRODUCTION COMPANY, L.P.
PAD GRADING AND CROSS SECTIONS
FOR HAFLINGER 27-22 FED COM 231H & 232H
SECTION 27, TOWNSHIP 25 SOUTH,
RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO

CUT	FILL	NET
6299 CU. YD	7530 CU. YD	1231 CU. YD (FILL)

EARTHWORK QUANTITIES ARE ESTIMATED

OCTOBER 16, 2018

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

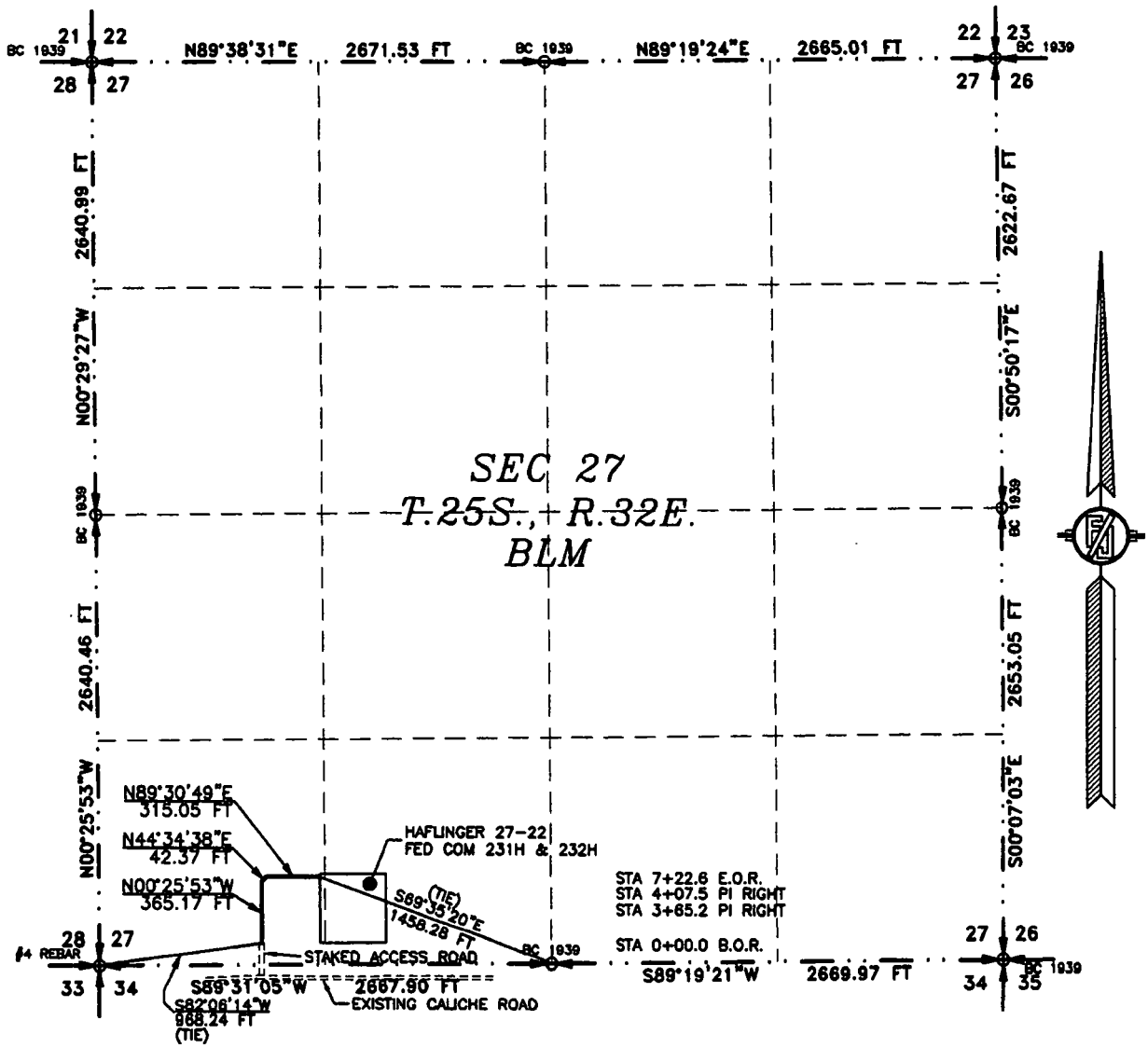
SHEET 2-2
SURVEY NO. 6621

ACCESS ROAD PLAT

ACCESS ROAD FOR HAFLINGER 27-22 FED COM 231H & 232H

DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
OCTOBER 16, 2018



SEE NEXT SHEET (2-2) FOR DESCRIPTION

1000 0 1000
Scale: 1" = 1000'

GENERAL NOTES

1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 18TH DAY OF OCTOBER 2018

FILIMON F. JARAMILLO, PLS NO. 12797

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

SHEET: 1-2

SURVEY NO. 6621

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD FOR HAFLINGER 27-22 FED COM 231H & 232H

DEVON ENERGY PRODUCTION COMPANY, L.P.

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M.
LEA COUNTY, STATE OF NEW MEXICO
OCTOBER 16, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M., LEA COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY:

BEGINNING AT A POINT WITHIN THE SW/4 SW/4 OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M., WHENCE THE SOUTHWEST CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS S82°06'14"W, A DISTANCE OF 968.24 FEET;
THENCE N00°25'53"W A DISTANCE OF 365.17 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N44°34'38"E A DISTANCE OF 42.37 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N89°30'49"E A DISTANCE OF 315.05 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 27, TOWNSHIP 25 SOUTH, RANGE 32 EAST, N.M.P.M. BEARS S69°35'20"E, A DISTANCE OF 1458.28 FEET;

SAID STRIP OF LAND BEING 722.59 FEET OR 43.79 RODS IN LENGTH, CONTAINING 0.498 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS:

SW/4 SW/4	722.59 L.F.	43.79 RODS	0.498 ACRES

GENERAL NOTES

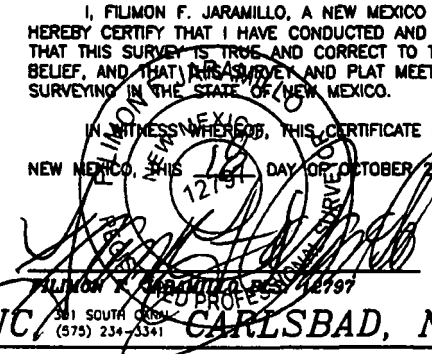
1.) THE INTENT OF THIS ROUTE SURVEY IS TO ACQUIRE AN EASEMENT.

2.) BASIS OF BEARING AND DISTANCE IS NMSP EAST (NAD83) MODIFIED TO SURFACE COORDINATES. NAD 83 (FEET) AND NAVD 88 (FEET) COORDINATE SYSTEMS USED IN THE SURVEY.

SURVEYOR CERTIFICATE

I, FILIMON F. JARAMILLO, A NEW MEXICO PROFESSIONAL SURVEYOR NO. 12797, HEREBY CERTIFY THAT I HAVE CONDUCTED AND AM RESPONSIBLE FOR THIS SURVEY, THAT THIS SURVEY IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF, AND THAT THIS SURVEY AND PLAT MEET THE MINIMUM STANDARDS FOR LAND SURVEYING IN THE STATE OF NEW MEXICO.

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 16TH DAY OF OCTOBER 2018



FILIMON F. JARAMILLO, PLS 12797
301 SOUTH CANAL
(575) 234-3341

MADRON SURVEYING, INC.
301 SOUTH CANAL
CARLSBAD, NEW MEXICO 88220
Phone (575) 234-3341

APD ID: 10400035836 **Submission Date:** 11/12/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Well Type: OIL WELL **Well Work Type:** Drill

[redacted]

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	[redacted]						
2							
3							
4							
5							
6							
7							

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 4709

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M 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:

Haflinger_27_22_Fed_Com_232H_3M_BOPE_CK_20181102082005.pdf

BOP Diagram Attachment:

Haflinger_27_22_Fed_Com_232H_3M_BOPE_CK_20181102082014.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Pressure Rating (PSI): 5M **Rating Depth:** 10670

Equipment: BOP/BOPE will be installed per Onshore Oil & Gas Order #2 requirements prior to drilling below surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 3M 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:

Haflinger_27_22_Fed_Com_232H_5M_BOPE__CK_20181102082118.pdf

BOP Diagram Attachment:

Haflinger_27_22_Fed_Com_232H_5M_BOPE__CK_20181102082128.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	864	0	864			864	H-40	48		1.125	1	BUOY	1.6	BUOY	1.6
2	INTERMEDIATE	12.25	9.625	NEW	API	N	0	4709	0	4709			4709	J-55	40		1.125	1	BUOY	1.6	BUOY	1.6
3	PRODUCTION	8.75	5.5	NEW	API	N	0	20969	0	10670			20969	P-110	17		1.125	1	BUOY	1.6	BUOY	1.6

Casing Attachments

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Haflinger_27_22_Fed_Com_232H_Surf_Csg_Ass_20181102082312.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Haflinger_27_22_Fed_Com_232H_Int_Csg_Ass_20181102082501.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Haflinger_27_22_Fed_Com_232H_Prod_Csg_Ass_20181102082804.pdf

Section 4 - Cement

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead			864		1.33	13.2		100	C	Class C + adds
INTERMEDIATE	Lead			4209		1.94	9		50	C	Class C + adds
INTERMEDIATE	Tail			4709		1.33	13.2		50	C	Class C + adds
PRODUCTION	Lead			10146		3.27	9		10	TUNED	Class C + adds
PRODUCTION	Tail			20969		1.2	13.2		10	H	(50:50) Clas 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	864	WATER-BASED MUD	8.5	9							

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

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
864	4709	SALT SATURATED	10	10.5							
10670	20969	WATER-BASED MUD	8.5	9							

Section 6 - Test, Logging, Coring

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

Will run GRMWD from TD to from KOP. Cement bond logs will be run in vertical to determine top of cement. Stated logs run will be in the Completion Report and submitted to the BLM.

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

CALIPER,CBL,DS,GR,MUDLOG

Coring operation description for the well:

N/A

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 4994 **Anticipated Surface Pressure:** 2646.6

Anticipated Bottom Hole Temperature(F): 171

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Haflinger_27_22_Fed_Com_232H_H2S_Plan_20181102085807.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Haflinger_27_22_Fed_Com_232H_Plot_20181102085939.pdf
Haflinger_27_22_Fed_Com_232H_Permit_Plan_20181102085948.pdf
Haflinger_27_22_Fed_Com_232H_AC_Rpt_20181102090000.pdf
Drilling_Plan_Haflinger_27_22_Fed_Com_232H_4_11_20190411090428.pdf

Other proposed operations facets description:

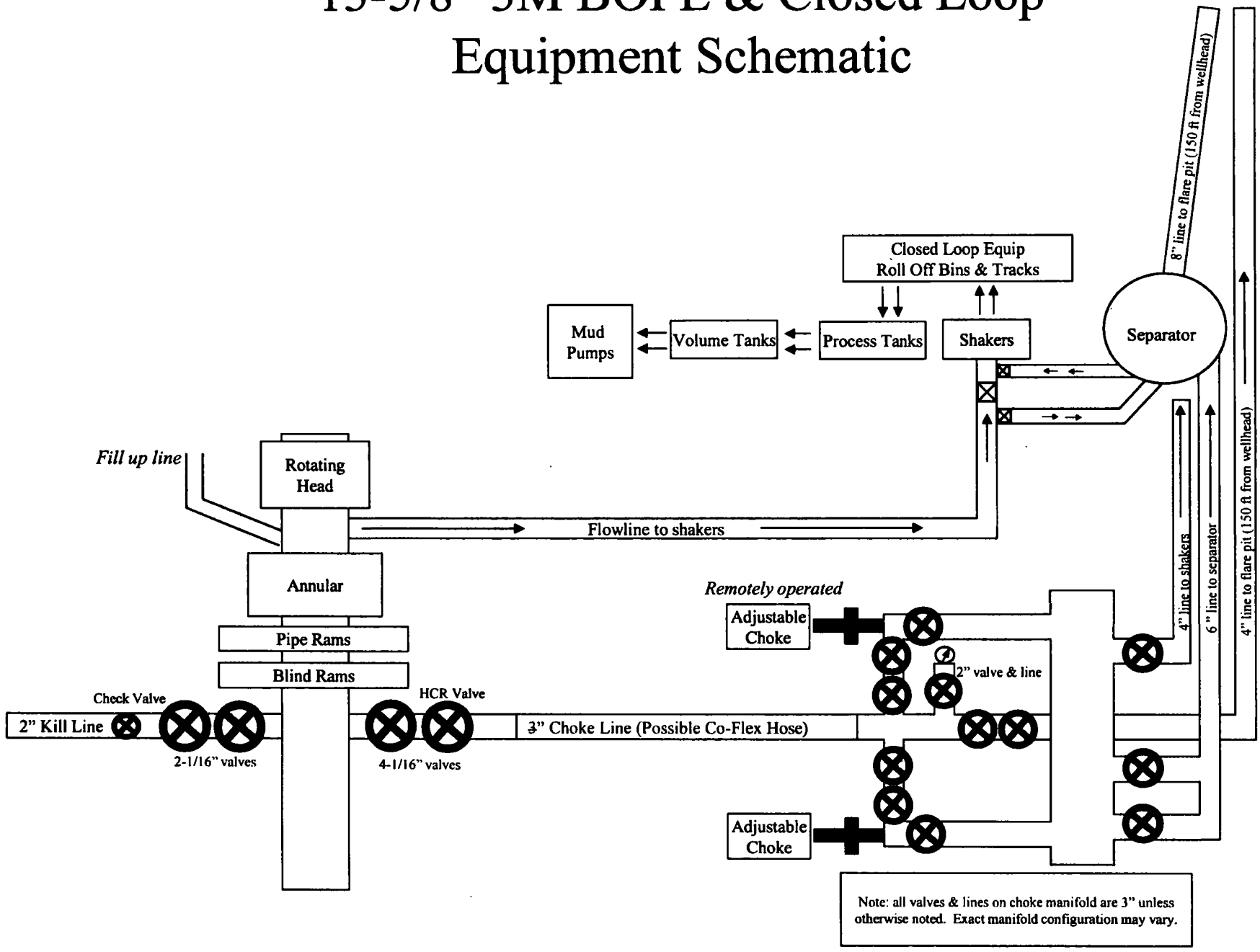
Other proposed operations facets attachment:

Haflinger_27_22_Fed_Com_232H_Clsd_Loop_20181102090033.pdf
Haflinger_27_22_Fed_Com_232H_Drilling_Plan_20181102090034.pdf
Haflinger_27_22_Fed_Com_232H_MB_Wellhd_20181102090036.pdf
Haflinger_27_22_Fed_Com_232H_MB_Verb_20181102090035.pdf
Haflinger_27_22_Fed_Com_232H_Gas_Capture_Plan_20181102090047.pdf
Spudder_Rig_Info_20190411090459.pdf

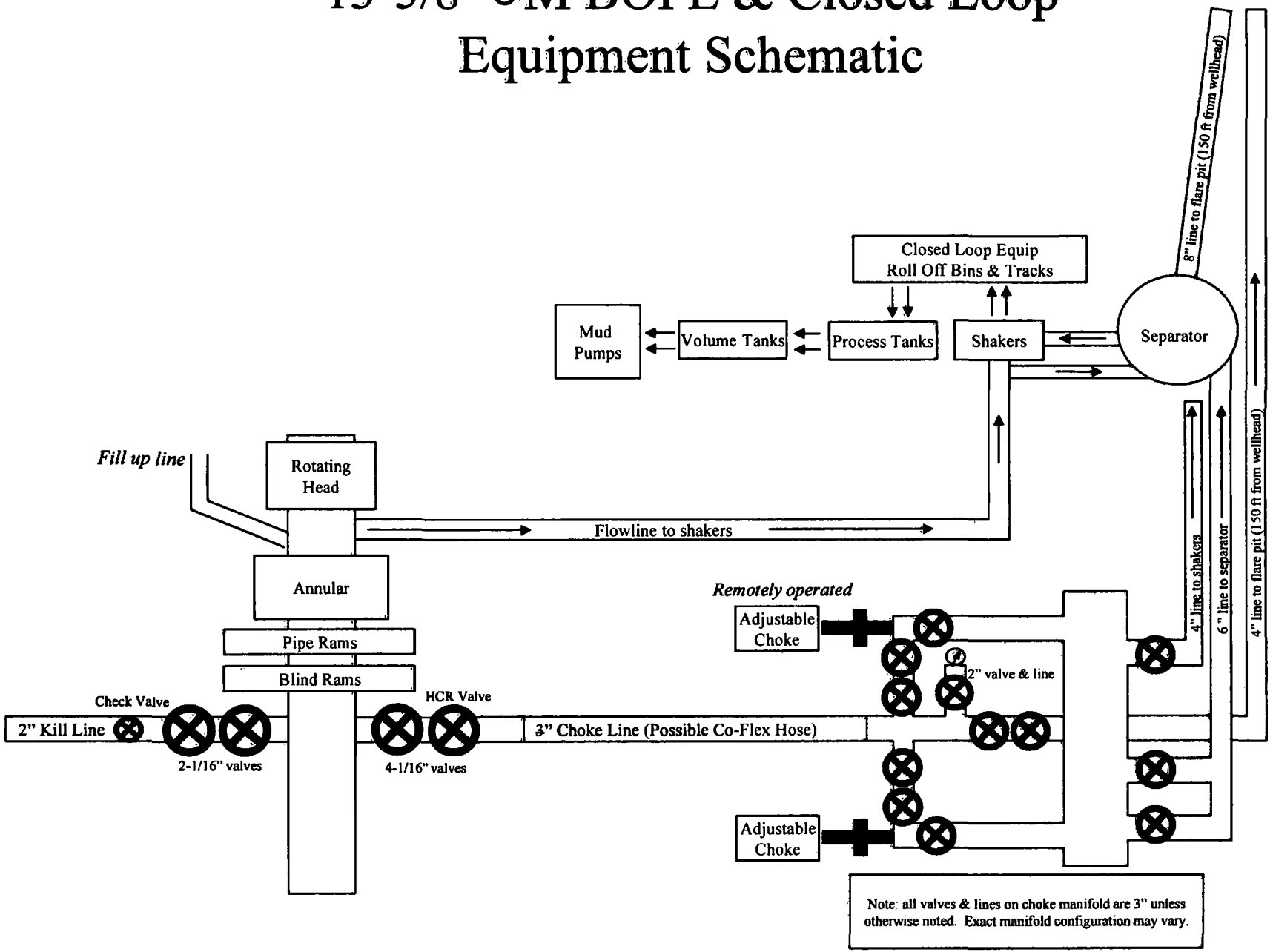
Other Variance attachment:

Haflinger_27_22_Fed_Com_232H_Co_flex_20181101073810.pdf

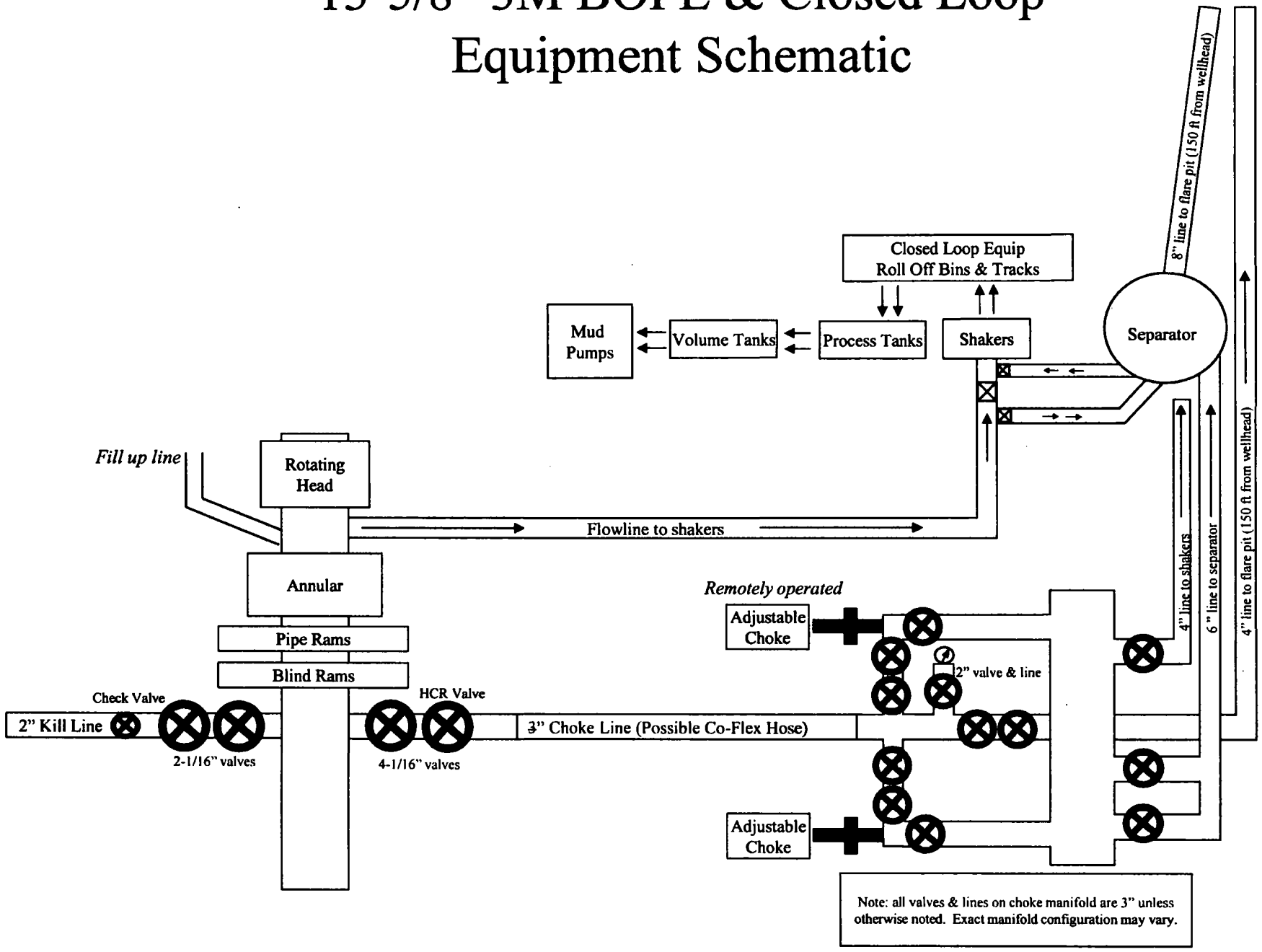
13-5/8" 3M BOPE & Closed Loop Equipment Schematic



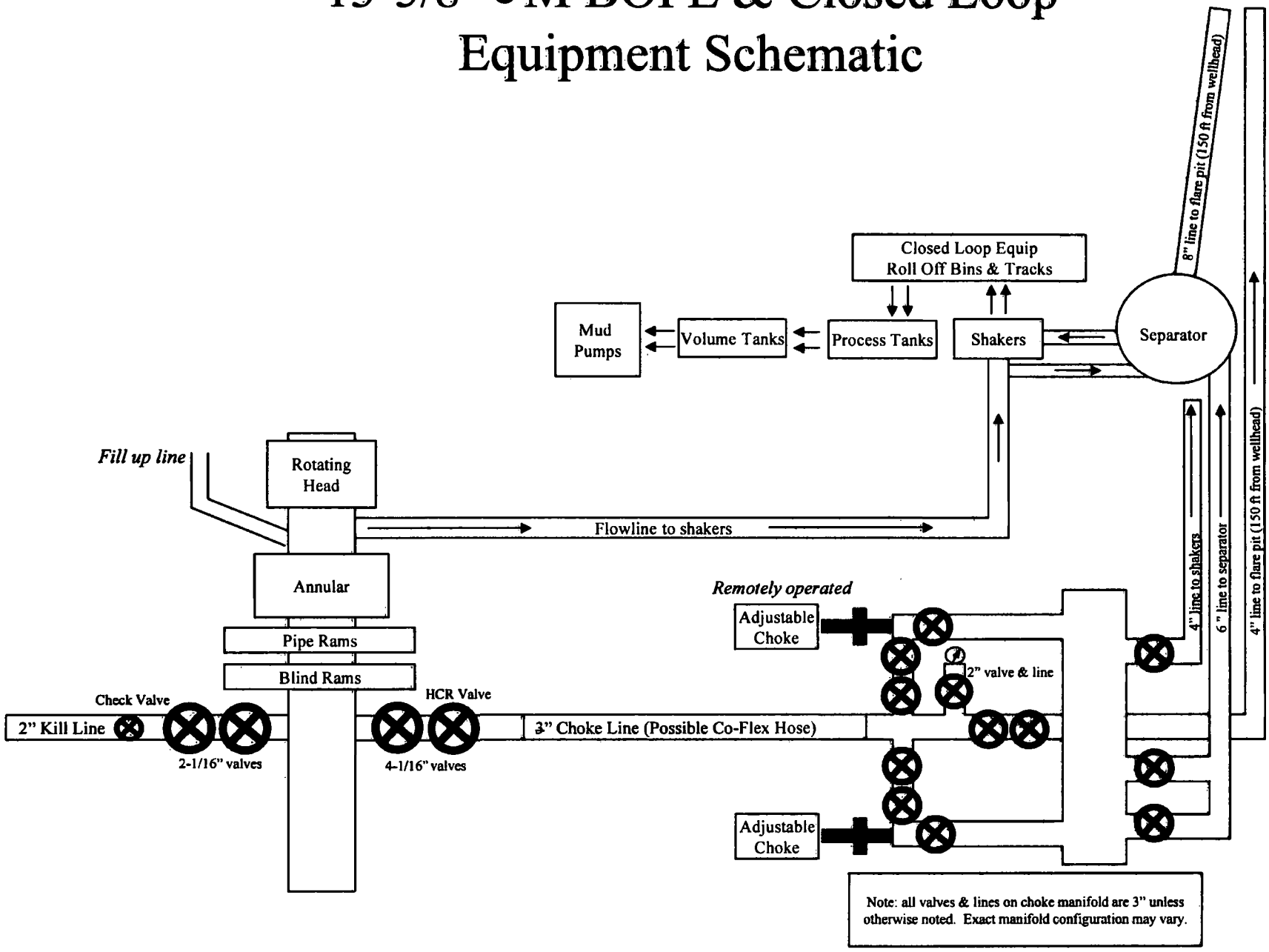
13-5/8" 5M BOPE & Closed Loop Equipment Schematic



13-5/8" 3M BOPE & Closed Loop Equipment Schematic



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



Casing Assumptions and Load Cases

Surface

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Surface Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Displace to Gas	Formation Pore Pressure	Dry gas from next casing point

Surface Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Surface Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	3 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Intermediate

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Intermediate Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Max mud weight of next hole-section plus Test psi
Drill Ahead	Formation Pore Pressure	Max mud weight of next hole section
Fracture @ Shoe	Formation Pore Pressure	Dry gas

Intermediate Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC	None
Cementing	Wet cement weight	Water (8.33ppg)

Intermediate Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

Casing Assumptions and Load Cases

Production

All casing design assumptions were ran in Stress Check to determine safety factor which meet or exceed both Devon Energy and BLM minimum requirements. All casing strings will be filled while running in hole in order to not exceed collapse rating of the pipe.

Production Casing Burst Design		
Load Case	**External Pressure**	**Internal Pressure**
Pressure Test	Formation Pore Pressure	Fluid in hole (water or produced water) + test psi
Tubing Leak	Formation Pore Pressure	Packer @ KOP, leak below surface 8.6 ppg packer fluid
Stimulation	Formation Pore Pressure	Max frac pressure with heaviest frac fluid

Production Casing Collapse Design		
Load Case	**External Pressure**	**Internal Pressure**
Full Evacuation	Water gradient in cement, mud above TOC.	None
Cementing	Wet cement weight	Water (8.33ppg)

Production Casing Tension Design	
Load Case	**Assumptions**
Overpull	100kips
Runing in hole	2 ft/s
Service Loads	N/A

devon

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

Hydrogen Sulfide (H_2S) Contingency Plan

For

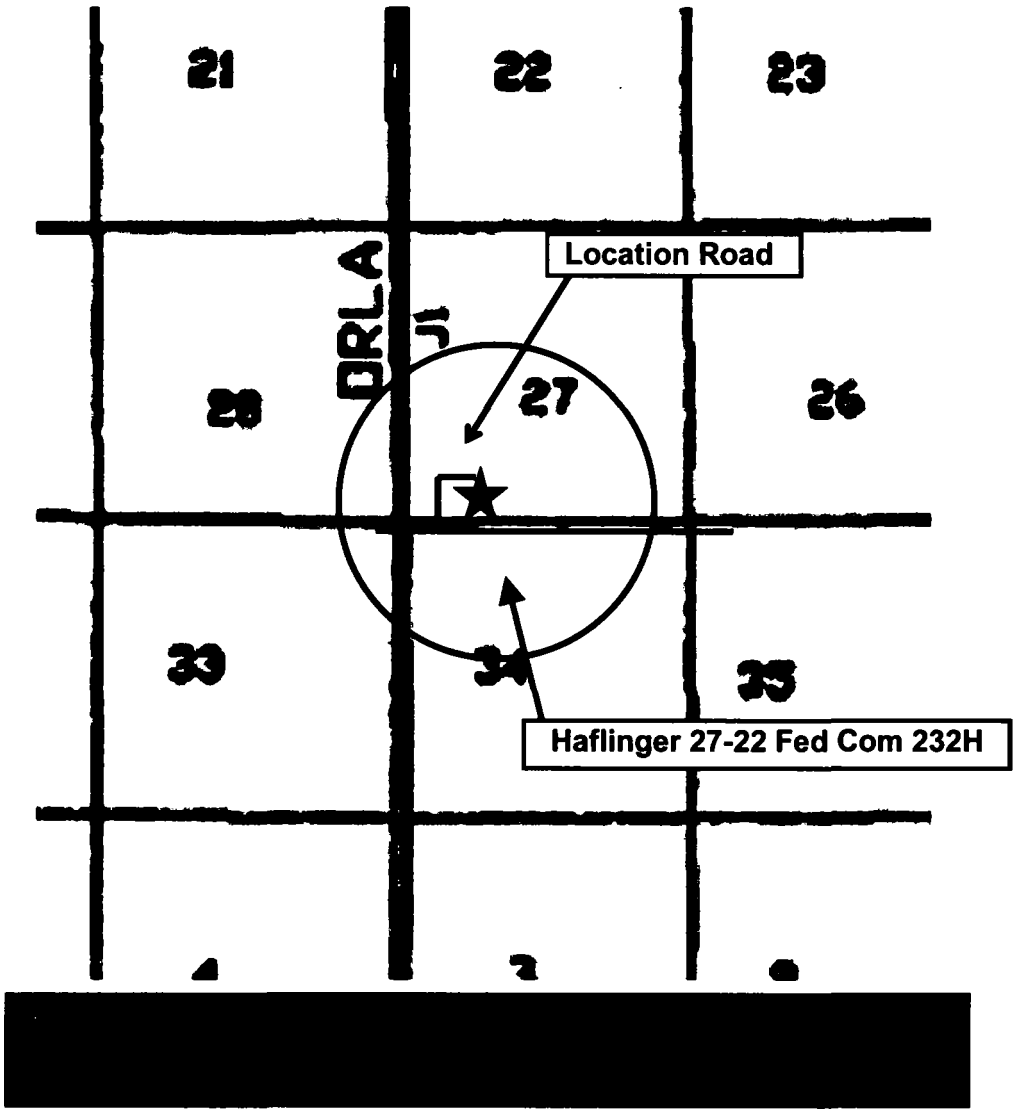
Haflinger 27-22 Fed Com 232H

Sec-27 T-25S R-32E
325' FSL & 1545' FWL
LAT. = 32.0950942' N (NAD83)
LONG = 103.6664791' W

Lea County NM

Haflinger 27-22 Fed Com 232H

This is an open drilling site. H_2S monitoring equipment and emergency response equipment will be used within 500' of zones known to contain H_2S, including warning signs, wind indicators and H_2S monitor.



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 H_2S concentration shall trigger activation of this plan.

Emergency Procedures

In the event of a release of gas containing H_2S, 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 H_2S 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 H_2S, 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 (SO_2). 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 H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air = 1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	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 the State of New Mexico's 'Hazardous Materials Emergency Response Plan' (HMER)

Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE (H_2S) 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 (H_2S)
2. The proper use and maintenance of personal protective equipment and life support systems.
3. The proper use of H_2S 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 H_2S 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 H_2S Drilling Operations Plan and Public Protection Plan.

There will be an initial training session just prior to encountering a known or probable H_2S zone (within 3 days or 500 feet) and weekly H_2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H_2S Drilling Operations Plan and the Public Protection Plan.

II. HYDROGEN SULFIDE TRAINING

Note: All H_2S 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 H_2S.

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. **H_2S detection and monitoring equipment:**

   Portable H_2S monitors positioned on location for best coverage and response. These units have warning lights which activate when H_2S levels reach 10 ppm and audible sirens which activate at 15 ppm. Sensor locations:

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

   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 H_2S circulated to surface. Proper mud weight, safe drilling practices and the use of H_2S scavengers will minimize hazards when penetrating H_2S bearing zones.

5. **Metallurgy:**

   A. All drill strings, casings, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold lines, and valves shall be H_2S trim.

   B. All elastomers used for packing and seals shall be H_2S 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 H_2S environment will use the closed chamber method of testing.

   B. There will be no drill stem testing.

Devon Energy Corp. Company Call List		
Drilling Supervisor – Basin – Mark Kramer		405-823-4796
EHS Professional – Laura Wright		405-439-8129
Agency Call List		
Lea County (575)	**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
Eddy County (575)	**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
Give GPS position:	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

SHARP COMMUNICATIONS & CONSULTING, LLC

WCDSC Permian NM

WELL DETAILS: Hafinger 27-22 Fed Com 232H

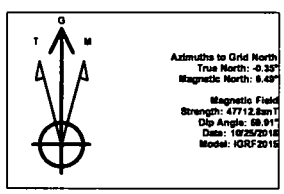
RKB @ 3390.80ft
3365.80

Northing	Easting	Latitude	Longitude
398970.56	747842.76	32.065084	-103.666479

SECTION DETAILS Permit Plan 1

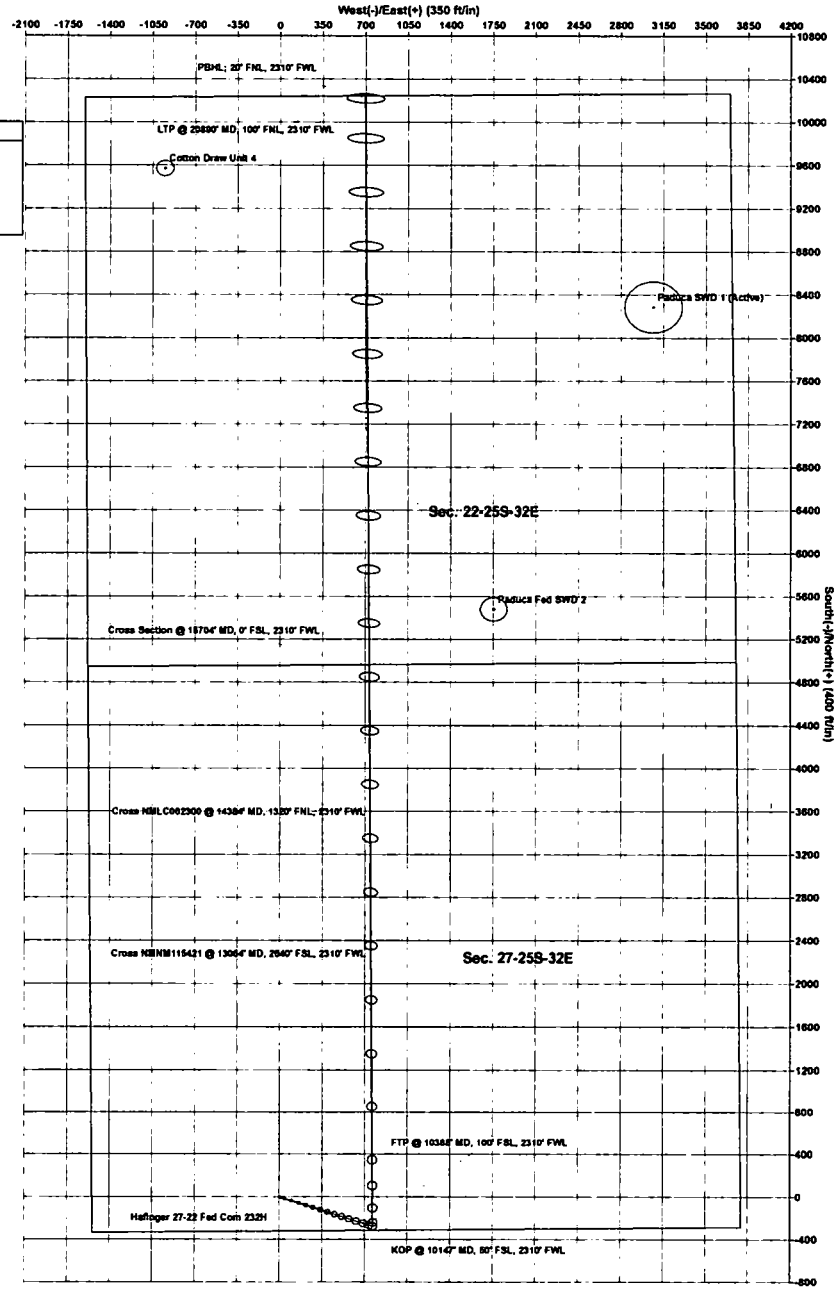
	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect	Annotation
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	2700.00	0.00	0.00	2700.00	0.00	0.00	0.00	0.00	
	3418.78	7.19	109.77	3416.78	-15.23	42.35	1.00	-12.31	
	9317.39	7.19	109.77	9289.17	-264.85	736.78	0.00	-214.18	
5	9796.48	0.00	0.00	9747.00	-275.00	765.00	1.50	-222.37	
6	10146.52	0.00	0.00	10097.04	-275.00	765.00	0.00	-222.37	KOP @ 10147' MD, 50' FSL, 2310' FWL
7	11046.52	90.00	350.62	10670.00	207.95	761.25	10.00	348.00	
8	20969.61	90.00	350.62	10670.00	10220.53	696.29	0.00	10244.52	PBHL; 20' FNL, 2310' FWL

devon



Azimuths to Grid North
True North: -0.35°
Magnetic North: 8.49°

Magnetic Field
Strength: 47712.8nT
Dip Angle: 59.91°
Date: 10/25/2018
Model: IGRF2015



WCDSC Permian NM
Hafinger 27-22 Fed Com 232H - Permit Plan 1

Lea County (NAD83 New Mexico East)
Sec 27-T25S-R32E
Your Ref:

Measured Depth (ft)	Incl.	Azim.	Vertical Depth (ft)	Northings (ft)	Eastings (ft)	Vertical Section (ft)	Dogleg Rate (°/100ft)
0	0	0	0	0	0	0	0
100	0	0	100	0	0	0	0
200	0	0	200	0	0	0	0
300	0	0	300	0	0	0	0
400	0	0	400	0	0	0	0
500	0	0	500	0	0	0	0
600	0	0	600	0	0	0	0
700	0	0	700	0	0	0	0
800	0	0	800	0	0	0	0
900	0	0	900	0	0	0	0
1000	0	0	1000	0	0	0	0
1100	0	0	1100	0	0	0	0
1200	0	0	1200	0	0	0	0
1300	0	0	1300	0	0	0	0
1400	0	0	1400	0	0	0	0
1500	0	0	1500	0	0	0	0
1600	0	0	1600	0	0	0	0
1700	0	0	1700	0	0	0	0
1800	0	0	1800	0	0	0	0
1900	0	0	1900	0	0	0	0
2000	0	0	2000	0	0	0	0
2100	0	0	2100	0	0	0	0
2200	0	0	2200	0	0	0	0
2300	0	0	2300	0	0	0	0
2400	0	0	2400	0	0	0	0
2500	0	0	2500	0	0	0	0
2600	0	0	2600	0	0	0	0
2700	0	0	2700	0	0	0	0
2800	1	109.772	2799.99	-0.3	0.82	-0.24	1
2900	2	109.772	2899.96	-1.18	3.28	-0.95	1
3000	3	109.772	2999.86	-2.66	7.39	-2.15	1
3100	4	109.772	3099.68	-4.72	13.13	-3.82	1

3200	5	109.772	3199.37	-7.38	20.52	-5.96	1
3300	6	109.772	3298.9	-10.62	29.54	-8.59	1
3400	7	109.772	3398.26	-14.45	40.19	-11.68	1
3418.63	7.186	109.772	3416.75	-15.23	42.35	-12.31	1
3500	7.186	109.772	3497.48	-18.67	51.93	-15.1	0
3600	7.186	109.772	3596.69	-22.9	63.71	-18.52	0
3700	7.186	109.772	3695.91	-27.13	75.48	-21.94	0
3800	7.186	109.772	3795.12	-31.36	87.25	-25.36	0
3900	7.186	109.772	3894.34	-35.6	99.02	-28.78	0
4000	7.186	109.772	3993.55	-39.83	110.79	-32.21	0
4100	7.186	109.772	4092.76	-44.06	122.57	-35.63	0
4200	7.186	109.772	4191.98	-48.29	134.34	-39.05	0
4300	7.186	109.772	4291.19	-52.52	146.11	-42.47	0
4400	7.186	109.772	4390.41	-56.76	157.88	-45.89	0
4500	7.186	109.772	4489.62	-60.99	169.65	-49.31	0
4600	7.186	109.772	4588.84	-65.22	181.43	-52.74	0
4700	7.186	109.772	4688.05	-69.45	193.2	-56.16	0
4800	7.186	109.772	4787.27	-73.68	204.97	-59.58	0
4900	7.186	109.772	4886.48	-77.91	216.74	-63	0
5000	7.186	109.772	4985.7	-82.15	228.52	-66.42	0
5100	7.186	109.772	5084.91	-86.38	240.29	-69.85	0
5200	7.186	109.772	5184.12	-90.61	252.06	-73.27	0
5300	7.186	109.772	5283.34	-94.84	263.83	-76.69	0
5400	7.186	109.772	5382.55	-99.07	275.6	-80.11	0
5500	7.186	109.772	5481.77	-103.31	287.38	-83.53	0
5600	7.186	109.772	5580.98	-107.54	299.15	-86.96	0
5700	7.186	109.772	5680.2	-111.77	310.92	-90.38	0
5800	7.186	109.772	5779.41	-116	322.69	-93.8	0
5900	7.186	109.772	5878.63	-120.23	334.46	-97.22	0
6000	7.186	109.772	5977.84	-124.46	346.24	-100.64	0
6100	7.186	109.772	6077.05	-128.7	358.01	-104.07	0
6200	7.186	109.772	6176.27	-132.93	369.78	-107.49	0
6300	7.186	109.772	6275.48	-137.16	381.55	-110.91	0
6400	7.186	109.772	6374.7	-141.39	393.33	-114.33	0
6500	7.186	109.772	6473.91	-145.62	405.1	-117.75	0
6600	7.186	109.772	6573.13	-149.85	416.87	-121.18	0
6700	7.186	109.772	6672.34	-154.09	428.64	-124.6	0
6800	7.186	109.772	6771.56	-158.32	440.41	-128.02	0
6900	7.186	109.772	6870.77	-162.55	452.19	-131.44	0
7000	7.186	109.772	6969.98	-166.78	463.96	-134.86	0
7100	7.186	109.772	7069.2	-171.01	475.73	-138.28	0
7200	7.186	109.772	7168.41	-175.25	487.5	-141.71	0
7300	7.186	109.772	7267.63	-179.48	499.27	-145.13	0
7400	7.186	109.772	7366.84	-183.71	511.05	-148.55	0
7500	7.186	109.772	7466.06	-187.94	522.82	-151.97	0
7600	7.186	109.772	7565.27	-192.17	534.59	-155.39	0
7700	7.186	109.772	7664.49	-196.4	546.36	-158.82	0

7800	7.186	109.772	7763.7	-200.64	558.13	-162.24	0
7900	7.186	109.772	7862.91	-204.87	569.91	-165.66	0
8000	7.186	109.772	7962.13	-209.1	581.68	-169.08	0
8100	7.186	109.772	8061.34	-213.33	593.45	-172.5	0
8200	7.186	109.772	8160.56	-217.56	605.22	-175.93	0
8300	7.186	109.772	8259.77	-221.8	617	-179.35	0
8400	7.186	109.772	8358.99	-226.03	628.77	-182.77	0
8500	7.186	109.772	8458.2	-230.26	640.54	-186.19	0
8600	7.186	109.772	8557.42	-234.49	652.31	-189.61	0
8700	7.186	109.772	8656.63	-238.72	664.08	-193.04	0
8800	7.186	109.772	8755.84	-242.95	675.86	-196.46	0
8900	7.186	109.772	8855.06	-247.19	687.63	-199.88	0
9000	7.186	109.772	8954.27	-251.42	699.4	-203.3	0
9100	7.186	109.772	9053.49	-255.65	711.17	-206.72	0
9200	7.186	109.772	9152.7	-259.88	722.94	-210.14	0
9300	7.186	109.772	9251.92	-264.11	734.72	-213.57	0
9317.39	7.186	109.772	9269.17	-264.85	736.76	-214.16	0
9400	5.947	109.772	9351.24	-268.05	745.65	-216.75	1.5
9500	4.447	109.772	9450.82	-271.11	754.18	-219.22	1.5
9600	2.947	109.772	9550.61	-273.29	760.25	-220.99	1.5
9700	1.447	109.772	9650.54	-274.59	763.85	-222.04	1.5
9796.48	0	0	9747	-275	765	-222.37	1.5
9800	0	0	9750.52	-275	765	-222.37	0
9900	0	0	9850.52	-275	765	-222.37	0
10000	0	0	9950.52	-275	765	-222.37	0
10100	0	0	10050.52	-275	765	-222.37	0
10146.52	0	0	10097.04	-275	765	-222.37	0
10200	5.348	359.625	10150.45	-272.51	764.98	-219.88	10
10300	15.348	359.625	10248.7	-254.57	764.87	-201.99	10
10400	25.348	359.625	10342.34	-219.84	764.64	-167.36	10
10500	35.348	359.625	10428.52	-169.38	764.31	-117.04	10
10600	45.348	359.625	10504.64	-104.72	763.89	-52.56	10
10700	55.348	359.625	10568.37	-27.82	763.38	24.13	10
10800	65.348	359.625	10617.78	58.97	762.81	110.68	10
10900	75.348	359.625	10651.37	153.02	762.2	204.48	10
11000	85.348	359.625	10668.11	251.48	761.55	302.66	10
11046.52	90	359.625	10670	297.95	761.25	349	10
11100	90	359.625	10670	351.43	760.9	402.33	0
11200	90	359.625	10670	451.43	760.24	502.05	0
11300	90	359.625	10670	551.42	759.59	601.78	0
11400	90	359.625	10670	651.42	758.94	701.5	0
11500	90	359.625	10670	751.42	758.28	801.22	0
11600	90	359.625	10670	851.42	757.63	900.94	0
11700	90	359.625	10670	951.42	756.97	1000.66	0
11800	90	359.625	10670	1051.41	756.32	1100.39	0
11900	90	359.625	10670	1151.41	755.66	1200.11	0
12000	90	359.625	10670	1251.41	755.01	1299.83	0

12100	90	359.625	10670	1351.41	754.35	1399.55	0
12200	90	359.625	10670	1451.41	753.7	1499.28	0
12300	90	359.625	10670	1551.4	753.04	1599	0
12400	90	359.625	10670	1651.4	752.39	1698.72	0
12500	90	359.625	10670	1751.4	751.73	1798.44	0
12600	90	359.625	10670	1851.4	751.08	1898.16	0
12700	90	359.625	10670	1951.39	750.43	1997.89	0
12800	90	359.625	10670	2051.39	749.77	2097.61	0
12900	90	359.625	10670	2151.39	749.12	2197.33	0
13000	90	359.625	10670	2251.39	748.46	2297.05	0
13100	90	359.625	10670	2351.39	747.81	2396.77	0
13200	90	359.625	10670	2451.38	747.15	2496.5	0
13300	90	359.625	10670	2551.38	746.5	2596.22	0
13400	90	359.625	10670	2651.38	745.84	2695.94	0
13500	90	359.625	10670	2751.38	745.19	2795.66	0
13600	90	359.625	10670	2851.38	744.53	2895.39	0
13700	90	359.625	10670	2951.37	743.88	2995.11	0
13800	90	359.625	10670	3051.37	743.22	3094.83	0
13900	90	359.625	10670	3151.37	742.57	3194.55	0
14000	90	359.625	10670	3251.37	741.92	3294.27	0
14100	90	359.625	10670	3351.36	741.26	3394	0
14200	90	359.625	10670	3451.36	740.61	3493.72	0
14300	90	359.625	10670	3551.36	739.95	3593.44	0
14400	90	359.625	10670	3651.36	739.3	3693.16	0
14500	90	359.625	10670	3751.36	738.64	3792.88	0
14600	90	359.625	10670	3851.35	737.99	3892.61	0
14700	90	359.625	10670	3951.35	737.33	3992.33	0
14800	90	359.625	10670	4051.35	736.68	4092.05	0
14900	90	359.625	10670	4151.35	736.02	4191.77	0
15000	90	359.625	10670	4251.35	735.37	4291.5	0
15100	90	359.625	10670	4351.34	734.71	4391.22	0
15200	90	359.625	10670	4451.34	734.06	4490.94	0
15300	90	359.625	10670	4551.34	733.41	4590.66	0
15400	90	359.625	10670	4651.34	732.75	4690.38	0
15500	90	359.625	10670	4751.33	732.1	4790.11	0
15600	90	359.625	10670	4851.33	731.44	4889.83	0
15700	90	359.625	10670	4951.33	730.79	4989.55	0
15800	90	359.625	10670	5051.33	730.13	5089.27	0
15900	90	359.625	10670	5151.33	729.48	5188.99	0
16000	90	359.625	10670	5251.32	728.82	5288.72	0
16100	90	359.625	10670	5351.32	728.17	5388.44	0
16200	90	359.625	10670	5451.32	727.51	5488.16	0
16300	90	359.625	10670	5551.32	726.86	5587.88	0
16400	90	359.625	10670	5651.32	726.2	5687.6	0
16500	90	359.625	10670	5751.31	725.55	5787.33	0
16600	90	359.625	10670	5851.31	724.9	5887.05	0
16700	90	359.625	10670	5951.31	724.24	5986.77	0

16800	90	359.625	10670	6051.31	723.59	6086.49	0
16900	90	359.625	10670	6151.3	722.93	6186.22	0
17000	90	359.625	10670	6251.3	722.28	6285.94	0
17100	90	359.625	10670	6351.3	721.62	6385.66	0
17200	90	359.625	10670	6451.3	720.97	6485.38	0
17300	90	359.625	10670	6551.3	720.31	6585.1	0
17400	90	359.625	10670	6651.29	719.66	6684.83	0
17500	90	359.625	10670	6751.29	719	6784.55	0
17600	90	359.625	10670	6851.29	718.35	6884.27	0
17700	90	359.625	10670	6951.29	717.69	6983.99	0
17800	90	359.625	10670	7051.29	717.04	7083.71	0
17900	90	359.625	10670	7151.28	716.39	7183.44	0
18000	90	359.625	10670	7251.28	715.73	7283.16	0
18100	90	359.625	10670	7351.28	715.08	7382.88	0
18200	90	359.625	10670	7451.28	714.42	7482.6	0
18300	90	359.625	10670	7551.27	713.77	7582.33	0
18400	90	359.625	10670	7651.27	713.11	7682.05	0
18500	90	359.625	10670	7751.27	712.46	7781.77	0
18600	90	359.625	10670	7851.27	711.8	7881.49	0
18700	90	359.625	10670	7951.27	711.15	7981.21	0
18800	90	359.625	10670	8051.26	710.49	8080.94	0
18900	90	359.625	10670	8151.26	709.84	8180.66	0
19000	90	359.625	10670	8251.26	709.18	8280.38	0
19100	90	359.625	10670	8351.26	708.53	8380.1	0
19200	90	359.625	10670	8451.26	707.88	8479.82	0
19300	90	359.625	10670	8551.25	707.22	8579.55	0
19400	90	359.625	10670	8651.25	706.57	8679.27	0
19500	90	359.625	10670	8751.25	705.91	8778.99	0
19600	90	359.625	10670	8851.25	705.26	8878.71	0
19700	90	359.625	10670	8951.24	704.6	8978.44	0
19800	90	359.625	10670	9051.24	703.95	9078.16	0
19900	90	359.625	10670	9151.24	703.29	9177.88	0
20000	90	359.625	10670	9251.24	702.64	9277.6	0
20100	90	359.625	10670	9351.24	701.98	9377.32	0
20200	90	359.625	10670	9451.23	701.33	9477.05	0
20300	90	359.625	10670	9551.23	700.67	9576.77	0
20400	90	359.625	10670	9651.23	700.02	9676.49	0
20500	90	359.625	10670	9751.23	699.37	9776.21	0
20600	90	359.625	10670	9851.23	698.71	9875.93	0
20700	90	359.625	10670	9951.22	698.06	9975.66	0
20800	90	359.625	10670	10051.22	697.4	10075.38	0
20900	90	359.625	10670	10151.22	696.75	10175.1	0
20969.61	90	359.625	10670	10220.83	696.29	10244.52	0

All data are in feet unless otherwise stated. Directions and coordinates are relative to Grid North.
Vertical depths are relative to RKB. Northings and Eastings are relative to Well.

The Dogleg Severity is in Degrees per 100 feet.
Vertical Section is from Slot and calculated along an Azimuth of 3.897° (Grid).

Coordinate System is North American Datum 1983 US State Plane 1983, New Mexico Eastern Zone.
Central meridian is -104.333°.
Grid Convergence at Surface is 0.354°.

Based upon Minimum Curvature type calculations, at a Measured Depth of 20969.61ft.,
the Bottom Hole Displacement is 10244.52ft., in the Direction of 3.897° (Grid).

WCDSC Permian NM

Lea County (NAD83 New Mexico East)
Sec 27-T25S-R32E
Hafinger 27-22 Fed Com 232H

Wellbore #1
Permit Plan 1

Anticollision Report

31 October, 2018

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Reference	Permit Plan 1		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD Interval 50.00ft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 1,500.00 ft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 10/31/2018

From (ft)	To (ft)	Survey (Wellbore)	Tool Name	Description
0.00	20,969.61	Permit Plan 1 (Wellbore #1)	MWD+HDGM	OWSG MWD + HDGM

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (ft)	Offset Measured Depth (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Separation Factor	Warning
Sec 22-T25S-R32E						
Cotton Draw Unit 4 - Wellbore #1 - Wellbore #1						Out of range
Paduca Fed SWD 2 - Wellbore #1 - Wellbore #1						Out of range
Paduca SWD 1 (Active) - Wellbore #1 - Wellbore #1						Out of range
Sec 27-T25S-R32E						
Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Pla	2,700.00	2,700.50	30.01	11.07	1.585	Minor Risk, CC
Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Pla	2,750.00	2,750.50	30.22	10.93	1.566	Minor Risk, ES, SF

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
0.00	0.00	0.50	0.50	0.50	0.50	-90.36	-0.19	-30.01	30.01				
50.00	50.00	50.50	50.50	0.50	0.50	-90.36	-0.19	-30.01	30.01	29.00	1.01	29.814	
100.00	100.00	100.50	100.50	0.52	0.52	-90.36	-0.19	-30.01	30.01	28.97	1.04	28.968	
150.00	150.00	150.50	150.50	0.59	0.59	-90.36	-0.19	-30.01	30.01	28.83	1.18	25.402	
200.00	200.00	200.50	200.50	0.70	0.70	-90.36	-0.19	-30.01	30.01	28.61	1.41	21.353	
250.00	250.00	250.50	250.50	0.84	0.84	-90.36	-0.19	-30.01	30.01	28.33	1.68	17.897	
300.00	300.00	300.50	300.50	0.99	0.99	-90.36	-0.19	-30.01	30.01	28.03	1.98	15.186	
350.00	350.00	350.50	350.50	1.15	1.15	-90.36	-0.19	-30.01	30.01	27.72	2.29	13.090	
400.00	400.00	400.50	400.50	1.31	1.31	-90.36	-0.19	-30.01	30.01	27.39	2.62	11.455	
450.00	450.00	450.50	450.50	1.48	1.48	-90.36	-0.19	-30.01	30.01	27.06	2.95	10.158	
500.00	500.00	500.50	500.50	1.65	1.65	-90.36	-0.19	-30.01	30.01	26.72	3.29	9.111	
550.00	550.00	550.50	550.50	1.82	1.82	-90.36	-0.19	-30.01	30.01	26.37	3.64	8.251	
600.00	600.00	600.50	600.50	1.99	1.99	-90.36	-0.19	-30.01	30.01	26.03	3.98	7.535	
650.00	650.00	650.50	650.50	2.16	2.17	-90.36	-0.19	-30.01	30.01	25.68	4.33	6.929	
700.00	700.00	700.50	700.50	2.34	2.34	-90.36	-0.19	-30.01	30.01	25.33	4.68	6.412	
750.00	750.00	750.50	750.50	2.51	2.52	-90.36	-0.19	-30.01	30.01	24.98	5.03	5.965	
800.00	800.00	800.50	800.50	2.69	2.69	-90.36	-0.19	-30.01	30.01	24.63	5.38	5.575	
850.00	850.00	850.50	850.50	2.87	2.87	-90.36	-0.19	-30.01	30.01	24.28	5.74	5.232	
900.00	900.00	900.50	900.50	3.04	3.05	-90.36	-0.19	-30.01	30.01	23.92	6.09	4.929	Alert
950.00	950.00	950.50	950.50	3.22	3.22	-90.36	-0.19	-30.01	30.01	23.57	6.44	4.658	Alert
1,000.00	1,000.00	1,000.50	1,000.50	3.40	3.40	-90.36	-0.19	-30.01	30.01	23.21	6.80	4.415	Alert

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
1,050.00	1,050.00	1,050.50	1,050.50	3.58	3.58	-90.36	-0.19	-30.01	30.01	22.86	7.15	4.196	Alert
1,100.00	1,100.00	1,100.50	1,100.50	3.75	3.75	-90.36	-0.19	-30.01	30.01	22.50	7.51	3.998	Alert
1,150.00	1,150.00	1,150.50	1,150.50	3.93	3.93	-90.36	-0.19	-30.01	30.01	22.15	7.86	3.817	Alert
1,200.00	1,200.00	1,200.50	1,200.50	4.11	4.11	-90.36	-0.19	-30.01	30.01	21.79	8.22	3.652	Alert
1,250.00	1,250.00	1,250.50	1,250.50	4.29	4.29	-90.36	-0.19	-30.01	30.01	21.44	8.57	3.500	Alert
1,300.00	1,300.00	1,300.50	1,300.50	4.48	4.47	-90.36	-0.19	-30.01	30.01	21.08	8.93	3.361	Alert
1,350.00	1,350.00	1,350.50	1,350.50	4.64	4.64	-90.36	-0.19	-30.01	30.01	20.72	9.29	3.232	Alert
1,400.00	1,400.00	1,400.50	1,400.50	4.82	4.82	-90.36	-0.19	-30.01	30.01	20.37	9.64	3.112	Alert
1,450.00	1,450.00	1,450.50	1,450.50	5.00	5.00	-90.36	-0.19	-30.01	30.01	20.01	10.00	3.001	Alert
1,500.00	1,500.00	1,500.50	1,500.50	5.18	5.18	-90.36	-0.19	-30.01	30.01	19.65	10.36	2.898	Alert
1,550.00	1,550.00	1,550.50	1,550.50	5.36	5.36	-90.36	-0.19	-30.01	30.01	19.30	10.71	2.801	Alert
1,600.00	1,600.00	1,600.50	1,600.50	5.53	5.54	-90.36	-0.19	-30.01	30.01	18.94	11.07	2.711	Alert
1,650.00	1,650.00	1,650.50	1,650.50	5.71	5.71	-90.36	-0.19	-30.01	30.01	18.58	11.43	2.626	Alert
1,700.00	1,700.00	1,700.50	1,700.50	5.89	5.89	-90.36	-0.19	-30.01	30.01	18.23	11.78	2.547	Alert
1,750.00	1,750.00	1,750.50	1,750.50	6.07	6.07	-90.36	-0.19	-30.01	30.01	17.87	12.14	2.472	Minor Risk
1,800.00	1,800.00	1,800.50	1,800.50	6.25	6.25	-90.36	-0.19	-30.01	30.01	17.51	12.50	2.401	Minor Risk
1,850.00	1,850.00	1,850.50	1,850.50	6.43	6.43	-90.36	-0.19	-30.01	30.01	17.15	12.86	2.334	Minor Risk
1,900.00	1,900.00	1,900.50	1,900.50	6.61	6.61	-90.36	-0.19	-30.01	30.01	16.80	13.21	2.271	Minor Risk
1,950.00	1,950.00	1,950.50	1,950.50	6.78	6.79	-90.36	-0.19	-30.01	30.01	16.44	13.57	2.211	Minor Risk
2,000.00	2,000.00	2,000.50	2,000.50	6.96	6.97	-90.36	-0.19	-30.01	30.01	16.08	13.93	2.155	Minor Risk
2,050.00	2,050.00	2,050.50	2,050.50	7.14	7.14	-90.36	-0.19	-30.01	30.01	15.72	14.29	2.101	Minor Risk
2,100.00	2,100.00	2,100.50	2,100.50	7.32	7.32	-90.36	-0.19	-30.01	30.01	15.37	14.64	2.049	Minor Risk
2,150.00	2,150.00	2,150.50	2,150.50	7.50	7.50	-90.36	-0.19	-30.01	30.01	15.01	15.00	2.001	Minor Risk
2,200.00	2,200.00	2,200.50	2,200.50	7.68	7.68	-90.36	-0.19	-30.01	30.01	14.65	15.36	1.954	Minor Risk
2,250.00	2,250.00	2,250.50	2,250.50	7.86	7.86	-90.36	-0.19	-30.01	30.01	14.29	15.72	1.909	Minor Risk
2,300.00	2,300.00	2,300.50	2,300.50	8.04	8.04	-90.36	-0.19	-30.01	30.01	13.94	16.07	1.867	Minor Risk
2,350.00	2,350.00	2,350.50	2,350.50	8.22	8.22	-90.36	-0.19	-30.01	30.01	13.58	16.43	1.826	Minor Risk
2,400.00	2,400.00	2,400.50	2,400.50	8.39	8.40	-90.36	-0.19	-30.01	30.01	13.22	16.79	1.787	Minor Risk
2,450.00	2,450.00	2,450.50	2,450.50	8.57	8.57	-90.36	-0.19	-30.01	30.01	12.86	17.15	1.750	Minor Risk
2,500.00	2,500.00	2,500.50	2,500.50	8.75	8.75	-90.36	-0.19	-30.01	30.01	12.50	17.51	1.714	Minor Risk
2,550.00	2,550.00	2,550.50	2,550.50	8.93	8.93	-90.36	-0.19	-30.01	30.01	12.15	17.86	1.680	Minor Risk
2,600.00	2,600.00	2,600.50	2,600.50	9.11	9.11	-90.36	-0.19	-30.01	30.01	11.79	18.22	1.647	Minor Risk
2,650.00	2,650.00	2,650.50	2,650.50	9.29	9.29	-90.36	-0.19	-30.01	30.01	11.43	18.58	1.615	Minor Risk
2,700.00	2,700.00	2,700.50	2,700.50	9.47	9.47	-90.36	-0.19	-30.01	30.01	11.07	18.94	1.585	Minor Risk, CC
2,750.00	2,750.00	2,750.50	2,750.50	9.64	9.65	160.01	-0.19	-30.01	30.22	10.93	19.29	1.568	Minor Risk, ES, SF
2,800.00	2,799.99	2,800.49	2,800.49	9.81	9.83	160.42	-0.19	-30.01	30.83	11.19	19.64	1.570	Minor Risk
2,850.00	2,849.98	2,850.48	2,850.48	9.98	10.01	161.07	-0.19	-30.01	31.86	11.87	19.99	1.594	Minor Risk
2,900.00	2,899.96	2,900.46	2,900.46	10.15	10.19	161.92	-0.19	-30.01	33.31	12.98	20.33	1.638	Minor Risk
2,950.00	2,949.92	2,950.42	2,950.42	10.32	10.36	162.91	-0.19	-30.01	35.18	14.50	20.68	1.701	Minor Risk
3,000.00	2,999.86	3,000.36	3,000.36	10.49	10.54	163.98	-0.19	-30.01	37.48	16.45	21.03	1.782	Minor Risk
3,050.00	3,049.78	3,050.28	3,050.28	10.66	10.72	165.09	-0.19	-30.01	40.21	18.84	21.38	1.881	Minor Risk
3,100.00	3,099.68	3,100.18	3,100.18	10.83	10.90	166.19	-0.19	-30.01	43.38	21.66	21.72	1.997	Minor Risk
3,150.00	3,149.54	3,150.04	3,150.04	11.00	11.08	167.26	-0.19	-30.01	46.99	24.92	22.07	2.129	Minor Risk
3,200.00	3,199.37	3,200.13	3,199.87	11.17	11.26	168.28	-0.19	-30.01	51.04	28.62	22.42	2.278	Minor Risk
3,250.00	3,249.16	3,249.66	3,249.66	11.34	11.44	169.23	-0.19	-30.01	55.52	32.76	22.77	2.439	Minor Risk
3,300.00	3,298.90	3,300.60	3,299.40	11.51	11.62	170.11	-0.19	-30.01	60.45	37.33	23.12	2.615	Alert
3,350.00	3,348.61	3,349.11	3,349.11	11.69	11.79	170.91	-0.19	-30.01	65.82	42.36	23.46	2.805	Alert
3,400.00	3,398.26	3,401.24	3,398.76	11.86	11.98	171.65	-0.19	-30.01	71.63	47.81	23.82	3.007	Alert
3,450.00	3,447.87	3,448.37	3,448.37	12.04	12.15	172.31	-0.19	-30.01	77.80	53.64	24.16	3.220	Alert
3,500.00	3,497.48	3,502.02	3,497.98	12.22	12.34	172.88	-0.19	-30.01	84.00	59.48	24.52	3.426	Alert
3,550.00	3,547.09	3,547.59	3,547.59	12.39	12.50	173.37	-0.19	-30.01	90.21	65.36	24.85	3.630	Alert
3,600.00	3,596.69	3,602.81	3,597.19	12.57	12.70	173.80	-0.19	-30.01	96.43	71.20	25.22	3.823	Alert

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
3,650.00	3,646.30	3,646.80	3,646.80	12.75	12.88	174.18	-0.19	-30.01	102.65	77.10	25.55	4.017	Alert
3,700.00	3,695.91	3,703.59	3,696.41	12.93	13.06	174.51	-0.19	-30.01	108.87	82.95	25.93	4.199	Alert
3,750.00	3,745.51	3,748.01	3,746.01	13.11	13.21	174.81	-0.19	-30.01	115.10	88.85	26.25	4.385	Alert
3,800.00	3,795.12	3,804.38	3,795.62	13.29	13.42	175.08	-0.19	-30.01	121.33	94.70	26.63	4.556	Alert
3,850.00	3,844.73	3,845.23	3,845.23	13.47	13.57	175.32	-0.19	-30.01	127.57	100.61	26.95	4.733	Alert
3,900.00	3,894.34	3,905.16	3,894.84	13.65	13.78	175.54	-0.19	-30.01	133.80	106.46	27.34	4.894	Alert
3,950.00	3,943.94	3,944.44	3,944.44	13.83	13.92	175.74	-0.19	-30.01	140.04	112.39	27.65	5.064	
4,000.00	3,993.55	3,994.05	3,994.05	14.01	14.10	175.92	-0.19	-30.01	146.28	118.27	28.00	5.223	
4,050.00	4,043.16	4,042.63	4,042.63	14.20	14.27	176.03	-0.28	-30.19	152.66	124.32	28.34	5.388	
4,100.00	4,092.76	4,090.97	4,090.97	14.38	14.44	176.01	-0.61	-30.81	159.43	130.75	28.68	5.559	
4,150.00	4,142.37	4,139.21	4,139.19	14.56	14.60	175.86	-1.17	-31.88	166.57	137.56	29.01	5.742	
4,200.00	4,191.98	4,187.33	4,187.28	14.75	14.76	175.62	-1.97	-33.40	174.10	144.76	29.33	5.935	
4,250.00	4,241.59	4,235.33	4,235.22	14.93	14.92	175.28	-2.99	-35.36	182.00	152.34	29.66	6.137	
4,300.00	4,291.19	4,283.18	4,283.00	15.12	15.08	174.87	-4.25	-37.76	190.30	160.32	29.98	6.347	
4,350.00	4,340.80	4,330.89	4,330.61	15.30	15.24	174.40	-5.73	-40.59	198.98	168.68	30.30	6.567	
4,400.00	4,390.41	4,378.44	4,378.01	15.49	15.40	173.87	-7.44	-43.84	208.07	177.45	30.62	6.796	
4,450.00	4,440.02	4,425.83	4,425.22	15.67	15.56	173.30	-9.36	-47.52	217.55	186.62	30.93	7.033	
4,500.00	4,489.62	4,473.04	4,472.20	15.86	15.72	172.70	-11.51	-51.61	227.44	196.19	31.25	7.279	
4,550.00	4,539.23	4,520.36	4,519.24	16.05	15.88	172.08	-13.88	-56.14	237.74	206.18	31.56	7.533	
4,600.00	4,588.84	4,569.19	4,567.76	16.23	16.05	171.45	-16.41	-60.97	248.20	216.30	31.90	7.781	
4,650.00	4,638.44	4,618.01	4,616.28	16.42	16.21	170.88	-18.94	-65.80	258.69	226.45	32.23	8.025	
4,700.00	4,688.05	4,666.83	4,664.80	16.61	16.38	170.36	-21.46	-70.62	269.20	236.63	32.57	8.264	
4,750.00	4,737.66	4,715.66	4,713.32	16.80	16.55	169.87	-23.99	-75.45	279.73	246.82	32.91	8.499	
4,800.00	4,787.27	4,764.48	4,761.84	16.98	16.72	169.42	-26.52	-80.28	290.28	257.03	33.25	8.730	
4,850.00	4,836.87	4,813.31	4,810.36	17.17	16.89	169.00	-29.05	-85.11	300.85	267.25	33.59	8.956	
4,900.00	4,886.48	4,862.13	4,858.88	17.36	17.06	168.60	-31.58	-89.93	311.43	277.49	33.93	9.177	
4,950.00	4,936.09	4,910.96	4,907.40	17.55	17.23	168.24	-34.11	-94.76	322.02	287.74	34.28	9.395	
5,000.00	4,985.70	4,959.78	4,955.92	17.74	17.40	167.89	-36.64	-99.59	332.63	298.01	34.62	9.608	
5,050.00	5,035.30	5,008.61	5,004.44	17.93	17.57	167.57	-39.16	-104.42	343.24	308.28	34.96	9.817	
5,100.00	5,084.91	5,057.43	5,052.96	18.12	17.74	167.27	-41.69	-109.24	353.87	318.56	35.31	10.023	
5,150.00	5,134.52	5,106.26	5,101.48	18.31	17.91	166.99	-44.22	-114.07	364.50	328.85	35.65	10.224	
5,200.00	5,184.12	5,155.08	5,150.00	18.50	18.08	166.72	-46.75	-118.90	375.14	339.15	35.99	10.422	
5,250.00	5,233.73	5,203.91	5,198.52	18.69	18.25	166.46	-49.28	-123.73	385.79	349.45	36.34	10.618	
5,300.00	5,283.34	5,252.73	5,247.04	18.88	18.43	166.22	-51.81	-128.55	396.45	359.77	36.69	10.807	
5,350.00	5,332.95	5,301.56	5,295.56	19.07	18.60	166.00	-54.34	-133.38	407.11	370.08	37.03	10.994	
5,400.00	5,382.55	5,350.38	5,344.08	19.26	18.77	165.78	-56.87	-138.21	417.78	380.40	37.38	11.177	
5,450.00	5,432.16	5,400.79	5,392.60	19.45	18.95	165.57	-59.39	-143.04	428.46	390.73	37.73	11.358	
5,500.00	5,481.77	5,448.03	5,441.12	19.64	19.12	165.38	-61.92	-147.86	439.14	401.06	38.07	11.535	
5,550.00	5,531.37	5,503.14	5,489.64	19.83	19.32	165.19	-64.45	-152.69	449.82	411.38	38.44	11.702	
5,600.00	5,580.98	5,545.66	5,538.16	20.03	19.47	165.01	-66.98	-157.52	460.51	421.74	38.77	11.879	
5,650.00	5,630.59	5,605.49	5,586.68	20.22	19.68	164.85	-69.51	-162.35	471.20	432.05	39.15	12.035	
5,700.00	5,680.20	5,643.33	5,635.20	20.41	19.82	164.68	-72.04	-167.18	481.90	442.43	39.46	12.211	
5,750.00	5,729.80	5,707.84	5,683.72	20.60	20.05	164.53	-74.57	-172.00	492.60	452.73	39.87	12.356	
5,800.00	5,779.41	5,740.98	5,732.24	20.79	20.17	164.38	-77.10	-176.83	503.30	463.14	40.16	12.532	
5,850.00	5,829.02	5,789.81	5,780.76	20.99	20.35	164.24	-79.62	-181.66	514.00	473.49	40.51	12.688	
5,900.00	5,878.63	5,838.63	5,829.28	21.18	20.53	164.10	-82.15	-186.49	524.71	483.85	40.86	12.841	
5,950.00	5,928.23	5,887.46	5,877.80	21.37	20.70	163.97	-84.68	-191.31	535.42	494.21	41.21	12.992	
6,000.00	5,977.84	5,936.28	5,926.32	21.56	20.88	163.85	-87.21	-196.14	546.14	504.58	41.56	13.140	
6,050.00	6,027.45	5,985.11	5,974.84	21.76	21.06	163.72	-89.74	-200.97	556.85	514.94	41.91	13.288	
6,100.00	6,077.05	6,033.93	6,023.36	21.95	21.23	163.61	-92.27	-205.80	567.57	525.31	42.26	13.429	
6,150.00	6,126.66	6,082.76	6,071.88	22.14	21.41	163.50	-94.80	-210.62	578.29	535.68	42.62	13.570	
6,200.00	6,176.27	6,131.58	6,120.40	22.33	21.59	163.39	-97.33	-215.45	589.02	546.05	42.97	13.708	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
6,250.00	6,225.88	6,180.40	6,168.92	22.53	21.77	163.28	-99.85	-220.28	599.74	556.42	43.32	13.844	
6,300.00	6,275.48	6,229.23	6,217.43	22.72	21.95	163.18	-102.38	-225.11	610.47	566.80	43.67	13.978	
6,350.00	6,325.09	6,278.05	6,265.95	22.91	22.12	163.09	-104.91	-229.93	621.20	577.17	44.02	14.110	
6,400.00	6,374.70	6,326.88	6,314.47	23.11	22.30	162.99	-107.44	-234.76	631.93	587.55	44.38	14.240	
6,450.00	6,424.30	6,375.70	6,362.99	23.30	22.48	162.90	-109.97	-239.59	642.66	597.93	44.73	14.367	
6,500.00	6,473.91	6,424.53	6,411.51	23.50	22.66	162.82	-112.50	-244.42	653.39	608.31	45.08	14.493	
6,550.00	6,523.52	6,473.35	6,460.03	23.69	22.84	162.73	-115.03	-249.24	664.13	618.69	45.44	14.616	
6,600.00	6,573.13	6,522.18	6,508.55	23.88	23.02	162.65	-117.56	-254.07	674.86	629.07	45.79	14.738	
6,650.00	6,622.73	6,571.00	6,557.07	24.08	23.20	162.57	-120.08	-258.90	685.60	639.45	46.14	14.858	
6,700.00	6,672.34	6,619.83	6,605.59	24.27	23.38	162.49	-122.61	-263.73	696.34	649.84	46.50	14.975	
6,750.00	6,721.95	6,668.65	6,654.11	24.47	23.56	162.42	-125.14	-268.55	707.08	660.22	46.85	15.091	
6,800.00	6,771.56	6,717.48	6,702.63	24.66	23.74	162.34	-127.67	-273.38	717.82	670.61	47.21	15.205	
6,850.00	6,821.16	6,766.30	6,751.15	24.85	23.92	162.27	-130.20	-278.21	728.56	681.00	47.56	15.318	
6,900.00	6,870.77	6,815.13	6,799.67	25.05	24.10	162.21	-132.73	-283.04	739.30	691.38	47.92	15.429	
6,950.00	6,920.38	6,863.95	6,848.19	25.24	24.28	162.14	-135.26	-287.86	750.05	701.77	48.27	15.538	
7,000.00	6,969.98	6,912.78	6,896.71	25.44	24.47	162.08	-137.79	-292.69	760.79	712.16	48.63	15.645	
7,050.00	7,019.59	6,961.60	6,945.23	25.63	24.65	162.01	-140.31	-297.52	771.54	722.55	48.98	15.751	
7,100.00	7,069.20	7,010.43	6,993.75	25.83	24.83	161.95	-142.84	-302.35	782.28	732.94	49.34	15.855	
7,150.00	7,118.81	7,059.25	7,042.27	26.02	25.01	161.89	-145.37	-307.17	793.03	743.33	49.70	15.958	
7,200.00	7,168.41	7,108.08	7,090.79	26.22	25.19	161.83	-147.90	-312.00	803.78	753.73	50.05	16.059	
7,250.00	7,218.02	7,156.90	7,139.31	26.41	25.37	161.78	-150.43	-316.83	814.53	764.12	50.41	16.159	
7,300.00	7,267.63	7,205.73	7,187.83	26.61	25.55	161.72	-152.96	-321.66	825.28	774.51	50.76	16.257	
7,350.00	7,317.23	7,254.55	7,236.35	26.80	25.74	161.67	-155.49	-326.48	836.03	784.91	51.12	16.354	
7,400.00	7,366.84	7,303.38	7,284.87	27.00	25.92	161.62	-158.02	-331.31	846.78	795.30	51.48	16.450	
7,450.00	7,416.45	7,352.20	7,333.39	27.19	26.10	161.57	-160.54	-336.14	857.53	805.69	51.83	16.544	
7,500.00	7,466.06	7,401.03	7,381.91	27.39	26.28	161.52	-163.07	-340.97	868.28	816.09	52.19	16.637	
7,550.00	7,515.66	7,449.85	7,430.43	27.58	26.47	161.47	-165.60	-345.80	879.03	826.48	52.55	16.728	
7,600.00	7,565.27	7,501.32	7,478.95	27.78	26.66	161.42	-168.13	-350.62	889.79	836.87	52.92	16.815	
7,650.00	7,614.88	7,547.50	7,527.47	27.98	26.83	161.38	-170.66	-355.45	900.54	847.28	53.26	16.907	
7,700.00	7,664.49	7,603.68	7,575.99	28.17	27.04	161.33	-173.19	-360.28	911.29	857.65	53.65	16.987	
7,750.00	7,714.09	7,645.15	7,624.51	28.37	27.20	161.29	-175.72	-365.11	922.05	868.07	53.98	17.082	
7,800.00	7,763.70	7,706.03	7,673.03	28.56	27.43	161.25	-178.24	-369.93	932.80	878.42	54.38	17.153	
7,850.00	7,813.31	7,742.80	7,721.55	28.76	27.58	161.20	-180.77	-374.76	943.56	888.87	54.69	17.251	
7,900.00	7,862.91	7,808.38	7,770.07	28.95	27.81	161.16	-183.30	-379.59	954.32	899.20	55.11	17.316	
7,950.00	7,912.52	7,840.45	7,818.59	29.15	27.93	161.12	-185.83	-384.42	965.07	909.66	55.41	17.417	
8,000.00	7,962.13	7,889.27	7,867.11	29.35	28.12	161.08	-188.36	-389.24	975.83	920.06	55.77	17.498	
8,050.00	8,011.74	7,938.10	7,915.63	29.54	28.30	161.05	-190.89	-394.07	986.59	930.46	56.13	17.577	
8,100.00	8,061.34	7,986.92	7,964.15	29.74	28.48	161.01	-193.42	-398.90	997.35	940.86	56.49	17.656	
8,150.00	8,110.95	8,035.75	8,012.67	29.94	28.67	160.97	-195.95	-403.73	1,008.10	951.26	56.85	17.734	
8,200.00	8,160.56	8,084.57	8,061.19	30.13	28.85	160.94	-198.47	-408.55	1,018.86	961.66	57.20	17.811	
8,250.00	8,210.17	8,133.40	8,109.70	30.33	29.03	160.90	-201.00	-413.38	1,029.62	972.06	57.56	17.887	
8,300.00	8,259.77	8,182.22	8,158.22	30.52	29.22	160.87	-203.53	-418.21	1,040.38	982.46	57.92	17.962	
8,350.00	8,309.38	8,231.05	8,206.74	30.72	29.40	160.83	-206.06	-423.04	1,051.14	992.86	58.28	18.035	
8,400.00	8,358.99	8,279.87	8,255.26	30.92	29.59	160.80	-208.59	-427.86	1,061.90	1,003.26	58.64	18.108	
8,450.00	8,408.59	8,328.70	8,303.78	31.11	29.77	160.77	-211.12	-432.69	1,072.66	1,013.66	59.00	18.180	
8,500.00	8,458.20	8,377.52	8,352.30	31.31	29.96	160.74	-213.65	-437.52	1,083.42	1,024.06	59.36	18.252	
8,550.00	8,507.81	8,426.35	8,400.82	31.51	30.14	160.71	-216.18	-442.35	1,094.18	1,034.46	59.72	18.322	
8,600.00	8,557.42	8,475.17	8,449.34	31.70	30.33	160.68	-218.70	-447.17	1,104.95	1,044.87	60.08	18.391	
8,650.00	8,607.02	8,524.00	8,497.86	31.90	30.51	160.65	-221.23	-452.00	1,115.71	1,055.27	60.44	18.460	
8,700.00	8,656.63	8,572.82	8,546.38	32.10	30.70	160.62	-223.76	-456.83	1,126.47	1,065.67	60.80	18.527	
8,750.00	8,706.24	8,621.65	8,594.90	32.29	30.88	160.59	-226.29	-461.66	1,137.23	1,076.07	61.16	18.594	
8,800.00	8,755.84	8,670.47	8,643.42	32.49	31.07	160.56	-228.82	-466.48	1,148.00	1,086.47	61.52	18.660	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
8,850.00	8,805.45	8,719.30	8,691.94	32.69	31.25	160.53	-231.35	-471.31	1,158.76	1,096.88	61.88	18.725	
8,900.00	8,855.06	8,768.12	8,740.46	32.88	31.44	160.50	-233.88	-476.14	1,169.52	1,107.28	62.24	18.790	
8,950.00	8,904.67	8,816.95	8,788.98	33.08	31.62	160.48	-236.41	-480.97	1,180.28	1,117.68	62.60	18.854	
9,000.00	8,954.27	8,865.77	8,837.50	33.28	31.81	160.45	-238.93	-485.79	1,191.05	1,128.08	62.96	18.917	
9,050.00	9,003.88	8,914.60	8,886.02	33.47	31.99	160.43	-241.46	-490.62	1,201.81	1,138.49	63.32	18.979	
9,100.00	9,053.49	8,963.42	8,934.54	33.67	32.18	160.40	-243.99	-495.45	1,212.58	1,148.89	63.69	19.040	
9,150.00	9,103.10	9,012.25	8,983.06	33.87	32.36	160.38	-246.52	-500.28	1,223.34	1,159.29	64.05	19.101	
9,200.00	9,152.70	9,061.07	9,031.58	34.06	32.55	160.35	-249.05	-505.10	1,234.10	1,169.70	64.41	19.161	
9,250.00	9,202.31	9,109.90	9,080.10	34.26	32.74	160.33	-251.58	-509.93	1,244.87	1,180.10	64.77	19.220	
9,300.00	9,251.92	9,158.72	9,128.62	34.46	32.92	160.30	-254.11	-514.76	1,255.63	1,190.50	65.13	19.279	
9,350.00	9,301.54	9,207.57	9,177.17	34.65	33.11	160.31	-256.64	-519.59	1,266.27	1,200.78	65.49	19.335	
9,400.00	9,351.24	9,256.54	9,225.83	34.85	33.29	160.33	-259.17	-524.43	1,276.34	1,210.49	65.85	19.382	
9,450.00	9,401.00	9,305.63	9,274.61	35.04	33.48	160.34	-261.72	-529.29	1,285.81	1,219.60	66.21	19.420	
9,500.00	9,450.82	9,356.05	9,324.71	35.23	33.67	160.33	-264.33	-534.27	1,294.87	1,228.09	66.58	19.445	
9,550.00	9,500.70	9,406.86	9,394.98	35.41	33.94	160.29	-267.65	-540.61	1,302.48	1,235.37	67.10	19.410	
9,600.00	9,550.61	9,457.75	9,465.81	35.59	34.20	160.27	-270.38	-545.83	1,308.66	1,241.25	67.61	19.359	
9,650.00	9,600.56	9,509.23	9,537.14	35.77	34.46	160.25	-272.51	-549.90	1,313.81	1,245.71	68.10	19.292	
9,700.00	9,650.54	9,641.00	9,608.83	35.95	34.72	160.23	-274.03	-552.80	1,317.33	1,248.75	68.58	19.208	
9,750.00	9,700.53	9,712.95	9,680.76	36.12	34.98	160.22	-274.92	-554.50	1,319.39	1,250.35	69.04	19.111	
9,800.00	9,750.53	9,785.00	9,752.80	36.28	35.22	-90.01	-275.19	-555.01	1,320.01	1,250.53	69.48	18.999	
9,806.18	9,756.70	9,793.90	9,761.70	36.30	35.25	-90.01	-275.18	-554.99	1,319.99	1,250.48	69.53	18.984	
9,850.00	9,800.53	9,833.22	9,801.03	36.45	35.39	-90.01	-275.19	-555.01	1,320.01	1,250.20	69.81	18.908	
9,900.00	9,850.53	9,883.22	9,851.03	36.61	35.56	-90.01	-275.19	-555.01	1,320.01	1,249.86	70.15	18.817	
9,950.00	9,900.53	9,933.22	9,901.03	36.78	35.73	-90.01	-275.19	-555.01	1,320.01	1,249.52	70.49	18.726	
10,000.00	9,950.53	9,983.22	9,951.03	36.94	35.90	-90.01	-275.19	-555.01	1,320.01	1,249.18	70.83	18.636	
10,050.00	10,000.53	10,033.22	10,001.03	37.11	36.07	-90.01	-275.19	-555.01	1,320.01	1,248.84	71.17	18.546	
10,100.00	10,050.53	10,083.22	10,051.03	37.27	36.24	-90.01	-275.19	-555.01	1,320.01	1,248.50	71.51	18.458	
10,147.66	10,098.18	10,130.88	10,098.68	37.43	36.40	-89.64	-275.19	-555.01	1,320.01	1,248.17	71.84	18.374	
10,150.00	10,100.53	10,133.17	10,100.97	37.44	36.40	-89.63	-275.18	-555.01	1,320.01	1,248.15	71.86	18.370	
10,200.00	10,150.45	10,182.44	10,150.17	37.60	36.57	-89.63	-272.72	-555.03	1,320.01	1,247.82	72.19	18.286	
10,250.00	10,199.98	10,231.72	10,198.97	37.75	36.73	-89.64	-266.05	-555.07	1,320.01	1,247.50	72.51	18.205	
10,300.00	10,248.70	10,281.00	10,247.04	37.90	36.88	-89.64	-255.21	-555.14	1,320.01	1,247.19	72.81	18.128	
10,350.00	10,296.27	10,330.30	10,294.00	38.04	37.02	-89.65	-240.27	-555.24	1,320.01	1,246.90	73.11	18.056	
10,400.00	10,342.34	10,379.61	10,339.52	38.17	37.15	-89.66	-221.35	-555.38	1,320.01	1,246.62	73.39	17.987	
10,450.00	10,386.53	10,428.95	10,383.27	38.29	37.28	-89.67	-198.57	-555.51	1,320.00	1,246.35	73.65	17.922	
10,500.00	10,428.52	10,478.32	10,424.92	38.39	37.38	-89.69	-172.10	-555.68	1,320.00	1,246.09	73.91	17.860	
10,550.00	10,467.99	10,527.71	10,464.16	38.48	37.48	-89.71	-142.13	-555.88	1,320.00	1,245.85	74.15	17.802	
10,600.00	10,504.64	10,577.15	10,500.70	38.55	37.56	-89.73	-108.86	-556.10	1,319.99	1,245.62	74.38	17.747	
10,650.00	10,538.18	10,626.62	10,534.26	38.61	37.63	-89.75	-72.53	-556.33	1,319.99	1,245.39	74.60	17.694	
10,700.00	10,568.37	10,676.14	10,564.60	38.66	37.68	-89.77	-33.41	-556.59	1,319.99	1,245.17	74.81	17.643	
10,750.00	10,594.97	10,725.71	10,591.46	38.70	37.72	-89.80	8.23	-556.88	1,319.98	1,244.96	75.02	17.594	
10,800.00	10,617.78	10,775.33	10,614.65	38.72	37.75	-89.83	52.08	-557.14	1,319.98	1,244.75	75.23	17.548	
10,850.00	10,636.63	10,825.01	10,633.98	38.73	37.77	-89.85	97.83	-557.44	1,319.98	1,244.55	75.43	17.499	
10,900.00	10,651.37	10,874.74	10,649.29	38.73	37.77	-89.88	145.13	-557.75	1,319.98	1,244.34	75.64	17.452	
10,950.00	10,661.89	10,924.53	10,660.46	38.72	37.77	-89.91	193.63	-558.07	1,319.97	1,244.14	75.84	17.405	
11,000.00	10,668.11	10,974.39	10,667.38	38.72	37.81	-89.95	242.99	-558.39	1,319.97	1,243.93	76.04	17.359	
11,050.00	10,670.00	11,034.18	10,670.00	38.72	37.95	-89.98	292.82	-558.72	1,319.97	1,243.71	76.26	17.309	
11,100.00	10,670.00	11,074.30	10,670.00	38.75	38.05	-89.98	342.82	-559.04	1,319.97	1,243.51	76.45	17.265	
11,150.00	10,670.00	11,124.30	10,670.00	38.81	38.18	-89.98	392.82	-559.37	1,319.97	1,243.27	76.70	17.209	
11,200.00	10,670.00	11,174.30	10,670.00	38.92	38.33	-89.98	442.82	-559.69	1,319.97	1,243.01	76.96	17.151	
11,250.00	10,670.00	11,224.30	10,670.00	39.07	38.49	-89.98	492.82	-560.02	1,319.97	1,242.71	77.26	17.085	
11,300.00	10,670.00	11,274.30	10,670.00	39.23	38.66	-89.98	542.81	-560.35	1,319.98	1,242.39	77.57	17.016	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
11,350.00	10,670.00	11,324.30	10,670.00	39.41	38.84	-89.98	592.81	-560.67	1,319.96	1,242.04	77.92	16.939	
11,400.00	10,670.00	11,374.30	10,670.00	39.61	39.03	-89.98	642.81	-561.00	1,319.96	1,241.68	78.29	16.861	
11,450.00	10,670.00	11,424.30	10,670.00	39.82	39.24	-89.98	692.81	-561.32	1,319.96	1,241.27	78.69	16.775	
11,500.00	10,670.00	11,474.30	10,670.00	40.03	39.45	-89.98	742.81	-561.65	1,319.96	1,240.86	79.10	16.687	
11,550.00	10,670.00	11,524.30	10,670.00	40.27	39.68	-89.98	792.81	-561.98	1,319.96	1,240.41	79.55	16.593	
11,600.00	10,670.00	11,574.30	10,670.00	40.50	39.92	-89.98	842.81	-562.30	1,319.96	1,239.94	80.01	16.497	
11,650.00	10,670.00	11,624.30	10,670.00	40.76	40.17	-89.98	892.81	-562.63	1,319.96	1,239.44	80.51	16.395	
11,700.00	10,670.00	11,674.30	10,670.00	41.02	40.43	-89.98	942.81	-562.95	1,319.95	1,238.93	81.02	16.292	
11,750.00	10,670.00	11,724.30	10,670.00	41.30	40.71	-89.98	992.81	-563.28	1,319.95	1,238.39	81.56	16.183	
11,800.00	10,670.00	11,774.30	10,670.00	41.58	40.99	-89.98	1,042.80	-563.61	1,319.95	1,237.83	82.12	16.074	
11,850.00	10,670.00	11,824.30	10,670.00	41.88	41.29	-89.98	1,092.80	-563.93	1,319.95	1,237.25	82.71	15.960	
11,900.00	10,670.00	11,874.30	10,670.00	42.19	41.59	-89.98	1,142.80	-564.26	1,319.95	1,236.65	83.30	15.845	
11,950.00	10,670.00	11,924.30	10,670.00	42.51	41.90	-89.98	1,192.80	-564.59	1,319.95	1,236.02	83.93	15.726	
12,000.00	10,670.00	11,974.30	10,670.00	42.83	42.23	-89.98	1,242.80	-564.91	1,319.95	1,235.38	84.57	15.607	
12,050.00	10,670.00	12,024.30	10,670.00	43.17	42.56	-89.98	1,292.80	-565.24	1,319.95	1,234.71	85.24	15.485	
12,100.00	10,670.00	12,074.30	10,670.00	43.51	42.91	-89.98	1,342.80	-565.56	1,319.95	1,234.03	85.92	15.363	
12,150.00	10,670.00	12,124.30	10,670.00	43.87	43.26	-89.98	1,392.80	-565.89	1,319.94	1,233.32	86.63	15.237	
12,200.00	10,670.00	12,174.30	10,670.00	44.23	43.62	-89.98	1,442.80	-566.22	1,319.94	1,232.60	87.34	15.112	
12,250.00	10,670.00	12,224.30	10,670.00	44.60	44.00	-89.98	1,492.79	-566.54	1,319.94	1,231.85	88.09	14.984	
12,300.00	10,670.00	12,274.30	10,670.00	44.98	44.38	-89.98	1,542.79	-566.87	1,319.94	1,231.10	88.84	14.857	
12,350.00	10,670.00	12,324.30	10,670.00	45.37	44.76	-89.98	1,592.79	-567.19	1,319.94	1,230.32	89.62	14.728	
12,400.00	10,670.00	12,374.30	10,670.00	45.76	45.16	-89.98	1,642.79	-567.52	1,319.94	1,229.53	90.41	14.600	
12,450.00	10,670.00	12,424.30	10,670.00	46.17	45.57	-89.98	1,692.79	-567.85	1,319.94	1,228.72	91.22	14.470	
12,500.00	10,670.00	12,474.30	10,670.00	46.58	45.98	-89.98	1,742.79	-568.17	1,319.94	1,227.90	92.04	14.341	
12,550.00	10,670.00	12,524.30	10,670.00	47.00	46.40	-89.98	1,792.79	-568.50	1,319.93	1,227.05	92.88	14.211	
12,600.00	10,670.00	12,574.30	10,670.00	47.42	46.83	-89.98	1,842.79	-568.83	1,319.93	1,226.20	93.73	14.082	
12,650.00	10,670.00	12,624.30	10,670.00	47.86	47.26	-89.98	1,892.79	-569.15	1,319.93	1,225.33	94.60	13.952	
12,700.00	10,670.00	12,674.30	10,670.00	48.30	47.70	-89.98	1,942.78	-569.48	1,319.93	1,224.45	95.48	13.824	
12,750.00	10,670.00	12,724.30	10,670.00	48.75	48.15	-89.98	1,992.78	-569.80	1,319.93	1,223.55	96.38	13.695	
12,800.00	10,670.00	12,774.30	10,670.00	49.20	48.61	-89.98	2,042.78	-570.13	1,319.93	1,222.64	97.29	13.567	
12,850.00	10,670.00	12,824.30	10,670.00	49.66	49.07	-89.98	2,092.78	-570.46	1,319.93	1,221.71	98.22	13.439	
12,900.00	10,670.00	12,874.30	10,670.00	50.13	49.54	-89.98	2,142.78	-570.78	1,319.93	1,220.78	99.15	13.312	
12,950.00	10,670.00	12,924.30	10,670.00	50.60	50.01	-89.98	2,192.78	-571.11	1,319.93	1,219.82	100.10	13.186	
13,000.00	10,670.00	12,974.30	10,670.00	51.08	50.49	-89.98	2,242.78	-571.43	1,319.92	1,218.86	101.06	13.061	
13,050.00	10,670.00	13,024.30	10,670.00	51.56	50.98	-89.98	2,292.78	-571.76	1,319.92	1,217.89	102.04	12.936	
13,100.00	10,670.00	13,074.30	10,670.00	52.05	51.47	-89.98	2,342.78	-572.09	1,319.92	1,216.91	103.02	12.813	
13,150.00	10,670.00	13,124.30	10,670.00	52.55	51.97	-89.98	2,392.78	-572.41	1,319.92	1,215.91	104.01	12.690	
13,200.00	10,670.00	13,174.30	10,670.00	53.05	52.47	-89.98	2,442.77	-572.74	1,319.92	1,214.90	105.02	12.569	
13,250.00	10,670.00	13,224.30	10,670.00	53.56	52.98	-89.98	2,492.77	-573.07	1,319.92	1,213.88	106.04	12.448	
13,300.00	10,670.00	13,274.30	10,670.00	54.07	53.49	-89.98	2,542.77	-573.39	1,319.92	1,212.86	107.06	12.329	
13,350.00	10,670.00	13,324.30	10,670.00	54.58	54.01	-89.98	2,592.77	-573.72	1,319.92	1,211.82	108.10	12.210	
13,400.00	10,670.00	13,374.30	10,670.00	55.10	54.53	-89.98	2,642.77	-574.04	1,319.91	1,210.77	109.14	12.094	
13,450.00	10,670.00	13,424.30	10,670.00	55.63	55.06	-89.98	2,692.77	-574.37	1,319.91	1,209.72	110.20	11.978	
13,500.00	10,670.00	13,474.30	10,670.00	56.16	55.59	-89.98	2,742.77	-574.70	1,319.91	1,208.65	111.26	11.863	
13,550.00	10,670.00	13,524.30	10,670.00	56.69	56.13	-89.98	2,792.77	-575.02	1,319.91	1,207.58	112.33	11.750	
13,600.00	10,670.00	13,574.30	10,670.00	57.23	56.67	-89.98	2,842.77	-575.35	1,319.91	1,206.50	113.41	11.638	
13,650.00	10,670.00	13,624.30	10,670.00	57.77	57.21	-89.98	2,892.76	-575.67	1,319.91	1,205.40	114.50	11.527	
13,700.00	10,670.00	13,674.30	10,670.00	58.32	57.76	-89.98	2,942.76	-576.00	1,319.91	1,204.31	115.60	11.418	
13,750.00	10,670.00	13,724.30	10,670.00	58.87	58.31	-89.98	2,992.76	-576.33	1,319.91	1,203.20	116.71	11.310	
13,800.00	10,670.00	13,774.30	10,670.00	59.42	58.87	-89.98	3,042.76	-576.65	1,319.91	1,202.09	117.82	11.203	
13,850.00	10,670.00	13,824.30	10,670.00	59.98	59.43	-89.98	3,092.76	-576.98	1,319.90	1,200.96	118.94	11.097	
13,900.00	10,670.00	13,874.30	10,670.00	60.54	59.99	-89.98	3,142.76	-577.30	1,319.90	1,199.84	120.07	10.993	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
13,950.00	10,670.00	13,924.30	10,670.00	61.11	60.58	-89.98	3,192.76	-577.63	1,319.90	1,198.70	121.20	10.890	
14,000.00	10,670.00	13,974.30	10,670.00	61.67	61.13	-89.98	3,242.76	-577.96	1,319.90	1,197.56	122.34	10.789	
14,050.00	10,670.00	14,024.30	10,670.00	62.24	61.71	-89.98	3,292.76	-578.28	1,319.90	1,196.41	123.49	10.688	
14,100.00	10,670.00	14,074.30	10,670.00	62.82	62.28	-89.98	3,342.76	-578.61	1,319.90	1,195.25	124.64	10.589	
14,150.00	10,670.00	14,124.30	10,670.00	63.40	62.86	-89.98	3,392.75	-578.94	1,319.90	1,194.09	125.81	10.492	
14,200.00	10,670.00	14,174.30	10,670.00	63.98	63.45	-89.98	3,442.75	-579.26	1,319.90	1,192.92	126.97	10.395	
14,250.00	10,670.00	14,224.30	10,670.00	64.56	64.03	-89.98	3,492.75	-579.59	1,319.89	1,191.75	128.15	10.300	
14,300.00	10,670.00	14,274.30	10,670.00	65.15	64.62	-89.98	3,542.75	-579.91	1,319.89	1,190.57	129.32	10.206	
14,350.00	10,670.00	14,324.30	10,670.00	65.74	65.21	-89.98	3,592.75	-580.24	1,319.89	1,189.39	130.51	10.114	
14,400.00	10,670.00	14,374.30	10,670.00	66.33	65.81	-89.98	3,642.75	-580.57	1,319.89	1,188.20	131.69	10.022	
14,450.00	10,670.00	14,424.30	10,670.00	66.92	66.40	-89.98	3,692.75	-580.89	1,319.89	1,187.00	132.89	9.932	
14,500.00	10,670.00	14,474.30	10,670.00	67.52	67.00	-89.98	3,742.75	-581.22	1,319.89	1,185.80	134.09	9.843	
14,550.00	10,670.00	14,524.30	10,670.00	68.12	67.60	-89.98	3,792.75	-581.54	1,319.89	1,184.59	135.29	9.756	
14,600.00	10,670.00	14,574.30	10,670.00	68.72	68.21	-89.98	3,842.74	-581.87	1,319.89	1,183.38	136.50	9.669	
14,650.00	10,670.00	14,624.30	10,670.00	69.33	68.82	-89.98	3,892.74	-582.20	1,319.89	1,182.17	137.72	9.584	
14,700.00	10,670.00	14,674.30	10,670.00	69.93	69.43	-89.98	3,942.74	-582.52	1,319.88	1,180.95	138.94	9.500	
14,750.00	10,670.00	14,724.30	10,670.00	70.54	70.04	-89.98	3,992.74	-582.85	1,319.88	1,179.72	140.16	9.417	
14,800.00	10,670.00	14,774.30	10,670.00	71.15	70.65	-89.98	4,042.74	-583.18	1,319.88	1,178.49	141.39	9.335	
14,850.00	10,670.00	14,824.30	10,670.00	71.77	71.27	-89.98	4,092.74	-583.50	1,319.88	1,177.26	142.62	9.254	
14,900.00	10,670.00	14,874.30	10,670.00	72.38	71.88	-89.98	4,142.74	-583.83	1,319.88	1,176.02	143.86	9.175	
14,950.00	10,670.00	14,924.30	10,670.00	73.00	72.50	-89.98	4,192.74	-584.15	1,319.88	1,174.78	145.10	9.097	
15,000.00	10,670.00	14,974.30	10,670.00	73.62	73.13	-89.98	4,242.74	-584.48	1,319.88	1,173.54	146.34	9.019	
15,050.00	10,670.00	15,024.30	10,670.00	74.24	73.75	-89.98	4,292.74	-584.81	1,319.88	1,172.29	147.59	8.943	
15,100.00	10,670.00	15,074.30	10,670.00	74.87	74.38	-89.98	4,342.73	-585.13	1,319.87	1,171.03	148.84	8.868	
15,150.00	10,670.00	15,124.30	10,670.00	75.49	75.00	-89.98	4,392.73	-585.46	1,319.87	1,169.78	150.10	8.793	
15,200.00	10,670.00	15,174.30	10,670.00	76.12	75.63	-89.98	4,442.73	-585.78	1,319.87	1,168.52	151.36	8.720	
15,250.00	10,670.00	15,224.30	10,670.00	76.75	76.26	-89.98	4,492.73	-586.11	1,319.87	1,167.25	152.62	8.648	
15,300.00	10,670.00	15,274.30	10,670.00	77.38	76.90	-89.98	4,542.73	-586.44	1,319.87	1,165.99	153.88	8.577	
15,350.00	10,670.00	15,324.30	10,670.00	78.01	77.53	-89.98	4,592.73	-586.76	1,319.87	1,164.72	155.15	8.507	
15,400.00	10,670.00	15,374.30	10,670.00	78.64	78.17	-89.98	4,642.73	-587.09	1,319.87	1,163.44	156.43	8.438	
15,450.00	10,670.00	15,424.30	10,670.00	79.28	78.80	-89.98	4,692.73	-587.41	1,319.87	1,162.16	157.70	8.369	
15,500.00	10,670.00	15,474.30	10,670.00	79.92	79.44	-89.98	4,742.73	-587.74	1,319.87	1,160.89	158.98	8.302	
15,550.00	10,670.00	15,524.30	10,670.00	80.56	80.08	-89.98	4,792.72	-588.07	1,319.86	1,159.60	160.26	8.236	
15,600.00	10,670.00	15,574.30	10,670.00	81.20	80.73	-89.98	4,842.72	-588.39	1,319.86	1,158.32	161.55	8.170	
15,650.00	10,670.00	15,624.30	10,670.00	81.84	81.37	-89.98	4,892.72	-588.72	1,319.86	1,157.03	162.83	8.106	
15,700.00	10,670.00	15,674.30	10,670.00	82.48	82.01	-89.98	4,942.72	-589.05	1,319.86	1,155.74	164.12	8.042	
15,750.00	10,670.00	15,724.30	10,670.00	83.13	82.66	-89.98	4,992.72	-589.37	1,319.86	1,154.44	165.42	7.979	
15,800.00	10,670.00	15,774.30	10,670.00	83.77	83.31	-89.98	5,042.72	-589.70	1,319.86	1,153.15	166.71	7.917	
15,850.00	10,670.00	15,824.30	10,670.00	84.42	83.96	-89.98	5,092.72	-590.02	1,319.86	1,151.85	168.01	7.856	
15,900.00	10,670.00	15,874.30	10,670.00	85.07	84.61	-89.98	5,142.72	-590.35	1,319.86	1,150.54	169.31	7.795	
15,950.00	10,670.00	15,924.30	10,670.00	85.72	85.26	-89.98	5,192.72	-590.68	1,319.85	1,149.24	170.62	7.738	
16,000.00	10,670.00	15,974.30	10,670.00	86.37	85.91	-89.98	5,242.71	-591.00	1,319.85	1,147.93	171.92	7.677	
16,050.00	10,670.00	16,024.30	10,670.00	87.02	86.56	-89.98	5,292.71	-591.33	1,319.85	1,146.62	173.23	7.619	
16,100.00	10,670.00	16,074.30	10,670.00	87.67	87.22	-89.98	5,342.71	-591.65	1,319.85	1,145.31	174.54	7.562	
16,150.00	10,670.00	16,124.30	10,670.00	88.33	87.88	-89.98	5,392.71	-591.98	1,319.85	1,144.00	175.85	7.505	
16,200.00	10,670.00	16,174.30	10,670.00	88.98	88.53	-89.98	5,442.71	-592.31	1,319.85	1,142.68	177.17	7.450	
16,250.00	10,670.00	16,224.30	10,670.00	89.64	89.19	-89.98	5,492.71	-592.63	1,319.85	1,141.36	178.49	7.395	
16,300.00	10,670.00	16,274.30	10,670.00	90.30	89.85	-89.98	5,542.71	-592.96	1,319.85	1,140.04	179.80	7.340	
16,350.00	10,670.00	16,324.30	10,670.00	90.96	90.51	-89.98	5,592.71	-593.29	1,319.85	1,138.72	181.13	7.287	
16,400.00	10,670.00	16,374.30	10,670.00	91.61	91.17	-89.98	5,642.71	-593.61	1,319.84	1,137.40	182.45	7.234	
16,450.00	10,670.00	16,424.30	10,670.00	92.28	91.84	-89.98	5,692.71	-593.94	1,319.84	1,136.07	183.78	7.182	
16,500.00	10,670.00	16,474.30	10,670.00	92.94	92.50	-89.98	5,742.70	-594.26	1,319.84	1,134.74	185.10	7.130	

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — **Offset Site Error:** 0.00 ft

Survey Program: 0-MWD+HDGM — **Offset Well Error:** 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
16,550.00	10,670.00	16,524.30	10,670.00	93.60	93.16	-89.98	5,792.70	-594.59	1,319.84	1,133.41	186.43	7.079	
16,600.00	10,670.00	16,574.30	10,670.00	94.26	93.83	-89.98	5,842.70	-594.92	1,319.84	1,132.08	187.76	7.029	
16,650.00	10,670.00	16,624.30	10,670.00	94.93	94.49	-89.98	5,892.70	-595.24	1,319.84	1,130.74	189.10	6.980	
16,700.00	10,670.00	16,674.30	10,670.00	95.59	95.16	-89.98	5,942.70	-595.57	1,319.84	1,129.41	190.43	6.931	
16,750.00	10,670.00	16,724.30	10,670.00	96.26	95.83	-89.98	5,992.70	-595.89	1,319.84	1,128.07	191.77	6.882	
16,800.00	10,670.00	16,774.30	10,670.00	96.93	96.50	-89.98	6,042.70	-596.22	1,319.84	1,126.73	193.10	6.835	
16,850.00	10,670.00	16,824.30	10,670.00	97.60	97.17	-89.98	6,092.70	-596.55	1,319.83	1,125.39	194.45	6.788	
16,900.00	10,670.00	16,874.30	10,670.00	98.27	97.84	-89.98	6,142.70	-596.87	1,319.83	1,124.05	195.79	6.741	
16,950.00	10,670.00	16,924.30	10,670.00	98.94	98.51	-89.98	6,192.69	-597.20	1,319.83	1,122.70	197.13	6.695	
17,000.00	10,670.00	16,974.30	10,670.00	99.61	99.18	-89.98	6,242.69	-597.53	1,319.83	1,121.36	198.47	6.650	
17,050.00	10,670.00	17,024.30	10,670.00	100.28	99.86	-89.98	6,292.69	-597.85	1,319.83	1,120.01	199.82	6.605	
17,100.00	10,670.00	17,074.30	10,670.00	100.95	100.53	-89.98	6,342.69	-598.18	1,319.83	1,118.66	201.17	6.561	
17,150.00	10,670.00	17,124.30	10,670.00	101.62	101.20	-89.98	6,392.69	-598.50	1,319.83	1,117.31	202.52	6.517	
17,200.00	10,670.00	17,174.30	10,670.00	102.30	101.88	-89.98	6,442.69	-598.83	1,319.83	1,115.96	203.87	6.474	
17,250.00	10,670.00	17,224.30	10,670.00	102.97	102.55	-89.98	6,492.69	-599.16	1,319.82	1,114.60	205.22	6.431	
17,300.00	10,670.00	17,274.30	10,670.00	103.65	103.23	-89.98	6,542.69	-599.48	1,319.82	1,113.25	206.57	6.389	
17,350.00	10,670.00	17,324.30	10,670.00	104.32	103.91	-89.98	6,592.69	-599.81	1,319.82	1,111.89	207.93	6.347	
17,400.00	10,670.00	17,374.30	10,670.00	105.00	104.59	-89.98	6,642.69	-600.13	1,319.82	1,110.54	209.28	6.306	
17,450.00	10,670.00	17,424.30	10,670.00	105.68	105.26	-89.98	6,692.68	-600.46	1,319.82	1,109.18	210.64	6.266	
17,500.00	10,670.00	17,474.30	10,670.00	106.35	105.94	-89.98	6,742.68	-600.79	1,319.82	1,107.82	212.00	6.226	
17,550.00	10,670.00	17,524.30	10,670.00	107.03	106.62	-89.98	6,792.68	-601.11	1,319.82	1,106.46	213.36	6.186	
17,600.00	10,670.00	17,574.30	10,670.00	107.71	107.30	-89.98	6,842.68	-601.44	1,319.82	1,105.09	214.72	6.147	
17,650.00	10,670.00	17,624.30	10,670.00	108.39	107.99	-89.98	6,892.68	-601.76	1,319.82	1,103.73	216.09	6.108	
17,700.00	10,670.00	17,674.30	10,670.00	109.07	108.67	-89.98	6,942.68	-602.09	1,319.81	1,102.36	217.45	6.070	
17,750.00	10,670.00	17,724.30	10,670.00	109.75	109.35	-89.98	6,992.68	-602.42	1,319.81	1,101.00	218.81	6.032	
17,800.00	10,670.00	17,774.30	10,670.00	110.43	110.03	-89.98	7,042.68	-602.74	1,319.81	1,099.63	220.18	5.994	
17,850.00	10,670.00	17,824.30	10,670.00	111.12	110.72	-89.98	7,092.68	-603.07	1,319.81	1,098.26	221.55	5.957	
17,900.00	10,670.00	17,874.30	10,670.00	111.80	111.40	-89.98	7,142.67	-603.40	1,319.81	1,096.89	222.92	5.921	
17,950.00	10,670.00	17,924.30	10,670.00	112.48	112.08	-89.98	7,192.67	-603.72	1,319.81	1,095.52	224.29	5.885	
18,000.00	10,670.00	17,974.30	10,670.00	113.17	112.77	-89.98	7,242.67	-604.05	1,319.81	1,094.15	225.66	5.849	
18,050.00	10,670.00	18,024.30	10,670.00	113.85	113.46	-89.98	7,292.67	-604.37	1,319.81	1,092.78	227.03	5.813	
18,100.00	10,670.00	18,074.30	10,670.00	114.54	114.14	-89.98	7,342.67	-604.70	1,319.80	1,091.40	228.40	5.778	
18,150.00	10,670.00	18,124.30	10,670.00	115.22	114.83	-89.98	7,392.67	-605.03	1,319.80	1,090.03	229.77	5.744	
18,200.00	10,670.00	18,174.30	10,670.00	115.91	115.52	-89.98	7,442.67	-605.35	1,319.80	1,088.65	231.15	5.710	
18,250.00	10,670.00	18,224.30	10,670.00	116.59	116.20	-89.98	7,492.67	-605.68	1,319.80	1,087.28	232.52	5.676	
18,300.00	10,670.00	18,274.30	10,670.00	117.28	116.89	-89.98	7,542.67	-606.00	1,319.80	1,085.90	233.90	5.643	
18,350.00	10,670.00	18,324.30	10,670.00	117.97	117.58	-89.98	7,592.66	-606.33	1,319.80	1,084.52	235.28	5.610	
18,400.00	10,670.00	18,374.30	10,670.00	118.66	118.27	-89.98	7,642.66	-606.66	1,319.80	1,083.14	236.66	5.577	
18,450.00	10,670.00	18,424.30	10,670.00	119.35	118.96	-89.98	7,692.66	-606.98	1,319.80	1,081.76	238.04	5.545	
18,500.00	10,670.00	18,474.30	10,670.00	120.03	119.65	-89.98	7,742.66	-607.31	1,319.80	1,080.38	239.42	5.513	
18,550.00	10,670.00	18,524.30	10,670.00	120.72	120.34	-89.98	7,792.66	-607.64	1,319.79	1,079.00	240.80	5.481	
18,600.00	10,670.00	18,574.30	10,670.00	121.41	121.03	-89.98	7,842.66	-607.96	1,319.79	1,077.61	242.18	5.450	
18,650.00	10,670.00	18,624.30	10,670.00	122.10	121.72	-89.98	7,892.66	-608.29	1,319.79	1,076.23	243.56	5.419	
18,700.00	10,670.00	18,674.30	10,670.00	122.79	122.41	-89.98	7,942.66	-608.61	1,319.79	1,074.85	244.94	5.388	
18,750.00	10,670.00	18,724.30	10,670.00	123.49	123.10	-89.98	7,992.66	-608.94	1,319.79	1,073.46	246.33	5.358	
18,800.00	10,670.00	18,774.30	10,670.00	124.18	123.80	-89.98	8,042.66	-609.27	1,319.79	1,072.07	247.71	5.328	
18,850.00	10,670.00	18,824.30	10,670.00	124.87	124.49	-89.98	8,092.65	-609.59	1,319.79	1,070.69	249.10	5.298	
18,900.00	10,670.00	18,874.30	10,670.00	125.56	125.18	-89.98	8,142.65	-609.92	1,319.79	1,069.30	250.49	5.269	
18,950.00	10,670.00	18,924.30	10,670.00	126.25	125.88	-89.98	8,192.65	-610.24	1,319.78	1,067.91	251.88	5.240	
19,000.00	10,670.00	18,974.30	10,670.00	126.95	126.57	-89.98	8,242.65	-610.57	1,319.78	1,066.52	253.26	5.211	
19,050.00	10,670.00	19,024.30	10,670.00	127.64	127.26	-89.98	8,292.65	-610.90	1,319.78	1,065.13	254.65	5.183	
19,100.00	10,670.00	19,074.30	10,670.00	128.33	127.96	-89.98	8,342.65	-611.22	1,319.78	1,063.74	256.04	5.155	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Anticollision Report

Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

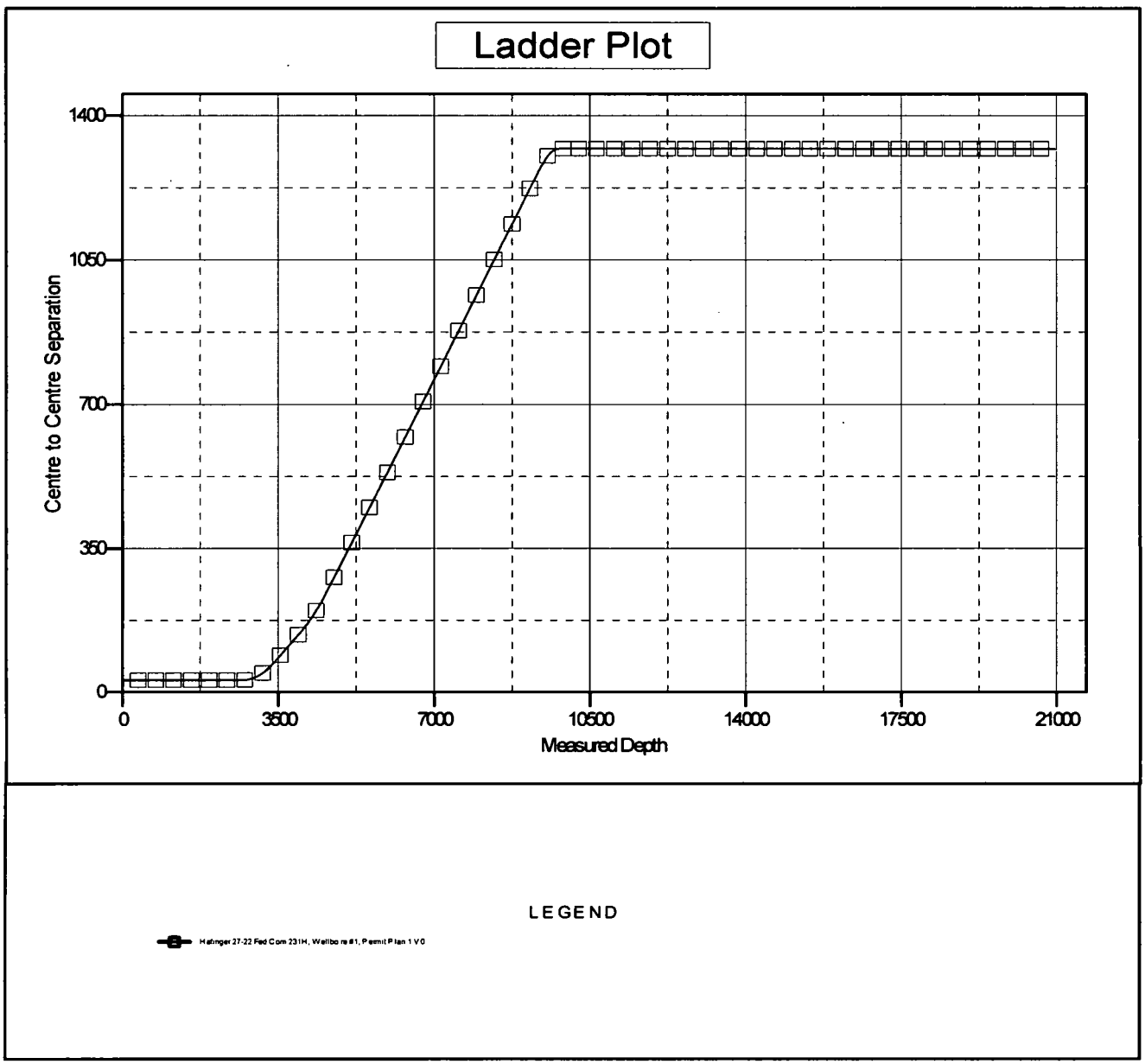
Offset Design Sec 27-T25S-R32E - Hafinger 27-22 Fed Com 231H - Wellbore #1 - Permit Plan 1 — Offset Site Error: 0.00 ft

Survey Program: 0-MWD+HDGM — Offset Well Error: 0.50 ft

Reference Measured Depth (ft)	Reference Vertical Depth (ft)	Offset Measured Depth (ft)	Offset Vertical Depth (ft)	Semi Major Axis Reference (ft)	Semi Major Axis Offset (ft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (ft)	Offset Wellbore Centre +E/-W (ft)	Distance Between Centres (ft)	Distance Between Ellipses (ft)	Minimum Separation (ft)	Separation Factor	Warning
19,150.00	10,670.00	19,124.30	10,670.00	129.03	128.65	-89.98	8,392.65	-611.55	1,319.78	1,062.35	257.43	5.127	
19,200.00	10,670.00	19,174.30	10,670.00	129.72	129.35	-89.98	8,442.65	-611.88	1,319.78	1,060.95	258.82	5.099	
19,250.00	10,670.00	19,224.30	10,670.00	130.42	130.05	-89.98	8,492.65	-612.20	1,319.78	1,059.56	260.22	5.072	
19,300.00	10,670.00	19,274.30	10,670.00	131.11	130.74	-89.98	8,542.64	-612.53	1,319.78	1,058.17	261.61	5.045	
19,350.00	10,670.00	19,324.30	10,670.00	131.81	131.44	-89.98	8,592.64	-612.85	1,319.78	1,056.77	263.00	5.018	
19,400.00	10,670.00	19,374.30	10,670.00	132.50	132.14	-89.98	8,642.64	-613.18	1,319.77	1,055.38	264.40	4.992	Alert
19,450.00	10,670.00	19,424.30	10,670.00	133.20	132.83	-89.98	8,692.64	-613.51	1,319.77	1,053.98	265.79	4.965	Alert
19,500.00	10,670.00	19,474.30	10,670.00	133.90	133.53	-89.98	8,742.64	-613.83	1,319.77	1,052.59	267.19	4.940	Alert
19,550.00	10,670.00	19,524.30	10,670.00	134.59	134.23	-89.98	8,792.64	-614.16	1,319.77	1,051.19	268.58	4.914	Alert
19,600.00	10,670.00	19,574.30	10,670.00	135.29	134.93	-89.98	8,842.64	-614.48	1,319.77	1,049.79	269.98	4.888	Alert
19,650.00	10,670.00	19,624.30	10,670.00	135.99	135.62	-89.98	8,892.64	-614.81	1,319.77	1,048.39	271.38	4.863	Alert
19,700.00	10,670.00	19,674.30	10,670.00	136.69	136.32	-89.98	8,942.64	-615.14	1,319.77	1,046.99	272.77	4.838	Alert
19,750.00	10,670.00	19,724.30	10,670.00	137.38	137.02	-89.98	8,992.64	-615.46	1,319.77	1,045.59	274.17	4.814	Alert
19,800.00	10,670.00	19,774.30	10,670.00	138.08	137.72	-89.98	9,042.63	-615.79	1,319.76	1,044.19	275.57	4.789	Alert
19,850.00	10,670.00	19,824.30	10,670.00	138.78	138.42	-89.98	9,092.63	-616.11	1,319.76	1,042.79	276.97	4.765	Alert
19,900.00	10,670.00	19,874.30	10,670.00	139.48	139.12	-89.98	9,142.63	-616.44	1,319.76	1,041.39	278.37	4.741	Alert
19,950.00	10,670.00	19,924.30	10,670.00	140.18	139.82	-89.98	9,192.63	-616.77	1,319.76	1,039.99	279.77	4.717	Alert
20,000.00	10,670.00	19,974.30	10,670.00	140.88	140.52	-89.98	9,242.63	-617.09	1,319.76	1,038.59	281.17	4.694	Alert
20,050.00	10,670.00	20,024.30	10,670.00	141.58	141.22	-89.98	9,292.63	-617.42	1,319.76	1,037.18	282.57	4.670	Alert
20,100.00	10,670.00	20,074.30	10,670.00	142.28	141.92	-89.98	9,342.63	-617.75	1,319.76	1,035.78	283.98	4.647	Alert
20,150.00	10,670.00	20,124.30	10,670.00	142.98	142.63	-89.98	9,392.63	-618.07	1,319.76	1,034.38	285.38	4.625	Alert
20,200.00	10,670.00	20,174.30	10,670.00	143.68	143.33	-89.98	9,442.63	-618.40	1,319.76	1,032.97	286.78	4.602	Alert
20,250.00	10,670.00	20,224.30	10,670.00	144.38	144.03	-89.98	9,492.62	-618.72	1,319.75	1,031.57	288.19	4.580	Alert
20,300.00	10,670.00	20,274.30	10,670.00	145.08	144.73	-89.98	9,542.62	-619.05	1,319.75	1,030.16	289.59	4.557	Alert
20,350.00	10,670.00	20,324.30	10,670.00	145.79	145.43	-89.98	9,592.62	-619.38	1,319.75	1,028.76	291.00	4.535	Alert
20,400.00	10,670.00	20,374.30	10,670.00	146.49	146.14	-89.98	9,642.62	-619.70	1,319.75	1,027.35	292.40	4.513	Alert
20,450.00	10,670.00	20,424.30	10,670.00	147.19	146.84	-89.98	9,692.62	-620.03	1,319.75	1,025.94	293.81	4.492	Alert
20,500.00	10,670.00	20,474.30	10,670.00	147.89	147.54	-89.98	9,742.62	-620.35	1,319.75	1,024.54	295.21	4.470	Alert
20,550.00	10,670.00	20,524.30	10,670.00	148.59	148.24	-89.98	9,792.62	-620.68	1,319.75	1,023.13	296.62	4.449	Alert
20,600.00	10,670.00	20,574.30	10,670.00	149.30	148.95	-89.98	9,842.62	-621.01	1,319.75	1,021.72	298.03	4.428	Alert
20,650.00	10,670.00	20,624.30	10,670.00	150.00	149.65	-89.98	9,892.62	-621.33	1,319.74	1,020.31	299.43	4.407	Alert
20,700.00	10,670.00	20,674.30	10,670.00	150.70	150.36	-89.98	9,942.61	-621.66	1,319.74	1,018.90	300.84	4.387	Alert
20,750.00	10,670.00	20,724.30	10,670.00	151.41	151.06	-89.98	9,992.61	-621.99	1,319.74	1,017.49	302.25	4.366	Alert
20,800.00	10,670.00	20,774.30	10,670.00	152.11	151.76	-89.98	10,042.61	-622.31	1,319.74	1,016.08	303.66	4.346	Alert
20,850.00	10,670.00	20,824.30	10,670.00	152.81	152.47	-89.98	10,092.61	-622.64	1,319.74	1,014.67	305.07	4.326	Alert
20,900.00	10,670.00	20,874.30	10,670.00	153.52	153.17	-89.98	10,142.61	-622.96	1,319.74	1,013.26	306.48	4.306	Alert
20,950.00	10,670.00	20,924.30	10,670.00	154.22	153.88	-89.98	10,192.61	-623.29	1,319.74	1,011.85	307.89	4.286	Alert
20,969.61	10,670.00	20,943.92	10,670.00	154.50	154.16	-89.98	10,212.22	-623.42	1,319.74	1,011.29	308.44	4.279	Alert

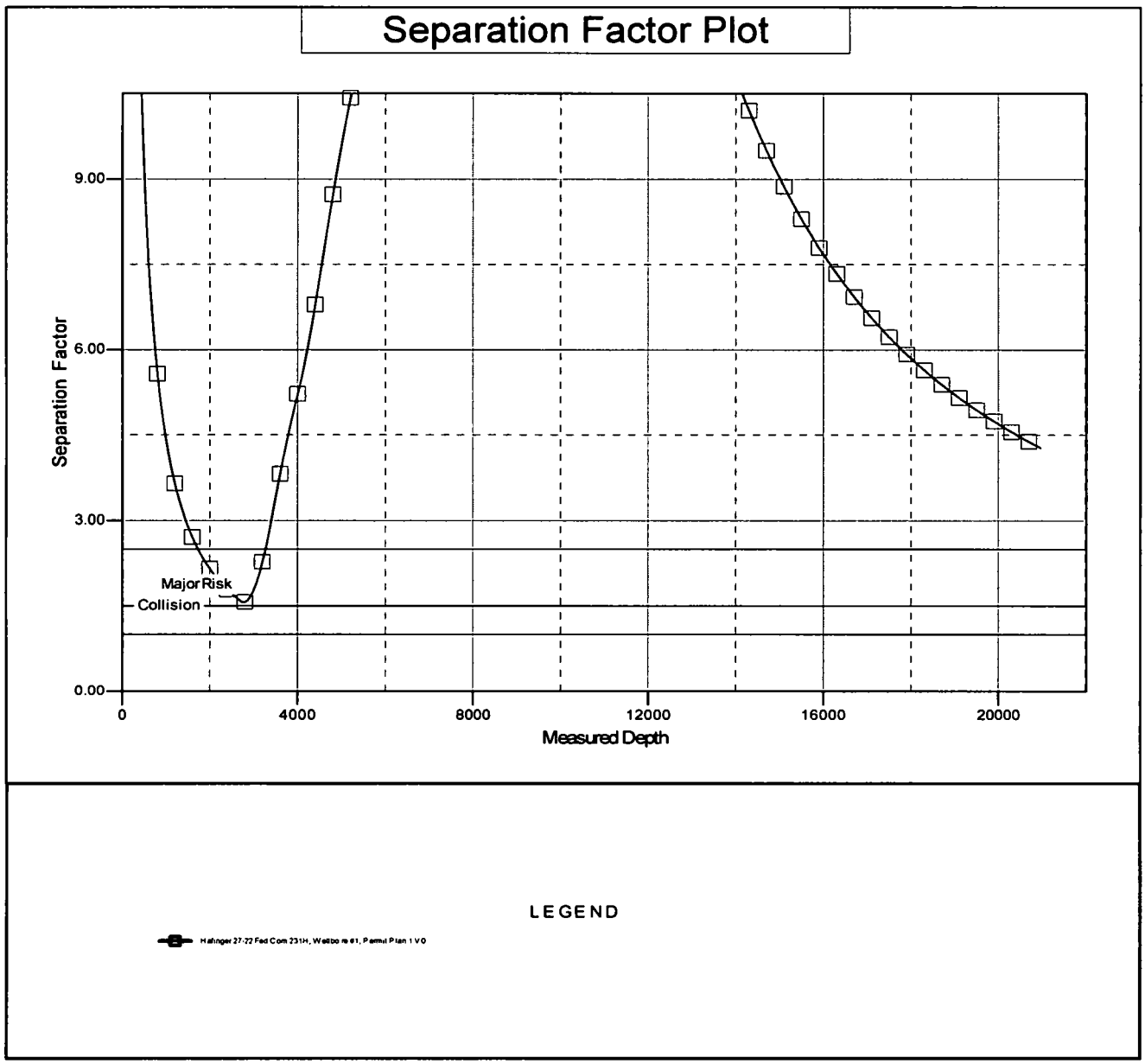
Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 3390.80ft	Coordinates are relative to: Hafinger 27-22 Fed Com 232H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: 0.35°



Company:	WCDSC Permian NM	**Local Co-ordinate Reference:**	Well Hafinger 27-22 Fed Com 232H
Project:	Lea County (NAD83 New Mexico East)	**TVD Reference:**	RKB @ 3390.80ft
Reference Site:	Sec 27-T25S-R32E	**MD Reference:**	RKB @ 3390.80ft
Site Error:	0.00 ft	**North Reference:**	Grid
Reference Well:	Hafinger 27-22 Fed Com 232H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.50 ft	**Output errors are at**	2.00 sigma
Reference Wellbore	Wellbore #1	**Database:**	EDM r5000.141_Prod US
Reference Design:	Permit Plan 1	**Offset TVD Reference:**	Offset Datum

Reference Depths are relative to RKB @ 3390.80ft	Coordinates are relative to: Hafinger 27-22 Fed Com 232H
Offset Depths are relative to Offset Datum	Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334	Grid Convergence at Surface is: 0.35°



Devon Energy – Haflinger 27-22 Fed Com 232

1. Geologic Formations

TVD of target	10670	Pilot hole depth	N/A
MD at TD:	20969	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	839		
Salado	1099		
Base of Salt	4579		
Delaware	4609		
L Brushy Canyon	8479		
Bone Spring	8704		
Leonard 'A'	8819		
Leonard 'B'	9139		
Leonard 'C'	9379		
1st BSPG Sand	9679		
2nd BSPG Sand	10239		
L 2nd BSPG Sand	10649		
Landing Point	10670		
EOL	10614		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

Devon Energy – Haflinger 27-22 Fed Com 232

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (PPF)	Grade	Conn.
	From	To				
17.5"	0	864	13.375"	48	H-40	STC
12.25"	0	4709	9.625"	40	J-55	BTC
8.75"	0	TD	5.5"	17	P-110	BTC
BLM Minimum Safety Factor				Collapse: 1.125	Burst: 1.00	Tension: 1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- Variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing. No losses are expected in subsequent hole section.
- Int casing shoe will be selected based on drilling data, gamma, and flows experienced while drilling. Setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the intermediate and production casing strings if drilling conditions dictate

Devon Energy – Haflinger 27-22 Fed Com 232

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (3-String Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	H_20 (gal/sk)	Yld (ft3/sack)	Slurry Description
Surface	902	Surf	13.2	6.33	1.33	Lead: Class C Cement + additives
Int	774	Surf	9	20.6	1.94	Lead: Class C Cement + additives
	196	500' above shoe	13.2	6.42	1.33	Tail: Class H / C + additives
Production	463	500' tieback	9	20.6	3.27	Lead: Class H / C + additives
	2060	KOP	13.2	5.31	1.2	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	100%
Intermediate	50%
Production	10%

Devon Energy – Haflinger 27-22 Fed Com 232

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-5/8"	3M	Annular	X	50% of rated working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	5M	Annular	X	50% of rated working pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

5. Mud Program

6. Depth		Type	Weight (ppg)	Vis	Water Loss
From	To				
0	864	FW	8.5 – 9.0	28-34	N/C
864	4709	Brine	10 – 10.5	28-34	N/C
4709	TD	WBM	8.5 – 9.0	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	
	Density	
X	CBL	Production casing
X	Mud log	KOP to TD

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4994 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

Is this a walking operation? Potentially

1. If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2. The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3. The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1. Spudder rig will move in and drill surface hole.
    a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.
2. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5. Spudder rig operations is expected to take 4-5 days per well on a multi well pad.
6. The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7. Drilling operations will be performed with the drilling rig. At that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
    a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

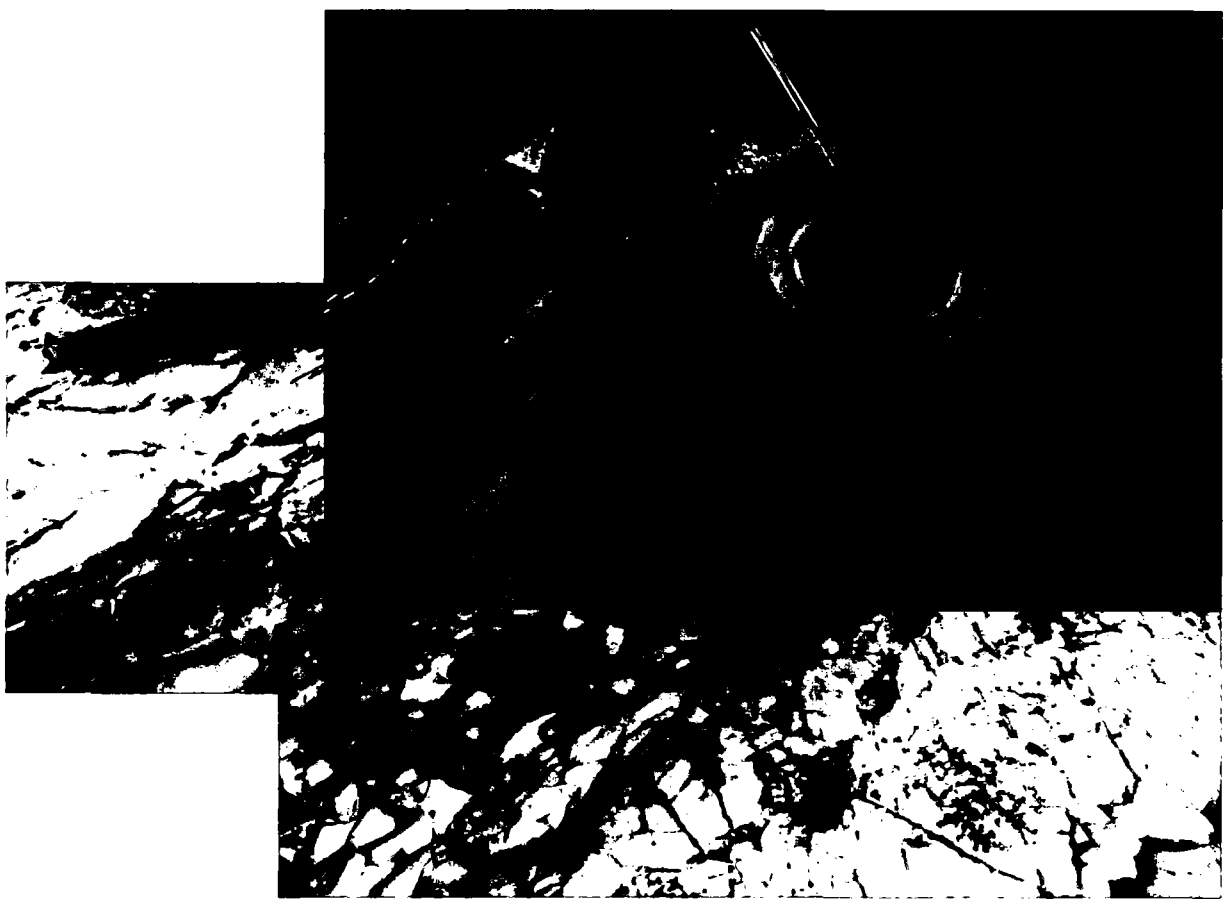
Attachments

_x_ Directional Plan

___ Other, describe

devon

Commitment Runs Deep



Design Plan
Operation and Maintenance Plan
Closure Plan

SENM - Closed Loop Systems
June 2010

I. Design Plan

Devon uses MI SWACO closed loop system (CLS). The MI SWACO CLS is designed to maintain drill solids at or below 5%. The equipment is arranged to progressively remove solids from the largest to the smallest size. Drilling fluids can thus be reused and savings is realized on mud and disposal costs. Dewatering may be required with the centrifuges to insure removal of ultra fine solids.

The drilling location is constructed to allow storm water to flow to a central sump normally the cellar. This insures no contamination leaves the drilling pad in the event of a spill. Storm water is reused in the mud system or stored in a reserve fluid tank farm until it can be reused. All lubricants, oils, or chemicals are removed immediately from the ground to prevent the contamination of storm water. An oil trap is normally installed on the sump if an oil spill occurs during a storm.

A tank farm is utilized to store drilling fluids including fresh water and brine fluids. The tank farm is constructed on a 20 ml plastic lined, bermed pad to prevent the contamination of the drilling site during a spill. Fluids from other sites may be stored in these tanks for processing by the solids control equipment and reused in the mud system. At the end of the well the fluids are transported from the tank farm to an adjoining well or to the next well for the rig.

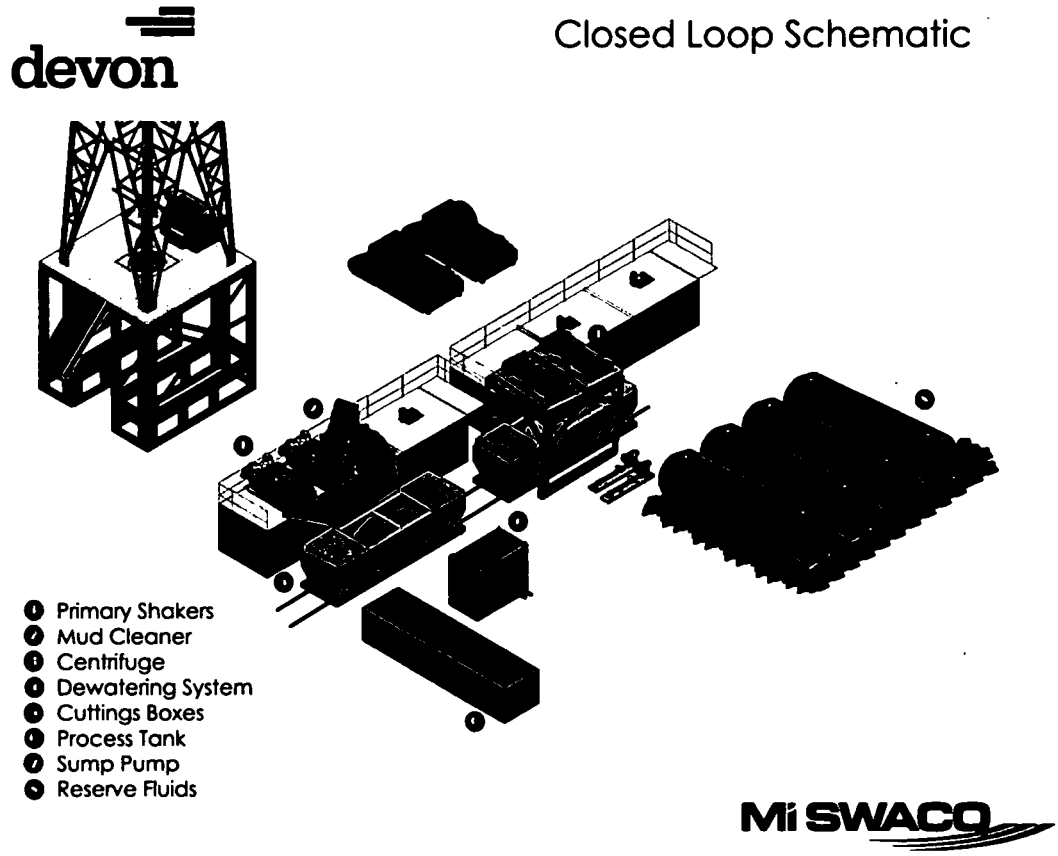
Prior to installing a closed-loop system on site, the topsoil, if present, will be stripped and stockpiled for use as the final cover or fill at the time of closure.

Signs will be posted on the fence surrounding the closed-loop system unless the closed-loop system is located on a site where there is an existing well, that is operated by Devon.

II. Operations and Maintenance Plan

Primary Shakers: The primary shakers make the first removal of drill solids from the drilling mud as it leaves the well bore. The shakers are sized to handle maximum drilling rate at optimal screen size. The shakers normally remove solids down to 74 microns.

Mud Cleaner: The Mud Cleaner cleans the fluid after it leaves the shakers. A set of hydrocyclones are sized to handle 1.25 to 1.5 times the maximum circulating rate. This ensures all the fluid is being processed to an average cut point of 25 microns. The wet discharged is dewatered on a shaker equipped with ultra fine mesh screens and generally cut at 40 microns.



Centrifuges: The centrifuges can be one or two in number depending on the well geometry or depth of well. The centrifuges are sized to maintain low gravity solids at 5% or below. They may or may not need a dewatering system to enhance the removal rates. The centrifuges can make a cut point of 8-10 microns depending on bowl speed, feed rate, solids loading and other factors.

The centrifuge system is designed to work on the active system and be flexible to process incoming fluids from other locations. This set-up is also dependant on well factors.

Dewatering System: The dewatering system is a chemical mixing and dosing system designed to enhance the solids removal of the centrifuge. Not commonly used in shallow wells. It may contain pH adjustment, coagulant mixing and dosing, and polymer mixing and dosing. Chemical flocculation binds ultra fine solids into a mass that is within the centrifuge operating design. The

dewatering system improves the centrifuge cut point to infinity or allows for the return of clear water or brine fluid. This ability allows for the ultimate control of low gravity solids.

Cuttings Boxes: Cuttings boxes are utilized to capture drill solids that are discarded from the solids control equipment. These boxes are set upon a rail system that allows for the removal and replacement of a full box of cuttings with an empty one. They are equipped with a cover that insures no product is spilled into the environment during the transportation phase.

Process Tank: (Optional) The process tank allows for the holding and process of fluids that are being transferred into the mud system. Additionally, during times of lost circulation the process tank may hold active fluids that are removed for additional treatment. It can further be used as a mixing tank during well control conditions.

Sump and Sump Pump: The sump is used to collect storm water and the pump is used to transfer this fluid to the active system or to the tank for to hold in reserve. It can also be used to collect fluids that may escape during spills. The location contains drainage ditches that allow the location fluids to drain to the sump.

Reserve Fluids (Tank Farm): A series of frac tanks are used to replace the reserve pit. These are steel tanks that are equipped with a manifold system and a transfer pump. These tanks can contain any number of fluids used during the drilling process. These can include fresh water, cut brine, and saturated salt fluid. The fluid can be from the active well or reclaimed fluid from other locations. A 20 ml liner and berm system is employed to ensure the fluids do not migrate to the environment during a spill.

If a leak develops, the appropriate division district office will be notified within 48 hours of the discovery and the leak will be addressed. Spill prevention is accomplished by maintaining pump packing, hoses, and pipe fittings to insure no leaks are occurring. During an upset condition the source of the spill is isolated and repaired as soon as it is discovered. Free liquid is removed by a diaphragm pump and returned to the mud system. Loose topsoil may be used to stabilize the spill and the contaminated soil is excavated and placed in the cuttings boxes. After the well is finished and the rig has moved, the entire location is scrapped and testing will be performed to determine if a release has occurred.

All trash is kept in a wire mesh enclosure and removed to an approved landfill when full. All spent motor oils are kept in separate containers and they are removed and sent to an approved recycling center. Any spilled lubricants, pipe

dope, or regulated chemicals are removed from soil and sent to landfills approved for these products.

These operations are monitored by Mi Swaco service technicians. Daily logs are maintained to ensure optimal equipment operation and maintenance. Screen and chemical use is logged to maintain inventory control. Fluid properties are monitored and recorded and drilling mud volumes are accounted for in the mud storage farm. This data is kept for end of well review to insure performance goals are met. Lessons learned are logged and used to help with continuous improvement.

A MI SWACO field supervisor manages from 3-5 wells. They are responsible for training personnel, supervising installations, and inspecting sites for compliance of MI SWACO safety and operational policy.

III. Closure Plan

A maximum 340' X 340' caliche pad is built per well. All of the trucks and steel tanks fit on this pad. All fluid cuttings go to the steel tanks to be hauled by various trucking companies to an agency approved disposal.

Devon Energy – Haflinger 27-22 Fed Com 232

1. Geologic Formations

TVD of target	10670	Pilot hole depth	N/A
MD at TD:	20969	Deepest expected fresh water:	

Basin

Formation	Depth (TVD) from KB	Water/Mineral Bearing/ Target Zone?	Hazards*
Rustler	839		
Salado	1099		
Base of Salt	4579		
Delaware	4609		
L Brushy Canyon	8479		
Bone Spring	8704		
Leonard 'A'	8819		
Leonard 'B'	9139		
Leonard 'C'	9379		
1st BSPG Sand	9679		
2nd BSPG Sand	10239		
L 2nd BSPG Sand	10649		
Landing Point	10670		
EOL	10614		

*H2S, water flows, loss of circulation, abnormal pressures, etc.

2. Casing Program

Hole Size	Casing Interval		Csg. Size	Weight (PPF)	Grade	Conn.
	From	To				
17.5"	0	864	13.375"	48	H-40	STC
12.25"	0	4709	9.625"	40	J-55	BTC
8.75"	0	TD	5.5"	17	P-110	BTC
BLM Minimum Safety Factor				Collapse: 1.125	Burst: 1.00	Tension: 1.6 Dry 1.8 Wet

- All casing strings will be tested in accordance with Onshore Oil and Gas Order #2 III.B.1.h Must have table for contingency casing
- Rustler top will be validated via drilling parameters (i.e. reduction in ROP) and surface casing setting depth revised accordingly if needed.
- Variance is requested for collapse rating on intermediate casing. Operator will keep pipe full while running casing. No losses are expected in subsequent hole section.
- Int casing shoe will be selected based on drilling data, gamma, and flows experienced while drilling. Setting depth with be revised accordingly if needed.
- A variance is requested to wave the centralizer requirement for the intermediate and production casing strings if drilling conditions dictate

	Y or N
Is casing new? If used, attach certification as required in Onshore Order #1	Y
Does casing meet API specifications? If no, attach casing specification sheet.	Y
Is premium or uncommon casing planned? If yes attach casing specification sheet.	N
Does the above casing design meet or exceed BLM's minimum standards? If not provide justification (loading assumptions, casing design criteria).	Y
Will the intermediate pipe be kept at a minimum 1/3 fluid filled to avoid approaching the collapse pressure rating of the casing?	Y
Is well located within Capitan Reef?	N
If yes, does production casing cement tie back a minimum of 50' above the Reef?	
Is well within the designated 4 string boundary.	
Is well located in SOPA but not in R-111-P?	N
If yes, are the first 2 strings cemented to surface and 3rd string cement tied back 500' into previous casing?	
Is well located in R-111-P and SOPA?	N
If yes, are the first three strings cemented to surface?	
Is 2nd string set 100' to 600' below the base of salt?	
Is well located in high Cave/Karst?	N
If yes, are there two strings cemented to surface?	
(For 2 string wells) If yes, is there a contingency casing if lost circulation occurs?	
Is well located in critical Cave/Karst?	N
If yes, are there three strings cemented to surface?	

3. Cementing Program (3-String Primary Design)

Casing	# Sks	TOC	Wt. (lb/gal)	H_20 (gal/sk)	Yld (ft3/sack)	Slurry Description
Surface	902	Surf	13.2	6.33	1.33	Lead: Class C Cement + additives
Int	774	Surf	9	20.6	1.94	Lead: Class C Cement + additives
	196	500' above shoe	13.2	6.42	1.33	Tail: Class H / C + additives
Production	462	500' tieback	9	20.6	1.94	Lead: Class H / C + additives
	1882	KOP	13.2	5.31	1.6	Tail: Class H / C + additives

If a DV tool is ran the depth(s) will be adjusted based on hole conditions and cement volumes will be adjusted proportionally. Slurry weights will be adjusted based on estimated fracture gradient of the formation. DV tool will be set a minimum of 50 feet below previous casing and a minimum of 200 feet

above current shoe. If cement is not returned to surface during the primary cement job on the surface casing string, a planned top job will be conducted immediately after completion of the primary job.

Casing String	% Excess
Surface	100%
Intermediate	50%
Production	10%

4. Pressure Control Equipment

BOP installed and tested before drilling which hole?	Size?	Min. Required WP	Type	✓	Tested to:
Int 1	13-5/8"	3M	Annular	X	50% of rated working pressure
			Blind Ram		3M
			Pipe Ram		
			Double Ram	X	
			Other*		
Production	13-5/8"	5M	Annular	X	50% of rated working pressure
			Blind Ram		5M
			Pipe Ram		
			Double Ram	X	
			Other *		
			Annular		
			Blind Ram		
			Pipe Ram		
			Double Ram		
			Other *		

5. Mud Program

6. Depth		Type	Weight (ppg)	Vis	Water Loss
From	To				
0	864	FW	8.5 – 9.0	28-34	N/C
864	4709	Brine	10 – 10.5	28-34	N/C
4709	TD	WBM	8.5 – 9.0	28-34	N/C

Sufficient mud materials to maintain mud properties and meet minimum lost circulation and weight increase requirements will be kept on location at all times.

What will be used to monitor the loss or gain of fluid?	PVT/Pason/Visual Monitoring

6. Logging and Testing Procedures

Logging, Coring and Testing.	
X	Will run GR/CNL from TD to surface (horizontal well – vertical portion of hole). Stated logs run will be in the Completion Report and submitted to the BLM.
	No Logs are planned based on well control or offset log information.
	Drill stem test? If yes, explain
	Coring? If yes, explain

Additional logs planned		Interval
	Resistivity	
	Density	
X	CBL	Production casing
X	Mud log	KOP to TD

7. Drilling Conditions

Condition	Specify what type and where?
BH Pressure at deepest TVD	4994 psi
Abnormal Temperature	No

Mitigation measure for abnormal conditions. Describe. Lost circulation material/sweeps/mud scavengers.

Hydrogen Sulfide (H2S) monitors will be installed prior to drilling out the surface shoe. If H2S is detected in concentrations greater than 100 ppm, the operator will comply with the provisions of Onshore Oil and Gas Order #6. If Hydrogen Sulfide is encountered, measured values and formations will be provided to the BLM.	
N	H2S is present
Y	H2S Plan attached

8. Other facets of operation

Is this a walking operation? Potentially

1. If operator elects, drilling rig will batch drill the surface holes and run/cement surface casing; walking the rig to next wells on the pad.
2. The drilling rig will then batch drill the intermediate sections and run/cement intermediate casing; the wellbore will be isolated with a blind flange and pressure gauge installed for monitoring the well before walking to the next well.
3. The drilling rig will then batch drill the production hole sections on the wells with OBM, run/cement production casing, and install TA caps or tubing heads for completions.

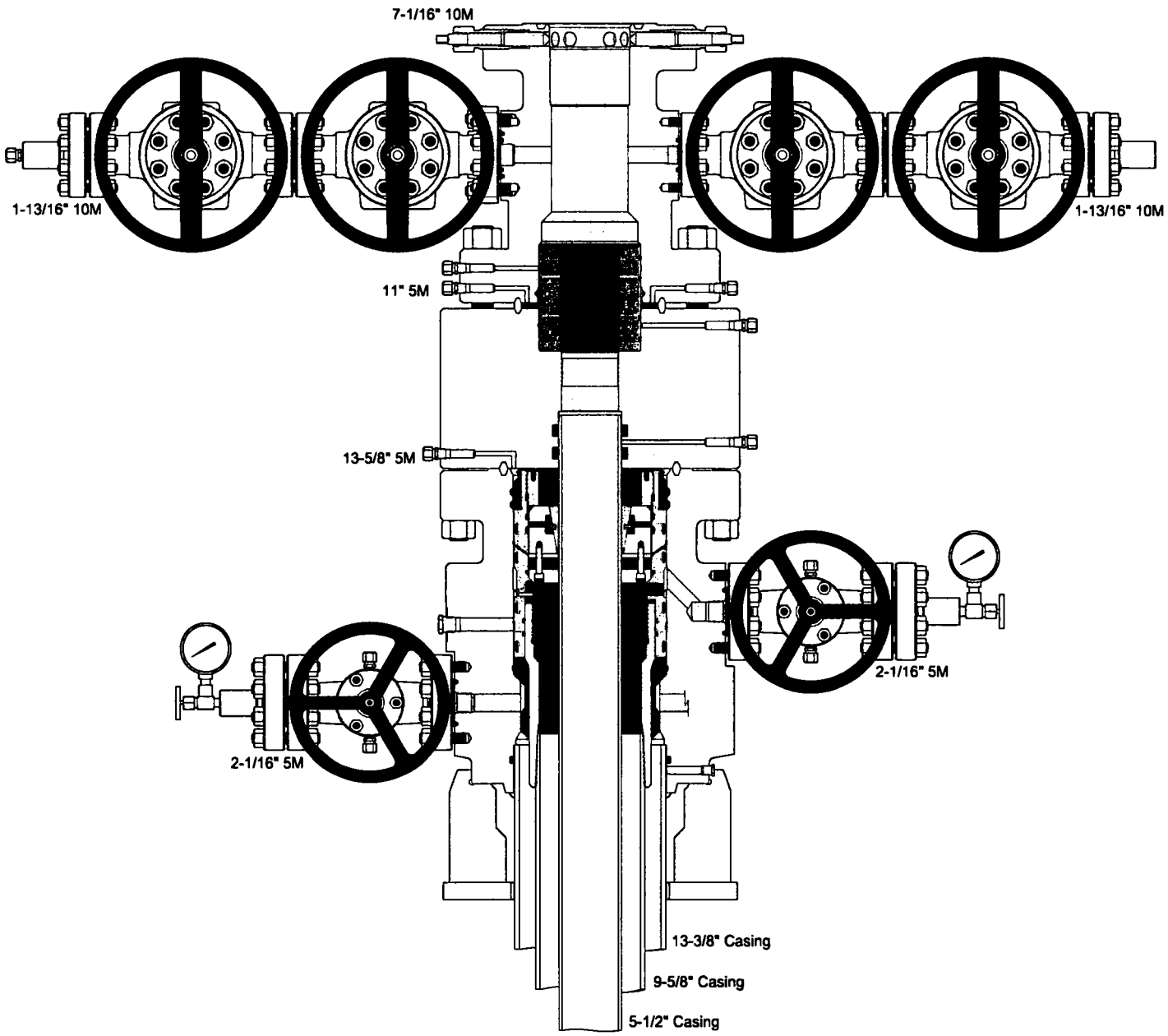
NOTE: During batch operations the drilling rig will be moved from well to well however, it will not be removed from the pad until all wells have production casing run/cemented.

Will be pre-setting casing? Potentially

1. Spudder rig will move in and drill surface hole.

   a. Rig will utilize fresh water based mud to drill surface hole to TD. Solids control will be handled entirely on a closed loop basis.
2. After drilling the surface hole section, the spudder rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
3. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
4. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with a pressure gauge installed on the wellhead.
5. Spudder rig operations is expected to take 4-5 days per well on a multi well pad.
6. The NMOCD will be contacted and notified 24 hours prior to commencing spudder rig operations.
7. Drilling operations will be performed with the drilling rig. At that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
   a. The NMOCD will be contacted / notified 24 hours before the drilling rig moves back on to the pad with the pre-set surface casing.

Attachments
_x_ Directional Plan
___ Other, describe


7-1/16" 10M
1-13/16" 10M
1-13/16" 10M
11" 5M
13-5/8" 5M
2-1/16" 5M
2-1/16" 5M
13-3/8" Casing
9-5/8" Casing
5-1/2" Casing

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.

Devon proposes using 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.

- Wellhead will be installed by wellhead representatives.
- If the welding is performed by a third party, the wellhead representative will monitor the temperature to verify that it does not exceed the maximum temperature of the seal.
- Wellhead representative will install the test plug for the initial BOP test.
- Wellhead company will install a solid steel body pack-off to completely isolate the lower head after cementing intermediate casing. After installation of the pack-off, the pack-off and the lower flange will be tested to 5M, as shown on the attached schematic. Everything above the pack-off will not have been altered whatsoever from the initial nipple up. Therefore the BOP components will not be retested at that time.
- If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head will be cut and top out operations will be conducted.
- Devon will pressure test all seals above and below the mandrel (but still above the casing) to full working pressure rating.
- Devon will test the casing to 0.22 psi/ft or 1500 psi, whichever is greater, as per Onshore Order #2.

After running the 13-3/8" surface casing, a 13-5/8" BOP/BOPE system with a minimum rating of 5M will be installed on the wellhead system and will undergo a 250 psi low pressure test followed by a 5,000 psi high pressure test. The 5,000 psi high and 250 psi low test will cover testing requirements a maximum of 30 days, as per Onshore Order #2. If the well is not complete within 30 days of this BOP test, another full BOP test will be conducted, as per Onshore Order #2.

After running the 9-5/8' intermediate casing with a mandrel hanger, the 13-5/8" BOP/BOPE system with a minimum rating of 5M will already be installed on the wellhead.

The pipe rams will be operated and checked each 24 hour period and each time the drill pipe is out of the hole. These tests will be logged in the daily driller's log. A 2" kill line and 3" choke line will be incorporated into the drilling spool below the ram BOP. In addition to the rams and annular preventer, additional BOP accessories include a kelly cock, floor safety valve, choke lines, and choke manifold rated at 5,000 psi WP.

Devon's proposed wellhead manufactures will be FMC Technologies, Cactus Wellhead, or Cameron.

Devon Energy
APD VARIANCE DATA

OPERATOR NAME: Devon Energy

1. SUMMARY OF Variance:

Devon Energy respectfully requests approval for the following additions to the drilling plan:

1. Potential utilization of a spudder rig to pre-set surface casing.

2. Description of Operations

1. A spudder rig contractor may move in their rig to drill the surface hole section and pre-set surface casing on this well.
    a. After drilling the surface hole section, the rig will run casing and cement following all of the applicable rules and regulations (OnShore Order 2, all COAs and NMOCD regulations).
    b. Rig will utilize fresh water based mud to drill surface hole to TD.
2. The wellhead will be installed and tested once the surface casing is cut off and the WOC time has been reached.
3. A blind flange with the same pressure rating as the wellhead will be installed to seal the wellbore. Pressure will be monitored with needle valves installed on two wingvalves.
    a. A means for intervention will be maintained while the drilling rig is not over the well.
4. The BLM will be contacted and notified 24 hours prior to commencing spudder rig operations.
5. Drilling operation will be performed with the big rig. At that time an approved BOP stack will be nippled up and tested on the wellhead before drilling operations commences on each well.
    a. The BLM will be contacted / notified 24 hours before the big rig moves back on to the pad with the pre-set surface casing.
6. Devon Energy will have supervision on the rig to ensure compliance with all BLM and NMOCD regulations and to oversee operations.
7. Once the rig is removed, Devon Energy will secure the wellhead area by placing a guard rail around the cellar area.

Continental CONTITECH

Fluid Technology

ContiTech Beattie Corp.
Website: www.contitechbeattie.com

Monday, June 14, 2010

RE: Drilling & Production Hoses
Lifting & Safety Equipment

To Helmerich & Payne,

A Continental ContiTech hose assembly can perform as intended and suitable for the application regardless of whether the hose is secured or unsecured in its configuration. As a manufacturer of High Pressure Hose Assemblies for use in Drilling & Production, we do offer the corresponding lifting and safety equipment, this has the added benefit of easing the lifting and handling of each hose assembly whilst affording hose longevity by ensuring correct handling methods and procedures as well as securing the hose in the unlikely event of a failure; but in no way does the lifting and safety equipment affect the performance of the hoses providing the hoses have been handled and installed correctly It is good practice to use lifting & safety equipment but not mandatory

Should you have any questions or require any additional information/clarifications then please do not hesitate to contact us.

ContiTech Beattie is part of the Continental AG Corporation and can offer the full support resources associated with a global organization.

Best regards,

Robin Hodgson
Sales Manager
ContiTech Beattie Corp

ContiTech Beattie Corp,
11535 Brittmoore Park Drive,
Houston, TX 77041
Phone: +1 (832) 327-0141
Fax: +1 (832) 327-0148
www.contitechbeattie.com

RIG 212

PHOENIX

QUALITY DOCUMENT

PHOENIX RUBBER INDUSTRIAL LTD.

6728 Szeged, Budapesti út 10. Hungary • H-6701 Szeged, P. O. Box 152
Phone: (3662) 566-737 • Fax: (3662) 566-739

SALES & MARKETING: H-1092 Budapest, Ráday u. 42-44. Hungary • H-1440 Budapest, P. O. Box 26
Phone: (361) 456-4200 • Fax: (361) 217-2972, 456-4273 • www.taurusemerge.hu

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°: 552
PURCHASER: Phoenix Beattie Co.					P.O. N°: 1519FA-871
PHOENIX RUBBER order N°: 170466		HOSE TYPE: 3" ID		Choke and Kill Hose	
HOSE SERIAL N°: 34128		NOMINAL / ACTUAL LENGTH:		11,43 m	
W.P. 68,96 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 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS

Type	Serial N°	Quality	Heat N°
3" coupling with	720 719	AISI 4130	C7626
4 1/16" Flange end		AISI 4130	47357

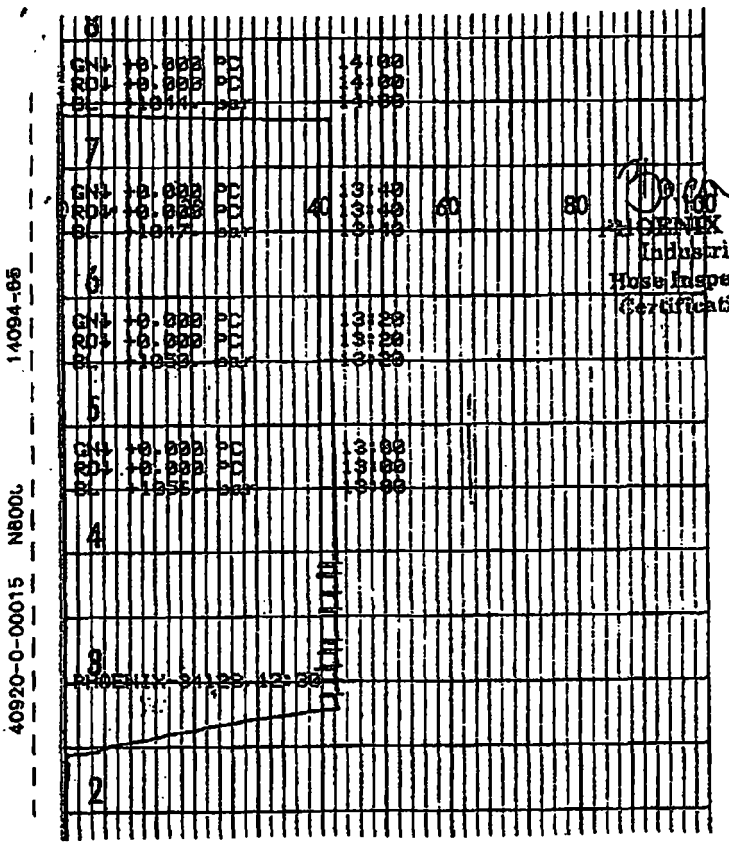
API Spec 16 C
Temperature rate:"B"

All metal parts are flawless

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

Date:	Inspector	Quality Control
29. April. 2002.		PHOENIX RUBBER Industrial Ltd. Hose Inspection and Testing Dept.

CERTIFIED TRUE COPY
PHOENIX RUBBER Q.C.



PHOENIX RUBBER
Industrial Ltd.
Hose Inspection and
Certification Dept.

VERIFIED TRUE CO.
PHOENIX RUBBER Q.C.

APD ID: 10400035836 **Submission Date:** 11/12/2018

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Well Type: OIL WELL **Well Work Type:** Drill

[redacted]

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Haflinger_27_22_Fed_Com_232H_Ex_Access_Rd_20181112081342.pdf

Existing Road Purpose: ACCESS **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? YES

New Road Map:

Haflinger_27_22_Fed_Com_232H_Access_Rds_20181112081429.pdf

New road type: COLLECTOR,RESOURCE

Length: 906 Feet **Width (ft.):** 30

Max slope (%): 6 **Max grade (%):** 4

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 30

New road access erosion control: N/A

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Access surfacing type: OTHER

Access topsoil source: BOTH

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description: Caliche Pit

Onsite topsoil removal process: See attached Interim reclamation diagram

Access other construction information:

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: CULVERT

Drainage Control comments: Culvert used if deemed necessary.

Road Drainage Control Structures (DCS) description: N/A

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

Haflinger_27_22_Fed_Com_232H_1mile_Map_20181101073911.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? DEFER

Estimated Production Facilities description: All flowlines will be buried going to the Haflinger 27 CTB 1.

Section 5 - Location and Types of Water Supply

Water Source Table

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Water source use type: STIMULATION **Water source type:** RECYCLED

Describe type:

Source latitude: **Source longitude:**

Source datum:

Water source permit type: OTHER

Source land ownership: FEDERAL

Water source transport method: PIPELINE

Source transportation land ownership: FEDERAL

Water source volume (barrels): 230000 **Source volume (acre-feet):** 29.645412

Source volume (gal): 9660000

Water source and transportation map:

Haflinger_27_22_Fed_Com_232H_Wtr_Xfr_Map_20181105054322.pdf

Water source comments: The attached Water Transfer Map is a proposal only and the final route and documentation will be provided by a Devon contractor prior to installation. When available Devon will always follow existing disturbance.
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:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Section 6 - Construction Materials

Construction Materials description: Dirt fill and caliche will be used to construct well pad. See attached map.

Construction Materials source location attachment:

Haflinger_27_22_Fed_Com_232H_Caliche_Pit_20181101074048.pdf

Section 7 - Methods for Handling Waste

Waste type: COMPLETIONS/STIMULATION

Waste content description: Flow back water during completion operations

Amount of waste: 3000 barrels

Waste disposal frequency : One Time Only

Safe containment description: N.A

Safe containmant attachment:

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

Disposal type description:

Disposal location description: Various disposal locations in Lea & Eddy counties.

Waste type: PRODUCED WATER

Waste content description: Produced water during production operations. This amount is a daily average during the first year of production (BWPD).

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: OFF-LEASE INJECTION **Disposal location ownership:** PRIVATE

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89 , CDU 84.

Waste type: FLOWBACK

Waste content description: Produced water during flowback operations. This amount is a daily average during flowback (BWPD).

Amount of waste: 1500 barrels

Waste disposal frequency : Daily

Safe containment description: N/A

Safe containmant attachment:

Waste disposal type: OFF-LEASE INJECTION **Disposal location ownership:** PRIVATE

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Disposal type description:

Disposal location description: One of three company owned SWD facilities in the area: CDU 181, CDU 89, CDU 84.

Reserve Pit

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:

Section 9 - Well Site Layout

Well Site Layout Diagram:

Haflinger_27_22_Fed_Com_232H_Rig_Layout_20181102090247.pdf

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** HAFLINGER 27 WELLPAD

Multiple Well Pad Number: 1

Recontouring attachment:

Haflinger_27_22_Fed_Com_232H_Reclamation_20181112081638.pdf

Drainage/Erosion control construction: All areas disturbed shall be reclaimed as early and as nearly as practicable to their original condition or their final land use and shall be maintained to control dust and minimize erosion to the extent practicable.
Drainage/Erosion control reclamation: Topsoils and subsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns. The disturbed area then shall be reseeded in the first favorable growing season.

Well pad proposed disturbance (acres): 3.671
Road proposed disturbance (acres): 0.416
Powerline proposed disturbance (acres): 2.089
Pipeline proposed disturbance (acres): 0.465
Other proposed disturbance (acres): 5.74
Total proposed disturbance: 12.381

Well pad interim reclamation (acres): 1.674
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0
Total interim reclamation: 1.674

Well pad long term disturbance (acres): 1.997
Road long term disturbance (acres): 0.416
Powerline long term disturbance (acres): 2.089
Pipeline long term disturbance (acres): 0.465
Other long term disturbance (acres): 5.74
Total long term disturbance: 10.707

Disturbance Comments:

Reconstruction method: Operator will use Best Management Practices"BMP" to mechanically recontour to obtain the desired outcome.
Topsoil redistribution: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.
Soil treatment: Topsoils shall be replaced to their original relative positions and contoured so as to achieve erosion control, long-term stability and preservation of surface water flow patterns.
Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

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:

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	
Seed Type	Pounds/Acre

Total pounds/Acre:

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Jacob **Last Name:** Ochoa

Phone: (575)748-9934 **Email:** jacob.ochoa@dvn.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: Maintain weeks on an as need basis.

Weed treatment plan attachment:

Monitoring plan description: Monitor as needed.

Monitoring plan attachment:

Success standards: N/A

Pit closure description: N/A

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: NEW 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:

Other Local Office:

USFS Region:

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

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

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:

Other Local Office:

USFS Region:

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

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:**

Operator Name: DEVON ENERGY PRODUCTION COMPANY LP

Well Name: HAFLINGER 27-22 FED COM **Well Number:** 232H

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? NO **Use APD as ROW?**

ROW Type(s):

ROW Applications

[redacted]

Use a previously conducted onsite? YES

Previous Onsite information: 9/1/2018 Haflinger 27 Wellpad 1

Other SUPO Attachment

Haflinger_27_22_Fed_Com_232H_CTB_20181102090407.pdf
Haflinger_27_22_Fed_Com_232H_Electric_20181112083117.pdf
Haflinger_27_22_Fed_Com_232H_Flowline_BURIED_20190411071416.pdf

AFMSS

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

PWD Data Report

05/10/2019

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

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:

AFMSS

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

Bond Info Data Report

05/10/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: CO1104

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:

Harms, Jenny

Subject: COTTONWOOD DRAW 32 STATE SWD NO 2
Location: CR OKDEC 30.304

Start: Mon 5/13/2019 9:00 AM
End: Mon 5/13/2019 10:00 AM

Recurrence: (none)

Meeting Status: Meeting organizer

Organizer: Harms, Jenny
Required Attendees: Walla, Jeff; Garbrecht, Fred; Harlin, Clifton; Schroder, Brent; Bartlett, Brent
Resources: CR OKDEC 30.304

Update: 5/10/2019- Phillip responded back to Brent with the following email:

Brent:

Sorry for the delay in response. Thank you for informing the Division of the plan for further assessment of this well. Please keep us informed. And as a note, I see that the other SWD well with issues, Cotton Draw Unit 84 (30-015-29728; SWD-1621), has been approved for P&A which resolves this matter. PRG

Hello all,

There have been a few emails sent regarding questions about the Cottonwood Draw 32 State SWD No 2 location. It will be beneficial for regulatory and other disciplines to meet to discuss the regulatory filings that need to take place in order to stay compliant with this well. From reading historical information in the files and discussions with production, Devon was given instructions to submit quarterly reporting and keep an annual pressure to not exceed 200 PSI. Please see attachments for reference.

Discussion topics:

- Has there been any remedial work initiated/completed?
- From March 2017, were quarterly reporting documents filed? Would there have been another discipline filing these items besides regulatory
- Create plan to propose to NMOCD (Phillip Goetze) with remedial solution to the liner leakage- Brent Schroder and I have both reached out to Phillip and have not received a response yet.
    - Extension to initial Administrative Order SWD-1459 may not be an option due to expiring March 2019

I appreciate everyone's time getting together to work out these items.

Thank you,

Jenny Harms
Regulatory Compliance Professional
Work Phone: (405)552-6560
Jennifer.harms@dvn.com
Devon Energy Center-Tower
333 West Sheridan Avenue Oklahoma City OK 73102-5015

Harms, Jenny

From: Deal, Rebecca
Sent: Monday, May 6, 2019 7:43 AM
To: Harms, Jenny
Subject: FW: Cotton Draw Unit 32 State 2 SWD

Devon - Internal

From: McPherson, Wayne
Sent: Monday, May 6, 2019 7:32 AM
To: Deal, Rebecca <Rebecca.Deal@dvn.com>
Cc: Walla, Jeff <Jeff.Walla@dvn.com>; Garbrecht, Fred <Fred.Garbrecht@dvn.com>; Harlin, Clifton <Clifton.Harlin@dvn.com>
Subject: Cotton Draw Unit 32 State 2 SWD

Good morning, Rebecca.

I am assisting Brent Schroder and Clifton Harlin on the above reference SWD. I understand the State of New Mexico granted an exemption allowing 200 psi on the annulus for two years, which has now expired. Since, Devon have communicated to the NMOCD relative to the matter.

Can you help with a few questions about the CDU 32-2 SWD:

1. What notice (written or verbal) have we provided to NMOCD?
2. Are we under a timeline to take action, i.e., rig up and repair the well? Shut-in the well? Other requirements?
3. May we continue to dispose water as we prepare the work plan and materials to test, and/or repair the well?
4. Will NMOCD require advanced notice prior to Devon rigging up to commence test/repair the well.

We have three other SWD's with backside pressure:

- Rio Blanco 33 Fed 2 – possible tubing leak, bleed gas from annulus after acid job. This well is a candidate to deepen in the existing zone. Any repair work could be done in conjunction with the deepening project.
- Burton Flat Deep Unit 44 – possible tubing leak? Ran Schlumberger logs and results indicated no fluid movement behind pipe or packer; Backside pressure has not retuned – continue to monitor
- Rattlesnake 16 SWD 1 – gas pressure on annulus. Pressure returns after bled off. This work must be coordinated with facility work.

In general, it would be good to get a run down of the SWD rules and regulations for New Mexico. I am familiar with other States, but not so much with NM.

Thank you in advance for your assistance.

Wayne McPherson
Production Engineer
Delaware Basin

Devon Energy Corporation
333 West Sheridan Ave
Oklahoma City, Oklahoma 73102-5015

(405) 552-3376 Direct
(405) 365-1026 Mobile

devon

Harms, Jenny

From: Schroder, Brent
Sent: Thursday, March 14, 2019 10:42 AM
To: Phillip.Goetze@state.nm.us
Cc: Bartlett, Brent; Garbrecht, Fred; Harms, Jenny; Prout, Tim
Subject: Cotton Draw 32 State 2 SWD Agreement
Attachments: Cotton Draw 32 State SWD 2 Ops Agreement.pdf

Philip, I understand our agreement with the NM EMNRD for annular pressure relieve of 200 psi on the Cotton Draw 32-2 SWD (API 30-025-41524) is due to expire this month. We have been monitoring the annulus pressure and for the past year we have consistently held ~50 psi on said annulus. We would like to work with you and your office to extend this agreement. Can you please let us know what mechanism/form we need to proceed with to formalize the extension request?

From an operational standpoint we have seen recent backside pressures up to 200 psi and have shut the well-in while we do diagnostics on the root cause. In short we are planning to set a wireline plug in the packer and pressure test (both positive and negative) the tubing and tubing casing annulus for diagnostics. Once these tests are performed we will share the results with the State and share our remediation plan.

If you have any further questions or concerns please let me know.

Thanks

Brent Schroder
Production Engineer, Delaware Basin
Devon Energy
333 West Sheridan Avenue
Oklahoma City OK 73102-5015
405.552.4921 (direct)
405.593.6714 (cell)
brent.schroder@dvn.com

Harms, Jenny

From: Goetze, Phillip, EMNRD <Phillip.Goetze@state.nm.us>
Sent: Friday, May 10, 2019 10:52 AM
To: Schroder, Brent
Cc: Garbrecht, Fred; Harms, Jenny; Prout, Tim; McMillan, Michael, EMNRD; Jones, William V, EMNRD
Subject: [EXTERNAL] RE: Cotton Draw 32 State 2 SWD Agreement

Brent:

Sorry for the delay in response. Thank you for informing the Division of the plan for further assessment of this well. Please keep us informed. And as a note, I see that the other SWD well with issues, Cotton Draw Unit 84 (30-015-29728; SWD-1621), has been approved for P&A which resolves this matter. PRG

Phillip Goetze, PG
Engineering Bureau, Oil Conservation Division, NM EMNRD
1220 South St. Francis Drive, Santa Fe, NM 87505
Direct: 505.476.3466
E-mail: phillip.goetze@state.nm.us

From: Schroder, Brent <Brent.Schroder@dvn.com>
Sent: Thursday, March 14, 2019 9:42 AM
To: Goetze, Phillip, EMNRD <Phillip.Goetze@state.nm.us>
Cc: Bartlett, Brent <Brent.Bartlett@dvn.com>; Garbrecht, Fred <Fred.Garbrecht@dvn.com>; Harms, Jenny <Jenny.Harms@dvn.com>; Prout, Tim <Tim.Prout@dvn.com>
Subject: [EXT] Cotton Draw 32 State 2 SWD Agreement

Philip, I understand our agreement with the NM EMNRD for annular pressure relieve of 200 psi on the Cotton Draw 32-2 SWD (API 30-025-41524) is due to expire this month. We have been monitoring the annulus pressure and for the past year we have consistently held ~50 psi on said annulus. We would like to work with you and your office to extend this agreement. Can you please let us know what mechanism/form we need to proceed with to formalize the extension request?

From an operational standpoint we have seen recent backside pressures up to 200 psi and have shut the well-in while we do diagnostics on the root cause. In short we are planning to set a wireline plug in the packer and pressure test (both positive and negative) the tubing and tubing casing annulus for diagnostics. Once these tests are performed we will share the results with the State and share our remediation plan.

If you have any further questions or concerns please let me know.

Thanks

Brent Schroder
Production Engineer, Delaware Basin
Devon Energy
333 West Sheridan Avenue
Oklahoma City OK 73102-5015
405.552.4921 (direct)

405.593.6714 (cell)
brent.schroder@dvn.com

Submit 1 Copy To Appropriate District Office
District I – (575) 393-6161
1625 N. French Dr., Hobbs, NM 88240
District II – (575) 748-1283
811 S. First St., Artesia, NM 88210
District III – (505) 334-6178
1000 Rio Brazos Rd., Aztec, NM 87410
District IV – (505) 476-3460
1220 S. St. Francis Dr., Santa Fe, NM 87505

HOBBSOCD
MAR 02 2017
RECEIVED

State of New Mexico
Energy, Minerals and Natural Resources

OIL CONSERVATION DIVISION
1220 South St. Francis Dr.
Santa Fe, NM 87505

Form C-103
Revised July 18, 2013

WELL API NO. 30-025-41524
5. Indicate Type of Lease STATE [X] FEE [ ]
6. State Oil & Gas Lease No.

SUNDRY NOTICES AND REPORTS ON WELLS
(DO NOT USE THIS FORM FOR PROPOSALS TO DRILL OR TO DEEPEN OR PLUG BACK TO A DIFFERENT RESERVOIR. USE "APPLICATION FOR PERMIT" (FORM C-101) FOR SUCH PROPOSALS.)

7. Lease Name or Unit Agreement Name: COTTON DRAW 32 STATE SWD
1. Type of Well: Oil Well [ ] Gas Well [ ] Other SWD
8. Well Number 2
2. Name of Operator: Devon Energy Production Co., L.P. Linda Good
9. OGRID Number 6137
3. Address of Operator: 333 West Sheridan Ave, Oklahoma City, OK 73102 405-552-6558
10. Pool name or Wildcat: PADUCA SOUTH
4. Well Location
Unit Letter P : 1180 feet from the SOUTH line and 1000 feet from the EAST line
Section 32 Township 24S Range 32E NMPM County LEA
11. Elevation (*Show whether DR, RKB, RT, GR, etc.*) 3477.7' GR

12. Check Appropriate Box to Indicate Nature of Notice, Report or Other Data

NOTICE OF INTENTION TO:				SUBSEQUENT REPORT OF:			
PERFORM REMEDIAL WORK	[ ]	PLUG AND ABANDON	[ ]	REMEDIAL WORK	[ ]	ALTERING CASING	[ ]
TEMPORARILY ABANDON	[ ]	CHANGE PLANS	[ ]	COMMENCE DRILLING OPNS.	[ ]	P AND A	[ ]
PULL OR ALTER CASING	[ ]	MULTIPLE COMPL	[ ]	CASING/CEMENT JOB	[ ]		
DOWNHOLE COMMINGLE	[ ]						
CLOSED-LOOP SYSTEM	[ ]						
OTHER: Remediation of Annular Pressure	[X]			OTHER:			[ ]

13. Describe proposed or completed operations. (Clearly state all pertinent details, and give pertinent dates, including estimated date of starting any proposed work). SEE RULE 19.15.7.14 NMAC. For Multiple Completions: Attach wellbore diagram of proposed completion or recompletion.

1. A description of the well control method to be used along with specifics on the final product to be used as the annular fluid: 14.8 pound per gallon Calcium Bromide (clear ultra saturated brine) was placed in the annulus between the injection string and production casing to control the slow gas migration through the suspected leaking collars of the BTC connections in the 7" 32# casing with the added hydrostatic pressure provided by the heavy fluid. Fluid was sourced from Tetra Technologies with the following additives for protection of the casing and tubing: Corsaf SP (corrosion inhibitor), Oxban HB (Oxygen scavenger), Spec Cide 50 (biocide), and H2S Scavenger ZF (precautionary only, no H2S in gas analysis sample.)
2. Agreement that the well will be included in the SCADA system being operated by Devon: The well is already set up in Devon operated SCADA system
3. A current well completion diagram showing the final configuration including the two packers: Updated PDP included with Sundry.
4. Conduct a successful MIT with bradenhead measurements to be witnessed by Division personnel before commencing injection: MIT ran 3/1/2017, included with Sundry.
5. Provisions for reporting the well's performance and any annular issues which may indicate a degradation in well control (e.g. pressure changes not related to operation, equipment failures at the well head, annular fluid losses, annular fluid releases, etc.) first for the 30 days following the commencement of injection, then followed by quarterly reporting (using standard calendar-year quarter system). These reports may be submitted on a C-103 Sundry to the District Supervisor to be included into the well file. The CBL log was sent via email on 2/28/17 to Phillip Goetz and Maxey Brown

I hereby certify that the information above is true and complete to the best of my knowledge and belief.

SIGNATURE Linda Good TITLE Regulatory Compliance Specialist DATE 3/2/2017

Type or print name Linda Good E-mail address: linda.good@dvn.com PHONE: 405-552-6558

For State Use Only

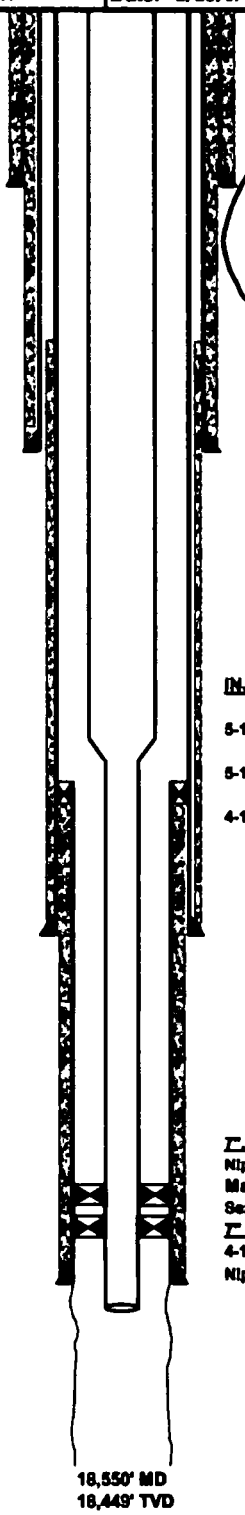
APPROVED BY: Maley Brown TITLE AO/II DATE 3/2/2017
Conditions of Approval (if any):

RBDMS - CHART - ✓

DEVON ENERGY PRODUCTION COMPANY LP

Well Name: COTTON DRAW 32 STATE SWD #2	Field: PADUCA SOUTH		
Location: 1180' FSL & 1000' FEL; SEC 32-T24S-R32E	County: LEA	State: NM	
Elevation: 3502.70' KB; 3477.70' GL; 25' KB to GL	Spud Date: 11/18/15	Compl Date:	
API#: 30-025-41524	Prepared by: Brent Bartlett	Date: 2/28/17	Rev:

CURRENT WELLBORE



26" Hole
20", 94#, J55, BTC, @ 609'
Cmt'd w/1700 sx, circ cmt to surface

TOC @ 3,500' - *CBL (1/24/16)*

18-1/8" Hole
16", 97#, NT80DE, BTC, @ 4,551'
Cmt'd w/2375 sx, circ cmt to surface

7" Liner Hanger @ 11,391'
unable to set hanger, set liner weight on bottom.
Performed positive/neg liner test. Good test.-1/16/16

14-3/4" hole to 8,816'
12-1/4" hole to 12,115'
9-5/8", 47#, P-110HC, BTC, @ 12,115'
Cmt'd w/3200 sx. TOC @ 3,500'-CBL, per wellview

8-1/2" Hole
7", 32#, P-110HC, BTC, liner bottom @ 16,982'
Cmt'd w/775 sx

DEVONIAN/SILURIAN/ORDOVICIAN
6" Open Hole 16,982' - 18,550'

18,550' MD
18,449' TVD

* **PACKER FLUID**
14.8# ppg Calcium Bromide packer fluid with additives for corrosion inhibitor, oxygen scavenger, biocide, and H2S scavenger(precautionary, gas analysis shows no H2S)

* SPECIAL NOTE *
WEIGHTED PACKER FLUID.

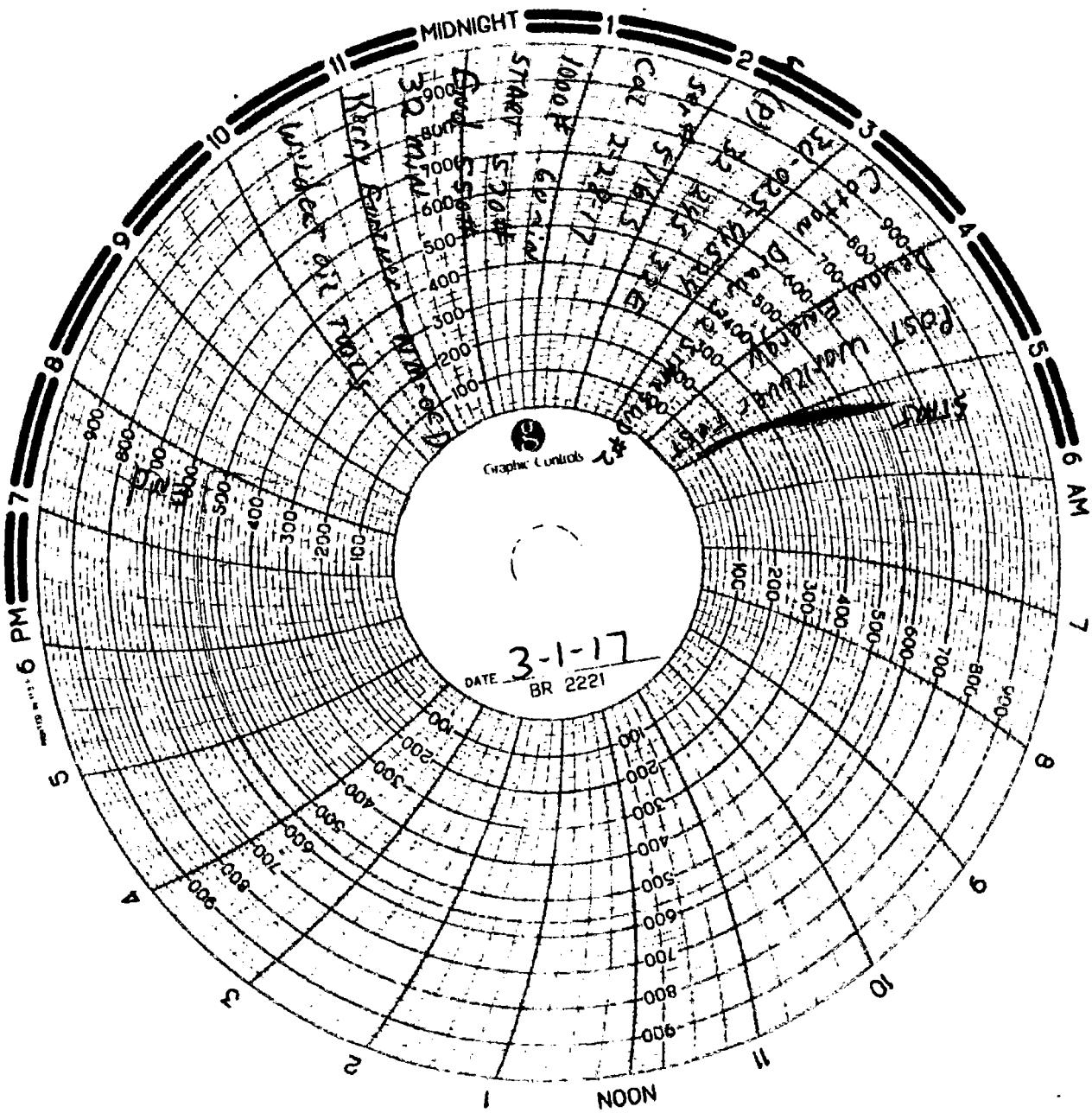
INJECTION TUBING - Set 12/30/16

5-1/2" 17#,P110: Western Falcon Polycore: surface to 11,315'

5-1/2" X 4-1/2" X/O: 11,315' - 11,317'

4-1/2", 11.7#, P110: Western Falcon Ultratube 11,317' - 16,933'

7" UltraPak Pkr 16,935' -16,940'
Nipple (2.813" id) 16,940' - 16,941'
Magnum dual disk assembly: 16,941' - 16,942'
Seal Assembly: 16,943' - 16,944'
7" UltraPak Pkr @ 16,944' - 16,949'
4-1/2", 11.7#, P110: Ultratube lining: 16,950' - 16,982'
Nipple (3.813" id) 16,982' - 16,983'


MIDNIGHT
NOON
6 AM
6 PM
Graphic Controls
DATE 3-1-17
BR 2221

District I
1625 N. French Dr., Hobbs, NM 88240
Phone: (575) 393-6161 Fax: (575) 393-0720

State of New Mexico
Energy, Minerals and Natural Resources Department
Oil Conservation Division Hobbs District Office

BRADENHEAD TEST REPORT

Operator Name	API Number
Devon Energy Production	30-025-41524
Property Name	**Well No.**
Cotton Draw 32 State SWD	002

Surface Location

UL - Lot	Section	Township	Range		Feet from	N/S Line	Feet From	E/W Line	County
P	32	24S	32E		1180	S	1000	E	Lea

Well Status

TA'D WELL		SHUT-IN		INJECTOR		PRODUCER		DATE
YES	NO	YES	NO	INJ	SWD	OIL	GAS	3-1-17

OBSERVED DATA

	(A)Surface	(B)Interm(1)	(C)Interm(2)	(D)Prod Csng	(E)Tubing
Pressure	0	0		0	0
Flow Characteristics					
Puff	Y / N	Y / N	Y / N	Y / N	CO2 ___
Steady Flow	Y / N	Y / N	Y / N	Y / N	WTR ___
Surges	Y / N	Y / N	Y / N	Y / N	GAS ___
Down to nothing	Y / N	Y / N	Y / N	Y / N	Type of Fluid Injected for Waterflood if applies.
Gas or Oil	Y / N	Y / N	Y / N	Y / N	
Water	Y / N	Y / N	Y / N	Y / N	

Remarks – Please state for each string (A,B,C,D,E) pertinent information regarding bleed down or continuous build up if applies.

Signature:		OIL CONSERVATION DIVISION
Printed name:		Entered into RBDMS
Title:		Re-test
E-mail Address:		
Date: 3-1-17	Phone:	
	Witness: Kerry Fortner - OCD	

399-3221

INSTRUCTIONS ON BACK OF THIS FORM

Goetze, Phillip, EMNRD

From: Goetze, Phillip, EMNRD
Sent: Wednesday, February 15, 2017 9:39 AM
To: 'Bartlett, Brent'
Cc: Brown, Maxey G, EMNRD; Jones, William V, EMNRD; Martin, Ed; McMillan, Michael, EMNRD; Whitaker, Mark A, EMNRD; Inge, Richard, EMNRD; Sanchez, Daniel J., EMNRD
Subject: Cottonwood Draw 32 State SWD No. 2 - Well Integrity and Proposed Operating Plan by Devon

RE: Cottonwood Draw 32 State SWD No. 2 (API 30-025-41524) Administrative Order SWD-1459

Brent:

The Santa Fe Bureau staff discussed the content of your presentation (Devon e-mail correspondence dated February 8, 2017) with Maxey Brown, District I Supervisor, and have come to the following conclusions and recommendations:

1. The Division is satisfied that Devon has provided sufficient testing and corresponding analysis to demonstrate that the integrity issue is isolated to the 7-inch liner; that gas entering the annulus is from the Pennsylvanian section and does not, at this time, affect the mechanical integrity of the well resulting in possible impacts of Underground Sources of Drinking Water (USDWs). Devon also provided an analysis of a sample of the annular gas which showed no detectable concentrations of hydrogen sulfide.
2. That Devon has proposed a plan of well control using a weighted annular fluid along with monitoring as a means to address the integrity issue while still having the disposal well available for use.
3. The Division views this proposed plan as only a temporary solution and shall limit it's application to this well to no more than two years following commencement of injection. Prior to the end of this period, Devon shall provide an alternative remedial solution that addresses the liner leakage.

The Division understands the ability to balance the annulus pressure to achieve 0 psi at surface is difficult and offers Devon the latitude to operate the well with an annular pressure that does not exceed 200 psi.

As such, Devon shall file a C-103 NOI with the District Supervisor for his approval containing the following items:

1. A description of the well control method to be used along with specifics on the final product to be used as the annular fluid;
2. Agreement that the well will be included in the SCADA system being operated by Devon;
3. A current well completion diagram showing the final configuration including the two packers;
4. Conduct a successful MIT with bradenhead measurements to be witnessed by Division personnel before commencing injection;
5. Provisions for reporting the well's performance and any annular issues which may indicate a degradation in well control (e.g. pressure changes not related to operation, equipment failures at the well head, annular fluid losses, annular fluid releases, etc.) first for the 30 days following the commencement of injection, then followed by quarterly reporting (using standard calendar-year quarter system). These reports may be submitted on a C-103 Sundry to the District Supervisor to be included into the well file.

Devon shall assure that all logs involving this well, including the CBL discussed in the presentation, are submitted to the District prior to commencing injection.

Though Devon's proposed plan has satisfied the requirements for the protection of USDWs under the New Mexico UIC program, the plan does raise issues concerning communication between formations with high potential for future horizontal development (lower Wolfcamp) that under rule (both NMAC and Oil and Gas Act) are to be isolated. Finally, the Division continues to express concern with Devon's recent experiences in the proper completion of their Devonian disposal wells. At this time, Devon is the only operator reporting similar well integrity issues for recently drilled Devonian

disposal wells, two of these being this well and the other being the Cotton Draw Unit SWD No. 84 (API 30-015-29728). The Division requests that Devon review its procedures with the intent to avoid future well integrity problems that require monitoring.

Thank you for the presentation and the rapid reply to our questions. The content of this e-mail along with Devon's submittals will be made part of the well file and the SWD order file. Please contact either Maxey or I regarding the content of this e-mail and any additional questions regarding this well. PRG

Phillip Goetze, PG
Engineering Bureau, Oil Conservation Division
New Mexico Energy, Minerals and Natural Resources Department
1220 South St. Francis Drive, Santa Fe, NM 87505
Direct: 505.476.3466
E-mail: phillip.goetze@state.nm.us

Goetze, Phillip, EMNRD

From: Bartlett, Brent <Brent.Bartlett@dvn.com>
Sent: Wednesday, February 8, 2017 4:16 PM
To: Goetze, Phillip, EMNRD
Subject: Cotton Draw 32 State SWD #2 summary slides
Attachments: 32-2 summary slides.pptx

Mr. Goetze,

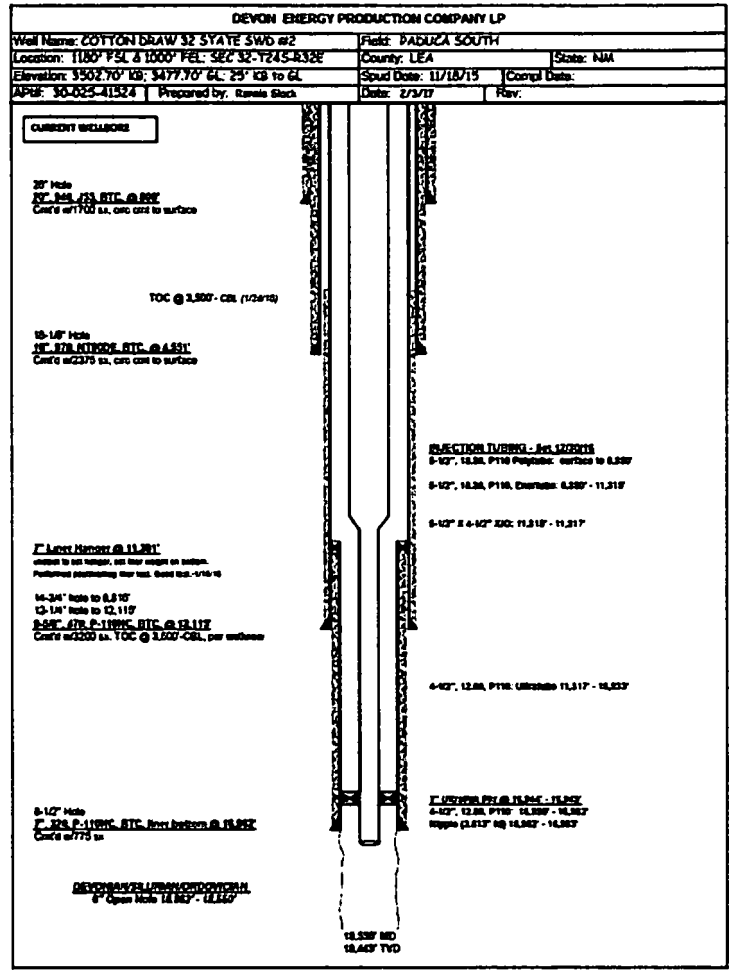
Please find the attached summary slides that we discussed this afternoon for your reference. I will plan on being available for your call and to discuss any other questions tomorrow morning at 9:30am OKC / 8:30am New Mexico time.

Thank you.

Brent Bartlett
Production Engineer-Delaware BU
Devon Energy
Brent.Bartlett@dvn.com
Office: 405.228.7233
Cell: 405.229.6221

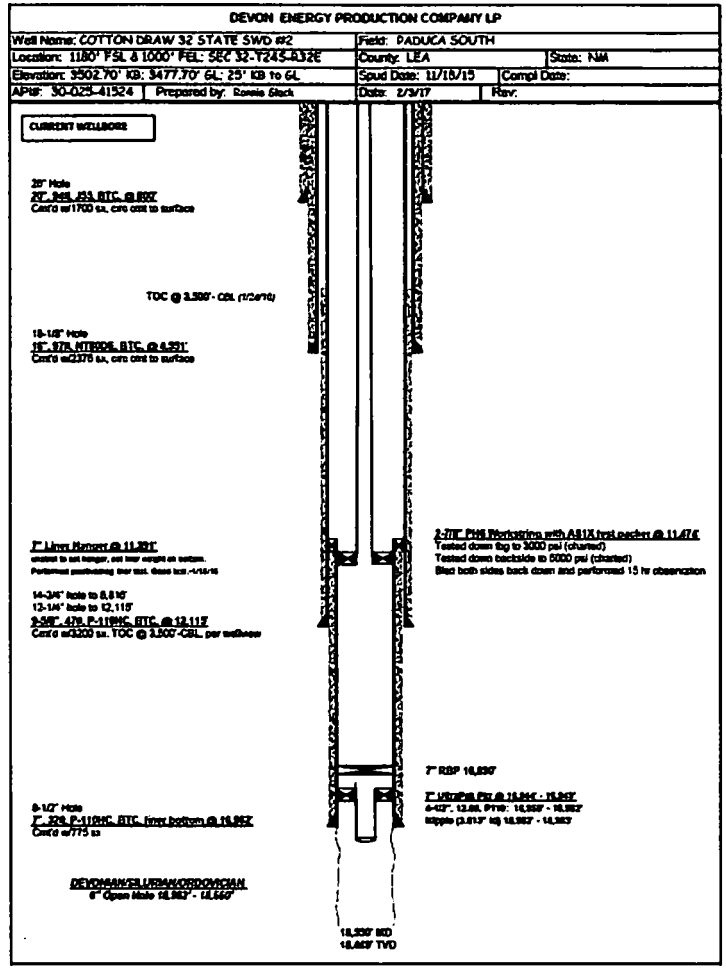
Cotton Draw 32 State SWD #2

- Pressure found on wellhead while working on facility.
- Bled down and had slight gas blow to tank.
- Pumped 390 bbls down tbg, with no pressure.
- Loaded casing w 4.3 bbls to perform MIT. Pumped 11 bbls total to pressure to 540 psi. Monitored for 32 minutes, ending pressure 565 psi.



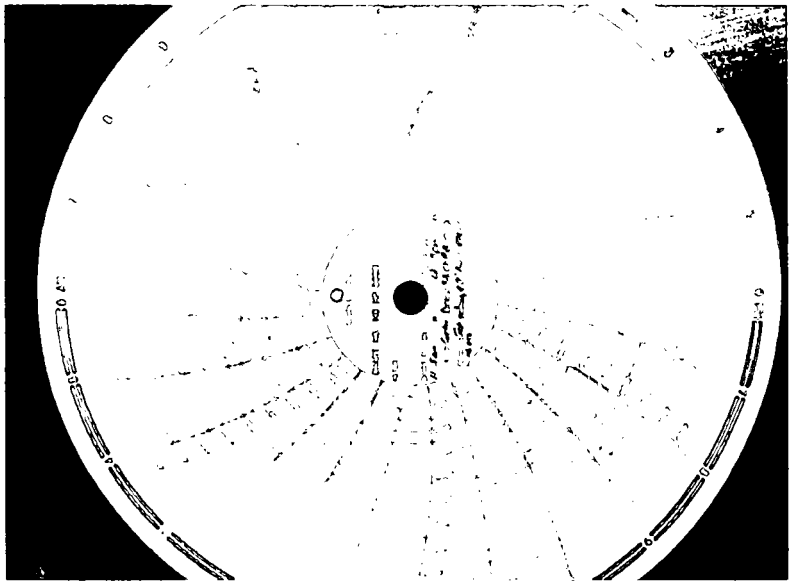
Cotton Draw 32 State SWD #2

- Tbg was pulled and 7" RBP set at 16,890'
- RIH with work string and test packer to top of 7" liner.
- Tested down tbg to test 7" liner to 3000 psi.
- Test down backside to test 9-5/8" csg and liner top packer to 5000 psi.
- Bled off and negative test for 15 hrs.
  - Tbg (Liner section) gained 355 psi
  - Backside gained 8 psi
- Confirmed pressure is coming from liner section and injection could not be established.

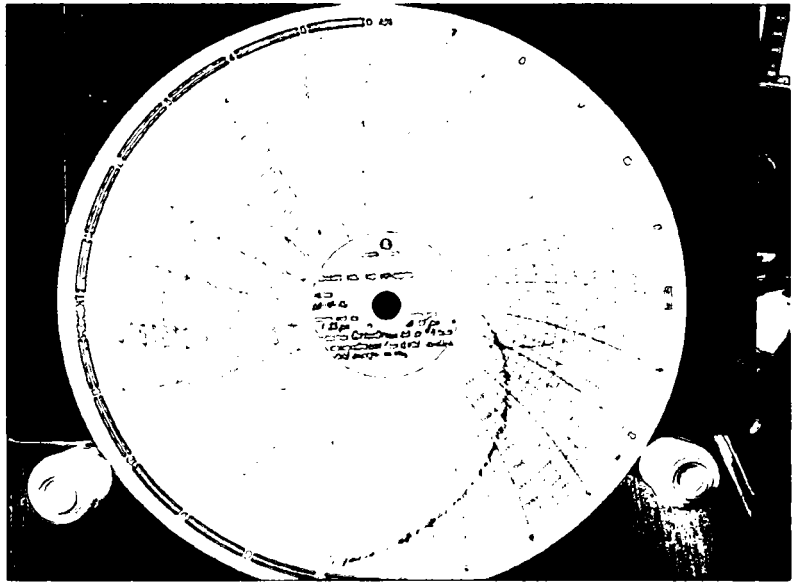


Cotton Draw 32 State SWD #2

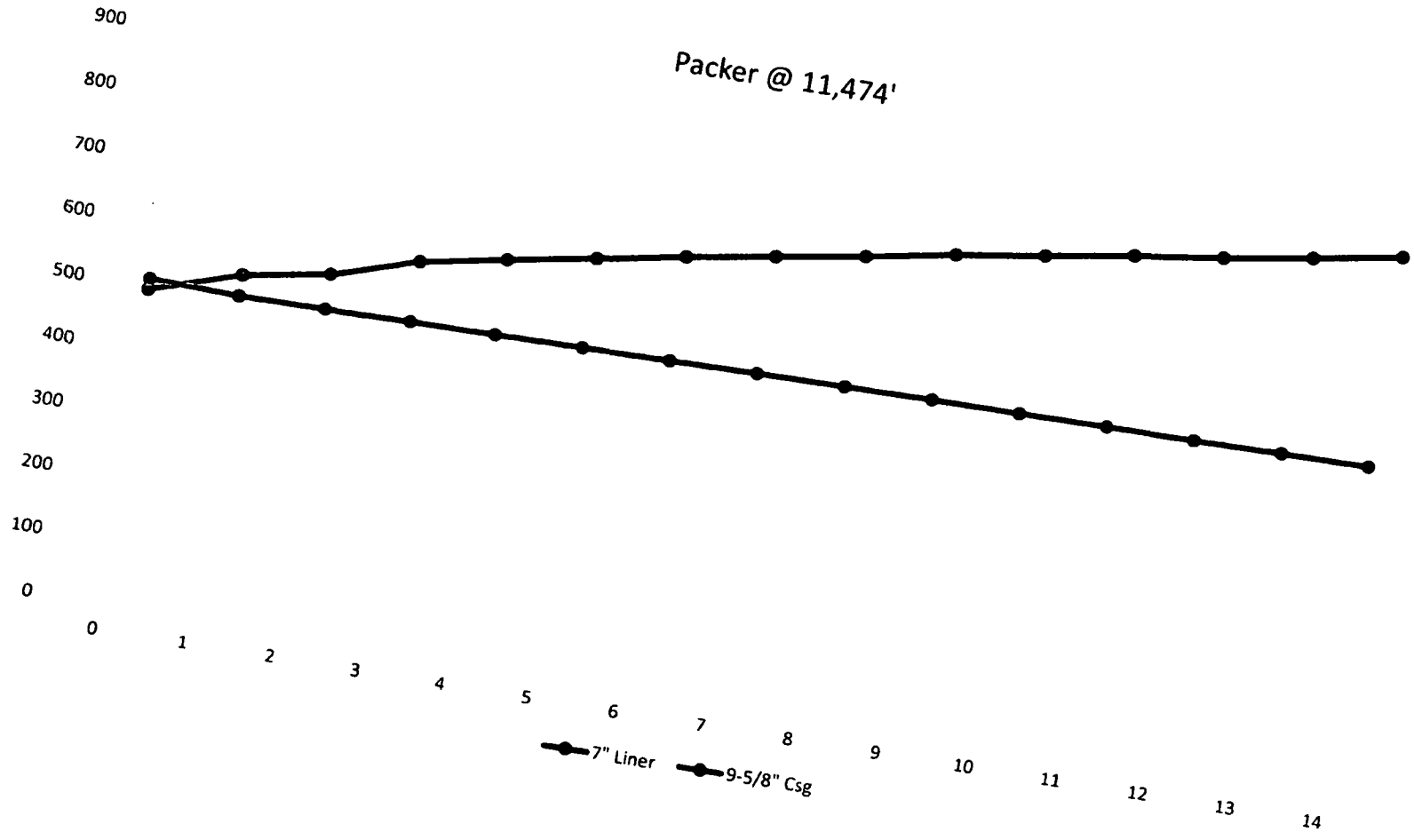
7” liner below Packer



9-5/8” Csg above Packer

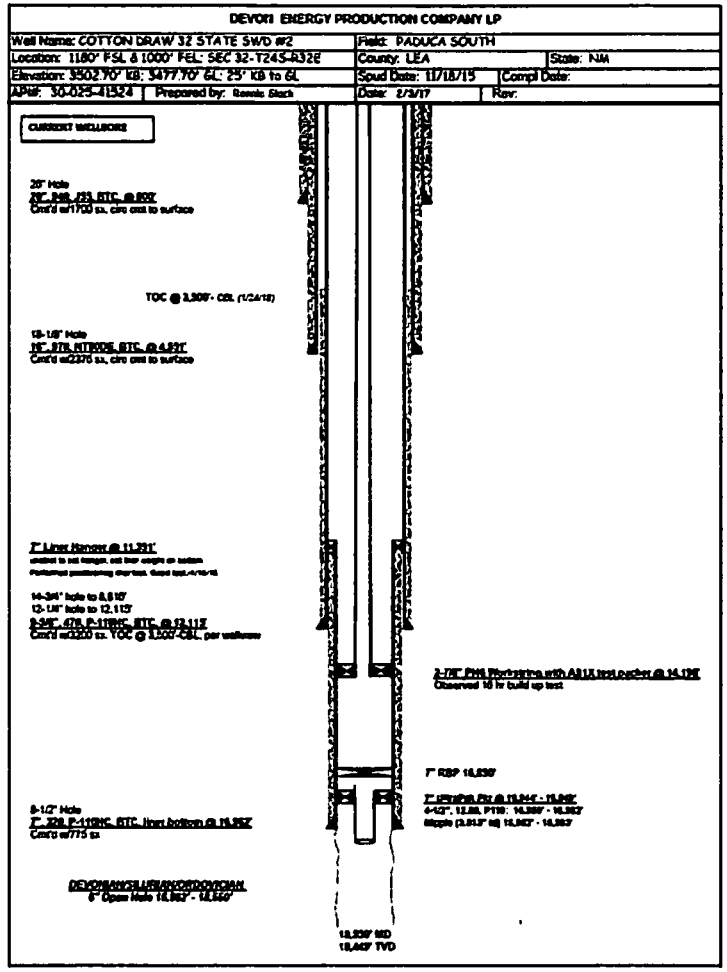


32-2- Build Up Test

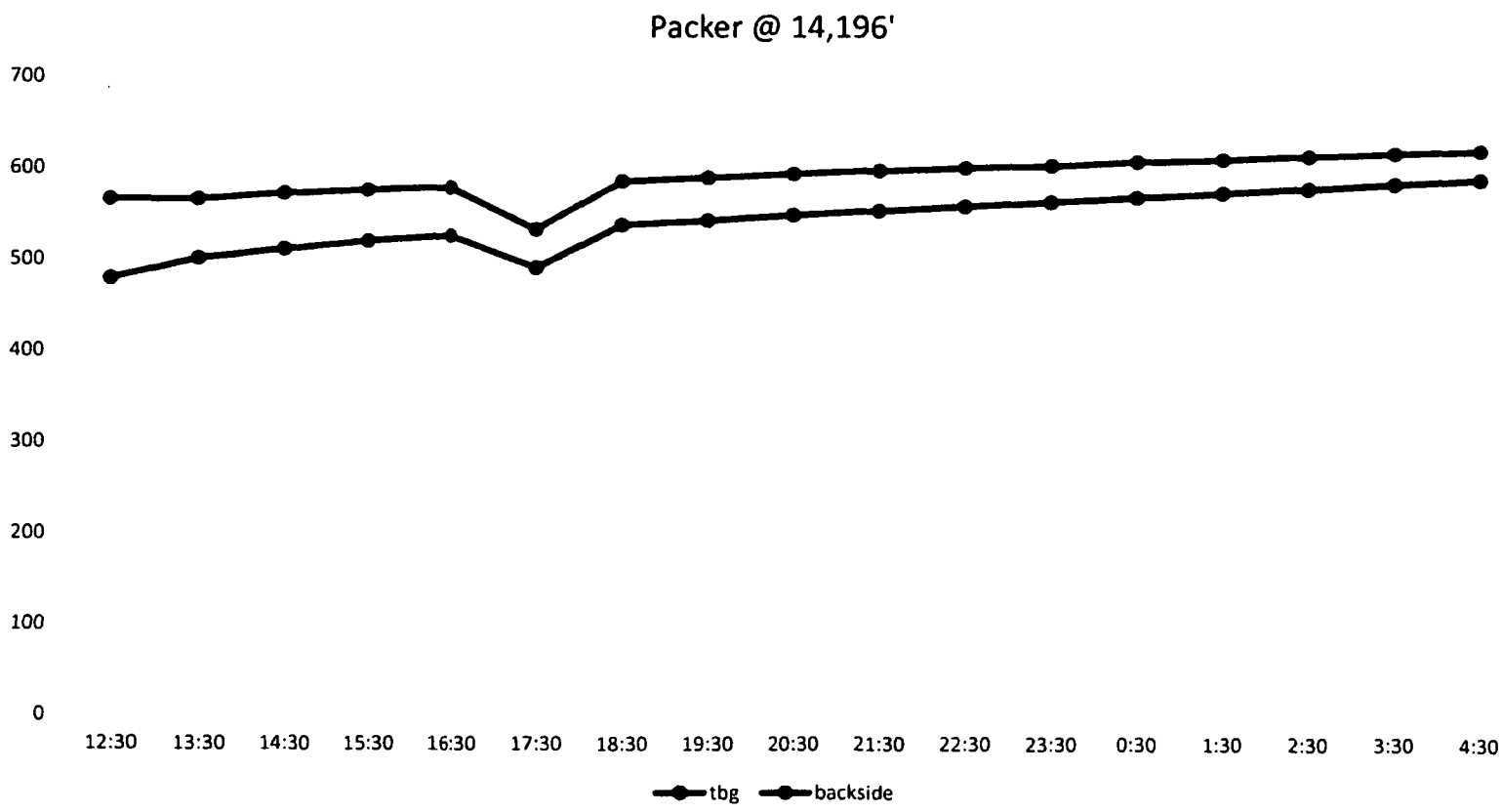


Cotton Draw 32 State SWD #2

- With build up confirmed in 7" liner section reset packer at 14,196'.
- Perform 16 hour build up.
- Saw pressure rise equally on both csg and tbg indicating multiple leaks.
- Believed to be from BTC connections used in liner sections which are not gas tight.

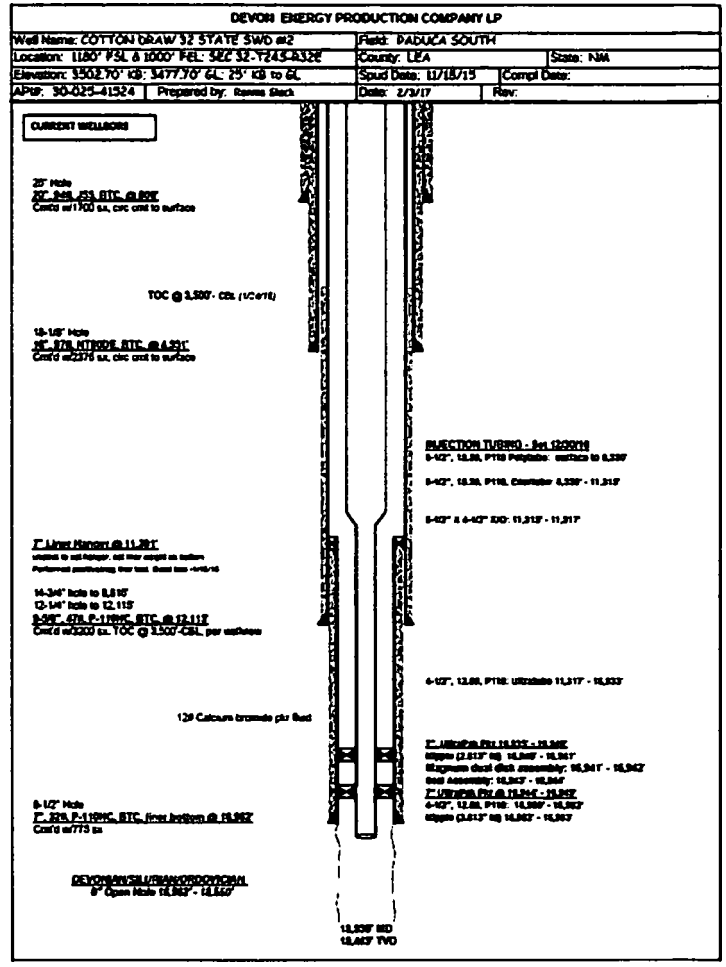


32-2- Build Up Test



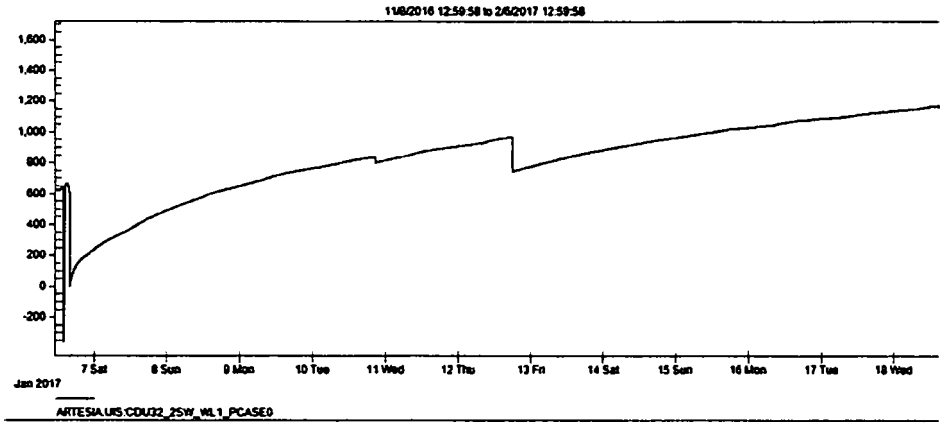
Cotton Draw 32 State SWD #2

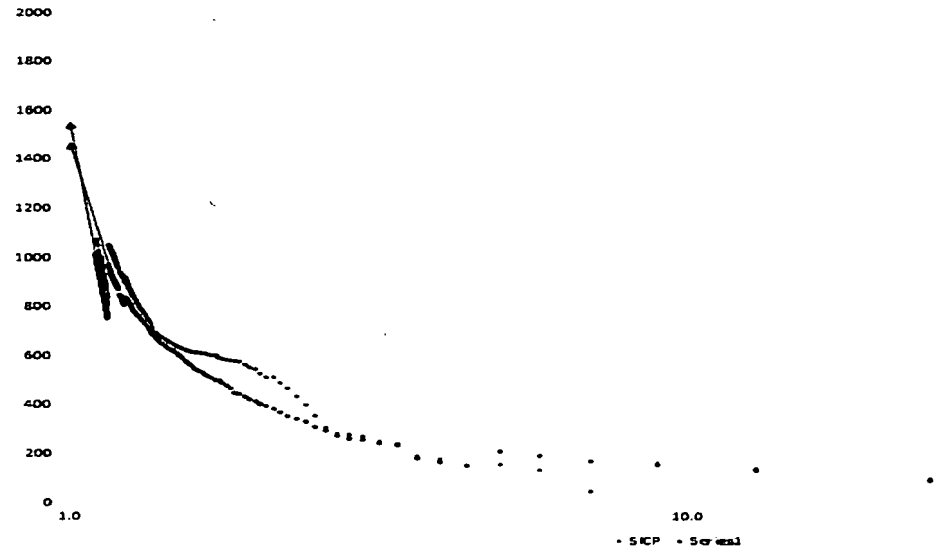
- Made decision to run injection tbg back in hole.
- Had to run 2nd packer to be able to get packer fluid on backside due to profile nipple size and tbg ID restriction from lining.
- 2nd packer is stung into 1st packer with seal assembly.
- Dual disc sub ran in second packer assembly to displace packer fluid. (still in tact)
- 12 # Calcium Bromide packer fluid circulated around on the backside and rig down to observe pressure.



Cotton Draw 32 Sate SWD #2

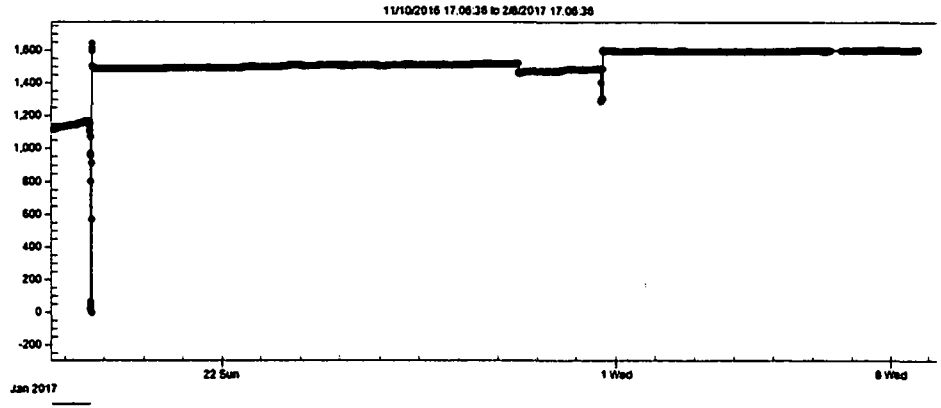
- Pressure continued to rise following workover.
- Bled off pressure, only gas. No fluid.
- Plotted data on Horner plot and determined a 1600 psi max pressure build.





Cotton Draw 32 Sate SWD #2

- To confirm max pressure projection from Horner plot, the well was bled off to remove any gas cap that had migrated and then 1500 psi was put on the well with a pump truck. Pressure remained constant
- Pressure was bled off and loaded and pressured to confirm fluid wasn't leaking off. (only took 1 bbl to load)
- 1600 additional psi would be equivalent to the hydrostatic of a 14.7 ppg fluid at the liner top. (11,391').
- This test shows that we have integrity and that heavy weight packer fluid would keep pressure in check.



Conclusion

- Devon is seeking approval to use 14.8 ppg Calcium Bromide brine (with oxygen scavenger, biocide, and corrosion inhibitor additives) as the annular packer fluid. We feel the diagnostic work done to date demonstrates casing integrity for any positive mechanical integrity testing concerns and still allows us the ability to monitor down to the injection packer(s) that are within the required proximity to the injection interval.

Goetze, Phillip, EMNRD

From: Bartlett, Brent <Brent.Bartlett@dvn.com>
Sent: Thursday, February 9, 2017 12:27 PM
To: Goetze, Phillip, EMNRD
Subject: Cotton Draw 32 State SWD #2 Gas Analysis
Attachments: COTTON DRAW 32-2 (WELLHEAD).pdf

Mr. Goetze,

During our phone call earlier today it was asked if we had a gas analysis from the backside pressure on our 32-2 SWD. I have found the analysis from the sample that was taken prior to our diagnostic work over efforts and wanted to pass it along. I'm not sure who on the call was requesting it but trust if it was someone else other than yourself you can get this to them since I don't have the email addresses of the others on the call.

Thanks.

Brent Bartlett
Production Engineer-Delaware BU
Devon Energy
Brent.Bartlett@dvn.com
Office: 405.228.7233
Cell: 405.229.6221

Natural Gas Analysis Report
AKM Measurement Services

Sample Information

	Sample Information
Sample Name	COTTON DRAW 32-2 (WELLHEAD)
Injection Date	2016-11-16 17:09:54

Component Results

Component Name	Norm%	GPM (Dry) (Gal. / 1000 cu.ft.)	
Nitrogen	0.7022	0.000	
Methane	93.7494	0.000	
CO2	0.0099	0.000	
Ethane	3.5493	0.951	
H2S	0.0000	0.000	
Propane	0.8521	0.235	
iso-Butane	0.1667	0.055	
n-Butane	0.2988	0.094	
iso-Pentane	0.1371	0.050	
n-Pentane	0.1420	0.052	
Hexanes Plus	0.3925	0.171	
Water	0.0000	0.000	
Total:	100.0000	1.608	

Results Summary

Result	Dry	Sat.	
Pressure Base (psia)	14.730		
Flowing Temperature (Deg. F)	82.0		
Flowing Pressure (psia)	168.0		
Gross Heating Value (BTU / Real cu.ft.)	1082.7	1064.2	
Relative Density (G), Real	0.6062	0.6067	
Total GPM	1.608	1.680	
Total Molecular Weight	17.521	17.530	