

**NM OIL CONSERVATION
ARTESIA DISTRICT**

OCD-ARTESIA

Form 3160-3
(August 2010)



**UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT**
United States Department of the Interior
SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill an unpermitted abandoned well. Use form 3160-3 (APD) for such proposals.

FORM APPROVED
ON 08/10/2015
Expires July 31, 2016

Lease Serial No.
NMLC029426B

**TAKE PRIDE
IN AMERICA**

1. Type of Well <input type="checkbox"/> Oil Well <input type="checkbox"/> Gas Well <input checked="" type="checkbox"/> Other: UNKNOWN OTH		6. If Indian, Allotment, or Tribal
2. Name of Operator APACHE CORPORATION		7. If Unit or CA/Agreement, Name and/or No.
3a. Address 303 VETERANS AIRPARK LANE SUITE 3000 MIDLAND, TX 79705		8. Well Name and No. CROW FEDERAL SWD 1
3b. Phone No. (include area code) Ph: 432-818-1062		9. API Well No. 30-015-42469
4. Location of Well (Footage, Sec., T., R., M., or Survey Description) Sec 9 T17S R31E NENE 890FNL 625FEL		10. Field and Pool, or Exploratory SWD;DEVONIAN-ELLENBURGER
11. County or Parish, and State EDDY COUNTY COUNTY, NM		

12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION
<input checked="" type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize <input type="checkbox"/> Deepen <input type="checkbox"/> Production (Start/Resume) <input type="checkbox"/> Water Shut-Off <input type="checkbox"/> Alter Casing <input type="checkbox"/> Fracture Treat <input type="checkbox"/> Reclamation <input type="checkbox"/> Well Integrity <input type="checkbox"/> Subsequent Report <input type="checkbox"/> Casing Repair <input type="checkbox"/> New Construction <input type="checkbox"/> Recomplete <input checked="" type="checkbox"/> Other <input type="checkbox"/> Final Abandonment Notice <input type="checkbox"/> Change Plans <input type="checkbox"/> Plug and Abandon <input type="checkbox"/> Temporarily Abandon Production Start-up <input type="checkbox"/> Convert to Injection <input type="checkbox"/> Plug Back <input type="checkbox"/> Water Disposal

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

This is an after-the-fact NOI Sundry requested by Paul Swartz of the BLM. Attached is the completion procedure Apache followed when completing this SWD well. Also attached is data provided by our geologist to substantiate the fact that there is no commercial production in this area, which includes log sections. There is contact information listed if speaking with the geologist is necessary.

**SUBJECT TO LIKE
APPROVAL BY STATE**

**SEE ATTACHED FOR
CONDITIONS OF APPROVAL**

Accepted for record

WSD 10/7/2015

14. I hereby certify that the foregoing is true and correct. Electronic Submission #313086 verified by the BLM Well Information System For APACHE CORPORATION, sent to the Carlsbad	
Name (Printed/Typed) REESA FISHER	Title SR STAFF REGULATORY ANALYST
Signature (Electronic Submission)	Date 08/18/2015
THIS SPACE FOR FEDERAL OR STATE OFFICE USE	
Approved By _____	Title _____
Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.	Office _____
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.	

ACCEPTED FOR RECORD

SEP 15 2015

PK Swartz

**BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE**

**** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ** OPERATOR-SUBMITTED ****



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Crowfoot, New Mexico

30815-27469

COMPLETION PROCEDURE

Roswell, New Mexico 88201-2019



Relative Data:

www.blm.gov/nm/st/en.html

Casing: 7" 10,573' 29# P110 followed by 3,387' 29# HCL-80 (Total Length 13,960')

KB = 25 ft (AGL) TD = 14,000' KB

1. Test 7" casing surface to DV Tool to 5000 psig.
2. Pick up 6" bit & DCs on 3 1/2" PH6 P110 (weight 10.3# or greater) work string and drill out DV Tool at 10,573' and test 7" casing to 5000 psig.
3. Clean out 7" casing to float collar at 13,914'. TOH with bit.
4. Run CBL-GR-CNL surface to TD.
5. Evaluate possible remediation & completion.
6. Perforate Devonian per cased log and geologic analysis @ 2SPF 60 degree phasing using a charge that generates a .37 to .42" hole 13,720 - 840'. TIH w/ Treating packer on 3 1/2" work string.
7. Spot acid over perms 13,840-13,720'. Acid Devonian perms 13,720 to 13,840' w/10,000 gals 15% HCL NEFE acid at 10 to 12 bpm not to exceed 5000 psig using BS to divert. Over flush acid stimulation with 100 Bbl 10# brine water. Record 5, 10 15 & 30 minute shut in. Release pkr. & knock balls off. TOH w/pkr.
8. Perforate Devonian per cased log and geologic analysis @ 2SPF 60 degree phasing using a charge that generates a .37 to .42" hole 13,300 - 500. TIH w/ Prk & RTBP. Set RTBP at 13,600' w/pkr at 13,550'. Test RTBP to 2000 psi. Spot acid over perms 13,300 to 13,500. Re-set pkr at 13,200'. Acid Devonian perms 13,300 to 13,500' w/20,000 gals 15% HCL NEFE acid at 10 to 12 bpm not to exceed 5000 psig do not use BS to divert. Over flush acid stimulation with 100 Bbl 10# brine water. Record 5, 10 15 & 30 minute shut in. Retrieve BP and TOH with tools.
9. Run 4 1/2" Duolined injection tubing. Set Packer assem 100' above perms at 13,300. Test Annulus. Run 4 point injectivity test using 10 PPG brine @ 2, 4, 6 & 8 BPM using 50 barrels 10# brine water per injection rate point. Not to exceed 5000 psig. Evaluate injectivity. If necessary acid Frac down 4 1/2" tubing per recommendation.
10. Perforate, stimulate and test additional pay as necessary.
11. Place on injection. If injection results do not meet expectations call engineer and move to next steps.
12. MIRU Wireline and lubricator. PU 2" RTG guns and run in under lubricator. Tag for fill with guns, move up hole to perforation interval.



United States Department of the Interior



Devonian por case log and geologic analysis @ 4SPF 60 degree phasing using a charge!
that generates a .37 to .42" hole 13,776' - 13,818' & 13,433' - 13,475'. POOH w/ WL.
BUREAU OF LAND MANAGEMENT
Devonian perfs 13,433 to 13,818' w/ 10,000 gals 15% HCL NEFE acid at 10 to 12
exceed 5000 psig. Over flush acid stimulation with 200 Bbl 10# brine water. Record 5, 10, 15, & 30
minute shut in.

2909 West Second Street
Roswell, New Mexico 88201-2019
www.blm.gov/nm/st/en.html

15. Place on injection.



United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Pecos District

Roswell Field Office

2909 West Second Street

Roswell, New Mexico 88201-2019

www.blm.gov/nm/st/en.html



Federal SWD #1 NOI SUNDRY

This document serves as Apache Corporation's procedure to review and verify Section F, item 1 and 2 of the notice of intent sundry:

- 1) Properly evaluate the injection zone utilizing open hole logs, swab testing and/or any other method to confirm that hydrocarbons cannot be produced in paying quantities. This evaluation shall be reviewed by the BLM prior to injection commencing.
- 2) Restrict the injection fluid to the approved formation

PERF INTERVAL: 13,300'–13,500' 13,720'–13,840'

MUD LOG

No observed oil shows are recorded in the mud log from 13,300 – 13,840' MD as indicated by absence of fluorescence, cut, and continuous gas readings as shown in Figure 1. The mud log is shown over a depth interval from 13,280' to 13,920' MD. Track 1 contains drill rate in Minutes/5Ft. Track 2 is interpreted lithology with visual porosity, fluorescence, and cut indicators that are colored in black. Track 3 is the sample description of the well cuttings. Track 4 shows recorded gas units with their curve explanation toward the top of the Figure 1.

OPEN HOLE LOGS

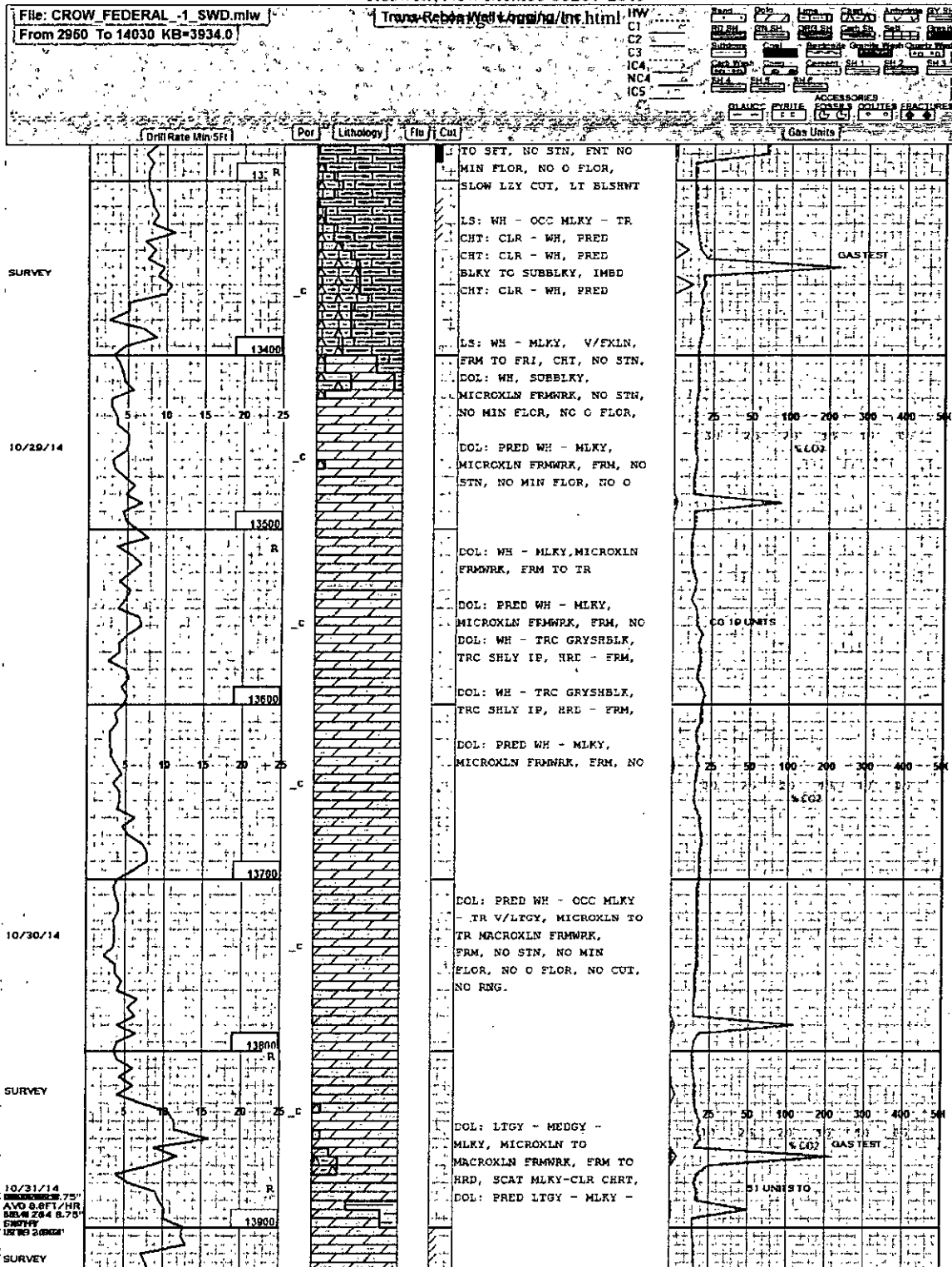
Well logs do not show a hydrocarbon profile over porous intervals shown in Figure 2. This interpretation matches with the no oil shows observed in the mud log. Interpreted formation tops are Woodford Shale at 13,012' MD and Devonian at 13,079' MD. Track 1 contains gamma ray on a scale from 0 to 150 API. Track 2 contains the depth interval from 12,900 to 13,900' MD with each interval equal to 20' MD. Track 3 shows the shallow laterolog reading in red and deep laterolog reading in blue. The scale for track 3 is logarithmic and ranges from 0.2 to 2,000 ohm-m. Track 4 contains bulk density, shown in red, and neutron porosity in the blue dashed line. Bulk density is on a scale from 2 to 3 g/cm³ while neutron porosity ranges from 45% to -15%.

Geologist: Mike Muncy

Apache Corporation

Email: mike.muncy@apachecorp.com

Office: 432-818-1622





United States Department of the Interior

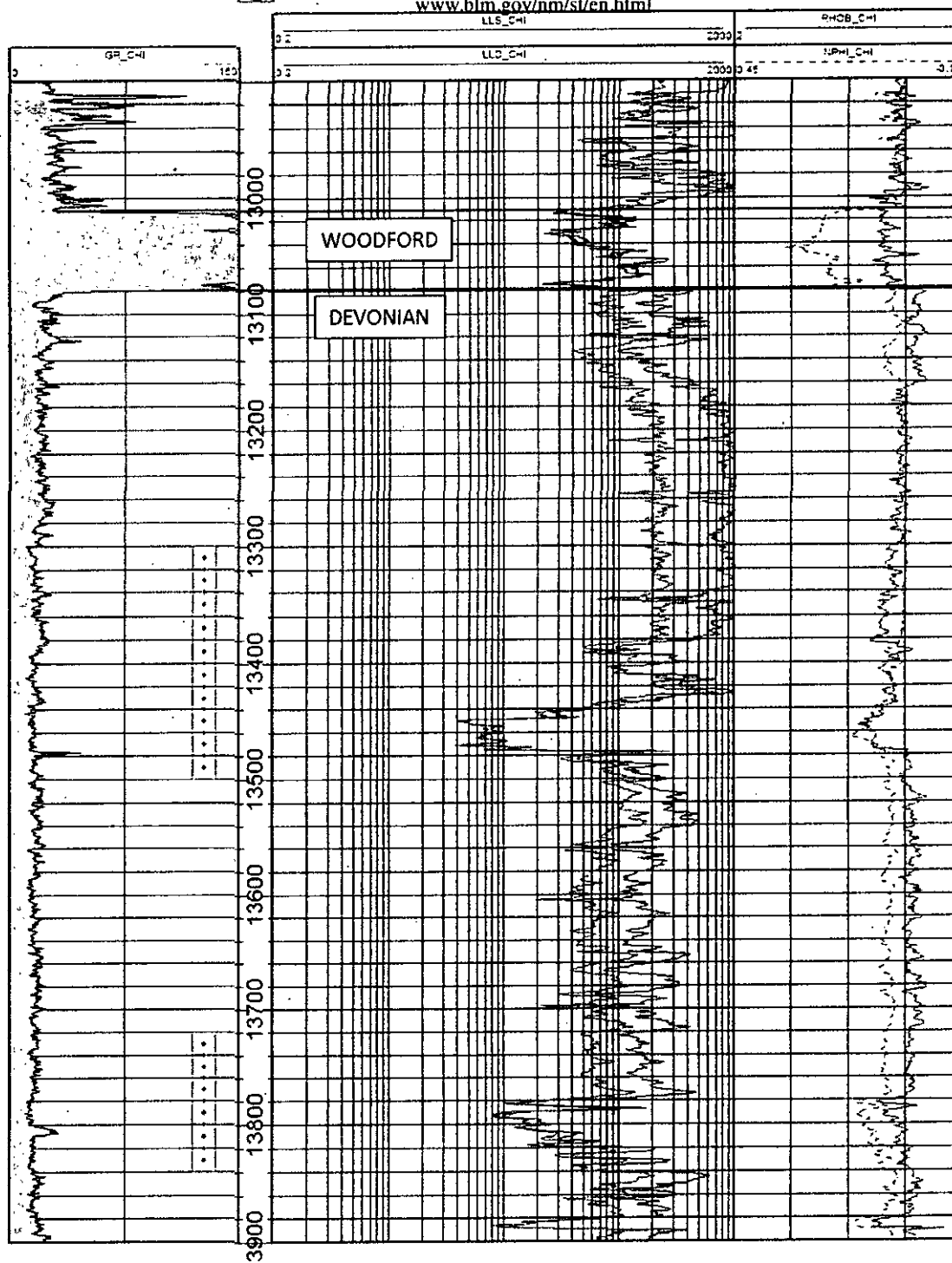


BUREAU OF LAND MANAGEMENT
Crow Federal SWD #1 Open hole logs Pecos District

Crow Federal SWD 1
APACHE CORPORATION



Roswell Field Office
2909 West Second Street
Roswell, New Mexico 88201-2019
www.blm.gov/nm/st/en.html



30015424690000

Conditions of Approval

Apache Corporation
Crow - 01, API 3001542469
T17S-R31E, Sec 09, 890FNL & 625FEL
September 15, 2015

1. Subject to like approval by the New Mexico Oil Conservation Division.
2. Notify BLM 575-200-7902 Eddy Co. as work begins. Some procedures are to be witnessed. If there is no response, call 575-361-2822, leave a voice mail with the API#, workover purpose, and a call back phone number. Note the contact, time, & date in your subsequent report.
3. **Perform a charted casing integrity test** of 2660psig minimum from 13250' to surface. Document the pressure test on a one hour full rotation calibrated (within 6 months) recorder chart registering within 25 to 85 per cent of its full range. **Verify all annular casing vents are plumbed to the surface and open during this pressure test. Call BLM 575-200-7902 and arrange for a BLM witness of that pressure test.** Include a copy of the chart in the subsequent sundry for this workover.
4. Before casing or a liner is added, replaced, or repaired prior BLM approval of the design is required. Use notice of intent Form 3160-5.
5. **Provide BLM with an electronic copy (Adobe Acrobat Document) cement bond log record from 13250 or below to top of cement taken with 0psig casing pressure. The CBL may be attached to a pswartz@blm.gov email.**
6. **Do not exceed the approved SWD-1460a injection pressure of 2660 with stimulation pump pressure to attain the 12BMP rate of the submitted procedure.**
7. Surface disturbance beyond the existing pad shall have prior approval.
8. A closed loop system is required. The operator shall properly dispose of drilling/circulating contents at an authorized disposal site. Tanks are required for all operations, no excavated pits.
9. Functional H₂S monitoring equipment shall be on location.
10. 5000 (5M) Blow Out Prevention Equipment to be used. All BOPE and workover procedures shall establish fail safe well control. Blind ram(s) and pipe ram(s) designed to close on all workstring diameters used is required equipment. A manual BOP closure system (hand wheels) shall be available for use regardless of BOP design. Function test the installed BOPE to 500psig when well conditions allow. Related equipment, (choke manifolds, kill trucks, gas vent or flare lines, etc.) shall be employed when needed for reasonable well control requirements.
11. All waste (i.e. trash, salts, chemicals, sewage, gray water, etc.) created as a result of work over 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.

12. Submit a (BLM Form 3160-5 subsequent report (daily reports) via BLM's Well Information System; <https://www.blm.gov/wispermits/wis/SP> (email pswartz@blm.gov for instructions) describing all wellbore activity and Mechanical Integrity Test as per item 1) above. Include the date(s) of the well work, and the setting depths of installed equipment: internally corrosive protected tubing, tubing on/off equipment just above the packer, and an in line tubing check valve below the packer or between the on/off tool and packer. The setting depths and descriptions of each are to be included in the subsequent sundry. File intermediate Form 3160-5 within 30 days of any interrupted workover procedures and a complete workover subsequent sundry.
13. Submit the BLM Form 3160-4 **Recompletion Report** within 30 days of the date all BLM approved procedures are complete.
14. Workover approval is good for 90 days (completion to be within 90 days of approval). A legitimate request is necessary for extension of that date.
15. The operator shall test for oil and gas production from the injection zone. Demonstrate that paying quantities of hydrocarbons are not produced when the well has a pumped off fluid level. Open hole logs may support the evaluation. BLM agreement is to be obtained prior completion as a disposal well.
16. Approval is granted for disposal of water produced from the lease, communitization, or unit agreement of this well only. Disposal fluid from another operator, lease, communitization, or unit agreement require BLM surface right-of-way agreement **approvals** and if applicable, authorization from the surface owner.
17. Disposal of water from another operator requires that the well be designated as a commercial well and BLM surface right-of-way agreement **approvals**.
18. If the well is to receive off-lease water or commercial disposal, the operator shall provide proof of surface right-of-way approval prior to injection.
19. Enclose a site security diagram for the water disposal facility upstream of this well. Document the lease name and the lease number of the source(s) of production water disposed to that facility with the diagram.
20. Should "beneficial use" not be achieved submit for BLM approval a plan for plug and abandonment.

Well with a Packer - Operations

- 1) Conduct a Mechanical Integrity Test of the tubing/casing annulus after a tubing, packer or casing seal is established.
- 2) The minimum test pressure should be 500 psig for 30 minutes or 300 psig for 60 minutes, with a minimum 200 psig differential between tubing and casing pressure (at test time) but no more than 70% of casing burst pressure as described by Onshore Order 2.III.B.1.h. (The tubing or reservoir pressure may need to be reduced). Verify all annular casing vents are plumbed to surface and those valves open to the surface during this pressure test. An alternate method for a BLM approved MIT is to have the fluid filled system open to atmospheric pressure and have a loss of less than five barrels in 30 days witnessed by a BLM authorized officer.
- 3) Document the pressure test on a one hour full rotation chart recorder (calibrated within the last 6 months) registering within 25 to 85 per cent of its full range. Greater than 10% pressure leakoff will be viewed as a failed MIT. Less than 10% pressure leakoff will be evaluated site specifically and may restrict injection approval.
- 4) Make arrangements 24 hours before the test for BLM to witness. In Eddy County email Paul R. Swartz pswartz@blm.gov or phone 575-200-7902, if there is no response, 575-361-2822. If no answer, leave a voice mail or email with the API#, workover purpose, and a call back phone number
- 5) Use of tubing internal protection, tubing on/off equipment just above the packer, a profile nipple, and an in line tubing check valve below the packer or between the on/off tool and packer is a "Best Management Practice". The setting depths and descriptions of each are to be included in the subsequent sundry.
- 6) Compliance with a NMOCD Administrative Order is required, submit documentation of that authorization.
 - a) Approved injection pressure compliance is required.
 - b) If injection pressure exceeds the approved pressure you are required to reduce that pressure and notify the BLM within 24 hours.
 - c) When injection pressure is within 50 psig of the maximum pressure, install automation equipment that will prevent exceeding that maximum. Submit a subsequent report (Sundry Form 3160-5) describing the installed automation equipment within 30 days.
- 7) Unexplained significant variations of rate or pressure to be reported within 5 days of notice.
- 8) The casing/tubing annulus is required to be monitored for communication with injection fluid or loss of casing integrity. A BLM inspector may request verification of a full annular fluid level at any time.
- 9) A "Best Management Practice" is to maintain the annulus full of packer fluid at atmospheric pressure. Equipment that will display on site, continuous open to the air fluid level is necessary to achieve this goal.
- 10) Loss of packer fluid above five barrels per month indicates a developing problem. Notify BLM Carlsbad Field Office, Petroleum Engineering within 5 days.

- 11) A suggested format for monthly records documenting that the casing annulus is fluid filled is available from the BLM Carlsbad Field Office.
- 12) Gain of annular fluid pressure requires notification within 24 hours. Cease injection and maintain a production casing pressure of Opsia. Notify the BLM's authorized officer ("Paul R. Swartz" <pswartz@blm.gov>, cell phone 575-200-7902). If there is no response phone 575-361-2822.
- 13) Submit a (BLM Form 3160-5 subsequent report (daily reports) via BLM's Well Information System; <https://www.blm.gov/wispermits/wis/SP> (email pswartz@blm.gov for operator setup instructions) describing all wellbore activity and Mechanical Integrity Test as per item 1) above. Include the date(s) of the well work, and the setting depths of installed equipment: internally corrosive protected tubing, tubing on/off equipment just above the packer. The setting depths and descriptions of each are to be included in the subsequent sundry.
- 14) A request for increased wellhead pressures is to be accompanied by a step rate test. PRIOR to a Step Rate Test BLM – CFO is requiring a Notice of Intent.
- 15) Class II (production water injection) wells will not be permitted stimulation injection pressures that exceed frac pressure.

Access information for use of Form 3160-5 "Sundry Notices and Reports on Wells"

NM Fed Regs & Forms - http://www.blm.gov/nm/st/en/prog/energy/oil_and_gas.html

§ 43 CFR 3162.3-2 Subsequent Well Operations.

§ 43 CFR 3160.0-9 (c)(1) Information collection.

§ 3162.4-1 (c) Well records and reports.