PECOS DISTRICT
DRILLING CONDITIONS OF APPROVAL

OPERATOR'S NAME:	Ameredev Operating LLC
LEASE NO.:	NMNM136233
WELL NAME & NO.:	Firethorn Fed Com 26 36 04 113H
SURFACE HOLE FOOTAGE:	200'/S & 1700'/W
BOTTOM HOLE FOOTAGE	330'/S & 1700'/W
LOCATION:	Section 33, T.25 S., R.36 E., NMPM
COUNTY:	Lea County, New Mexico

Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	◉ Conventional	○ Multibowl	
Other	☐ 4 String Area	☒ Capitan Reef	☐ WIPP

A. Hydrogen Sulfide

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

B. CASING

1. The **13 3/8** inch surface casing shall be set at approximately **1350** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface.

   i. 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.

   ii. 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).

   iii. 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.

iv. If cement falls back, remedial cementing will be done prior to drilling out that string.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

2. The minimum required fill of cement behind the **9 5/8** inch first intermediate casing is:
    - Cement to surface. If cement does not circulate see B.1.a, c-d above. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to Capitan Reef.**

3. The minimum required fill of cement behind the **7 5/8** inch second intermediate casing is:
    - Cement should tie-back at least **50** feet above the top of Capitan Reef (Capitan Reef Top estimated at 3680'). Operator shall provide method of verification. **Excess calculates to negative 14% - additional cement will be required.**

Pilot hole is required to have plug from 13600' – 13364' and from 11,178' – 10,968' (KOP plug). BLM is to be contacted (575-393-3612) prior to tag of bottom plug. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report. Excess calculates to 0% - additional cement will be required.

4. The minimum required fill of cement behind the **5 1/2** inch production casing is:
    - Cement as proposed. Operator shall provide method of verification. **Excess calculates to 23% - additional 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:

i. 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. **In the case where the only BOP installed is an annular preventer, it shall be tested to a minimum of 2000 psi (which may require upgrading to 3M or 5M annular).**

ii. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **9 5/8** inch first intermediate casing shoe shall be **5000 (5M)** psi.

iii. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7 5/8** inch second intermediate casing shoe shall be **10,000 (10M)** psi. **Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi.)**

Option 2:

i. 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 **10,000 (10M)** 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. 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.

Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi.)

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.

Waste Minimization Plan (WMP)

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

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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. Operator shall perform the intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.
    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:	Ameredev Operating LLC
LEASE NO.:	NMNM136233
WELL NAME & NO.:	Firethorn Fed Com 26 36 04 113H
SURFACE HOLE FOOTAGE:	200'/S & 1700'/W
BOTTOM HOLE FOOTAGE	330'/S & 1700'/W
LOCATION:	Section 33, T.25 S., R.36 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.

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)

Watershed:

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. 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 berm shall be maintained through the life of the well and 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.

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.

VI. CONSTRUCTION

A. NOTIFICATION

The BLM shall administer compliance and monitor construction of the access road and well pad. Notify the 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 .

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.

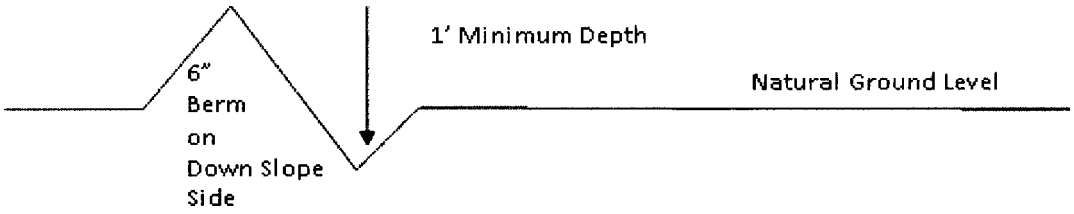
Ditching
Ditching shall be required on both sides of the road.

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, leadoff 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.



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 %);

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

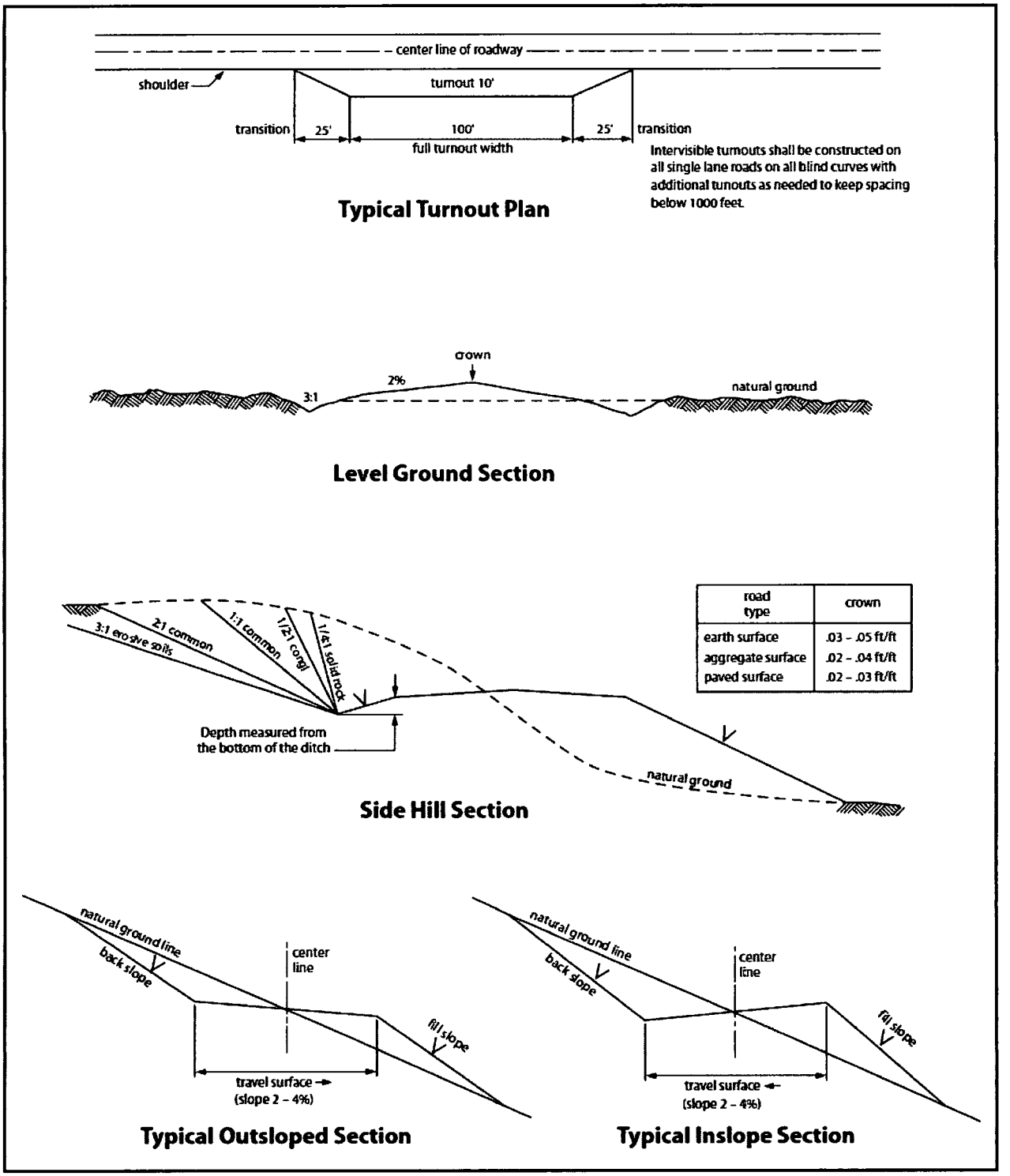


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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
(X) seed mixture 2	( ) seed mixture 4
( ) 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.

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) 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 activity of 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. The holder shall be liable for damage or injury to the United States to the extent provided by 43 CFR Sec. 2883.1-4. The holder shall be held to a standard of strict liability for damage or injury to the United States resulting from pipe rupture, fire, or spills caused or substantially aggravated by any of the following within the right-of-way or permit area:

a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
b. Activities of other parties including, but not limited to:
    (1) Land clearing.
    (2) Earth-disturbing and earth-moving work.
    (3) Blasting.
    (4) Vandalism and sabotage.
c. Acts of God.

The maximum limitation for such strict liability damages shall not exceed one million dollars ($1,000,000) for any one event, and any liability in excess of such amount shall be determined by the ordinary rules of negligence of the jurisdiction in which the damage or injury occurred.

This section shall not impose strict liability for damage or injury resulting primarily from an act of war or from the negligent acts or omissions of the United States.

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, 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, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the 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 the holder of any responsibility as provided herein.

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

way width of 20 feet. If the pipeline route follows an existing road or buried pipeline right-of-way, the surface pipeline must be installed no farther than 10 feet from the edge of the road or buried pipeline right-of-way. If existing surface pipelines prevent this distance, the proposed surface pipeline must be installed immediately adjacent to the outer surface pipeline. All construction and maintenance activity will be confined to existing roads or right-of-ways.

7. No blading or clearing of any vegetation will be allowed unless approved in writing by the Authorized Officer.

8. The holder shall install the pipeline on the surface in such a manner that will minimize suspension of the pipeline across low areas in the terrain. In hummocky of duney areas, the pipeline will be "snaked" around hummocks and dunes rather then suspended across these features.

9. The pipeline shall be buried with a minimum of 24 inches under all roads, "two-tracks," and trails. Burial of the pipe will continue for 20 feet on each side of each crossing. The condition of the road, upon completion of construction, shall be returned to at least its former state with no bumps or dips remaining in the road surface.

10. 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.

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. Excluding the pipe, all above-ground structures not subject to safety requirement shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be a color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2; designated by the Rocky Mountain Five State Interagency Committee.

13. 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. Signs will be maintained in a legible condition for the life of the pipeline.

14. 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. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. 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 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.

16. 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, powerline 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.

17. Surface pipelines must be less than or equal to 4 inches and a working pressure below 125 psi.

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.

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).

(Insert Seed Mixture Here)

AMEREDEV

Ameredev Operating, LLC

Lea County, NM (NAD83 NME)
(FIRETHORN)SEC 33_T-25-S_R-36-E
Firethorn Fed Com 26_36_4 #113H

OWB

Plan: Plan #1

Standard Planning Report

06 December, 2017

INTREPID

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Project	Lea County, NM (NAD83 NME)		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	(FIRETHORN)SEC 33_T-25-S_R-36-E				
Site Position:		**Northing:**	394,502.00 usft	**Latitude:**	32° 4' 48.467 N
From:	Map	**Easting:**	869,710.00 usft	**Longitude:**	103° 16' 23.268 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Firethorn Fed Com 26_36_4 #113H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	394,502.00 usft	**Latitude:**	32° 4' 48.467 N
	+E/-W	0.0 usft	**Easting:**	869,710.00 usft	**Longitude:**	103° 16' 23.268 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	0.0 usft	**Ground Level:**	2,998.0 usft

Design	Plan #1				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	179.42	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
11,128.0	0.00	0.00	11,128.0	0.0	0.0	0.00	0.00	0.00	0.00	
12,017.6	88.96	179.42	11,700.9	-562.5	5.7	10.00	10.00	20.17	179.42	
21,889.2	88.96	179.42	11,880.0	-10,432.0	106.0	0.00	0.00	0.00	0.00	LTP (Firethorn Fed

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,187.0	0.00	0.00	1,187.0	0.0	0.0	0.0	0.00	0.00	0.00
Rustler									
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,763.0	0.00	0.00	1,763.0	0.0	0.0	0.0	0.00	0.00	0.00
Salado									
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	0.00	0.00	2,100.0	0.0	0.0	0.0	0.00	0.00	0.00
2,200.0	0.00	0.00	2,200.0	0.0	0.0	0.0	0.00	0.00	0.00
2,300.0	0.00	0.00	2,300.0	0.0	0.0	0.0	0.00	0.00	0.00
2,400.0	0.00	0.00	2,400.0	0.0	0.0	0.0	0.00	0.00	0.00
2,500.0	0.00	0.00	2,500.0	0.0	0.0	0.0	0.00	0.00	0.00
2,600.0	0.00	0.00	2,600.0	0.0	0.0	0.0	0.00	0.00	0.00
2,700.0	0.00	0.00	2,700.0	0.0	0.0	0.0	0.00	0.00	0.00
2,800.0	0.00	0.00	2,800.0	0.0	0.0	0.0	0.00	0.00	0.00
2,900.0	0.00	0.00	2,900.0	0.0	0.0	0.0	0.00	0.00	0.00
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.0	0.00	0.00	0.00
3,100.0	0.00	0.00	3,100.0	0.0	0.0	0.0	0.00	0.00	0.00
3,200.0	0.00	0.00	3,200.0	0.0	0.0	0.0	0.00	0.00	0.00
3,300.0	0.00	0.00	3,300.0	0.0	0.0	0.0	0.00	0.00	0.00
3,345.0	0.00	0.00	3,345.0	0.0	0.0	0.0	0.00	0.00	0.00
Tansill									
3,400.0	0.00	0.00	3,400.0	0.0	0.0	0.0	0.00	0.00	0.00
3,500.0	0.00	0.00	3,500.0	0.0	0.0	0.0	0.00	0.00	0.00
3,600.0	0.00	0.00	3,600.0	0.0	0.0	0.0	0.00	0.00	0.00
3,700.0	0.00	0.00	3,700.0	0.0	0.0	0.0	0.00	0.00	0.00
3,800.0	0.00	0.00	3,800.0	0.0	0.0	0.0	0.00	0.00	0.00
3,900.0	0.00	0.00	3,900.0	0.0	0.0	0.0	0.00	0.00	0.00
4,000.0	0.00	0.00	4,000.0	0.0	0.0	0.0	0.00	0.00	0.00
4,100.0	0.00	0.00	4,100.0	0.0	0.0	0.0	0.00	0.00	0.00
4,200.0	0.00	0.00	4,200.0	0.0	0.0	0.0	0.00	0.00	0.00
4,300.0	0.00	0.00	4,300.0	0.0	0.0	0.0	0.00	0.00	0.00
4,400.0	0.00	0.00	4,400.0	0.0	0.0	0.0	0.00	0.00	0.00
4,500.0	0.00	0.00	4,500.0	0.0	0.0	0.0	0.00	0.00	0.00
4,600.0	0.00	0.00	4,600.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
4,700.0	0.00	0.00	4,700.0	0.0	0.0	0.0	0.00	0.00	0.00
4,800.0	0.00	0.00	4,800.0	0.0	0.0	0.0	0.00	0.00	0.00
4,900.0	0.00	0.00	4,900.0	0.0	0.0	0.0	0.00	0.00	0.00
5,000.0	0.00	0.00	5,000.0	0.0	0.0	0.0	0.00	0.00	0.00
5,100.0	0.00	0.00	5,100.0	0.0	0.0	0.0	0.00	0.00	0.00
5,128.0	0.00	0.00	5,128.0	0.0	0.0	0.0	0.00	0.00	0.00
Bell Canyon									
5,200.0	0.00	0.00	5,200.0	0.0	0.0	0.0	0.00	0.00	0.00
5,300.0	0.00	0.00	5,300.0	0.0	0.0	0.0	0.00	0.00	0.00
5,400.0	0.00	0.00	5,400.0	0.0	0.0	0.0	0.00	0.00	0.00
5,500.0	0.00	0.00	5,500.0	0.0	0.0	0.0	0.00	0.00	0.00
5,600.0	0.00	0.00	5,600.0	0.0	0.0	0.0	0.00	0.00	0.00
5,700.0	0.00	0.00	5,700.0	0.0	0.0	0.0	0.00	0.00	0.00
5,800.0	0.00	0.00	5,800.0	0.0	0.0	0.0	0.00	0.00	0.00
5,900.0	0.00	0.00	5,900.0	0.0	0.0	0.0	0.00	0.00	0.00
6,000.0	0.00	0.00	6,000.0	0.0	0.0	0.0	0.00	0.00	0.00
6,100.0	0.00	0.00	6,100.0	0.0	0.0	0.0	0.00	0.00	0.00
6,200.0	0.00	0.00	6,200.0	0.0	0.0	0.0	0.00	0.00	0.00
6,300.0	0.00	0.00	6,300.0	0.0	0.0	0.0	0.00	0.00	0.00
6,400.0	0.00	0.00	6,400.0	0.0	0.0	0.0	0.00	0.00	0.00
6,500.0	0.00	0.00	6,500.0	0.0	0.0	0.0	0.00	0.00	0.00
6,600.0	0.00	0.00	6,600.0	0.0	0.0	0.0	0.00	0.00	0.00
6,700.0	0.00	0.00	6,700.0	0.0	0.0	0.0	0.00	0.00	0.00
6,756.0	0.00	0.00	6,756.0	0.0	0.0	0.0	0.00	0.00	0.00
Brushy Canyon									
6,800.0	0.00	0.00	6,800.0	0.0	0.0	0.0	0.00	0.00	0.00
6,900.0	0.00	0.00	6,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,000.0	0.00	0.00	7,000.0	0.0	0.0	0.0	0.00	0.00	0.00
7,100.0	0.00	0.00	7,100.0	0.0	0.0	0.0	0.00	0.00	0.00
7,200.0	0.00	0.00	7,200.0	0.0	0.0	0.0	0.00	0.00	0.00
7,300.0	0.00	0.00	7,300.0	0.0	0.0	0.0	0.00	0.00	0.00
7,400.0	0.00	0.00	7,400.0	0.0	0.0	0.0	0.00	0.00	0.00
7,500.0	0.00	0.00	7,500.0	0.0	0.0	0.0	0.00	0.00	0.00
7,600.0	0.00	0.00	7,600.0	0.0	0.0	0.0	0.00	0.00	0.00
7,700.0	0.00	0.00	7,700.0	0.0	0.0	0.0	0.00	0.00	0.00
7,800.0	0.00	0.00	7,800.0	0.0	0.0	0.0	0.00	0.00	0.00
7,900.0	0.00	0.00	7,900.0	0.0	0.0	0.0	0.00	0.00	0.00
7,915.0	0.00	0.00	7,915.0	0.0	0.0	0.0	0.00	0.00	0.00
Bone Spring Lime									
8,000.0	0.00	0.00	8,000.0	0.0	0.0	0.0	0.00	0.00	0.00
8,100.0	0.00	0.00	8,100.0	0.0	0.0	0.0	0.00	0.00	0.00
8,200.0	0.00	0.00	8,200.0	0.0	0.0	0.0	0.00	0.00	0.00
8,300.0	0.00	0.00	8,300.0	0.0	0.0	0.0	0.00	0.00	0.00
8,400.0	0.00	0.00	8,400.0	0.0	0.0	0.0	0.00	0.00	0.00
8,500.0	0.00	0.00	8,500.0	0.0	0.0	0.0	0.00	0.00	0.00
8,600.0	0.00	0.00	8,600.0	0.0	0.0	0.0	0.00	0.00	0.00
8,700.0	0.00	0.00	8,700.0	0.0	0.0	0.0	0.00	0.00	0.00
8,800.0	0.00	0.00	8,800.0	0.0	0.0	0.0	0.00	0.00	0.00
8,900.0	0.00	0.00	8,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,000.0	0.00	0.00	9,000.0	0.0	0.0	0.0	0.00	0.00	0.00
9,100.0	0.00	0.00	9,100.0	0.0	0.0	0.0	0.00	0.00	0.00
9,200.0	0.00	0.00	9,200.0	0.0	0.0	0.0	0.00	0.00	0.00
9,300.0	0.00	0.00	9,300.0	0.0	0.0	0.0	0.00	0.00	0.00

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
9,400.0	0.00	0.00	9,400.0	0.0	0.0	0.0	0.00	0.00	0.00
9,439.0	0.00	0.00	9,439.0	0.0	0.0	0.0	0.00	0.00	0.00
First Bone Spring									
9,500.0	0.00	0.00	9,500.0	0.0	0.0	0.0	0.00	0.00	0.00
9,600.0	0.00	0.00	9,600.0	0.0	0.0	0.0	0.00	0.00	0.00
9,700.0	0.00	0.00	9,700.0	0.0	0.0	0.0	0.00	0.00	0.00
9,800.0	0.00	0.00	9,800.0	0.0	0.0	0.0	0.00	0.00	0.00
9,900.0	0.00	0.00	9,900.0	0.0	0.0	0.0	0.00	0.00	0.00
9,975.0	0.00	0.00	9,975.0	0.0	0.0	0.0	0.00	0.00	0.00
Second Bone Spring									
10,000.0	0.00	0.00	10,000.0	0.0	0.0	0.0	0.00	0.00	0.00
10,100.0	0.00	0.00	10,100.0	0.0	0.0	0.0	0.00	0.00	0.00
10,200.0	0.00	0.00	10,200.0	0.0	0.0	0.0	0.00	0.00	0.00
10,300.0	0.00	0.00	10,300.0	0.0	0.0	0.0	0.00	0.00	0.00
10,400.0	0.00	0.00	10,400.0	0.0	0.0	0.0	0.00	0.00	0.00
10,500.0	0.00	0.00	10,500.0	0.0	0.0	0.0	0.00	0.00	0.00
10,600.0	0.00	0.00	10,600.0	0.0	0.0	0.0	0.00	0.00	0.00
10,650.0	0.00	0.00	10,650.0	0.0	0.0	0.0	0.00	0.00	0.00
Third Bone Spring Lime									
10,700.0	0.00	0.00	10,700.0	0.0	0.0	0.0	0.00	0.00	0.00
10,800.0	0.00	0.00	10,800.0	0.0	0.0	0.0	0.00	0.00	0.00
10,900.0	0.00	0.00	10,900.0	0.0	0.0	0.0	0.00	0.00	0.00
11,000.0	0.00	0.00	11,000.0	0.0	0.0	0.0	0.00	0.00	0.00
11,100.0	0.00	0.00	11,100.0	0.0	0.0	0.0	0.00	0.00	0.00
11,128.0	0.00	0.00	11,128.0	0.0	0.0	0.0	0.00	0.00	0.00
KOP - DLS 10.00 TFO 179.42									
11,150.0	2.20	179.42	11,150.0	-0.4	0.0	0.4	10.00	10.00	0.00
11,200.0	7.20	179.42	11,199.8	-4.5	0.0	4.5	10.00	10.00	0.00
11,212.3	8.43	179.42	11,212.0	-6.2	0.1	6.2	10.00	10.00	0.00
Third Bone Spring Sand									
11,250.0	12.20	179.42	11,249.1	-12.9	0.1	12.9	10.00	10.00	0.00
11,300.0	17.20	179.42	11,297.4	-25.6	0.3	25.6	10.00	10.00	0.00
11,350.0	22.20	179.42	11,344.5	-42.5	0.4	42.5	10.00	10.00	0.00
11,400.0	27.20	179.42	11,389.9	-63.4	0.6	63.4	10.00	10.00	0.00
11,450.0	32.20	179.42	11,433.3	-88.1	0.9	88.1	10.00	10.00	0.00
11,488.3	36.03	179.42	11,465.0	-109.6	1.1	109.6	10.00	10.00	0.00
Wolfcamp									
11,500.0	37.20	179.42	11,474.4	-116.6	1.2	116.6	10.00	10.00	0.00
11,550.0	42.20	179.42	11,512.9	-148.5	1.5	148.5	10.00	10.00	0.00
11,600.0	47.20	179.42	11,548.4	-183.7	1.9	183.7	10.00	10.00	0.00
11,621.9	49.39	179.42	11,563.0	-200.0	2.0	200.0	10.00	10.00	0.00
CROSS S. SEC LN 33 @ 11621.9' MD									
11,650.0	52.20	179.42	11,580.7	-221.8	2.3	221.8	10.00	10.00	0.00
11,700.0	57.20	179.42	11,609.6	-262.6	2.7	262.6	10.00	10.00	0.00
11,750.0	62.20	179.42	11,634.8	-305.7	3.1	305.7	10.00	10.00	0.00
11,800.0	67.20	179.42	11,656.2	-350.9	3.6	350.9	10.00	10.00	0.00
11,850.0	72.20	179.42	11,673.5	-397.8	4.0	397.8	10.00	10.00	0.00
11,900.0	77.20	179.42	11,686.7	-446.0	4.5	446.0	10.00	10.00	0.00
11,950.0	82.20	179.42	11,695.7	-495.2	5.0	495.2	10.00	10.00	0.00
12,000.0	87.20	179.42	11,700.3	-544.9	5.5	545.0	10.00	10.00	0.00
12,017.6	88.96	179.42	11,700.9	-562.5	5.7	562.6	10.00	10.00	0.00
EOC - 9871.6 hold at 12017.6 MD									
12,100.0	88.96	179.42	11,702.4	-644.9	6.6	644.9	0.00	0.00	0.00

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
12,200.0	88.96	179.42	11,704.2	-744.9	7.6	744.9	0.00	0.00	0.00
12,300.0	88.96	179.42	11,706.0	-844.9	8.6	844.9	0.00	0.00	0.00
12,400.0	88.96	179.42	11,707.8	-944.8	9.6	944.9	0.00	0.00	0.00
12,500.0	88.96	179.42	11,709.6	-1,044.8	10.6	1,044.9	0.00	0.00	0.00
12,600.0	88.96	179.42	11,711.4	-1,144.8	11.6	1,144.9	0.00	0.00	0.00
12,700.0	88.96	179.42	11,713.2	-1,244.8	12.6	1,244.8	0.00	0.00	0.00
12,800.0	88.96	179.42	11,715.1	-1,344.8	13.7	1,344.8	0.00	0.00	0.00
12,900.0	88.96	179.42	11,716.9	-1,444.7	14.7	1,444.8	0.00	0.00	0.00
13,000.0	88.96	179.42	11,718.7	-1,544.7	15.7	1,544.8	0.00	0.00	0.00
13,100.0	88.96	179.42	11,720.5	-1,644.7	16.7	1,644.8	0.00	0.00	0.00
13,200.0	88.96	179.42	11,722.3	-1,744.7	17.7	1,744.8	0.00	0.00	0.00
13,300.0	88.96	179.42	11,724.1	-1,844.7	18.7	1,844.7	0.00	0.00	0.00
13,400.0	88.96	179.42	11,725.9	-1,944.6	19.8	1,944.7	0.00	0.00	0.00
13,500.0	88.96	179.42	11,727.8	-2,044.6	20.8	2,044.7	0.00	0.00	0.00
13,600.0	88.96	179.42	11,729.6	-2,144.6	21.8	2,144.7	0.00	0.00	0.00
13,700.0	88.96	179.42	11,731.4	-2,244.6	22.8	2,244.7	0.00	0.00	0.00
13,800.0	88.96	179.42	11,733.2	-2,344.5	23.8	2,344.7	0.00	0.00	0.00
13,900.0	88.96	179.42	11,735.0	-2,444.5	24.8	2,444.6	0.00	0.00	0.00
14,000.0	88.96	179.42	11,736.8	-2,544.5	25.9	2,544.6	0.00	0.00	0.00
14,100.0	88.96	179.42	11,738.7	-2,644.5	26.9	2,644.6	0.00	0.00	0.00
14,200.0	88.96	179.42	11,740.5	-2,744.5	27.9	2,744.6	0.00	0.00	0.00
14,300.0	88.96	179.42	11,742.3	-2,844.4	28.9	2,844.6	0.00	0.00	0.00
14,400.0	88.96	179.42	11,744.1	-2,944.4	29.9	2,944.6	0.00	0.00	0.00
14,500.0	88.96	179.42	11,745.9	-3,044.4	30.9	3,044.5	0.00	0.00	0.00
14,600.0	88.96	179.42	11,747.7	-3,144.4	32.0	3,144.5	0.00	0.00	0.00
14,700.0	88.96	179.42	11,749.5	-3,244.3	33.0	3,244.5	0.00	0.00	0.00
14,800.0	88.96	179.42	11,751.4	-3,344.3	34.0	3,344.5	0.00	0.00	0.00
14,900.0	88.96	179.42	11,753.2	-3,444.3	35.0	3,444.5	0.00	0.00	0.00
15,000.0	88.96	179.42	11,755.0	-3,544.3	36.0	3,544.5	0.00	0.00	0.00
15,100.0	88.96	179.42	11,756.8	-3,644.3	37.0	3,644.5	0.00	0.00	0.00
15,200.0	88.96	179.42	11,758.6	-3,744.2	38.0	3,744.4	0.00	0.00	0.00
15,300.0	88.96	179.42	11,760.4	-3,844.2	39.1	3,844.4	0.00	0.00	0.00
15,400.0	88.96	179.42	11,762.2	-3,944.2	40.1	3,944.4	0.00	0.00	0.00
15,500.0	88.96	179.42	11,764.1	-4,044.2	41.1	4,044.4	0.00	0.00	0.00
15,600.0	88.96	179.42	11,765.9	-4,144.2	42.1	4,144.4	0.00	0.00	0.00
15,700.0	88.96	179.42	11,767.7	-4,244.1	43.1	4,244.4	0.00	0.00	0.00
15,800.0	88.96	179.42	11,769.5	-4,344.1	44.1	4,344.3	0.00	0.00	0.00
15,900.0	88.96	179.42	11,771.3	-4,444.1	45.2	4,444.3	0.00	0.00	0.00
16,000.0	88.96	179.42	11,773.1	-4,544.1	46.2	4,544.3	0.00	0.00	0.00
16,100.0	88.96	179.42	11,774.9	-4,644.0	47.2	4,644.3	0.00	0.00	0.00
16,200.0	88.96	179.42	11,776.8	-4,744.0	48.2	4,744.3	0.00	0.00	0.00
16,300.0	88.96	179.42	11,778.6	-4,844.0	49.2	4,844.3	0.00	0.00	0.00
16,400.0	88.96	179.42	11,780.4	-4,944.0	50.2	4,944.2	0.00	0.00	0.00
16,500.0	88.96	179.42	11,782.2	-5,044.0	51.3	5,044.2	0.00	0.00	0.00
16,600.0	88.96	179.42	11,784.0	-5,143.9	52.3	5,144.2	0.00	0.00	0.00
16,700.0	88.96	179.42	11,785.8	-5,243.9	53.3	5,244.2	0.00	0.00	0.00
16,800.0	88.96	179.42	11,787.6	-5,343.9	54.3	5,344.2	0.00	0.00	0.00
16,900.0	88.96	179.42	11,789.5	-5,443.9	55.3	5,444.2	0.00	0.00	0.00
16,936.8	88.96	179.42	11,790.1	-5,480.7	55.7	5,480.9	0.00	0.00	0.00
CROSS S. SEC LN 4 @ 16936.8' MD									
17,000.0	88.96	179.42	11,791.3	-5,543.9	56.3	5,544.1	0.00	0.00	0.00
17,100.0	88.96	179.42	11,793.1	-5,643.8	57.3	5,644.1	0.00	0.00	0.00
17,200.0	88.96	179.42	11,794.9	-5,743.8	58.4	5,744.1	0.00	0.00	0.00
17,300.0	88.96	179.42	11,796.7	-5,843.8	59.4	5,844.1	0.00	0.00	0.00

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
17,400.0	88.96	179.42	11,798.5	-5,943.8	60.4	5,944.1	0.00	0.00	0.00
17,500.0	88.96	179.42	11,800.4	-6,043.7	61.4	6,044.1	0.00	0.00	0.00
17,600.0	88.96	179.42	11,802.2	-6,143.7	62.4	6,144.0	0.00	0.00	0.00
17,700.0	88.96	179.42	11,804.0	-6,243.7	63.4	6,244.0	0.00	0.00	0.00
17,800.0	88.96	179.42	11,805.8	-6,343.7	64.5	6,344.0	0.00	0.00	0.00
17,900.0	88.96	179.42	11,807.6	-6,443.7	65.5	6,444.0	0.00	0.00	0.00
18,000.0	88.96	179.42	11,809.4	-6,543.6	66.5	6,544.0	0.00	0.00	0.00
18,100.0	88.96	179.42	11,811.2	-6,643.6	67.5	6,644.0	0.00	0.00	0.00
18,200.0	88.96	179.42	11,813.1	-6,743.6	68.5	6,743.9	0.00	0.00	0.00
18,300.0	88.96	179.42	11,814.9	-6,843.6	69.5	6,843.9	0.00	0.00	0.00
18,400.0	88.96	179.42	11,816.7	-6,943.5	70.6	6,943.9	0.00	0.00	0.00
18,500.0	88.96	179.42	11,818.5	-7,043.5	71.6	7,043.9	0.00	0.00	0.00
18,600.0	88.96	179.42	11,820.3	-7,143.5	72.6	7,143.9	0.00	0.00	0.00
18,700.0	88.96	179.42	11,822.1	-7,243.5	73.6	7,243.9	0.00	0.00	0.00
18,800.0	88.96	179.42	11,823.9	-7,343.5	74.6	7,343.8	0.00	0.00	0.00
18,900.0	88.96	179.42	11,825.8	-7,443.4	75.6	7,443.8	0.00	0.00	0.00
19,000.0	88.96	179.42	11,827.6	-7,543.4	76.6	7,543.8	0.00	0.00	0.00
19,100.0	88.96	179.42	11,829.4	-7,643.4	77.7	7,643.8	0.00	0.00	0.00
19,200.0	88.96	179.42	11,831.2	-7,743.4	78.7	7,743.8	0.00	0.00	0.00
19,300.0	88.96	179.42	11,833.0	-7,843.4	79.7	7,843.8	0.00	0.00	0.00
19,400.0	88.96	179.42	11,834.8	-7,943.3	80.7	7,943.7	0.00	0.00	0.00
19,500.0	88.96	179.42	11,836.6	-8,043.3	81.7	8,043.7	0.00	0.00	0.00
19,578.1	88.96	179.42	11,838.1	-8,121.4	82.5	8,121.8	0.00	0.00	0.00
CROSS SEC 9 2ND QTR									
19,600.0	88.96	179.42	11,838.5	-8,143.3	82.7	8,143.7	0.00	0.00	0.00
19,700.0	88.96	179.42	11,840.3	-8,243.3	83.8	8,243.7	0.00	0.00	0.00
19,800.0	88.96	179.42	11,842.1	-8,343.2	84.8	8,343.7	0.00	0.00	0.00
19,900.0	88.96	179.42	11,843.9	-8,443.2	85.8	8,443.7	0.00	0.00	0.00
20,000.0	88.96	179.42	11,845.7	-8,543.2	86.8	8,543.6	0.00	0.00	0.00
20,100.0	88.96	179.42	11,847.5	-8,643.2	87.8	8,643.6	0.00	0.00	0.00
20,200.0	88.96	179.42	11,849.3	-8,743.2	88.8	8,743.6	0.00	0.00	0.00
20,300.0	88.96	179.42	11,851.2	-8,843.1	89.9	8,843.6	0.00	0.00	0.00
20,400.0	88.96	179.42	11,853.0	-8,943.1	90.9	8,943.6	0.00	0.00	0.00
20,500.0	88.96	179.42	11,854.8	-9,043.1	91.9	9,043.6	0.00	0.00	0.00
20,600.0	88.96	179.42	11,856.6	-9,143.1	92.9	9,143.5	0.00	0.00	0.00
20,700.0	88.96	179.42	11,858.4	-9,243.1	93.9	9,243.5	0.00	0.00	0.00
20,800.0	88.96	179.42	11,860.2	-9,343.0	94.9	9,343.5	0.00	0.00	0.00
20,898.5	88.96	179.42	11,862.0	-9,441.5	95.9	9,442.0	0.00	0.00	0.00
CROSS SEC 9 3RD QTR									
20,900.0	88.96	179.42	11,862.0	-9,443.0	96.0	9,443.5	0.00	0.00	0.00
21,000.0	88.96	179.42	11,863.9	-9,543.0	97.0	9,543.5	0.00	0.00	0.00
21,100.0	88.96	179.42	11,865.7	-9,643.0	98.0	9,643.5	0.00	0.00	0.00
21,200.0	88.96	179.42	11,867.5	-9,742.9	99.0	9,743.4	0.00	0.00	0.00
21,300.0	88.96	179.42	11,869.3	-9,842.9	100.0	9,843.4	0.00	0.00	0.00
21,400.0	88.96	179.42	11,871.1	-9,942.9	101.0	9,943.4	0.00	0.00	0.00
21,500.0	88.96	179.42	11,872.9	-10,042.9	102.0	10,043.4	0.00	0.00	0.00
21,600.0	88.96	179.42	11,874.8	-10,142.9	103.1	10,143.4	0.00	0.00	0.00
21,700.0	88.96	179.42	11,876.6	-10,242.8	104.1	10,243.4	0.00	0.00	0.00
21,800.0	88.96	179.42	11,878.4	-10,342.8	105.1	10,343.3	0.00	0.00	0.00
21,889.2	88.96	179.42	11,880.0	-10,432.0	106.0	10,432.5	0.00	0.00	0.00
TD at 21889.2									

Database:	EDM 10_13	**Local Co-ordinate Reference:**	Well Firethorn Fed Com 26_36_4 #113H
Company:	Ameredev Operating, LLC	**TVD Reference:**	KB @ 3023.0usft (H&P 616)
Project:	Lea County, NM (NAD83 NME)	**MD Reference:**	KB @ 3023.0usft (H&P 616)
Site:	(FIRETHORN)SEC 33_T-25-S_R-36-E	**North Reference:**	Grid
Well:	Firethorn Fed Com 26_36_4 #113H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OWB		
Design:	Plan #1		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
FTP (Firethorn Fed C	0.00	0.00	11,700.0	-530.0	5.0	393,972.00	869,715.00	32° 4' 43.222 N	103° 16' 23.270 W
- plan misses target center by 0.8usft at 11985.1usft MD (11699.4 TVD, -530.1 N, 5.4 E)									
- Point									
LTP (Firethorn Fed C	-1.04	359.42	11,880.0	-10,432.0	106.0	384,070.00	869,816.00	32° 3' 5.236 N	103° 16' 23.227 W
- plan hits target center									
- Rectangle (sides W60.0 H9,902.5 D25.0)									

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,187.0	1,187.0	Rustler			
1,763.0	1,763.0	Salado			
3,345.0	3,345.0	Tansill			
5,128.0	5,128.0	Bell Canyon			
6,756.0	6,756.0	Brushy Canyon			
7,915.0	7,915.0	Bone Spring Lime			
9,439.0	9,439.0	First Bone Spring			
9,975.0	9,975.0	Second Bone Spring			
10,650.0	10,650.0	Third Bone Spring Lime			
11,212.3	11,212.0	Third Bone Spring Sand			
11,488.3	11,465.0	Wolfcamp			

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
11,128.0	11,128.0	0.0	0.0	KOP - DLS 10.00 TFO 179.42
11,621.9	11,563.0	-200.0	2.0	CROSS S. SEC LN 33 @ 11621.9' MD
12,017.6	11,700.9	-562.5	5.7	EOC - 9871.6 hold at 12017.6 MD
16,936.8	11,790.1	-5,480.7	55.7	CROSS S. SEC LN 4 @ 16936.8' MD
19,578.1	11,838.1	-8,121.4	82.5	CROSS SEC 9 2ND QTR
20,898.5	11,862.0	-9,441.5	95.9	CROSS SEC 9 3RD QTR
21,889.2	11,880.0	-10,432.0	106.0	TD at 21889.2

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Casing Design

Firethorn Fed Com 26-36-04 113H (Pilot Hole)

Hole Size	Size	Footage	Top Depth	Bottom Depth	TVD	Weight, #/ft	Grade	Thread	Joint Yield, klbs	I.D.	Drift I.D.	Cplg O.D.	Burst	Collapse	Body Yield, klbs
SURFACE CASING															
17-1/2"	13-3/8"	1,350'	0'	1,350'	1,350'	68	J-55	BTC	1,585	12.415"	12.259"	14.375"	5,020	2,260	1556
INTERMEDIATE #1 CASING															
12-1/4"	9-5/8"	5,200'	0'	5,200'	5,200'	40	HCL-80 Special Drift	BTC	979	8.835"	8.75"	10.625"	5,750	3,090	916
INTERMEDIATE #2 CASING															
8-3/4"	7-5/8"	10,800'	0'	10,800'	10,800'	29.7	P-110 HC	Liberty FJM	558	6.789"	6.750"	7.625"	9,460	6,700	940
PILOT HOLE // Cement Through Whipstock															
6-3/4"	2-7/8"	2,400'	11,128'	13,600'	13,600'	7.9	L-80	EUE	180	2.441"	2.347"	3.46"	13,450	13,890	72.58
PRODUCTION CASING															
6-3/4"	5-1/2"	21,889'	0'	21,889'	11,880'	20	P-110 CYHP	TMK SF	655	4.734	4.653	5.777	143,360	12,780	728

U. S. Steel Tubular Products

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7.625" 29.70lbs/ft (0.375" Wall) P110 HC USS-LIBERTY FJM®

MECHANICAL PROPERTIES	Pipe	USS-LIBERTY FJM®	
Minimum Yield Strength	110,000	--	psi
Maximum Yield Strength	140,000	--	psi
Minimum Tensile Strength	125,000	--	psi
DIMENSIONS	**Pipe**	**USS-LIBERTY FJM®**	
Outside Diameter	7.625	7.625	in.
Wall Thickness	0.375	--	in.
Inside Diameter	6.875	6.789	in.
Standard Drift	6.750	6.750	in.
Alternate Drift	--	--	in.
Nominal Linear Weight, T&C	29.70	--	lbs/ft
Plain End Weight	29.06	--	lbs/ft
SECTION AREA	**Pipe**	**USS-LIBERTY FJM®**	
Critical Area	8.541	5.074	sq. in.
Joint Efficiency	--	59.4	%
PERFORMANCE	**Pipe**	**USS-LIBERTY FJM®**	
Minimum Collapse Pressure	6,700	6,700	psi
Minimum Internal Yield Pressure	9,460	9,460	psi
Minimum Pipe Body Yield Strength	940,000	--	lbs
Joint Strength	--	558,000	lbs
Compression Rating	--	558,000	lbs
Reference Length	--	12,810	ft
Maximum Uniaxial Bend Rating	--	39.3	deg/100 ft
MAKE-UP DATA	**Pipe**	**USS-LIBERTY FJM®**	
Make-Up Loss	--	3.92	in.
Minimum Make-Up Torque	--	10,800	ft-lbs
Maximum Make-Up Torque	--	15,250	ft-lbs

1. Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness and Specified Minimum Yield Strength (SMYS).
2. Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3. Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4. USS-LIBERTY FJM™ connections are optimized for each combination of OD and wall thickness and cannot be interchanged.
5. Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
6. Reference length is calculated by joint strength divided by nominal plain end weight with 1.5 safety factor.
7. Connection external pressure leak resistance has been verified to 100% API pipe body collapse pressure following the guidelines of API 5C5 Cal III.

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

1-877-893-9461
connections@uss.com
www.usstubular.com

PERFORMANCE DATA

TMK UP SF TORQ™ **5.500 in** **20.00 lbs/ft** **P-110 CYHP**
Technical Data Sheet

Tubular Parameters

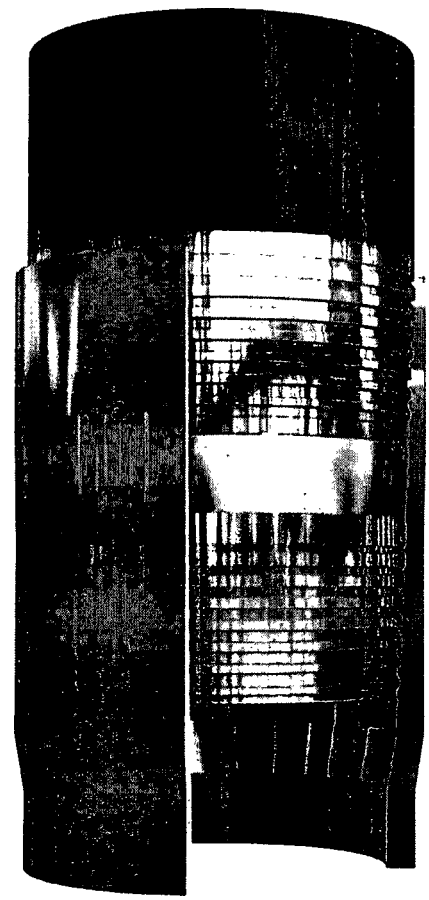
Size	5.500	in	Minimum Yield	125,000	psi
Nominal Weight	20.00	lbs/ft	Minimum Tensile	135,000	psi
Grade	P-110 CYHP		Yield Load	728,000	lbs
PE Weight	19.81	lbs/ft	Tensile Load	786,000	lbs
Wall Thickness	0.361	in	Min. Internal Yield Pressure	14,360	psi
Nominal ID	4.778	in	Collapse Pressure	12,780	psi
Drift Diameter	4.653	in			
Nom. Pipe Body Area	5.828	in²			

Connection Parameters

Connection OD	5.777	in
Connection ID	4.734	in
Make-Up Loss	5.823	in
Critical Section Area	5.875	in²
Tension Efficiency	90.0	%
Compression Efficiency	90.0	%
Yield Load In Tension	655,000	lbs
Min. Internal Yield Pressure	14,360	psi
Collapse Pressure	12,780	psi
Uniaxial Bending	93.8	°/ 100 ft

Make-Up Torques

Min. Make-Up Torque	15,700	ft-lbs
Opt. Make-Up Torque	19,600	ft-lbs
Max. Make-Up Torque	21,600	ft-lbs
Operating Torque	29,000	ft-lbs
Yield Torque	37,000	ft-lbs



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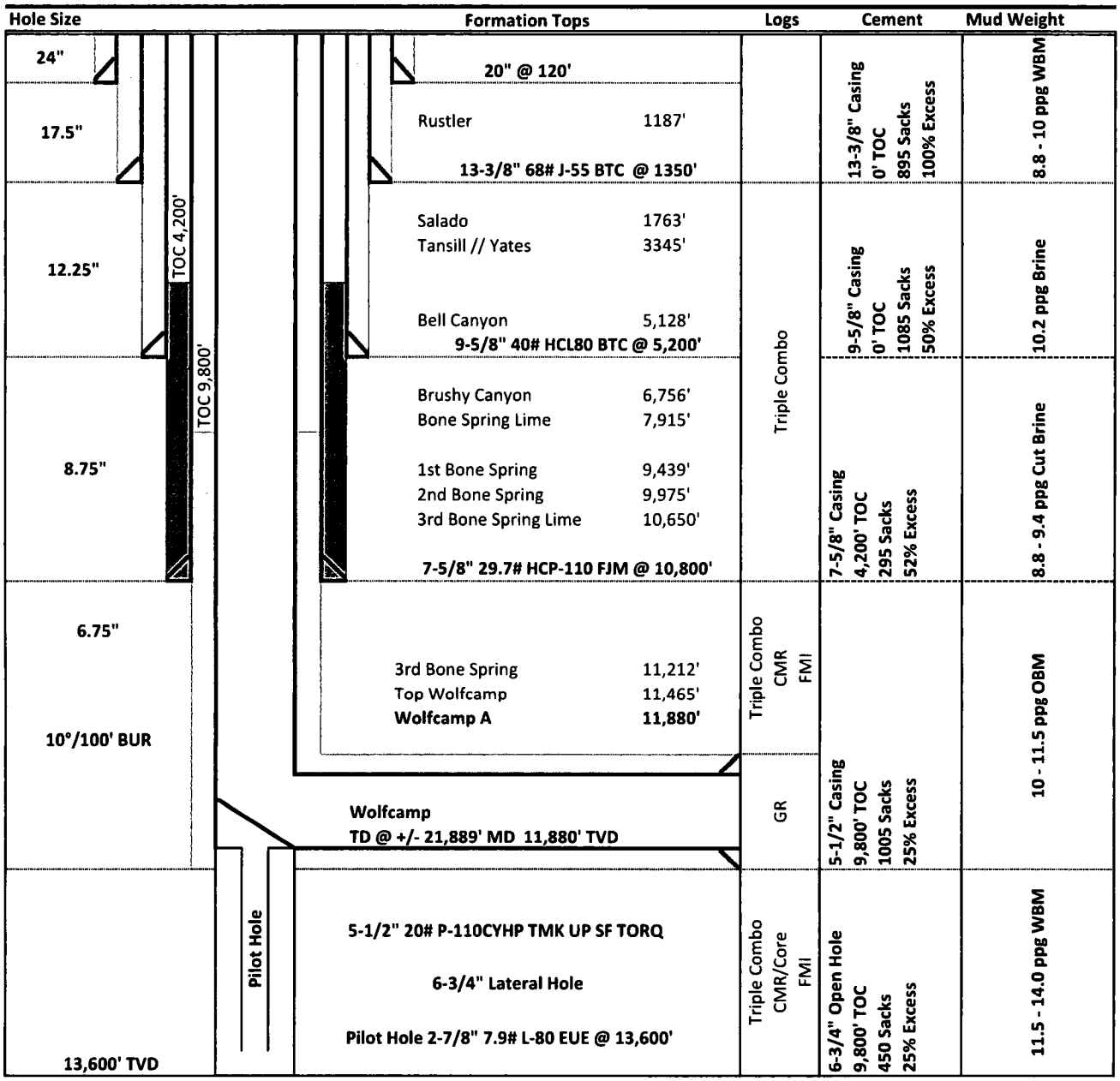
Wellbore Schematic

Well:	Firethorn Fed Com 26-36-04 113H (Pilot Hole)	**Co. Well ID:**	40120
SHL:	Sec 33 (25S-36E) 200ft FSL, 1700ft FWL	**AFE No.:**	2017-001
County, State:	Lea, NM	**API No.:**	
BHL:	Sec 9 (26S-36E) 200ft FSL, 1700ft FWL	**GL-ELEV:**	2,996'
E-Mail:	Wellsite2@ameredev.com	**Field:**	Delaware_WCB
Wellhead:	A - 13-5/8" 5M x 13-5/8" SOW	**Objective:**	Wolfcamp
	B - 13-5/8" 10M x 13-5/8" 10M	**TVD/MD:**	11,880' // 21,889'
	C - 13-5/8" 10M x 13-5/8" 10M	**Cement:**	
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**Mud:**	
Xmas Tree:	2-9/16" 10M	**Directional:**	
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**OH Logs:**	
		Rig:	H&P 616



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Cement Detail