PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Mcelvain Energy, INC.**
LEASE NO.:	**NMNM-0245247**
WELL NAME & NO.:	**EK 31 BS2 Federal Com 2H**
SURFACE HOLE FOOTAGE:	**0076' FSL & 0817' FEL**
BOTTOM HOLE FOOTAGE	**0150' FSL & 1989' FEL Sec. 301, T. 18 S., R 34 E.**
LOCATION:	**Section 30, T. 18 S., R 34 E., NMPM**
COUNTY:	**County, New Mexico**

Operator to submit NMOCD Gas Capture Plan via sundry notice to the BLM.

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.

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)

☐ **Lea County**
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 3933612

A. **Hydrogen Sulfide**

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

2. 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. **If the drilling rig is removed without approval – an Incident of Non-Compliance will be written and will be a "Major" violation.**

3. 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 is located, this does not include the dog house or stairway area.

4. **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.**

B. CASING

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.

Centralizers required on surface casing per Onshore Order 2.III.B.1.f.

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.

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.

No pea gravel permitted for remedial or fall back remedial without prior authorization from the BLM engineer.

Possible of water flows in the Artesia Group, Salado, and Capitan Reef.
Possible lost circulation in the Artesia Group, Rustler, Red Beds, and Capitan Reef.

1. The **13-3/8** inch surface casing shall be set at approximately **1809** feet (**in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt**) and cemented to the surface.

    a. If cement does not circulate to the surface, the appropriate BLM office shall be notified and a temperature survey utilizing an electronic type temperature survey with surface log readout will be used or a cement bond log shall be run to verify the top of the cement. Temperature survey will be run a minimum of six hours after pumping cement and ideally between 8-10 hours after completing the cement job.

    b. **Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry.**

    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours after bringing cement to surface or 500 pounds compressive strength, whichever is greater.

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

Formation below the 13-3/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

2. The minimum required fill of cement behind the **9-5/8** inch intermediate casing is:

☐ Cement to surface. If cement does not circulate see B.1.a, c-d above.

Formation below the 9-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

Centralizers required on horizontal leg, must be type for horizontal service and a minimum of one every other joint.

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

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

4. 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.

C. 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 53.

2. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi. **5M 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.**

3. The appropriate BLM office shall be notified a minimum of 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).

a. The tests shall be done by an independent service company utilizing a test plug **not a cup or J-packer**.

b. 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.

c. The results of the test shall be reported to the appropriate BLM office.

d. 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.**

e. 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.

D. DRILL STEM TEST

If drill stem tests are performed, Onshore Order 2.III.D shall be followed.

E. 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.

JAM 052918

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	McElvain Energy Inc
LEASE NO.:	NM0245247
WELL NAME & NO.:	2H – EK 31 BS2 Federal Com
SURFACE HOLE FOOTAGE:	76'/S & 817'/E
BOTTOM HOLE FOOTAGE	150'/S & 1989'/E, sec. 31
LOCATION:	Section 30, T. 18 S., R. 34 E.
COUNTY:	Lea County, New Mexico

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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)

Section 390 of the Energy Policy Act COA
If the proposed action has not been spuded by ***October 15, 2022***, this authorization will expire and the operator is to cease all operations related to the construction of this action. At that time, further NEPA analysis will be required.

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

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

This authorization is subject to your Certificate of Participation and/or Certificate of Inclusion under the New Mexico Candidate Conservation Agreement. Because it involves surface disturbing activities covered under your Certificate, your Habitat Conservation Fund Account with the Center of Excellence for Hazardous Materials Management (CEHMM) will be debited according to Exhibit B Part 2 of the Certificate of Participation.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

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

G. ON LEASE ACCESS ROADS

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

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

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

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

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

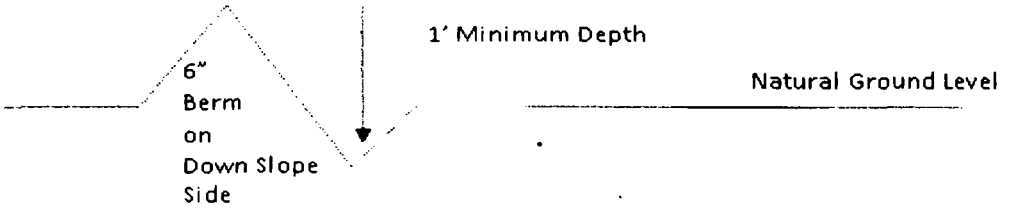
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

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

Public Access

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

Construction Steps

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

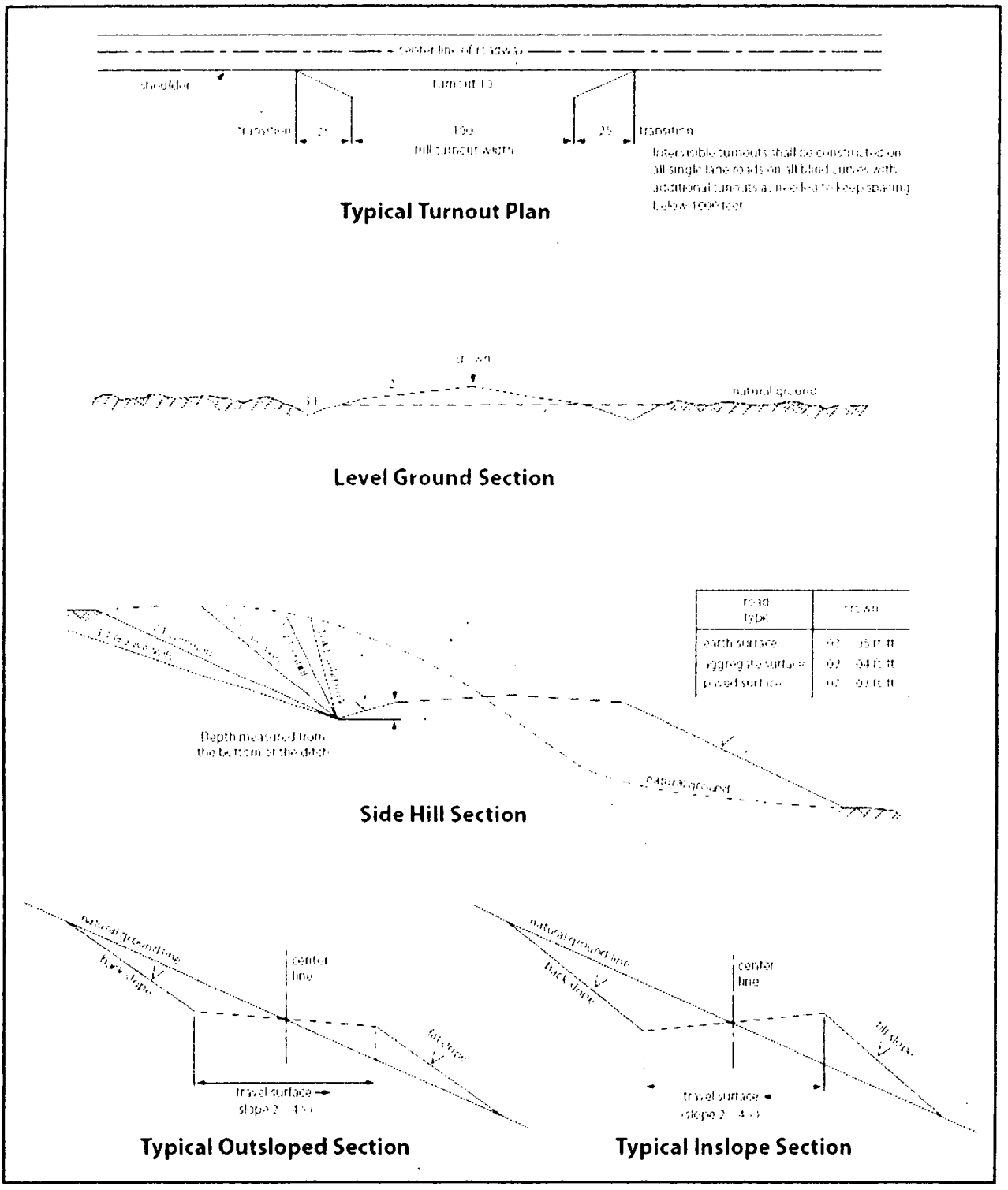


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

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

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

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

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).

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.

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

06/12/2018

Operator Certification

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

NAME: Natalie Stallsworth **Signed on:** 12/04/2017

Title: Regulatory Technician/Permitting Agent

Street Address: PO Box 99

City: Eastlake **State:** CO **Zip:** 80614

Phone: (303)857-9999

Email address: natalie@permitco-usa.com

Field Representative

Representative Name:

Street Address:

City: **State:** **Zip:**

Phone:

Email address:

EK 31 BS2 Federal Com 2H
76' FSL and 817' FEL Sec. 30 (Surface)
150' FSL and 1989' FEL Sec. 31 (Btm. Hole)
T18S – R34E
Lea County, NM

Confidential- Tight Hole
McElvain Energy Inc.
Lease No. NM-092780
Lease No. NM-107396
Lease No. NM-0245247

OIL & GAS OPERATIONS
SURFACE USE PLAN OF OPERATIONS

It is the sole responsibility of the operator and/or lessee to ensure that all the requirements of Federal Oil and Gas regulations (43 CFR 3160), Notice to Lessees (NTL's), and Federal Onshore Oil and Gas Orders No. 1, 2, 3, 4, 5, 6, and 7 are complied with. Any major deviations from the terms of this APD or Surface Use Plan require prior approval.

PLEASE NOTE: This is an existing pad that has already been constructed and existing wells have already been drilled. The following information is add one additional well to this pad.

1. EXISTING ROADS

a. **Directions to the location:** from Hobbs, NM are as follows:

From the intersection of US 62 and State Highway 529, west of Hobbs, New Mexico, take Highway 529 west to mile marker 17. Turn left (south on to lease road and follow road 1.2 miles. Bear right (Southwest and travel 1.8 miles to location on the East side of the road. Turn left (East and travel 1.1 miles. Bear left (Northeast) and travel 0.4 miles. Turn right (Southwest) and travel 0.5 miles to the location.

b. **Maintenance:**

1. Road maintenance of the lease road will continue until final abandonment and reclamation of this drilling location.

2. All roads shall be maintained in accordance with the standards of the surface management agency.

3. General maintenance will involve blading the road at least yearly or as needed to smooth the surface and pull surfacing material back on to the traveled surface.

2. ACCESS ROADS TO BE CONSTRUCTED AND RECONSTRUCTED

a. **Road Construction:** No new road construction will be required. The road is existing.

b. **Road width**: The access road has a driving surface that does not exceed fourteen (I4) feet in width. The maximum width of surface disturbance is twenty-five (25) feet or less.

c. **Maximum Grade:** The road grade is less than 3% percent.

d. **Turnouts:** No additional turnouts will be necessary.

e. **Drainage and Ditch Design:** No additional drainage structures or ditches are deemed necessary at this time, unless requested by the Bureau of Land Management.

f. **On-site and off-site erosion control:**

1. Erosion control methods may include but are not limited to the following: Re-vegetating the disturbed areas as soon as practical and the placement of straw wattles, hay bales, silt fences, water bars, or wing ditches as needed.

2. The road, borrow ditches, cuts, fills, must be kept in a safe and usable manner and be maintained to original construction standards.

3. All drainage ditches will be kept clear and free-flowing, and will be maintained to good standards. All culverts will be kept free of trash, free-flowing, and serviceable.

4. The road surface and shoulders will be kept in a safe and usable condition, and will be maintained to good standards.

g. **Re-vegetation of disturbed areas:** Re-vegetation, if not already completed, will consist of drill seeding and seed will be broadcast by hand where drill seeding is not possible.

h. **Location and size of culverts and/or low water crossings:** No additional culverts or low water crossings are deemed necessary at this time.

i. **Fence Cuts and/or cattle guards**: No new cattle guards will be constructed as a result of the proposed operation.

j. **Source and Storage of Topsoil:** Prior to construction of the existing road, the topsoil was stripped from the access road corridor to either side of the road and has been evenly distributed on the "out slope" areas of the borrow ditches and re-seeded.

k. **Type of Surfacing Materials that will be used:**

1. No additional construction materials will be required for the drilling of this well.

2. 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.

3. LOCATION OF EXISTING WELLS WITHIN A 1-MILE RADIUS OF THE PROPOSED LOCATION (See Map C)

Wells within a one mile radius are shown on Map C attached.

4. *LOCATION OF EXISTING AND/OR PROPOSED FACILITIES IF THE WELL PRODUCTIVE.*

a. **Production Layout:** Refer to the Production and Reclamation Diagram attached for the layout of production facilities. All facilities are existing with the exception of an additional separator to be installed. Production facilities will be placed on the well pad to allow for maximum interim recontouring and revegetation of the well location. The original well pad occupies and area of 3.7 acres. Approximately 0.6 acres will be reclaimed.

b. **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 1-1/2 inches. The netting must not be in contact with fluids and must not have holes or gaps.

c. **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 inches.

d. **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.

e. **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.

f. **Facility Painting:** 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).

g. **Proposed and Existing Flow lines:** All gas gathering lines are existing. This well will tie into the existing lines on location.

h. **Proposed Power lines (buried and overhead)**: All electrical lines are existing. No additional electric lines will be necessary.

i. **Proposed Waterlines**: No permanent water lines are proposed at this time.

j. **Other:**

1. Off Lease Storage: No off lease storage is planned. All production facilities will be located at the drill site.

5. LOCATION AND TYPE OF WATER SUPPLY

a. **Source:** Fresh water used for drilling and cementing operations will be produced from a McElvain owned water well, McElvain 29 Water Well, NMOSE CP-1563 located in the NW/4 of Section 29, T18S - R34E.

The Caviness fresh water station (Permit No. CP-00072) located in the NW SW Sec. 10, T18S – R33E will be used as a secondary source of fresh water, in the event that there are problems with the McElvain Water Well.

The Seeley Recycle Containment Facility Proposed Water (Sec. 20, T18S – R33E) will be used for fracking the wells. (Permit No. NM-136166.

b. **Proposed Transportation Method**: The water from the McElvain 29 well and the Seely Recycle Containment Facility will be piped to the well pad through above ground fresh water lines as shown on the Fresh Water Diagram.

Water from the Caviness Fresh Water Station (if used), will be hauled along the road routes shown on the Fresh Water Source Diagram.

c. **Newly Constructed Roads or Re-Constructed Roads requiring a Right of Way (needed for hauling water):** All water pumping operations will be done along existing oilfield roads, or County and State Highways. Water haul routes will not require any new construction or re-construction.

d. **Plans for drilling a water supply well:** No water wells will be drilled at this location.

e. **Anticipated Amount of Water needed:** This amount of water needed for this drilling will be approximately 30,000 Bbls. An additional 250,000 Bbls. will be needed for completion operations.

6. CONSTRUCTION MATERIALS

a. **Proposed Source of Materials:**

1. The pad was previously surfaced with 8" of caliche. No additional material will be necessary.

2. No surfacing material or gravel will be taken from Federal lands without a permit. Where the Surface Management Agency agrees to provide a source of surfacing materials, the permittee or its contractor shall make payment to the BLM prior to removal of any federal mineral materials. Contact the Carlsbad Field Office at (575) 234-5972.

7. METHODS FOR HANDLING WASTE DISPOSAL

a. **Containment and Disposal of Waste: See Waste Disposal Sheet Attached**

1. This well will be drilled using a closed loop mud system. The cuttings will be collected in containers located on location and disposed of in a state approved disposal site. Drilling fluids will likewise will be contained in tanks and disposed of in state approved disposal facilities.

2. All trash, junk and other waste material will be contained in trash cages or trash bins to prevent scattering. When job is complete, all contents will be taken from location and disposed of in a state approved disposal site.

3. Salts and other mud material remaining after completion of the well will be collected by the supplier and be removed from the location.

4. Waste water from living quarters will be directed into an onsite sewage treatment unit and when well is completed removed and disposed of in a state approved disposal site. Portable toilets will be on location for location construction, drilling, completion and production facilities construction. These portable toilets will be properly maintained and when all operations are complete they will be removed and disposed of in a state approved disposal site by the supplier.

5. Any fluids produced during the completion phase will be separated. The oil will be sold and the water will be disposed of in an approved disposal site.

b. **Construction and Lining of Reserve or Cuttings Pits:** The well will be drilled utilizing a closed system. Therefore, there will be no pits on location.

8. ANCILLARY FACILITIES

No camps, airstrips, staging areas or other facilities will be necessary during drilling of this well.

9. WELL SITE LAYOUT

a. **Proposed Drilling Pad:** A drawing of the well site is attached. The location was previously constructed, no additional construction will be necessary at this time.

b. **Location of the cuttings storage:** This well will be drilled using a closed loop mud system. The cuttings will be collected in containers located on location and disposed of in a state approved disposal site. Drilling fluids will likewise be contained in tanks and disposed of in a state approved disposal facility.

c. **Topsoil and/or spoil material stockpiles:**

1. Topsoil: The location is existing – no additional topsoil stripping will be required.

2. Subsoil: No additional subsoil removal or stockpiling will be required.

d. **Other:**

1. Approved APD: A complete copy of the approved APD, including conditions, stipulations, and exhibits will be on the well site and available for reference during the construction and drilling phases.

2. 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 (if any) 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, attached.)

10. RECLAMATION OF SURFACE

a. **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).

1. Notification: The BLM will be notified at least 24 hours prior to any reclamation, including topsoil spreading along the access road.

2. Rat and mouse holes: shall be filled and compacted from bottom to top immediately upon release of the drilling rig from location.

3. Removal of Fluids: This well will be drilled using a closed mud system. Any drilling fluids will be hauled to a state-approved facility shown on the Waste Disposal attachment.

4. Removal of Wastes: All wastes will be disposed of as stated in Section #7 of this Surface Use Plan.

5. Backfilling and Recontouring: Backfilling or recontouring of the pad will be done to reduce the cut and fill slopes in the areas not needed for production purposes.

b. **Final Abandonment & Reclamation:**

1. 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.

2. 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.

3. 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.

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

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

c. **Drainage systems:** If drainage systems (culverts) were put in place during the initial construction of the access road and pad they will be left in place during production operations. During final abandonment, the culverts will be removed if directed by the BLM.

d. **Segregation of spoil materials (stockpiles):** No spoil material is anticipated. The pad has been designed to balance as much as possible.

e. **Surface Disturbance:**

1. Rat and mouse holes will be backfilled on release of the completion rig from the location.

f. **Proposals for pit/sump closures:** This well will be drilled with a closed system. No pit closures will be necessary.

g. **Backfill Requirements:** No backfilling of pits will be required.

h. **Redistribution of topsoil:** Any topsoil reserved along the proposed access route will be spread on road slopes outside of the travel area and seeded. Any unused topsoil from the pad construction will be regraded to a pleasing appearance, re-seeded, properly signed, and protected with BMP's to ensure integrity is maintained throughout the production period of the facility.

i. **Soil treatments:** No soil treatments are anticipated at this time.

j. **Seed Mixture:**

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

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

Species	*Lbs. Pure Live Seed (PLS)*/acre*
Plains Bristlegrass	5
Sand bluestem	5
Little Bluestem	3
Big Bluestem	6
Plains Coreopsis	2

Sand Dropseed	1
TOTAL	**22**

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

3. Seed bed Preparation: Initial seedbed preparation will consist of ripping all compacted areas. Final seedbed preparation will consist of recontouring and cultivating along the contours to a depth of 4 to 6 inches. The specified seed mix will be used on all disturbed surfaces including pipelines and road cut/fill slopes.

4. Recommended reseeding measures are as follows:

Seeding Recommendations:

a. Seed will be drilled on the contour with a seed drill equipped with a depth regulator in order to ensure even depths of planting. Seeding depth will be maintained between ¼ to ½ inch deep. Precaution must be taken not to plant the seed too deeply in the soil or poor germination will result.

b. The seed bed should not be compacted, but prepared and left in a loosened condition prior to seeding.

c. Topsoil stockpiles to be stored beyond a growing season shall be protected from erosion. Methods to achieve this might include seeding with a temporary seed mixture approved by the BLM.

k. **Weed Control:**

1. Weed Management Objectives:

a. Implement strategies to prevent the introduction of weed species not currently established within the project area.

b. Inhibit the spread of established species to un-infested areas by activities related to oil well development.

c. Reduce weed dispersment by managing infestations around the well pad/ production facilities and access road.

2. Weed Management Plan: Weeds will be controlled on the well pad, exterior limits of the well pad, and on the roads and utility corridors.

3. Weed Monitoring: A weed monitoring and control program will be implemented beginning the first growing season after the location is built and interim and final reclamation.

4. Noxious Weeds: Noxious weeds that have been identified during monitoring will be promptly treated and controlled.

I. **Practices to reclaim all disturbed areas, including any access roads and pipelines:**

Final Reclamation:

1. Notice of Intent to Abandon: In accordance with 43 CFR 3162.3-4, before starting abandonment operations, the operator must submit a Notice of Intent to Abandon on a Sundry Notice, Form 3160-5. Of the operator plans to modify the plans for the surface reclamation, approved at the APD stage, the operator must attach these modifications to the Notice of Intent to Abandon.

2. Downhole plugging: Only the BLM can give approval of downhole plugging.

3. Facility Removal: Once the well is plugged and abandoned, and all production facilities and other related equipment will be removed from the production pad.

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

5. Removal of Surfacing Material: If any surfacing material is removed from the pad, it may be used along the access roads or may be moved to another proposed drill site.

6. Replacement of Topsoil: Any remaining topsoil that has been reserved will be spread over the location and/or access roads.

7. Re-Vegetation: Re-Vegetation of the location and access will be done utilizing the seed mixture specified by the Bureau of Land Management.

8. Weed Treatment plan description: 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 be held responsible if noxious weeds become established within the areas of operations. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

9. Success Standards: Reclamation will be considered successful if the following criteria are met:

- 70 percent of pre-disturbance cover;
- 90 percent dominate species;

11. SURFACE OWNERSHIP

a. **Well site** - Bureau of Land Management
620 E. Greene Street
Carlsbad NM 88220-6292
575-234-5972

b. **Roads** - Existing roads are located on BLM lands.

12. OTHER INFORMATION

a. Approved APD: 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. Note: No additional construction operations are anticipated since this is an existing well.

b. Rig Release: McElvain Energy Inc. shall notify the Bureau of Land Management office (Carlsbad – 575-234-5972) of the rig release date within two working days of that date.

c. Archeology: A Class III Archeological Survey was previously conducted by Southern New Mexico Archeological Services prior to construction of original well pad. A copy of this report is on file with the Bureau of Land Management.

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 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.

d. Changes: Additional requirements may be imposed if changes in operational and/or environmental conditions dictate. "Sundry Notice and Report of Wells" (Form 3160-5) will be filed for approval for all changes of plans and other operations in accordance with 32 CFR 3l64.

e. APD Expiration: Once approved, this APD will be valid for a period of 2 years from the date of the approval. If the well cannot be drilled within that time frame, a request can be made via Sundry Notice (Form 3160-5) for an extension of up to 2 years from the impending expiration date. It is recommended that such Sundry Notice shall be sent at least 2 weeks in advance of permit expiration.

f. Timing Limitation Stipulations: Any timing limitation stipulations which apply to this lease will be attached as a Condition of Approval by the Bureau of Land Management.

13. LESSEE'S OR OPERATOR'S REPRESENTATIVE AND CERTIFICATION

PERMIT MATTERS

PERMITCO INC.
PO Box 99
Eastlake, CO 80614
Lisa Smith
303-857-9999
303-324-9350 (cell)
303-450-9200 (fax)
303/857-0577 (fax)
E-mail: Lisa@permitco-usa.com

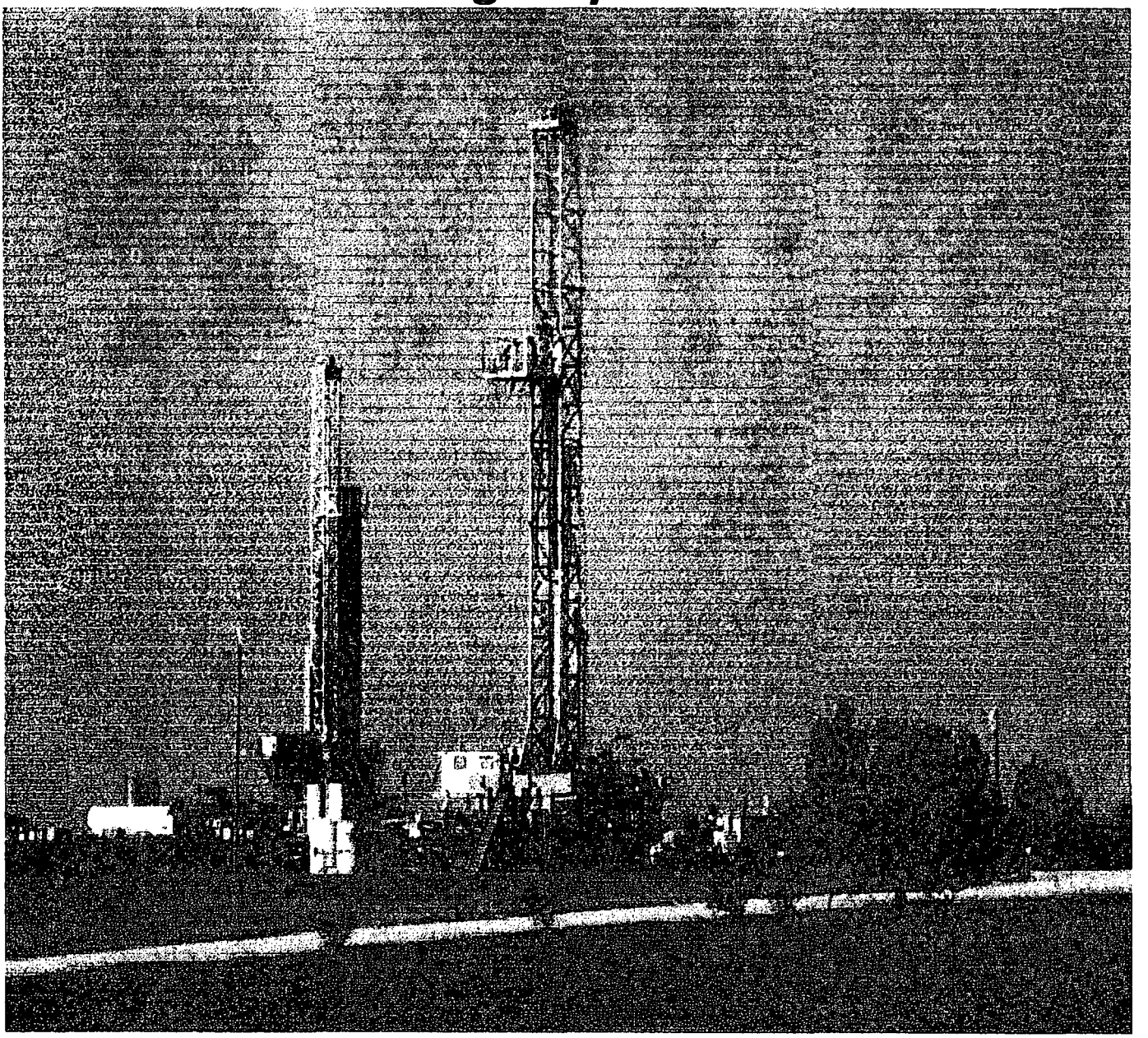
DRILLING AND COMPLETION MATTERS

McElvain Energy Inc.
1050-17th Street, Suite 2500
Denver, CO 80265-2080
Tony Cooper – Sr. Enviro. Health & Safety Spec.
303-893-0933 x 416, Tony.Cooper@mcelvain.com
Chris Caplis – VP Drilling and Completion
303-962-6475 (office)
927-601-4884 (cell)
E-Mail: Chris.Caplis@mcelvain.com

McELVAIN ENERGY

H_2S

Contingency Plan



Safety Automation Technology, LLC
3410 W Wall Street, Midland, Texas
(877) 394-1187

Injection Down Casing Burst Case:

MASP during stimulation = 9,500 psi (10,640 psi * 90% = 9,576 psi)

Therefore, 10,640 psi/9,500 psi = 1.12

Collapse: (MW*0.052*Max TVD')-(MW*0.052*Max TVD'*(1-% evac))

(9.4*0.052*10,119')-(9.4*0.052*10,119'*0) (100% evacuated)

4,946 psi – 0 psi = 4,946 psi

7,500/4,946 = 1.52

Tension: (Wt, lbs/ft*Max TVD') (wt in air)

(17 lbs/ft*10,119')

172,023 lbs

546,000/170,136 = 3.17

Emergency Assistance Telephone List

PUBLIC SAFETY:	911 or
State Police	911
U.S Dept of Transportation	806-743-7681
Air Ambulance (Angel Med Flight)	800-776-4256
Texas Poison Center	800-222-1222
Dept. of Public Safety	800-525-5555
Chris Caplis	303-962-6475
Kevin Oconnell	303-883-4124
Gary Arnold	318-423-9680

Rig Phone:

H&P Drilling

Safety Company

Safety Automation
Gary Crook — Office: (877) 394-1187

Table of Contents

H2S CONTINGENCY PLAN SECTION

Scope:

This contingency plan provides an organized plan of action for alerting and protecting the public within an area of exposure prior to an intentional release, or following the accidental release of a potentially hazardous volume of hydrogen sulfide. The plan establishes guidelines for all personnel whose work activity may involve exposure to Hydrogen Sulfide Gas (H_2S).

Objective:

Prevent any and all accidents, and prevent the uncontrolled release of H_2S into the atmosphere. Provide

proper evacuation procedures to cope with emergencies.

Provide immediate and adequate medical attention should an injury occur.

Discussion of Plan:

Suspected Problem Zones:

Implementation: This plan, with all details, is to be fully implemented 1000' before drilling into the first sour zone.

Emergency Response Procedure: This section outlines the conditions and denotes steps to be taken in the event of an emergency.

Emergency Equipment and Procedure: This section outlines the safety and emergency equipment that will be required for the drilling of this well.

Training Provisions: This section outlines the training provisions that must be adhered to 1000' before drilling into the first sour zone.

Emergency call list: Included are the telephone numbers of all persons that would need to be contacted, should an H_2S emergency occur.

Briefing: This section deals with the briefing of all persons involved with the drilling of this well. ***Public***

Safety: Public Safety Personnel will be made aware of the drilling of this well.

Check Lists: Status check lists and procedural check lists have been included to ensure adherence to the plan.

General Information: A general information section has been included to supply support information.

EMERGENCY PROCEDURES SECTION

I. In the event of any evidence of H_2S level above 10ppm, take the following steps immediately:

a. Secure breathing apparatus.

b. Order non-essential personnel out of the danger zone.

c. Take steps to determine if the H_2S level can be corrected or suppressed, and if so, proceed with normal operations.

II. If uncontrollable conditions occur, proceed with the following:

a. Take steps to protect and/or remove any public downwind of the rig, including partial evacuation or isolation. Notify necessary public safety personnel and TRRC in San Antonio, Texas.

b. Remove all personnel to the Safe Briefing Area.

c. Notify public safety personnel for help with maintaining roadblocks and implementing evacuation.

d. Determine and proceed with the best possible plan to regain control of the well. Maintain tight security and safety measures.

III. Responsibility:

a. The Company Approved Supervisor shall be responsible for the total implementation of the plan.

b. The Company Approved Supervisor shall be in complete command during any emergency.

c. The Company Approved Supervisor shall designate a back up Supervisor in the event that he/she is not available.

EMERGENCY PROCEDURE IMPLEMENTATION

I. Drilling

a. *All Personnel*

1. When alarm sounds, don escape unit if needed and report to upwind Safe Briefing Area..
2. Wait for orders from supervisor.

b. *Drilling Foreman*

1. Report to the upwind Safe Briefing Area.
2. Try to determine the concentration of H_2S and where gas is coming from by use of technology on company mans computer.
3. Assess the situation and take appropriate control measures.

c. *Tool Pusher*

1 Report to the upwind Safe Briefing Area.

d. *Driller*

1. Don 30 Minute SCBA
2. Proceed to secure the well.

e. *Derrick Man and Floor Hands*

1. Remain in the upwind Safe Briefing Area until otherwise instructed by a supervisor.

f. *Mud Engineer*

1. Report to the upwind Safe Briefing Area.
2. When instructed, begin check of mud for pH level and H_2S level.

g. *Safety Personnel*

1. Don Breathing Apparatus.
2. Preform assessment of H2S Gas being present.
3. Wait for instructions from Drilling Foreman or Tool Pusher.

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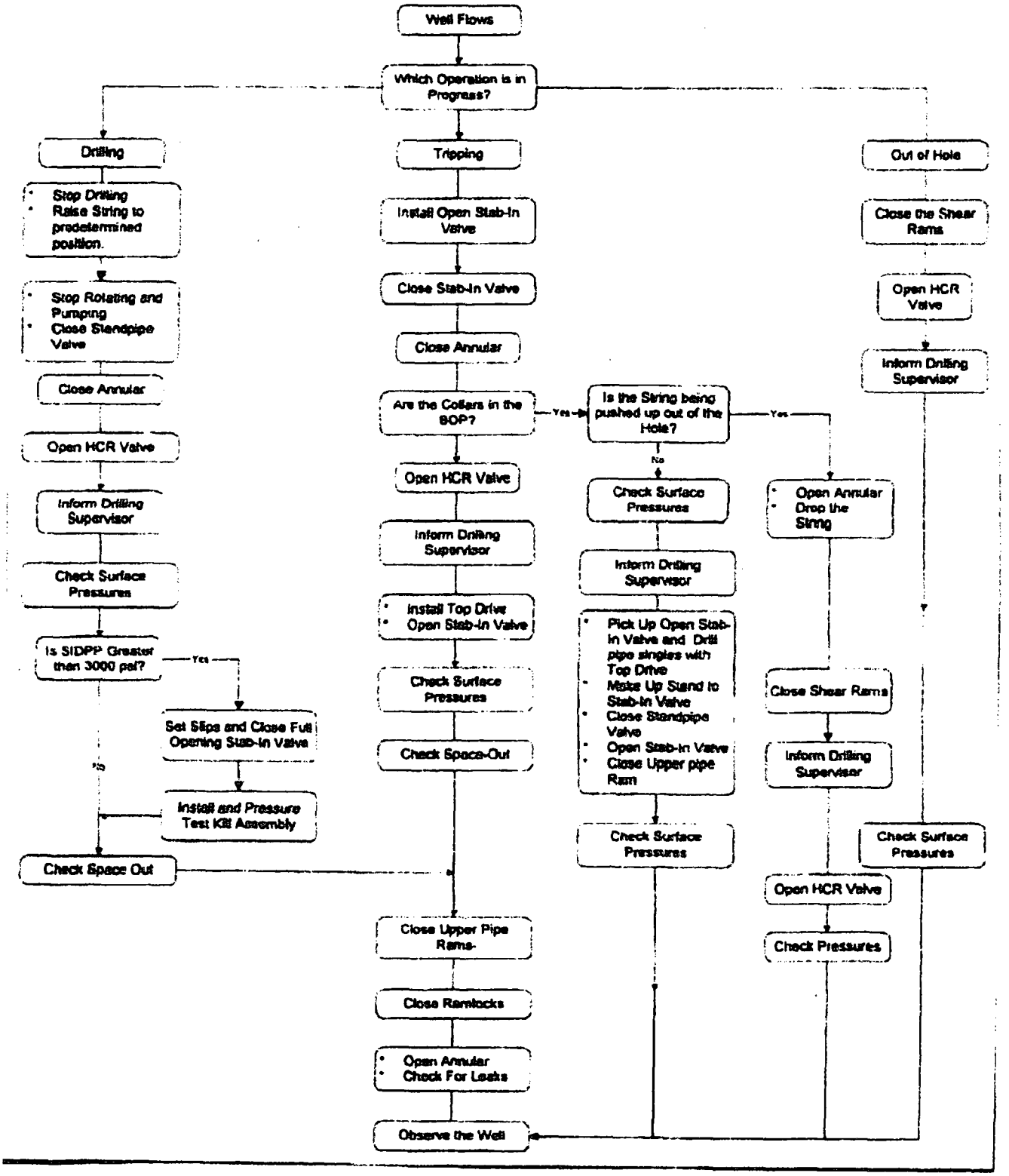

Well Flows
Which Operation is in Progress?
Drilling
Tripping
Out of Hole
Stop Drilling
Raise String to predetermined position.
Install Open Stab-In Valve
Close the Shear Rams
Stop Rotating and Pumping
Close Standpipe Valve
Close Stab-In Valve
Open HCR Valve
Close Annular
Close Annular
Inform Drilling Supervisor
Open HCR Valve
Are the Collars in the BOP?
Yes
Is the String being pushed up out of the Hole?
Yes
Inform Drilling Supervisor
Open HCR Valve
No
Check Surface Pressures
Open Annular
Drop the String
Check Surface Pressures
Inform Drilling Supervisor
Is SIDPP Greater than 3000 psi?
Yes
Install Top Drive
Open Stab-In Valve
Pick Up Open Stab-In Valve and Drill pipe singles with Top Drive
Make Up Stand to Stab-In Valve
Close Standpipe Valve
Open Stab-In Valve
Close Upper pipe Ram
Check Surface Pressures
Check Space-Out
Close Shear Rams
Inform Drilling Supervisor
Set Slips and Close Full Opening Stab-In Valve
Install and Pressure Test Kill Assembly
Check Space Out
Check Surface Pressures
Open HCR Valve
Check Pressures
Close Upper Pipe Rams
Close Ramlocks
Open Annular
Check For Leaks
Observe the Well

II. Tripping Pipe

a. *All Personnel*

1. 1. When alarm sounds, don emergency hooded escape unit (if needed, when in close proximity to one)and report to upwind Safe Briefing Area.

2. Wait for orders from supervisor.

b. *Drilling Foreman*

1. Report to the upwind Safe Briefing Area.

2. Try to determine the concentration of H_2S and where gas is coming from by use of technology on company mans computer.

3 .Assess the situation and take appropriate control measures.

c. *Tool Pusher*

1 Report to the upwind Safe Briefing Area.

d. *Driller*

1. Don 30 Minute SCBA

2. Proceed to Secure the well.

e. *Derrick Man and Floor Hands*

1. (2) Designated Floor Men will Don 30 min SCBA's for Self Protection, Secure the Drill Pipe and Set the Slips. The Driller will then Screw into the Stand of Drill Pipe with the Top Drive and Secure the Well. The Driller and 2 Floor Men will then Proceed to the Muster Area. The Derrick Man will Don an Emergency 15 Min (Full Face) SKA, Descend the Derrick to Rig Floor and Proceed to the Muster Area. All other Personnel will Don an Emergency Hood Escape Unit, when in Close Proximity to one and Proceed to the Muster Area.

f. *Mud Engineer*

1. Report to the upwind Safe Briefing Area.

2. When instructed, begin check of mud for pH level and H_2S level.

g. Safety Personnel

1. Don Breathing Apparatus.
2. Preform assessment of H2S Gas being present.
3. Wait for instructions from Drilling Foreman or Tool Pusher.

III. Taking a Kick

1. All Personnel report to the upwind Safe Briefing Area.
2. Follow standard BOP procedures Follow "Drilling or Tripping" Procedures

IV. Open Hole Logging

1. All unnecessary personnel should leave the rig floor.
2. Drilling Foreman and Safety Personnel should monitor the conditions and make necessary safety equipment recommendations.

IIV. Running Casing or Plugging

1. Follow "Drilling or Tripping" procedures.
2. Assure that all personnel have access to protective equipment.

SIMULATED BLOWOUT CONTROL DRILLS

All drills will be initiated by activating alarm devices (air horn). One long blast, on the air horn, for ACTUAL and SIMULATED Blowout Control Drills. This operation will be performed by the Drilling Foreman or Tool Pusher at least one time per week.

In each drill, the initial reaction time to shutting in the well shall be timed as well as the total time for the crew to complete its entire pit drill assignment. The times must be recorded on the IADC Driller's Log as "Blowout Control Drill".

Drill No.:

Reaction Time to Shut-In: minutes, seconds.
Total Time to Complete Assignment: minutes, seconds.

I. Drill Overviews

a. Drill No. 1 –Drilling

i. Sound the alarm immediately.

ii. Stop the rotary and hoist Kelly joint above the rotary table.

iii. Stop the circulatory pump.

iv. Close the drill pipe rams.

v. Record casing and drill pipe shut-in pressures and pit volume increases.

b. Drill No. 2 – Tripping Drill Pipe

i. Sound the alarm immediately.

ii. Position the upper tool joint just above the rotary table and set the slips.

iii. Install a full opening valve or inside blowout preventer tool in order to close the drill pipe.

iv. Close the drill pipe rams.

v. Record the shut-in annular pressure.

i. Driller

1. Stop the rotary and hoist Kelly joint above the rotary table.
2. Stop the circulatory pump.
3. Check Flow.
4. If flowing, sound the alarm immediately
5. Record the shit-in drill pipe pressure
6. Determine the mud weight increase needed or other courses of action.

ii. Derrickman

1. Open choke line valve at BOP.
2. Signal Floor Man #1 at accumulator that choke line is open.
3. Close choke and upstream valve after pipe tam have been closed.
4. Read the shut-in annular pressure and report readings to Driller.

iii. Floor Man #1

1. Close the pipe rams after receiving the signal from the Derrickman.
2. Report to Driller for further instructions.

iv. Floor Man #2

1. Notify the Tool Pusher and Operator representative of the H_2S alarms.
2. Check for open fires and, if safe to do so, extinguish them.
3. Stop all welding operations.
4. Turn-off all non-explosions proof lights and instruments.
5. Report to Driller for further instructions.

\v. *Tool Pusher*

1. Report to the rig floor.
2. Have a meeting with all crews.
3. Compile and summarize all information.
4. Calculate the proper kill weight.
5. Ensure that proper well procedures are put into action. *Operator*

Company Man

1. Notify the Drilling Superintendent.
2. Determine if an emergency exists and if so, activate the contingency plan.

b. Drill No. 2 Tripping Pipe

i Driller

1. Sound the alarm immediately when mud volume increase has been detected.
2. Position the upper tool joint just above the rotary table and set slips.
3. Install a full opening valve or inside blowout preventer tool to close the drill pipe.
4. Check flow.
5. Record all data reported by the crew.
6. Determine the course of action.

ii. Derrickman

1. Come down out of derrick.
2. Notify Tool Pusher and Operator Representative.
3. Check for open fires and, if safe to do so, extinguish them.
4. Stop all welding operations.
5. Report to Driller for further instructions.

iii. Floor Man #1

1. Pick up full opening valve or inside blowout preventer tool and stab into tool joint above rotary table (with Floor Man #2).
2. Tighten valve with back-up tongs.
3. Close pipe rams after signal from Floor Man #2.
4. Read accumulator pressure and check for possible high pressure fluid leaks in valves or piping.
5. Report to Driller for further instructions.

iv. Floor Man #2

1. Pick-up full opening valve or inside blowout preventer tool and stab into tool joint above rotary table (with Floor Man #1).
2. Position back-up tongs on drill pipe.
3. Open choke line valve at BOP.
4. Signal Floor Man #1 at accumulator that choke line is open.
5. Close choke and upstream valve after pipe rams have been closed.
6. Check for leaks on BOP stack and choke manifold.
7. Read annular pressure.
8. Report readings to the Driller.

v. Tool Pusher

1. Report to the rig floor.
2. Have a meeting with all of the crews.
3. Compile and summarize all information.
4. See that proper well kill procedures are put into action.

vi. Operator Representative

1. Notify Drilling Superintendent
2. Determine if an emergency exists, and if so, activate the contingency plan.

IGNITION PROCEDURES

Responsibility:

The decision to ignite the well is the responsibility of the DRILLING FOREMAN in concurrence with the STATE POLICE. In the event the Drilling Foreman is incapacitated, it becomes the responsibility of the RIG TOOL PUSHER. This decision should be made only as a last resort and in a situation where it is clear that:

1. Human life and property are endangered.

2. There is no hope of controlling the blowout under the prevailing conditions.

If time permits, notify the main office, but do not delay if human life is in danger. Initiate the first phase of the evacuation plan.

Instructions for Igniting the Well:

1. Two people are required for the actual igniting operation. Both men must wear self-contained breathing apparatus and must use a full body harness and attach a retrievable safety line to the D-Ring in the back. One man must monitor the atmosphere for explosive gases with the LEL monitor, while the Drilling Foreman is responsible for igniting the well.

2. The primary method to ignite is a 25mm flare gun with a range of approximately 500 feet.

3. Ignite from upwind and do not approach any closer than is warranted.

4. Select the ignition site best suited for protection and which offers an easy escape route.

5. Before igniting, check for the presence of combustible gases.

6. After igniting, continue emergency actions and procedures as before.

7. All unassigned personnel will limit their actions to those directed by the Drilling Foreman.

Note: After the well is ignited, burning Hydrogen Sulfide will convert to Sulfur Dioxide, which is also highly toxic. Do not assume the area is safe after the well is ignited.

TRAINING PROGRAM

When working in an area where Hydrogen Sulfide (H_2S) might be encountered, definite training requirements must be carried out. The Company Supervisor will ensure that all personnel, at the well site, have had adequate training in the following:

1. Hazards and characteristics of Hydrogen Sulfide.
2. Physicals effects of Hydrogen Sulfide on the human body.
3. Toxicity of Hydrogen Sulfide and Sulfur Dioxide.
4. H_2S detection, Emergency alarm and sensor location.
5. Emergency rescue.
6. First aid and artificial resuscitation.
7. The effects of Hydrogen Sulfide on metals.
8. Location safety.

Service company personnel and visiting personnel must be notified if the zone contains H_2S, and each service company must provide adequate training and equipment for their employees before they arrive at the well site.

EMERGENCY EQUIPMENT REQUIREMENTS

Lease Entrance Sign:

Should be located at the lease entrance with the following information:

CAUTION – POTENTIAL POISON GAS
HYDROGEN SULFIDE
NO ADMITTANCE WITHOUT AUTHORIZATION

Respiratory Equipment:

- Fresh air breathing equipment should be placed at the safe briefing areas and should include the following:
- Four 30 Minute SCBA units (2 at each briefing area).
- Six 5 minute escape packs (4) placed in drilling cabin, (2) Shaker area and.
- Cascade Trailer system on location to be used as refill station for SCBA's
- (5) 5 Minute Work Units, Airlines, Manifolds, to be placed on Rig Floor and Shaker Area

Windsocks or Wind Streamers:

- A minimum of two 10" windsocks located at strategic locations so that they may be seen from any point on location.
- Wind streamers (if preferred) should be placed at various locations on the well site to ensure wind consciousness at all times. (Corners of location).

Hydrogen Sulfide Detector and Alarms:

- 1 - Multi channel H_2S monitor with alarms. (GPS, Alarm notification, satellite)
- Computer in Company Man's Trailer. (Shepherd Software Bundles)
- Five (5) sensors located as follows: Floor, BOP-Sub, Pits and 2-Shaker area
- 4 gas monitor detector

Well Condition Sign and Flags:

The Well Condition Sign w/flags should be placed visible for people to see before they enter the location. It should have three (3) color coded flags (green, yellow and red) that will be used to denote the following location conditions:

Green 0-10 ppm Low
Yellow 10-30ppm Moderate
Red 30ppm and above . Extreme

Auxiliary Rescue Equipment:

- Stretcher
- First Aid Kit properly stocked.

Mud Inspection Equipment:

Garret Gas Train or Hach Tester for inspection of Hydrogen Sulfide in the drilling mud system if applicable

. Fire Extinguishers:

Adequate fire extinguishers shall be located at strategic locations.

Blowout Preventer:

- The well shall have hydraulic BOP equipment for the anticipated BHP.
- The BOP should be tested upon installation.
- BOP, Choke Line and Kill Line will be tested as specified by Operator.

Confined Space Monitor:

There should be a portable multi-gas monitor with at least 3 sensors (O_2, LEL H_2S). This instrument should be used to test the atmosphere of any confined space before entering. It should also be used for atmospheric testing for LEL gas before beginning any type of Hot Work. Proper calibration documentation should be provided.

Communication Equipment:

- Proper communication equipment or 2-way radios should be available at the rig.
- Radio communication shall be available for communication between the company man's trailer, rig floor and the tool pusher's trailer.
- **Special Control Equipment:**

- Hydraulic BOP equipment with remote control panel.
- Rotating head at the surface casing point.

Evacuation Plan:

- Evacuation routes should be established prior to spudding the well. **See McElvain Energy**

Site Plan Should be discussed with all rig personnel.

Designated Areas:

Parking and Visitor area:

All vehicles are to be parked at a pre-determined safe distance from the wellhead.

Designated smoking area.

Safe Briefing Areas:

Two Safe Briefing Areas (Muster Area) shall be designated on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds if wind directions tend to shift in the area.

Personal protective equipment should be stored at both briefing areas or if a moveable cascade trailer is used, it should be kept upwind of existing winds. When wind is from the prevailing direction, both briefing areas should be accessible.

Note:

Additional equipment will be available at the Safety Automation Technology, LLC office.

Additional personal H_2S monitors are available for all employees on location.

Automatic Flare Igniters are recommended for installation on the rig.

CHECK LISTS

Status Check List

1. Sign at location entrance. _____
2. Two (2) wind socks. _____
3. SCBA's on location for all rig personnel and mud loggers. _____
4. Air packs, inspected and ready for use. _____
5. Spare bottles for each air pack (if required). _____
6. Cascade system and hose line hook up (if required). _____
7. Choke manifold hooked-up and tested. (before drilling out surface casing.) _____
8. Remote Hydraulic BOP control (hooked-up and tested before drilling out surface casing). _____
9. BOP tested (before drilling out surface casing). _____
10. Safe Briefing Areas set-up _____
11. Well Condition sign and flags on location and ready. _____
12. Hydrogen Sulfide detection system hooked -up & tested. _____
13. Hydrogen Sulfide alarm system hooked-up & tested. _____
14. 1 – 20# Fire Extinguisher in safety trailer. _____
15. Confined Space Monitor on location and tested. _____
16. All rig crews and supervisor trained (as required). _____
17. Access restricted for unauthorized personnel. _____
18. Drills on H_2S and well control procedures. _____
19. All outside service contractors advised of potential H_2S on the well. _____
20. NO SMOKNG sign posted. _____
21. Automatic Flare Igniter installed on rig. _____

Procedural Check List

Perform the following on each tour:

1. Check fire extinguishers to see that they have the proper charge.
2. Check breathing equipment to insure that they have not been tampered with.
3. Check pressure on the supply air bottles to make sure they are capable of recharging.
4. Make sure all of the Hydrogen Sulfide detection systems are operative.

Perform the following each week:

1. Check each piece of breathing equipment to make sure that they are fully charged and operational. This requires that the air cylinder be opened and the mask assembly be put on and tested to make sure that the regulators and masks are properly working. Negative and Positive pressure should be conducted on all masks.
2. BOP skills.
3. Check supply pressure on BOP accumulator stand-by source.
4. Check all breathing air mask assemblies to see that straps are loosened and turned back, ready for use.
5. Check pressure on cascade air cylinders to make sure they are fully charged and ready to use for refill purposes if necessary.
6. Check all cascade system regulators to make sure they work properly if required.
7. Test the Four Gas Monitor to verify the batteries are good
8. Test all H2S Sensors to verify they are correctly reading gas sampling
9. Test and verify all air equipment on location is fully functional and full

BRIEFING PROCEDURES

The following scheduled briefings should be held to ensure the effective drilling and operation of this project:

Pre-Spud Meeting

Date: Prior to spudding the well.
Attendance: Drilling Supervisor Drilling Engineer
Drilling Foreman
Rig Tool Pushers Rig Drillers **(note: only crews members that have med eval and fit test will be allowed to work under air on rig)**
Mud Engineer
All Safety Personnel
Key Service Company Personnel

Purpose: Review and discuss the well program, step-by-step, to insure complete understanding of assignments and responsibilities.

EVACUATION PLAN

General Plan

The direct lines of action prepared by SAFETY AUTOMATION TECHNOLOGY, LLC to protect the public from hazardous gas situations are as follows:

1. When the company approved supervisor (Drilling Foreman, Tool Pusher or Driller) determine that Hydrogen Sulfide gas cannot be limited to the well location, and the public will be involved, he will activate the evacuation plan. Escape routes are noted on the area map.

2. Company safety personnel or designee will notify the appropriate local government agency that a hazardous condition exists and evacuation needs to be implemented.

3. Company approved safety personnel that have been trained in the use of the proper emergency equipment will be utilized.

4. Law enforcement personnel (State Police, Local Police Department, Fire Department, and the Sheriff's Department) will be called to aid in setting up and maintaining road blocks. Also, they will aid in evacuation of the public if necessary.

NOTE: Law enforcement personnel will not be asked to come into a contaminated area. Their assistance will be limited to uncontaminated areas. Constant radio contact will be maintained with them.

5. After the discharge of gas has been controlled, "Company" safety personnel will determine when the area is safe for re-entry.

EMERGENCY RESCUE PROCEDURES

DO NOT PANIC!!!

Remain Calm Think

1. Before attempting any rescue you must first get out of the hazardous area yourself. Go to a safe briefing area.
2. Sound alarm and activate the 911 system.
3. Put on breathing apparatus. At least two persons should do this, when available use the buddy system.
4. Rescue the victim and return them to a safe briefing area.
5. Perform an initial assessment and begin proper First Aid/CPR procedures.
6. Keep victim lying down with a blanket or coat, etc., under the shoulders to keep airway open. Conserve body heat and do not leave unattended.
7. If the eyes are affected by H_2S, wash them thoroughly with potable water. For slight irritation, cold compresses are helpful.
8. In case a person has only minor exposure and does not lose consciousness totally, it's best if he doesn't return to work until the following day.
9. Any personnel overcome by H_2S should always be examined by medical personnel. They should always be transported to a hospital or doctor.

RESPIRATOR USE

The Occupational Safety and Health Administration (OSHA) regulate the use of respiratory protection to protect the health of employees. OSHA's requirements are written in the Code of Federal Regulations, Title 29, Part 1910, Section 134, Respiratory Protection. This regulation requires that all employees who might be required to wear respirators, shall complete a OSHA mandated medical evaluation questionnaire. The employee then should be fit tested prior to wearing any respirator while being exposed to hazardous gases.

Written procedures shall be prepared covering safe use of respirators in dangerous atmospheric situations, which might be encountered in normal operations or in emergencies. Personnel shall be familiar with these procedures and the available respirators.

Respirators shall be inspected prior to and after each use to make sure that the respirator has been properly cleaned, disinfected and that the respirator works properly. The unit should be fully charged prior to being used.

Anyone who may use respirators shall be properly trained in how to properly seal the face piece. They shall wear respirators in normal air and then in a test atmosphere. (Note: Such items as facial hair (beard or sideburns) and eyeglass temple pieces will not allow a proper seal.) Anyone that may be expected to wear respirators should have these items removed before entering a toxic atmosphere. A special mask must be obtained for anyone who must wear eyeglasses. Contact lenses should not be allowed.

Respirators shall be worn during the following conditions:

A. Any employee who works near the top or on the top of any tank unless tests reveal less than 20 ppm of H_2S.

B. When breaking out any line where H_2S can reasonably be expected.

C. When sampling air in areas where H_2S may be present.

D. When working in areas where the concentration of H_2S exceeds the Threshold Limit Value for H_2S (10 ppm).

E. At any time where there is a doubt as to the H_2S level in the area to be entered.

PHYSICAL PROPERTIES OF H_2S

The properties of all gases are usually described in the context of seven major categories:

COLOR

ODOR

VAPOR DENSITY
EXPLOSIVE LIMITS
FLAMMABILITY
SOLUBILITY (IN WATER)

BOILING POINT

Hydrogen Sulfide is no exception. Information from these categories should be considered in order to provide a fairly complete picture of the properties of the gas.

COLOR TRANSPARENT

Hydrogen Sulfide is colorless so it is invisible. This fact simply means that you can't rely on your eyes to detect its presence. In fact that makes this gas extremely dangerous to be around.

ODOR ROTTEN EGGS

Hydrogen Sulfide has a distinctive offensive smell, similar to "rotten eggs". For this reason it earned its common name "sour gas". However, H_2S, even in low concentrations, is so toxic that it attacks and quickly impairs a victim's sense of smell, so it could be fatal to rely on your nose as a detection device.

VAPOR DENSITY SPECIFIC GRAVITY OF 1.192

Hydrogen Sulfide is heavier than air so it tends to settle in low-lying areas like pits, cellars or tanks. If you find yourself in a location where H_2S is known to exist, protect yourself. Whenever possible, work in an area upwind and keep to higher ground.

EXPLOSIVE LIMITS 4.3% TO 46%

Mixed with the right proportion of air or oxygen, H_2S will ignite and burn or explode, producing another alarming element of danger besides poisoning.

FLAMMABILITY

Hydrogen Sulfide will burn readily with a distinctive clear blue flame, producing Sulfur Dioxide (SO_2), another hazardous gas that irritates the eyes and lungs.

SOLUBILITY 4 TO 1 RATIO WITH WATER

Hydrogen Sulfide can be dissolved in liquids, which means that it can be present in any container or vessel used to carry or hold well fluids including oil, water, emulsion and sludge. The solubility of H_2S is dependent on temperature and pressure, but if conditions are right, simply agitating a fluid containing H_2S may release the gas into the air.

BOILING POINT (-76 degrees Fahrenheit)

Liquefied Hydrogen Sulfide boils at a very low temperature, so it is usually found as a gas.

TABLE 2

Toxicity Table of H_2S

Percent %	PPM	Physical Effects
.0001	1	Can smell less than 1 ppm.
.001	10	TLV for 8 hours of exposure.
.0015	15	STEL for 15 minutes of exposure.
.01	100	Immediately Dangerous to Life & Health. Kills sense of smell in 3 to 5 minutes.
.02	200	Kills sense of smell quickly, may burn eyes and throat.
.05	500	Dizziness, cessation of breathing begins **in a few minutes.**
.07	700	Unconscious quickly, death will result if not rescued promptly.
.10	1000	Death will result unless rescued promptly. Artificial resuscitation may be necessary.

Toxic Effects of H_2S Poisoning

Hydrogen Sulfide is extremely toxic. The acceptable ceiling concentration for eight-hour exposure is 10 PPM, which is .001% by volume. Hydrogen Sulfide is heavier than air (specific gravity 1.192) and is colorless and transparent. Hydrogen Sulfide is almost as toxic as Hydrogen Cyanide and is 5-6 times more toxic than Carbon Monoxide. Occupational exposure limits for Hydrogen Sulfide and other gases are compared below in Table 1. Toxicity table for H_2S and physical effects are shown in Table 2.

Table 1
Permissible Exposure Limits of Various Gases

Common Name	Symbol	Sp. Gravity	TLV	STEL	IDLH
Hydrogen Cyanide	HCN	.94	4.7 ppm	C	
Hydrogen Sulfide	H_2S	1.192	10 ppm	15 ppm	100 ppm
Sulfide Dioxide	SO_2	2.21	2 ppm	5 ppm	
Chlorine	CL	2.45	.5 ppm	1 ppm	
Carbon Monoxide	CO	.97	25 ppm	200 ppm	
Carbon Dioxide	CO_2	1.52	5000 ppm	30,000 ppm	
Methane	CH_4	.55	4.7% LEL	14% UEL	

Definitions

A. TLV Threshold Limit Value is the concentration employees may be exposed based on a TWA (time weighted average) for eight (8) hours in one day for 40 hours in one (1) week. This is set by ACGIH (American Conference of Governmental Hygienists) and regulated by OSHA.

B. STEL Short Term Exposure Limit is the 15 minute average concentration an employee may be exposed to providing that the highest exposure never exceeds the OEL (Occupational Exposure Limit). The OEL for H_2S is 19 PPM.

C. IDLH Immediately Dangerous to Life and Health is the concentration that has been determined by the ACGIH to cause serious health problems or death if exposed to this level. The IDLH for H_2S is 100 PPM.

D. TWA Time Weighted Average is the average concentration of any chemical or gas for an eight (8) hour period. This is the concentration that any employee may be exposed based on an TWA.

GENERAL INFORMATION

Affected Notification List
(within a 65' radius of exposure @100ppm)

The geologic zones that will be encountered during drilling are known to contain hazardous quantities of H_2S. The accompanying map illustrates the affected areas of the community. The residents within this radius will be notified via a hand delivered written notice describing the activities, potential hazards, conditions of evacuation, evacuation drill siren alarms and other precautionary measures.

Evacuee Description: Residents: **THERE ARE NO RESIDENTS WITHIN 65' ROE.**

Notification Process:

A continuous siren audible to all residence will be activated, signaling evacuation of previously notified and informed residents.

Evacuation Plan:

All evacuees will migrate lateral to the wind direction.

The Oil Company will identify all home bound or highly susceptible individuals and make special evacuation preparations, interfacing with the local and emergency medical service as necessary.

Waste Minimization Plan

Provide the information below for all wells to be drilled from the same well pad.

1	Well Name(s):	EK 31 BS2 Federal Com 2H	
2	Qtr. Qtr., Sec. Twn. Range	SESE 30 18S 34E	
3	County, State	County: Lea	State: NM

4	Anticipated completion date of the proposed well(s):	est. 9/1/2018	
5	Anticipated date of first production:	est 9/15/2018	
6	Expected oil and gas production rates and duration. (Note: if the proposed well is on a multi-well pad, the plan should include the total expected production for all wells being completed)	600 MCFD 600 BOPD This is the 4th well on the pad other wells completed in 2017. Total All - 2400 BOPD...2400 MCFD	Duration: 24 hrs
7	Expected production decline curve of both oil and gas from the proposed well(s)		
8	Expected BTU Value for gas production	1200-1300 BTU	
9	Certification that the operator has provided one or more midstream processing companies with information about the operator's production plans, including the anticipated completion dates and gas production rates of the proposed well or wells:	Attach Letter	

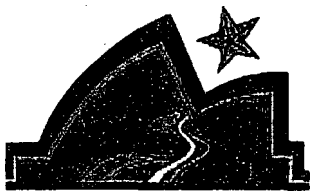
Pipeline Information:

10	Identify the gas pipeline which the operator plan to connect (with sufficient capacity to accommodate the anticipated production of the proposed well(s):	Well will tie into an existing Targa / Versado Gas Pipeline. This well will have its own gas sales allocation meter on the well pad before being sent off pad, but still on-lease, to the Targa custody transfer meter.
11	Maximum current daily capacity of the pipeline	15MM
12	Current throughput of the pipeline;	2.3MM
13	Anticipated daily capacity of the pipeline at the anticipated date of first gas sales from the proposed well:	12MM

14	Anticipated throughput of the pipeline at the anticipated date of first gas sales from the proposed well;	1.5MM
15	Any plans known to the operator for expansion of pipeline capacity for the area that includes the proposed well(s);	None at this time, but as needed

If an operator <u>cannot</u> identify a gas pipeline with sufficient capacity to accommodate the anticipated production of the proposed well(s), the waste minimization plan must also include the following:

16	A gas pipeline system location map of sufficient detail, size and scale as to show the field in which the proposed well will be located and all existing gas trunk lines within 20 miles of the well.	Attach Map	
17	Show name and location of the gas processing plant(s) closest to the proposed well(s), and of the intended destination processing plant, if different	Gas Plant Name(s):	Plant Locations:
18	Show the location and name of the operator of each gas trunk line within 20 miles of the proposed well;	Show on Map	
19	Show the proposed route and tie-in point that connects or could connect the subject well to an existing gas trunk line;	Show on Map	
20	Total Volume of produced gas, and percentage of total produced gas, that the operator is currently flaring or venting from wells in the same field and any wells within a 20 mile radius of the field;	Volume of total produced gas:	Percentage of total produced gas:
21	Provide a detailed evaluation, including estimates of costs and returns, of opportunities for on-site capture approaches, such as compression or liquefaction of natural gas, removal of natural gas liquids, or generation of electricity from gas.	Attach evaluation	



McElvain Energy, Inc.

Sec. 30 T18S R34E
EK Federal Com 30
EK 31 BS2 Federal Com 2H

Wellbore #1

Plan: Design #1 13Nov17 kjs

Standard Planning Report - Geographic

13 November, 2017

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well EK 31 BS2 Federal Com 2H
Company:	McElvain Energy, Inc.	**TVD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Project:	Sec. 30 T18S R34E	**MD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Site:	EK Federal Com 30	**North Reference:**	True
Well:	EK 31 BS2 Federal Com 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 13Nov17 kjs		

Project	Sec. 30 T18S R34E, Lea County, NM		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site EK Federal Com 30

Site Position:		**Northing:**	623,533.90 usft	**Latitude:**	32° 42' 42.986 N
From:	Map	**Easting:**	769,543.90 usft	**Longitude:**	103° 35' 28.945 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.40 °

Well EK 31 BS2 Federal Com 2H

Well Position	**+N/-S**	0.0 usft	**Northing:**	623,430.08 usft	**Latitude:**	32° 42' 42.008 N
	+E/-W	0.0 usft	**Easting:**	768,828.28 usft	**Longitude:**	103° 35' 37.329 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	3,894.0 usft

Wellbore Wellbore #1

Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	11/13/17	6.96	60.50	48,179

Design Design #1 13Nov17 kjs

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	180.00	

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	
3,000.0	0.00	0.00	3,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
3,769.5	11.54	265.06	3,764.3	-6.6	-77.0	1.50	1.50	0.00	265.06	
8,806.3	11.54	265.06	8,699.2	-93.4	-1,081.0	0.00	0.00	0.00	0.00	
9,575.7	0.00	0.00	9,463.5	-100.0	-1,158.0	1.50	-1.50	0.00	180.00	
10,314.4	88.64	180.00	9,940.8	-566.1	-1,158.0	12.00	12.00	0.00	180.00	
14,957.2	88.64	180.00	10,051.0	-5,207.6	-1,158.0	0.00	0.00	0.00	0.00	TD / PBHL EK 31 BS2

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well EK 31 BS2 Federal Com 2H
Company:	McElvain Energy, Inc.	**TVD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Project:	Sec. 30 T18S R34E	**MD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Site:	EK Federal Com 30	**North Reference:**	True
Well:	EK 31 BS2 Federal Com 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 13Nov17 kjs		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
200.0	0.00	0.00	200.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
400.0	0.00	0.00	400.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
600.0	0.00	0.00	600.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
800.0	0.00	0.00	800.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
1,000.0	0.00	0.00	1,000.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
1,200.0	0.00	0.00	1,200.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
1,400.0	0.00	0.00	1,400.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
1,600.0	0.00	0.00	1,600.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
1,671.0	0.00	0.00	1,671.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
Rustler									
1,731.0	0.00	0.00	1,731.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
Salt									
1,800.0	0.00	0.00	1,800.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
2,000.0	0.00	0.00	2,000.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
2,200.0	0.00	0.00	2,200.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
2,400.0	0.00	0.00	2,400.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
2,600.0	0.00	0.00	2,600.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
2,800.0	0.00	0.00	2,800.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
3,000.0	0.00	0.00	3,000.0	0.0	0.0	623,430.08	768,828.28	32° 42' 42.008 N	103° 35' 37.329 W
Start Build 1.50									
3,200.0	3.00	265.06	3,199.9	-0.5	-5.2	623,429.60	768,823.07	32° 42' 42.004 N	103° 35' 37.390 W
3,221.1	3.32	265.06	3,221.0	-0.6	-6.4	623,429.49	768,821.91	32° 42' 42.003 N	103° 35' 37.404 W
Yates									
3,400.0	6.00	265.06	3,399.3	-1.8	-20.8	623,428.14	768,807.44	32° 42' 41.990 N	103° 35' 37.573 W
3,600.0	9.00	265.06	3,597.5	-4.0	-46.9	623,425.71	768,781.46	32° 42' 41.968 N	103° 35' 37.877 W
3,725.5	10.88	265.06	3,721.1	-5.9	-68.4	623,423.70	768,759.88	32° 42' 41.950 N	103° 35' 38.130 W
Seven Rivers									
3,769.5	11.54	265.06	3,764.3	-6.6	-77.0	623,422.90	768,751.37	32° 42' 41.942 N	103° 35' 38.230 W
Hold 11.54 Inc, 265.06 Az									
3,800.0	11.54	265.06	3,794.2	-7.2	-83.0	623,422.33	768,745.29	32° 42' 41.937 N	103° 35' 38.301 W
4,000.0	11.54	265.06	3,990.1	-10.6	-122.9	623,418.61	768,705.45	32° 42' 41.903 N	103° 35' 38.768 W
4,200.0	11.54	265.06	4,186.1	-14.1	-162.8	623,414.89	768,665.60	32° 42' 41.869 N	103° 35' 39.234 W
4,400.0	11.54	265.06	4,382.0	-17.5	-202.7	623,411.17	768,625.76	32° 42' 41.835 N	103° 35' 39.701 W
4,440.2	11.54	265.06	4,421.4	-18.2	-210.7	623,410.42	768,617.75	32° 42' 41.828 N	103° 35' 39.795 W
Queen									
4,600.0	11.54	265.06	4,578.0	-20.9	-242.5	623,407.45	768,585.91	32° 42' 41.801 N	103° 35' 40.167 W
4,705.7	11.54	265.06	4,681.5	-22.8	-263.6	623,405.48	768,564.86	32° 42' 41.783 N	103° 35' 40.414 W
Penrose									
4,800.0	11.54	265.06	4,774.0	-24.4	-282.4	623,403.73	768,546.07	32° 42' 41.767 N	103° 35' 40.634 W
4,928.6	11.54	265.06	4,900.0	-26.6	-308.0	623,401.33	768,520.44	32° 42' 41.745 N	103° 35' 40.934 W
9 5/8"									
5,000.0	11.54	265.06	4,969.9	-27.8	-322.3	623,400.01	768,506.22	32° 42' 41.733 N	103° 35' 41.101 W
5,200.0	11.54	265.06	5,165.9	-31.3	-362.1	623,396.29	768,466.38	32° 42' 41.699 N	103° 35' 41.567 W
5,282.6	11.54	265.06	5,246.8	-32.7	-378.6	623,394.75	768,449.92	32° 42' 41.684 N	103° 35' 41.760 W
San Andres									
5,400.0	11.54	265.06	5,361.8	-34.7	-402.0	623,392.56	768,426.53	32° 42' 41.664 N	103° 35' 42.034 W
5,512.3	11.54	265.06	5,471.9	-36.6	-424.4	623,390.47	768,404.15	32° 42' 41.645 N	103° 35' 42.296 W
Delaware									
5,522.5	11.54	265.06	5,481.9	-36.8	-426.4	623,390.28	768,402.12	32° 42' 41.644 N	103° 35' 42.320 W
1st Delaware Sand									
5,600.0	11.54	265.06	5,557.8	-38.2	-441.9	623,388.84	768,386.69	32° 42' 41.630 N	103° 35' 42.501 W
5,800.0	11.54	265.06	5,753.7	-41.6	-481.7	623,385.12	768,346.84	32° 42' 41.596 N	103° 35' 42.967 W

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Project:	Sec. 30 T18S R34E	**MD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Site:	EK Federal Com 30	**North Reference:**	True
Well:	EK 31 BS2 Federal Com 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 13Nov17 kjs		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
5,920.7	11.54	265.06	5,872.0	-43.7	-505.8	623,382.88	768,322.79	32° 42' 41.576 N	103° 35' 43.249 W
2nd Delaware Sand									
6,000.0	11.54	265.06	5,949.7	-45.0	-521.6	623,381.40	768,307.00	32° 42' 41.562 N	103° 35' 43.434 W
6,200.0	11.54	265.06	6,145.6	-48.5	-561.5	623,377.68	768,267.15	32° 42' 41.528 N	103° 35' 43.901 W
6,400.0	11.54	265.06	6,341.6	-51.9	-601.3	623,373.96	768,227.31	32° 42' 41.494 N	103° 35' 44.367 W
6,600.0	11.54	265.06	6,537.6	-55.4	-641.2	623,370.24	768,187.46	32° 42' 41.460 N	103° 35' 44.834 W
6,800.0	11.54	265.06	6,733.5	-58.8	-681.1	623,366.52	768,147.62	32° 42' 41.426 N	103° 35' 45.300 W
7,000.0	11.54	265.06	6,929.5	-62.3	-721.0	623,362.80	768,107.77	32° 42' 41.392 N	103° 35' 45.767 W
7,200.0	11.54	265.06	7,125.4	-65.7	-760.8	623,359.07	768,067.93	32° 42' 41.358 N	103° 35' 46.234 W
7,400.0	11.54	265.06	7,321.4	-69.1	-800.7	623,355.35	768,028.08	32° 42' 41.324 N	103° 35' 46.700 W
7,600.0	11.54	265.06	7,517.3	-72.6	-840.6	623,351.63	767,988.24	32° 42' 41.290 N	103° 35' 47.167 W
7,728.0	11.54	265.06	7,642.8	-74.8	-866.1	623,349.25	767,962.73	32° 42' 41.268 N	103° 35' 47.466 W
Bone Spring									
7,800.0	11.54	265.06	7,713.3	-76.0	-880.4	623,347.91	767,948.39	32° 42' 41.256 N	103° 35' 47.634 W
8,000.0	11.54	265.06	7,909.2	-79.5	-920.3	623,344.19	767,908.55	32° 42' 41.221 N	103° 35' 48.100 W
8,200.0	11.54	265.06	8,105.2	-82.9	-960.2	623,340.47	767,868.70	32° 42' 41.187 N	103° 35' 48.567 W
8,400.0	11.54	265.06	8,301.1	-86.4	-1,000.0	623,336.75	767,828.86	32° 42' 41.153 N	103° 35' 49.034 W
8,600.0	11.54	265.06	8,497.1	-89.8	-1,039.9	623,333.03	767,789.01	32° 42' 41.119 N	103° 35' 49.500 W
8,800.0	11.54	265.06	8,693.1	-93.2	-1,079.8	623,329.31	767,749.17	32° 42' 41.085 N	103° 35' 49.967 W
8,806.3	11.54	265.06	8,699.2	-93.4	-1,081.0	623,329.19	767,747.92	32° 42' 41.084 N	103° 35' 49.981 W
Start Drop -1.50									
9,000.0	8.64	265.06	8,889.9	-96.3	-1,114.8	623,326.03	767,714.13	32° 42' 41.055 N	103° 35' 50.377 W
9,053.9	7.83	265.06	8,943.3	-96.9	-1,122.5	623,325.32	767,706.44	32° 42' 41.049 N	103° 35' 50.467 W
1st Bone Spring Sand									
9,200.0	5.64	265.06	9,088.3	-98.4	-1,139.6	623,323.72	767,689.39	32° 42' 41.034 N	103° 35' 50.667 W
9,400.0	2.64	265.06	9,287.8	-99.7	-1,154.0	623,322.38	767,675.03	32° 42' 41.022 N	103° 35' 50.835 W
9,575.7	0.00	0.00	9,463.5	-100.0	-1,158.0	623,322.01	767,671.00	32° 42' 41.018 N	103° 35' 50.882 W
KOP 12/100									
9,600.0	2.91	180.00	9,487.7	-100.6	-1,158.0	623,321.39	767,671.01	32° 42' 41.012 N	103° 35' 50.882 W
9,605.6	3.59	180.00	9,493.4	-100.9	-1,158.0	623,321.07	767,671.01	32° 42' 41.009 N	103° 35' 50.882 W
2nd Bone Spring Sand									
9,800.0	26.91	180.00	9,679.6	-151.7	-1,158.0	623,270.31	767,671.36	32° 42' 40.507 N	103° 35' 50.882 W
10,000.0	50.91	180.00	9,834.1	-276.4	-1,158.0	623,145.62	767,672.23	32° 42' 39.273 N	103° 35' 50.882 W
10,022.6	53.63	180.00	9,847.9	-294.3	-1,158.0	623,127.71	767,672.36	32° 42' 39.096 N	103° 35' 50.882 W
Top "C" sand									
10,200.0	74.91	180.00	9,924.5	-453.1	-1,158.0	622,968.87	767,673.47	32° 42' 37.524 N	103° 35' 50.882 W
10,219.2	77.21	180.00	9,929.1	-471.8	-1,158.0	622,950.25	767,673.60	32° 42' 37.340 N	103° 35' 50.882 W
POP - TOP TARGET WINDOW									
10,314.4	88.64	180.00	9,940.8	-566.1	-1,158.0	622,855.88	767,674.26	32° 42' 36.406 N	103° 35' 50.882 W
Landing Pt 88.64 Inc, 180 Az									
10,400.0	88.64	180.00	9,942.9	-651.7	-1,158.0	622,770.35	767,674.85	32° 42' 35.560 N	103° 35' 50.882 W
10,600.0	88.64	180.00	9,947.6	-851.6	-1,158.0	622,570.41	767,676.25	32° 42' 33.581 N	103° 35' 50.882 W
10,800.0	88.64	180.00	9,952.4	-1,051.6	-1,158.0	622,370.47	767,677.64	32° 42' 31.603 N	103° 35' 50.882 W
11,000.0	88.64	180.00	9,957.1	-1,251.5	-1,158.0	622,170.53	767,679.04	32° 42' 29.625 N	103° 35' 50.882 W
11,200.0	88.64	180.00	9,961.8	-1,451.4	-1,158.0	621,970.59	767,680.43	32° 42' 27.646 N	103° 35' 50.882 W
11,400.0	88.64	180.00	9,966.6	-1,651.4	-1,158.0	621,770.65	767,681.83	32° 42' 25.668 N	103° 35' 50.882 W
11,600.0	88.64	180.00	9,971.3	-1,851.3	-1,158.0	621,570.71	767,683.22	32° 42' 23.689 N	103° 35' 50.881 W
11,800.0	88.64	180.00	9,976.1	-2,051.3	-1,158.0	621,370.78	767,684.61	32° 42' 21.711 N	103° 35' 50.881 W
12,000.0	88.64	180.00	9,980.8	-2,251.2	-1,158.0	621,170.84	767,686.01	32° 42' 19.733 N	103° 35' 50.881 W
12,200.0	88.64	180.00	9,985.6	-2,451.2	-1,158.0	620,970.90	767,687.40	32° 42' 17.754 N	103° 35' 50.881 W
12,400.0	88.64	180.00	9,990.3	-2,651.1	-1,158.0	620,770.96	767,688.80	32° 42' 15.776 N	103° 35' 50.881 W
12,600.0	88.64	180.00	9,995.1	-2,851.1	-1,158.0	620,571.02	767,690.19	32° 42' 13.797 N	103° 35' 50.881 W
12,800.0	88.64	180.00	9,999.8	-3,051.0	-1,158.0	620,371.08	767,691.59	32° 42' 11.819 N	103° 35' 50.881 W

Planning Report - Geographic

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well EK 31 BS2 Federal Com 2H
Company:	McElvain Energy, Inc.	**TVD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Project:	Sec. 30 T18S R34E	**MD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Site:	EK Federal Com 30	**North Reference:**	True
Well:	EK 31 BS2 Federal Com 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 13Nov17 kjs		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Map Northing (usft)	Map Easting (usft)	Latitude	Longitude
13,000.0	88.64	180.00	10,004.5	-3,250.9	-1,158.0	620,171.15	767,692.98	32° 42' 9.841 N	103° 35' 50.881 W
13,200.0	88.64	180.00	10,009.3	-3,450.9	-1,158.0	619,971.21	767,694.38	32° 42' 7.862 N	103° 35' 50.881 W
13,400.0	88.64	180.00	10,014.0	-3,650.8	-1,158.0	619,771.27	767,695.77	32° 42' 5.884 N	103° 35' 50.881 W
13,408.1	88.64	180.00	10,014.2	-3,659.0	-1,158.0	619,763.10	767,695.83	32° 42' 5.803 N	103° 35' 50.881 W
TARGET									
13,600.0	88.64	180.00	10,018.8	-3,850.8	-1,158.0	619,571.33	767,697.17	32° 42' 3.906 N	103° 35' 50.881 W
13,800.0	88.64	180.00	10,023.5	-4,050.7	-1,158.0	619,371.39	767,698.56	32° 42' 1.927 N	103° 35' 50.881 W
14,000.0	88.64	180.00	10,028.3	-4,250.7	-1,158.0	619,171.45	767,699.96	32° 41' 59.949 N	103° 35' 50.880 W
14,200.0	88.64	180.00	10,033.0	-4,450.6	-1,158.0	618,971.52	767,701.35	32° 41' 57.970 N	103° 35' 50.880 W
14,400.0	88.64	180.00	10,037.8	-4,650.5	-1,158.0	618,771.58	767,702.75	32° 41' 55.992 N	103° 35' 50.880 W
14,600.0	88.64	180.00	10,042.5	-4,850.5	-1,158.0	618,571.64	767,704.14	32° 41' 54.014 N	103° 35' 50.880 W
14,777.2	88.64	180.00	10,046.7	-5,027.7	-1,158.0	618,394.46	767,705.38	32° 41' 52.260 N	103° 35' 50.880 W
TD at 14777.2									
14,800.0	88.64	180.00	10,047.2	-5,050.4	-1,158.0	618,371.70	767,705.53	32° 41' 52.035 N	103° 35' 50.880 W
14,957.2	88.64	180.00	10,051.0	-5,207.6	-1,158.0	618,214.53	767,706.63	32° 41' 50.480 N	103° 35' 50.880 W
End of 180' Rathole - TD / PBHL EK 31 BS2 Fed Com 2H									

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
TD / PBHL EK 31 BS2 F - plan hits target center - Point	0.00	0.00	10,051.0	-5,207.6	-1,158.0	618,214.53	767,706.63	32° 41' 50.480 N	103° 35' 50.880 W

Casing Points

Measured Depth (usft)	Vertical Depth (usft)	Name	Casing Diameter (")	Hole Diameter (")
4,928.6	4,900.0	9 5/8"	9-5/8	12-1/4

Database:	EDM 5000.1 Single User Db	**Local Co-ordinate Reference:**	Well EK 31 BS2 Federal Com 2H
Company:	McElvain Energy, Inc.	**TVD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Project:	Sec. 30 T18S R34E	**MD Reference:**	WELL @ 3921.0usft (Original Well Elev)
Site:	EK Federal Com 30	**North Reference:**	True
Well:	EK 31 BS2 Federal Com 2H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1 13Nov17 kjs		

Formations

Measured Depth (usft)	Vertical Depth (usft)	Name	Lithology	Dip (°)	Dip Direction (°)
1,671.0	1,671.0	Rustler		1.35	180.00
1,731.0	1,731.0	Salt		1.35	180.00
3,221.1	3,221.0	Yates		1.35	180.00
3,725.5	3,721.1	Seven Rivers		1.35	180.00
4,440.2	4,421.4	Queen		1.35	180.00
4,705.7	4,681.5	Penrose		1.35	180.00
5,282.6	5,246.8	San Andres		1.35	180.00
5,512.3	5,471.9	Delaware		1.35	180.00
5,522.5	5,481.9	1st Delaware Sand		1.35	180.00
5,920.7	5,872.0	2nd Delaware Sand		1.35	180.00
7,728.0	7,642.8	Bone Spring		1.35	180.00
9,053.9	8,943.3	1st Bone Spring Sand		1.35	180.00
9,605.6	9,493.4	2nd Bone Spring Sand		1.35	180.00
10,022.6	9,847.9	Top "C" sand		1.35	180.00
10,219.2	9,929.1	TOP TARGET WINDOW		1.35	180.00
13,408.1	10,014.2	TARGET		1.35	180.00

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
3,000.0	3,000.0	0.0	0.0	Start Build 1.50
3,769.5	3,764.3	-6.6	-77.0	Hold 11.54 Inc, 265.06 Az
8,806.3	8,699.2	-93.4	-1,081.0	Start Drop -1.50
9,575.7	9,463.5	-100.0	-1,158.0	KOP 12/100
10,219.2	9,929.1	-471.8	-1,158.0	POP
10,314.4	9,940.8	-566.1	-1,158.0	Landing Pt 88.64 Inc, 180 Az
14,777.2	10,046.7	-5,027.7	-1,158.0	TD at 14777.2
14,957.2	10,051.0	-5,207.6	-1,158.0	End of 180' Rathole