NMOCD
Artesia

NM OIL CONSERVATION
ARTESIA DISTRICT

APR 18 2018

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Form 3160 3
(March 2012)

FORM APPROVED
OMB No 1004-0137
Expires October 31 2014

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5 Lease Serial No
NMNM121949

6 If Indian, Allotee or Tribe Name

1a Type of work ☑ DRILL ☐ REENTER

7 If Unit or CA Agreement, Name and No
321210

1b Type of Well ☑ Oil Well ☐ Gas Well ☐ Other ☑ Single Zone ☐ Multiple Zone

8 Lease Name and Well No
CHILLIWACK FEDERAL COM 1H

2 Name of Operator
MACK ENERGY CORPORATION
13837

9 API Well No
30-005-64311

3a Address
11344 Lovington HWY Artesia NM 88211

3b Phone No *(include area code)*
(575)748-1288

10 Field and Pool, or Exploratory
ROUND TANK / SAN ANDRES

4 Location of Well *(Report location clearly and in accordance with any State requirements *)*
At surface SWSW / 810 FSL / 965 FWL / LAT 33 0109009 / LONG -104 0560517
At proposed prod zone SWSW / 5 FSL / 965 FWL / LAT 32 9941805 / LONG -104 0506126

11 Sec, T R M or Blk and Survey or Area
SEC 17 / T15S / R29E / NMP

14 Distance in miles and direction from nearest town or post office*
30 miles

12 County or Parish
CHAVES

13 State
NM

15 Distance from proposed* location to nearest property or lease line, ft (Also to nearest drig unit line, if any)
330 feet

16 No of acres in lease
640

17 Spacing Unit dedicated to this well
200

18 Distance from proposed location* to nearest well, drilling completed applied for, on this lease, ft
480 feet

19 Proposed Depth
3195 feet / 8925 feet

20 BLM/BIA Bond No. on file
FED NMB000286

21 Elevations (Show whether DF, KDB, RT, GL, etc)
3781 feet

22 Approximate date work will start*
05/01/2018

23 Estimated duration
20 days

24 Attachments

The following completed in accordance with the requirements of Onshore Oil and Gas Order No 1, must be attached to this form

1 Well plat certified by a registered surveyor
2 A Drilling Plan
3 A Surface Use Plan (if the location is on National Forest System Lands the SUPO must be filed with the appropriate Forest Service Office)
4 Bond to cover the operations unless covered by an existing bond on file (see Item 20 above)
5 Operator certification
6 Such other site specific information and/or plans as may be required by the BLM

25 Signature
(Electronic Submission)

Name *(Printed/Typed)*
Deana Weaver / Ph (575)748-1288

Date
03/08/2018

Title
Production Clerk

Approved by *(Signature)*
(Electronic Submission)

Name *(Printed/Typed)*
Ruben J Sanchez / Ph (575)627-0250

Date
04/12/2018

Title
Assistant Field Manager Lands & Minerals

Office
ROSWELL

Application approval does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon
Conditions of approval, if any, are attached

Title 18 U S C Section 1001 and Title 43 U S C Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction

(Continued on page 2)

*(Instructions on page 2)

APPROVED WITH CONDITIONS

Approval Date. 04/12/2018

RWP 4-19-18

NSP

INSTRUCTIONS

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

ITEM 1 If the proposal is to redrill to the same reservoir at a different subsurface location or to a new reservoir, use this form with appropriate notations Consult applicable Federal regulations concerning subsequent work proposals or reports on the well

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

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

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

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

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2 48(d) provide that you be furnished the following information in connection with information required by this application
AUTHORITY 30 U S C 181 et seq , 25 U S C 396, 43 CFR 3160
PRINCIPAL PURPOSES The information will be used to (1) process and evaluate your application for a permit to drill a new oil, gas, or service well or to reenter a plugged and abandoned well, and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered, (b) reviewing procedures and equipment and the projected impact on the land involved, and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts
ROUTINE USE Information from the record and/or the record will be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities
EFFECT OF NOT PROVIDING INFORMATION Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease

The Paperwork Reduction Act of 1995 requires us to inform you that
The BLM collects this information to allow evaluation of the technical, safety, and environmental factors involved with drilling for oil and/or gas on Federal and Indian oil and gas leases This information will be used to analyze and approve applications Response to this request is mandatory only if the operator elects to initiate drilling or reentry operations on an oil and gas lease The BLM would like you to know that you do not have to respond to this or any other Federal agency-sponsored information collection unless it displays a currently valid OMB control number

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

(Continued on page 3)

Approval Date 04/12/2018

Additional Operator Remarks

Location of Well

1 SHL SWSW / 810 FSL / 965 FWL / TWSP 15S / RANGE 29E / SECTION 17 / LAT 33 0109009 / LONG -104 0560517 (TVD 0 feet, MD 0 feet)
PPP SWSW / 62 FSL / 965 FWL / TWSP 15S / RANGE 29E / SECTION 17 / LAT 33 0088455 / LONG -104 0560587 (TVD 0 feet, MD 0 feet)
BHL SWSW / 5 FSL / 965 FWL / TWSP 15S / RANGE 29E / SECTION 17 / LAT 32 9941805 / LONG -104 0506126 (TVD 8195 feet, MD 8925 feet)

BLM Point of Contact

Name Meighan M Salas
Title Production Accountability Technician
Phone 5756270228
Email mmsalas@blm gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165 3) The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165 4) Contact the above listed Bureau of Land Management office for further information

Geologic Conditions of Approval

Set casing in a competent bed at an approximate depth of 200 feet Operator proposes 225 feet, which protects all usable water zones but potentially will be in the salt, if Salt is encountered, set casing at least 25 feet above salt Salt may be encountered as shallow as 215 feet

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME.	**Mack Energy Corporation**
LEASE NO.:	**NMNM-121949**
WELL NAME & NO.:	**Chilliwack Federal Com 1H**
SURFACE HOLE FOOTAGE:	**0810' FSL & 0965' FWL**
BOTTOM HOLE FOOTAGE	**0005' FSL & 0965' FWL Sec. 20, T. 15 S , R 29 E.**
LOCATION:	**Section 17, T. 15 S., R 29 E., NMPM**
COUNTY:	**County, New Mexico**

Communitization Agreement

The operator will submit a Communitization Agreement to the Roswell Field Office, 2909 West 2nd Street Roswell, 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

I. DRILLING

A DRILLING OPERATIONS REQUIREMENTS

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

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

☐ **Chaves and Roosevelt Counties**

Call the Roswell Field Office, 2909 West Second St , Roswell NM 88201
During office hours call (575) 6270272
After office hours call (575) 627-0205

1 **A Hydrogen Sulfide (H2S) Drilling Plan shall be activated prior to drilling out the surface shoe. 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, 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.

Medium Cave/Karst
Possibility of lost circulation in the Queen and San Andres formations.

1 The **9-5/8** inch surface casing shall be set at approximately **225** feet (a minimum of 25 feet into the Rustler Anhydrite and above the salt) and cemented to the surface **If salt is encountered, set casing at least 25 feet above the salt.**

   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

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

2 The minimum required fill of cement behind the **7 X 5-1/2** inch production casing is

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

3 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 **(Operator installing 3M, testing to 2,000 psi)**

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 032118

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME	Mack Energy Corporation ,
LEASE NO	NMNM-121949
WELL NAME & NO	Chilliwack Fed Com #1H
SURFACE HOLE LOCATION	Section 17, T 15 S , R 29 E , NMPM
COUNTY	Chaves County, New Mexico

1 GENERAL PROVISIONS

Approval of the APD does not warrant that any party holds equitable or legal title Any request for a variance shall be submitted to the Authorized Officer on Sundry Notice (Form 3160-5)

For BLM's surface operating standards and guidelines, refer to The Gold Book , Fourth Edition - Revised 2007 To obtain a copy free of charge contact the Roswell Field Office (575) 627-0272 or visit BLM on the web at http://www.blm.gov/wo/st/en/prog/energy/oil_and_gas/best_management_practices/gold_book.html
All construction, operations, and reclamation shall follow the Onshore Oil and Gas Operations as described in the 43 CFR part 3160

The Operator shall submit a Sundry Notice (Form 3160-5) to the Bureau of Land Management, Roswell Field Office (address above) for approval prior to beginning any new surface-disturbing activities or operations that are not specifically addressed and approved by this APD

A site facility diagram and a site security plan shall be filed no later than 60 calendar days following first production (Onshore Order 3, Section III, I and 43 CFR 3162 7-5)

2 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, 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)

3 JUISTICTIONAL WATERS of the U S

The operator shall obtain appropriate permits from the U S Army Corps of Engineers prior to discharge or dredge and fill material into waters of the United States in accordance with Section 404 of the Clean Water Act Contact The U S Army Corps of Engineers regulatory New Mexico Branch Office, 4101 Jefferson Plaza NE, Albuquerque, NM 87109-3435 at (505) 342-3678 or Email CESPA-RD-NM@usace army mil if you have questions

4 ARCHAEOLOGICAL, PALEONTOLOGICAL & HISTORICAL SITES

Any cultural and/or paleontological resource discovered inadvertently 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

5 HUMAN REMAINS AND OBJECTS OF CULTURAL PATRIMONY

The operator shall comply with procedures established in the Native American Graves Protection and Repatriation Act (NAGPRA) to protect such cultural items as human remains, funerary objects, sacred objects, and objects of cultural patrimony that are discovered inadvertently during project implementation In the event that any of the cultural items listed above are

discovered during the course of project work, the proponent shall immediately halt the disturbance and contact the BLM within 24 hours for instructions The proponent or initiator of any project shall be held responsible for protecting, evaluating, reporting, excavating, treating, and disposing of these cultural items according to the procedures established by the BLM in consultation with Indian Tribes

6 NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations (access road and/or well pad) 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

7 CAVE AND KARST

Any Cave or Karst feature discovered by the operator or by any person working on the operator's behalf shall immediately report the feature 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 During drilling, previously unknown cave and karst features could be encountered If a void is encountered while drilling and a loss of circulation occurs, lost drilling fluids can directly contaminate groundwater recharge areas, aquifers, and groundwater quality Drilling operations can also lead to sudden collapse of underground voids

To mitigate or lessen the probability of impacts associated with the drilling and production of oil and gas wells in karst areas, the guidelines listed in Appendix 3, Practices for Oil and Gas Drilling and Production in Cave and Karst Areas, as approved in the Roswell Resource Management Plan Amendment of 1997, page AP3-4 through AP 3-7 shall be followed

A more complete discussion of the impacts of oil and gas drilling can be found in the *Dark Canyon Environmental Impact*

Statement of 1993, published by the U S Department of the Interior, Bureau of Land Management

8 CONSTRUCTION

NOTIFICATION The BLM shall administer compliance and monitor construction of the access road and well pad Notify Natural Resource Specialist, Forrest Mayer at (575) 627-0272 or the Roswell Field Office at (575) 627-0272 **at least three (3) working days prior to commencing construction of the access road and/or well pad**

A complete copy of the *approved* APD and the attached Conditions of Approval (COAs) **shall be kept on the well's location** for reference upon inspections

Construction over and/or immediately adjacent to existing pipelines shall be coordinated, and in accordance with, the relevant pipeline companies' policy

Any trench left open for (8) hours or less is not required to have escape ramps, however, before the trench is backfilled, an agency approved monitor shall walk the entire length of the open trench and remove all trapped fauna The bottom surface of the trench will be disturbed a minimum of 2 inches in order to arouse any buried fauna All fauna will be released a minimum of 100 yards from the trench

For trenches left open for (8) hours or more, earthen escape ramps (built at nor more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench Structures will also be authorized within the trench Metal structures will not be authorized Structures used as escape ramps will be placed at no more than a 30 degree slope and spaced no more than 500 feet apart

9 TOPSOIL

When saturated soil conditions exist on access roads or location, construction shall be halted until soil material dries out or is frozen sufficiently for construction to proceed without undue damage and erosion to soils, roads and locations

Topsoil shall be stripped following removal of vegetation during construction of well pads, pipelines, roads, or other surface facilities This shall include all growth medium - at a minimum,

the upper 2-6 inches of soil - but shall also include stripping of any additional topsoil present at a site, such as indicated by color or texture Stripping depth may be specified during the onsite inspection Stripped topsoil shall be stored separately from subsoil or other excavated material and replaced prior to interim seedbed preparation No topsoil shall be stripped when soils are moisture-saturated or frozen below the stripping depth

The topsoil will not be used to construct the containment structures or earthen dikes that are on the outside boundaries of the constructed well pad, tanks, and storage facilities

Each construction area is site specific as to topsoil depth It is the operator's responsibility to ensure that topsoil, caliche, or spoils are not mixed together

(**Pads**) topsoil will be stripped and stored in separate piles from the spoils pile They can be stored on opposite or adjacent sides If topsoil and spoils must be stored on the same pad side together they shall be no closer than toe to toe, not overlapping Each pile shall be kept within 30 feet of the pad's side 100% of the topsoil will be used for both interim and final reclamation 100% of topsoil will be respread over the disturbed areas during reclamation

(**Roads**) topsoil shall be stripped in such a way to follow the road's edge outside of the surfacing or drivable area During final reclamation, after removal of surface material and re-contouring, 100% of topsoil will be respread over the disturbed areas during reclamation Vegetation in the topsoil will help hold re-seeding, moisture content, and reduce erosion

10 WELL PAD SURFACING:

The well pad shall be constructed in a manner which creates the smallest possible surface disturbance, consistent with safety and operational need Surfacing of the well pad is not required If the operator elects to surface the well pad, the surfacing material will be required to be removed at the time of reclamation

Cattleguards

An appropriately sized cattleguard(s) sufficient to carry out the project shall be installed and maintained at fence crossing(s) Any existing cattle guard(s) on the access road

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 guard(s) that are in place and are utilized during lease operations Gates or cattle guards on public lands will not be locked or closed to public use unless closure is specifically determined to be necessary and is authorized in writing by the authorized officer A gate shall be constructed and fastened securely to H-braces

Fence Requirement

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

11 PRODUCTION

Storage

Fiberglass storage tanks are ***not*** permitted for the storage of production

Placement of Production Facilities

Production facilities should be placed on the well pad to allow for maximum interim reclamation and re-vegetation of the well location

Containment Structures

All production facilities shall have a lined containment structure large enough to contain **110% of the largest Tank (PLUS) 24 hours of production** (43 CFR 3162 5-1) ***Environmental Obligations***, unless more stringent protective requirements are deemed necessary by the Authorized Officer

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, **OIL GREEN** (Standard Environmental Color Chart June 2008)

Completion Report

In accordance with 43 CFR 3160, Form 3160-4 (Well Completion or Re-completion Report and Log) must be submitted to the Bureau of Land Management, Roswell Field Office within 30 days after completion of the well or producer Copies of all open hole and cased hole logs, core descriptions, core analyses, well test data, geologic summaries, sample descriptions, formation test reports, stimulation reports, directional survey (if applicable), and all other surveys or data obtained and compiled during the drilling, completion, and/or work over operations, shall be included with Form 3160-4

12. INTERIM RECLAMATION

Reclamation earthwork for interim and/or final reclamation shall be completed within 6 months of well completion or well plugging (weather permitting), and shall consist of 1) backfilling pits, 2) re-contouring and stabilizing the well site, access road, cut/fill slopes, drainage channels, utility and pipeline corridors, and all other disturbed areas, to approximately the original contour, shape, function, and configuration that existed before construction (any compacted backfilling activities shall ensure proper spoils placement , settling, and stabilization, 3) surface ripping, prior to topsoil placement, to a depth of 18-24 inches deep on 18-24 inch centers to reduce compaction, 4) final grading and replacement of all topsoil so that no topsoil's remains in the stockpile, 5) seeding in accordance with reclamation portions of the APD and these COA's

Any subsequent re-disturbance of interim reclamation shall be reclaimed within six (6) months by the same means described above

Prior to conducting interim reclamation, <u>the operator is required to</u>

- Submit a Sundry Notices and Reports on Wells (Notice of Intent), Form 3160-5, prior to conducting interim reclamation

- Contact BLM at least three (3) working days prior to conducting any interim reclamation activities, and prior to seeding

During reclamation, the removal of caliche is important to increasing the success of re-vegetating the site Removed caliche may be used in road repairs, fire walls or for building

other roads and locations In addition, 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 re-vegetated areas for production or workover operations will be allowed If there is significant disturbance and loss of vegetation, the area will need to be re-vegetated Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

Use a certified noxious weed-free seed mixture Use seed tested for viability and purity in accordance with State law(s) within nine months prior to purchase Use a commercial seed mixture certified or registered and tagged in accordance with State law(s) Make the seed mixture labels available for BLM inspection

13 SEED MIX

SEE ATTACHED SEED MIX

WELL NAME	ECOSITE (ACCESS ROAD)	ECOSITE (PAD)
CHILLIWACK FEDERAL COM #1H	SHALLOW SD-3	SHALLOW SD-3

14 FINAL ABANDONMENT

A Upon abandonment of the well a Notice of Intent for Plug and Abandonment describing plugging procedures. Followed within 30 days you shall file with this office, a Subsequent Report of Abandonment (Form 3160-5) To be included with this report is where the plugs were placed, volumes of cement used and well bore schematic as plugged

B On private surface/federal mineral estate land the reclamation procedures on the road and well pad shall be accomplished in accordance with the Private Surface Land Owner agreements and a copy of the release is to be submitted upon abandonment

C The Operator shall promptly plug and abandoned each newly completed, re-completed or producing well which is not capable of producing in paying quantities. No well may be temporarily abandoned for more than 30 days without prior approval from this office. When justified by the Operator, BLM may authorize additional delays, no one of which may exceed an additional 12 months Upon removal of drilling or producing equipment form the site of a well which is to be permanently abandoned, the

surface of the lands disturbed shall be reclaimed in accordance with an approved Notice of Intent for final reclamation

D **Final reclamation shall include** the removal of all solid waste, trash, surfacing materials, storage facilities and all other related equipment, flow lines, and meter housing, power poles, guy wires, and all other related power materials All disturbed areas, i e cuts and fills, shall be re-contoured to their original surroundings 100% of topsoil shall be used to resurface all disturbed areas including access roads A label of the seed mix used shall be submitted with the Final Abandonment Notice (FAN) for review once reclamation is complete

15. PIPELINE PROTECTION REQUIREMENT:

Precautionary measures shall be taken by the operator during construction of the access road to protect existing pipelines that the access road will cross over An earthen berm, 2 feet high by 3 feet wide and 14 feet across the access road travelway (2' X 3' X 14'), shall be constructed over existing pipelines The operator shall be held responsible for any damage to existing pipelines If the pipeline is ruptured and/or damaged the operator shall immediately cease construction operations and repair the pipeline The operator shall be held liable for any unsafe construction operations that threaten human life and/or cause the destruction of equipment

16. WILDLIFE PROTECTION MEASURES - Best Management Practices (BMPs)

Wildlife Mortality - General
The operator will notify the Bureau of Land Management (BLM) authorized officer and nearest Fish and Wildlife Service (FWS) Law Enforcement office within 24 hours, if the operator discovers a dead or injured federally protected species (i e , migratory bird species, bald or golden eagle, or species listed by the FWS as threatened or endangered) in or adjacent to a pit, trench, tank, exhaust stack, or fence (If the operator is unable to contact the FWS Law Enforcement office, the operator must contact the nearest FWS Ecological Services office)

1 **Closed top tanks are required for any containment system.** All tanks are required to have a closed top tank

2 **Chemical and Fuel Secondary Containment Systems**
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 Closed-top tanks are required for any secondary containment systems

3 **Open-Vent Exhaust Stacks**

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 Production equipment includes, but may not be limited to, tanks, heater-treaters, separators, dehydrators, flare stacks, in-line units, and compressor mufflers

17 SURFACE WATER AND GROUNDWATER PROTECTION MEASURES

Best Management Practices (BMPs)

A containment structure or earthen dike shall be constructed and maintained around the north, west, and south outside boundary of the well pad to protect the ephemeral drainage and earthen tank located downslope of the well pad location The containment structure or earthen dike shall be constructed two (2) feet high (the containment structure or earthen dike can be constructed higher than the two (2) feet high minimum) The containment structure or earthen dike is required so that if a oilfield waste contaminant or product contaminant were leaked, spilled, and or released upon the well pad the oilfield waste contaminant or product contaminant shall be contained in order to prevent the contaminant from entering into the ephemeral drainage and earthen tank located downslope of the well pad location

AFMSS

U S. Department of the Interior
BUREAU OF LAND MANAGEMENT

Operator Certification Data Report

04/12/2018

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 Deana Weaver **Signed on** 03/08/2018

Title Production Clerk

Street Address 11344 Lovington HWY

City Artesia **State** NM **Zip** 88211

Phone (575)748-1288

Email address dweaver@mec com

Field Representative

Representative Name

Street Address

City **State** **Zip**

Phone

Email address

AFMSS

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

Application Data Report

04/12/2018

APD ID 10400027607 **Submission Date** 03/08/2018

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID 10400027607 **Tie to previous NOS?** 10400027103 **Submission Date** 03/08/2018

BLM Office ROSWELL **User** Deana Weaver **Title** Production Clerk

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

Lease number NMNM121949 **Lease Acres** 640

Surface access agreement in place? **Allotted?** **Reservation**

Agreement in place? NO **Federal or Indian agreement**

Agreement number

Agreement name

Keep application confidential? YES

Permitting Agent? NO **APD Operator** MACK ENERGY CORPORATION

Operator letter of designation

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 18 2018
RECEIVED

Operator Info

Operator Organization Name MACK ENERGY CORPORATION

Operator Address 11344 Lovington HWY **Zip** 88211

Operator PO Box

Operator City Artesia **State** NM

Operator Phone (575)748-1288

Operator Internet Address jerrys@mec com

Section 2 - Well Information

Well in Master Development Plan? NO **Mater Development Plan name**

Well in Master SUPO? NO **Master SUPO name**

Well in Master Drilling Plan? NO **Master Drilling Plan name**

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H **Well API Number**

Field/Pool or Exploratory? Field and Pool **Field Name** ROUND TANK **Pool Name** SAN ANDRES

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

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Describe other minerals

Is the proposed well in a Helium production area? N **Use Existing Well Pad?** NO **New surface disturbance?**

Type of Well Pad SINGLE WELL **Multiple Well Pad Name** **Number**

Well Class HORIZONTAL **Number of Legs** 1

Well Work Type Drill

Well Type OIL WELL

Describe Well Type

Well sub-Type DELINEATION

Describe sub-type

Distance to town 30 Miles **Distance to nearest well** 480 FT **Distance to lease line** 330 FT

Reservoir well spacing assigned acres Measurement 200 Acres

Well plat Chilliwack_Plats_20180307113646.pdf

Well work start Date 05/01/2018 **Duration** 20 DAYS

Section 3 - Well Location Table

Survey Type RECTANGULAR

Describe Survey Type

Datum NAD83 **Vertical Datum** NAVD88

Survey number 5986

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	810	FSL	965	FWL	15S	29E	17	Aliquot SWSW	33 01090 09	-104 0560 517	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 121949	3781	0	0
KOP Leg #1	810	FSL	965	FWL	15S	29E	17	Aliquot SWSW	33 30109 01	-104 0560 517	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 121949	3781	0	0
PPP Leg #1	62	FSL	965	FWL	15S	29E	17	Aliquot SWSW	33 00884 55	-104 0560 587	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 121949	3781	0	0

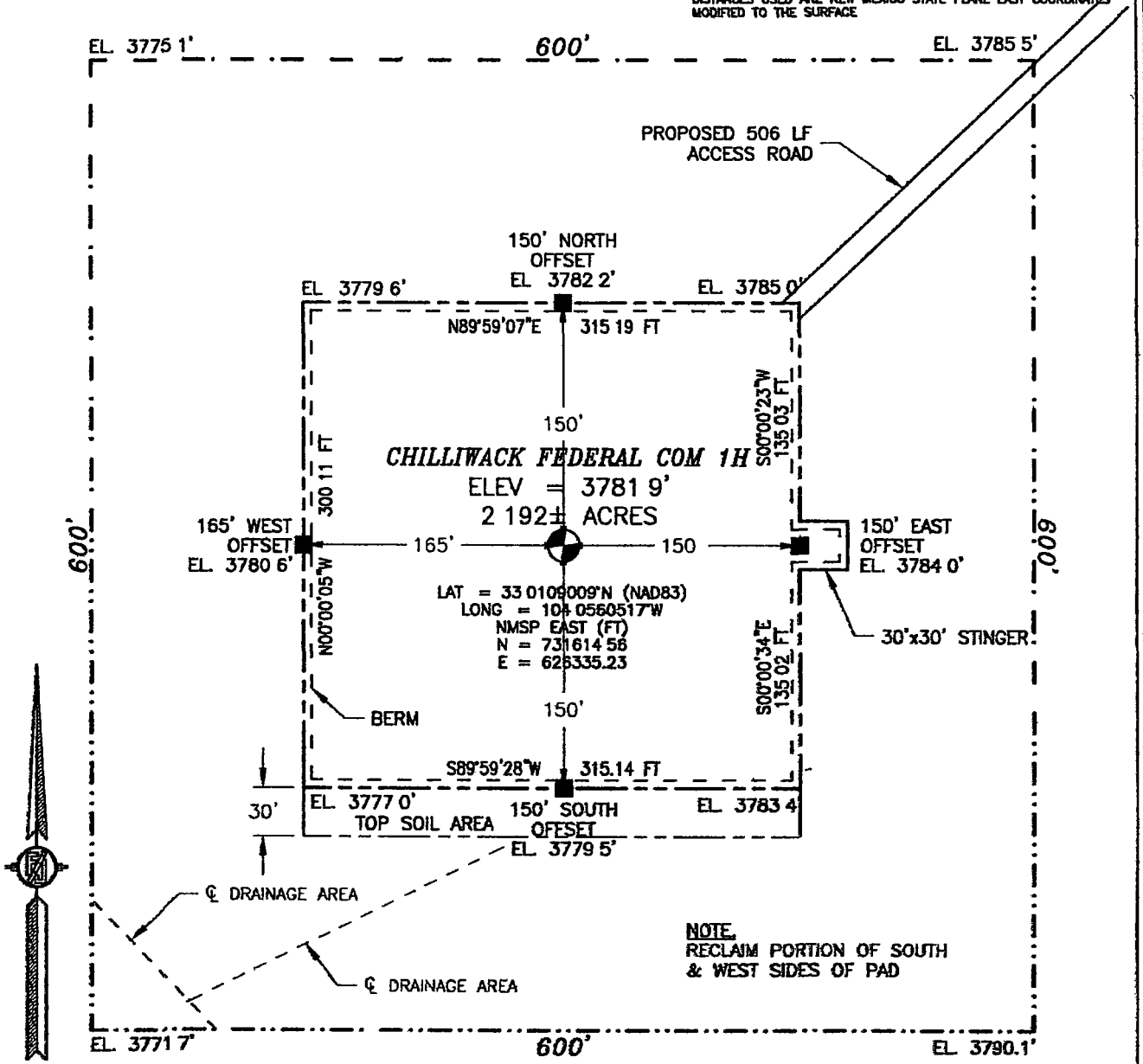
Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
EXIT Leg #1	40	FSL	965	FWL	15S	29E	20	Aliquot SWSW	32 99419 26	-104 0560 739	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 121949	3781	0	0
BHL Leg #1	5	FSL	965	FWL	15S	29E	17	Aliquot SWSW	32 99418 05	-104 0506 126	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 121949	586	8925	3195

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M
CHAVES COUNTY, STATE OF NEW MEXICO
SITE MAP

NOTE. LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83). BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE



0 10 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HIGHWAY 249 AND CR 30 (JENNIA) GO NORTHWEST ON STATE HIGHWAY 249 FOR APPROX. 2.1 MILES. GO SOUTH ON 20' CALICHE LEASE ROAD FOR APPROX. 3.21 MILES TO THE WHISTLER FEDERAL 9. FROM THE NORTHEAST CORNER GO EAST 858.0' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 10. THEN FROM THE SOUTHWEST CORNER GO SOUTHWEST 688.9' TO THE NORTHEAST CORNER OF WHISTLER FEDERAL 5. FROM THE SOUTHEAST CORNER GO SOUTH THEN SOUTHEAST 558.2' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 8, THEN FROM SOUTHWEST CORNER GO SOUTHWEST 506' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MACK ENERGY CORPORATION

CHILLIWACK FEDERAL COM 1H

LOCATED 810 FT. FROM THE SOUTH LINE AND 965 FT. FROM THE WEST LINE OF SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M. CHAVES COUNTY, STATE OF NEW MEXICO

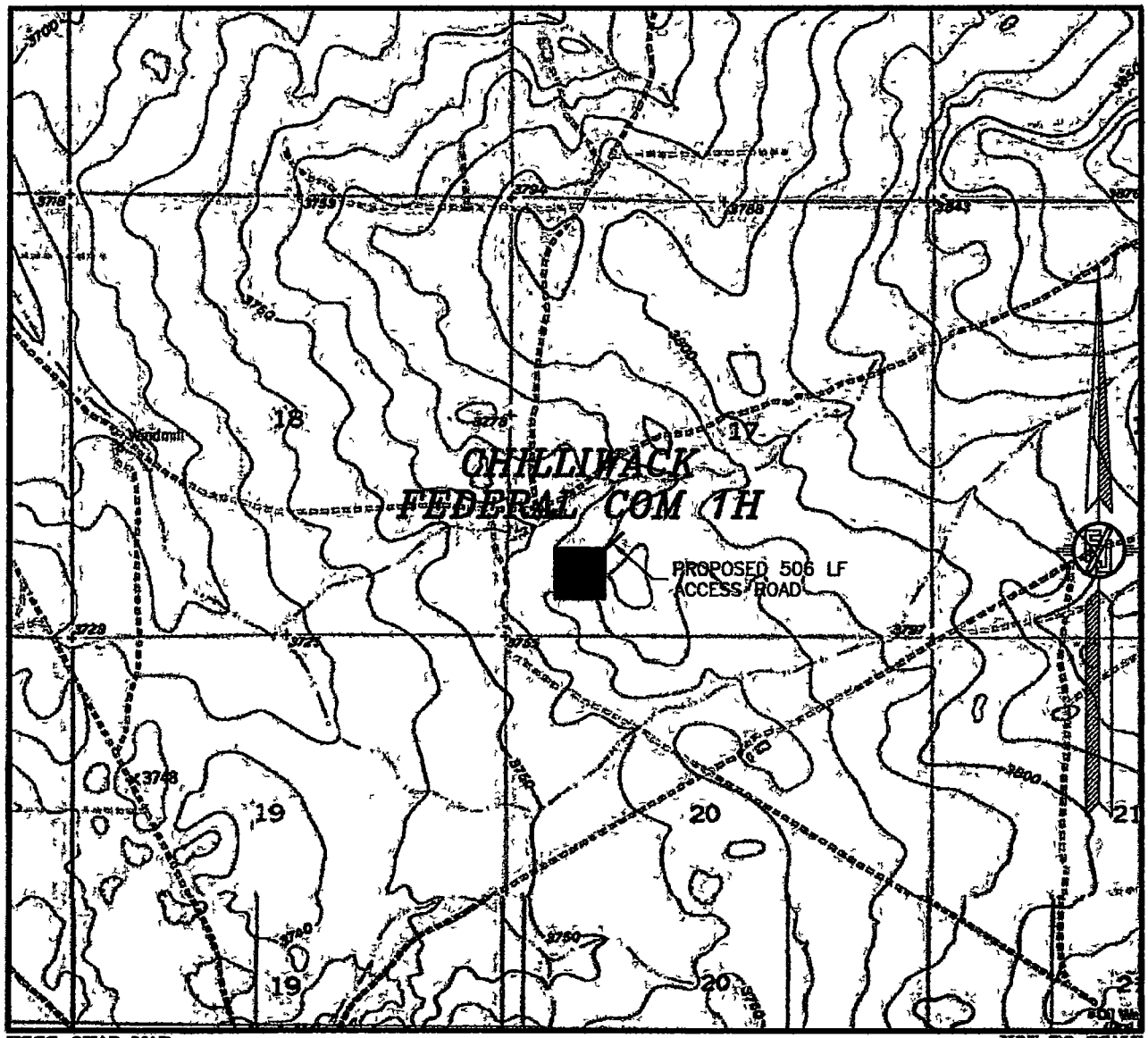
FEBRUARY 1, 2018

SURVEY NO. 5986

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

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP:
KING CAMP

NOT TO SCALE

MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT. FROM THE SOUTH LINE
AND 965 FT. FROM THE WEST LINE OF
SECTION 17, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

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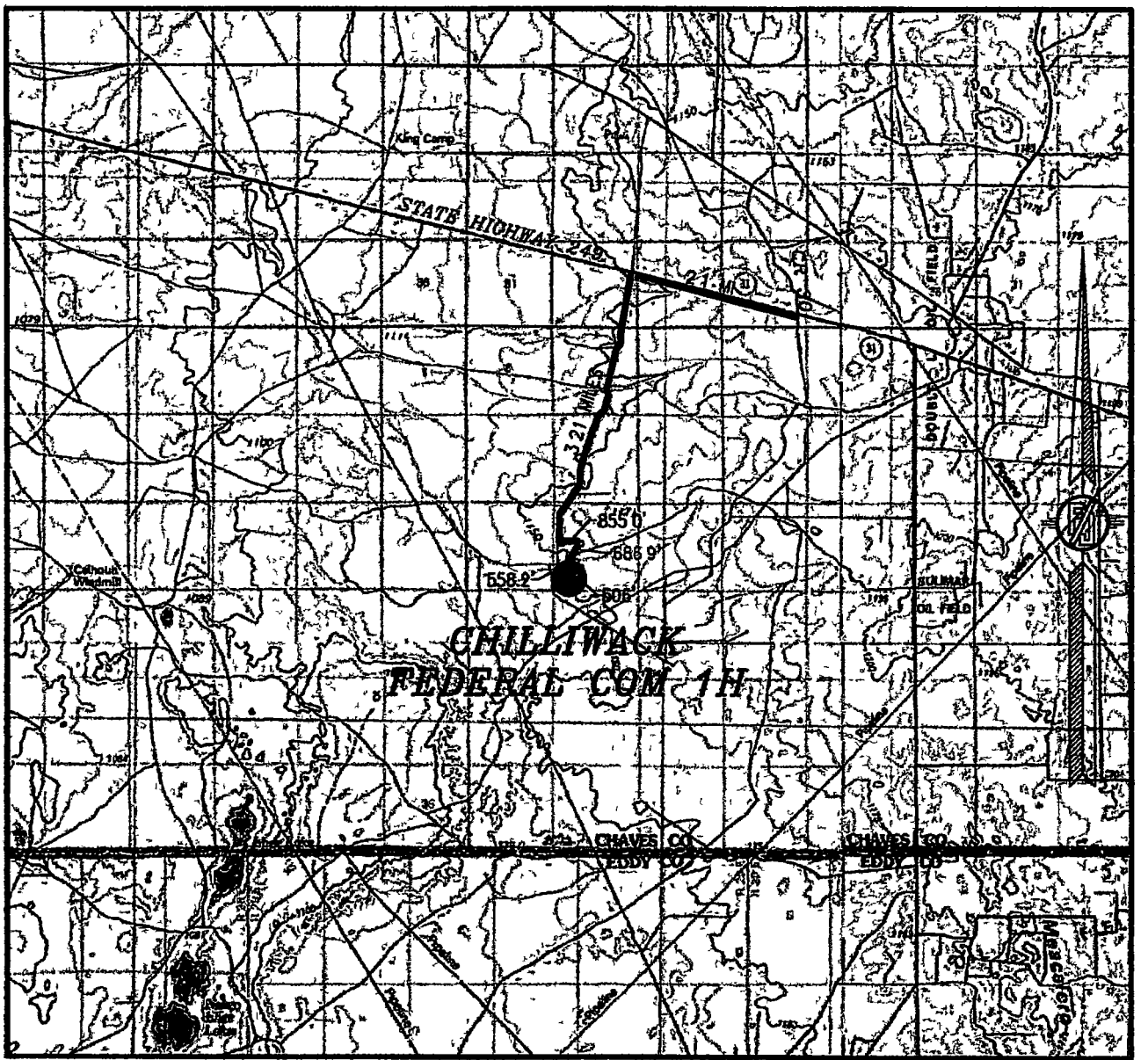
SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DISTANCES IN MILES *NOT TO SCALE*

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF STATE HIGHWAY 249 AND CR 30 (JEMINA) GO NORTHWEST ON STATE HIGHWAY 249 FOR APPROX. 2.1 MILES. GO SOUTH ON 29' CALICHE LEASE ROAD FOR APPROX. 3.21 MILES TO THE WHISTLER FEDERAL 9 FROM THE NORTHEAST CORNER GO EAST 855.0' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 10. THEN FROM THE SOUTHWEST CORNER GO SOUTHWEST 688.9' TO THE NORTHEAST CORNER OF WHISTLER FEDERAL 5. FROM THE SOUTHEAST CORNER GO SOUTH THEN SOUTHEAST 558.2' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 6, THEN FROM SOUTHWEST CORNER GO SOUTHWEST 50' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT. FROM THE SOUTH LINE AND 965 FT. FROM THE WEST LINE OF SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

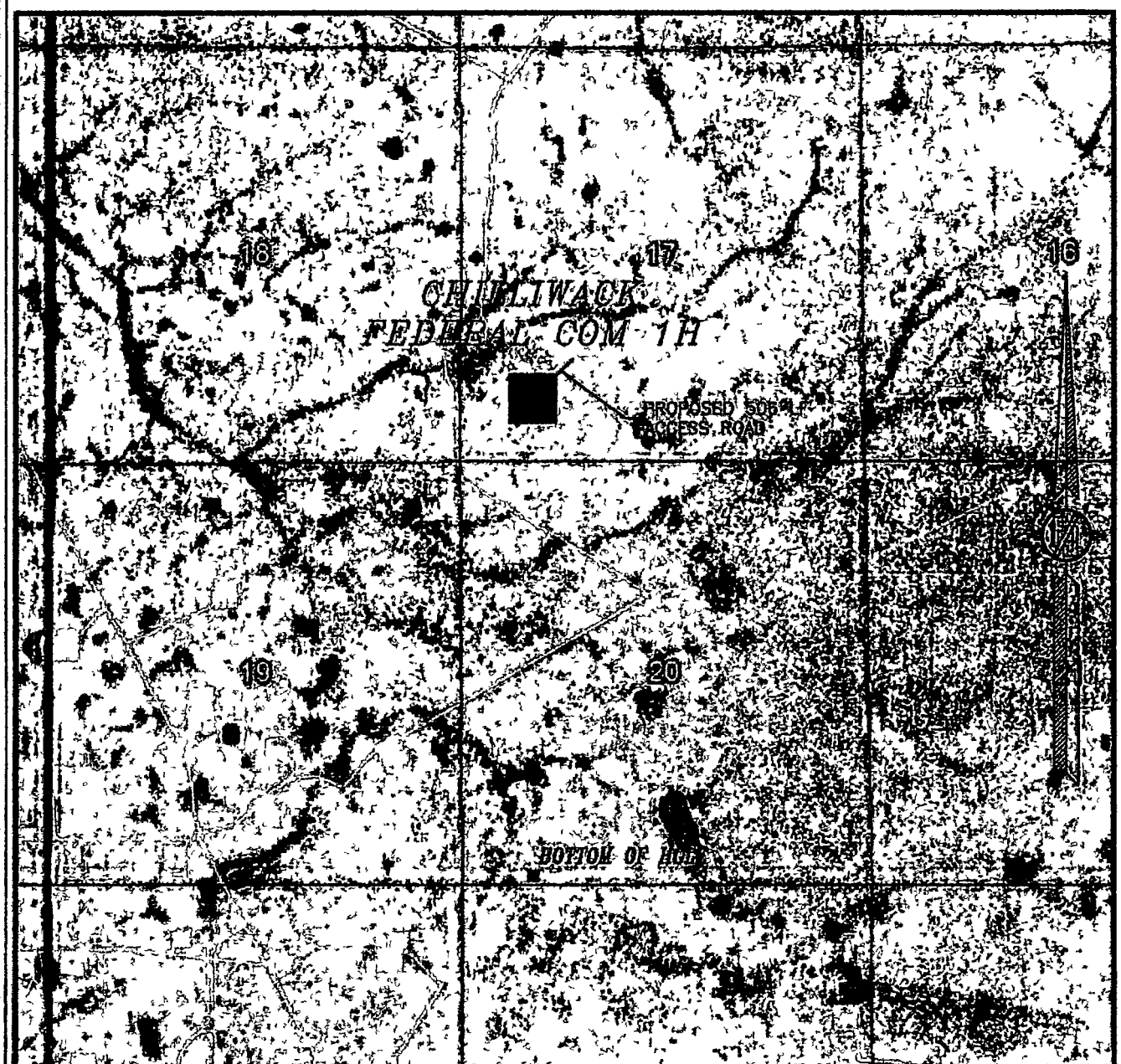
FEBRUARY 1, 2018

SURVEY NO. 5986

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

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

AERIAL PHOTO



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
OCTOBER 2014

MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT. FROM THE SOUTH LINE
AND 965 FT. FROM THE WEST LINE OF
SECTION 17, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

FEBRUARY 1, 2018

SURVEY NO. 5986

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

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M P M.
CHAVES COUNTY, STATE OF NEW MEXICO

ACCESS AERIAL ROUTE MAP

NOT TO SCALE
AERIAL PHOTO-
GOOGLE EARTH
OCTOBER 2014

MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT. FROM THE SOUTH LINE
AND 965 FT. FROM THE WEST LINE OF
SECTION 17, TOWNSHIP 15 SOUTH,
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CHAVES COUNTY, STATE OF NEW MEXICO

FEBRUARY 1, 2018

SURVEY NO. 5986

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

AFMSS

U.S Department of the Interior
BUREAU OF LAND MANAGEMENT

Drilling Plan Data Report

04/12/2018

APD ID 10400027607 **Submission Date** 03/08/2018

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

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

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	3781	0	0	ALLUVIUM	NONE	No
2	TOP OF SALT	3551	230	230	SALT	NONE	No
3	BASE OF SALT	2991	790	790	SALT	NONE	No
4	YATES	2891	890	890	ANHYDRITE,SILTSTONE	NATURAL GAS OIL	No
5	SEVEN RIVERS	2652	1129	1129	ANHYDRITE SILTSTONE	NATURAL GAS OIL	No
6	QUEEN	2163	1618	1618	ANHYDRITE SILTSTONE	NATURAL GAS,OIL	No
7	GRAYBURG	1771	2010	2010	DOLOMITE,ANHYDRITE SILTSTONE	NATURAL GAS,OIL	No
8	SAN ANDRES	1474	2307	2307	DOLOMITE,ANHYDRITE	NATURAL GAS OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI). 3M **Rating Depth** 8925

Equipment Rotng Head, Mud - Gas Separtor

Requesting Variance? NO

Variance request

Testing Procedure 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

Choke Diagram Attachment

choke_manifold_20180226104822 pdf

BOP Diagram Attachment

bop_diagram_20180226104837 pdf

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE	14 75	9 625	NEW	API	N	0	225	0	225			225	J-55	36	STC	17 984	6 975	BUOY	57 017	BUOY	7 04
2	PRODUCTION	8 75	7 0	NEW	API	N	0	3250	0	3195			3250	HCP-110	26	LTC	5 894	3 344	BUOY	8 524	BUOY	3 317
3	PRODUCTION	8 75	5 5	NEW	API	N	3250	8925	0	3195			5675	HCP-110	17	BUTT	5 063	3 66	BUOY	6 976	BUOY	3 587

Casing Attachments

Casing ID 1 **String Type** SURFACE

Inspection Document

Spec Document

Tapered String Spec

Casing Design Assumptions and Worksheet(s)

Chilliwack_Csg_20180301094359 pdf

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Casing Attachments

Casing ID 2 **String Type** PRODUCTION

Inspection Document

Spec Document

Tapered String Spec

Casing Design Assumptions and Worksheet(s)

Chilliwack_Csg_20180301094411 pdf

Casing ID 3 **String Type** PRODUCTION

Inspection Document

Spec Document

Tapered String Spec

Casing Design Assumptions and Worksheet(s).

Chilliwack_Csg_20180301094422 pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead	225	0	225	100	1 61	14 4	157		RFC+12% PF53+2%PF1+5 PPS PF42+ 125PPS PF29	20BBLS GELLED WATER 50SX OF 11# SCAVENGER CEMENT
SURFACE	Tail		0	225	200	1 34	14 8		100	CLASS C + 1% PF1	20BBLS GELLED WATER 50SX OF 11# SCAVENGER CEMENT
PRODUCTION	Lead	2700	0	2700	350	1 84	13 2	0	35	Class C 4% PF20+4 pps PF45 + 125pps	20bbls gelled water, 20bbls chemical wash, 50sx of 11# scavenger

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Strng Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
										PF29	
PRODUCTION	Lead	3250	2700	3250	1030	1 48	13	0	35	PVL + 1 3 (BWOW) PF44 + 5% PF 174+ 5%PF 606 + 1%PF153+ 4PP	20BBLS GELLED WATER 20BBLS CHEMICAL WASH, 50SX OF 11# SCAVENGER

Section 5 - Circulating Medium

Mud System Type Closed

Will an air or gas system be Used? NO

Description of the equipment for the circulating system in accordance with Onshore Order #2

Diagram of the equipment for the circulating system in accordance with Onshore Order #2

Describe what will be on location to control well or mitigate other conditions BOPE Brine Water

Describe the mud monitoring system utilized Pason PVT with Pit Volume Recorder

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
225	8925	LSND/GEL	8 3	10	74 8		11		160000	10	GEL STRENGTH - 0-1 0 VISCOSITY- 34-38
0	225	SPUD MUD	8 3	10	74 8		11		160000	10	GEL STRENGTH- 0-1 0 VISCOSITY- 34 38

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Section 6 - Test, Logging, Coring

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

NONE

List of open and cased hole logs run in the well

CALIPER,CNL/FDC,DLL,FDC,GR

Coring operation description for the well

Will evaluate after logging to determine the necessity for sidewall coring

Section 7 - Pressure

Anticipated Bottom Hole Pressure 1600 **Anticipated Surface Pressure** 897.1

Anticipated Bottom Hole Temperature(F) 95

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

Describe

Contingency Plans geoharzards description

Contingency Plans geohazards attachment

Hydrogen Sulfide drilling operations plan required? NO

Hydrogen sulfide drilling operations plan

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission

Chilliwack_Federal_Com__1H_Prelim_Plan__1_20180227151059.pdf
chilliwack_drilling_plan_20180308142323.pdf

Other proposed operations facets description

Other proposed operations facets attachment

Other Variance attachment

Mack Energy Corporation

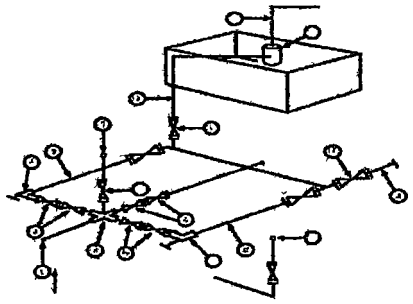
Exhibit #1

MIMIMUM CHOKE MANIFOLD

3 000, 5,000, and 10,000 PSI Working Pressure

3M will be used

3 MWP - 5 MWP - 10 MWP



Mud Pit

Reserve Pit

* Location of separator optional

Below Substructure

Mimimum requirements

No.		3,000 MWP I.D	Nominal	Rating	5,000 MWP I.D	Nominal	Rating	10,000 MWP I.D	Nominal	Rating
1	Line from drilling Spool		3"	3 000		3"	5 000		3"	10,000
2	Cross 3" x 3" x 3" x 2"			3,000			5 000			
2	Cross 3" x 3" x 3" x 2"									10 000
3	Valve Gate Plug	3 1/8		3 000	3 1/8		5,000	3 1/8		10 000
4	Valve Gate Plug	1 13/16		3,000	1 13/16		5 000	1 13/16		10,000
4a	Valves (1)	2 1/16		3 000	2 1/16		5,000	2 1/16		10,000
5	Pressure Gauge			3,000			5 000			10 000
6	Valve Gate Plug	3 1/8		3,000	3 1/8		5 000	3 1/8		10,000
7	Adjustable Choke (3)	2"		3 000	2"		5 000	2"		10 000
8	Adjustable Choke	1"		3,000	1"		5 000	2"		10 000
9	Line		3"	3 000		3"	5 000		3"	10 000
10	Line		2"	3,000		2"	5 000		2"	10 000
11	Valve Gate Plug	3 1/8		3,000	3 1/8		5,000	3 1/8		10,000
12	Line		3"	1,000		3"	1 000		3"	2,000
13	Line		3"	1,000		3"	1,000		3"	2 000
14	Remote reading compound Standpipe pressure guage			3 000			5,000			10,000
15	Gas Separator		2' x5'			2' x5'			2' x5'	
16	Line		4"	1,000		4"	1,000		4"	2,000
17	Valve Gate Plug	3 1/8		3 000	3 1/8		5 000	3 1/8		10,000

(1) Only one required in Class 3M

(2) Gate valves only shall be used for Class 10 M

(3) Remote operated hydraulic choke required on 5 000 psi and 10,000 psi for drilling.

EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

1 All connections in choke manifold shall be welded, studded, flanged or Cameron clamp of comparable rating

2 All flanges shall be API 6B or 6BX and ring gaskets shall be API RX or BX Use only BX for 10 MWP

3 All lines shall be securely anchored.

4 Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available

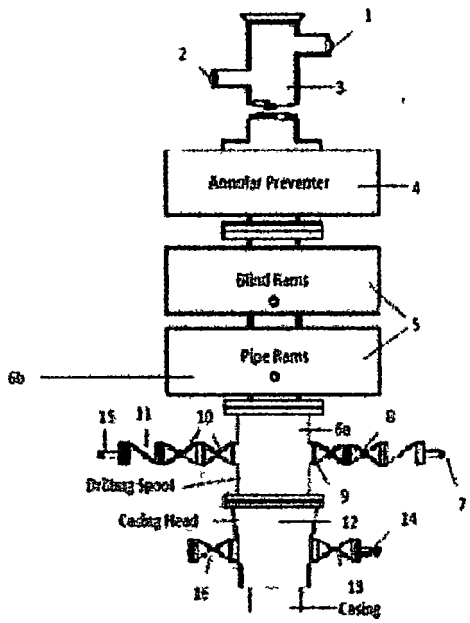
5 alternate with automatic chokes, a choke manifold pressure gauge shall be located on the rig floor in conjunction with the standpipe pressure gauge

6. Line from drilling spool to choke manifold should bee as straight as possible Lines downstream from chokes shall make turns by large bends or 90 degree bends using bull plugged tees

Mack Energy Corporation
Minimum Blowout Preventer Requirements
5000 psi Working Pressure
13 5/8 inch- 5 MWP
11 Inch - 5 MWP

Stack Requirements

NO	Items	Min ID	Min Nominal
1	Flowline		2"
2	Fill up line		2"
3	Drilling nipple		
4	Annular preventer		
5	Two single or one dual hydraulically operated rams		
6a	Drilling spool with 2" min kill line and 3" min choke line outlets		2" Choke
6b	2" min kill line and 3" min choke line outlets in ram, (Alternate to 6a above)		
7	Valve Gate Plug	3 1/8	
8	Gate valve-power operated	3 1/8	
9	Line to choke manifold		3"
10	Valve Gate Plug	2 1/16	
11	Check valve	2 1/16	
12	Casing head		
13	Valve Gate Plug	1 13/16	
14	Pressure gauge with needle valve		
15	Kill line to rig mud pump manifold		2"



OPTIONAL

16	Flanged Valve	1 13/16	

CONTRACTOR'S OPTION TO FURNISH

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 2000 psi minimum
2. Automatic accumulator (80 gallons minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure
3. BOP controls to be located near drillers' position
4. Kelly equipped with Kelly cock
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used
6. Kelly saver-sub equipped with rubber casing protector at all times
7. Plug type blowout preventer tester
8. Extra set pipe rams to fit drill pipe in use on location at all times.
9. Type RX ring gaskets in place of Type R.

MEC TO FURNISH

1. Bradenhead or casing head and side valves
2. Wear bushing if required.

10

MI

GENERAL NOTES

1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager
2. All connections, valves, fittings, piping, etc. subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service
3. Controls to be of standard design and each marked, showing opening and closing position
4. Chokes will be positioned so as not to hamper or delay changing of choke beans
5. Replaceable parts for adjustable choke or bean sizes, retainers, and choke wrenches to be conveniently located for immediate use
5. All valves to be equipped with hand-wheels or handles ready for immediate use
6. Choke lines must be suitably anchored
7. Handwheels and extensions to be connected and ready for use.
8. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency
9. All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted
10. Casinghead connections shall not be used except in case of emergency
11. Does not use kill line for routine fill up operations

Casing Design Well Chilhwack federal Com #1H

String Size & Function. 9 5/8 in surface intermediate

Total Depth 225 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse. 9.6 #/gal Safety Factor Collapse. 1.125

Mud weight, burst 9.6 #/gal Safety Factor Burst 1.25

Mud weight for joint strength 9.6 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for collapse 112.32 psi Burst 112.32 psi joint strength 112.32 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure 500 psi

1st segment	225 ft to	0 ft		Make up Torque ft-lbs		Total ft =	225
O D	Weight	Grade	Threads	opt.	min.	mx	
9.625 inches	36 #/ft	J-55	STaC	3,940	2,880	4,930	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
2,020 psi	3,620 psi	394 000 #		564 ,000 #		8.765	

2nd segment	0 ft to	0 ft		Make up Torque ft-lbs		Total ft =	0
O D.	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

3rd segment	0 ft to	0 ft		Make up Torque ft-lbs		Total ft =	0
O D	Weight	Grade	Threads	opt	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

4th segment	0 ft to	0 ft		Make up Torque ft-lbs		Total ft =	0
O.D	Weight	Grade	Threads	opt.	min	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

5th segment	0 ft to	0 ft		Make up Torque ft-lbs		Total ft =	0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

6th segment	0 ft to	0 ft		Make up Torque ft-lbs		Total ft =	0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

Select 1st segment bottom	225	S.F	Actual		Desire
		collapse	17.98433	>=	1.125
225 ft to 0 ft		burst-b	6.974717	>=	1.25
9.625 0 J-55 STaC		burst-t	7.04		
Top of segment 1 (ft)	0	S.F	Actual		Desire
Select 2nd segment from bottom		collapse	#DIV/0!	>=	1.125
		burst-b	0	>=	1.25
0 ft to 0 ft		burst-t	0		
0 0 0 0		jnt strngth	57.01657	>=	1.8

Casing Design Well: Chillwack Federal Com #1H

String Size & Function 7" and 5.5" in Production

Total Depth: 8925 ft TVD: 3195 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse: 10.2 #/gal Safety Factor Collapse: 1.125

Mud weight, burst: 10.2 #/gal Safety Factor Burst: 1.25

Mud weight for joint strength: 10.2 #/gal Safety Factor Joint Strength: 1.8

BHP @ TD for collapse: 1694.628 psi Burst: 1694.628 psi Joint strength: 1694.628 psi

Partially evacuated hole? Pressure gradient remaining: 10 #/gal

Max Shut in surface pressure: 3000 psi

1st segment	3250 ft to 8925 ft			Make up Torque ft-lbs			Total ft = 5675
O D	Weight	Grade	Threads	opt.	min.	mx	
5.5 inches	17 #/ft	HCP-110	Buttress	4,520	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
6,580 psi	10,640 psi-lrcr	568 000 #		546 000 #		4.767	

2nd segment	2400 ft to 3250 ft			Make up Torque ft-lbs			Total ft = 850
O D	Weight	Grade	Threads	opt.	min.	mx.	
7 inches	26 #/ft	HCP-110	Buttress	6,930	5,200	8,660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi-lrcr	653 000 #		830 ,000 #		6.151	

3rd segment	2400 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2400
O D	Weight	Grade	Threads	opt	min.	mx.	
7 inches	26 #/ft	HCP-110	LTSC	6930	5200	8660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi	693 000 #		830 ,000 #		6.151	

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O D	Weight	Grade	Threads	opt	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

Select 1st segment bottom	8925	S.F.	Actual		Desire
		collapse	5.063058	>=	1.125
8925 ft to 3250 ft		burst-b	3.855904	>=	1.25
5.5 0 HCP-110 Buttress		burst-t	3.587081		
Top of segment 1 (ft)	3250	S.F	Actual		Desire
Select 2nd segment from bottom		collapse	4.289138	>=	1.125
		burst-b	3.35446	>=	1.25
3250 ft to 2400 ft		burst-t	3.344493		
7 26 HCP-110 Buttress		jnt strngth	6.976249	>=	1.8

	Top of segment 2 (ft)	2400	S F	Actual	-	Desire
Select	3rd segment from bottom		collapse	5.893706	>=	1 125
			burst-b	3 344493	>=	1.25
2400 ft to 0 ft			burst-t	3 316867		
7	26 HCP 110 LT&C		jnt strngth	6 524017	>=	1.8
	Top of segment 3 (ft)	0	S.F	Actual		Desire
Select	4th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1 25
0 ft to 0 ft			burst-t	0		
0 0 0 0			jnt strngth	6 92514	>=	1 8
	Top of segment 4 (ft)		S.F	Actual		Desire
Select	5th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1.25
0 ft to ft			burst-t	0		
0 0 0 0			jnt strngth	0	>=	1 8
	Top of segment 5 (ft)		S.F	Actual		Desire
Select	6th segment from bottom		collapse	#DIV/0!	>=	1.125
			burst-b	0	>=	1.25
0 ft to ft			burst-t	0		
0 0 0 0			jnt strngth	0	>=	1 8
	Top of segment 6 (ft)		jnt strngth		>=	1 8

use in collapse calculations across different pressured formations

Three gradient pressure function						
Depth of evaluation:	1,200 ft		516	psi @	1,200 ft	
Top of salt	2 400 ft	fx #1	516			
Base of salt	3 700 ft	fx #2	900			
TD of intermediate	4 600 ft	fx #3	540			

Pressure gradient to be used above each top to be used as a function of depth. ex psi/ft

fx #1	fx #2	fx #3
0 43	0 75	0 45

1) Calculate neutral point for buckling with temperature affects computed also
2) Surface burst calculations & kick tolerance in surface pressure for burst
3) Do a comparison test to determine which value is lower joint strength or body yield to use in tensile strength calculations
4) Raise joint strength safety factor up to next level on page #2
5) Sour service what pipe can be used with proper degrading of strength factors and as function of temp

Adjust for best combination of safety factors

	Secondary
S.F Collapse bottom of segment:	
S.F Collapse top of segment:	4 73253
S.F Burst bottom of segment:	
S F Burst top of segment	
S.F Joint strength bottom of segment:	795.516
S.F Joint strength top of segment:	
S.F Body yield strength bottom of segment:	784 708
S.F Body yield strength top of segment:	6.70604

Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse:	0.84394	
calculations for bottom of segment @	3195 ft	
hydrostatic pressure collapse - backside:	1694.63 psi	
Axial load @ bottom of section	0 lbs	previous segments
Axial load factor:	0	load/(pipe body yield strength)
Collapse strength reduction factor	1	Meyers, Westcott, Dunlap, Kemler,1940
Adjusted collapse rating of segment:	8580 psi	
Actual safety factor	5 06306	adjusted casing rating / actual pressure

Casing Design Well Chalkwack Federal Com #1H

String Size & Function: 9 5/8 in surface x Intermediate

Total Depth. 225 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse 9.6 #/gal Safety Factor Collapse. 1.125

Mud weight, burst 9.6 #/gal Safety Factor Burst 1.25

Mud weight for joint strength 9.6 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for collapse 112.32 psi Burst 112.32 psi Joint strength 112.32 psi

Partially evacuated hole? Pressure gradient remaining. 10 #/gal

Max Shut in surface pressure 500 psi

1st segment	225 ft to 0 ft			Make up Torque ft-lbs			Total ft = 225
O D	Weight	Grade	Threads	opt.	min.	mx	
9.625 inches	36 #/ft	J-55	ST&C	3,940	2,960	4,930	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
2,020 psi	3,520 psi	394 ,000 #		564 ,000 #		8.765	

2nd segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		000 #			

3rd segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		000 #			

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O D	Weight	Grade	Threads	opt.	min	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

Select 1st segment bottom		225	S.F	Actual		Desire
			collapse	17.98433	>=	1.125
225 ft to 0 ft			burst-b	6.974717	>=	1.25
9.625	0 J-55 ST&C		burst-t	7.04		
Top of segment 1 (ft)		0	S.F	Actual		Desire
Select 2nd segment from bottom			collapse	#DIV/0!	>=	1.125
			burst-b	0	>=	1.25
0 ft to 0 ft			burst-t	0		
0	0 0 0		jet strngth	57.01657	>=	1.8

Casing Design Well. Chilliwack Federal Com #1H

String Size & Function: 7" and 5.5 in Production

Total Depth 8925 ft TVD 8195 ft

Pressure Gradient for Calculations (While drilling)

Mud weight collapse 10.2 #/gal Safety Factor Collapse 1.125

Mud weight burst 10.2 #/gal Safety Factor Burst. 1.25

Mud weight for joint strength 10.2 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for collapse 1694.628 psi Burst 1694.628 psi Joint strength: 1694.628 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max. Shut in surface pressure. 3000 psi

1st segment	3250 ft to 8925 ft			Make up Torque ft-lbs			Total ft = 5675
O.D	Weight	Grade	Threads	opt.	min	mx.	
5.5 inches	17 #/ft	HCP-110	Buttress	4,628	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
8,580 psi	10,640 psi-Incr	588 000 #		546 000 #		4.767	

2nd segment	2400 ft to 3250 ft			Make up Torque ft-lbs			Total ft = 850
O.D.	Weight	Grade	Threads	opt.	min.	mx.	
7 inches	26 #/ft	HCP-110	Buttress	6,930	5,200	8,660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi-Incr	853 000 #		830 000 #		6.151	

3rd segment	2400 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2400
O.D	Weight	Grade	Threads	opt	min.	mx.	
7 inches	26 #/ft	HCP-110	LT&C	6930	5200	8660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi	693 000 #		830 000 #		6.151	

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		000 #			

Select 1st segment bottom		8925	S.F	Actual		Desire
			collapse	5.083058	>=	1.125
8925 ft to 3250 ft			burst-b	3.659904	>=	1.25
5.5	0 HCP-110 Buttress		burst-t	3.587081		
	Top of segment 1 (ft)	3250	S.F	Actual		Desire
Select 2nd segment from bottom			collapse	4.389138	>=	1.125
			burst-b	3.35446	>=	1.25
3250 ft to 2400 ft			burst-t	3.344493		
7	26 HCP-110 Buttress		jnt strngth	6.576249	>=	1.8

	Top of segment 2 (ft)	2400	S.F	Actual		Desire
Select	3rd segment from bottom		collapse	5 893706	>=	1 125
			burst-b	3 344493	>=	1.25
2400 ft	to 0 ft		burst-t	3.316667		
7	28 HCP 110 LT&C		jnt strngth	8 524017	>=	1 8
	Top of segment 3 (ft)	0	S F	Actual		Desire
Select	4th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1 25
0 ft	to 0 ft		burst-t	0		
0	0 0 0		jnt strngth	6 92514	>=	1 8
	Top of segment 4 (ft)		S.F	Actual		Desire
Select	5th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1.25
0 ft	to ft		burst-t	0		
0	0 0 0		jnt strngth	0	>=	1 8
	Top of segment 5 (ft)		S.F	Actual		Desire
Select	6th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1.25
0 ft	to ft		burst-t	0		
0	0 0 0		jnt strngth	0	>=	1 8
	Top of segment 6 (ft)		jnt strngth		>=	1.8

use in collapse calculations across different pressured formations

Three gradient pressure function

Depth of evaluation	1,200 ft		516	psi @	1,200 ft	
Top of salt	2 400 ft	fx #1	516			
Base of salt	3 700 ft	fx #2	900			
TD of intermediate	4 600 ft	fx #3	540			

Pressure gradient to be used above each top to be used as a function of depth. ex psi/ft

fx #1	fx #2	fx #3
0 43	0 75	0 45

1) Calculate neutral point for buckling with temperature affects computed also
2) Surface burst calculations & kick tolerance in surface pressure for burst
3) Do a comparison test to determine which value is lower joint strength or body yield to use in tensile strength calculations
4) Raise joint strength safety factor up to next level on page #2
5) Sour service what pipe can be used with proper degrading of strength factors and as function of temp

Adjust for best combination of safety factors

	Secondary
S.F Collapse bottom of segment:	
S.F Collapse top of segment:	4 73253
S.F Burst bottom of segment:	
S.F Burst top of segment	
S F Joint strength bottom of segment:	795.518
S.F Joint strength top of segment:	
S.F Body yield strength bottom of segment:	764 708
S.F Body yield strength top of segment:	6 70604

Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse:	0.84394	
calculations for bottom of segment @	3195 ft	
hydrostatic pressure collapse - backside:	1694 63 psi	
Axial load @ bottom of section	0 lbs	previous segments
Axial load factor:	0	load/(pipe body yield strength)
Collapse strength reduction factor	1	Messrs, Westcott, Dunlop, Kemler 1949
Adjusted collapse rating of segment:	8580 psi	
Actual safety factor	5.06306	adjusted casing rating / actual pressure

Casing Design Well Chinwack Federal Com #1H

String Size & Function. 9 5/8 in surface intermediate

Total Depth 225 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse 9.6 #/gal Safety Factor Collapse. 1.125

Mud weight burst 9.6 #/gal Safety Factor Burst. 1.25

Mud weight for joint strength 9.6 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for collapse 112.32 psi Burst 112.32 psi Joint strength 112.32 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure 500 psi

1st segment	225 ft to 0 ft			Make up Torque ft-lbs		Total ft = 225
O D	Weight	Grade	Threads	opt.	min.	mx
9.625 inches	36 #/ft	J-55	ST&C	3,940	2,960	4,930
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
2,020 psi	3,520 psi	394 000 #		564 000 #		8.765

2nd segment	0 ft to 0 ft			Make up Torque ft-lbs		Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.
inches	#/ft					
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
psi	psi	000 #		000 #		

3rd segment	0 ft to 0 ft			Make up Torque ft-lbs		Total ft = 0
O.D	Weight	Grade	Threads	opt.	min	mx.
inches	#/ft					
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
psi	psi	000 #		000 #		

4th segment	0 ft to 0 ft			Make up Torque ft-lbs		Total ft = 0
O D	Weight	Grade	Threads	opt.	min	mx.
inches	#/ft					
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
psi	psi	000 #		000 #		

5th segment	0 ft to 0 ft			Make up Torque ft-lbs		Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.
inches	#/ft					
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
psi	psi	000 #		000 #		

6th segment	0 ft to 0 ft			Make up Torque ft-lbs		Total ft = 0
O D	Weight	Grade	Threads	opt.	min.	mx.
inches	#/ft					
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift
psi	psi	000 #		000 #		

Select 1st segment bottom 225

225 ft	to	0 ft	
9.625	.0	J-55	ST&C

	S.F	Actual		Desire
collapse		17.98433	>=	1.125
burst-b		6.974717	>=	1.25
burst-t		7.06		

Top of segment 1 (ft) 0

	S.F	Actual		Desire
collapse		#DIV/0!	>=	1.125
burst-b		0	>=	1.25
burst-t		0		
jnt strngth		57.01657	>=	1.8

Select 2nd segment from bottom

0 ft	to	0 ft	
0	0	0	0

Casing Design Well: Chiltwack Federal Com #1H

String Size & Function 7" and 5.5" in Production X

Total Depth 8925 ft TVD 3195 ft

Pressure Gradient for Calculations (While drilling)

Mud weight, collapse 10.2 #/gal Safety Factor Collapse 1.125

Mud weight, burst 10.2 #/gal Safety Factor Burst 1.25

Mud weight for joint strength 10.2 #/gal Safety Factor Joint Strength 1.8

BHP @ TD for collapse 1694.628 psi Burst 1694.628 psi joint strength: 1694.628 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure 3000 psi

1st segment	3250 ft to 8925 ft			Make up Torque ft-lbs			Total ft = 5675
O.D.	Weight	Grade	Threads	opt.	min	mx.	
5.5 inches	17 #/ft	HCP-110	Buttress	4,520	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
8,580 psi	10,640 psi-tncr	568 000 #		546 000 #		4.767	

2nd segment	2400 ft to 3250 ft			Make up Torque ft-lbs			Total ft = 850
O.D.	Weight	Grade	Threads	opt.	min	mx.	
7 inches	26 #/ft	HCP-110	Buttress	6,930	5,200	8,660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi-tncr	853 000 #		830 000 #		6.151	

3rd segment	2400 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2400
O.D	Weight	Grade	Threads	opt	min.	mx.	
7 inches	26 #/ft	HCP-110	LT&C	6930	5200	8660	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
7,800 psi	9,950 psi	693 000 #		830 000 #		6.151	

4th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	000 #		,000 #			

5th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

6th segment	0 ft to 0 ft			Make up Torque ft-lbs			Total ft = 0
O.D	Weight	Grade	Threads	opt.	min.	mx.	
inches	#/ft						
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
psi	psi	,000 #		,000 #			

Select 1st segment bottom		8925	S.F.	Actual		Desire
			collapse	5.063058	>=	1.125
8925 ft to 3250 ft			burst-b	3.659904	>=	1.25
5.5	0 HCP-110 Buttress		burst-t	3.587081		
Top of segment 1 (ft)		3250	S.F	Actual		Desire
Select 2nd segment from bottom			collapse	4.389136	>=	1.125
			burst-b	3.35445	>=	1.25
3250 ft to 2400 ft			burst-t	3.344493		
7	26 HCP-110 Buttress		jnt strngth	8.976249	>=	1.8

	Top of segment 2 (ft)	2400	S F	Actual		Desire
Select	3rd segment from bottom		collapse	5 893706	>=	1 125
			burst-b	3 344493	>=	1.25
2400 ft	to 0 ft		burst-t	3 316667		
7	26 HCP-110 LT&C		jnt strngth	8 524017	>=	1.8
	Top of segment 3 (ft)	0	S F	Actual		Desire
Select	4th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1 25
0 ft	to 0 ft		burst-t	0		
0 0	0 0		jnt strngth	6 92514	>=	1.8
	Top of segment 4 (ft)		S.F	Actual		Desire
Select	5th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1.25
0 ft	to ft		burst t	0		
0 0	0 0		jnt strngth	0	>=	1 8
	Top of segment 5 (ft)		S.F	Actual		Desire
Select	6th segment from bottom		collapse	#DIV/0!	>=	1 125
			burst-b	0	>=	1.25
0 ft	to ft		burst t	0		
0 0	0 0		jnt strngth	0	>=	1 8
	Top of segment 6 (ft)		jnt strngth		>=	1.8

use in collapse calculations across different pressured formations

Three gradient pressure function						
Depth of evaluation:	1,200 ft		516	psi @	1,200 ft	
Top of salt:	2 400 ft	fx #1	516			
Base of salt:	3 700 ft	fx #2	900			
TD of intermediate	4 600 ft	fx #3	540			

Pressure gradient to be used above each top to be used as a function of depth. ex psi/ft

fx #1	fx #2	fx #3
0.43	0 75	0 45

1) Calculate neutral point for buckling with temperature affects computed also
2) Surface burst calculations & kick tolerance in surface pressure for burst
3) Do a comparison test to determine which value is lower joint strength or body yield to use in tensile strength calculations
4) Raise joint strength safety factor up to next level on page #2
5) Sour service what pipe can be used with proper degrading of strength factors and as function of temp

Adjust for best combination of safety factors

	Secondary
S.F Collapse bottom of segment:	
S.F Collapse top of segment:	4 73253
S.F Burst bottom of segment:	
S.F Burst top of segment	
S F Joint strength bottom of segment:	795.518
S.F Joint strength top of segment:	
S.F Body yield strength bottom of segment:	764.708
S.F Body yield strength top of segment:	6.70604

Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse.	0.84394	
calculations for bottom of segment @	3195 ft	
hydrostatic pressure collapse - backside:	1694.63 psi	
Axial load @ bottom of section	0 lbs	previous segments
Axial load factor	0	load/(pipe body yield strength)
Collapse strength reduction factor	1	Messrs. Westcott, Dunlap, Kemler,1940
Adjusted collapse rating of segment:	8580 psi	
Actual safety factor	5.06306	adjusted casing rating / actual pressure

Chilliwack Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	14 37 Thursday, February 08, 2018	Page 1 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	179 91
Well Name	Chilliwack Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 810 FSL & 965 FWL Sec 17-T15S-R29E 5 FSL & 965 FWL Sec 20-T15S-R29E	BHL	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929858 2	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11983857 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3803 4	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3781 9	**Local North Ref** Grid

DIRECTIONAL WELL PLAN

MD*	INC*	AZI*	TVD*	N*	E*	DLS*	V. S.*	MapE*	MapN*	SysTVD*
ft	deg	deg	ft	ft	ft	°/100ft	ft	ft	ft	ft
*** TIE (at MD = 2308 00)										
2308 00	0 00	0 0	2308 00	0 00	0 00		0 00	1929858 20	11983857 90	1495 40
2350 00	0 00	0 0	2350 00	0 00	0 00	0 00	0 00	1929858 20	11983857 90	1453 40
2400 00	0 00	0 0	2400 00	0 00	0 00	0 00	0 00	1929858 20	11983857 90	1403 40
*** KOP 8 DEGREE BUILD (at MD = 2408 00)										
2408 00	0 00	0 0	2408 00	0 00	0 00	0 00	0 00	1929858 20	11983857 90	1395 40
2450 00	3 36	179 9	2449 98	-1 23	0 00	8 00	1 23	1929858 20	11983856 67	1353 42
2500 00	7 36	179 9	2499 75	-5 90	0 01	8 00	5 90	1929858 21	11983852 00	1303 65
2550 00	11 36	179 9	2549 07	-14 03	0 02	8 00	14 03	1929858 22	11983843 87	1254 33
2600 00	15 36	179 9	2597 71	-25 58	0 04	8 00	25 58	1929858 24	11983832 32	1205 69
2650 00	19 36	179 9	2645 42	-40 50	0 06	8 00	40 50	1929858 26	11983817 40	1157 98
2700 00	23 36	179 9	2691 98	-58 71	0 09	8 00	58 71	1929858 29	11983799 19	1111 42
2750 00	27 36	179 9	2737 15	-80 12	0 13	8 00	80 12	1929858 33	11983777 78	1066 25
2800 00	31 36	179 9	2780 72	-104 63	0 16	8 00	104 63	1929858 36	11983753 27	1022 68
2850 00	35 36	179 9	2822 47	-132 12	0 21	8 00	132 12	1929858 41	11983725 78	980 93
2900 00	39 36	179 9	2862 21	-162 45	0 26	8 00	162 45	1929858 46	11983695 45	941 19
2950 00	43 36	179 9	2899 73	-195 48	0 31	8 00	195 48	1929858 51	11983662 42	903 67
3000 00	47 36	179 9	2934 85	-231 05	0 36	8 00	231 05	1929858 56	11983626 85	868 55
3050 00	51 36	179 9	2967 41	-268 99	0 42	8 00	268 99	1929858 62	11983588 91	835 99
*** 55 DEGREE TANG (at MD = 3095 50)										
3095 50	55 00	179 9	2994 67	-305 40	0 48	8 00	305 40	1929858 68	11983552 50	808 73
3100 00	55 00	179 9	2997 26	-309 09	0 49	0 00	309 09	1929858 69	11983548 81	806 14
3150 00	55 00	179 9	3025 93	-350 05	0 55	0 00	350 05	1929858 75	11983507 85	777 47
3200 00	55 00	179 9	3054 61	-391 00	0 61	0 00	391 00	1929858 81	11983466 90	748 79
3250 00	55 00	179 9	3083 29	-431 96	0 68	0 00	431 96	1929858 88	11983425 94	720 11
*** 12 DEGREE BUILD (at MD = 3295 50)										
3295 50	55 00	179 9	3109 39	-469 23	0 74	0 00	469 23	1929858 94	11983388 67	694 01
3300 00	55 54	179 9	3111 95	-472 93	0 74	12 00	472 93	1929858 94	11983384 97	691 45
3350 00	61 54	179 9	3138 04	-515 56	0 81	12 00	515 56	1929859 01	11983342 34	665 36
3400 00	67 54	179 9	3159 52	-560 69	0 88	12 00	560 69	1929859 08	11983297 21	643 88
3450 00	73 54	179 9	3176 17	-607 81	0 95	12 00	607 81	1929859 15	11983250 09	627 23
3500 00	79 54	179 9	3187 80	-656 41	1 03	12 00	656 41	1929859 23	11983201 49	615 60
3550 00	85 54	179 9	3194 29	-705 97	1 11	12 00	705 97	1929859 31	11983151 93	609 11
*** LANDING POINT (at MD = 3591 33)										
3591 33	90 50	179 9	3195 72	-747 26	1 17	12 00	747 26	1929859 37	11983110 64	607 68
3600 00	90 50	179 9	3195 64	-755 93	1 19	0 00	755 93	1929859 39	11983101 97	607 76
3650 00	90 50	179 9	3195 21	-805 93	1 27	0 00	805 93	1929859 47	11983051 97	608 19
3700 00	90 50	179 9	3194 77	-855 92	1 34	0 00	855 93	1929859 54	11983001 98	608 63
3750 00	90 50	179 9	3194 34	-905 92	1 42	0 00	905 92	1929859 62	11982951 98	609 06

Chilliwack Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	**Vertical Section Azimuth**	179 91
Field	Round Tank	**County**	Chaves	**Survey Calculation Method**	Minimum Curvature
Well Name	Chilliwack Federal Com #1H	**State**	New Mexico	**Database**	Access
Plan	1	**Country**	USA		

Location	SL 810 FSL & 965 FWL Sec 17 T15S-R29E 5 FSL & 965 FWL Sec 20 T15S-R29E	BHL	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929858 2	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11983857 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3803 4	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3781 9	**Local North Ref** Grid

DIRECTIONAL WELL PLAN

MD*	INC*	AZI*	TVD*	N*	E*	DLS*	V. S.*	MapE*	MapN*	SysTVD*
ft	deg	deg	ft	ft	ft	°/100ft	ft	ft	ft	ft
3800 00	90 50	179 9	3193 90	-955 92	1 50	0 00	955 92	1929859 70	11982901 98	609 50
3850 00	90 50	179 9	3193 46	-1005 92	1 58	0 00	1005 92	1929859 78	11982851 98	609 94
3900 00	90 50	179 9	3193 03	-1055 92	1 66	0 00	1055 92	1929859 86	11982801 98	610 37
3950 00	90 50	179 9	3192 59	-1105 91	1 74	0 00	1105 92	1929859 94	11982751 99	610 81
4000 00	90 50	179 9	3192 15	-1155 91	1 82	0 00	1155 91	1929860 02	11982701 99	611 25
4050 00	90 50	179 9	3191 72	-1205 91	1 89	0 00	1205 91	1929860 09	11982651 99	611 68
4100 00	90 50	179 9	3191 28	-1255 91	1 97	0 00	1255 91	1929860 17	11982601 99	612 12
4150 00	90 50	179 9	3190 84	-1305 91	2 05	0 00	1305 91	1929860 25	11982551 99	612 56
4200 00	90 50	179 9	3190 41	-1355 90	2 13	0 00	1355 91	1929860 33	11982502 00	612 99
4250 00	90 50	179 9	3189 97	-1405 90	2 21	0 00	1405 90	1929860 41	11982452 00	613 43
4300 00	90 50	179 9	3189 54	-1455 90	2 29	0 00	1455 90	1929860 49	11982402 00	613 86
4350 00	90 50	179 9	3189 10	-1505 90	2 37	0 00	1505 90	1929860 57	11982352 00	614 30
4400 00	90 50	179 9	3188 66	-1555 90	2 44	0 00	1555 90	1929860 64	11982302 00	614 74
4450 00	90 50	179 9	3188 23	-1605 90	2 52	0 00	1605 90	1929860 72	11982252 01	615 17
4500 00	90 50	179 9	3187 79	-1655 89	2 60	0 00	1655 90	1929860 80	11982202 01	615 61
4550 00	90 50	179 9	3187 35	-1705 89	2 68	0 00	1705 89	1929860 88	11982152 01	616 05
4600 00	90 50	179 9	3186 92	-1755 89	2 76	0 00	1755 89	1929860 96	11982102 01	616 48
4650 00	90 50	179 9	3186 48	-1805 89	2 84	0 00	1805 89	1929861 04	11982052 01	616 92
4700 00	90 50	179 9	3186 05	-1855 89	2 92	0 00	1855 89	1929861 12	11982002 01	617 35
4750 00	90 50	179 9	3185 61	-1905 88	2 99	0 00	1905 89	1929861 19	11981952 02	617 79
4800 00	90 50	179 9	3185 17	-1955 88	3 07	0 00	1955 88	1929861 27	11981902 02	618 23
4850 00	90 50	179 9	3184 74	-2005 88	3 15	0 00	2005 88	1929861 35	11981852 02	618 66
4900 00	90 50	179 9	3184 30	-2055 88	3 23	0 00	2055 88	1929861 43	11981802 02	619 10
4950 00	90 50	179 9	3183 86	-2105 88	3 31	0 00	2105 88	1929861 51	11981752 02	619 54
5000 00	90 50	179 9	3183 43	-2155 87	3 39	0 00	2155 88	1929861 59	11981702 03	619 97
5050 00	90 50	179 9	3182 99	-2205 87	3 47	0 00	2205 87	1929861 67	11981652 03	620 41
5100 00	90 50	179 9	3182 55	-2255 87	3 54	0 00	2255 87	1929861 74	11981602 03	620 85
5150 00	90 50	179 9	3182 12	-2305 87	3 62	0 00	2305 87	1929861 82	11981552 03	621 28
5200 00	90 50	179 9	3181 68	-2355 87	3 70	0 00	2355 87	1929861 90	11981502 03	621 72
5250 00	90 50	179 9	3181 25	-2405 86	3 78	0 00	2405 87	1929861 98	11981452 04	622 15
5300 00	90 50	179 9	3180 81	-2455 86	3 86	0 00	2455 86	1929862 06	11981402 04	622 59
5350 00	90 50	179 9	3180 37	-2505 86	3 94	0 00	2505 86	1929862 14	11981352 04	623 03
5400 00	90 50	179 9	3179 94	-2555 86	4 01	0 00	2555 86	1929862 21	11981302 04	623 46
5450 00	90 50	179 9	3179 50	-2605 86	4 09	0 00	2605 86	1929862 29	11981252 04	623 90
5500 00	90 50	179 9	3179 06	-2655 85	4 17	0 00	2655 86	1929862 37	11981202 05	624 34
5550 00	90 50	179 9	3178 63	-2705 85	4 25	0 00	2705 86	1929862 45	11981152 05	624 77
5600 00	90 50	179 9	3178 19	-2755 85	4 33	0 00	2755 85	1929862 53	11981102 05	625 21

Chilliwack Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	**Vertical Section Azimuth**	179 91
Field	Round Tank	**County**	Chaves	**Survey Calculation Method**	Minimum Curvature
Well Name	Chilliwack Federal Com #1H	**State**	New Mexico	**Database**	Access
Plan	1	**Country**	USA		

Location	SL 810 FSL & 965 FWL Sec 17-T15S-R29E 5 FSL & 965 FWL Sec 20-T15S-R29E	BHL	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929858 2	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11983857 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3803 4	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3781 9	**Local North Ref** Grid

DIRECTIONAL WELL PLAN

MD*	INC*	AZI*	TVD*	N*	E*	DLS*	V. S.*	MapE*	MapN*	SysTVD*
ft	deg	deg	ft	ft	ft	°/100ft	ft	ft	ft	ft
5650 00	90 50	179 9	3177 76	-2805 85	4 41	0 00	2805 85	1929862 61	11981052 05	625 64
5700 00	90 50	179 9	3177 32	-2855 85	4 49	0 00	2855 85	1929862 69	11981002 05	626 08
5750 00	90 50	179 9	3176 88	-2905 84	4 56	0 00	2905 85	1929862 76	11980952 06	626 52
5800 00	90 50	179 9	3176 45	-2955 84	4 64	0 00	2955 85	1929862 84	11980902 06	626 95
5850 00	90 50	179 9	3176 01	-3005 84	4 72	0 00	3005 84	1929862 92	11980852 06	627 39
5900 00	90 50	179 9	3175 57	-3055 84	4 80	0 00	3055 84	1929863 00	11980802 06	627 83
5950 00	90 50	179 9	3175 14	-3105 84	4 88	0 00	3105 84	1929863 08	11980752 06	628 26
6000 00	90 50	179 9	3174 70	-3155 83	4 96	0 00	3155 84	1929863 16	11980702 07	628 70
6050 00	90 50	179 9	3174 26	-3205 83	5 04	0 00	3205 84	1929863 24	11980652 07	629 14
6100 00	90 50	179 9	3173 83	-3255 83	5 11	0 00	3255 83	1929863 31	11980602 07	629 57
6150 00	90 50	179 9	3173 39	-3305 83	5 19	0 00	3305 83	1929863 39	11980552 07	630 01
6200 00	90 50	179 9	3172 96	-3355 83	5 27	0 00	3355 83	1929863 47	11980502 07	630 44
6250 00	90 50	179 9	3172 52	-3405 82	5 35	0 00	3405 83	1929863 55	11980452 08	630 88
6300 00	90 50	179 9	3172 08	-3455 82	5 43	0 00	3455 83	1929863 63	11980402 08	631 32
6350 00	90 50	179 9	3171 65	-3505 82	5 51	0 00	3505 82	1929863 71	11980352 08	631 75
6400 00	90 50	179 9	3171 21	-3555 82	5 59	0 00	3555 82	1929863 79	11980302 08	632 19
6450 00	90 50	179 9	3170 77	-3605 82	5 66	0 00	3605 82	1929863 86	11980252 08	632 63
6500 00	90 50	179 9	3170 34	-3655 81	5 74	0 00	3655 82	1929863 94	11980202 09	633 06
6550 00	90 50	179 9	3169 90	-3705 81	5 82	0 00	3705 82	1929864 02	11980152 09	633 50
6600 00	90 50	179 9	3169 46	-3755 81	5 90	0 00	3755 82	1929864 10	11980102 09	633 94
6650 00	90 50	179 9	3169 03	-3805 81	5 98	0 00	3805 81	1929864 18	11980052 09	634 37
6700 00	90 50	179 9	3168 59	-3855 81	6 06	0 00	3855 81	1929864 26	11980002 09	634 81
6750 00	90 50	179 9	3168 16	-3905 80	6 14	0 00	3905 81	1929864 34	11979952 10	635 24
6800 00	90 50	179 9	3167 72	-3955 80	6 21	0 00	3955 81	1929864 41	11979902 10	635 68
6850 00	90 50	179 9	3167 28	-4005 80	6 29	0 00	4005 81	1929864 49	11979852 10	636 12
6900 00	90 50	179 9	3166 85	-4055 80	6 37	0 00	4055 80	1929864 57	11979802 10	636 55
6950 00	90 50	179 9	3166 41	-4105 80	6 45	0 00	4105 80	1929864 65	11979752 10	636 99
7000 00	90 50	179 9	3165 97	-4155 79	6 53	0 00	4155 80	1929864 73	11979702 11	637 43
7050 00	90 50	179 9	3165 54	-4205 79	6 61	0 00	4205 80	1929864 81	11979652 11	637 86
7100 00	90 50	179 9	3165 10	-4255 79	6 69	0 00	4255 80	1929864 89	11979602 11	638 30
7150 00	90 50	179 9	3164 67	-4305 79	6 76	0 00	4305 79	1929864 96	11979552 11	638 73
7200 00	90 50	179 9	3164 23	-4355 79	6 84	0 00	4355 79	1929865 04	11979502 11	639 17
7250 00	90 50	179 9	3163 79	-4405 78	6 92	0 00	4405 79	1929865 12	11979452 12	639 61
7300 00	90 50	179 9	3163 36	-4455 78	7 00	0 00	4455 79	1929865 20	11979402 12	640 04
7350 00	90 50	179 9	3162 92	-4505 78	7 08	0 00	4505 79	1929865 28	11979352 12	640 48
7400 00	90 50	179 9	3162 48	-4555 78	7 16	0 00	4555 78	1929865 36	11979302 12	640 92
7450 00	90 50	179 9	3162 05	-4605 78	7 23	0 00	4605 78	1929865 43	11979252 12	641 35

Chilliwack Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	14 37 Thursday, February 08, 2018	Page 4 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	179 91
Well Name	Chilliwack Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 810 FSL & 965 FWL Sec 17-T15S-R29E 5 FSL & 965 FWL Sec 20-T15S-R29E	BHL	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929858 2	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11983857 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3803 4	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3781 9	**Local North Ref** Grid

DIRECTIONAL WELL PLAN

MD*	INC*	AZI*	TVD*	N*	E*	DLS*	V. S.*	MapE*	MapN*	SysTVD*
ft	deg	deg	ft	ft	ft	°/100ft	ft	ft	ft	ft
7500 00	90 50	179 9	3161 61	-4655 78	7 31	0 00	4655 78	1929865 51	11979202 12	641 79
7550 00	90 50	179 9	3161 17	-4705 77	7 39	0 00	4705 78	1929865 59	11979152 13	642 23
7600 00	90 50	179 9	3160 74	-4755 77	7 47	0 00	4755 78	1929865 67	11979102 13	642 66
7650 00	90 50	179 9	3160 30	-4805 77	7 55	0 00	4805 78	1929865 75	11979052 13	643 10
7700 00	90 50	179 9	3159 87	-4855 77	7 63	0 00	4855 77	1929865 83	11979002 13	643 53
7750 00	90 50	179 9	3159 43	-4905 77	7 71	0 00	4905 77	1929865 91	11978952 13	643 97
7800 00	90 50	179 9	3158 99	-4955 76	7 78	0 00	4955 77	1929865 98	11978902 14	644 41
7850 00	90 50	179 9	3158 56	-5005 76	7 86	0 00	5005 77	1929866 06	11978852 14	644 84
7900 00	90 50	179 9	3158 12	-5055 76	7 94	0 00	5055 77	1929866 14	11978802 14	645 28
7950 00	90 50	179 9	3157 68	-5105 76	8 02	0 00	5105 76	1929866 22	11978752 14	645 72
8000 00	90 50	179 9	3157 25	-5155 76	8 10	0 00	5155 76	1929866 30	11978702 14	646 15
8050 00	90 50	179 9	3156 81	-5205 75	8 18	0 00	5205 76	1929866 38	11978652 15	646 59
8100 00	90 50	179 9	3156 38	-5255 75	8 26	0 00	5255 76	1929866 46	11978602 15	647 03
8150 00	90 50	179 9	3155 94	-5305 75	8 33	0 00	5305 76	1929866 53	11978552 15	647 46
8200 00	90 50	179 9	3155 50	-5355 75	8 41	0 00	5355 75	1929866 61	11978502 15	647 90
8250 00	90 50	179 9	3155 07	-5405 75	8 49	0 00	5405 75	1929866 69	11978452 15	648 33
8300 00	90 50	179 9	3154 63	-5455 74	8 57	0 00	5455 75	1929866 77	11978402 16	648 77
8350 00	90 50	179 9	3154 19	-5505 74	8 65	0 00	5505 75	1929866 85	11978352 16	649 21
8400 00	90 50	179 9	3153 76	-5555 74	8 73	0 00	5555 75	1929866 93	11978302 16	649 64
8450 00	90 50	179 9	3153 32	-5605 74	8 81	0 00	5605 74	1929867 01	11978252 16	650 08
8500 00	90 50	179 9	3152 88	-5655 74	8 88	0 00	5655 74	1929867 08	11978202 16	650 52
8550 00	90 50	179 9	3152 45	-5705 73	8 96	0 00	5705 74	1929867 16	11978152 17	650 95
8600 00	90 50	179 9	3152 01	-5755 73	9 04	0 00	5755 74	1929867 24	11978102 17	651 39
8650 00	90 50	179 9	3151 58	-5805 73	9 12	0 00	5805 74	1929867 32	11978052 17	651 82
8700 00	90 50	179 9	3151 14	-5855 73	9 20	0 00	5855 74	1929867 40	11978002 17	652 26
8750 00	90 50	179 9	3150 70	-5905 73	9 28	0 00	5905 73	1929867 48	11977952 17	652 70
8800 00	90 50	179 9	3150 27	-5955 72	9 36	0 00	5955 73	1929867 56	11977902 18	653 13
8850 00	90 50	179 9	3149 83	-6005 72	9 43	0 00	6005 73	1929867 63	11977852 18	653 57
8900 00	90 50	179 9	3149 39	-6055 72	9 51	0 00	6055 73	1929867 71	11977802 18	654 01
*** TD (at MD = 8924 88)										
8924 88	90 50	179 9	3149 18	-6080 60	9 55	0 00	6080 61	1929867 75	11977777 30	654 22

Attached to Form 3160-3
Mack Energy Corporation
Chilliwack Federal Com #1H NMNM-121949
SHL : 810 FSL & 2965 FWL, SWSW, Sec. 17 T15S R29E
BHL : 5 FSL & 965 FWL, SWSW, Sec. 20 T15S R29E
Chaves County, NM

DRILLING PROGRAM

1. **Geologic Name of Surface Formation**

   Quaternary

2. **Estimated Tops of Important Geologic Markers:**

Rustler	210'
Top of Salt	230'
Base of Salt	790'
Yates	890'
Seven Rivers	1129'
Queen	1618'
Grayburg	2010'
San Andres	2307'

3. **Estimated Depths of Anticipated Fresh Water, Oil and Gas:**

Water Sand	150'	Fresh Water
Yates	890'	Oil/Gas
Seven Rivers	1129'	Oil/Gas
Queen	1618'	Oil/Gas
Grayburg	2010'	Oil/Gas
San Andres	2307'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities Setting 9 5/8" casing to 225' and circulating cement back to surface will protect the surface fresh water sand. Salt section and shallower zones above TD, which contain commercial quantities of oil and/or gas, will have cement circulated across them by cementing 5 ½" production casing, sufficient cement will be pumped to circulate back to surface.

4. **Casing Program:**

Hole Size	Interval	OD Casing	Wt, Grade, Jt, cond, collapse/burst/tension
14 3/4"	0-225'	9 5/8"	36#, J-55, ST&C, New, 17.98433/6.974717/7.04
8 3/4"	0-3250'	7"	26#,HPC-110,Buttress,New, 4.389136/3.35446/3.34
8 ¾"	3250-8925'	5 ½"	17#, HCP-110 Buttress, New, 5.063058/3.659904/3.59

5. **Cement Program:**

9 5/8" Surface Casing: Lead 100sx, RFC+12%PF53+2%PF1+5ppsPF42+.125ppsPF29, yld 1.61, wt 14.4 ppg, 7.357gals/sx, excess 100% Tail 200sx, Class C+1% PF1, yld 1.34, wt 14.8 ppg, 6.323 gals/sx, excess 100%
7" & 5 ½" Production Casing: Lead 350sx Class C 4% PF 20+4 pps PF45 +1.25pps PF-29, yld 1.84, wt 13.2 ppg, 9.914gals/sx, excess 35%, Tail 1030sx, PVL + 1.3% (BWOW) PF44

+ 5% PF174 + 5% PF606 + 1% PF153 +.4% PF44, yield 1 48, wt 13.0, 7.57gals/sx, 35% excess

6. Minimum Specifications for Pressure Control:

The blowout preventer equipment (BOP) shown in Exhibit #10 will consist of a double ram-type (3000 psi WP) minimum preventer. This unit will be hydraulically operated and the ram type preventer will be equipped with blind rams on top of 4 1/2" drill pipe rams on bottom. The 11" BOP will be nipped up on the 8 5/8" surface casing and tested by a 3rd party to 2000 psi used continuously until TD is reached All BOP's and accessory equipment will be tested to 2000 psi before drilling out of intermediate casing Pipe rams will be operationally checked each 24-hour period Blind rams will be operationally checked on each trip out of the hole These checks will be noted on the daily tour sheets. Other accessories to the BOP equipment (Exhibit #10) will include a Kelly cock and floor safety valve and choke lines and choke manifold (Exhibit #11) with a minimum 3000 psi WP rating

7. Types and Characteristics of the Proposed Mud System:

The well will be drilled to TD with a combination of fresh and cut brine mud system. The applicable depths and properties of this system are as follows.

DEPTH	TYPE	WEIGHT	VISCOSITY	WATERLOSS
0-225'	Fresh Water	8 5	28	N C
225'-TD'	Cut Brine	9.1	29	N.C.

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

8. Auxiliary Well Control and Monitoring Equipment:

A. Kelly cock will be kept in the drill string at all times
B A full opening drill pipe-stabbing valve with proper drill pipe connections will be on the rig floor at all times

9. Logging, Testing and Coring Program:

A The electric logging program will consist of GR-Dual Laterolog, Spectral Density, Dual Spaced Neutron, CSNG Log from T.D. to 8 5/8 casing shoe.
B. Drill Stem test is not anticipated.
C. No conventional coring is anticipated.
D Further testing procedures will be determined at TD

10. Abnormal Conditions, Pressures, Temperatures and Potential Hazards:

No abnormal pressures or temperatures are anticipated The estimated bottom hole at TD is 120 degrees and estimated maximum bottom hole pressure is 1600 psig. Low levels of Hydrogen sulfide have been monitors in producing wells in the area, so H2S may be present

while drilling of the well, a plan is attached to the Drilling program. No major loss of circulation zones has been reported in offsetting wells

11. Anticipated Starting Date and Duration of Operations:

Road and location work will not begin until approval has been received from the BLM The anticipated spud date is May 1, 2018. Once commenced, the drilling operation should be finished in approximately 20 days If the well is productive, an additional 30 days will be required for completion and testing before a decision is made to install permanent facilities

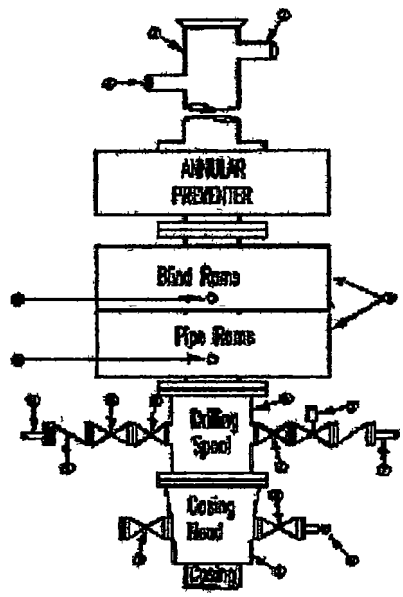
Attachment to Exhibit #10
NOTES REGARDING THE BLOWOUT PREVENTERS
Chilliwack Federal Com #1H
Chaves County, New Mexico

1. Drilling nipple to be so constructed that it can be removed without use of a welder through rotary table opening, with minimum I D. equal to preventer bore
2. Wear ring to be properly installed in head
3. Blow out preventer and all fittings must be in good condition, 2000 psi WP minimum
4. All fittings to be flanged.
5. Safety valve must be available on rig floor at all times with proper connections, valve to be full 2000 psi WP minimum.
6. All choke and fill lines to be securely anchored especially ends of choke lines
7. Equipment through which bit must pass shall be at least as large as the diameter of the casing being drilled through
8. Kelly cock on Kelly.
9. Extension wrenches and hands wheels to be properly installed
10. Blow out preventer control to be located as close to driller's position as feasible.
11. Blow out preventer closing equipment to include minimum 40-gallon accumulator, two independent sources of pump power on each closing unit installation all API specifications.

Mack Energy Corporation
Minimum Blowout Preventer Requirements
3000 psi Working Pressure
13 3/8 inch- 3 MWP
11 Inch - 3 MWP
EXHIBIT #10

Stack Requirements

NO	Items	Min. I D	Min Nominal
1	Flowline		2"
2	Fill up line		2"
3	Drilling nipple		
4	Annular preventer		
5	Two single or one dual hydraulically operated rams		
6a	Drilling spool with 2" min. kill line and 3" min choke line outlets		2" Choke
6b	2" min kill line and 3" min choke line outlets in ram (Alternate to 6a above)		
7	Valve Gate Plug	3 1/8	
8	Gate valve-power operated	3 1/8	
9	Line to choke manifold		3"
10	Valve Gate Plug	2 1/16	
11	Check valve	2 1/16	
12	Casing head		
13	Valve Gate Plug	1 13/16	
14	Pressure gauge with needle valve		
15	Kill line to rig mud pump manifold		2"



OPTIONAL

16	Flanged Valve	1 13/16	

CONTRACTOR'S OPTION TO FURNISH

1. All equipment and connections above bradenhead or casinghead. Working pressure of preventers to be 2000 psi minimum.
2. Automatic accumulator (80 gallons, minimum) capable of closing BOP in 30 seconds or less and, holding them closed against full rated working pressure
3. BOP controls, to be located near drillers' position.
4. Kelly equipped with Kelly cock.
5. Inside blowout preventer or its equivalent on derrick floor at all times with proper threads to fit pipe being used.
6. Kelly saver-sub equipped with rubber casing protector at all times.
7. Plug type blowout preventer tester
8. Extra set pipe rams to fit drill pipe in use on location at all times
9. Type RX ring gaskets in place of Type R.

MEC TO FURNISH

1. Bradenhead or casing head and side valves.
2. Wear bushing, if required.

10

ME

GENERAL NOTES

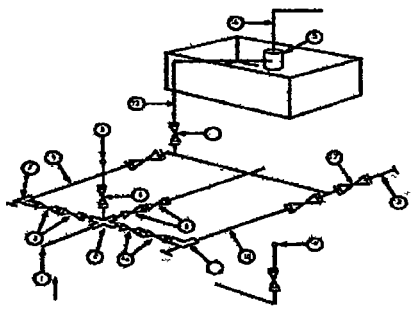
1. Deviations from this drawing may be made only with the express permission of MEC's Drilling Manager
2. All connections, valves, fittings, piping, etc., subject to well or pump pressure must be flanged (suitable clamp connections acceptable) and have minimum working pressure equal to rated working pressure of preventers up through choke valves must be full opening and suitable for high pressure mud service
3. Controls to be of standard design and each marked, showing opening and closing position
4. Chokes will be positioned so as not to hamper or delay changing of choke beans

Replaceable parts for adjustable choke, or bean sizes, retainers and choke wrenches to be conveniently located for immediate use

5. All valves to be equipped with hand-wheels or handles ready for immediate use.
6. Choke lines must be suitably anchored
7. Handwheels and extensions to be connected and ready for use
8. Valves adjacent to drilling spool to be kept open. Use outside valves except for emergency
9. All seamless steel control piping (2000 psi working pressure) to have flexible joints to avoid stress. Hoses will be permitted.
10. Casinghead connections shall not be used except in case of emergency
11. Does not use kill line for routine fill up operations.

Mack Energy Corporation

Exhibit #11
MIMIMUM CHOKE MANIFOLD
3,000, 5,000 and 10,000 PSI Working Pressure
3M will be used
3 MWP - 5 MWP - 10 MWP



Mud Pit

Reserve Pit

*** Location of separator optional**

Below Substructure

Mimimum requirements

No		3,000 MWP I.D	Nominal	Rating	5,000 MWP I.D	Nominal	Rating	10,000 MWP I.D.	Nominal	Rating
1	Line from drilling Spool		3"	3,000		3"	5 000		3"	10,000
2	Cross 3" x 3" x 3" x 2"			3,000			5,000			
2	Cross 3" x 3" x 3" x 2"									10 000
3	Valve Gate Plug	3 1/8		3 000	3 1/8		5 000	3 1/8		10 000
4	Valve Gate Plug	1 13/16		3,000	1 13/16		5 000	1 13/16		10,000
4a	Valves (1)	2 1/16		3 000	2 1/16		5,000	2 1/16		10 000
5	Pressure Gauge			3,000			5,000			10,000
6	Valve Gate Plug	3 1/8		3 000	3 1/8		5,000	3 1/8		10,000
7	Adjustable Choke (3)	2"		3,000	2"		5,000	2"		10,000
8	Adjustable Choke	1"		3,000	1"		5,000	2"		10,000
9	Line		3"	3,000		3"	5,000		3"	10,000
10	Line		2"	3,000		2"	5 000		2"	10,000
11	Valve Gate Plug	3 1/8		3 000	3 1/8		5 000	3 1/8		10,000
12	Line		3"	1 000		3"	1 000		3"	2,000
13	Line		3"	1,000		3"	1 000		3"	2 000
14	Remote reading compound Standpipe pressure gauge			3,000			5,000			10,000
15	Gas Separator		2' x5'			2' x5'			2' x5'	
16	Line		4"	1,000		4"	1 000		4"	2,000
17	Valve Gate Plug	3 1/8		3,000	3 1/8		5 000	3 1/8		10,000

(1) Only one required in Class 3M
(2) Gate valves only shall be used for Class 10 M
(3) Remote operated hydraulic choke required on 5,000 psi and 10,000 psi for drilling

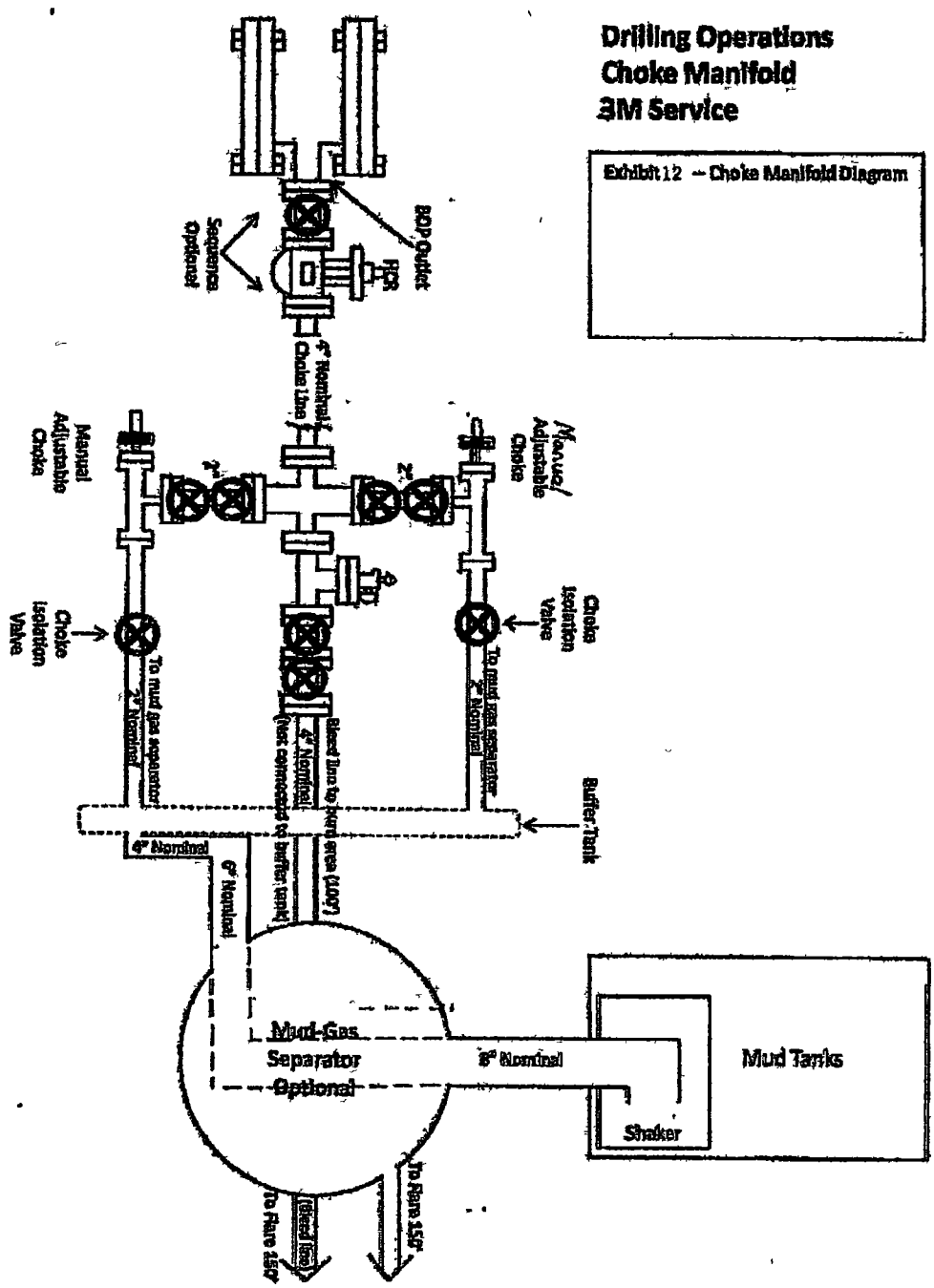
EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

1 All connections in choke manifold shall be welded, studded, flanged or Cameron clamp of comparable rating
2 All flanges shall be API 6B or 6BX and ring gaskets shall be API RX or BX Use only BX for 10 MWP
3 All lines shall be securely anchored.
4 Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available.
5 alternate with automatic chokes, a choke manifold pressure gauge shall be located on the rig floor in conjunction with the standpipe pressure gauge.
6. Line from drilling spool to choke manifold should bee as straight as possible. Lines downstream from chokes shall make turns by large bends or 90 degree bends using bull plugged tees

Mack Energy Corporation

MANIFOLD SCHEMATIC

Exhibit #12



APD ID 10400027607 **Submission Date** 03/08/2018

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map

Chilliwack_Road_Plat_20180307103247.pdf

Existing Road Purpose ACCESS,FLUID TRANSPORT **Row(s) Exist?** YES

ROW ID(s)

ID NM-118607

Do the existing roads need to be improved? NO

Existing Road Improvement Description

Existing Road Improvement Attachment

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map

Chilliwack_Road_Plat_20180307103230.pdf

New road type TWO-TRACK

Length 506 Feet **Width (ft)** 14

Max slope (%) 2 **Max grade (%)** 1

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s)

New road travel width 14

New road access erosion control The maximum width of the running surface will be 14' The road will be crowned and ditched and constructed of 6" rolled and compacted caliche Ditches will be at 3 1 slope and 3' wide Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns

New road access plan or profile prepared? NO

New road access plan attachment

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Access road engineering design? NO

Access road engineering design attachment

Access surfacing type OTHER

Access topsoil source ONSITE

Access surfacing type description Caliche will be obtained from the nearest BLM approved caliche pit located Sec 19 T15S R29E and or Sec 34 T15S R29E

Access onsite topsoil source depth 2

Offsite topsoil source description

Onsite topsoil removal process Blade topsoil into windrow along up-slope edge of road

Access other construction information

Access miscellaneous information

Number of access turnouts **Access turnout map**

Drainage Control

New road drainage crossing OTHER

Drainage Control comments The maximum width of the running surface will be 14' The road will be crowned and ditched and constructed of 6" rolled and compacted caliche Ditches will be at 3 1 slope and 3' wide Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns

Road Drainage Control Structures (DCS) description The maximum width of the running surface will be 14' The road will be crowned and ditched and constructed of 6" rolled and compacted caliche Ditches will be at 3 1 slope and 3' wide Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage and to be consistent with local drainage patterns

Road Drainage Control Structures (DCS) attachment

Access Additional Attachments

Additional Attachment(s)

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map

Chilliwack_existing_wells_20180227145811 pdf

Existing Wells description

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description 1) San Andres Completion Will be sent to the Prince Rupert Federal TB located at the #1 well NWSW Sec 20 T15S R29E

Production Facilities map

PR_Fed_TB_20180226115713 pdf

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type. CAMP USE, DUST CONTROL, INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING

Water source type. GW WELL

Describe type

Source longitude

Source latitude

Source datum

Water source permit type OTHER

Source land ownership OTHER

Describe land ownership

Water source transport method TRUCKING

Source transportation land ownership OTHER

Describe transportation land ownership

Water source volume (barrels) 2000

Source volume (acre-feet) 0 25778618

Source volume (gal) 84000

Water source and transportation map

Water_Source_2_20180226115845 pdf

Water_Source_3_20180226115857 pdf

Water_Source_20180226115909 pdf

Water source comments Please see attachment City/Municipal Water Town of Hagerman S10 T14S R26E, Mor-West S20 T17S R30E Brine Water Salty Dog S5 T19S R36E Wasserhund S36 T16S R34E

New water well? NO

New Water Well Info

Well latitude **Well Longitude** **Well datum**

Well target aquifer

Est depth to top of aquifer(ft) **Est thickness of aquifer**

Aquifer comments

Aquifer documentation

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Well depth (ft)

Well casing type

Well casing outside diameter (in)

Well casing inside diameter (in)

New water well casing?

Used casing source

Drilling method

Drill material

Grout material

Grout depth

Casing length (ft)

Casing top depth (ft)

Well Production type

Completion Method

Water well additional information

State appropriation permit

Additional information attachment

Section 6 - Construction Materials

Construction Materials description All caliche required for construction of drill pad and proposed new access road (approximately 2500 cubic yards) will be obtained from approved caliche pit @ Sec 34 T15S R29E and/ or Sec/ 19 T15S R29E

Construction Materials source location attachment

Caliche_Pits_20180226121739 pdf

Section 7 - Methods for Handling Waste

Waste type DRILLING

Waste content description Drill cutting and fluids will be disposed into the steel tanks and hauled to R-360 disposal facility, permit number NM-01-0006 Located on HWY 62 to MM 66 Drilling fluids will be contained in steel tanks using a closed loop system NO pits will be used during drilling operations

Amount of waste 380 barrels

Waste disposal frequency Weekly

Safe containment description Drill cutting and fluids will be disposed into the steel tanks and hauled to R-360 disposal facility, permit number NM-01-0006 Located on HWY 62 to MM 66 Drilling fluids will be contained in steel tanks using a closed loop system No pits will be used during drilling operations

Safe containmant attachment

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

Disposal type description

Disposal location description R-360 disposal facility, permit number NM-01-0006 Located on HWY 62 at MM 66

Waste type SEWAGE

Waste content description Sewage and Gray Water will be placed in container and hauled to an approved facility Container and disposal handled by Black Hawk

Amount of waste

Waste disposal frequency Weekly

Safe containment description Sewage and Gray Water will be placed in container and hauled to an approved facility Container and disposal handled by Black Hawk

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Safe containmant attachment

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

Disposal type description

Disposal location description Black Hawk will dispose at an approved location Black Hawk Keith Willis 1-575-637-6378

Waste type PRODUCED WATER

Waste content description Water produced from the well during completion may be disposed into a steel tank After the well is permanently placed on production, produced water will be collected in tanks (fiberglass) and trucked to the Round Tank SWD #1 L-0729, 30-005-64095, Sec 19 T15S R29E 1980 FSL 1980 FWL, Chaves County NM, produced oil will be collected in steel tanks until sold

Amount of waste 2080 barrels

Waste disposal frequency Weekly

Safe containment description Water produced from the well during completion may be disposed into a steel tank After the well is permanently placed on production, produced water will be collected in tanks (fiberglass) and trucked to the Round Tank SWD #1 L-0729, 30-005-64095, Sec 19 T15S R29E 1980 FSL 1980 FWL, Chaves County NM, produced oil will collected in steel tanks until sold

Safe containmant attachment

Waste disposal type OFF-LEASE INJECTION **Disposal location ownership** STATE

Disposal type description

Disposal location description Round Tank SWD #1 L-0729, 30-005-64095, Sec 19 T15S R29E 1980 FSL 1980 FWL, Chaves County, NM

Waste type GARBAGE

Waste content description Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved local landfill No toxic waste or hazardous chemicals will be produced by this operation

Amount of waste pounds

Waste disposal frequency Weekly

Safe containment description Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved local landfill No toxic waste or hazardous chemicals will be produced by this operation

Safe containmant attachment

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

Disposal type description

Disposal location description Black Hawk will dispose at an approved location Black Hawk, Keith Willis 1-575-631-6378

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

Reserve pit length (ft) **Reserve pit width (ft)**

Reserve pit depth (ft) **Reserve pit volume (cu yd)**

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Is at least 50% of the reserve pit in cut?

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

Cuttings area length (ft) **Cuttings area width (ft)**

Cuttings area depth (ft) **Cuttings area volume (cu yd)**

Is at least 50% of the cuttings area in cut?

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities? NO

Ancillary Facilities attachment

Comments

Section 9 - Well Site Layout

Well Site Layout Diagram

Chilliwack_Site_Map_20180226141921.pdf

Comments A) The well site and elevation plat for the proposed well is shown in Exhibit #14 It was staked by Maddron Surveying, Carlsbad, NM B) The drill pad layout, with elevations staked by Maddron Surveying, is shown in attachment Dimensions of the pad are shown Topsoil, if available, will be stockpiled per BLM specifications Because the pad is almost level no major cuts will be required C) Diagram below shows the proposed orientation of the location No permanent living facilities are planned, but a temporary foreman/ toolpusher's trailer will be on location during the drilling operations

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Section 10 - Plans for Surface Reclamation

Type of disturbance New Surface Disturbance **Multiple Well Pad Name**

Multiple Well Pad Number

Recontouring attachment

chilliwack_reclaimed_20180301102944 pdf

Drainage/Erosion control construction Edges of location will be bermed to prevent run off or erosion

Drainage/Erosion control reclamation The maximum width of the running surface will be 14' The road will be crowned and ditched and constructed of 6" rolled and compacted caliche Ditches will be at 3 1 slope and 3 feet wide. Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage and to be consistent with local drainage patterns

Well pad proposed disturbance (acres) 2 192	**Well pad interim reclamation (acres)** 1 43	**Well pad long term disturbance (acres)** 1 43
Road proposed disturbance (acres) 0	**Road interim reclamation (acres)** 0	**Road long term disturbance (acres)** 0
Powerline proposed disturbance (acres) 0	**Powerline interim reclamation (acres)** 0	**Powerline long term disturbance (acres)** 0
Pipeline proposed disturbance (acres) 5 7	**Pipeline interim reclamation (acres)** 5 51	**Pipeline long term disturbance (acres)** 0 19
Other proposed disturbance (acres) 0	**Other interim reclamation (acres)** 0	**Other long term disturbance (acres)** 0
Total proposed disturbance 7 892	**Total interim reclamation** 6 94	**Total long term disturbance** 1 62

Reconstruction method Caliche will be removed, ground ripped and stockpiled topsoil used to recontoured as close as possible to the original natural level to prevent erosion and ponding of water 2) Area will be reseeded as per BLM specifications Seeding will be done when moisture is available and weather permitting Pure live seed will be used to prevent noxious weeds Annual inspection of growth will be done and necessary measures taken to eliminate noxious weeds

Topsoil redistribution Caliche will be removed, ground ripped and stockpiled topsoil used to recontoured as close as possible to the original natural level to prevent erosion and ponding of water 2) Area will be reseeded as per BLM specifications Seeding will be done when moisture is available and weather permitting Pure live seed will be used to prevent noxious weeds Annual inspection of growth will be done and necessary measures taken to eliminate noxious weeds

Soil treatment Caliche will be removed, ground ripped and stockpiled topsoil used to recontourned as close as possible to the original natural level to prevent erosion and ponding of water 2) Area will be reseeded as per BLM specifications Seeding will be done when moisture is available and weather permitting Pure live seed will be used to prevent noxious weeds Annual inspection of growth will be done and necessary measures taken to eliminate noxious weeds

Existing Vegetation at the well pad The area around the well site is grassland and topsoil is sandy The vegetation is native scrub grass with sagebrush

Existing Vegetation at the well pad attachment

Existing Vegetation Community at the road The area around the well site is grassland and topsoil is sandy The vegetation is native scrub grass with sagebrush

Existing Vegetation Community at the road attachment

Existing Vegetation Community at the pipeline The area around the well site is grassland and topsoil is sandy The vegetation is native scrub grass with sagebrush

Existing Vegetation Community at the pipeline attachment

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Existing Vegetation Community at other disturbances The area around the well site is grassland and topsoil is sandy The vegetation is native scrub grass with sagebrush

Existing Vegetation Community at other disturbances attachment

Non native seed used? NO

Non native seed description

Seedling transplant description

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment

Will seed be harvested for use in site reclamation? YES

Seed harvest description A cultural resources examination has been requested and will be forwarded to your office in the near future

Seed harvest description attachment

Seed Management

Seed Table

Seed type **Seed source**

Seed name

Source name **Source address**

Source phone

Seed cultivar

Seed use location

PLS pounds per acre **Proposed seeding season**

Total pounds/Acre

Seed Summary	
Seed Type	**Pounds/Acre**

Seed reclamation attachment

Operator Contact/Responsible Official Contact Info

First Name JERRY **Last Name** SHERRELL

Phone (575)748-1288 **Email** JERRYS@MEC COM

Seedbed prep

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Seed BMP

Seed method

Existing invasive species? NO

Existing invasive species treatment description

Existing invasive species treatment attachment

Weed treatment plan description The holder shall seed all disturber areas with the seeds mixture listed by BLM The seed mixture will be planted in the amounts specified in pounds of pure live seed (PLS)* per acres There shall be no primary or secondary noxious weeds in the seed mixture Seed will be tested and the viability tested of seed will be done in accordance with State Laws and the nine (9) months prior to purchase Commercial seed will be either certified or registered seed The seed container will be tagged in accordance with State Law (s) and available for inspection by the authorized office

Weed treatment plan attachment

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

Monitoring plan attachment

Success standards The seeding will be repeated until a satisfactory stand is established as determined by the authorized office Evaluation of growth will not be made before completion of at least one full growing season after seeding

Pit closure description No pit

Pit closure attachment

Section 11 - Surface Ownership

Disturbance type WELL PAD

Describe

Surface Owner PRIVATE OWNERSHIP

Other surface owner description

BIA Local Office

BOR Local Office

COE Local Office

DOD Local Office

NPS Local Office

State Local Office

Military Local Office

USFWS Local Office

Other Local Office

USFS Region

USFS Forest/Grassland **USFS Ranger District**

Operator Name MACK ENERGY CORPORATION

Well Name CHILLIWACK FEDERAL COM **Well Number** 1H

Section 12 - Other Information

Right of Way needed? NO **Use APD as ROW?**

ROW Type(s)

ROW Applications

SUPO Additional Information

Use a previously conducted onsite? YES

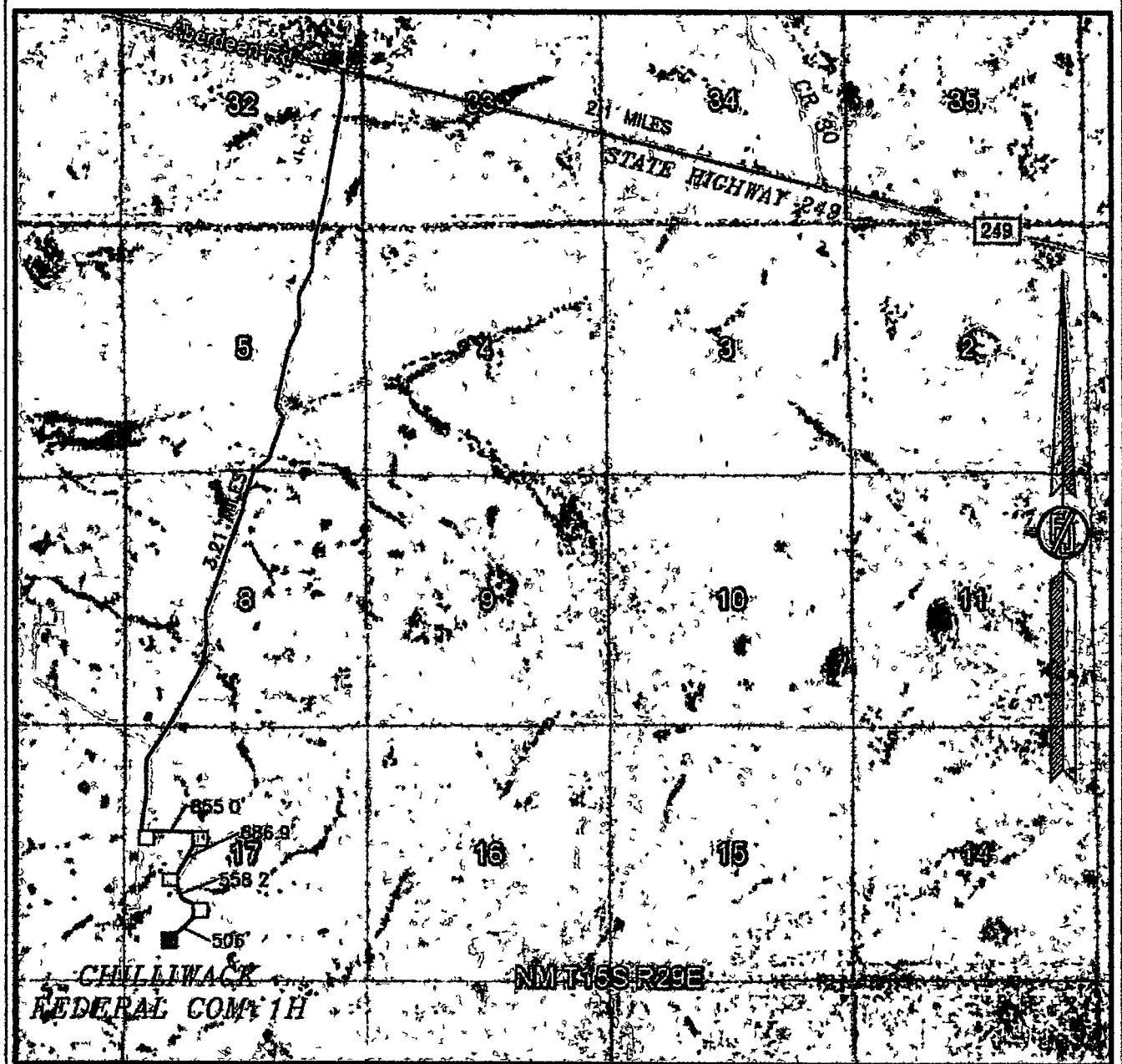
Previous Onsite information Onsite - 2/23/2018

Other SUPO Attachment

h2s_contingency_plan_20180301103448 pdf
gas_cap_chilliwack_20180301103501 pdf
chilliwack_suop_2018030814183700_20180308142503 pdf
chilliwack_h2s_2018030814213700_20180308142529 pdf

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

ACCESS AERIAL ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
OCTOBER 2014

MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT FROM THE SOUTH LINE AND 965 FT. FROM THE WEST LINE OF SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M. CHAVES COUNTY, STATE OF NEW MEXICO

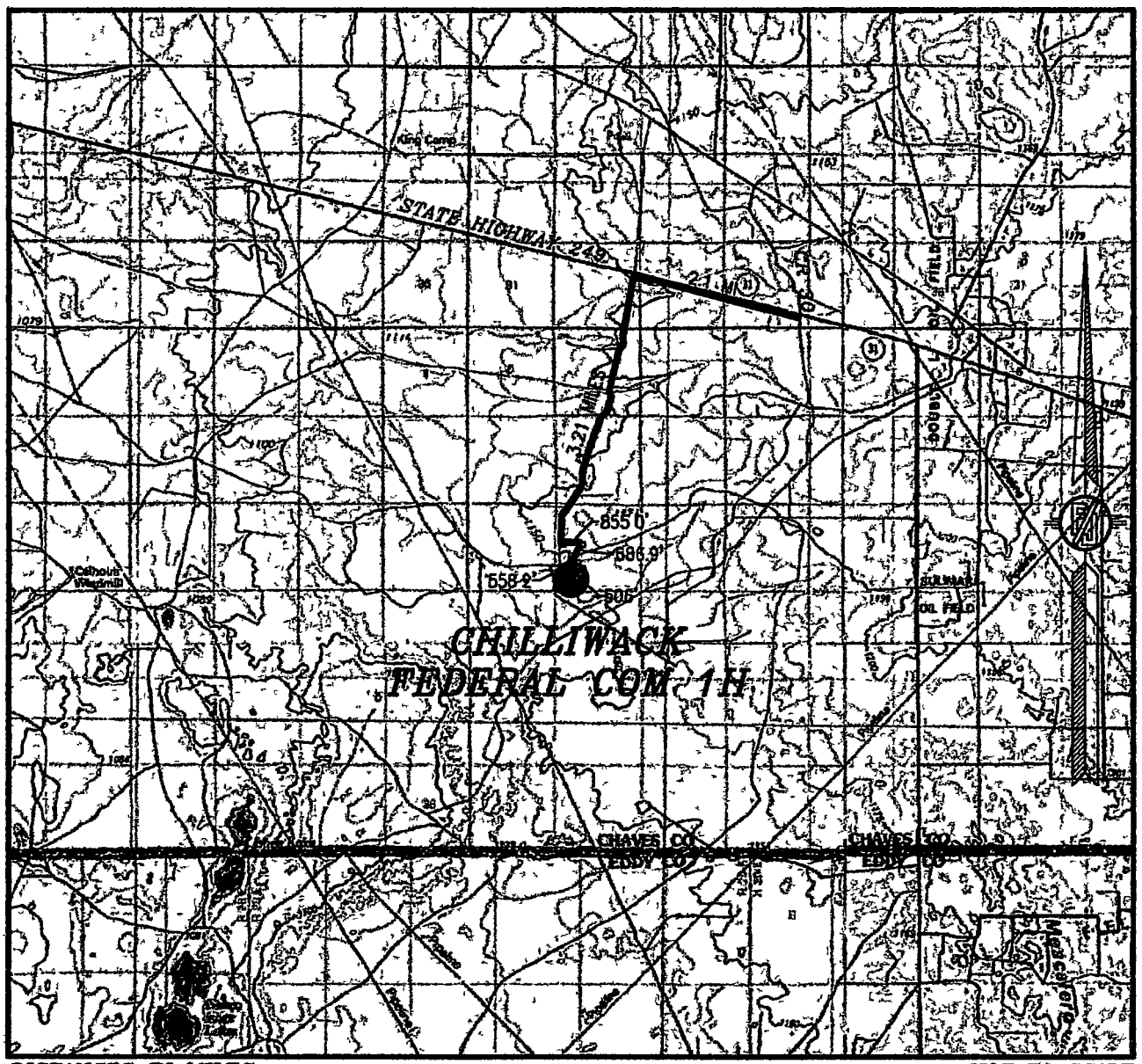
FEBRUARY 1, 2018

SURVEY NO. 5986

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

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO

VICINITY MAP



DISTANCES IN MILES

NOT TO SCALE

DIRECTIONS TO LOCATION
FROM THE INTERSECTION OF STATE HIGHWAY 249 AND CR 30 (JENNA) GO NORTHWEST ON STATE HIGHWAY 249 FOR APPROX. 2.1 MILES. GO SOUTH ON 20' CALICHE LEASE ROAD FOR APPROX. 3.21 MILES TO THE WHISTLER FEDERAL 9. FROM THE NORTHEAST CORNER GO EAST 855.6' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 10. THEN FROM THE SOUTHWEST CORNER GO SOUTHWEST 688.9' TO THE NORTHEAST CORNER OF WHISTLER FEDERAL 5. FROM THE SOUTHEAST CORNER GO SOUTH THEN SOUTHEAST 558.2' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 6. THEN FROM SOUTHWEST CORNER GO SOUTHWEST 505' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

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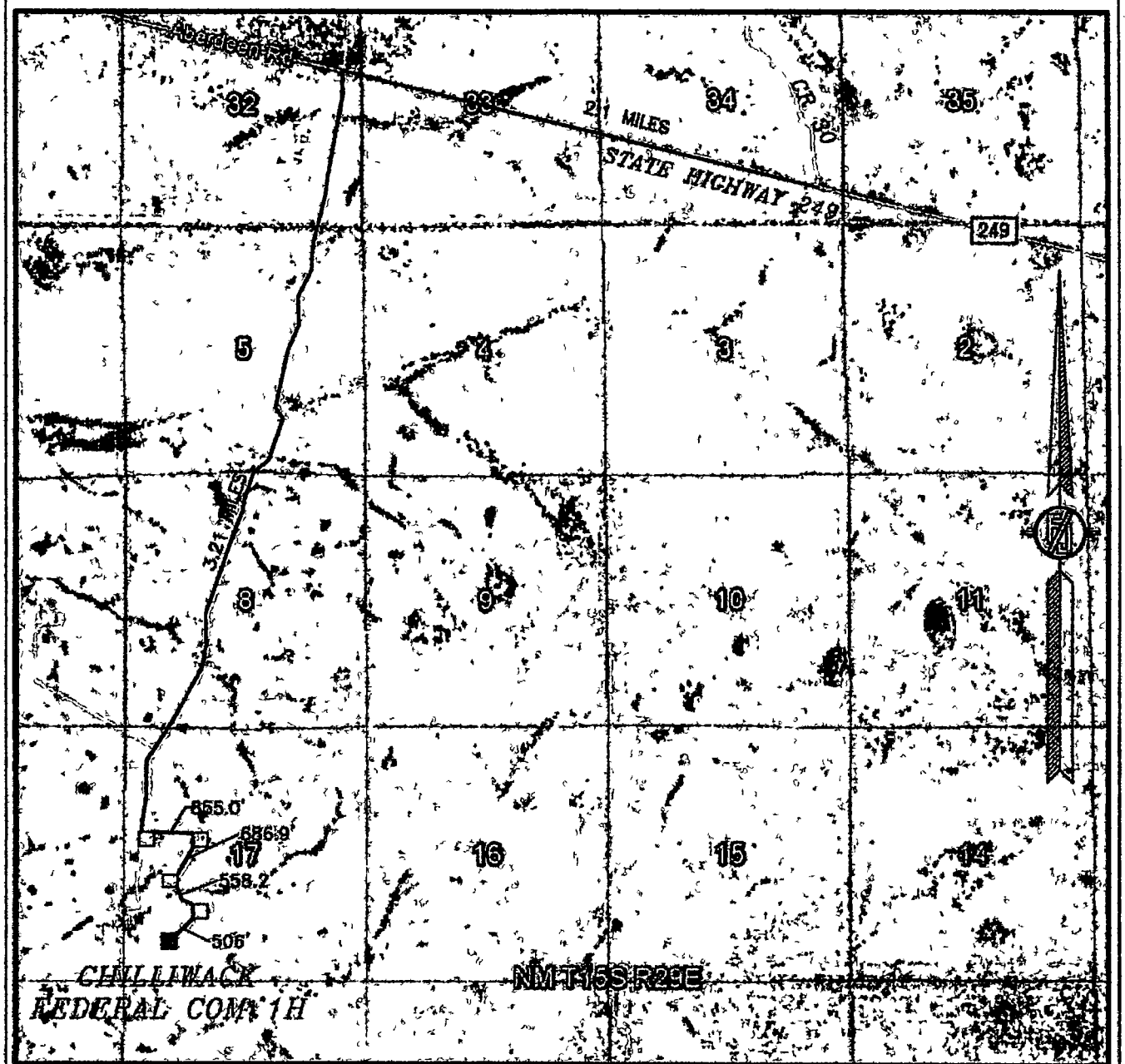
CHAVES COUNTY, STATE OF NEW MEXICO

ACCESS AERIAL ROUTE MAP



NOT TO SCALE
AERIAL PHOTO:
GOOGLE EARTH
OCTOBER 2014

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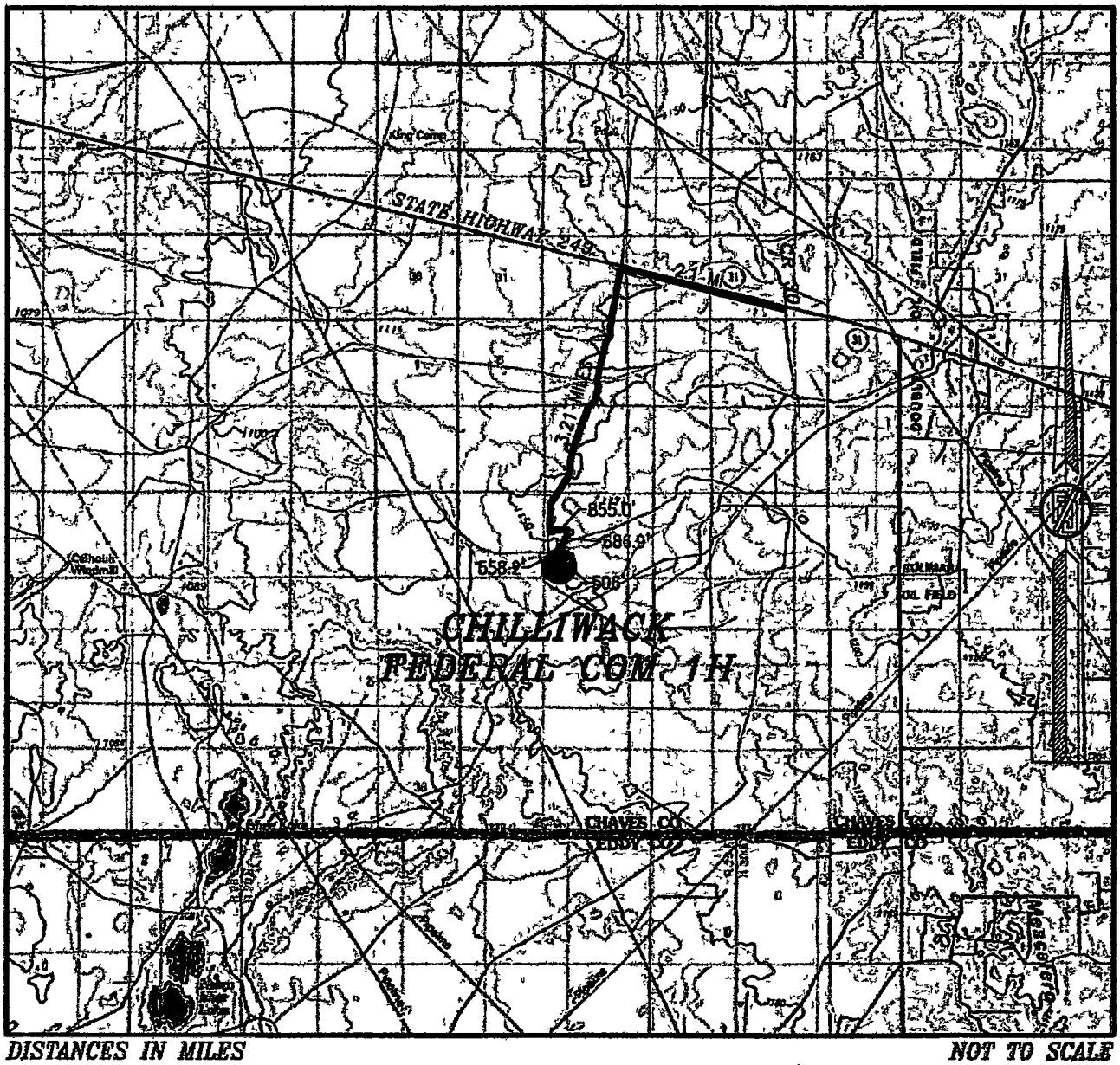
CHAVES COUNTY, STATE OF NEW MEXICO
VICINITY MAP



DIRECTIONS TO LOCATION
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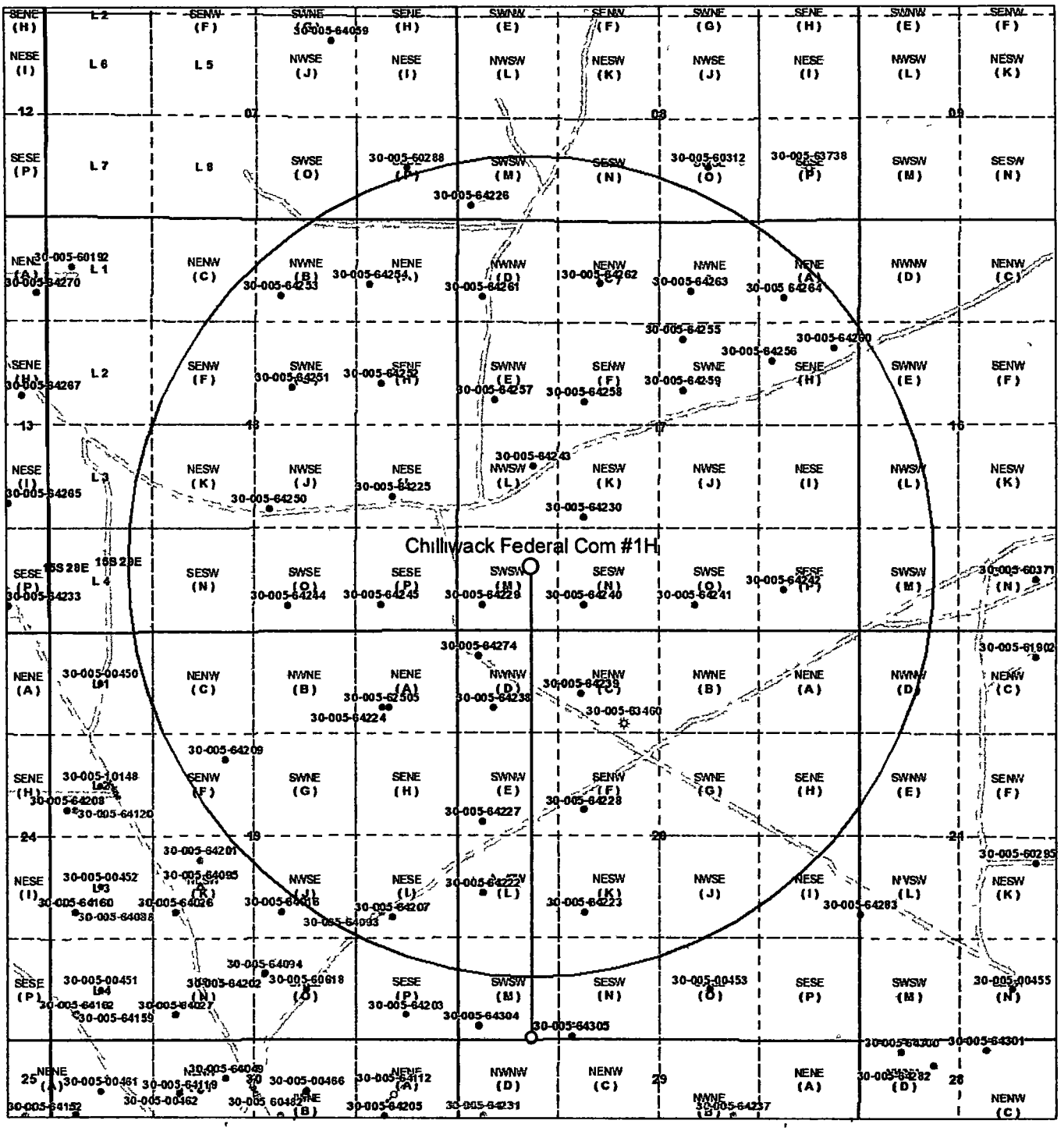
MACK ENERGY CORPORATION
CHILLIWACK FEDERAL COM 1H
LOCATED 810 FT. FROM THE SOUTH LINE AND 965 FT FROM THE WEST LINE OF SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M. CHAVES COUNTY, STATE OF NEW MEXICO

FEBRUARY 1, 2018

SURVEY NO. 5986

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

Chilliwack Federal Com #1H



2/27/2018 10 06 34 AM

1 18 056

0 0 175 0 35 0 7 mi

0 0 175 0 35 0 7 km

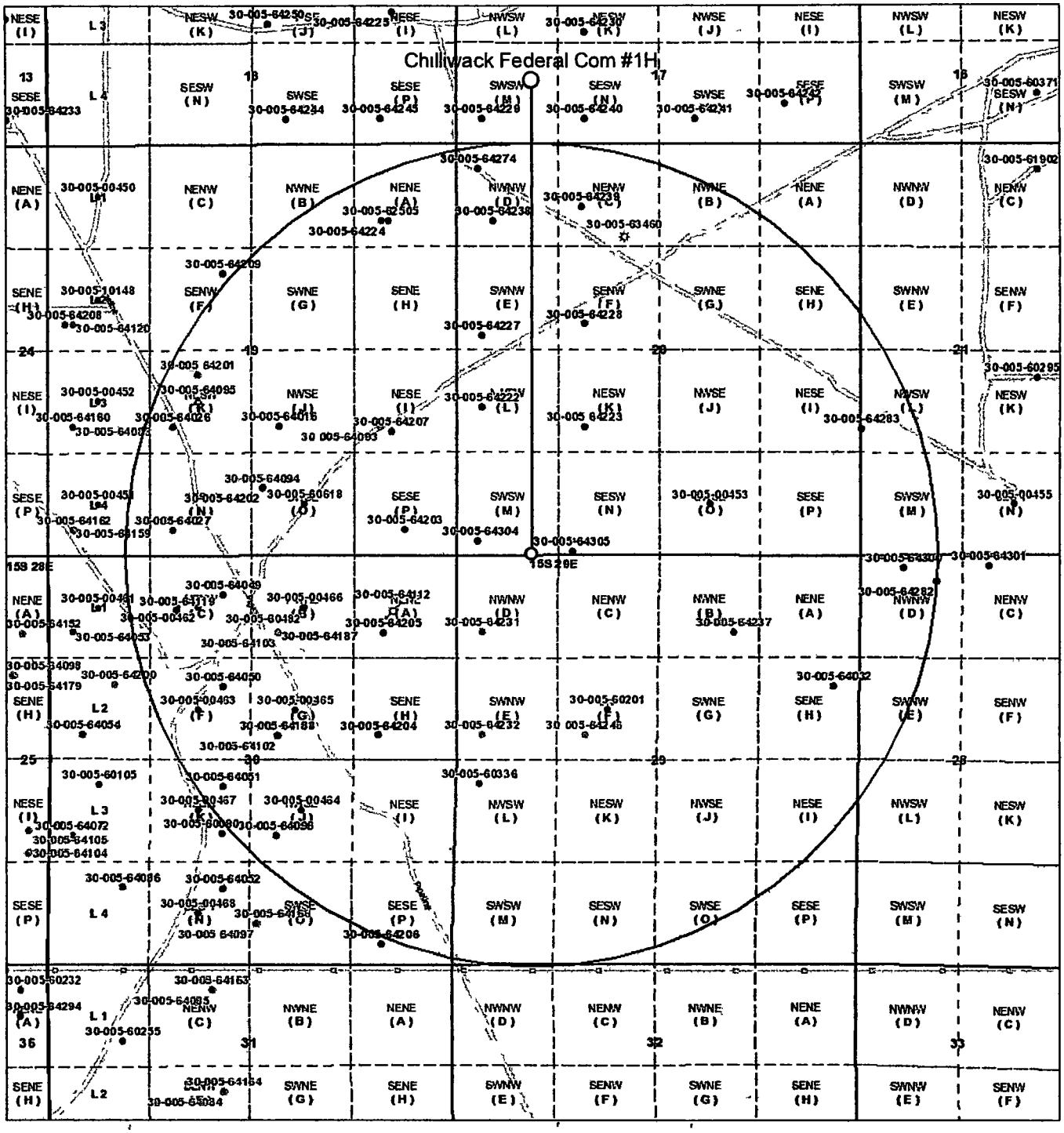
Points
- Override 1
- Override 2
- Override 3
- Override 4

Lines
- Override 1
- Override 2
- Override 3

Areas
- Override 1

Well Locations Large Scale
- Miscellaneous
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2 Plugged
- CO2 Temporarily Abandoned
- Gas Active
- Gas Cancelled Never Drilled
- Gas New
- Gas Plugged
- Gas Temporarily Abandoned
- Injection Active
- Injection Cancelled
- Injection New
- Injection Plugged
- Injection Temporarily Abandoned
- Oil Active
- Oil Cancelled
- Oil New
- Oil Plugged
- Oil Temporarily Abondoned
- Salt Water Injection Active
- Salt Water Injection Cancelled
- Salt Water Injection New
- Salt Water Injection Plugged
- Salt Water InjectionTemporarily Abandoned
- Water Active
- Water Cancelled
- Water New
- Water Plugged
- Water Temporarily Abandoned
- OCD District Offices
- PLSS Townships
- PLSS Second Division
- PLSS First Division

Chilliwack Federal Com #1H BHL



2/27/2018 10 11 01 AM

1 18 056

0 0 175 0 35 0 7 mi

0 0 175 0 35 0 7 km

Points
- Override 1
- Override 2
- Override 3
- Override 4

Lines
- Override 1
- Override 2
- Override 3

Areas
- Override 1

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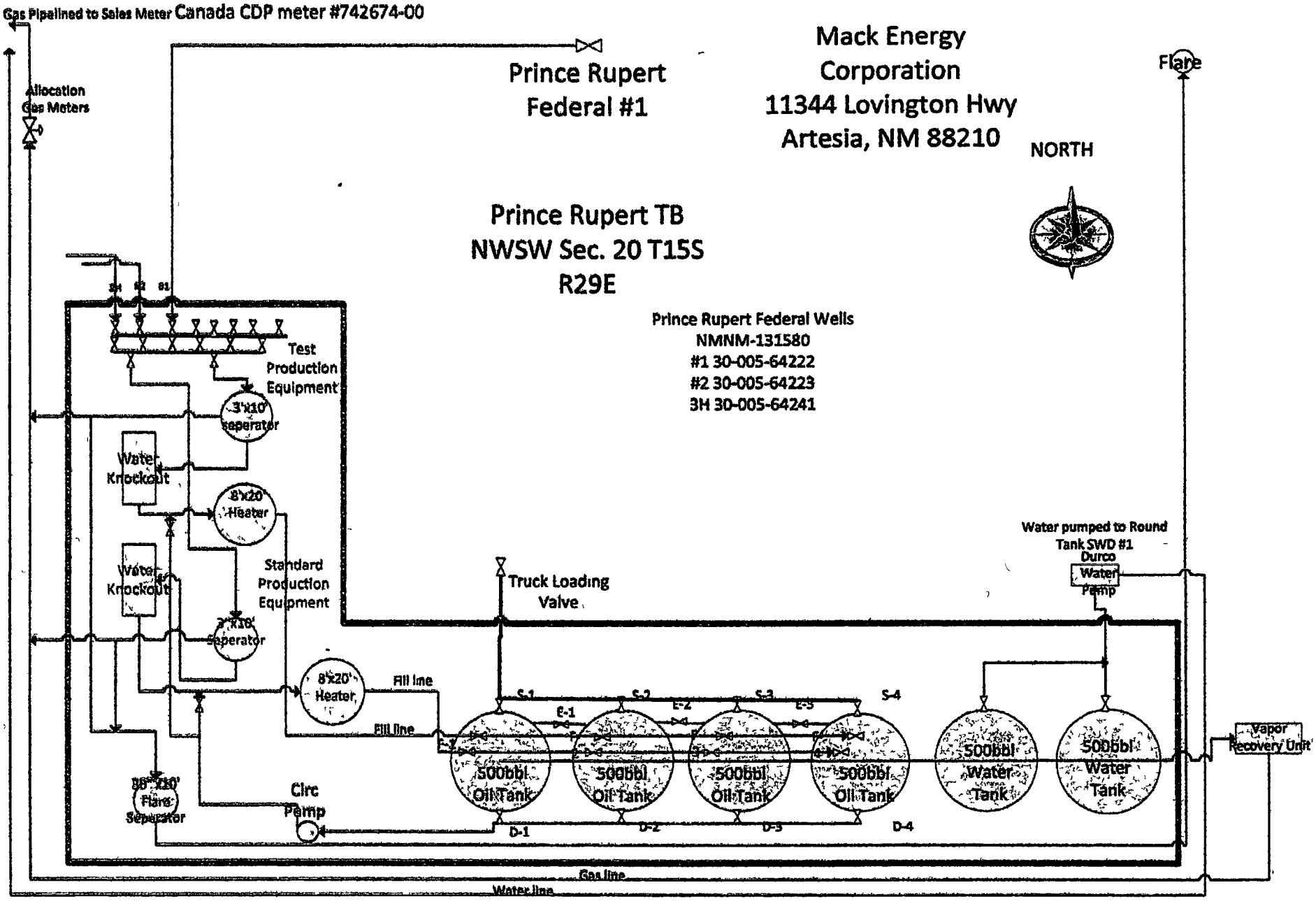
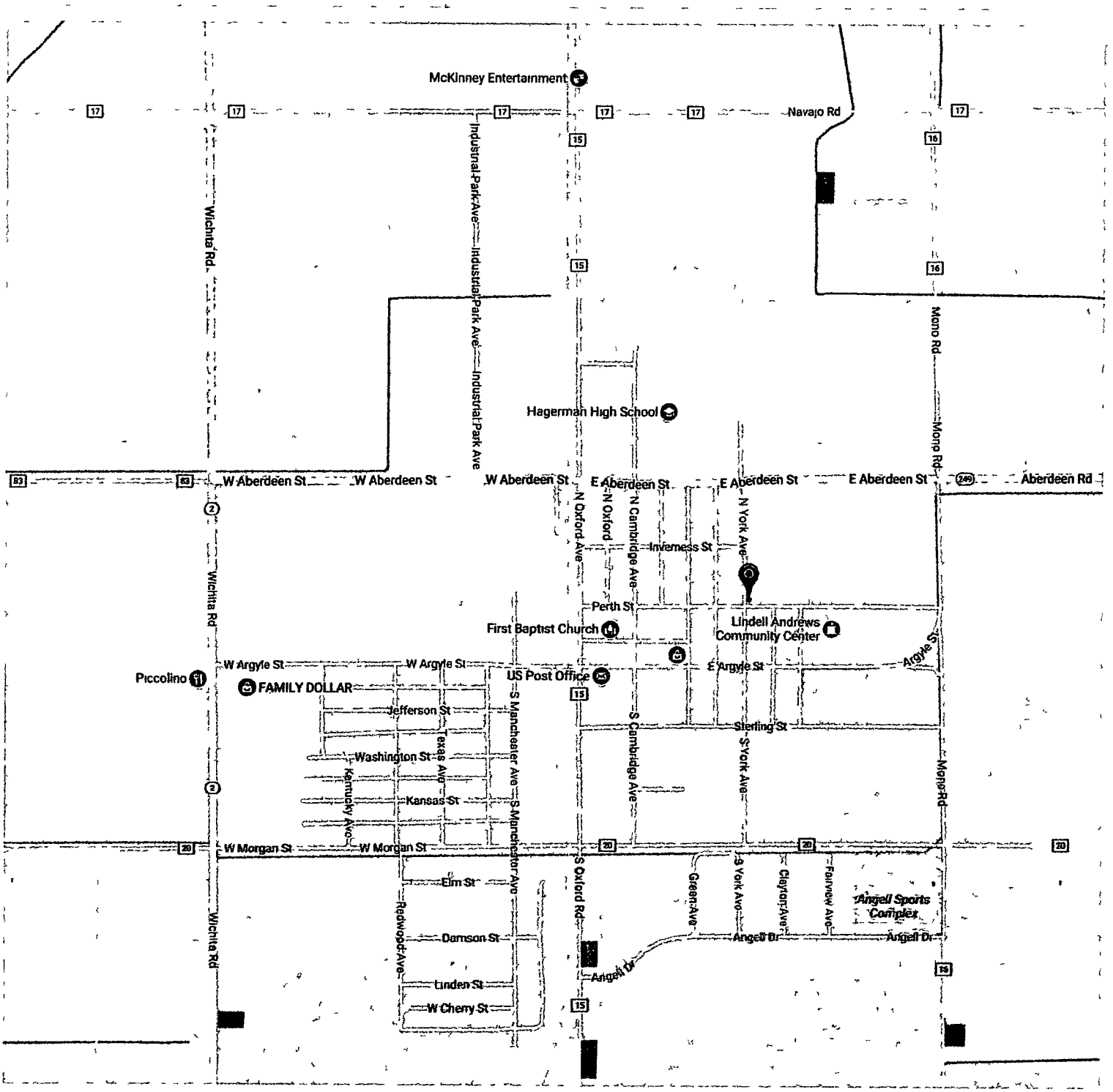
- Gas Plugged
- Gas Temporarily Abandoned
- Injection Active
- Injection Cancelled
- Injection New
- Injection Plugged
- Injection Temporarily Abandoned
- Oil Active
- Oil Cancelled
- Oil New
- Oil Plugged
- Oil Temporarily Abondoned
- Salt Water Injection Active
- Salt Water Injection Cancelled
- Salt Water Injection New
- Salt Water Injection Plugged
- Salt Water InjectionTemporarily Abandoned
- Water Active
- Water Cancelled
- Water New
- Water Plugged
- Water Temporarily Abandoned
- OCD District Offices
- PLSS Townships
- PLSS Second Division
- PLSS First Division

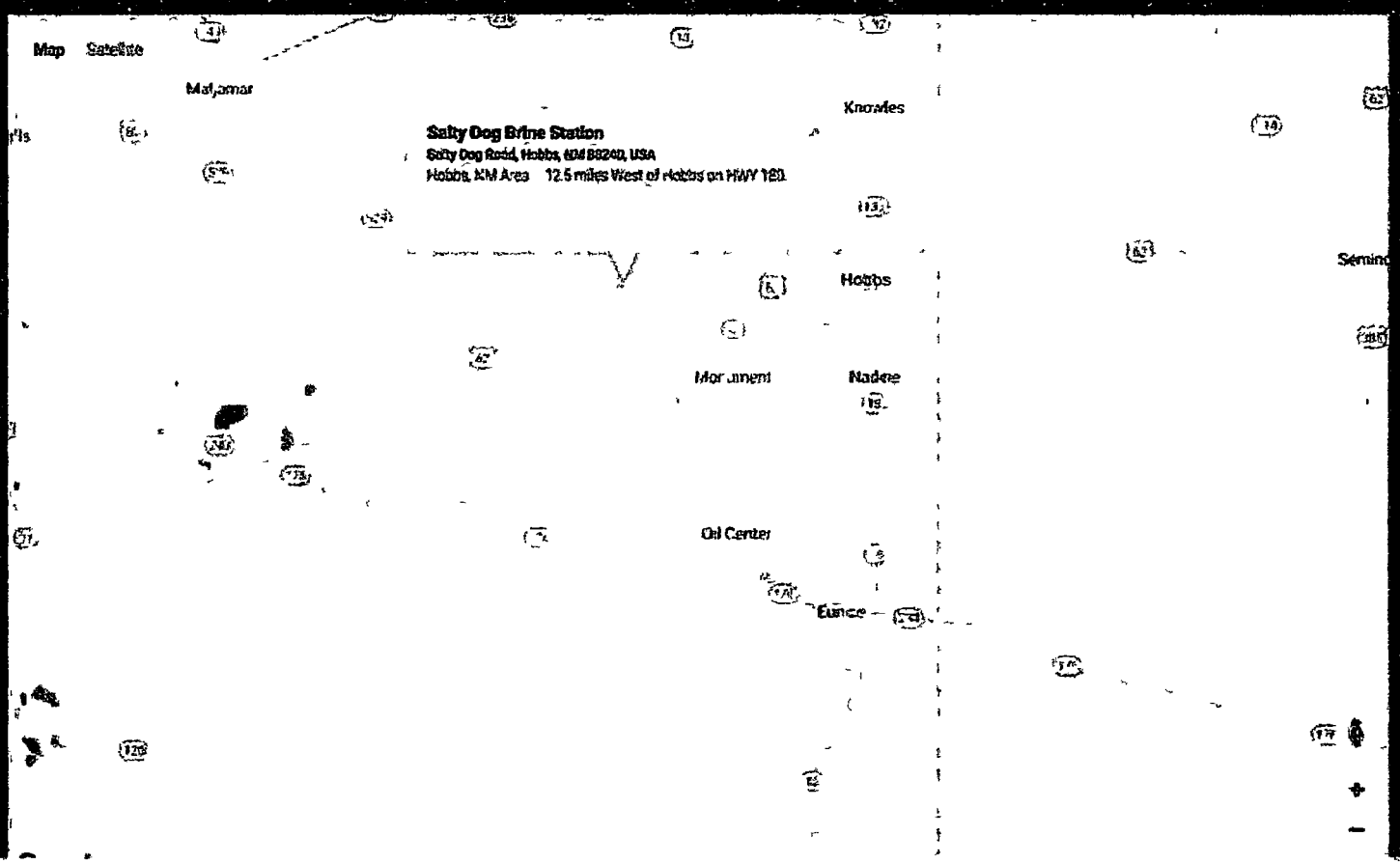

Gas Pipelined to Sales Meter Canada CDP meter #742674-00
Allocation Gas Meters
Prince Rupert Federal #1
Mack Energy Corporation
11344 Lovington Hwy
Artesia, NM 88210
Flare
NORTH
Prince Rupert TB
NWSW Sec. 20 T15S
R29E
Prince Rupert Federal Wells
NMNM-131580
#1 30-005-64222
#2 30-005-64223
3H 30-005-64241
Test Production Equipment
3'x10' Separator
Water Knockout
8'x20' Heater
Water Knockout
Standard Production Equipment
3'x10' Separator
8'x20' Heater
Fill line
Fill line
Truck Loading Valve
Water pumped to Round Tank SWD #1
Durco Water Pump
S-1
S-2
S-3
S-4
E-1
E-2
E-3
500bbl Oil Tank
500bbl Oil Tank
500bbl Oil Tank
500bbl Oil Tank
500bbl Water Tank
500bbl Water Tank
Vapor Recovery Unit
30" x10' Flare Separator
Circ Pump
D-1
D-2
D-3
D-4
Gas line
Water line

33°06 55 3"N 104°19'24 4"W



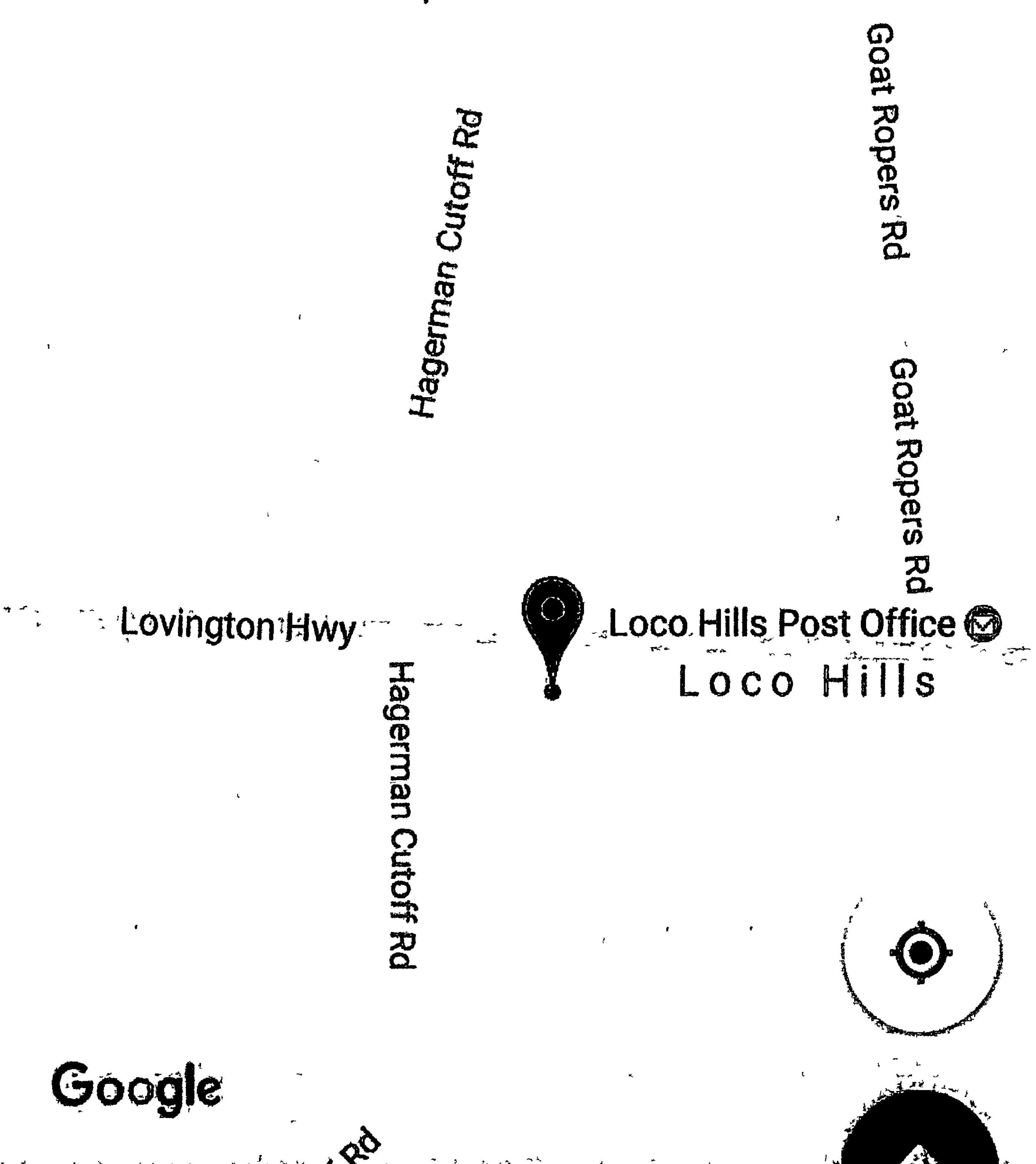
STANDARD

Home Mission Frac Tank Hot Oil Truck Pump Truck Vacuum Truck Well Service Disposals Fresh Water Disposal Sites & Brine Stations & Freshwater Well Servicing Rigs HS&E Standard Energy Locations Associations News and Events Testimonials Employment Opportunities Equipment For Sale Store

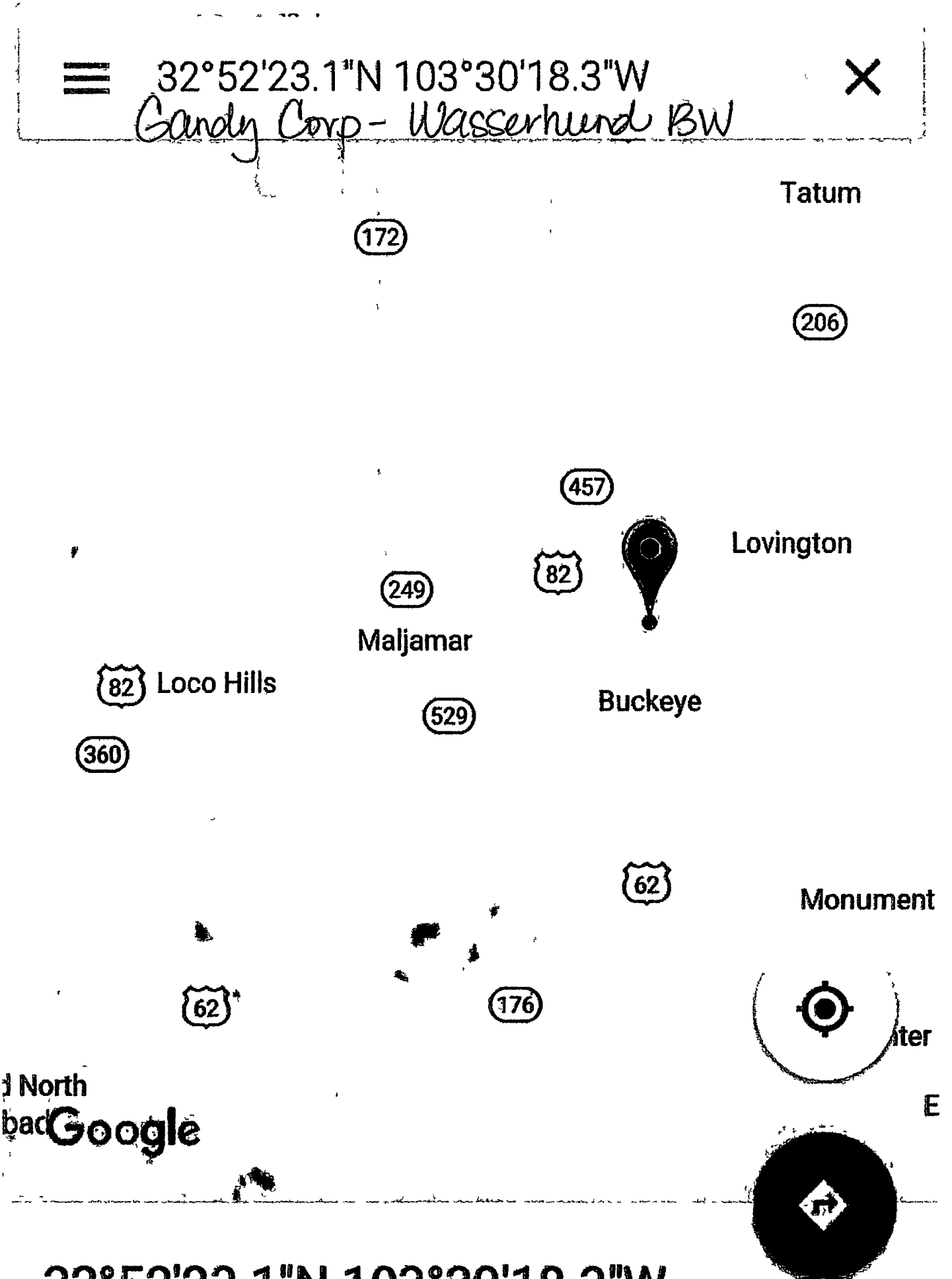


32°49'05.3"N 103°59'03.7"W

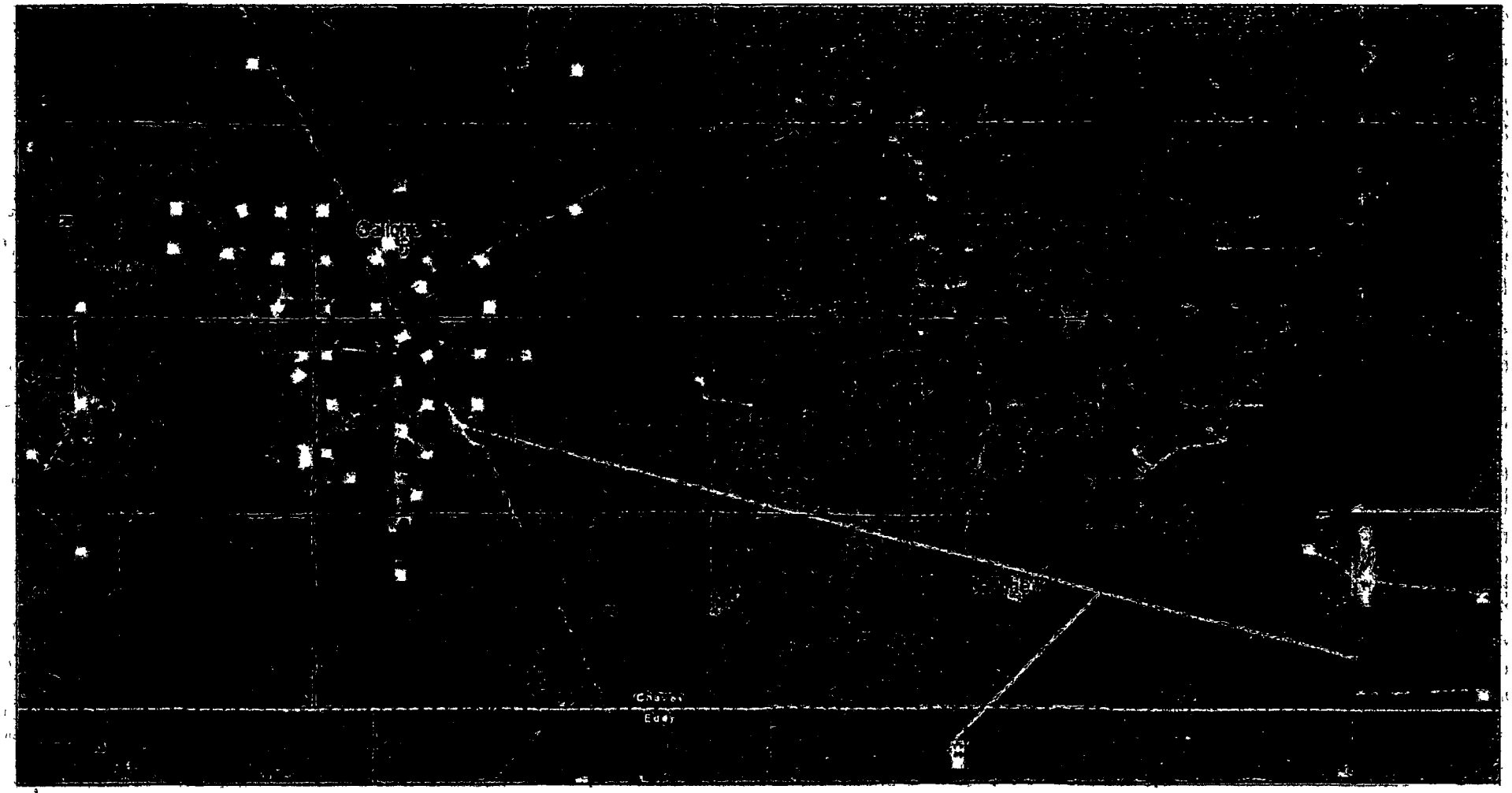
Mor-West Corp. — Loco Hills FW



32°49'05.3"N 103°59'03.7"W


32°52'23.1"N 103°30'18.3"W
Gandy Corp - Wasserhund BW
Tatum
172
206
457
82
Lovington
249
Maljamar
82
Loco Hills
529
Buckeye
360
62
Monument
62
176
North
Google
E
32°52'23.1"N 103°30'18.3"W

ArcGIS Web Map



July 27, 2017

Areas

- Override 1
- OCD District Offices
- PLSSTownship
- PLSSFirstDivision

1:36,112

0 0.35 0.7 1.4 mi

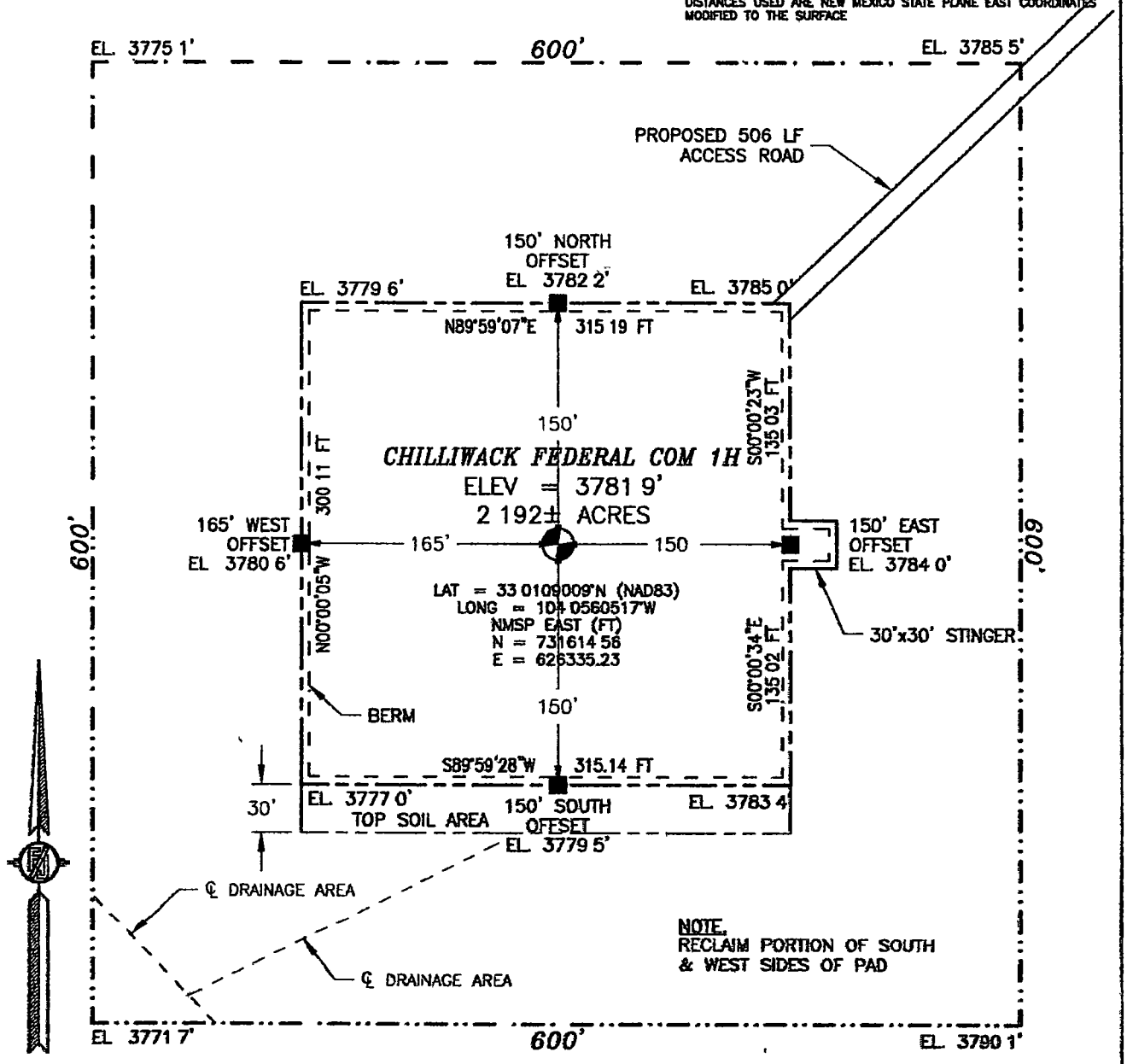
0 0.5 1 2 km

OCD
Esri, HERE, DeLorme, Mapmyindia, © OpenStreetMap contributors, and the GIS user community
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics,

Web AppBuilder for ArcGIS

SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M.
CHAVES COUNTY, STATE OF NEW MEXICO
SITE MAP

NOTE: LATITUDE AND LONGITUDE COORDINATES ARE SHOWN USING THE NORTH AMERICAN DATUM OF 1983 (NAD83). LISTED NEW MEXICO STATE PLANE EAST COORDINATES ARE GRID (NAD83) BASIS OF BEARING AND DISTANCES USED ARE NEW MEXICO STATE PLANE EAST COORDINATES MODIFIED TO THE SURFACE



0 10 50 100 200
SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HIGHWAY 249 AND CR 30 (JEMINA) GO NORTHWEST ON STATE HIGHWAY 249 FOR APPROX. 2.1 MILES. GO SOUTH ON 20' CALICHE LEASE ROAD FOR APPROX. 3.21 MILES TO THE WHISTLER FEDERAL 9. FROM THE NORTHEAST CORNER GO EAST 855.0' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 10. THEN FROM THE SOUTHWEST CORNER GO SOUTHWEST 688.9 TO THE NORTHEAST CORNER OF WHISTLER FEDERAL 5. FROM THE SOUTHEAST CORNER GO SOUTH THEN SOUTHEAST 558.2' TO THE NORTHWEST CORNER OF WHISTLER FEDERAL 8. THEN FROM SOUTHWEST CORNER GO SOUTHWEST 308' TO THE NORTHEAST PAD CORNER FOR THIS LOCATION.

MACK ENERGY CORPORATION

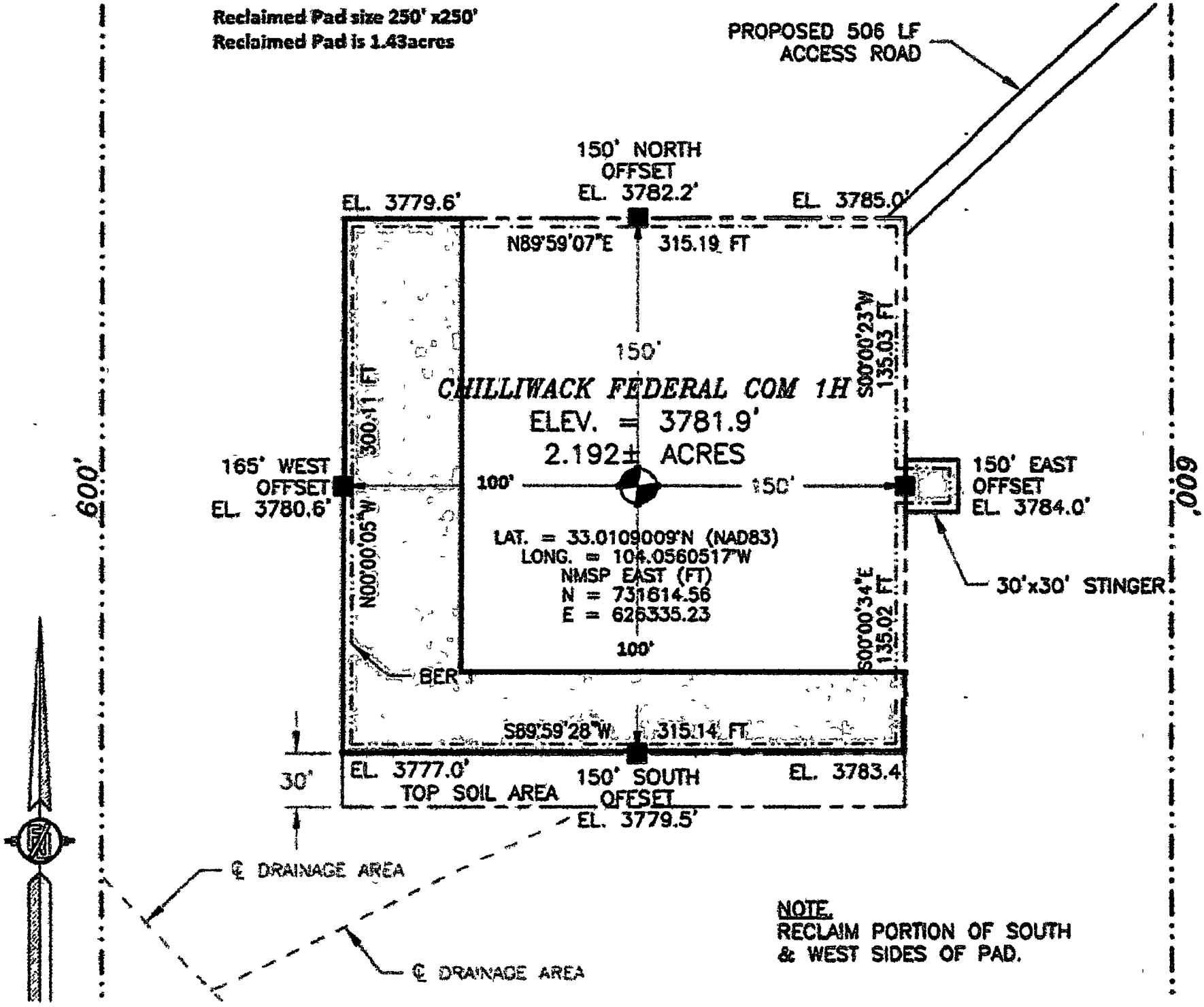
CHILLIWACK FEDERAL COM 1H

LOCATED 810 FT. FROM THE SOUTH LINE AND 965 FT. FROM THE WEST LINE OF SECTION 17, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N.M.P.M. CHAVES COUNTY, STATE OF NEW MEXICO

FEBRUARY 1, 2018

SURVEY NO. 5986

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


Reclaimed Pad size 250' x250'
Reclaimed Pad is 1.43acres
PROPOSED 506 LF
ACCESS ROAD
150' NORTH
OFFSET
EL. 3782.2'
EL. 3779.6'
EL. 3785.0'
N89°59'07"E 315.19 FT
150'
CHILLIWACK FEDERAL COM 1H
ELEV. = 3781.9'
2.192± ACRES
S00°00'23"W 135.03 FT
300.11 FT
165' WEST
OFFSET
EL. 3780.6'
100'
150'
150' EAST
OFFSET
EL. 3784.0'
N00°00'05"W
LAT. = 33.0109009°N (NAD83)
LONG. = 104.0560517°W
NMSP EAST (FT)
N = 731614.56
E = 626335.23
S00°00'34"E 135.02 FT
100'
30'x30' STINGER
BER
S89°59'28"W 315.14 FT
30'
EL. 3777.0'
TOP SOIL AREA
150' SOUTH
OFFSET
EL. 3783.4'
EL. 3779.5'
600'
600'
℄ DRAINAGE AREA
℄ DRAINAGE AREA
NOTE.
RECLAIM PORTION OF SOUTH
& WEST SIDES OF PAD.

Mack Energy Corporation

Legal Description
Mack Energy-San Andres MDP Area
Chaves Co New Mexico
Various Sections
T-15-S, R-28-E and R-29-E

H2S

"Contingency Plan"

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 H2S 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 H2S 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 H2S 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 H2S 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 public safety personnel and the New Mexico Oil Conservation Division or Bureau of Land Management, whichever is appropriate, of the situation

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 or Tripping

a. All Personnel

i When alarm sounds, don escape unit and report to upwind Safe Briefing Area

ii. Check status of other personnel (buddy system)

iii Secure breathing apparatus

iv. Wait for orders from supervisor

b. Drilling Foreman

i Report to the upwind Safe Briefing Area

ii Don Breathing Apparatus and return to the point of release with the Tool Pusher or Driller (buddy system)

iii Determine the concentration of H_2S

iv. Assess the situation and take appropriate control measures

c Tool Pusher

i. Report to the upwind Safe Briefing Area.

ii Don Breathing Apparatus and return to the point of release with the Drilling Foreman or the Driller (buddy system)

iii. Determine the concentration of H_2S

iv. Assess the situation and take appropriate control measures

d. Driller

i. Check the status of other personnel (in a rescue attempt, always use the buddy system)

ii. Assign the least essential person to notify the Drilling Foreman and Tool Pusher, in the event of their absence

iii. Assume the responsibility of the Drilling Foreman and the Tool Pusher until they arrive, in the event of their absence

e *Derrick Man and Floor Hands*

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

f. *Mud Engineer*

i. Report to the upwind Safe Briefing Area

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

g. *Safety Personnel*

i. Don Breathing Apparatus.

ii. Check status of personnel

iii. Wait for instructions from Drilling Foreman or Tool Pusher.

II. Taking a Kick

a. All Personnel report to the upwind Safe Briefing Area

b. Follow standard BOP procedures

III. Open Hole Logging

a. All unnecessary personnel should leave the rig floor

b. Drilling Foreman and Safety Personnel should monitor the conditions and make necessary safety equipment recommendations

IV. Running Casing or Plugging

a. Follow "Drilling or Tripping" procedures

b. 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 for each of the following conditions, with each crew

Drill #1 Bottom Drilling

Drill #2 Tripping Drill Pipe

In each of these drills, 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-Bottom 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

II **Crew Assignments**

a <u>Drill No 1-Bottom Drilling</u>

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 *Derrick man*

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

vi *Operator Representative*

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 Derrick man

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 emergency response officials. 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 consistent with the requirements in ANSI/ASSE Z390 1-2006 (R2010) Accepted Practices for Hydrogen Sulfide (H2S) Training Programs.

1 Physical and Chemical Properties of Hydrogen Sulfide

2 Sources of Hydrogen Sulfide

3 Human Physiology and Medical Evaluation.

4 Work Procedures

5. Personal Protective Equipment.

6. Use of Contingency Plans and Emergency Response

7. Burning, Flaring and Venting of Hydrogen Sulfide.

8 State and Federal Regulatory Requirements

9 Hydrogen Sulfide Release Dispersion Models

10 Rescue Techniques, First Aid and Post-Exposure Evaluation

11 Methods of Detection and Monitoring

12 Engineering Controls

13 Transportation of Hydrogen Sulfide Cargoes

14 Emerging Technology

Service company personnel and visiting personnel must be notified if the zone contains H_2S, and each service company must provide proof of 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
- Two SCBA's at each briefing area
- Enough airline units to operate safely, anytime the H_2S concentration reaches the IDLH level (100 ppm)
- Cascade system with enough breathing air hose and manifolds to reach the rig floor, the derrick man and the other operation areas

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- Four channel H_2S monitor with alarms
- Four (4) sensors located as follows #1- Rig Floor, #2- Bell Nipple, #3- Shale Shaker, #4- Mud Pits
- Gastec or Draeger pump with tubes
- Sensor test gas

Well Condition Sign and Flags:

The Well Condition Sign w/flags should be placed a minimum of 150' before you 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- Normal Operating Conditions
YELLOW- Potential Danger
RED- Danger, H_2S Gas Present

Auxiliary Rescue Equipment.

- Stretcher
- 2-100' Rescue lines
- First Aid Kit properly stocked

Mud Inspection Equipment.

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

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 will need to be provided

Communication Equipment:

- Proper communication equipment such as cell phones 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

- Communication equipment shall be available on the vehicles

Special Control Equipment:

- Hydraulic BOP equipment with remote control on the ground
- Rotating head at the surface casing point

Evacuation Plan.

- Evacuation routes should be established prior to spudding the well
- 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 shall be designated on either side of the location at the maximum allowable distance from the well bore so they offset prevailing winds or they are at a 180 degree angle 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 Alliance Safety 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

Note. Date each item as they are implemented

1 Sign at location entrance _____

2 Two (2) wind socks (in required locations). _____

3. Wind Streamers (If required). _____

4 SCBA's on location for all rig personnel and mud loggers _____

5 Air packs, inspected and ready for use _____

6 Spare bottles for each air pack (if required) _____

7 Cascade system for refilling air bottles. _____

8 Cascade system and hose line hook up _____

9 Choke manifold hooked-up and tested (before drilling out surface casing) _____

10. Remote Hydraulic BOP control (hooked-up and tested before drilling out surface casing) _____

11 BOP tested (before drilling out surface casing). _____

12 Mud engineer on location with equipment to test mud for H_2S _____

13 Safe Briefing Areas set-up _____

14 Well Condition sign and flags on location and ready _____

15 Hydrogen Sulfide detection system hooked -up & tested _____

16. Hydrogen Sulfide alarm system hooked-up & tested. _____

17. Stretcher on location at Safe Briefing Area. _____

18. 2 -100' Life Lines on location _____

19. 1-20# Fire Extinguisher in safety trailer. _____

20. Confined Space Monitor on location and tested _____

21 All rig crews and supervisor trained (as required). _____

22 Access restricted for unauthorized personnel _____

23 Drills on H_2S and well control procedures _____

24 All outside service contractors advised of potential H_2S on the well _____

25 NO SMOKNG sign posted _____

26 H_2S Detector Pump w/tubes on location _____

27 25mm Flare Gun on location w/flares _____

28 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

7. Perform breathing drills with on-site personnel

8 Check the following supplies for availability.

- Stretcher
- Safety Belts and Ropes
- Spare air Bottles
- Spare Oxygen Bottles (if resuscitator required)
- Gas Detector Pump and Tubes
- Emergency telephone lists

9 Test the Confined Space Monitor to verify the batteries are good

EVACUATION PLAN

General Plan

The direct lines of action prepared by Mack Energy Corporation 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

See Specific Site Safety Plan or Job Safety Analysis to be completed during drilling

Emergency Assistance Telephone List

PUBLIC SAFETY.	911 or
Pecos Valley Communication Center (Chaves County Police, Fire, EMS)	(575) 624-7590
Central Dispatch (Eddy County Police, Fire, EMS)	(575) 616-7155
Hospitals	
Roswell	(575) 622-8170
Artesia	(575) 748-3333
Dept of Public Safety/SE New Mexico	(575) 622-7200
Highway Department	(575) 637-7200
New Mexico Oil Conservation	(575) 748-1283
Bureau of Land Management	(575) 622-5335

Mack Energy Corporation

Company Drilling Supervisor

Jim Krogman	(575) 703-7385

Drilling Foreman

Emilio Martinez	(575) 703-5231

Silver Oak Drilling

Silver Oak Drilling	(575) 746-4405

Tool Pusher:

Darren Mc Bride	(575) 703-6070
Osiel Sanchez	(575) 703-4109

Safety

Lee Hassell (Alliance Safety)
(806) 217-2950
Scott Ford (Mack Energy)
(505) 692-4976
Robbie Houghtaling (Silver Oak)
(575) 703-2122

Intentionally Blank –Space provided for Specific Site Safety Plan or Job Safety Analysis

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 3000' 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

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	H2S	1 192	10 ppm	15 ppm	100 ppm
Sulfide Dioxide	so2	2.21	2 ppm	5 ppm	
Chlorine	CL	2 45	5 ppm	1 ppm	
Carbon Monoxide	co	.97	25 ppm	200 ppm	
Carbon Dioxide	C02	1 52	5000 ppm	30,000 ppm	
Methane	CH4	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.

TABLE 2

Toxicity Table of H_2S

Percent%	PPM	Physical Effects
.0001	1	Can smell less than 1ppm
.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

PHYSICAL PROPERTIES OF H2S

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.

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

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

SURFACE USE AND OPERATING PLAN

1. Existing Access Roads

A All roads to the location are shown in Exhibit #6 The existing lease roads are illustrated and are adequate for travel during drilling and production operations Upgrading existing roads prior to drilling well, will be done where necessary

B. Directions to Location From the intersection of Highway 249 and CR 30 (Jemma) go Northwest on State Highway 249 approx 2.1 miles. Go South on 20' caliche lease rd for approx. 3.21 miles to the Whistler Fed 9, from the Northeast corner go East 855.0' to the Northwest corner of Whistler Fed 10 Then from the Southwest corner go Southwest 686 9' to the Northeast corner of Whistler Fed 5 From the Southeast corner go South then Southeast 558 2 to the Northwest Corner of Whistler Fed 6, then from Southwest corner go Southwest 506' to the Northeast pad corner for this location

C Routine grading and maintenance of existing roads will be conducted as necessary to maintain their condition as long as any operations continue on this lease

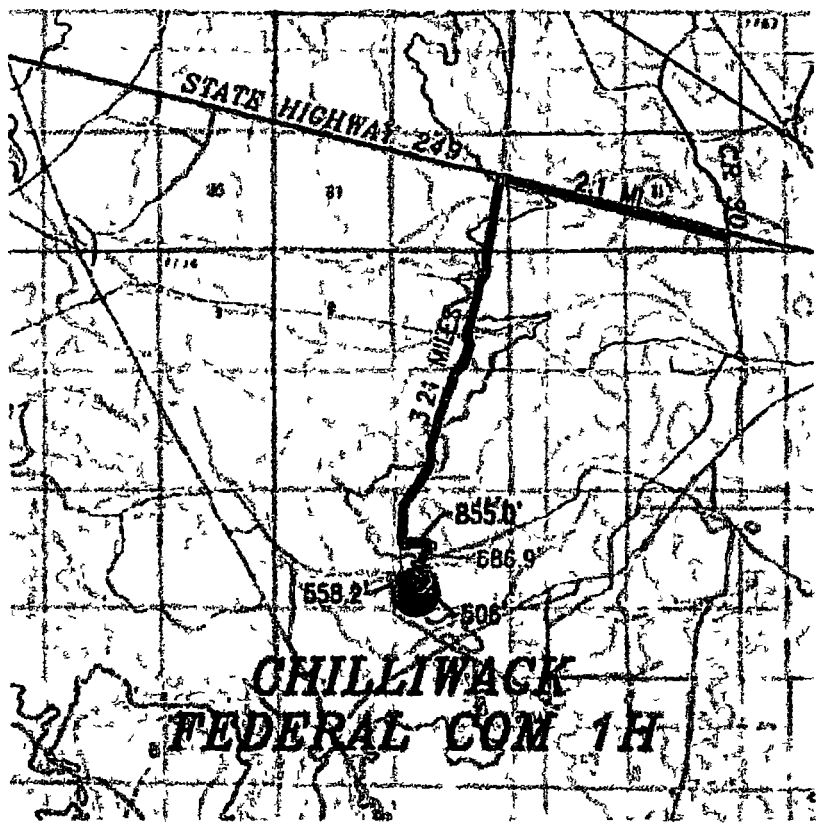


Exhibit #6

1. Proposed Access Road:

Vicinity Map shows this location with existing road and 506' of new road exiting the Northeast corner of the pad. Proposed upgrade of existing road will be done along staked centerline survey. Necessary maintenance will be done to insure traffic stays within EXISTING ROW NM-118607. The road has been constructed as follows:

A. The Maximum width of the running surface will be 14' The road will be crowned and ditched and constructed of 6" rolled and compacted caliche Ditches will be at 3:1 slope and 3 feet wide Water will be diverted where necessary to avoid ponding, prevent erosion, maintain good drainage, and to be consistent with local drainage patterns

B The average grade will be less than 1%.

C. No turnouts are planned

D No culverts, cattleguard, gates, low water crossings or fence cuts are necessary

E. Surfacing material will consist of native caliche, Caliche will be obtained from the nearest BLM approved caliche pit located Sec 19 T15S R29E and Sec 34 T15S R29E

F. The access road as shown in Exhibit #6 is existing

2. Location of Existing Wells:

Exhibit #16 shows all existing wells within a one-mile radius of this well

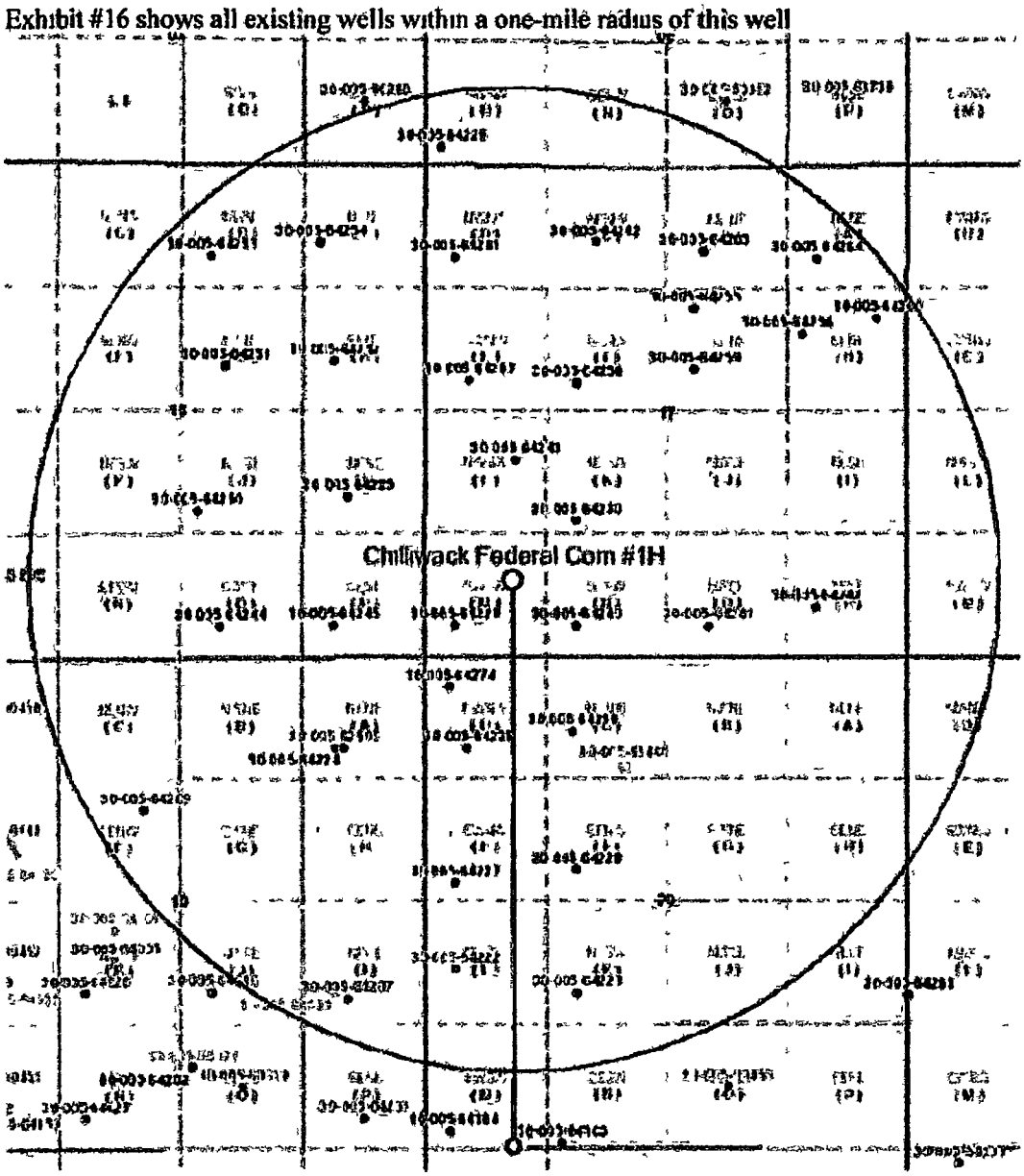


Exhibit #16

3 Location of Existing and/or Proposed Facilities:

A Mack Energy Corporation will produce this well at the Prince Rupert Federal TB.

B If the well is productive, contemplated facilities will be as follows:

1) San Andres Completion Will be sent to the Prince Rupert Federal 1B located at the NWSW Sec 20 T15S R29E The Facility is shown in Exhibit #13

2) The tank battery and facilities including all flow lines and piping will be installed according to API specifications

3) Any additional caliche will be obtained from a BLM approved caliche pit Any additional construction materials will be purchased from contractors

4) It will be necessary to run electric power if this well is productive Power will be run by CVE and they will send in a separate plan for power

C. Proposed flow lines will turn southwest to the Prince Rupert Federal TB. Flow line will be a 4" poly surface line, 8302.93' in length with a 40 psi working pressure

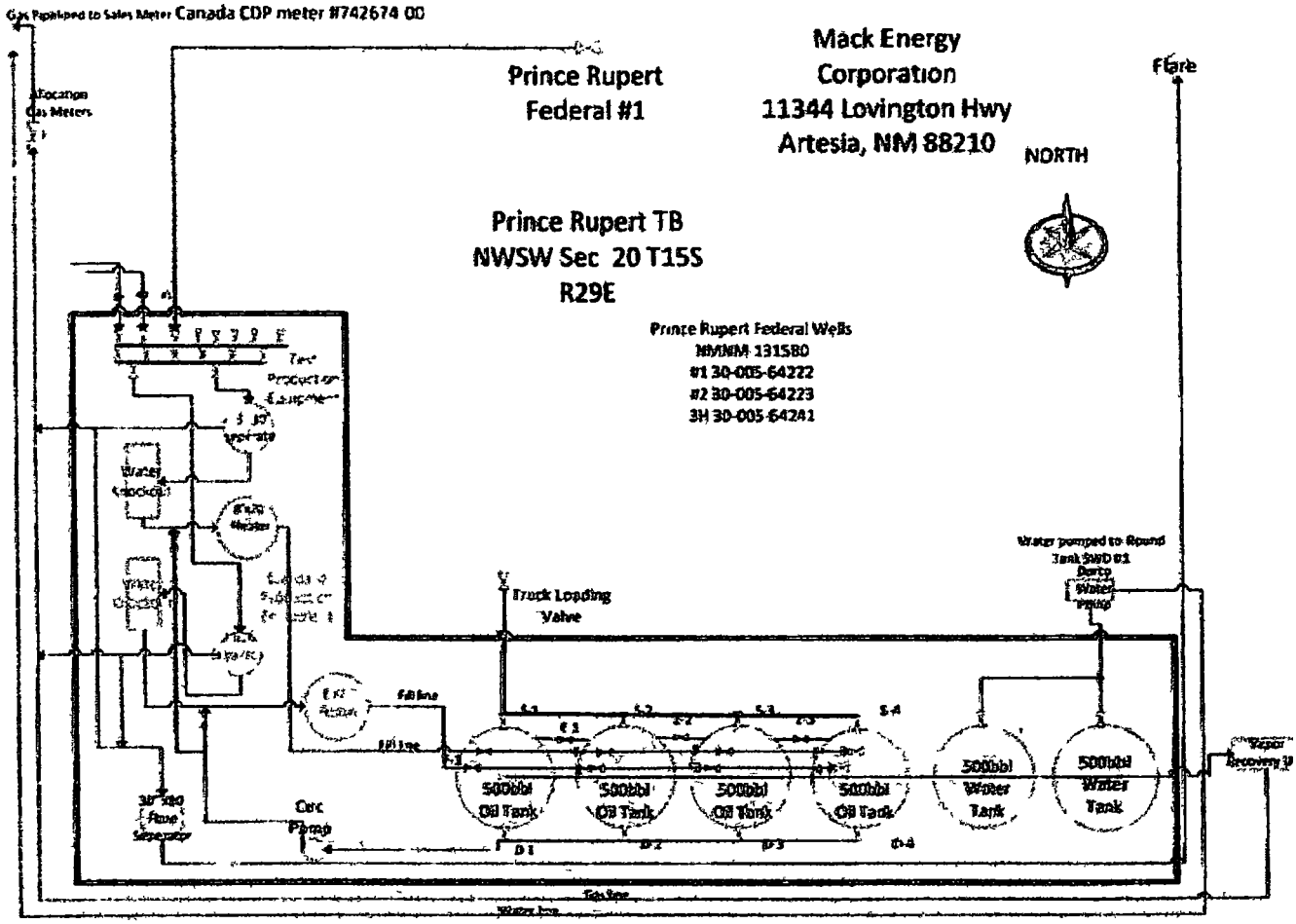


Exhibit #13

4. Location and Type of Water Supply:

The well will be drilled with combination brine and fresh water mud system as outlined in the drilling program. The water will be obtained from commercial water stations in the area and hauled to location by transport truck over the existing and proposed access roads shown in Exhibit #6 . If a commercial fresh water source is nearby, fasline may be laid along existing road ROW's and fresh water pumped to the well. No water well will be drilled on the location

5. Source of Construction Materials:

All caliche required for construction of the drill pad and proposed new access road (approximately 2500 cubic yards) will be obtained from BLM approved pit located at Sec 19 T15S R29E and Sec 34 T15S R29E

6. Methods of Handling Waste:

A Drill cuttings and fluids will be disposed into the steel tanks and hauled to R-360 disposal facility, permit number NM-01-0006. Located on Hwy 62 at MM 66.

B Water produced from the well during completion may be disposed into a steel tank After the well is permanently placed on production, produced water will be collected in tanks (fiberglass) and trucked to our Round Tank SWD #1, produced oil will be collected in steel tanks until sold

C Garbage and trash produced during drilling or completion operations will be collected in a trash bin and hauled to an approved local landfill. No toxic waste or hazardous chemicals will be produced by this operation

D After the rig is moved out and the well is either completed or abandoned, all waste materials will be cleaned up within 30 days In the event of a dry hole only a dry hole marker will remain

E Sewage and Gray Water will be placed in container and hauled to a approved facility. Container and disposal handled by Black Hawk

F. Drilling fluids will be contained in steel tanks using a closed loop system Exhibit #12 No pits will be used during drilling operations

7. Ancillary Facilities:

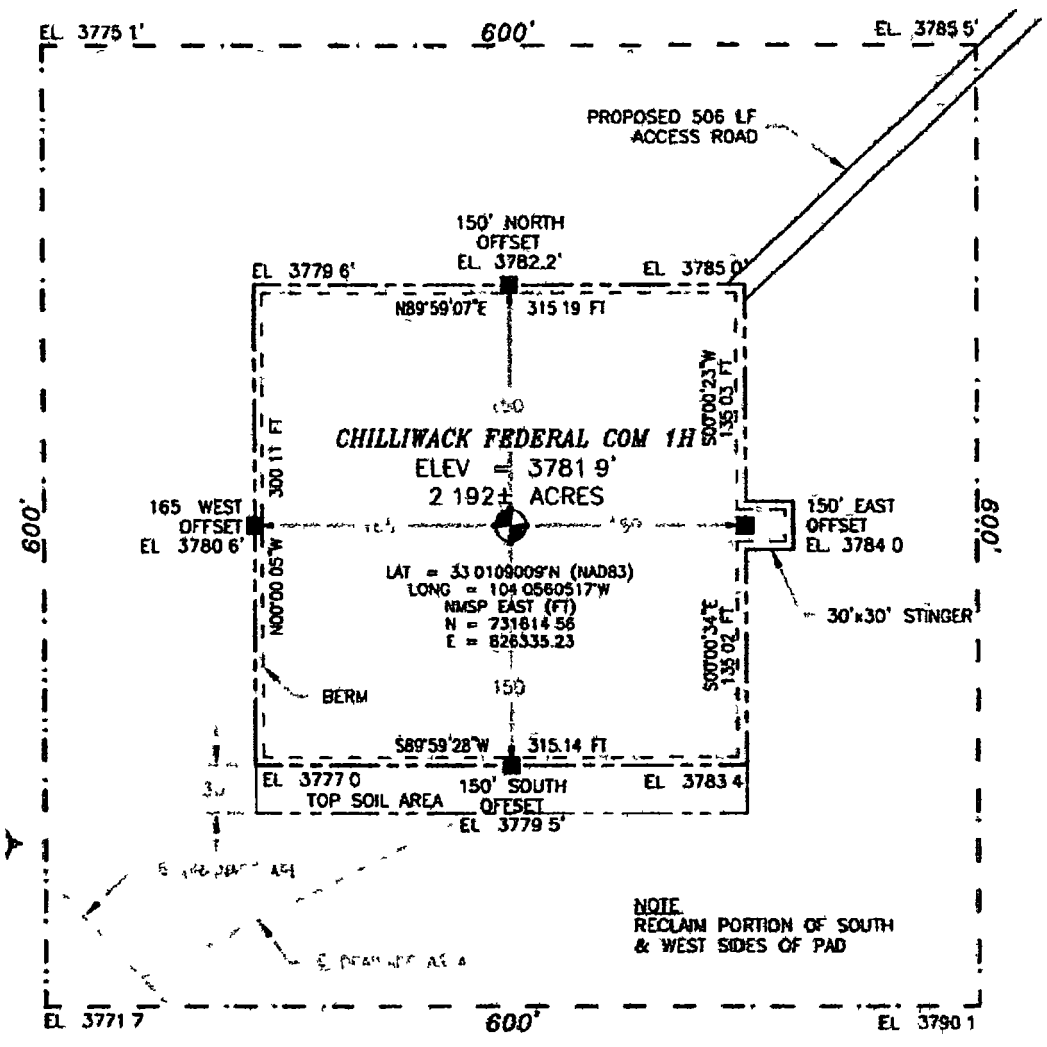
No airstrip, campsite or other facilities will be built as a result of the operation on this well.

8. Well Site Layout:

A. The well site and elevation plat for the proposed well is shown in Exhibit #14 It was staked by Maddron Surveying, Carlsbad, NM.

B. The drill pad layout, with elevations staked by Maddron Surveying, is shown in Exhibit #14. Dimensions of the pad are shown Topsoil, if available, will be stockpiled per BLM specifications. Because the pad is almost level no major cuts will be required.

C. Diagram below shows the proposed orientation of the location. No permanent living facilities are planned, but a temporary foreman/toolpusher's trailer will be on location during the drilling operations.



Exhibit# 14

9. Plans for Restoration of the Surface:

A. Upon completion of the proposed operations, if the well is completed, any additional caliche required for facilities will be obtained from a BLM approved caliche pit

B. Plans for interim and or final remediation

1) Caliche will be removed, ground ripped and stockpiled topsoil used to recontoured as close as possible to the original natural level to prevent erosion and ponding of water.
2) Area will be reseeded as per BLM specifications Seeding will be done when moisture is available and weather permitting. Pure live seed will be used to prevent noxious weeds Annual inspection of growth will be done and necessary measures taken to eliminate noxious weeds.

C. Exhibit #15 below shows the proposed downsized well site after Interim Reclamation. Dimensions are estimates on present conditions and are subject to change

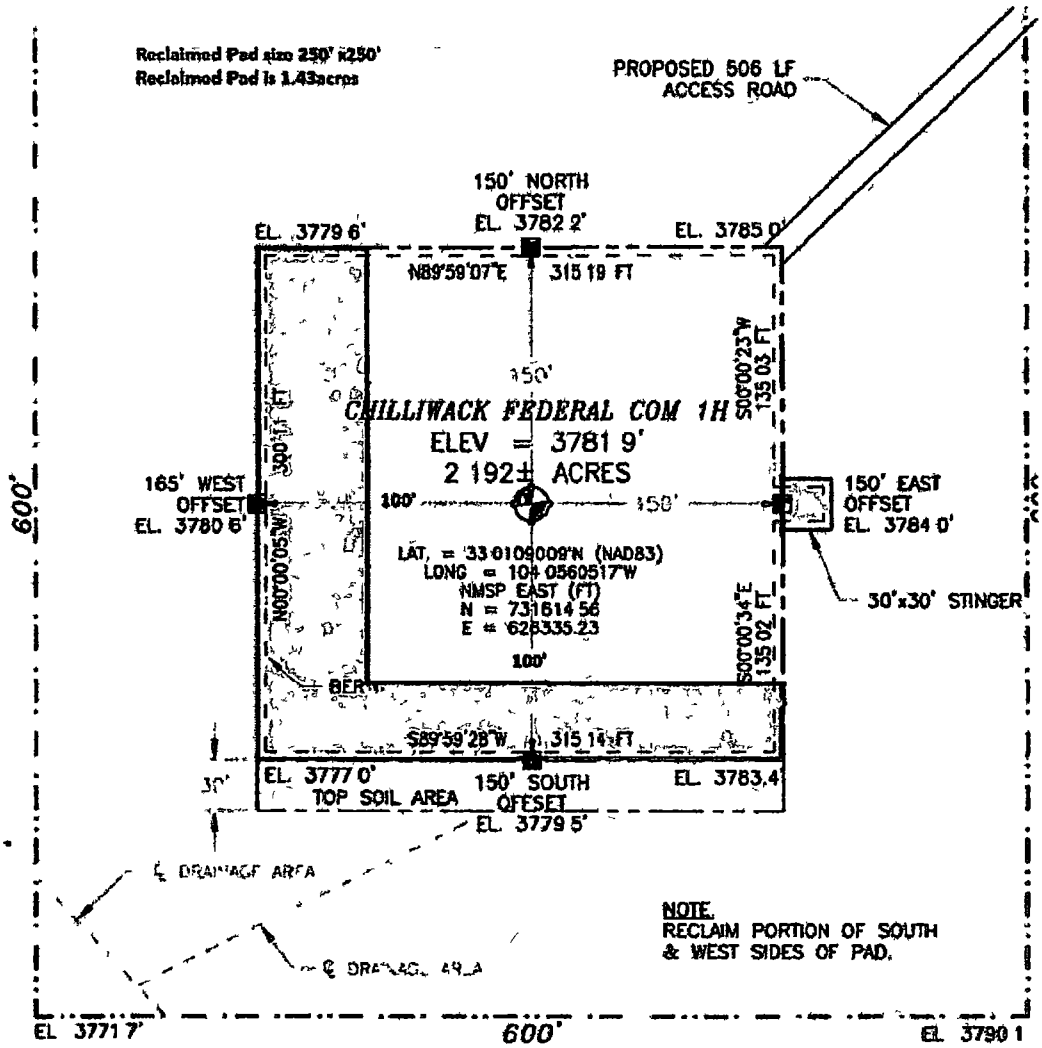


Exhibit #15

10. Surface Ownership:

The well site and lease is located entirely on Federal surface We have notified the surface lessee of the impending operations Bogel Limited Company, PO Box 460 Dexter, NM 88230 (575) 365-2996

11. Other Information:

A. The area around the well site is grassland and the topsoil is sandy. The vegetation is native scrub grass with sagebrush.

B. There is no permanent or live water in the immediate area.

C A Cultural Resources Examination has been requested and will be forwarded to your office in the near future.

12. Lessee's and Operator's Representative:

The Mack Energy Corporation representative responsible for assuring compliance with the surface use plan is as follows

Deana Weaver
Mack Energy Corporation
P O Box 960
Artesia, NM 88211-0960
Phone (575) 748-1288 (office)
dweaver@mec com

APD CERTIFICATION

I hereby certify that I, or person under my direct supervision, have inspected the proposed 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 the work associated with the operations proposed herein will be performed in conformity with this APD package and 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.

Date: March 8, 18 **Signed:** Deana Weaver

Deana Weaver

Attached to Form 3160-3
Mack Energy Corporation
Chilliwack Federal Com #1H NMNM-121949
SHL : 810 FSL & 2965 FWL, SWSW, Sec. 17 T15S R29E
BHL : 5 FSL & 965 FWL, SWSW, Sec. 20 T15S R29E
Chaves County, NM

Mack Energy Corporation
Onshore Order #6
Hydrogen Sulfide Drilling Operation Plan

I. HYDROGEN SULFIDE TRAINING

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

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

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

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

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500 feet) and weekly H2S and well control drills for all personnel in each crew The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan The concentrations of H2S of wells in this area from surface to TD are low enough that a contingency plan is not required.

II. H2S SAFETY EQUIPMENT AND SYSTEMS

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

1. **Well Control Equipment:**

A Flare line.
B. Choke manifold.
C. Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
D Auxiliary equipment may include if applicable: annular preventer & rotating head

2. **Protective equipment for essential personnel:**

   A Mark II Survive air 30-minute units located in the doghouse and at briefing areas, as indicated on well site diagram

3. **H2S detection and monitoring equipment:**

   A 1 portable H2S monitors positioned on location for best coverage and response These units have warning lights and audible sirens when H2S levels of 20 PPM are reached

4. **Visual warning systems:**

   A Wind direction indicators as shown on well site diagram (Exhibit #8)
   B. Caution/Danger signs (Exhibit #7) shall be posted on roads providing direct access to location Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate. See example attached

5. **Mud program:**

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

6. **Metallurgy:**

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

7. **Communication:**

   A Radio communications in company vehicles including cellular telephone and 2-way radio.
   B. Land line (telephone) communication at Office

8. **Well testing:**

   A. Drill stem testing will be performed with a minimum number of personnel in the immediate vicinity, which are necessary to safely and adequately conduct the test The drill stem testing will be conducted during daylight hours and formation fluids will not be flowed to the surface. All drill-stem-testing operations conducted in an H2S environment will use the closed chamber method of testing.

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Chaves County, NM

EXHIBIT #7

WARNING

YOU ARE ENTERING AN H2S

AUTHORIZED PERSONNEL ONLY

1 BEARDS OR CONTACT LENSES NOT ALLOWED

2 HARD HATS REQUIRED

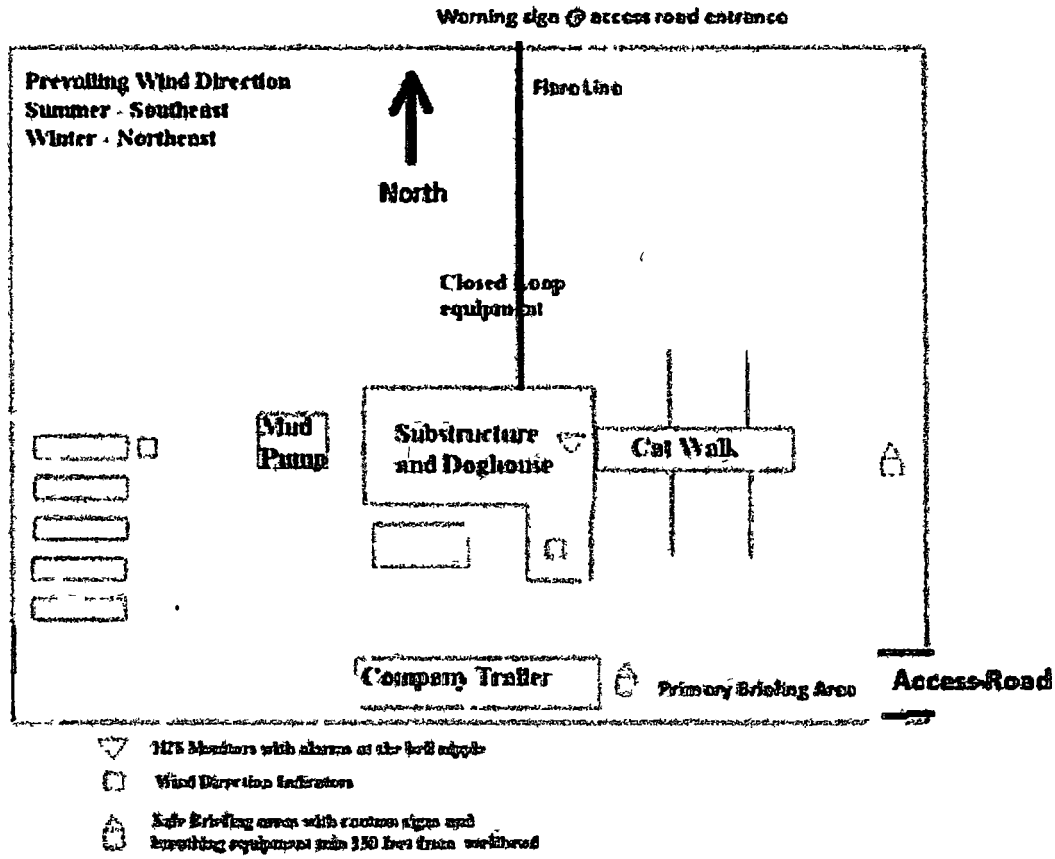
3 SMOKING IN DESIGNATED AREAS ONLY

4 BE WIND CONSCIOUS AT ALL TIMES

5. CHECK WITH MACK ENERGY FOREMAN AT OFFICE

MACK ENERGY CORPORATION

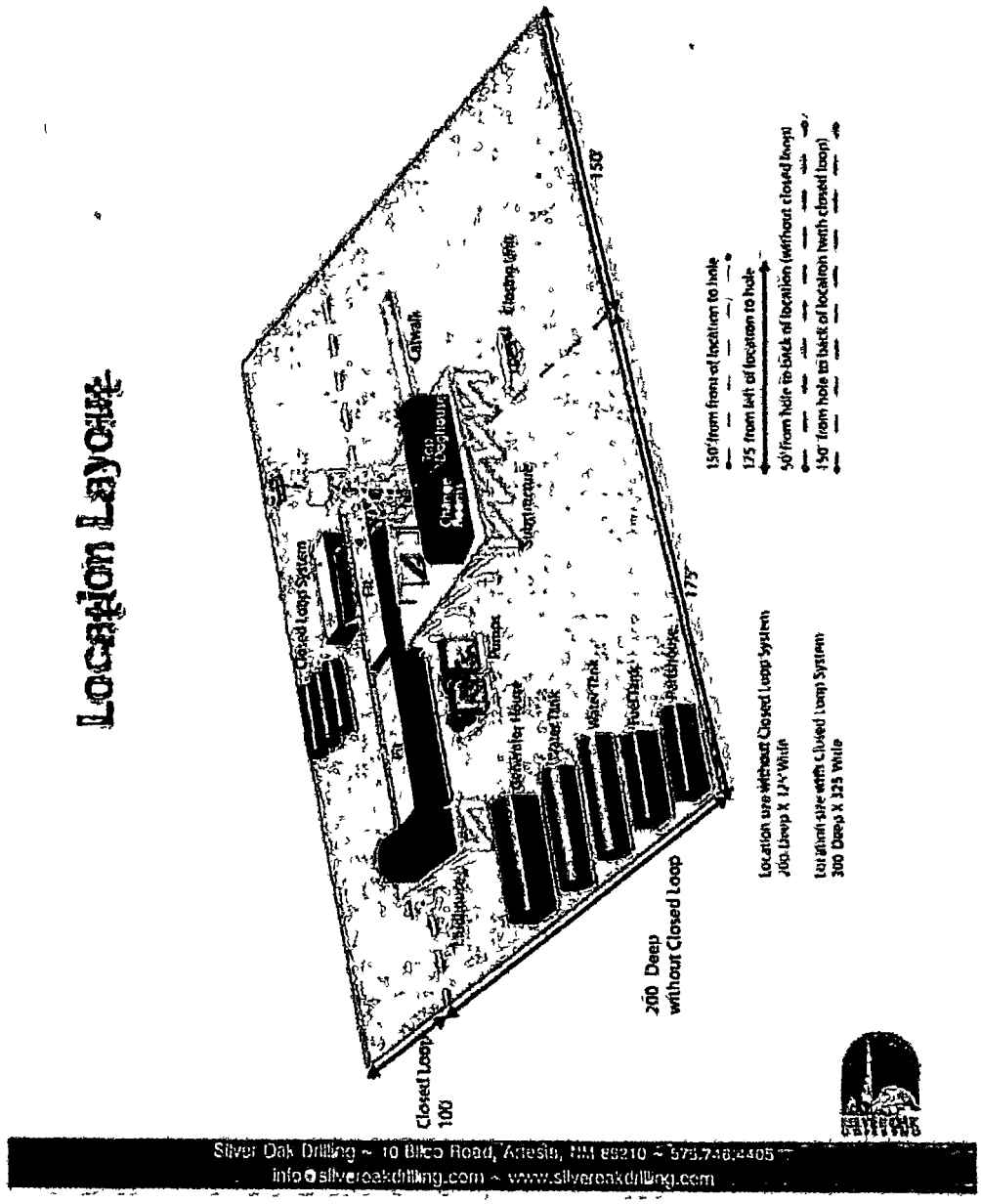
1-575-748-1288



B. There will be no drill stem testing.

DRILLING LOCATION H2S SAFTY EQUIPMENT

Exhibit # 8



Mack Energy Corporation Call List, Chaves County

Artesia (575)	Cellular	Office
Jim Krogman	432-934-1596	748-1288
Emilio Martinez	432-934-7586	748-1288

Agency Call List (575)

Roswell

State Police	622-7200
City Police	624-6770
Sheriff's Office	624-7590
Ambulance	624-7590
Fire Department	624-7590
LEPC (Local Emergency Planning Committee	624-6770
NMOCD	748-1283
Bureau of Land Management	627-0272

Emergency Services

Boots & Coots IWC	1-800-256-9688 or (281)931-8884
Cudd pressure Control	(915)699-0139 or (915)563-3356
Halliburton	746-2757
Par Five	748-9539
Flight For Life-Lubbock, TX	(806)743-9911
Aerocare-Lubbock, TX	(806)747-8923
Med Flight Air Amb-Albuquerque, NM	(505)842-4433
Lifeguard Air Med Svc Albuquerque, NM	(505)272-3115

Section 1 - General

Would you like to address long-term produced water disposal? NO

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location

PWD surface owner **PWD disturbance (acres)**

Lined pit PWD on or off channel

Lined pit PWD discharge volume (bbl/day)

Lined pit specifications

Pit liner description

Pit liner manufacturers information

Precipitated solids disposal

Decribe precipitated solids disposal

Precipitated solids disposal permit

Lined pit precipitated solids disposal schedule

Lined pit precipitated solids disposal schedule attachment

Lined pit reclamation description

Lined pit reclamation attachment

Leak detection system description

Leak detection system attachment

Lined pit Monitor description

Lined pit Monitor attachment

Lined pit do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number

Lined pit bond amount

Additional bond information attachment

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location

PWD surface owner **PWD disturbance (acres)**

Unlined pit PWD on or off channel

Unlined pit PWD discharge volume (bbl/day)

Unlined pit specifications

Precipitated solids disposal

Decribe precipitated solids disposal

Precipitated solids disposal permit

Unlined pit precipitated solids disposal schedule

Unlined pit precipitated solids disposal schedule attachment

Unlined pit reclamation description

Unlined pit reclamation attachment

Unlined pit Monitor description

Unlined pit Monitor attachment

Do you propose to put the produced water to beneficial use?

Beneficial use user confirmation

Estimated depth of the shallowest aquifer (feet)

Does the produced water have an annual average Total Dissolved Solids (TDS) concentration equal to or less than that of the existing water to be protected?

TDS lab results

Geologic and hydrologic evidence

State authorization

Unlined Produced Water Pit Estimated percolation

Unlined pit do you have a reclamation bond for the pit?

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number

Unlined pit bond amount

Additional bond information attachment

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location

PWD surface owner **PWD disturbance (acres)**

Injection PWD discharge volume (bbl/day)

Injection well mineral owner

Injection well type

Injection well number | **Injection well name**

Assigned injection well API number? | **Injection well API number**

Injection well new surface disturbance (acres)

Minerals protection information

Mineral protection attachment

Underground Injection Control (UIC) Permit?

UIC Permit attachment

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location

PWD surface owner | **PWD disturbance (acres)**

Surface discharge PWD discharge volume (bbl/day)

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment

Surface Discharge site facilities information

Surface discharge site facilities map

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location

PWD surface owner | **PWD disturbance (acres)**

Other PWD discharge volume (bbl/day)

Other PWD type description

Other PWD type attachment

Have other regulatory requirements been met?

Other regulatory requirements attachment

AFMSS

U.S Department of the Interior
BUREAU OF LAND MANAGEMENT

Bond Info Data Report

04/12/2018

Bond Information

Federal/Indian APD FED

BLM Bond number NMB000286

BIA Bond number

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number

Forest Service reclamation bond number

Forest Service reclamation bond attachment

Reclamation bond number

Reclamation bond amount

Reclamation bond rider amount

Additional reclamation bond information attachment