NMOCD
Artesia

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: NMNM131583

6 If Indian, Allotee or Tribe Name:

1a Type of work: ☑ DRILL ☐ REENTER

7 If Unit or CA Agreement, Name and No:

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

8 Lease Name and Well No: OTTAWA FEDERAL COM 1H 320469

2 Name of Operator: MACK ENERGY CORPORATION 13837

9 API Well No: 30-005-64304

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 / 660 FSL / 355 FWL / LAT 32 995992 / LONG -104 0580642

At proposed prod zone: SWSW / 5 FSL / 355 FWL / LAT 32 9797558 / LONG -104 0582943

11 Sec T R M or Blk and Survey or Area: SEC 20 / 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): 355 feet

16 No of acres in lease: 400

17 Spacing Unit dedicated to this well: 160

18 Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft: 1145 feet

19 Proposed Depth: 3235 feet / 8084 feet

20 BLM/BIA Bond No on file: FED NMB000286

21 Elevations (Show whether DF, KDB, RT, GL, etc): 3757 feet

22 Approximate date work will start*: 07/01/2018

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	Name (Printed/Typed)	Date
(Electronic Submission)	Deana Weaver / Ph (575)748-1288	03/19/2018

Title: Production Clerk

Approved by (Signature)	Name (Printed/Typed)	Date
(Electronic Submission)	Ruben J Sanchez / Ph (575)627-0250	04/12/2018

Title	Office
Assistant Field Manager Lands & Minerals	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

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 18 2018

RWP 4-19-18 RECEIVED

NSP

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

Ensure surface casing is set in a competent bed at an approximate depth of 200 feet If salt is encountered, set casing at least 25 feet above the salt An H2S contingency plan is required for this specific APD At this time, there are reports of H2S releases greater than 100 ppm in the immediate area There is possibility of lost circulation in the Queen and San Andres Formations The location of the proposed well is within a medium potential for the occurrence of karst type features

PECOS DISTRICT
DRILLING OPERATIONS
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Mack Energy Corporation**
LEASE NO.:	**NMNM-131583**
WELL NAME & NO.:	**Ottawa Federal Com 1H**
SURFACE HOLE FOOTAGE	**0660' FSL & 0355' FWL**
BOTTOM HOLE FOOTAGE	**0005' FSL & 0355' FWL Sec. 29, T. 15 S , R 29 E**
LOCATION.	**Section 20, T. 15 S., R 29 E., NMPM**
COUNTY.	**County, New Mexico**

The Gamma Ray and Neutron well logs must be run from total depth to surface and e-mailed to Chris Bolen at cbolen@blm.gov or hard copy mailed to 2909 West Second Street Roswell, NM 88201 to his attention.

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

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 **200** 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 **(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 040318

PECOS DISTRICT
CONDITIONS OF APPROVAL

OPERATOR'S NAME	MACK ENERGY CORPORATION
LEASE NO.	NMNM-131583
WELL NAME & NO	OTTAWA FEDERAL COM #1H
SURFACE HOLE FOOTAGE	[660] ' F [S] L [355] ' F [W] L
LOCATION	Section 20, 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, Ricky Flores at (575) 627-0339 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)
OTTAWA 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)

COA/Stipulation for above ground pipelines

- All pipelines laid on the surface will have sloped dirt berms built over them every 100 yards to allow reptiles, amphibians, small mammals, ground-dwelling birds and their broods access over them. Dirt berms should be no less than 12 inches in width and extend over all surface pipelines within the Right of Way Berms should be maintained for the life of the project

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 WASTE, HAZARDOUS AND SOLID

Waste materials produced during all phases of operation will be disposed of promptly in an approved manner so it will not impact the air, soil, water, vegetation or animals "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes and equipment All liquid waste, completion fluids and drilling products associated with oil and gas operations will be contained and then

removed and deposited in an approved disposal site Portable toilets will remain on site throughout well pad construction, drilling and reclamation

The operator and contractors shall ensure that all use, production, storage, transportation and disposal of hazardous materials, solid wastes and hazardous wastes associated with the drilling, completion and production of this well will be in accordance with all applicable existing or hereafter promulgated federal, state and local government rules, regulations and guidelines All project related activities involving hazardous materials will be conducted in a manner to minimize potential environmental impacts A file will be maintained onsite containing current Safety Data Sheets (SDS) for all chemicals, compounds and/or substances which are used in the course of construction, drilling, completion and production operations

18. SURFACE WATER AND GROUNDWATER PROTECTION MEASURES - Best Management Practices (BMPs)

A containment structure or earthen dike shall be constructed and maintained around the north, and east outside boundary of the well pad 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 located north and east and 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** 10/12/2017

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 10400028377 **Submission Date** 03/19/2018

Operator Name MACK ENERGY CORPORATION

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

Show Final Text

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

Section 1 - General

APD ID 10400028377 **Tie to previous NOS?** 10400017368 **Submission Date** 03/19/2018

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 NMNM131583 **Lease Acres** 400

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

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 OTTAWA 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 OTTAWA 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** 1145 FT **Distance to lease line** 355 FT

Reservoir well spacing assigned acres Measurement 160 Acres

Well plat Ottawa_Federal_Com_1H_plats_20180316095517.pdf

Well work start Date 07/01/2018 **Duration** 20 DAYS

Section 3 - Well Location Table

Survey Type RECTANGULAR

Describe Survey Type

Datum NAD83 **Vertical Datum** NGVD29

Survey number 5310B

	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	660	FSL	355	FWL	15S	29E	20	Aliquot SWSW	32.995992	-104.058064	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 131583	3757	0	0
KOP Leg #1	660	FSL	355	FWL	15S	29E	20	Aliquot SWSW	32.995992	-104.058064	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 131583	1163	2594	2594
PPP Leg #1	40	FNL	355	FWL	15S	29E	29	Aliquot NWNW	32.994083	-104.058062	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 131583	790	3000	2967

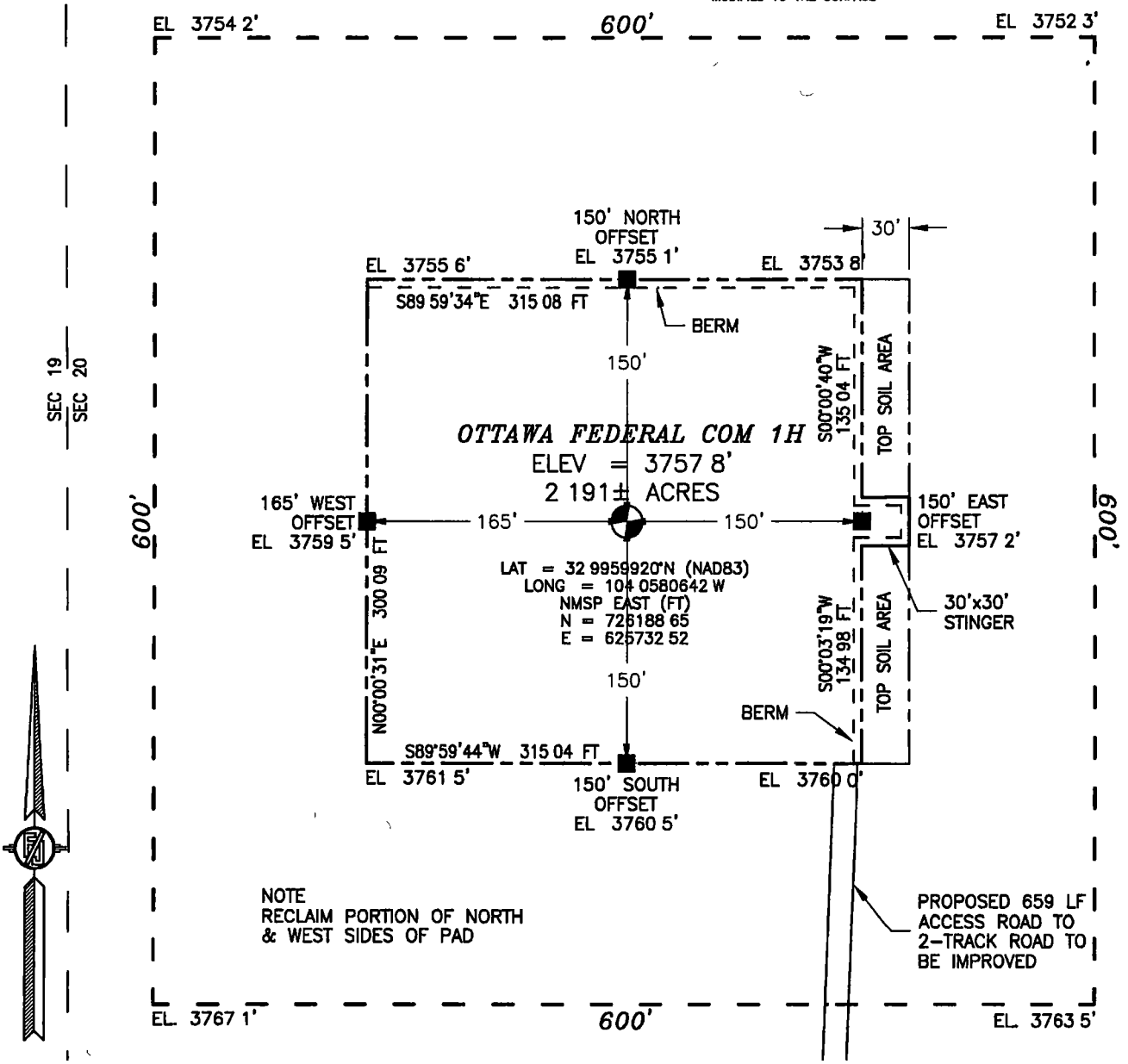
Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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	100	FSL	355	FWL	15S	29E	29	Aliquot SWSW	32 9869756	-104 0421225	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 131583	525	7900	3232
BHL Leg #1	5	FSL	355	FWL	15S	29E	29	Aliquot SWSW	32 9797558	-104 0582943	CHAVES	NEW MEXICO	NEW MEXICO	F	NMNM 131583	522	8084	3235

SECTION 20, 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



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HIGHWAY 82 AND CR 217 (HAGERMAN CUT-OFF ROAD) GO NORTH ON CR 217 FOR APPROX 10 0 MILES (TO CHAVES CO LINE) GO WEST ON 20 CALICHE LEASE ROAD APRROX 3 8 MILES, GO NORTH ON 15' CALICHE LEASE ROAD FOR APROX 0 4 OF A MILE TO END OF CALICHE LEASE ROAD, CONTINUE NORTH-NORTHEAST ON 2-TRACK ROAD FOR APPROX 0 2 OF A MILE TO BEGIN ROAD SURVEY, FOLLOW ROAD SURVEY NORTH APPROX. 659' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION

MACK ENERGY CORPORATION

OTTAWA FEDERAL COM 1H

LOCATED 660 FT FROM THE SOUTH LINE AND 355 FT FROM THE WEST LINE OF SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M

CHAVES COUNTY, STATE OF NEW MEXICO

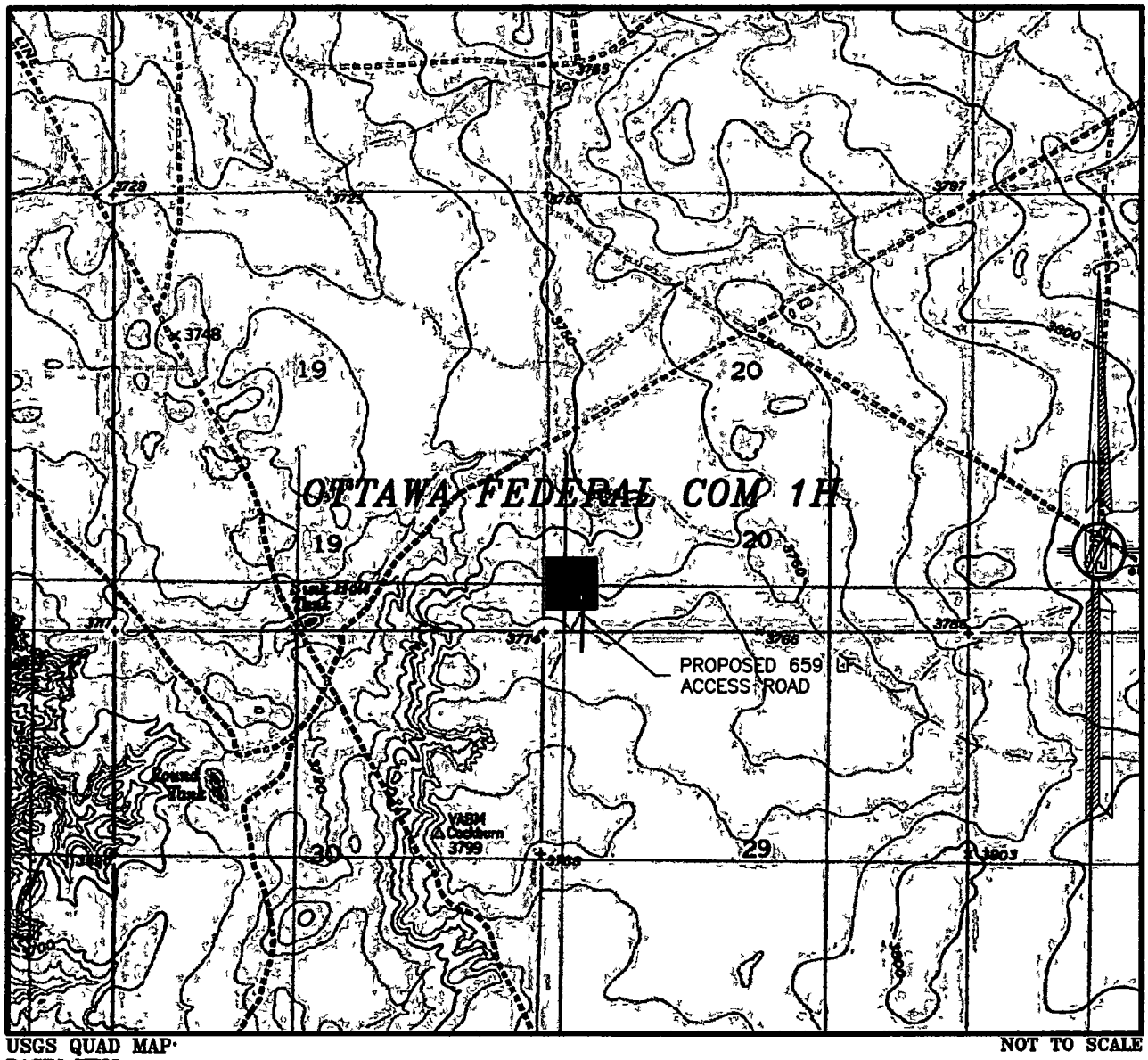
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP
BASIN WELL

NOT TO SCALE

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE
AND 355 FT FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

MARCH 1, 2018

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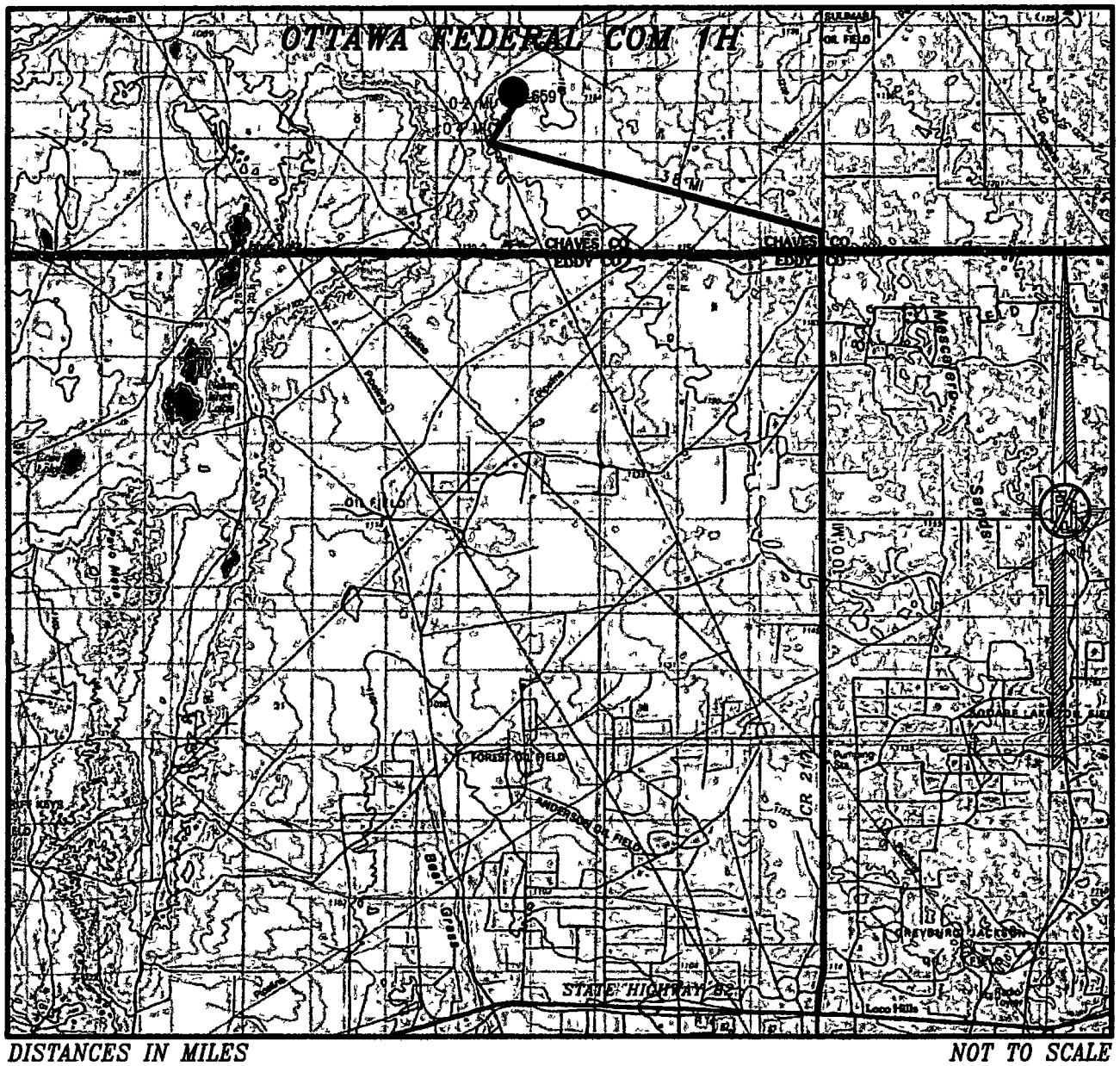
MADRON SURVEYING, INC 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

SECTION 20, 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 82 AND CR 217 (HAGERMAN CUT-OFF ROAD) GO NORTH ON CR 217 FOR APPROX. 10 0 MILES (TO CHAVES CO LINE) GO WEST ON 20' CALICHE LEASE ROAD APRROX 3 8 MILES, GO NORTH ON 15 CALICHE LEASE ROAD FOR APROX 0 4 OF A MILE TO END OF CALICHE LEASE ROAD CONTINUE NORTH-NORTHEAST ON 2-TRACK ROAD FOR APPROX. 0.2 OF A MILE TO BEGIN ROAD SURVEY, FOLLOW ROAD SURVEY NORTH APPROX 659' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE AND 355 FT FROM THE WEST LINE OF SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M CHAVES COUNTY, STATE OF NEW MEXICO

MARCH 1, 2018

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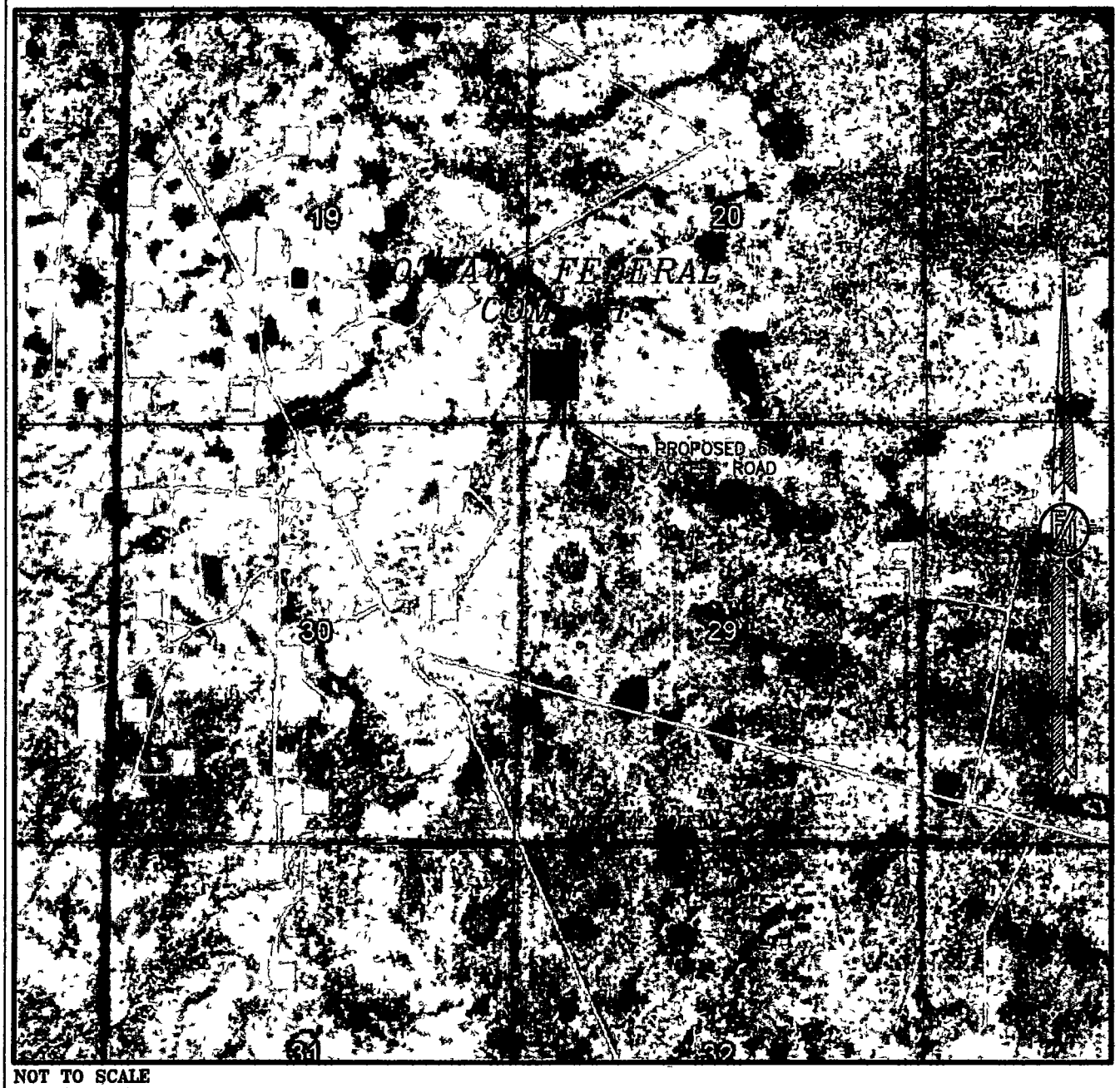
MADRON SURVEYING, INC 301 SOUTH CANAL (575) 234-3341 *CARLSBAD, NEW MEXICO*

SECTION 20, 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
FEBRUARY 2017

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE
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SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

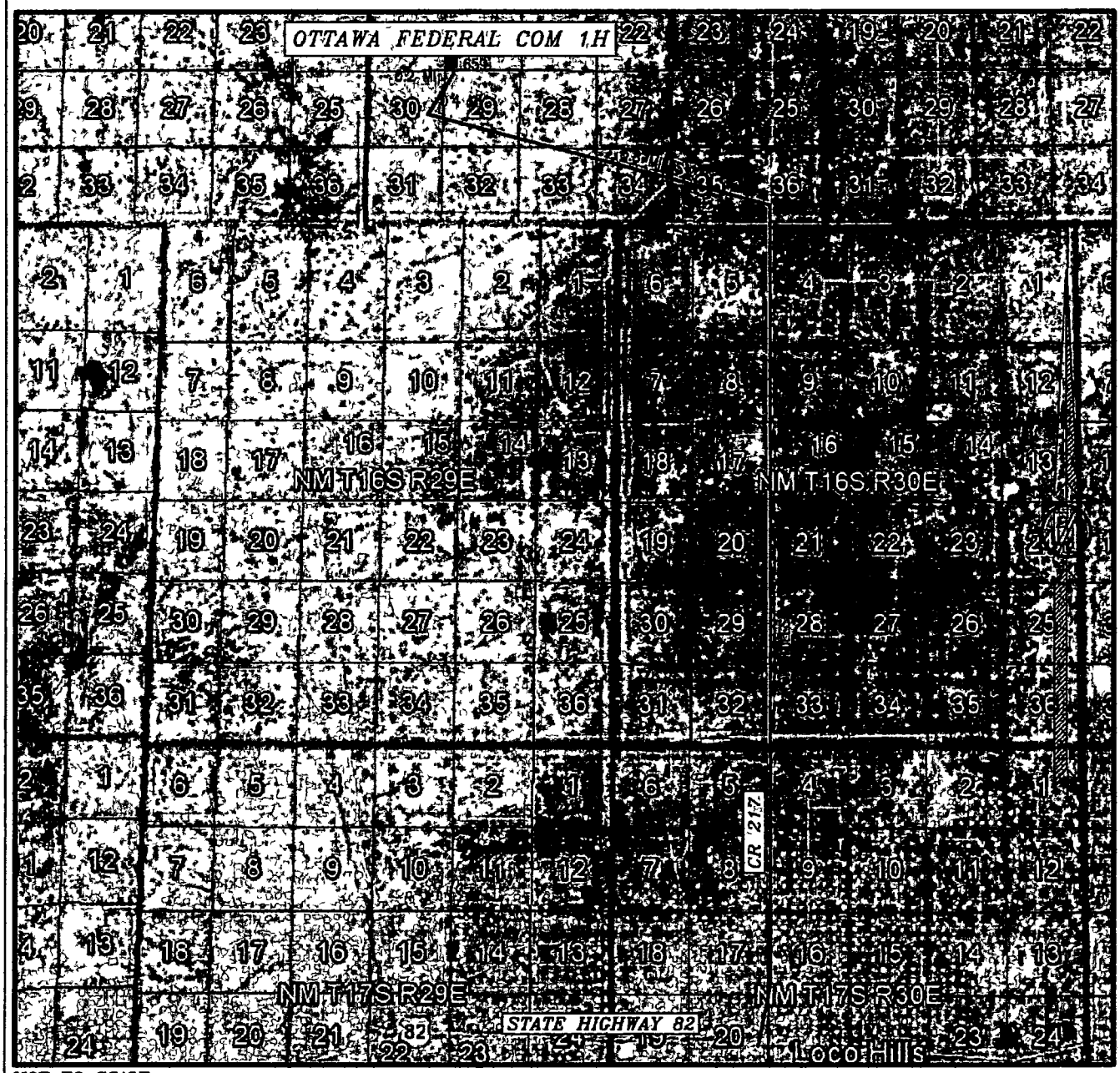
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, 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
FEBRUARY 2017

MACK ENERGY CORPORATION

OTTAWA FEDERAL COM 1H

LOCATED 660 FT FROM THE SOUTH LINE
AND 355 FT FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

MARCH 1, 2018

SURVEY NO 5310B

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

APD ID 10400028377 **Submission Date** 03/19/2018

Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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	3767	0	0	ALLUVIUM	NONE	No
2	TOP OF SALT	3517	250	250	SALT	NONE	No
3	BASE OF SALT	3077	690	690	SALT	NONE	No
4	YATES	2932	835	835	ANHYDRITE SILTSTONE	NATURAL GAS OIL	No
5	SEVEN RIVERS	2697	1070	1070	ANHYDRITE SILTSTONE	NATURAL GAS OIL	No
6	QUEEN	2207	1560	1560	ANHYDRITE SILTSTONE	NATURAL GAS OIL	No
7	GRAYBURG	1812	1955	1955	DOLOMITE ANHYDRITE SILTSTONE	NATURAL GAS OIL	No
8	SAN ANDRES	1512	2255	2255	DOLOMITE ANHYDRITE	NATURAL GAS OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI) 3M **Rating Depth** 10500

Equipment Rotating Head, Mud-Gas Separator

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 a test plug and 30 minutes without a test plug

Choke Diagram Attachment

choke_manifold_08-22-2017 pdf

choke_manifold_diagram_08-22-2017 pdf

BOP Diagram Attachment

bop_diagram_08-22-2017 pdf

Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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	230	0	230	3767	3537	230	J-55	36	STC	17 593	6 933	BUOY	55 777	BUOY	7 04
2	PRODUCTION	8 75	7 0	NEW	API	N	0	3300	0	3300			3300	HCP-110	26	LTC	4 351	3 355	BUOY	8 577	BUOY	3 343
3	PRODUCTION	8 75	5 5	NEW	API	N	3300	7916	3300	7916			4616	HCP-110	17	BUTT	5 131	3 647	BUOY	8 577	BUOY	3 588

Casing Attachments

Casing ID 1 **String Type** SURFACE

Inspection Document

Spec Document

Tapered String Spec

Casing Design Assumptions and Worksheet(s)

Ottawa_Fed_Csg_20180316102202 pdf

Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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)

Ottawa_Fed_Csg_20180316102215 pdf

Casing ID 3 **String Type** PRODUCTION

Inspection Document

Spec Document

Tapered String Spec

Casing Design Assumptions and Worksheet(s)

Ottawa_Fed_Csg_20180316102234 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	230	0	230	100	1 61	14 4	157		RFC + 12% PF53 + 2%PF1+5ppsPF4 2+ 125ppsPF29	20bbls Gelled Water, 50sx of 11# Scavenger Cement
SURFACE	Tail		0	230	250	1 34	14 8	0	100	Class C + 1% PF1	20bbls Gelled Water, 50sx of 11# Scavenger Cement
PRODUCTION	Lead	3300	0	3300	430	1 84	13 2	9 91	35	Class "C" 4% PF20+4 pps PF45+125pps PF29	20bbls Gelled water 20bbls Chemical wash, 50 sx of 11# Scavenger cmt

Operator Name MACK ENERGY CORPORATION

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

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
PRODUCTION	Lead	7916	3300	7916	1300	1 48	13	7 58	35	PVL + 1 3 (BWOW) PF44 +5% PF174+ 5% PF606+ 1% PF153+ 4pps PF44	20 bbls gelled water, 20 bbls chemical wash, 50sx of 11# scavenger cement

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
230	7916	LSND/GEL	8 3	10	74 8		11		160000	10	Gel Strength - 0-1 0 Viscosity - 34-38
0	230	SPUD MUD	8 3	10	74 8		11		160000	10	Gel Strength- 0-1 Viscosity - 34-38

Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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,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 1720 **Anticipated Surface Pressure** 1008.3

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

Ottawa_Federal_Com__1H_Plan__1_20180315150036.pdf
ottawa_drill_plan_20180316144038.pdf

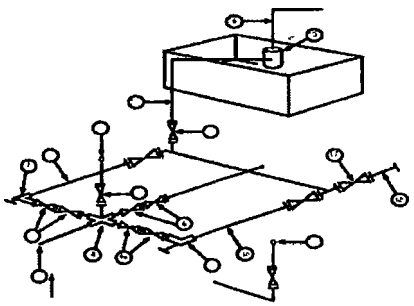
Other proposed operations facets description

Other proposed operations facets attachment

Other Variance attachment

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			5,000 MWP			10,000 MWP		
		I D	Nominal	Rating	I D	Nominal	Rating	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

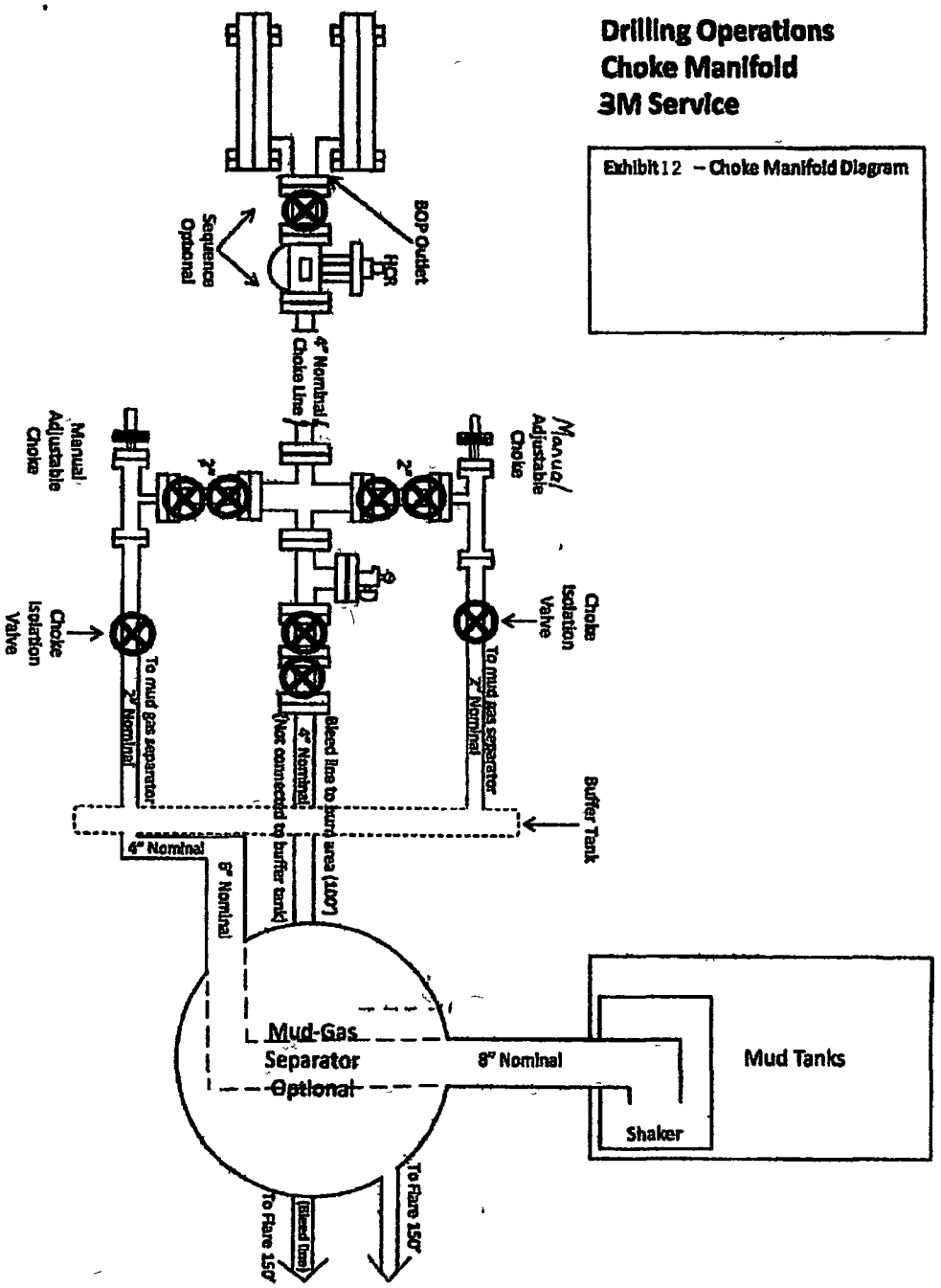
EQUIPMENT SPECIFICATIONS AND INSTALLATION INSTRUCTION

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

MANIFOLD SCHEMATIC

Exhibit #12



Mack Energy Corporation

Minimum Blowout Preventer Requirements

5000 psi Working Pressure

13 5/8 inch- 5 MWP

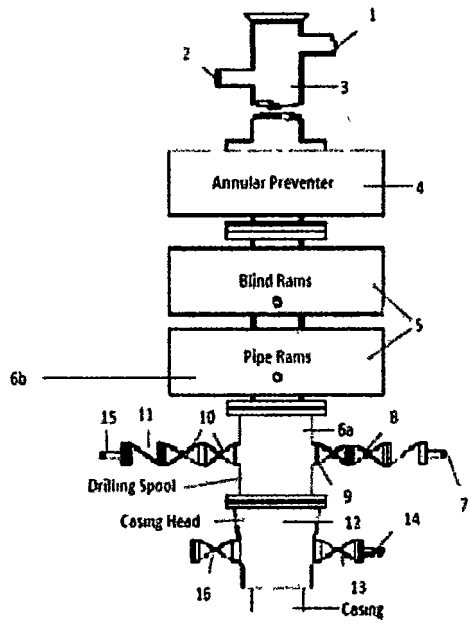
11 Inch - 5 MWP

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
10
ME

MEC TO FURNISH

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

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.

Casing Design Well Ottawa Federal Com #1H

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

Total Depth 230 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 114 816 psi Burst 114 816 psi joint strength 114.816 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure. 500 psi

1st segment	230 ft to 0 ft			Make up Torque ft lbs		Total ft = 230
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 230

230 ft to 0 ft			
9 625	0 J-55	ST&C	

	S.F	Actual		Desire
	collapse	17 59337	>=	1 125
	burst-b	6 97328	>=	1 25
	burst-t	7 04		

Top of segment 1 (ft) 0

Select 2nd segment from bottom

0 ft to 0 ft			
0	0	0	0

	S.F	Actual		Desire
	collapse	#DIV/0!	>=	1 125
	burst-b	0	>=	1 25
	burst-t	0		
	jnt strngth	55.77708	>=	1 8

Casing Design **Well** Ottawa Federal Com #1H

String Size & Function 7"x 5 1/2" in **Production** x

Total Depth. 7916 ft **TVD** 3159 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 1672.351 psi Burst 1672.351 psi Joint strength 1672.351 psi

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

Max Shut In surface pressure: 3000 psi

1st segment	7916 ft to 3300 ft		Make up Torque ft-lbs			Total ft = 4616
O D	Weight	Grade Threads	opt.	min.	mx.	
5.5 inches	17 #/ft	HCP-110 Buttress	4,620	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength	Body Yield		Drift	
6,580 psi	10,640 psi-Ircr	568 000 #	546 000 #		4.767	

2nd segment	3300 ft to 2300 ft		Make up Torque ft lbs			Total ft = 1000
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-Ircr	853 000 #	830 000 #		6 151	

3rd segment	2300 ft to 0 ft		Make up Torque ft-lbs			Total ft = 2300
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	8084	S F	Actual		Desire
		collapse	5 130501	>=	1 125
7916 ft to 3300 ft		burst-b	3 646741	>=	1.25
5 5 26 HCP 110 Buttress		burst t	3 58771		
Top of segment 1 (ft)	3300	S F	Actual		Desire
Select 2nd segment from bottom		collapse	4 350634	>=	1 125
		burst-b	3 355048	>=	1.25
3300 ft to 2300 ft		burst-t	3 343324		
7 26 HCP 110 Buttress		jnt strngth	8 576736	>=	1 8

	Top of segment 2 (ft)	2300	S F	Actual		Desire
Select	3rd segment from bottom		collapse	6 183546	>=	1 125
			burst-b	3 343324	>=	1 25
2300 ft	to 0 ft		burst-t	3 316667		
7	26 HCP-110 LT&C		jnt strngth	9 674701	>=	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	7 85999	>=	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 71364
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.	764 706
S F Body yield strength top of segment:	8.24454

Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse	0 84394	
calculations for bottom of segment @	3153 ft	
hydrostatic pressure collapse backside	1672 35 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 1940
Adjusted collapse rating of segment.	8580 psi	
Actual safety factor	5 1305	adjusted casing rating / actual pressure

Casing Design Well Ottawa Federal Com #1H

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

Total Depth 230 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 114 816 psi Burst 114 816 psi joint strength 114.816 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure. 500 psi

1st segment	230 ft to 0 ft			Make up Torque ft-lbs		Total ft = 230
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 230

230 ft	to	0 ft	
9 625	0	J-55	ST&C

S.F	Actual		Desire
collapse	17 59337	>=	1 125
burst-b	6 97328	>=	1 25
burst t	7 04		

Top of segment 1 (ft) 0

Select 2nd segment from bottom

0 ft	to	0 ft	
0	0	0	0

S.F	Actual		Desire
collapse	#DIV/0!	>=	1 125
burst-b	0	>=	1 25
burst t	0		
jnt strngth	55 77708	>=	1 8

Casing Design Well Ottawa Federal Com #1H

String Size & Function 7"x 5 1/2" in Production x

Total Depth. 7916 ft TVD 3159 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 1672.351 psi Burst 1672.351 psi Joint strength 1672.351 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure. 3000 psi

1st segment	7916 ft to 3300 ft			Make up Torque ft-lbs			Total ft = 4616
O D	Weight	Grade	Threads	opt.	min	mx.	
5.5 inches	17 #/ft	HCP-110	Buttress	4,620	3,470	5,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
6,580 psi	10,640 psi-incr	588 000 #		646 000 #		4.767	

2nd segment	3300 ft to 2300 ft			Make up Torque ft-lbs			Total ft = 1000
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	9,960 psi-incr	853 000 #		830 000 #		6 151	

3rd segment	2300 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2300
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		8084	S.F	Actual		Desire
			collapse	5 130501	>=	1 125
7916 ft to 3300 ft			burst-b	3 646741	>=	1 25
5 5	26 HCP 110 Buttress		burst-t	3 58771		
	Top of segment 1 (ft)	3300	S.F	Actual		Desire
Select 2nd segment from bottom			collapse	4 350634	>=	1 125
			burst-b	3 355048	>=	1.25
3300 ft to 2300 ft			burst-t	3 343324		
7	26 HCP-110 Buttress		jnt strngth	8 576736	>=	1.8

	Top of segment 2 (ft)	2300	S F	Actual		Desire
Select	3rd segment from bottom		collapse	6 183546	>=	1 125
			burst-b	3 343324	>=	1.25
2300 ft	to 0 ft		burst t	3 316667		
7	26 HCP-110 LT&C		jnt strngth	9 674701	>=	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	7 85999	>=	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
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S F Collapse bottom of segment	
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Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse	0 84394	
calculations for bottom of segment @	3153 ft	
hydrostatic pressure collapse backside	1672 35 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 1940
Adjusted collapse rating of segment	8580 psi	
Actual safety factor	5 1305	adjusted casing rating / actual pressure

Casing Design Well Ottawa Federal Com #1H

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

Total Depth 230 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 114 816 psi Burst 114 816 psi joint strength 114.816 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut in surface pressure. 500 psi

1st segment	230 ft to	0 ft	Make up Torque ft-lbs	Total ft = 230
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 230

230 ft to 0 ft			
9 625	0 J-55	ST&C	

S.F	Actual		Desire
collapse	17 59337	>=	1 125
burst-b	6 97328	>=	1.25
burst t	7 04		

Top of segment 1 (ft) 0

Select 2nd segment from bottom

0 ft to 0 ft			
0	0	0	0

S F	Actual		Desire
collapse	#DIV/0!	>=	1 125
burst-b	0	>=	1 25
burst-t	0		
jnt strngth	55 77708	>=	1 8

Casing Design Well Ottawa Federal Com #1H

String Size & Function 7"x 5 1/2" in Production x

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

BHP @ TD for collapse 1672.351 psi Burst 1672.351 psi joint strength 1672.351 psi

Partially evacuated hole? Pressure gradient remaining 10 #/gal

Max Shut In surface pressure 3000 psi

1st segment	7916 ft to 3300 ft			Make up Torque ft-lbs			Total ft = 4616
O D	Weight	Grade	Threads	opt.	min	mx.	
5.5 inches	17 #/ft	HCP-110	Buttress	4,820	3,470	6,780	
Collapse Resistance	Internal Yield	Joint Strength		Body Yield		Drift	
6,580 psi	10,640 psi-lncr	588 000 #		546 000 #		4.767	

2nd segment	3300 ft to 2300 ft			Make up Torque ft-lbs			Total ft = 1000
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-lncr	853 000 #		830 000 #		6.151	

3rd segment	2300 ft to 0 ft			Make up Torque ft-lbs			Total ft = 2300
O D	Weight	Grade	Threads	opt	min	mx	
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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		8084	S F	Actual		Desire
			collapse	5 130501	>=	1 125
7916 ft to 3300 ft			burst-b	3 646741	>=	1 25
5 5	26 HCP 110 Buttress		burst t	3 58771		
	Top of segment 1 (ft)	3300	S F	Actual		Desire
Select 2nd segment from bottom			collapse	4 350634	>=	1 125
			burst-b	3 355048	>=	1.25
3300 ft to 2300 ft			burst-t	3 343324		
7	26 HCP-110 Buttress		jnt strngth	8 576736	>=	1 8

	Top of segment 2 (ft)	2300	S F	Actual		Desire
Select	3rd segment from bottom		collapse	6 183546	>=	1 125
			burst b	3 343324	>=	1 25
2300 ft to 0 ft			burst-t	3 316867		
7	26 HCP-110 LT&C		jnt strngth	9 674701	>=	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	7 85999	>=	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			
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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
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S F Collapse bottom of segment	
S F Collapse top of segment	4 71364
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.	764 706
S F Body yield strength top of segment	8.24454

Collapse calculations for 1st segment - casing evacuated

Buoyancy factor collapse	0 84394	
calculations for bottom of segment @	3153 ft	
hydrostatic pressure collapse backside	1672 35 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 1940
Adjusted collapse rating of segment.	8580 psi	
Actual safety factor	5 1305	adjusted casing rating / actual pressure

Ottawa Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft		11 14 Thursday, March 15 2018 Page 1 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	180 62
Well Name	Ottawa Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 660 FSL & 355 FWL Sec 20-T15S R29E FSL & 355 FWL Sec 29-T15S R29E	BHL 5	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929250 6	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11978401 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3779 3	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3757 8	**Local North Ref** Grid

DIRECTIONAL WELL PLAN

MD*	INC*	AZI*	TVD*	N*	E*	DLS*	V. S *	MapE*	MapN*	SysTVD*
	ft	deg	ft	ft	ft	°/100ft	ft	ft	ft	ft
*** TIE (at MD = 2265 00)										
2265 00	0 00	0 0	2265 00	0 00	0 00		0 00	1929250 60	11978401 90	1514 30
2300 00	0 00	0 0	2300 00	0 00	0 00	0 00	0 00	1929250 60	11978401 90	1479 30
2350 00	0 00	0 0	2350 00	0 00	0 00	0 00	0 00	1929250 60	11978401 90	1429 30
*** KOP 8 DEGREE BUILD (at MD = 2365 00)										
2365 00	0 00	0 0	2365 00	0 00	0 00	0 00	0 00	1929250 60	11978401 90	1414 30
2400 00	2 80	180 6	2399 99	-0 86	-0 01	8 00	0 86	1929250 59	11978401 05	1379 31
2450 00	6 80	180 6	2449 80	-5 04	-0 05	8 00	5 04	1929250 55	11978396 86	1329 50
2500 00	10 80	180 6	2499 20	-12 69	-0 14	8 00	12 69	1929250 46	11978389 21	1280 10
2550 00	14 80	180 6	2547 95	-23 76	-0 26	8 00	23 76	1929250 34	11978378 14	1231 35
2600 00	18 80	180 6	2595 81	-38 21	-0 41	8 00	38 21	1929250 19	11978363 69	1183 49
2650 00	22 80	180 6	2642 54	-55 96	-0 61	8 00	55 96	1929249 99	11978345 94	1136 76
2700 00	26 80	180 6	2687 92	-76 93	-0 83	8 00	76 93	1929249 77	11978324 97	1091 38
2750 00	30 80	180 6	2731 72	-101 01	-1 09	8 00	101 01	1929249 51	11978300 89	1047 58
2800 00	34 80	180 6	2773 74	-128 08	-1 39	8 00	128 09	1929249 21	11978273 82	1005 56
2850 00	38 80	180 6	2813 77	-158 03	-1 71	8 00	158 04	1929248 89	11978243 87	965 53
2900 00	42 80	180 6	2851 61	-190 69	-2 06	8 00	190 70	1929248 54	11978211 21	927 69
2950 00	46 80	180 6	2887 09	-225 91	-2 44	8 00	225 93	1929248 16	11978175 99	892 21
3000 00	50 80	180 6	2920 01	-263 52	-2 85	8 00	263 54	1929247 75	11978138 38	859 29
3050 00	54 80	180 6	2950 24	-303 34	-3 28	8 00	303 36	1929247 32	11978098 56	829 06
*** 55 DEGREE TANGENT (at MD = 3052 50)										
3052 50	55 00	180 6	2951 67	-305 39	-3 30	8 00	305 40	1929247 30	11978096 51	827 63
3100 00	55 00	180 6	2978 92	-344 29	-3 73	0 00	344 31	1929246 87	11978057 61	800 38
3150 00	55 00	180 6	3007 60	-385 25	-4 17	0 00	385 27	1929246 43	11978016 65	771 70
3200 00	55 00	180 6	3036 28	-426 20	-4 61	0 00	426 23	1929245 99	11977975 70	743 02
3250 00	55 00	180 6	3064 96	-467 16	-5 06	0 00	467 19	1929245 54	11977934 74	714 34
*** 12 DEGREE BUILD (at MD = 3252 50)										
3252 50	55 00	180 6	3066 39	-469 21	-5 08	0 00	469 23	1929245 52	11977932 69	712 91
3300 00	60 70	180 6	3091 66	-509 40	-5 51	12 00	509 43	1929245 09	11977892 50	687 64
3350 00	66 70	180 6	3113 80	-554 20	-6 00	12 00	554 24	1929244 60	11977847 70	665 50
3400 00	72 70	180 6	3131 14	-601 08	-6 50	12 00	601 11	1929244 10	11977800 82	648 16
3450 00	78 70	180 6	3143 48	-649 50	-7 03	12 00	649 54	1929243 57	11977752 40	635 82
3500 00	84 70	180 6	3150 70	-698 95	-7 56	12 00	698 99	1929243 04	11977702 95	628 60
*** LANDING POINT (at MD = 3548 33)										
3548 33	90 50	180 6	3152 72	-747 22	-8 09	12 00	747 26	1929242 51	11977654 68	626 58
3550 00	90 50	180 6	3152 71	-748 89	-8 10	0 00	748 93	1929242 50	11977653 01	626 59
3600 00	90 50	180 6	3152 27	-798 88	-8 65	0 00	798 93	1929241 95	11977603 02	627 03
3650 00	90 50	180 6	3151 83	-848 88	-9 19	0 00	848 93	1929241 41	11977553 02	627 47
3700 00	90 50	180 6	3151 40	-898 87	-9 73	0 00	898 92	1929240 87	11977503 03	627 90

Ottawa Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	11 14 Thursday March 15, 2018	Page 2 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	180 62
Well Name	Ottawa Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 660 FSL & 355 FWL Sec 20-T15S R29E BHL 5 FSL & 355 FWL Sec 29 T15S-R29E	**Map Zone**	UTM	**Lat Long Ref**	
Site		**Surface X**	1929250 6	**Surface Long**	
Slot Name	**UWI**	**Surface Y**	11978401 9	**Surface Lat**	
Well Number	**API**	**Surface Z**	3779 3	**Global Z Ref**	Mean Sea Level
Project	**MD/TVD Ref** KB	**Ground Level**	3757 8	**Local North Ref**	Grid

DIRECTIONAL WELL PLAN

MD* ft	INC* deg	AZI* deg	TVD* ft	N* ft	E* ft	DLS* °/100ft	V. S * ft	MapE* ft	MapN* ft	SysTVD* ft
3750 00	90 50	180 6	3150 96	-948 87	-10 27	0 00	948 92	1929240 33	11977453 03	628 34
3800 00	90 50	180 6	3150 52	-998 86	-10 81	0 00	998 92	1929239 79	11977403 04	628 78
3850 00	90 50	180 6	3150 09	-1048 86	-11 35	0 00	1048 92	1929239 25	11977353 04	629 21
3900 00	90 50	180 6	3149 65	-1098 85	-11 89	0 00	1098 92	1929238 71	11977303 05	629 65
3950 00	90 50	180 6	3149 21	-1148 85	-12 43	0 00	1148 91	1929238 17	11977253 05	630 09
4000 00	90 50	180 6	3148 78	-1198 84	-12 97	0 00	1198 91	1929237 63	11977203 06	630 52
4050 00	90 50	180 6	3148 34	-1248 84	-13 51	0 00	1248 91	1929237 09	11977153 06	630 96
4100 00	90 50	180 6	3147 91	-1298 83	-14 06	0 00	1298 91	1929236 54	11977103 07	631 39
4150 00	90 50	180 6	3147 47	-1348 83	-14 60	0 00	1348 91	1929236 00	11977053 07	631 83
4200 00	90 50	180 6	3147 03	-1398 82	-15 14	0 00	1398 90	1929235 46	11977003 08	632 27
4250 00	90 50	180 6	3146 60	-1448 82	-15 68	0 00	1448 90	1929234 92	11976953 08	632 70
4300 00	90 50	180 6	3146 16	-1498 81	-16 22	0 00	1498 90	1929234 38	11976903 09	633 14
4350 00	90 50	180 6	3145 72	-1548 81	-16 76	0 00	1548 90	1929233 84	11976853 09	633 58
4400 00	90 50	180 6	3145 29	-1598 80	-17 30	0 00	1598 90	1929233 30	11976803 10	634 01
4450 00	90 50	180 6	3144 85	-1648 80	-17 84	0 00	1648 90	1929232 76	11976753 10	634 45
4500 00	90 50	180 6	3144 42	-1698 79	-18 38	0 00	1698 89	1929232 22	11976703 11	634 88
4550 00	90 50	180 6	3143 98	-1748 79	-18 92	0 00	1748 89	1929231 68	11976653 11	635 32
4600 00	90 50	180 6	3143 54	-1798 78	-19 47	0 00	1798 89	1929231 13	11976603 12	635 76
4650 00	90 50	180 6	3143 11	-1848 78	-20 01	0 00	1848 89	1929230 59	11976553 12	636 19
4700 00	90 50	180 6	3142 67	-1898 77	-20 55	0 00	1898 89	1929230 05	11976503 13	636 63
4750 00	90 50	180 6	3142 23	-1948 77	-21 09	0 00	1948 88	1929229 51	11976453 13	637 07
4800 00	90 50	180 6	3141 80	-1998 77	-21 63	0 00	1998 88	1929228 97	11976403 14	637 50
4850 00	90 50	180 6	3141 36	-2048 76	-22 17	0 00	2048 88	1929228 43	11976353 14	637 94
4900 00	90 50	180 6	3140 92	-2098 76	-22 71	0 00	2098 88	1929227 89	11976303 14	638 38
4950 00	90 50	180 6	3140 49	-2148 75	-23 25	0 00	2148 88	1929227 35	11976253 15	638 81
5000 00	90 50	180 6	3140 05	-2198 75	-23 79	0 00	2198 87	1929226 81	11976203 15	639 25
5050 00	90 50	180 6	3139 62	-2248 74	-24 33	0 00	2248 87	1929226 27	11976153 16	639 68
5100 00	90 50	180 6	3139 18	-2298 74	-24 88	0 00	2298 87	1929225 72	11976103 16	640 12
5150 00	90 50	180 6	3138 74	-2348 73	-25 42	0 00	2348 87	1929225 18	11976053 17	640 56
5200 00	90 50	180 6	3138 31	-2398 73	-25 96	0 00	2398 87	1929224 64	11976003 17	640 99
5250 00	90 50	180 6	3137 87	-2448 72	-26 50	0 00	2448 86	1929224 10	11975953 18	641 43
5300 00	90 50	180 6	3137 43	-2498 72	-27 04	0 00	2498 86	1929223 56	11975903 18	641 87
5350 00	90 50	180 6	3137 00	-2548 71	-27 58	0 00	2548 86	1929223 02	11975853 19	642 30
5400 00	90 50	180 6	3136 56	-2598 71	-28 12	0 00	2598 86	1929222 48	11975803 19	642 74
5450 00	90 50	180 6	3136 13	-2648 70	-28 66	0 00	2648 86	1929221 94	11975753 20	643 17
5500 00	90 50	180 6	3135 69	-2698 70	-29 20	0 00	2698 86	1929221 40	11975703 20	643 61
5550 00	90 50	180 6	3135 25	-2748 69	-29 74	0 00	2748 85	1929220 86	11975653 21	644 05

Ottawa Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft		11 14 Thursday, March 15, 2018 Page 3 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	180 62
Well Name	Ottawa Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 660 FSL & 355 FWL Sec 20-T15S-R29E FSL & 355 FWL Sec 29 T15S-R29E	BHL 5	**Map Zone**	UTM	**Lat Long Ref**
Site			**Surface X**	1929250 6	**Surface Long**
Slot Name		**UWI**	**Surface Y**	11978401 9	**Surface Lat**
Well Number		**API**	**Surface Z**	3779 3	**Global Z Ref** Mean Sea Level
Project		**MD/TVD Ref** KB	**Ground Level**	3757 8	**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
5600 00	90 50	180 6	3134 82	-2798 69	-30 29	0 00	2798 85	1929220 31	11975603 21	644 48
5650 00	90 50	180 6	3134 38	-2848 68	-30 83	0 00	2848 85	1929219 77	11975553 22	644 92
5700 00	90 50	180 6	3133 94	-2898 68	-31 37	0 00	2898 85	1929219 23	11975503 22	645 36
5750 00	90 50	180 6	3133 51	-2948 67	-31 91	0 00	2948 85	1929218 69	11975453 23	645 79
5800 00	90 50	180 6	3133 07	-2998 67	-32 45	0 00	2998 84	1929218 15	11975403 23	646 23
5850 00	90 50	180 6	3132 63	-3048 66	-32 99	0 00	3048 84	1929217 61	11975353 24	646 67
5900 00	90 50	180 6	3132 20	-3098 66	-33 53	0 00	3098 84	1929217 07	11975303 24	647 10
5950 00	90 50	180 6	3131 76	-3148 65	-34 07	0 00	3148 84	1929216 53	11975253 25	647 54
6000 00	90 50	180 6	3131 33	-3198 65	-34 61	0 00	3198 84	1929215 99	11975203 25	647 97
6050 00	90 50	180 6	3130 89	-3248 64	-35 16	0 00	3248 83	1929215 44	11975153 26	648 41
6100 00	90 50	180 6	3130 45	-3298 64	-35 70	0 00	3298 83	1929214 90	11975103 26	648 85
6150 00	90 50	180 6	3130 02	-3348 63	-36 24	0 00	3348 83	1929214 36	11975053 27	649 28
6200 00	90 50	180 6	3129 58	-3398 63	-36 78	0 00	3398 83	1929213 82	11975003 27	649 72
6250 00	90 50	180 6	3129 14	-3448 62	-37 32	0 00	3448 83	1929213 28	11974953 28	650 16
6300 00	90 50	180 6	3128 71	-3498 62	-37 86	0 00	3498 82	1929212 74	11974903 28	650 59
6350 00	90 50	180 6	3128 27	-3548 62	-38 40	0 00	3548 82	1929212 20	11974853 28	651 03
6400 00	90 50	180 6	3127 83	-3598 61	-38 94	0 00	3598 82	1929211 66	11974803 29	651 47
6450 00	90 50	180 6	3127 40	-3648 61	-39 48	0 00	3648 82	1929211 12	11974753 29	651 90
6500 00	90 50	180 6	3126 96	-3698 60	-40 02	0 00	3698 82	1929210 58	11974703 30	652 34
6550 00	90 50	180 6	3126 53	-3748 60	-40 57	0 00	3748 82	1929210 03	11974653 30	652 77
6600 00	90 50	180 6	3126 09	-3798 59	-41 11	0 00	3798 81	1929209 49	11974603 31	653 21
6650 00	90 50	180 6	3125 65	-3848 59	-41 65	0 00	3848 81	1929208 95	11974553 31	653 65
6700 00	90 50	180 6	3125 22	-3898 58	-42 19	0 00	3898 81	1929208 41	11974503 32	654 08
6750 00	90 50	180 6	3124 78	-3948 58	-42 73	0 00	3948 81	1929207 87	11974453 32	654 52
6800 00	90 50	180 6	3124 34	-3998 57	-43 27	0 00	3998 81	1929207 33	11974403 33	654 96
6850 00	90 50	180 6	3123 91	-4048 57	-43 81	0 00	4048 80	1929206 79	11974353 33	655 39
6900 00	90 50	180 6	3123 47	-4098 56	-44 35	0 00	4098 80	1929206 25	11974303 34	655 83
6950 00	90 50	180 6	3123 04	-4148 56	-44 89	0 00	4148 80	1929205 71	11974253 34	656 26
7000 00	90 50	180 6	3122 60	-4198 55	-45 43	0 00	4198 80	1929205 17	11974203 35	656 70
7050 00	90 50	180 6	3122 16	-4248 55	-45 98	0 00	4248 80	1929204 62	11974153 35	657 14
7100 00	90 50	180 6	3121 73	-4298 54	-46 52	0 00	4298 79	1929204 08	11974103 36	657 57
7150 00	90 50	180 6	3121 29	-4348 54	-47 06	0 00	4348 79	1929203 54	11974053 36	658 01
7200 00	90 50	180 6	3120 85	-4398 53	-47 60	0 00	4398 79	1929203 00	11974003 37	658 45
7250 00	90 50	180 6	3120 42	-4448 53	-48 14	0 00	4448 79	1929202 46	11973953 37	658 88
7300 00	90 50	180 6	3119 98	-4498 52	-48 68	0 00	4498 79	1929201 92	11973903 38	659 32
7350 00	90 50	180 6	3119 54	-4548 52	-49 22	0 00	4548 78	1929201 38	11973853 38	659 76
7400 00	90 50	180 6	3119 11	-4598 51	-49 76	0 00	4598 78	1929200 84	11973803 39	660 19

Ottawa Federal Com #1H, Plan 1

Operator	Mack Energy Corp	**Units**	feet, °/100ft	11 14 Thursday March 15, 2018	Page 4 of 4
Field	Round Tank	**County**	Chaves	**Vertical Section Azimuth**	180 62
Well Name	Ottawa Federal Com #1H	**State**	New Mexico	**Survey Calculation Method**	Minimum Curvature
Plan	1	**Country**	USA	**Database**	Access

Location	SL 660 FSL & 355 FWL Sec 20-T15S-R29E BHL 5 FSL & 355 FWL Sec 29-T15S-R29E	**Map Zone**	UTM	**Lat Long Ref**	
Site		**Surface X**	1929250 6	**Surface Long**	
Slot Name	**UWI**	**Surface Y**	11978401 9	**Surface Lat**	
Well Number	**API**	**Surface Z**	3779 3	**Global Z Ref**	Mean Sea Level
Project	**MD/TVD Ref** KB	**Ground Level**	3757 8	**Local North Ref**	Grid

DIRECTIONAL WELL PLAN

MD* ft	INC* deg	AZI* deg	TVD* ft	N* ft	E* ft	DLS* °/100ft	V. S.* ft	MapE* ft	MapN* ft	SysTVD* ft
7450 00	90 50	180 6	3118 67	-4648 51	-50 30	0 00	4648 78	1929200 30	11973753 39	660 63
7500 00	90 50	180 6	3118 24	-4698 50	-50 84	0 00	4698 78	1929199 76	11973703 40	661 06
7550 00	90 50	180 6	3117 80	-4748 50	-51 39	0 00	4748 78	1929199 21	11973653 40	661 50
7600 00	90 50	180 6	3117 36	-4798 49	-51 93	0 00	4798 78	1929198 67	11973603 41	661 94
7650 00	90 50	180 6	3116 93	-4848 49	-52 47	0 00	4848 77	1929198 13	11973553 41	662 37
7700 00	90 50	180 6	3116 49	-4898 48	-53 01	0 00	4898 77	1929197 59	11973503 42	662 81
7750 00	90 50	180 6	3116 05	-4948 48	-53 55	0 00	4948 77	1929197 05	11973453 42	663 25
7800 00	90 50	180 6	3115 62	-4998 48	-54 09	0 00	4998 77	1929196 51	11973403 42	663 68
7850 00	90 50	180 6	3115 18	-5048 47	-54 63	0 00	5048 77	1929195 97	11973353 43	664 12
7900 00	90 50	180 6	3114 75	-5098 47	-55 17	0 00	5098 76	1929195 43	11973303 43	664 55
*** TD (at MD = 7915 33)										
7915 33	90 50	180 6	3114 61	-5113 80	-55 34	0 00	5114 10	1929195 26	11973288 10	664 69

Attached to Form 3160-3
Mack Energy Corporation
Ottawa Federal Com #1H NMNM-131583
SHL 660 FSL & 355 FWL, SWSW, Sec 20 T15S R29E
BHL 5 FSL & 355 FWL, SWSW, Sec 29 T15S R29E
Chaves County, NM

DRILLING PROGRAM

1. Geologic Name of Surface Formation

Quaternary

2 Estimated Tops of Important Geologic Markers:

Top of Salt	250'
Base of Salt	690'
Yates	835'
Seven Rivers	1070'
Queen	1560'
Grayburg	1955'
San Andres	2255'

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

Water Sand	150'	Fresh Water
Yates	835'	Oil/Gas
Seven Rivers	1070'	Oil/Gas
Queen	1560'	Oil/Gas
Grayburg	1955'	Oil/Gas
San Andres	2255'	Oil/Gas

No other formations are expected to give up oil, gas or fresh water in measurable quantities Setting 9 5/8" casing to 230' 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"	0-230'	9 5/8"	36#, J-55, ST&C, New, 17 59337/6 97328/7 04
8 3/4"	0-3300'	7"	26#,HPC-110,LT&C, Buttress, New, 4 350634/3.355048/3 34
8 ¾'	3300-7916'	5 ½"	17#, HCP-110 Buttress, New, 5 130501/3 646741/3 58

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 250sx, Class C+1% PF1, yld 1 34, wt 14 8 ppg, 6 323 gals/sx, excess 100%
7" & 5 ½" Production Casing, Lead 430sx Class C 4% PF 20+4 pps PF45 +125pps PF29, yld 1 84, wt 13 2 ppg, 9 914gals/sx, excess 35%, Tail 1300sx, 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 nipple 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
0-230'	Fresh Water	8 5	28	N C
230'-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 July 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
Ottawa 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

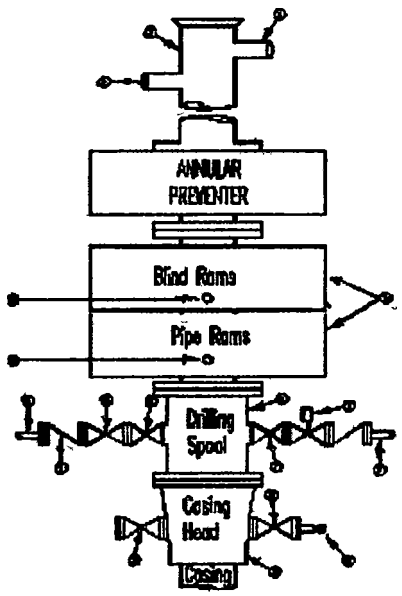
10 Blow out preventer control to be located as close to driller's position as feasible

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 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
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
10
ME

MEC TO FURNISH

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

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

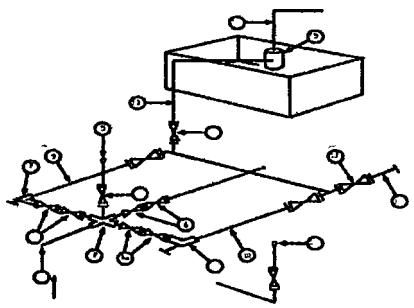
Exhibit #11

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 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

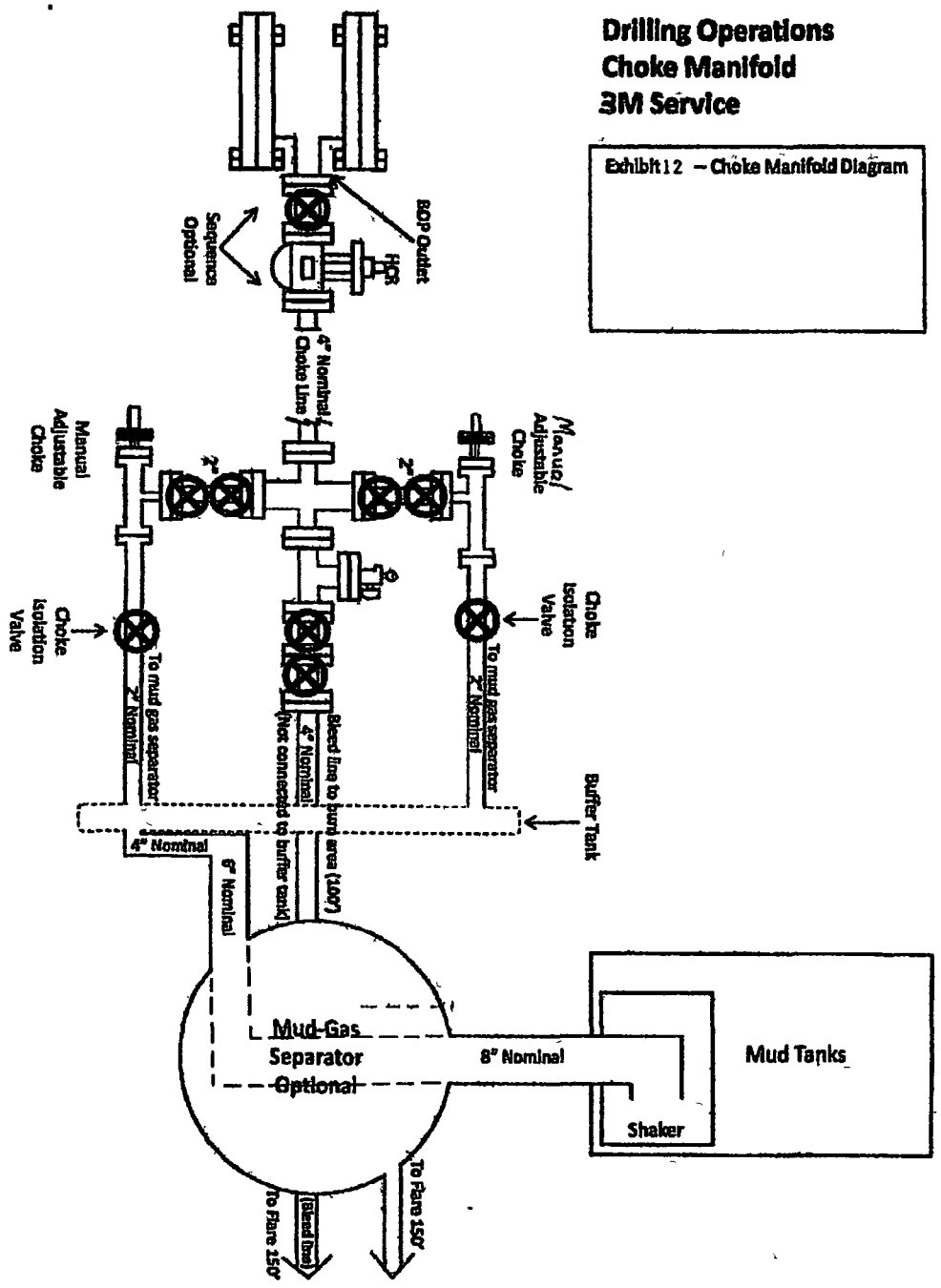
4 Chokes shall be equipped with tungsten carbide seats and needles, and replacements shall be available

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

MANIFOLD SCHEMATIC
Exhibit #12



APD ID 10400028377 **Submission Date** 03/19/2018

Operator Name MACK ENERGY CORPORATION

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

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

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map

ACCESS_TO_OTTAWA_FEDERAL_COM_1H_20170905114455 pdf
Waterloo_5_and_Ottawa_1H_Access_Road_07-27-2017 pdf
Ottawa_Fed___ROW_08-24-2017 pdf

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

ROW ID(s)

ID NM-132973

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

Ottawa_Federal_Com_1H_plats_20180316103454 pdf

New road type TWO-TRACK

Length 659 Feet **Width (ft)** 14

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

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 The average grade will be less then 1% No turnouts are planned, no culverts, cattleguard, gates, low water crossing or fence cuts are necessary

Operator Name MACK ENERGY CORPORATION

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

New road access plan or profile prepared? NO

New road access plan attachment

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 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 The average grade will be less then 1% No turnouts are planned No culverts, cattleguard, gates, low water crossing or fence cuts are necessary 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

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 The average grade will be less then 1% No turnouts are planned, no culverts, cattleguard, gates, low water crossing or fence cuts are necessary

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

Ottawa_Federal_Com__1H_existing_well_map_20180316144826.pdf

Existing Wells description

Operator Name MACK ENERGY CORPORATION

Well Name OTTAWA 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 CTB located at NWSW Sec 20 T15S R29E Proposed flow lines will tren North to the Prince Rupert Federal CTB Flowline will be a 4" poly surface line, 1146 91' in length with a 40 psi working pressure Ottawa Federal #1 - Flowline (a) 4" SDR 11 Poly surface line from Ottawa Federal #1 to the Prince Rupert Federal CTB location (b) Ottawa Federal #1 SWSW Sec 20 T15S R29E and Prince Rupert Federal CTB location NWSW Sec 20 T15S R29E (c) Total distance is 1146 91' in length all on Federal Land Width needed will be 30' No grading needed (d) The duration needed is 30 years (e) Pipeline will be used constantly (f) 3 days to lay line

Production Facilities map

Ottawa_Flowline_Plat_to_TB_20180315095451 pdf

Prince_Rupert_CTB_20180315095513 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_08-22-2017 pdf

Water_Source_3_08-22-2017 pdf

Water_Source_2_08-22-2017 pdf

Water source comments Please see attachments City/Municipal Water Town of Hagerman S10 T14S R26E, Mor-West S20 T17S R30E Brine Water Salty Dog S5 T19S R26E Wasserhund S36 T16S R24E

New water well? NO

New Water Well Info

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

Operator Name MACK ENERGY CORPORATION

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

Well target aquifer

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

Aquifer comments

Aquifer documentation

Well depth (ft) **Well casing type**

Well casing outside diameter (in) **Well casing inside diameter (in)**

New water well casing? **Used casing source**

Drilling method **Drill material**

Grout material **Grout depth**

Casing length (ft) **Casing top depth (ft)**

Well Production type **Completion Method**

Water well additional information

State appropriation permit

Additional information attachment

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_08-22-2017 pdf

Section 7 - Methods for Handling Waste

Waste type DRILLING

Waste content description 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 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 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 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

Operator Name MACK ENERGY CORPORATION

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

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
Safe containmant attachment

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

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

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 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 landfill No toxic waste or hazardous chemicals will be produced by this operation
Safe containmant attachment

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

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

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 tank 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 be collected in steel tank 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

Operator Name MACK ENERGY CORPORATION

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

Reserve Pit

Reserve Pit being used? NO

Temporary disposal of produced water into reserve pit?

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

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

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

Reserve pit liner

Reserve pit liner specifications and installation description

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? NO

Description of cuttings location

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

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

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

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities? NO

Ancillary Facilities attachment

Comments

Section 9 - Well Site Layout

Well Site Layout Diagram

ottawa_site_map_20180315100001 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

Section 10 - Plans for Surface Reclamation

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

Multiple Well Pad Number

Recontouring attachment

ottawa_reclaim_20170905151407 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) 2 191
Road proposed disturbance (acres) 0 45
Powerline proposed disturbance (acres) 0
Pipeline proposed disturbance (acres) 0 78
Other proposed disturbance (acres) 0
Total proposed disturbance 3 421

Well pad interim reclamation (acres) 1 43
Road interim reclamation (acres) 0 24
Powerline interim reclamation (acres) 0
Pipeline interim reclamation (acres) 0 76
Other interim reclamation (acres) 0
Total interim reclamation 2 43

Well pad long term disturbance (acres) 1 43
Road long term disturbance (acres) 0 24
Powerline long term disturbance (acres) 0
Pipeline long term disturbance (acres) 0 02
Other long term disturbance (acres) 0
Total long term disturbance 1 69

Reconstruction method 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
Topsoil redistribution 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
Soil treatment 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
Existing Vegetation at the well pad The area around the well site is grassland and the 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 the topsoil is sandy The vegetation is native scrub grass with sagebrush
Existing Vegetation Community at the road attachment

Operator Name MACK ENERGY CORPORATION

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

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

Existing Vegetation Community at the pipeline attachment

Existing Vegetation Community at other disturbances The area around the well site is grassland and the 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**

Seed Summary

Total pounds/Acre

Seed Type	Pounds/Acre

Seed reclamation attachment

Operator Contact/Responsible Official Contact Info

First Name Jerry **Last Name** Sherrell

Operator Name MACK ENERGY CORPORATION

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

Phone (575)748-1288 **Email** jerrys@mec com

Seedbed prep

Seed BMP

Seed method

Existing invasive species? NO

Existing invasive species treatment description

Existing invasive species treatment attachment

Weed treatment plan description The holder shall seed all disturbed areas with the seed mixture listed by BLM The seed mixture she be planted in the amounts specified in pounds of pure live seed (PLS)* per acre There shall be no primary or secondary noxious weeds in the seed mixture Seed will be tested and the viability testing of seed will be done in accordance with State Law(s) and the nine (9) months prior to purchase Commercial see 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 officer

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 should 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 officer 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 BUREAU OF LAND MANAGEMENT

Other surface owner description

BIA Local Office

BOR Local Office

COE Local Office

DOD Local Office

NPS Local Office

State Local Office

Military Local Office

USFWS Local Office

Other Local Office

Operator Name MACK ENERGY CORPORATION

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

USFS Region

USFS Forest/Grassland **USFS Ranger District**

Section 12 - Other Information

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

ROW Type(s)

ROW Applications

SUPO Additional Information

Use a previously conducted onsite? YES

Previous Onsite information Onsite 3/9/2018

Other SUPO Attachment

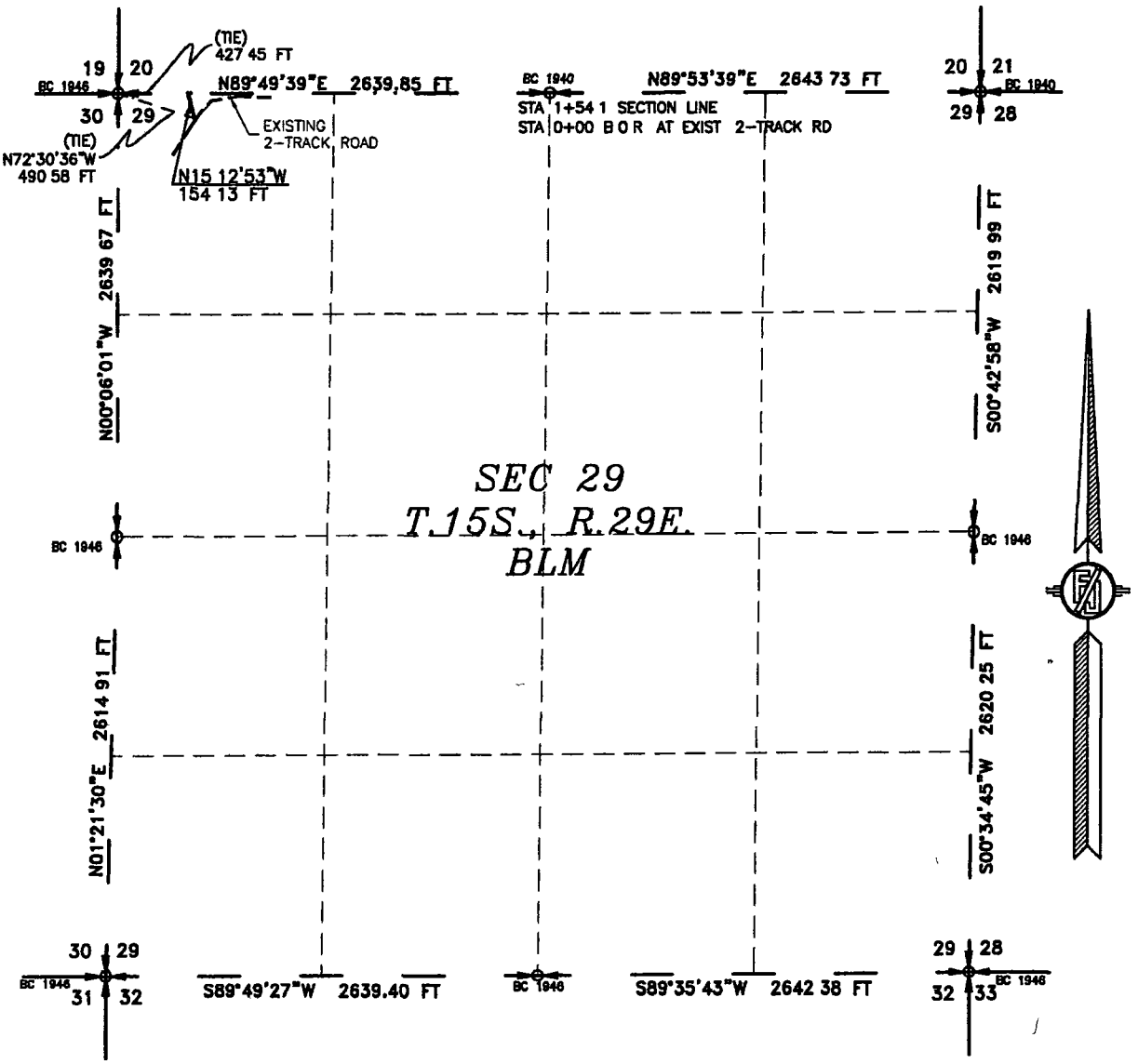
H2S_Contingency_Plan_20171002102522.docx
ottawa_h2s_plan_20171012143757.pdf
ottawa_gas_20180316110123.pdf
ottawa_sup_2018031614562200_20180316145655.pdf

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017



SEE NEXT SHEET (2-6) FOR DESCRIPTION

1000 0 1000
Scale 1" = 1000'

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30 DAY OF JUNE 2017

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

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

SHEET 1-6

SURVEY NO 5341

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , CHAVES COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , WHENCE THE NORTHWEST CORNER OF SAID SECTION 29, TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M BEARS N72°30'36"W, A DISTANCE OF 490 58 FEET,
THENCE N15 12'53"W A DISTANCE OF 154 13 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE NORTHWEST CORNER OF SAID SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M BEARS S89°49 39"W, A DISTANCE OF 427 45 FEET,

SAID STRIP OF LAND BEING 154 13 FEET OR 9 34 RODS IN LENGTH, CONTAINING 0 106 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

NW/4 NW/4 154 13 L.F 9 34 RODS 0 106 ACRES

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF MINE CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 30 DAY OF JUNE 2017

FILIMON F JARAMILLO 12797 REGISTERED PROFESSIONAL SURVEYOR

FILIMON F JARAMILLO PLS 12797

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

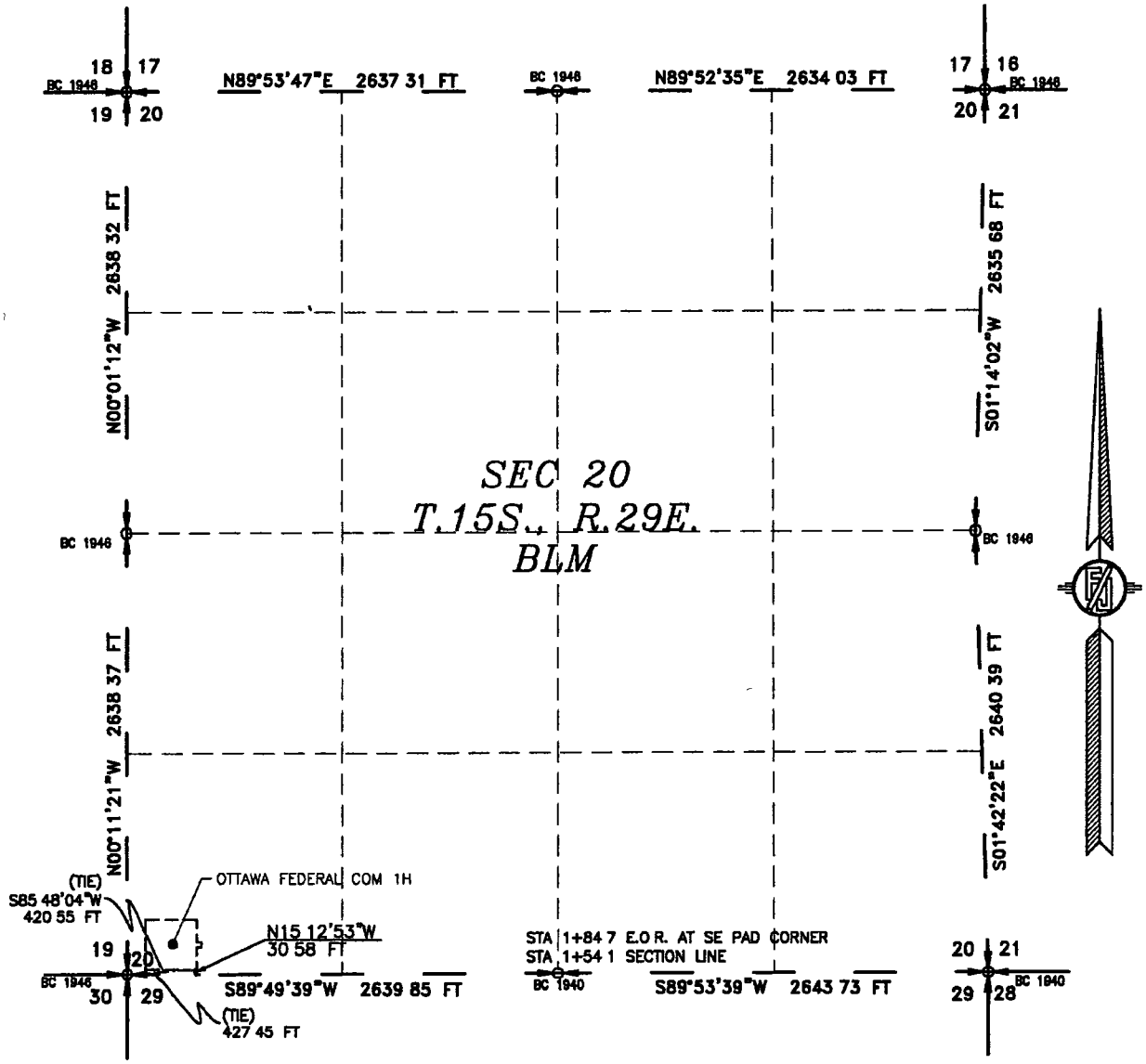
301 SOUTH CANAL
(575) 234-3341

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017



SEE NEXT SHEET (4–6) FOR DESCRIPTION

1000 0 1000
Scale. 1" = 1000

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO, THIS 28 DAY OF JUNE 2017

FILIMON F JARAMILLO 12797 REGISTERED PROFESSIONAL SURVEYOR

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

SHEET 3–6

SURVEY NO 5341

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20 TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , CHAVES COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE SW/4 SW/4 OF SAID SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , WHENCE THE SOUTHWEST CORNER OF SAID SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST, N M P M BEARS S89 49'39"W, A DISTANCE OF 427 45 FEET,
THENCE N15 12'53"W A DISTANCE OF 30 58 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE SOUTHWEST CORNER OF SAID SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M BEARS S85°48'04"W, A DISTANCE OF 420 55 FEET,

SAID STRIP OF LAND BEING 30 58 FEET OR 1 85 RODS IN LENGTH, CONTAINING 0 021 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

SW/4 SW/4 30 58 LF 1 85 RODS 0 021 ACRES

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO, THIS 30 DAY OF JUNE 2017

FILIMON F JARAMILLO
REGISTERED PROFESSIONAL SURVEYOR
12797
PROFESSIONAL SURVEYOR

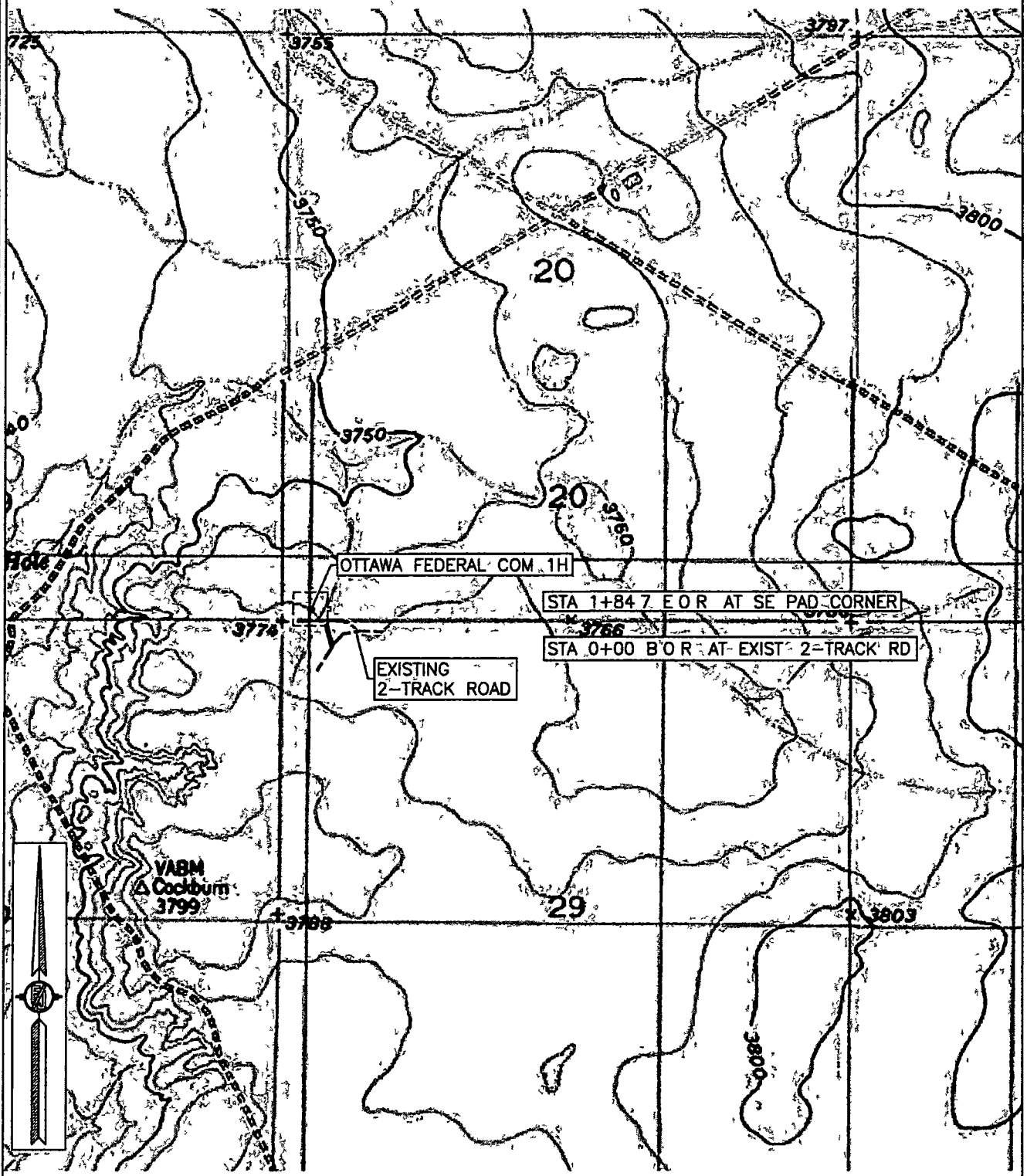
MADRON SURVEYING INC
301 SOUTH CANAL
CARLSBAD NEW MEXICO 88220
Phone (575) 234-3341

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTIONS 29, 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017



SHEET 5-6

SURVEY NO 5341

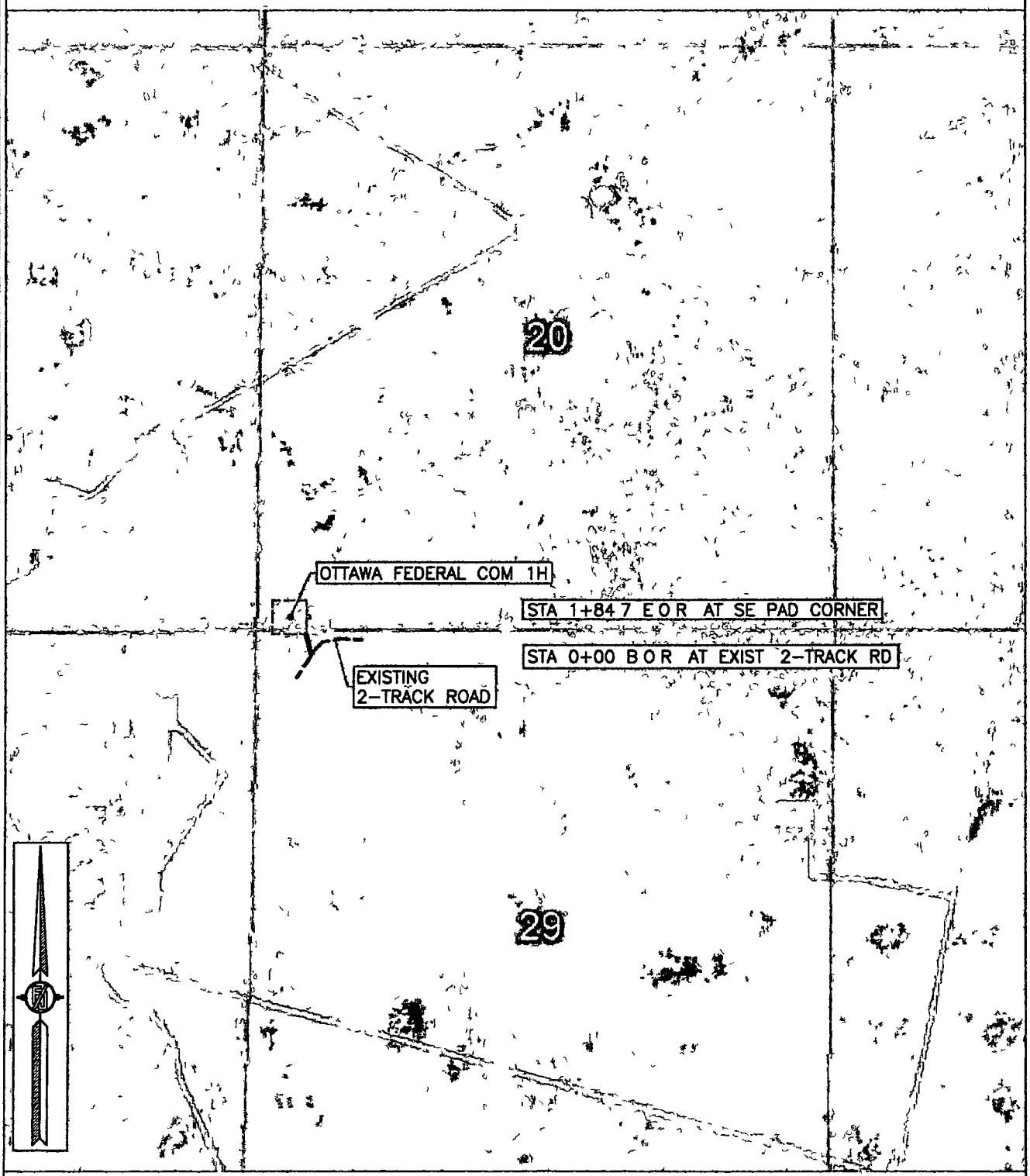
MADRON SURVEYING, INC 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

ACCESS ROAD PLAT

ACCESS ROAD TO THE OTTAWA FEDERAL COM 1H

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTIONS 29, 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
JUNE 23, 2017

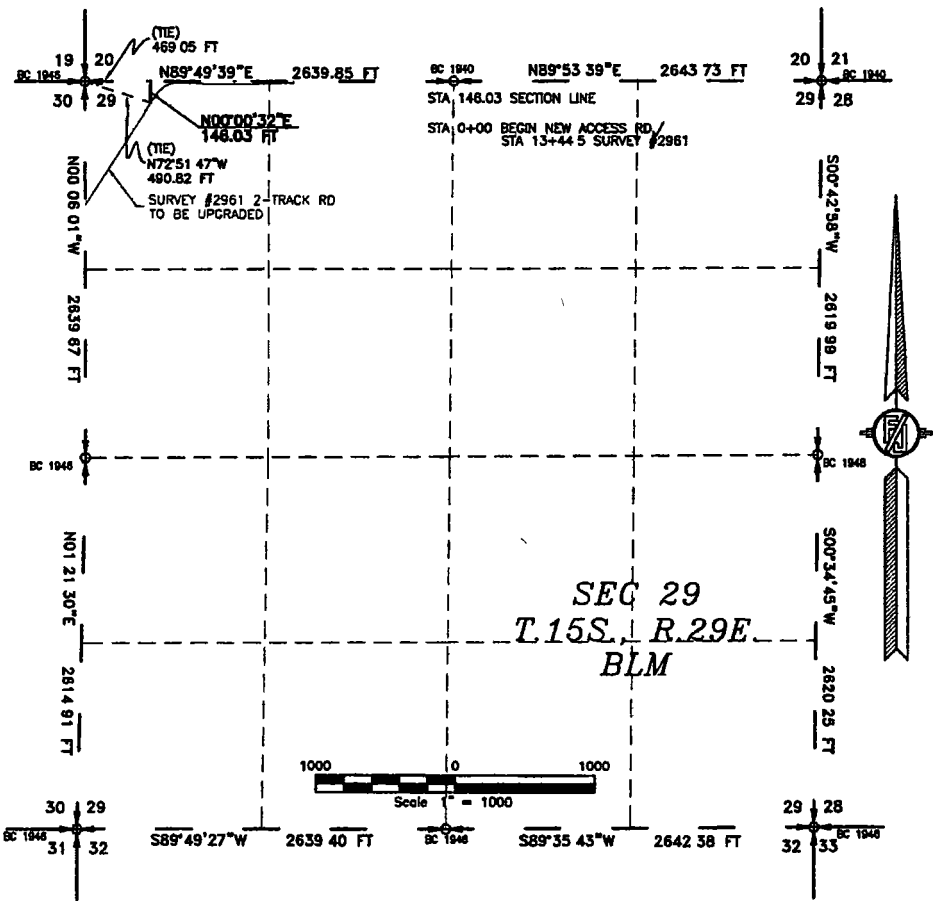


SHEET 6-6 *SURVEY NO 5341*

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

ACCESS ROAD TO THE WATERLOO FEDERAL #5

MACK ENERGY CORPORATION
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014



DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N M P M CHAVES COUNTY STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 29, TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M WHENCE THE NORTHWEST CORNER OF SAID SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N M.P M BEARS N72°51 47"W A DISTANCE OF 490 82 FEET

THENCE N00°00 32"E A DISTANCE OF 146.03 FEET THE TERMINUS OF THIS CENTERLINE SURVEY WHENCE THE NORTHWEST CORNER OF SAID SECTION 29 TOWNSHIP 15 SOUTH RANGE 29 EAST N M.P M. BEARS S89°49 39"W A DISTANCE OF 469 05 FEET

SAID STRIP OF LAND BEING 146 03 FEET OR 8.85 RODS IN LENGTH CONTAINING 0 067 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

NW/4 NW/4 146 03 L.F 8 85 RODS 0 067 ACRES

GENERAL NOTES

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

2.) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES

SURVEYOR CERTIFICATE

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

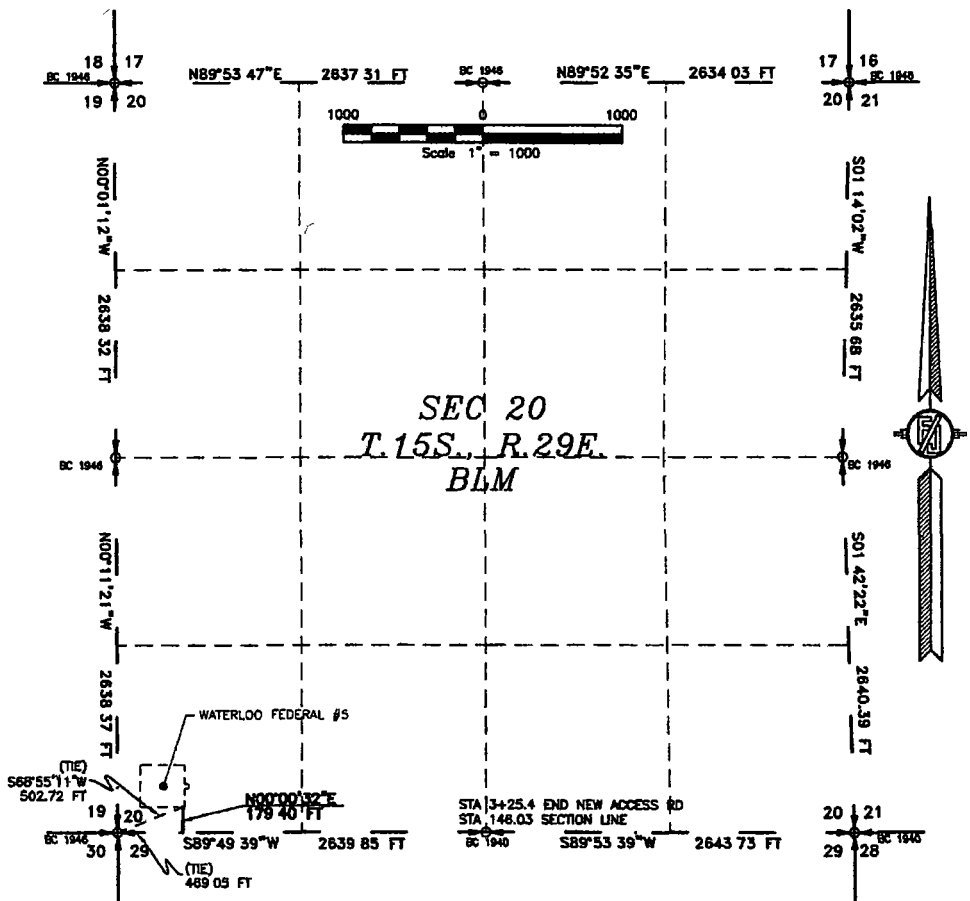
IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO, THIS 24 DAY OF MAY 2014

FILIMON F JARAMILLO NM 12797

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

ACCESS ROAD TO THE WATERLOO FEDERAL #5

MACK ENERGY CORPORATION
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014



DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M CHAVES COUNTY STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE SW/4 SW/4 OF SAID SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST N M.P M. WHENCE THE SOUTHWEST CORNER OF SAID SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST N M.P M BEARS S89°49 39"W A DISTANCE OF 469 05 FEET
THENCE N00°00 32"E A DISTANCE OF 179 40 FEET THE TERMINUS OF THIS CENTERLINE SURVEY WHENCE THE SOUTHWEST CORNER OF SAID SECTION 20 TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M.P M BEARS S68°55 11"W A DISTANCE OF 502 72 FEET

SAID STRIP OF LAND BEING 179 40 FEET OR 10 87 RODS IN LENGTH CONTAINING 0 082 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

SW/4 SW/4 179 40 L.F 10 87 RODS 0 082 ACRES

GENERAL NOTES

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

2) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO THIS 24 DAY OF MAY 2014

FILIMON F. JARAMILLO 12797

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

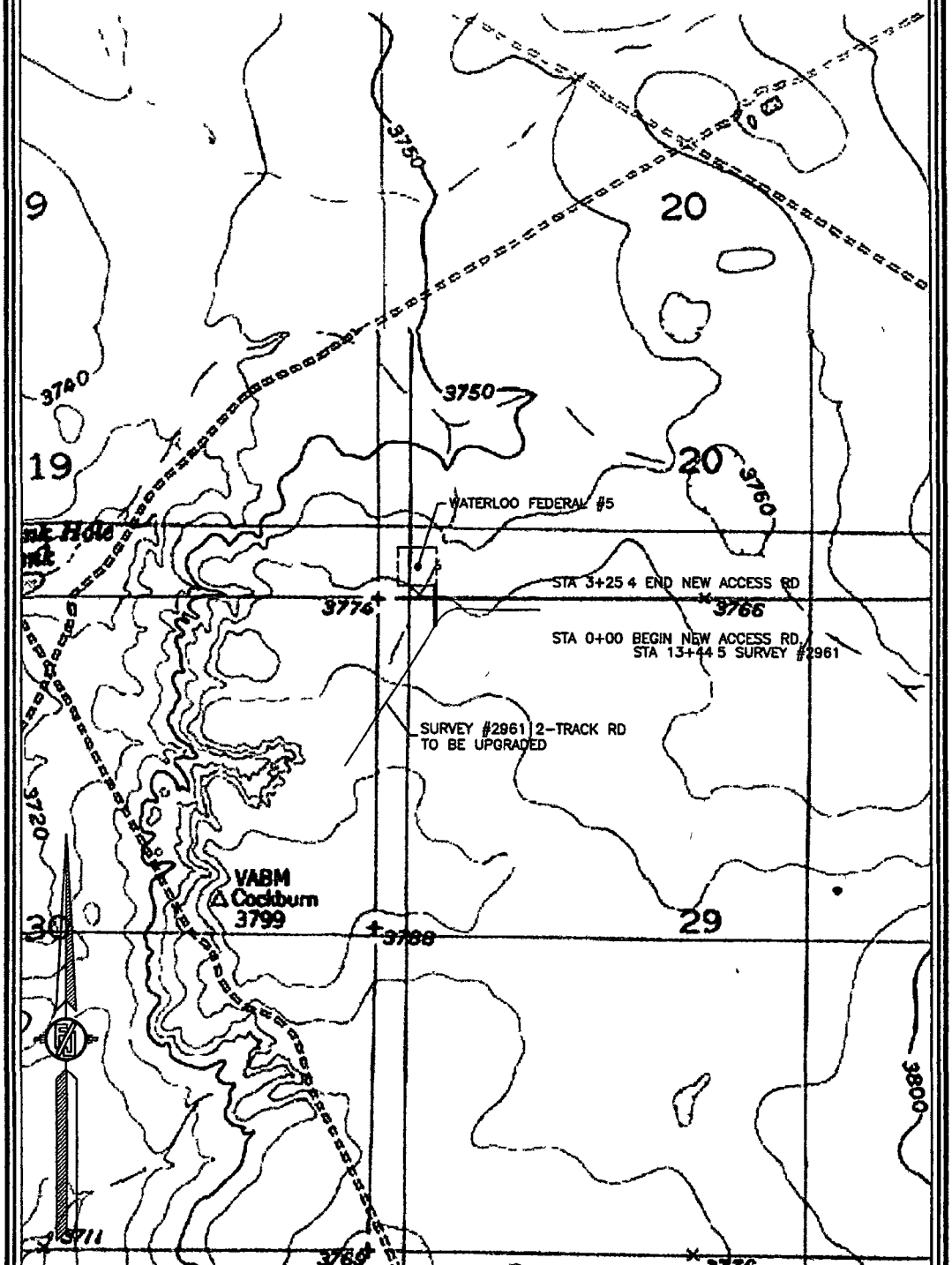
SURVEY NO 2997

MADRON SURVEYING, INC CARLSBAD, NEW MEXICO

ACCESS ROAD TO THE WATERLOO FEDERAL #5

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014



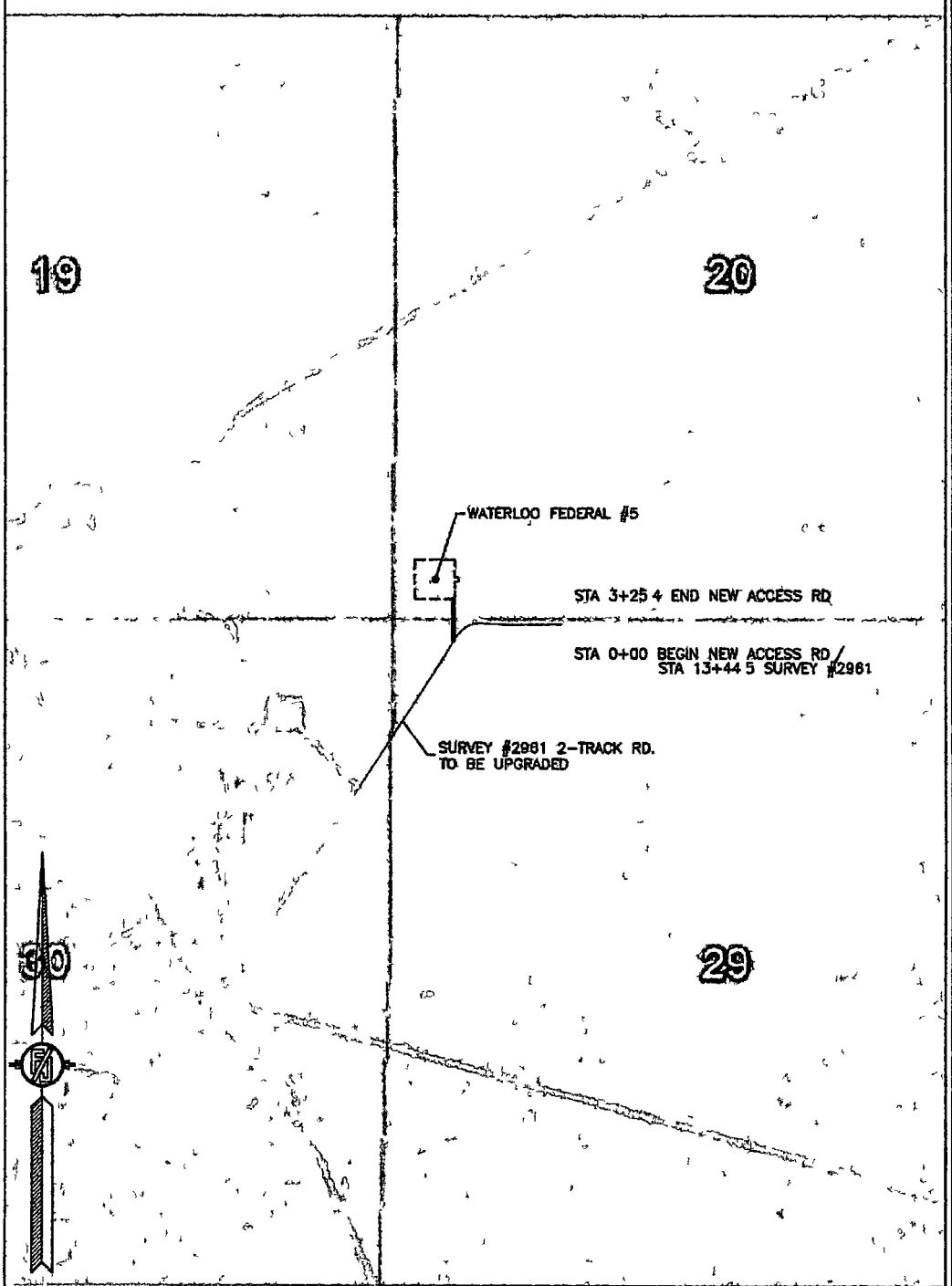
SHEET 3-4 *SURVEY NO 2997*

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

ACCESS ROAD TO THE WATERLOO FEDERAL #5

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014

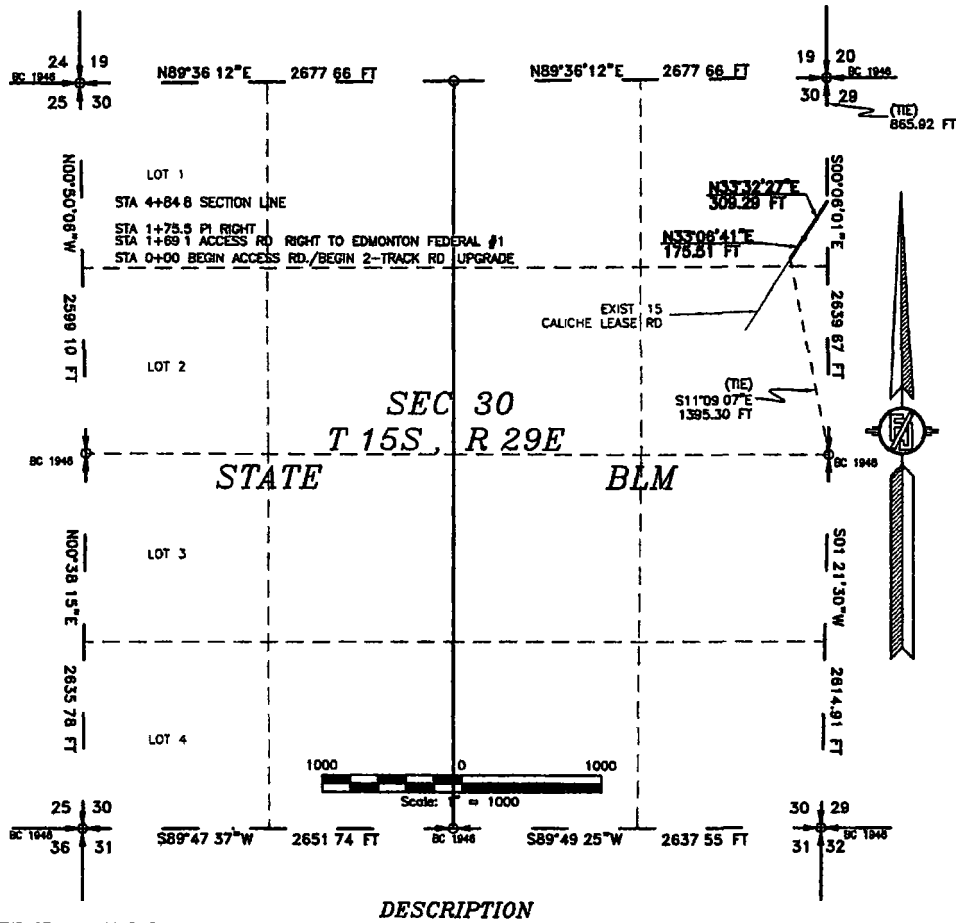


SHEET 4-4 *SURVEY NO 2997*

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

ACCESS ROAD TO THE WATERLOO FEDERAL #6

MACK ENERGY CORPORATION
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014



DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 30, TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M CHAVES COUNTY STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE NE/4 NE/4 OF SAID SECTION 30 TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M WHENCE THE EAST QUARTER CORNER OF SAID SECTION 30 TOWNSHIP 15 SOUTH RANGE 29 EAST N M P.M BEARS S11 09 07"E, A DISTANCE OF 1395 30 FEET
THENCE N33°08 41"E A DISTANCE OF 175.51 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N33°32 27"E A DISTANCE OF 309.29 FEET THE TERMINUS OF THIS CENTERLINE SURVEY WHENCE THE NORTHEAST CORNER OF SAID SECTION 30 TOWNSHIP 15 SOUTH RANGE 29 EAST N M P.M BEARS N00°06 01"W A DISTANCE OF 865 92 FEET

SAID STRIP OF LAND BEING 484 80 FEET OR 29 38 RODS IN LENGTH CONTAINING 0 223 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS.

NE/4 NE/4 484 80 LF 29.38 RODS 0.223 ACRES

GENERAL NOTES

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

2) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES

SURVEYOR CERTIFICATE -

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

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO THIS 16 DAY OF MAY 2014

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

FILIMON F JARAMILLO PLS 12797

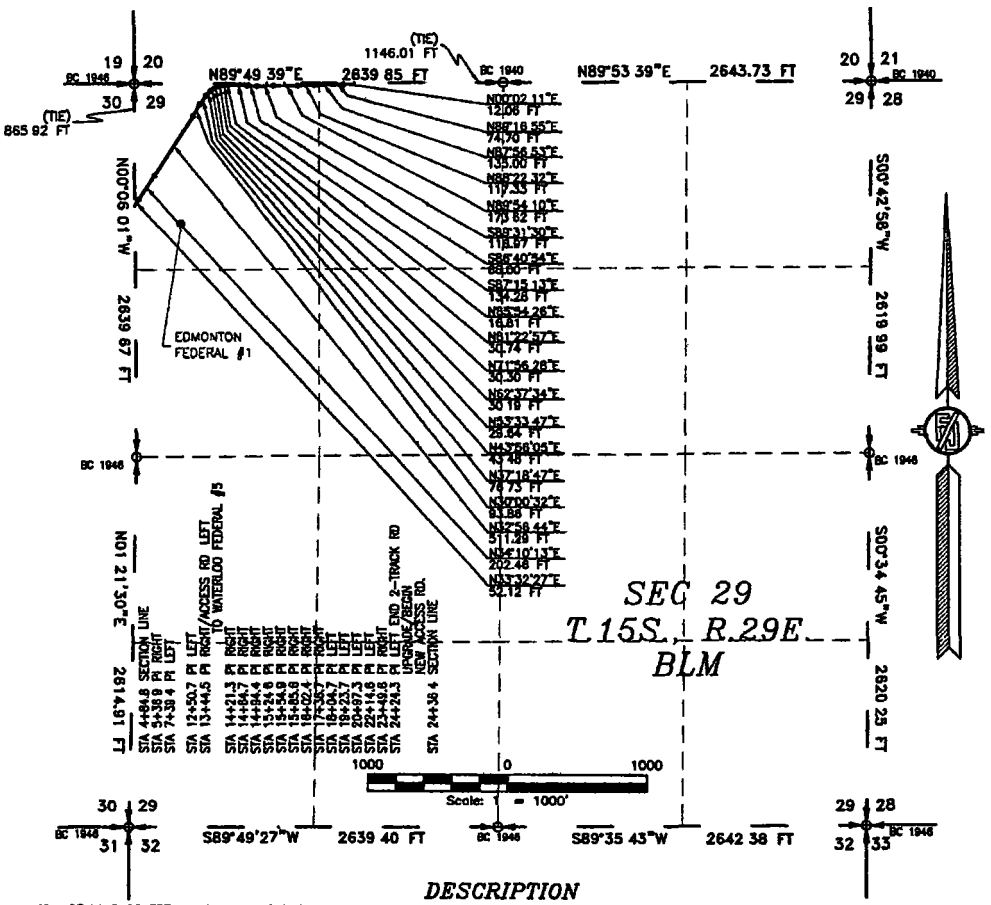
SHEET 1-5

SURVEY NO 2981

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

ACCESS ROAD TO THE WATERLOO FEDERAL #6

MACK ENERGY CORPORATION
CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY STATE OF NEW MEXICO
APRIL 24, 2014



DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M.P.M. CHAVES COUNTY STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY·

BEGINNING AT A POINT WITHIN THE NW/4 NW/4 OF SAID SECTION 29, TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M.P.M., WHENCE THE NORTHWEST CORNER OF SAID SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M.P.M. BEARS N00°06 01"W A DISTANCE OF 865.92 FEET
THENCE N33°32'27"E A DISTANCE OF 52.12 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N34°10'13"E A DISTANCE OF 202.48 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N32°56'44"E A DISTANCE OF 511.29 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N30°00'32"E A DISTANCE OF 93.86 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N37°18 47"E A DISTANCE OF 76.73 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N43°56'05"E A DISTANCE OF 43.48 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N53°33 47"E A DISTANCE OF 29.84 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N62°37 34"E A DISTANCE OF 30.19 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N71 56'28"E A DISTANCE OF 30.30 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N81°22'57"E A DISTANCE OF 30.74 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N85°54'26"E A DISTANCE OF 16.81 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED
THENCE S87°15 13"E A DISTANCE OF 134.28 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE S86°40'54"E A DISTANCE OF 68.00 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE S89°31 30"E A DISTANCE OF 118.97 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N89°54 10"E A DISTANCE OF 173.62 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N88°22 32"E A DISTANCE OF 117.33 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N87°56'53"E A DISTANCE OF 135.00 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED·
THENCE N89°16 55"E A DISTANCE OF 74 70 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED;
THENCE N00°02'11"E A DISTANCE OF 12.06 FEET THE TERMINUS OF THIS CENTERLINE SURVEY WHENCE THE NORTH QUARTER CORNER OF SAID SECTION 29 TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M.P.M. BEARS N89°49'39"E, A DISTANCE OF 1146.01 FEET

SAID STRIP OF LAND BEING 1951.58 FEET OR 118.28 RODS IN LENGTH, CONTAINING 0.898 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

NW/4 NW/4	1785.47 LF	107.00 RODS	0.811 ACRES
NE/4 NW/4	186.11 LF	11.28 RODS	0.085 ACRES

GENERAL NOTES

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

2) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO THIS 12TH DAY OF MAY 2014

12797

FILIMON F. JARAMILLO NMPS 12797

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

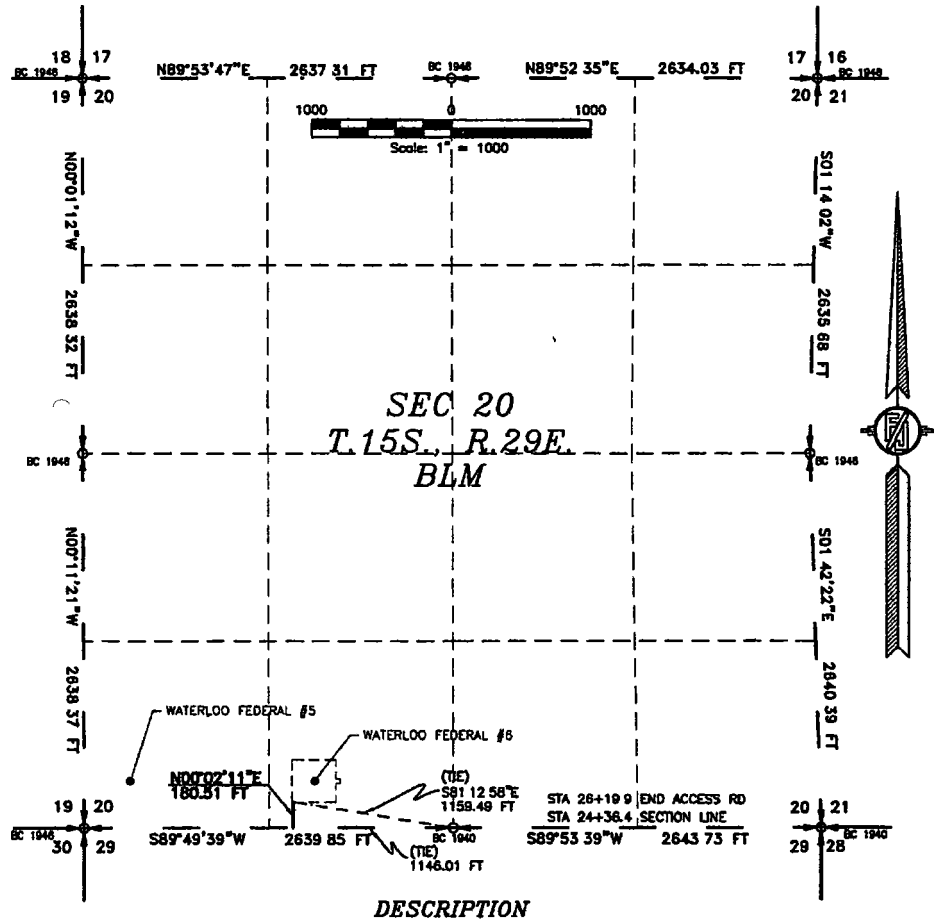
SHEET 2-5

SURVEY NO 2981

ACCESS ROAD TO THE WATERLOO FEDERAL #6

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24 2014



DESCRIPTION

A STRIP OF LAND 20 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST N M P M CHAVES COUNTY STATE OF NEW MEXICO AND BEING 10 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE SE/4 SW/4 OF SAID SECTION 20 TOWNSHIP 15 SOUTH RANGE 29 EAST N.M P M. WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 20 TOWNSHIP 15 SOUTH, RANGE 29 EAST N.M P M BEARS N89°49 39"E, A DISTANCE OF 1146.01 FEET
THENCE N00°02 11"E A DISTANCE OF 180.51 FEET THE TERMINUS OF THIS CENTERLINE SURVEY WHENCE THE SOUTH QUARTER CORNER OF SAID SECTION 20 TOWNSHIP 15 SOUTH, RANGE 29 EAST N M P.M BEARS S81 12 58"E, A DISTANCE OF 1159 49 FEET

SAID STRIP OF LAND BEING 180 51 FEET OR 10 94 RODS IN LENGTH CONTAINING 0 083 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

SE/4 SW/4 180.51 L.F 10 94 RODS 0 083 ACRES

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD NEW MEXICO THIS 16 DAY OF MAY 2014

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

GENERAL NOTES

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

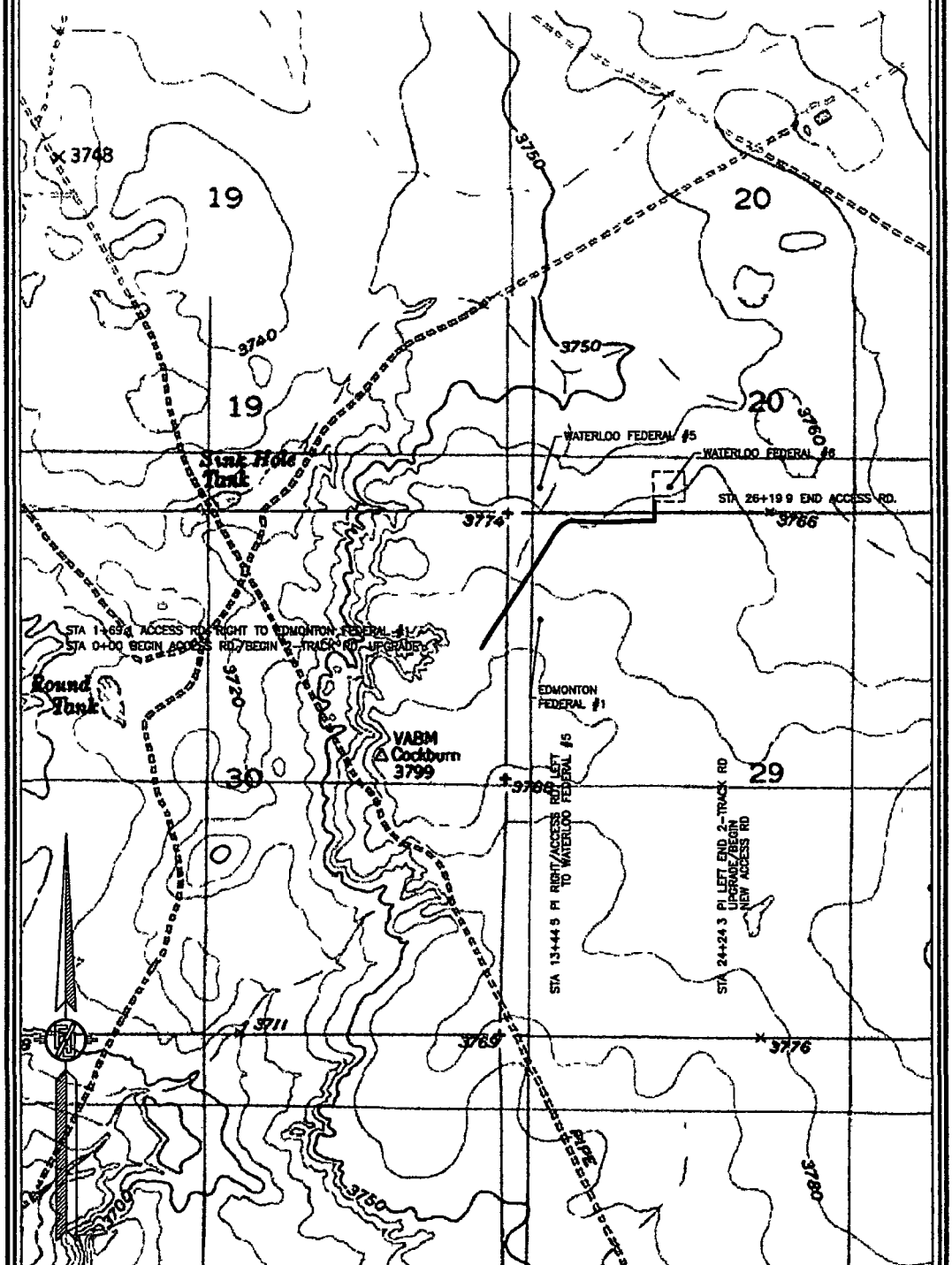
2) BASIS OF BEARING IS NMSP EAST MODIFIED TO SURFACE COORDINATES

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

ACCESS ROAD TO THE WATERLOO FEDERAL #6

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, 29, 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014



SHEET 4-5

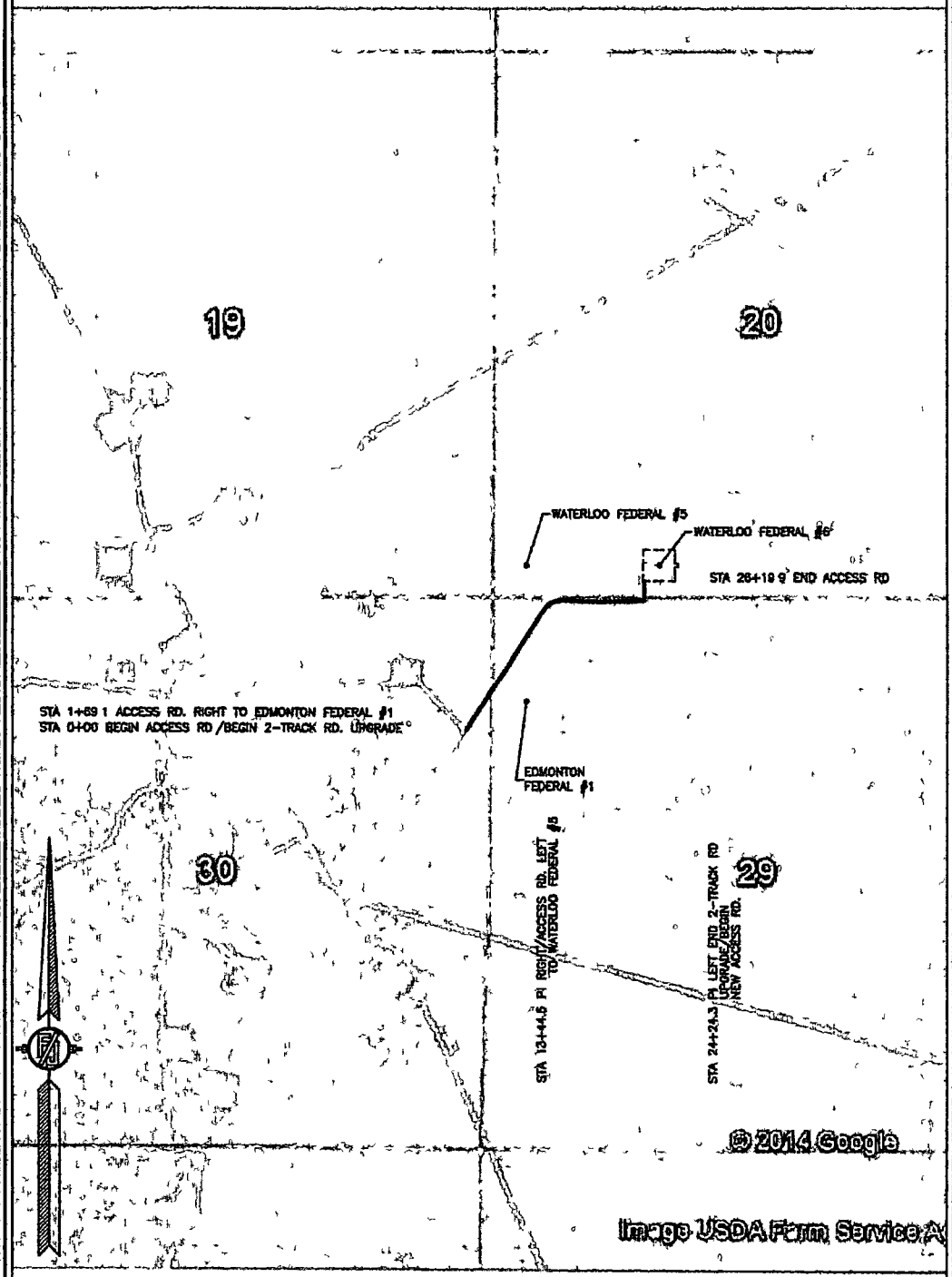
SURVEY NO 2961

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

ACCESS ROAD TO THE WATERLOO FEDERAL #6

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF AN ACCESS ROAD CROSSING
SECTION 30, 29, 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
APRIL 24, 2014

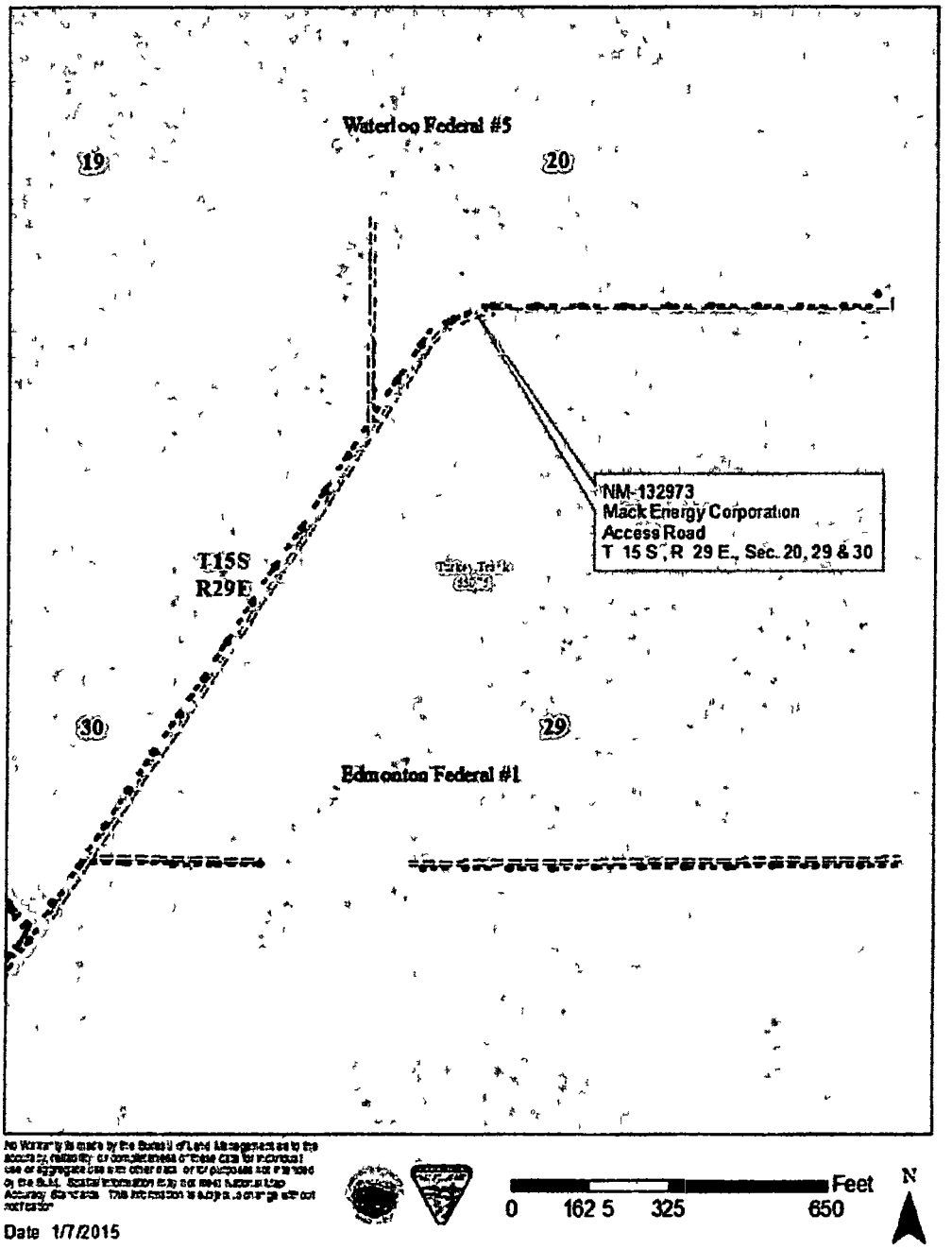


SHEET 5-5 SURVEY NO 2961

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

Exhibit B Map for NM-132973

NM-132973 Mack Energy Corporation



Date 1/7/2015

NM OIL CONSERVATION
ARTESIA DISTRICT
APR 18 2018
RECEIVED

District I
1625 N French Dr Hobbs, NM 88240
Phone (575) 393-6161 Fax (575) 393-0720
District II
811 S First St Artesia, NM 88210
Phone (575) 748-1283 Fax (575) 748-9720
District III
1000 Rio Brazos Road, Aztec NM 87410
Phone (505) 334-6178 Fax (505) 334-6170
District IV
1220 S St Francis Dr Santa Fe, NM 87505
Phone (505) 476-3460 Fax (505) 476-3462

State of New Mexico
Energy, Minerals & Natural Resources Department
OIL CONSERVATION DIVISION
1220 South St Francis Dr
Santa Fe, NM 87505

Form C-102
Revised August 1, 2011
Submit one copy to appropriate District Office

☐ AMENDED REPORT

WELL LOCATION AND ACREAGE DEDICATION PLAT

1 API Number	2 Pool Code	3 Pool Name
	52770	Round Tank; San Andres

4 Property Code	5 Property Name	6 Well Number
	OTTAWA FEDERAL COM	1H

7 OGRID No.	8 Operator Name	9 Elevation
13837	MACK ENERGY CORPORATION	3757.8

10 Surface Location

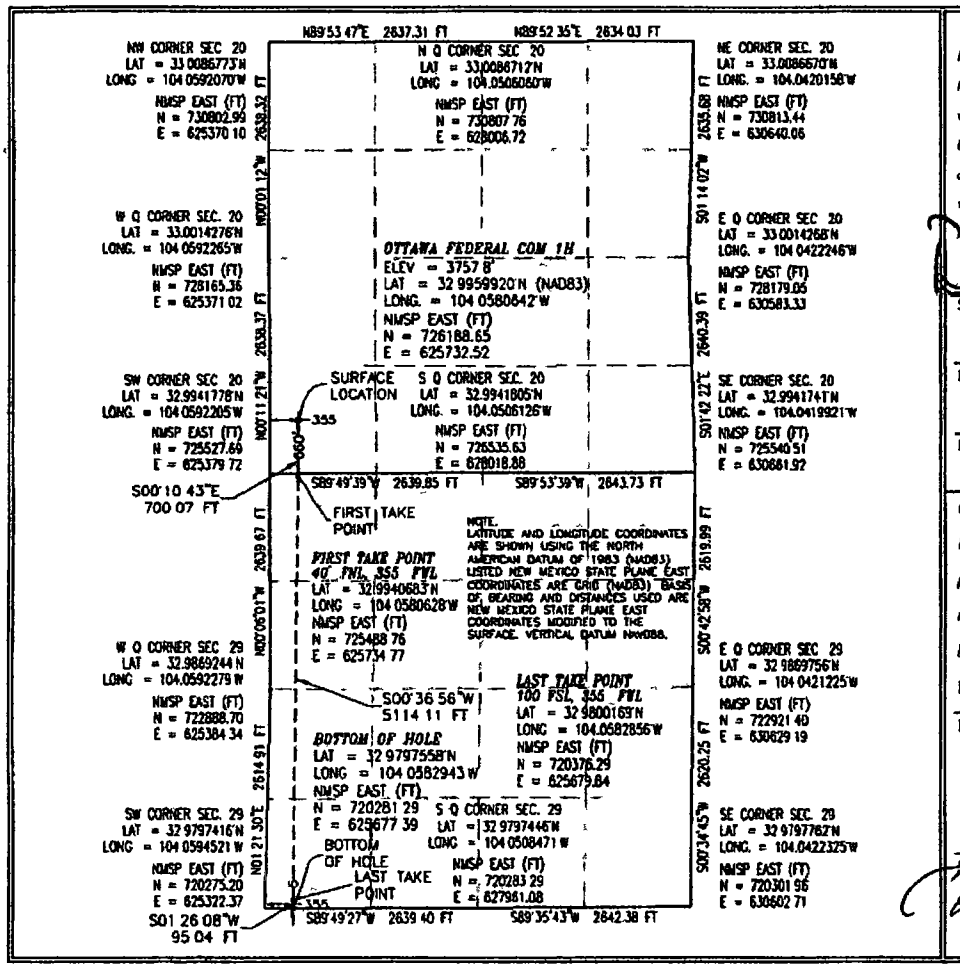
UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/West line	County
M	20	15 S	29 E		660	SOUTH	355	WEST	CHAVES

11 Bottom Hole Location If Different From Surface

UL or lot no	Section	Township	Range	Lot Idn	Feet from the	North/South line	Feet from the	East/ West line	County
M	29	15 S	29 E		5	SOUTH	355	WEST	CHAVES

12 Dedicated Acres	13 Joint or Infill	14 Consolidation Code	15 Order No

No allowable will be assigned to this completion until all interests have been consolidated or a non-standard unit has been approved by the division



16 OPERATOR CERTIFICATION

I hereby certify that the information contained herein is true and complete to the best of my knowledge and belief, and that this organization either owns a working interest or unleased mineral interest in the land including the proposed bottom hole location or has a right to drill this well at this location pursuant to a contract with an owner of such a mineral or working interest or to a voluntary pooling agreement or a compulsory pooling order heretofore entered by the division

Deana Weaver 3.15.18
Signature Date

Deana Weaver
Printed Name

dweaver@mec.com
E-mail Address

17 SURVEYOR CERTIFICATION

I hereby certify that the well location shown on this plat was plotted from field notes of actual surveys made by me or under my supervision and that the same is true and correct to the best of my belief.

MARCH 1, 2018
Date of Survey

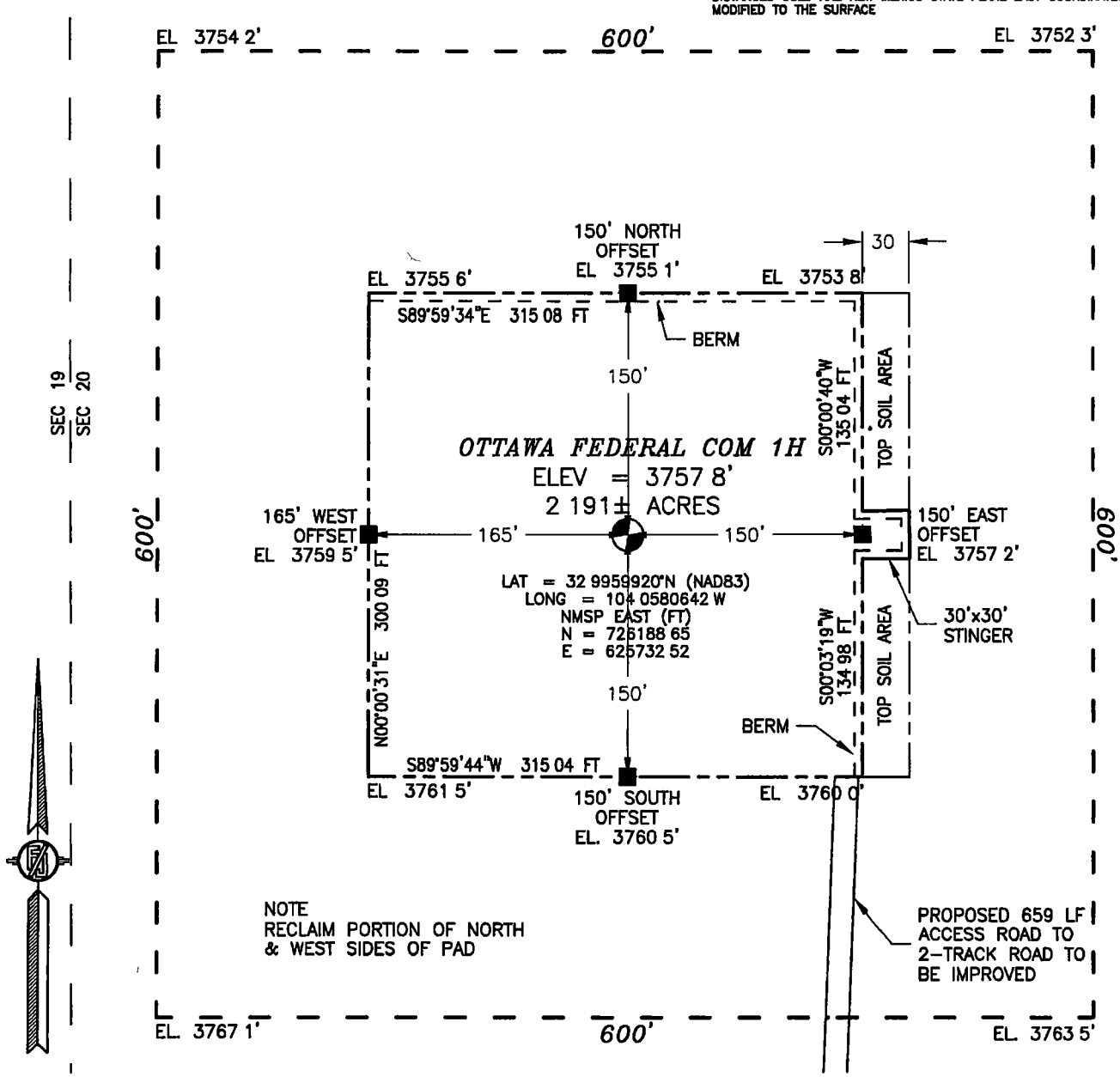
Signature and Seal of Professional Surveyor

Certificate Number HERMON F. JARAMILLO PLS 17797

SURVEY NO. 5110B

SECTION 20, 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



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HIGHWAY 82 AND CR 217 (HAGERMAN CUT-OFF ROAD) GO NORTH ON CR 217 FOR APPROX 10 0 MILES (TO CHAVES CO LINE) GO WEST ON 20 CALICHE LEASE ROAD APRROX. 3.8 MILES, GO NORTH ON 15' CALICHE LEASE ROAD FOR APROX 0 4 OF A MILE TO END OF CALICHE LEASE ROAD CONTINUE NORTH-NORTHEAST ON 2-TRACK ROAD FOR APPROX 0 2 OF A MILE TO BEGIN ROAD SURVEY, FOLLOW ROAD SURVEY NORTH APPROX. 659' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION

MACK ENERGY CORPORATION

OTTAWA FEDERAL COM 1H

LOCATED 660 FT FROM THE SOUTH LINE AND 355 FT FROM THE WEST LINE OF SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M CHAVES COUNTY, STATE OF NEW MEXICO

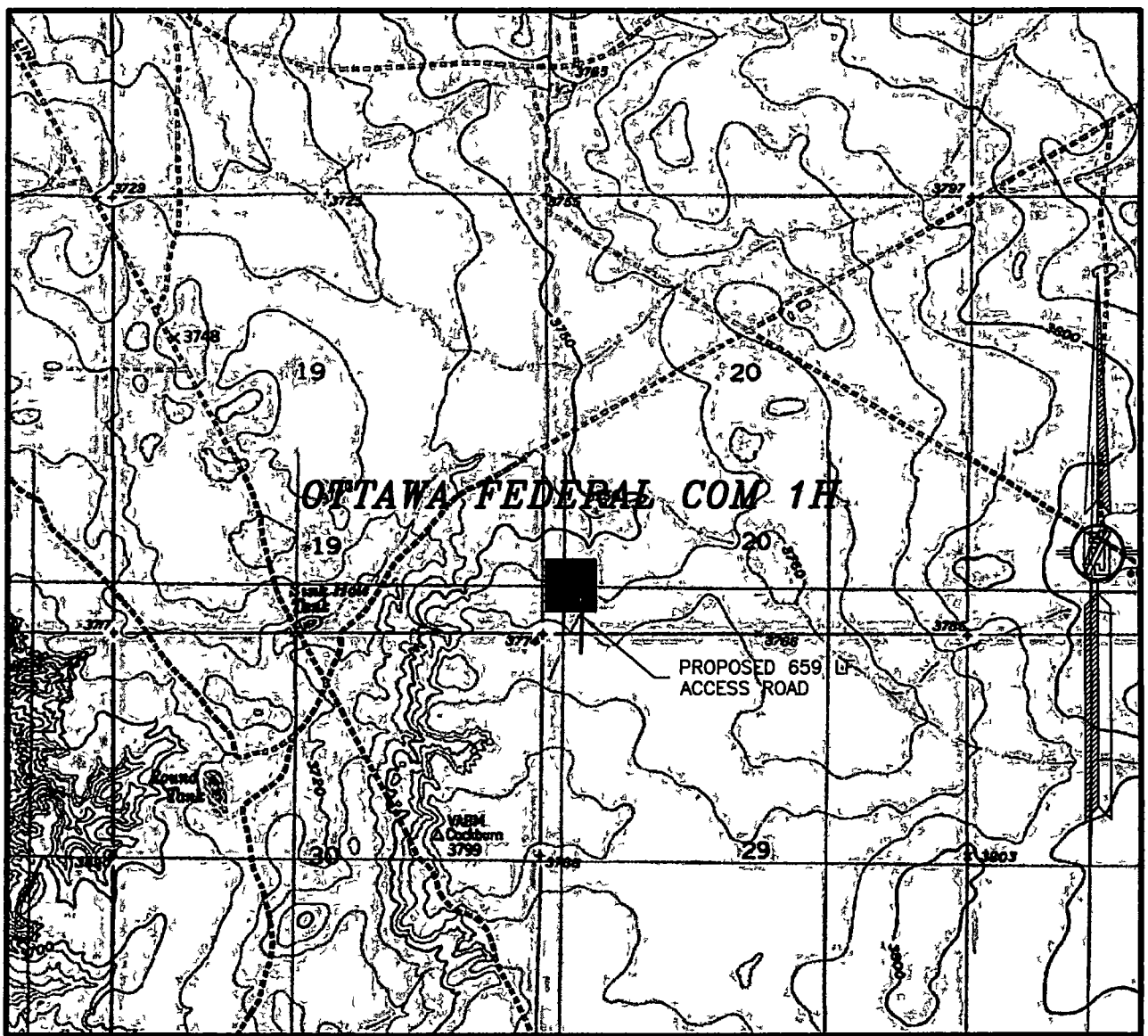
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

LOCATION VERIFICATION MAP



USGS QUAD MAP
BASIN WELL

NOT TO SCALE

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE
AND 355 FT FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

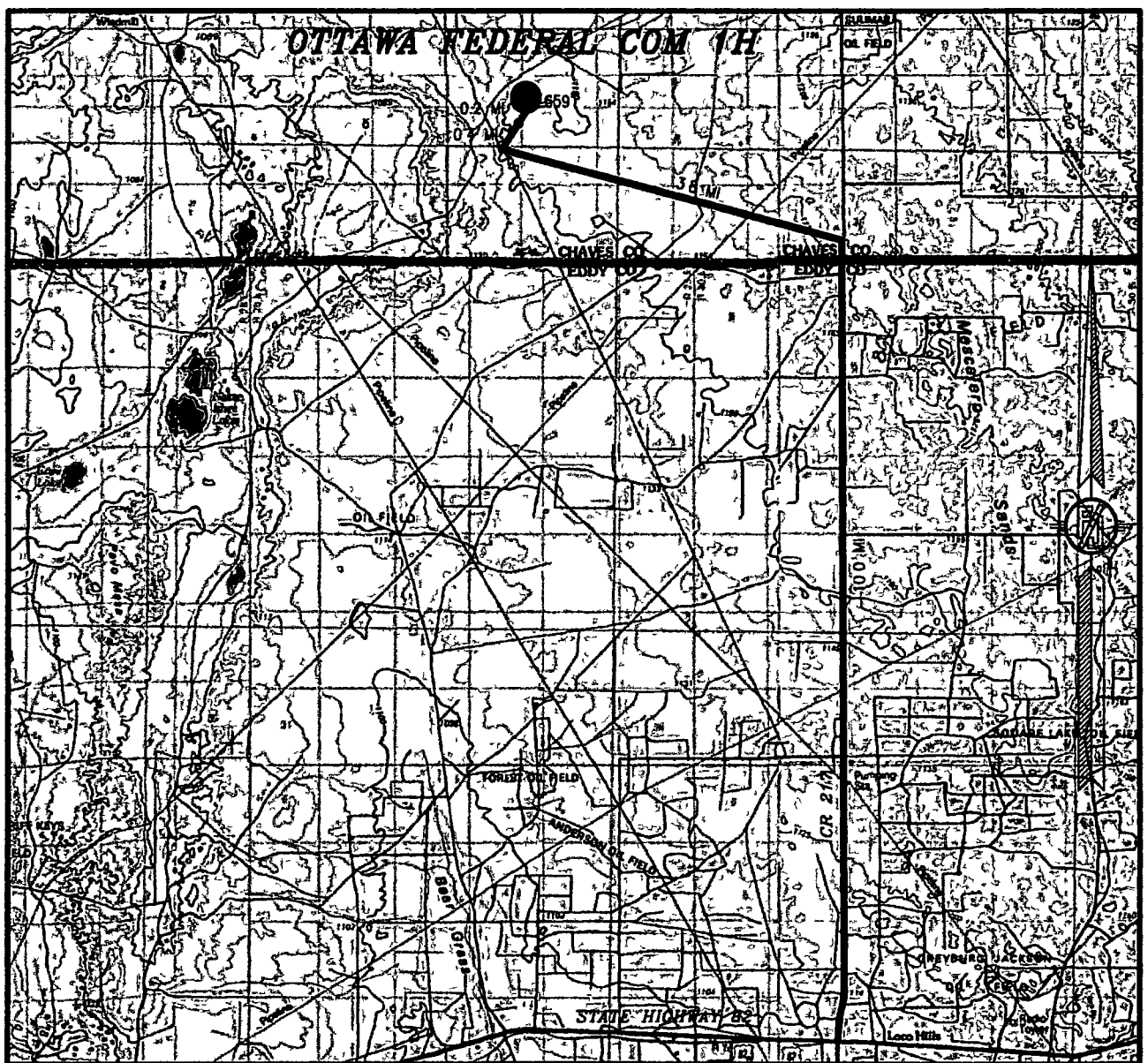
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, 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 82 AND CR 217 (HAGERMAN CUT-OFF ROAD) GO NORTH ON CR 217 FOR APPROX. 10 0 MILES (TO CHAVES CO LINE) GO WEST ON 20' CALICHE LEASE ROAD APRROX 3 8 MILES, GO NORTH ON 15' CALICHE LEASE ROAD FOR APROX. 0 4 OF A MILE TO END OF CALICHE LEASE ROAD CONTINUE NORTH-NORTHEAST ON 2-TRACK ROAD FOR APPROX. 0.2 OF A MILE TO BEGIN ROAD SURVEY, FOLLOW ROAD SURVEY NORTH APPROX 659' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE AND 355 FT FROM THE WEST LINE OF SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

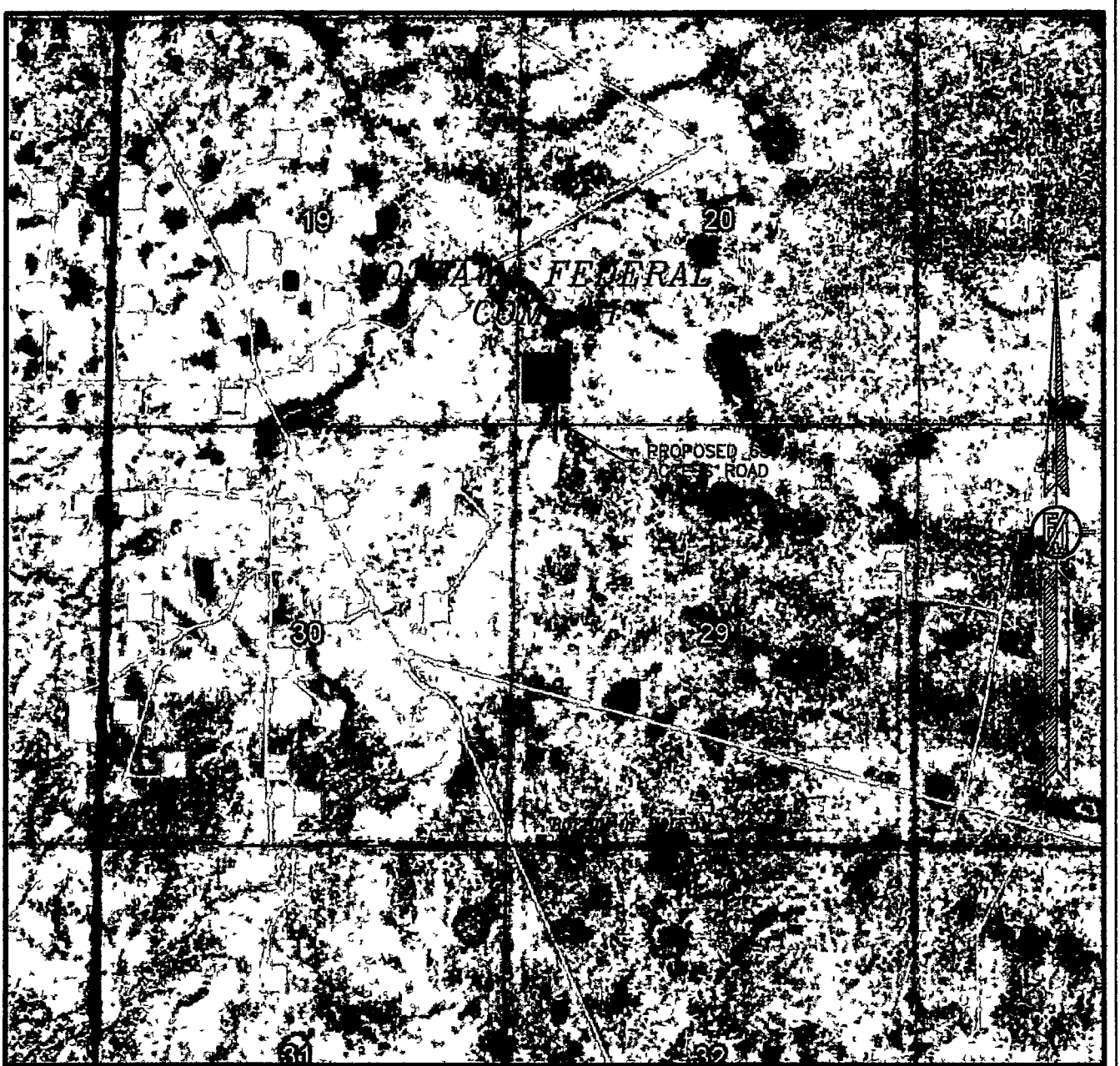
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, 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
FEBRUARY 2017

MACK ENERGY CORPORATION
OTTAWA FEDERAL COM 1H
LOCATED 660 FT FROM THE SOUTH LINE
AND 355 FT FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

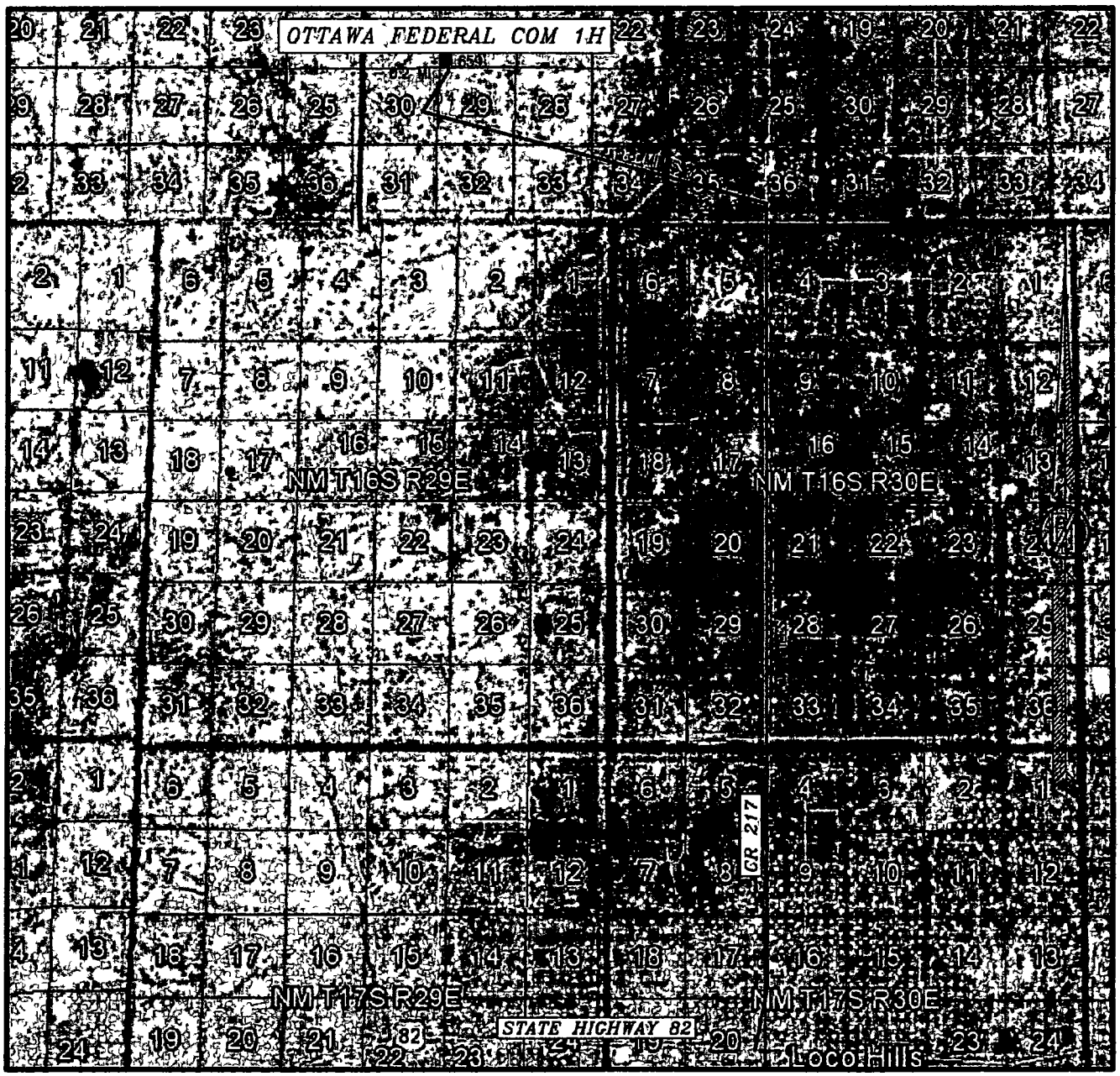
MARCH 1, 2018

SURVEY NO 5310B

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

SECTION 20, 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
FEBRUARY 2017

MACK ENERGY CORPORATION

OTTAWA FEDERAL COM 1H

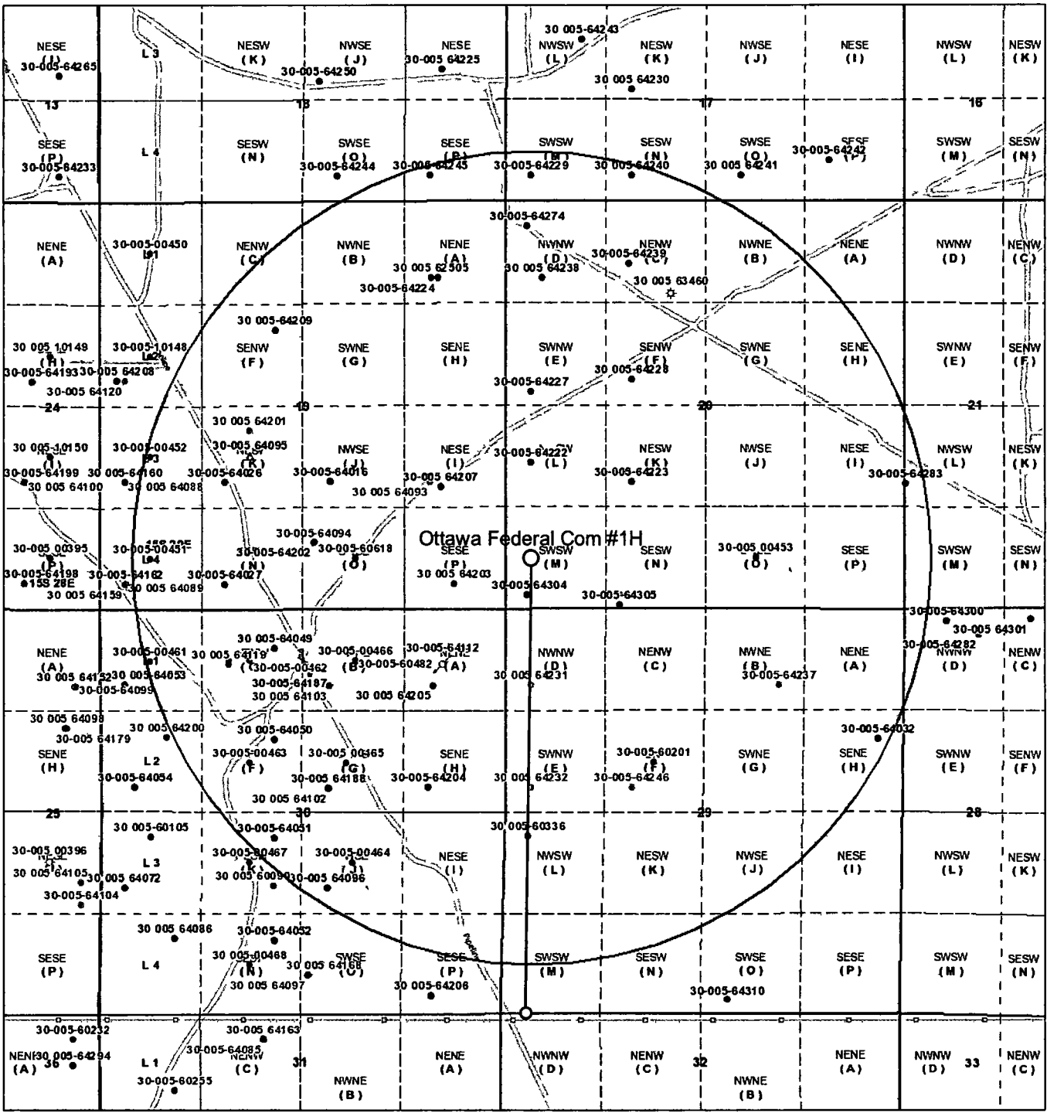
LOCATED 660 FT FROM THE SOUTH LINE
AND 355 FT FROM THE WEST LINE OF
SECTION 20, TOWNSHIP 15 SOUTH,
RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO

MARCH 1, 2018

SURVEY NO 5310B

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

Ottawa Federal Com #1H



3/15/2018 10 13 25 AM

1 18,056

0 0 175 0 35 0 7 mi

0 0 175 0 35 0 7 km

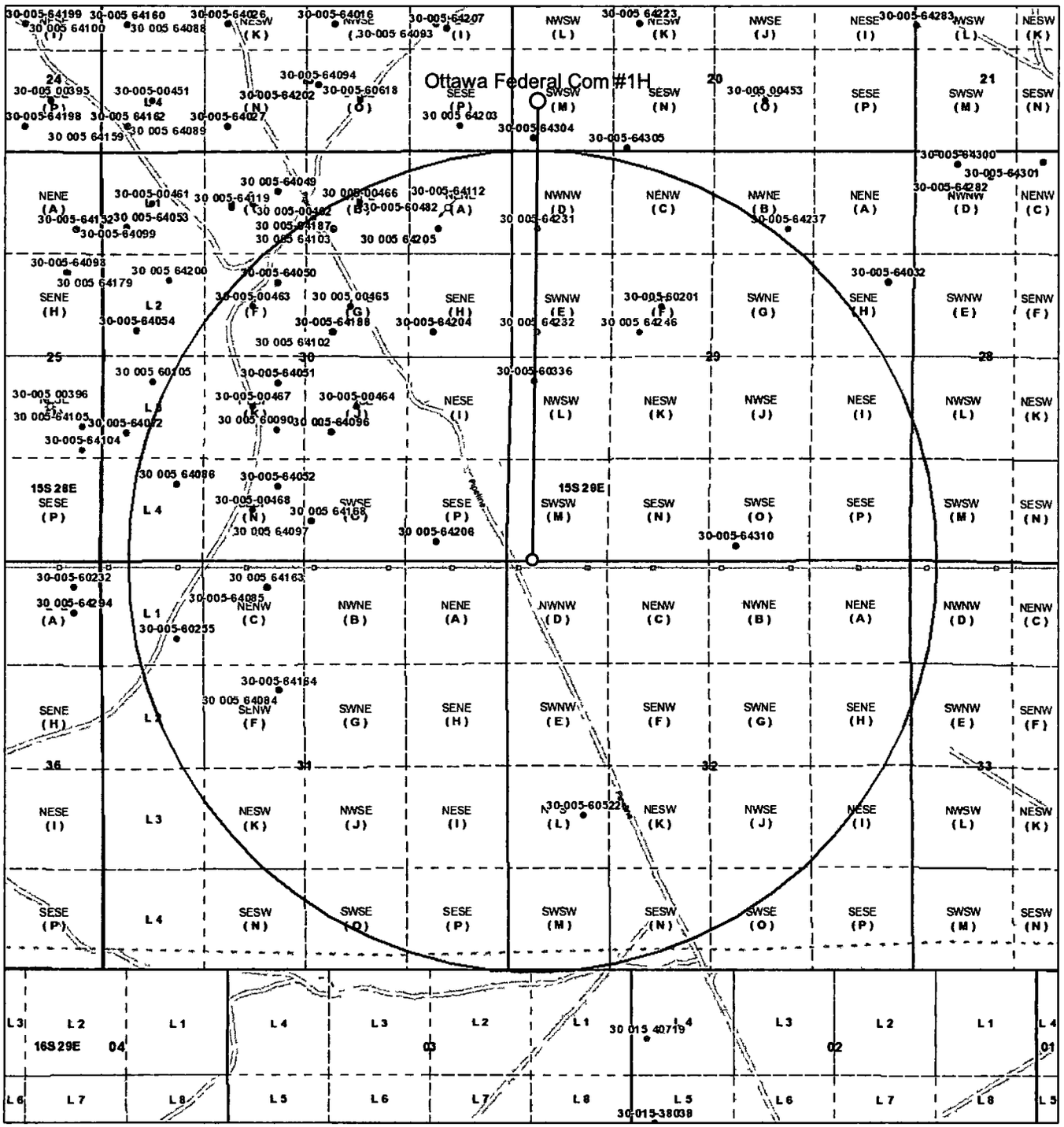
Points
- Override 1
- Override 2

Lines
- Override 1

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

Ottawa Federal Com #1H BHL



3/15/2018 10 21 31 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

Lines
- Override 1

Areas
- Override 1

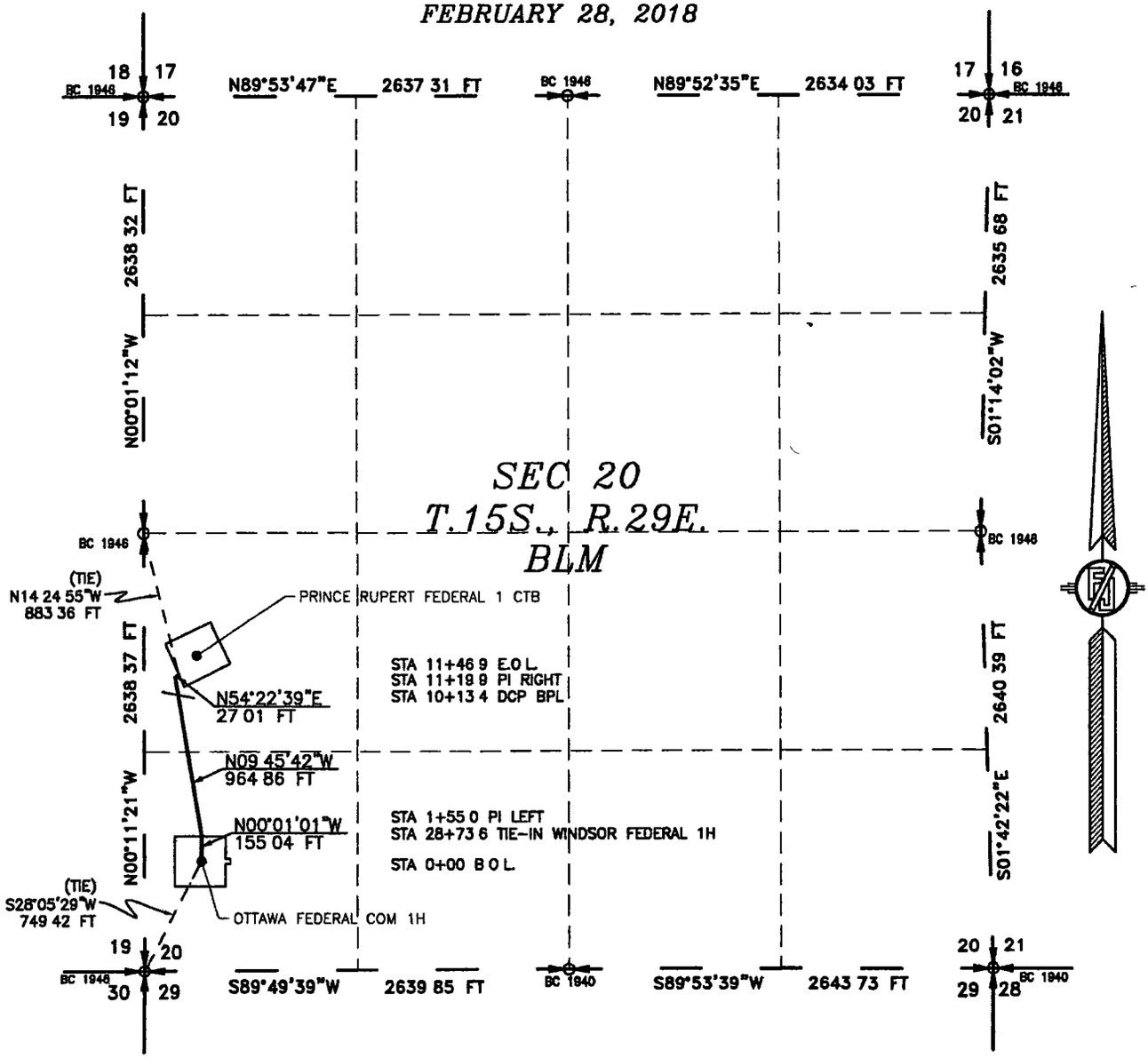
Well Locations Large Scale
- Miscellaneous
- CO2 Active
- CO2 Cancelled
- CO2 New
- CO2 Plugged
- CO2 Temporarily Abandoned
- Gas Active
- Gas Cancelled Never Drilled
- Gas New
- Gas Plugged
- Gas Temporarily Abandoned
- Injection Active
- Injection Cancelled
- Injection New
- Injection Plugged
- Injection Temporarily Abandoned
- Oil Active
- Oil Cancelled
- Oil New
- Oil Plugged
- Oil Temporarily Abandoned
- 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

FLOWLINE PLAT

RE-ROUTE TWO 4" POLY SURFACE LINES FROM THE OTTAWA FEDERAL COM 1H TO THE PRINCE RUPERT FEDERAL 1 CTB

MACK ENERGY CORPORATION

CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
FEBRUARY 28, 2018



SEE NEXT SHEET (2-4) FOR DESCRIPTION

1000 0 1000
Scale 1" = 1000

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO THIS 12 DAY OF MARCH 2018

FILIMON F JARAMILLO NEW MEXICO 12797 REGISTERED PROFESSIONAL SURVEYOR

FILIMON F JARAMILLO NM 12797

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

SHEET 1-4

SURVEY NO 5589B

MADRON SURVEYING, INC. CARLSBAD, NEW MEXICO

301 SOUTH CANAL
(575) 234-3341

FLOWLINE PLAT

RE-ROUTE TWO 4" POLY SURFACE LINES FROM THE OTTAWA FEDERAL COM 1H TO THE PRINCE RUPERT FEDERAL 1 CTB

MACK ENERGY CORPORATION
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
FEBRUARY 28, 2018

DESCRIPTION

A STRIP OF LAND 30 FEET WIDE CROSSING BUREAU OF LAND MANAGEMENT LAND IN SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , CHAVES COUNTY, STATE OF NEW MEXICO AND BEING 15 FEET EACH SIDE OF THE FOLLOWING DESCRIBED CENTERLINE SURVEY

BEGINNING AT A POINT WITHIN THE SW/4 SW/4 OF SAID SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M , WHENCE THE SOUTHWEST CORNER OF SAID SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M BEARS S28°05'29"W, A DISTANCE OF 749 42 FEET,
THENCE N00°01'01"W A DISTANCE OF 155 04 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED,
THENCE N09°45'42"W A DISTANCE OF 964 86 FEET TO AN ANGLE POINT OF THE LINE HEREIN DESCRIBED,
THENCE N54 22'39"E A DISTANCE OF 27 01 FEET THE TERMINUS OF THIS CENTERLINE SURVEY, WHENCE THE WEST QUARTER CORNER OF SAID SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M BEARS N14 24'55"W, A DISTANCE OF 883 36 FEET,

SAID STRIP OF LAND BEING 1146 91 FEET OR 69 51 RODS IN LENGTH, CONTAINING 0 790 ACRES MORE OR LESS AND BEING ALLOCATED BY FORTIES AS FOLLOWS

SW/4 SW/4	666 12 L F	40 37 RODS	0 459 ACRES
NW/4 SW/4	480 79 L.F	29 14 RODS	0 331 ACRES

GENERAL NOTES

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

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

SURVEYOR CERTIFICATE

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

IN WITNESS WHEREOF, THIS CERTIFICATE IS EXECUTED AT CARLSBAD, NEW MEXICO, THIS 2ND DAY OF MARCH 2018

FILIMON F JARAMILLO PLS 12797

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

FLOWLINE PLAT

RE-ROUTE TWO 4" POLY SURFACE LINES FROM THE OTTAWA FEDERAL COM 1H TO THE PRINCE RUPERT FEDERAL 1 CTB

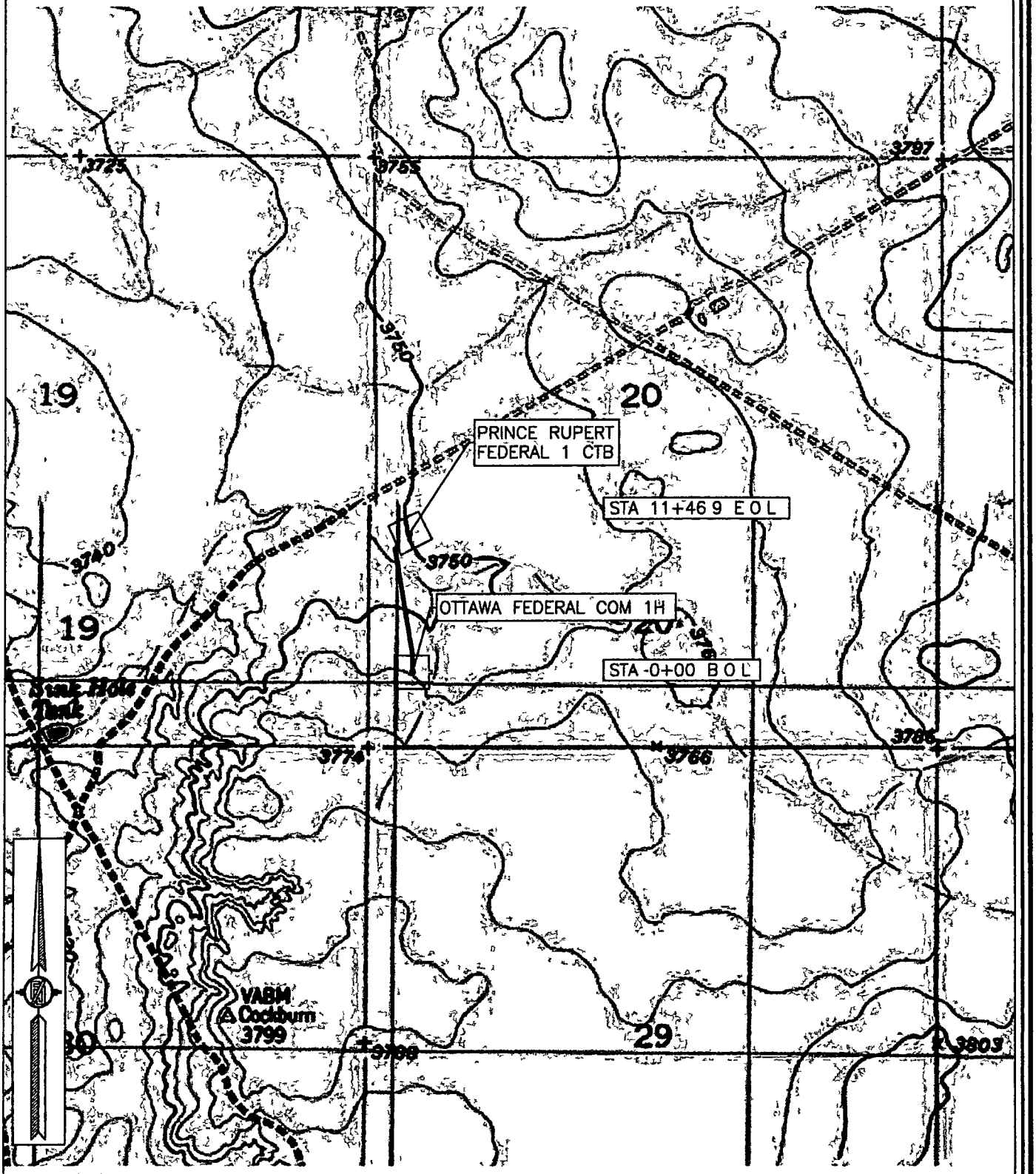
MACK ENERGY CORPORATION

CENTERLINE SURVEY OF A PIPELINE CROSSING

SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M

CHAVES COUNTY, STATE OF NEW MEXICO

FEBRUARY 28, 2018



SHEET 3-4

SURVEY NO 5589B

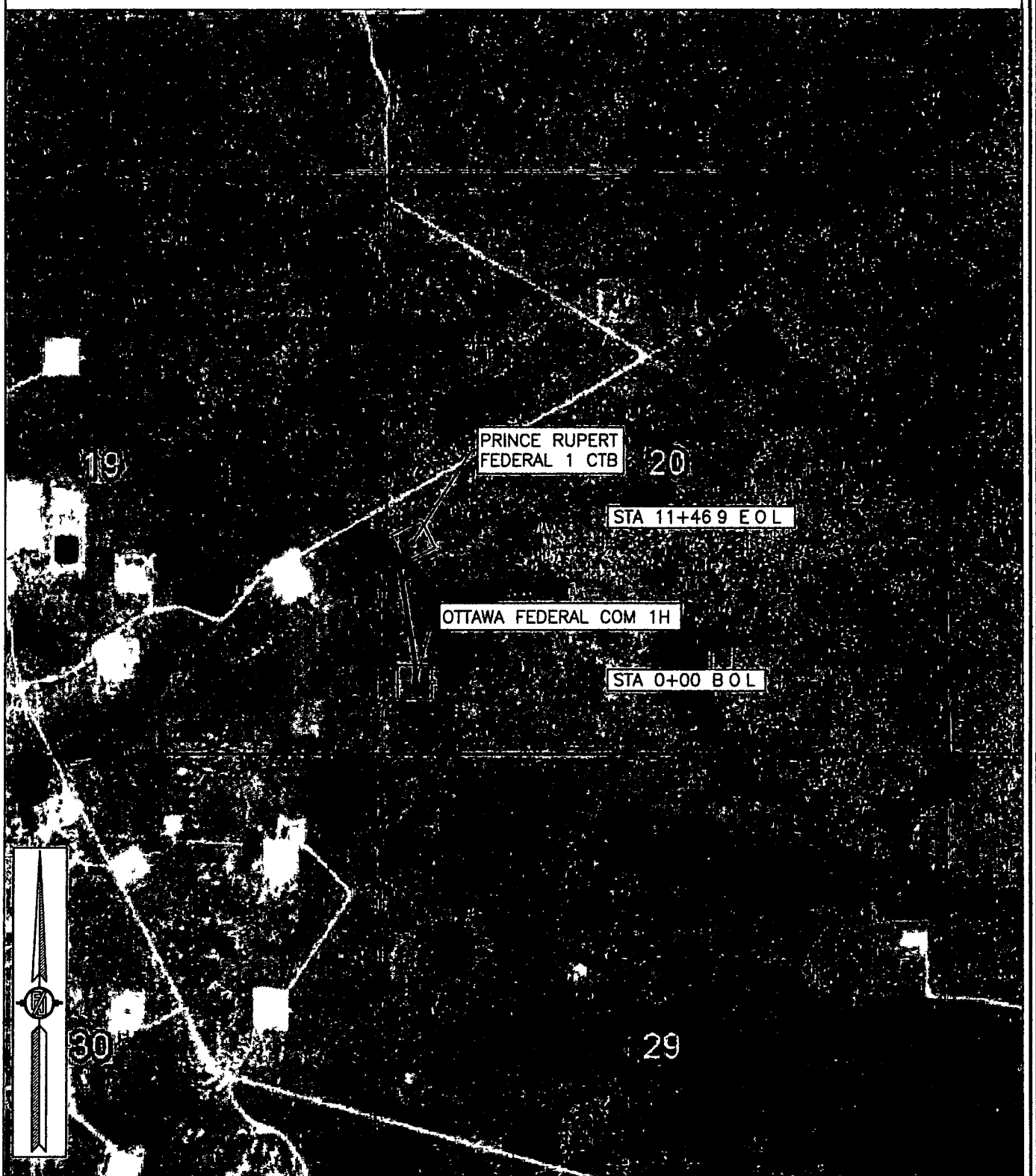
MADRON SURVEYING, INC 301 SOUTH CANAL (575) 234-3341 CARLSBAD, NEW MEXICO

FLOWLINE PLAT

RE-ROUTE TWO 4" POLY SURFACE LINES FROM THE OTTAWA FEDERAL COM 1H TO THE PRINCE RUPERT FEDERAL 1 CTB

MACK ENERGY CORPORATION

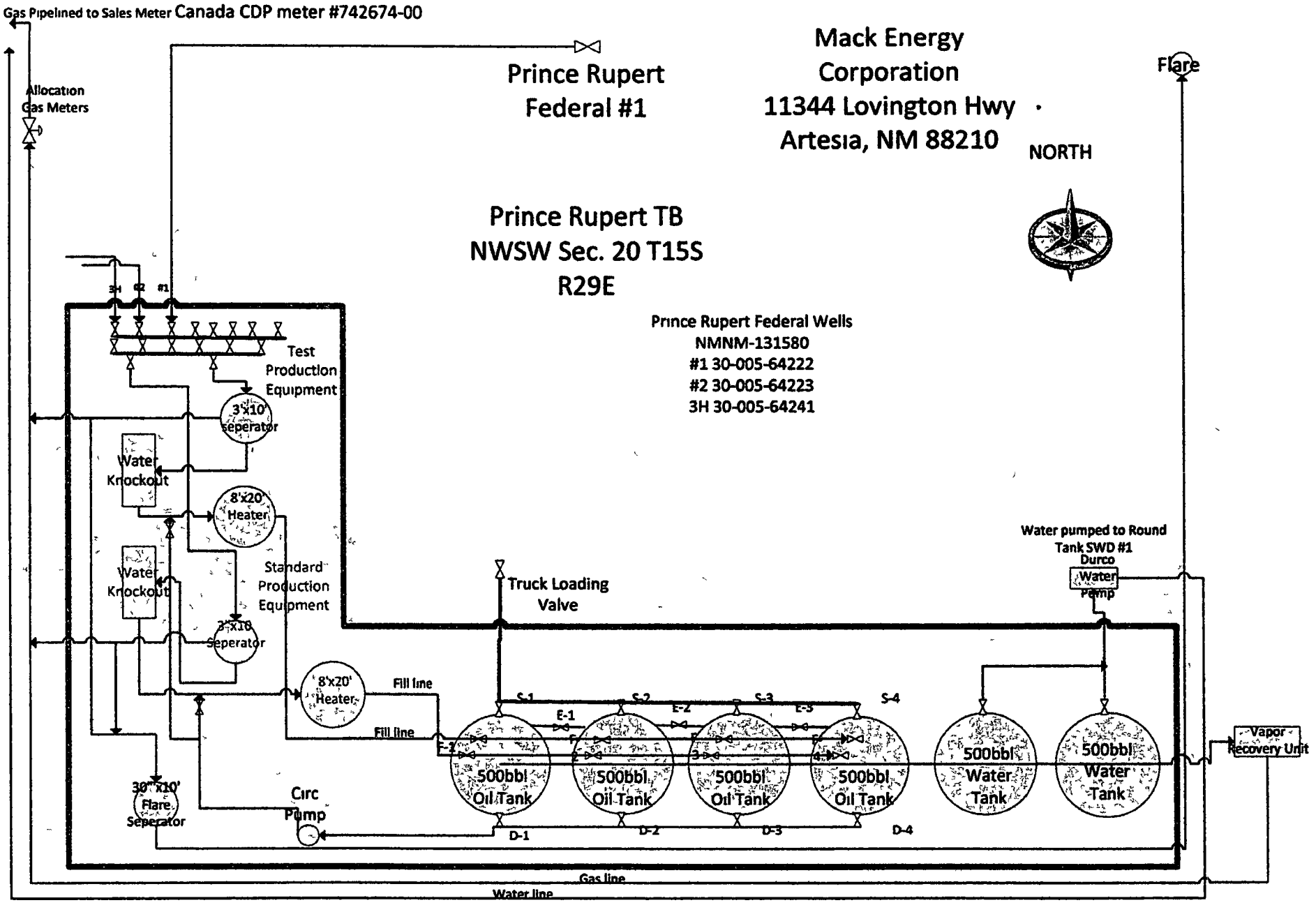
CENTERLINE SURVEY OF A PIPELINE CROSSING
SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M
CHAVES COUNTY, STATE OF NEW MEXICO
FEBRUARY 28, 2018



SHEET 4-4

SURVEY NO 5589B

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

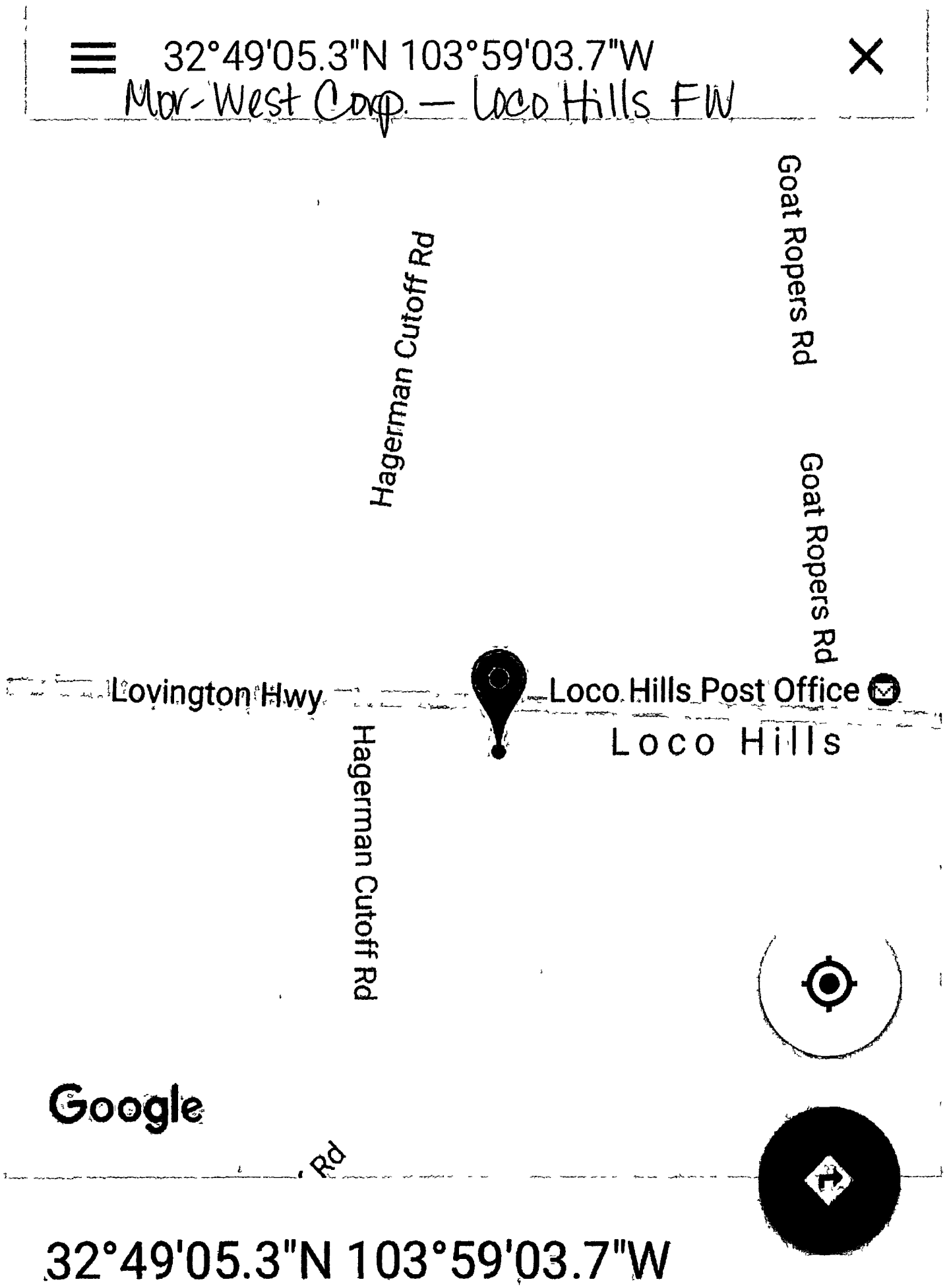

Gas Pipelined to Sales Meter Canada CDP meter #742674-00
Allocation Gas Meters
Prince Rupert Federal #1
Mack Energy Corporation
11344 Lovington Hwy
Artesia, NM 88210
Flare
NORTH
Prince Rupert TB
NWSW Sec. 20 T15S
R29E
Prince Rupert Federal Wells
NMNM-131580
#1 30-005-64222
#2 30-005-64223
3H 30-005-64241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

Sales Phase

Tank 1	Tank 2	Tank 3	Tank 4
F-1 Closed	F-1 Closed	F-1 Open	F-1 Closed
F-2 Closed	F-2 Closed	F-2 Closed	F-2 Open
F-3 Open	F-3 Closed	F-3 Closed	F-3 Closed
F-4 Closed	F-4 Open	F-4 Closed	F-4 Closed
E-1 Closed	E-1 Closed	E-1 Open	E-1 Open
E-2 Open	E-2 Open	E-2 Closed	E-2 Closed
D-1 Closed	D-1 Closed	D-1 Open	D-1 Closed
D-2 Closed	D-2 Closed	D-2 Closed	D-2 Open
D-3 Open	D-3 Closed	D-3 Closed	D-3 Closed
D-4 Closed	D-4 Open	D-4 Closed	D-4 Closed
S-1 Open	S-1 Closed	S-1 Closed	S-1 Closed
S-2 Closed	S-2 Open	S-2 Closed	S-2 Closed
S-3 Closed	S-3 Closed	S-3 Open	S-3 Closed
S-4 Closed	S-4 Closed	S-4 Closed	S-4 Open

Production Phase

Tank 1	Tank 2	Tank 3	Tank 4
F-1 Open	F-1 Closed	F-1 Closed	F-1 Closed
F-2 Closed	F-2 Open	F-2 Closed	F-2 Closed
F-3 Closed	F-3 Closed	F-3 Open	F-3 Closed
F-4 Closed	F-4 Closed	F-4 Closed	F-4 Open
E-1 Open	E-1 Open	E-1 Closed	E-1 Closed
E-2 Closed	E-2 Closed	E-2 Open	E-2 Open
D-1 Open	D-1 Closed	D-1 Closed	D-1 Closed
D-2 Closed	D-2 Open	D-2 Closed	D-2 Closed
D-3 Closed	D-3 Closed	D-3 Open	D-3 Closed
D-4 Closed	D-4 Closed	D-4 Closed	D-4 Open
S-1 Closed	S-1 Closed	S-1 Closed	S-1 Closed
S-2 Closed	S-2 Closed	S-2 Closed	S-2 Closed
S-3 Closed	S-3 Closed	S-3 Closed	S-3 Closed
S-4 Closed	S-4 Closed	S-4 Closed	S-4 Closed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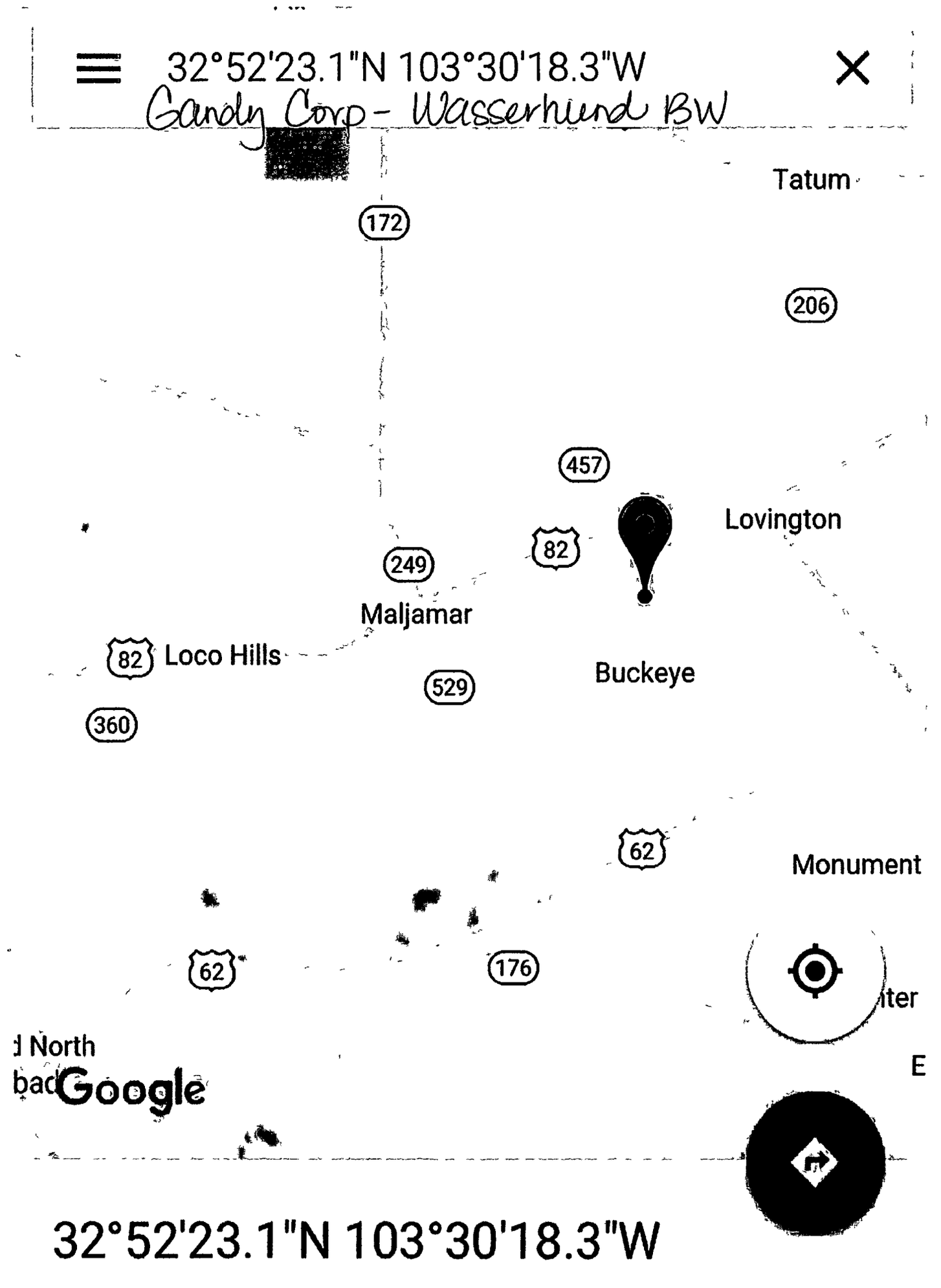
Mor-West Corp. — Loco Hills FW
Goat Ropers Rd
Hagerman Cutoff Rd
Goat Ropers Rd
Lovington Hwy
Loco Hills Post Office
Loco Hills
Hagerman Cutoff Rd
Google
Rd
32°49'05.3"N 103°59'03.7"W

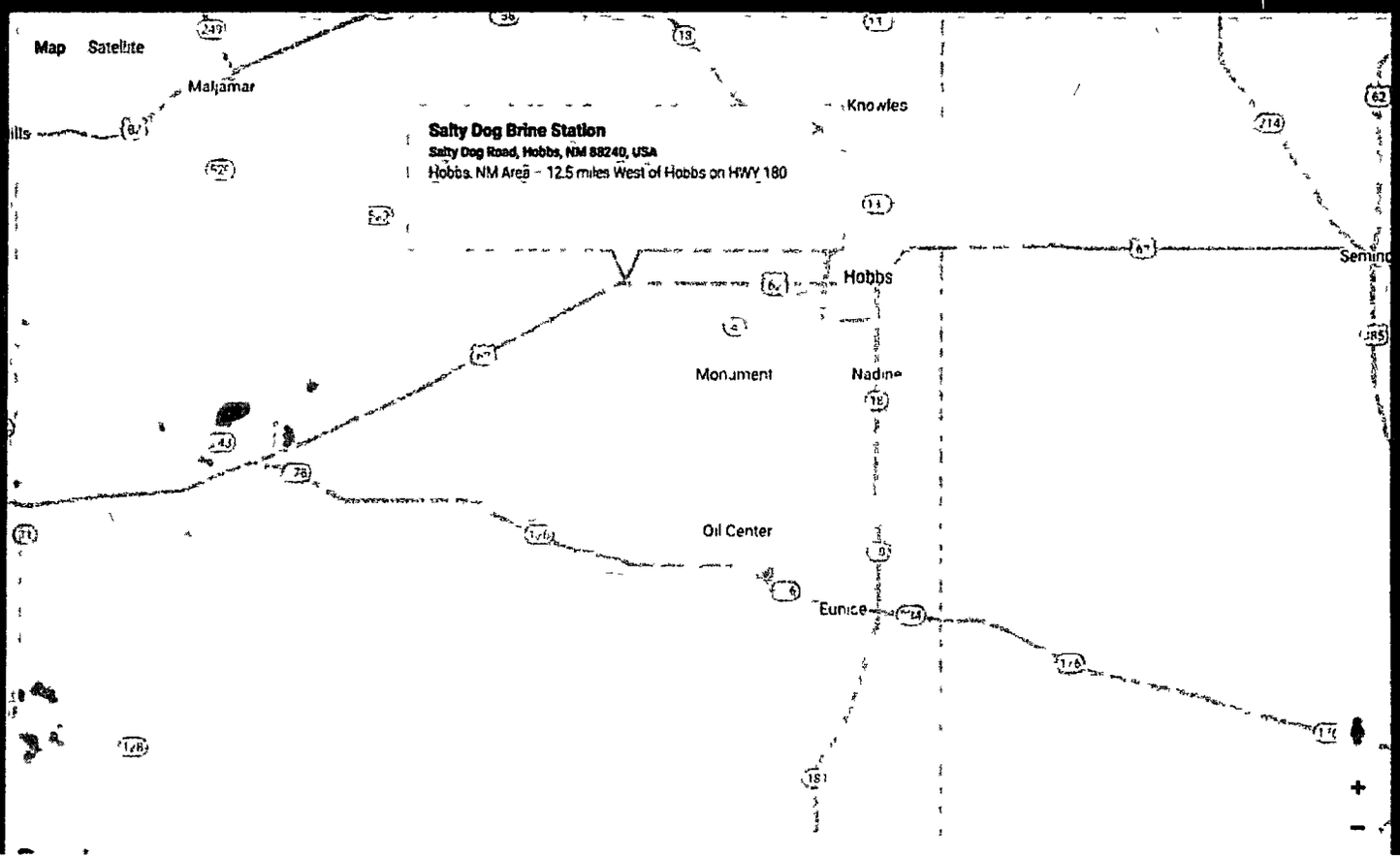

32°52'23.1"N 103°30'18.3"W
Gandy Corp - Wasserhund BW
Tatum
172
206
457
Lovington
82
249
Maljamar
82
Loco Hills
529
Buckeye
360
62
Monument
62
176
North
Google
32°52'23.1"N 103°30'18.3"W

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



33°06 55 3 N 104°19 24 4"W

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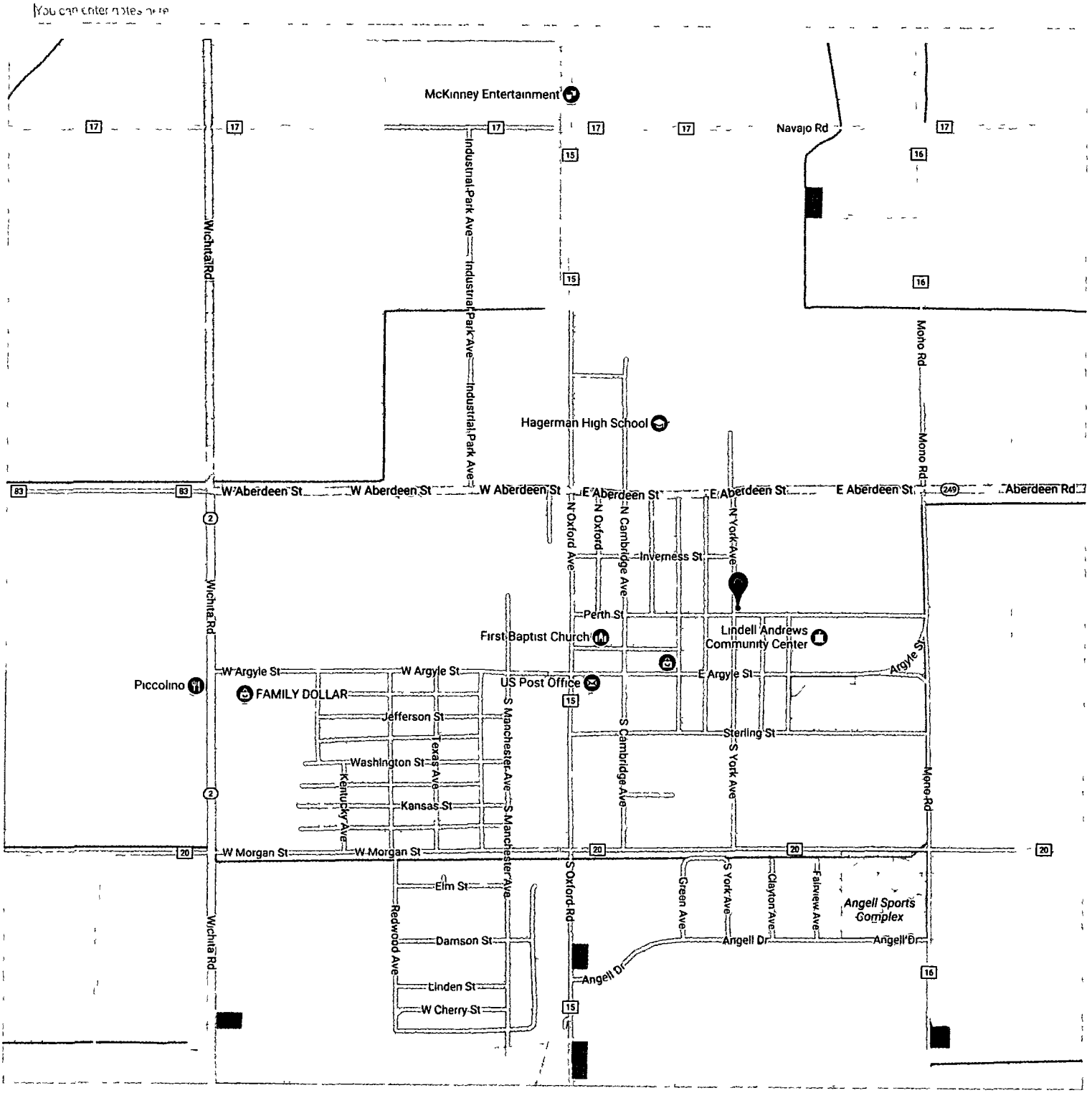
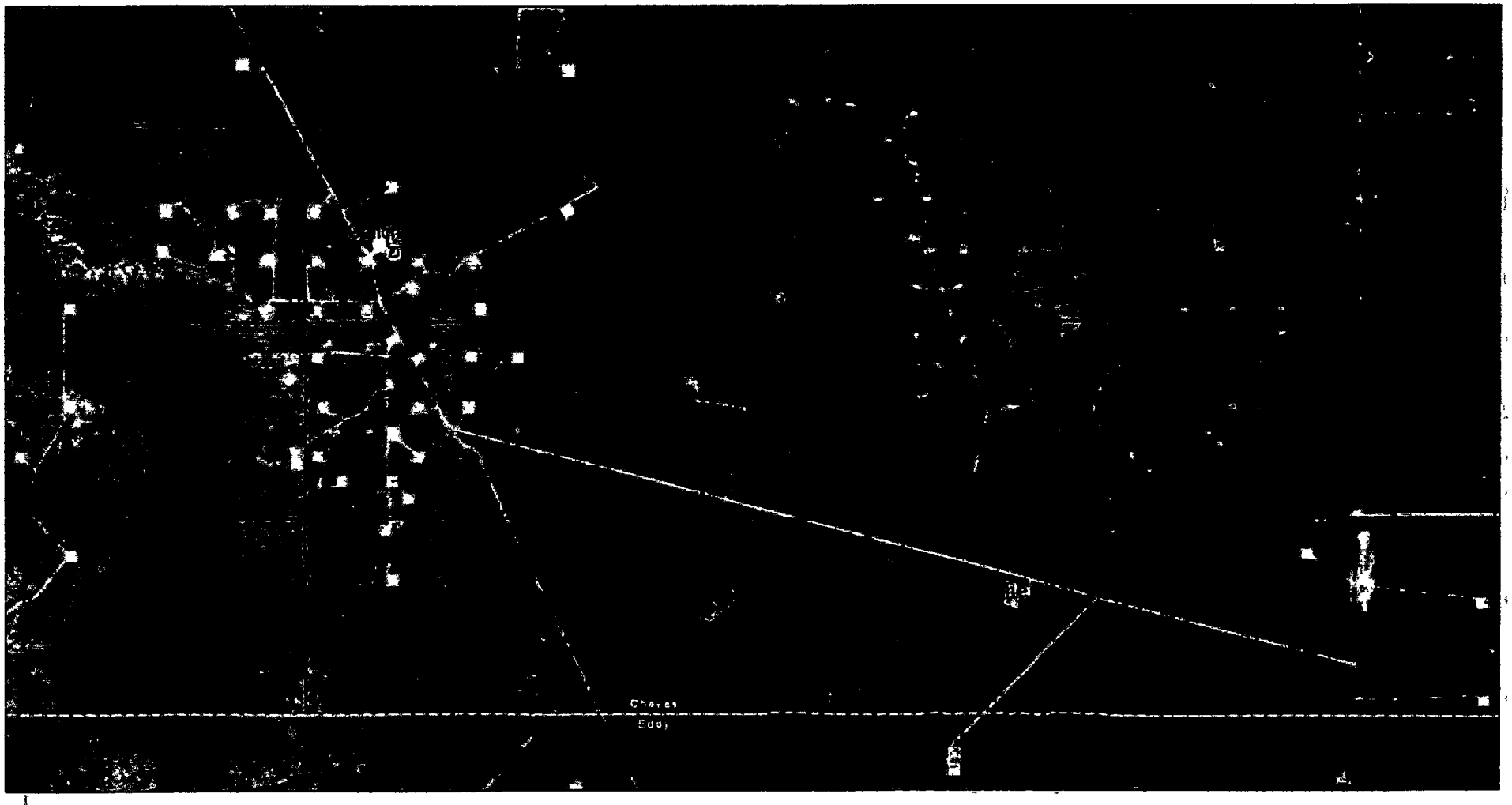


ArcGIS Web Map



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

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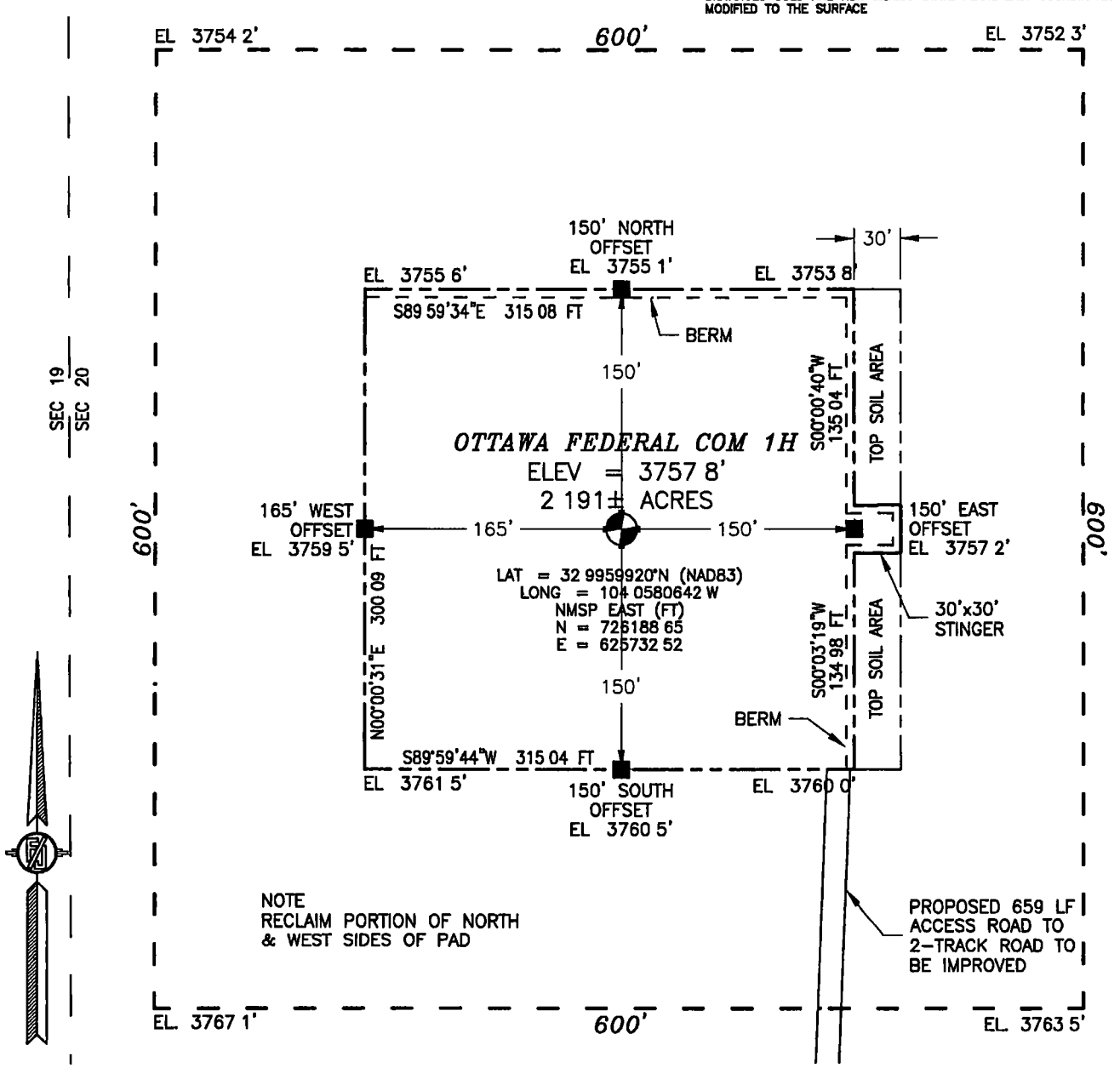
Web AppBuilder for ArcGIS

NM OSE | U.S. BLM | US Census Bureau, NMDOT | BLM | OCD | Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community | Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors, and the GIS user community |

SECTION 20, 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



010 50 100 200

SCALE 1" = 100'

DIRECTIONS TO LOCATION

FROM THE INTERSECTION OF STATE HIGHWAY 82 AND CR 217 (HAGERMAN CUT-OFF ROAD) GO NORTH ON CR 217 FOR APPROX 10 0 MILES (TO CHAVES CO LINE) GO WEST ON 20 CALICHE LEASE ROAD APRROX. 3 8 MILES, GO NORTH ON 15' CALICHE LEASE ROAD FOR APROX 0 4 OF A MILE TO END OF CALICHE LEASE ROAD, CONTINUE NORTH-NORTHEAST ON 2-TRACK ROAD FOR APPROX 0 2 OF A MILE TO BEGIN ROAD SURVEY, FOLLOW ROAD/SURVEY NORTH APPROX. 659' TO THE SOUTHEAST PAD CORNER FOR THIS LOCATION

MACK ENERGY CORPORATION

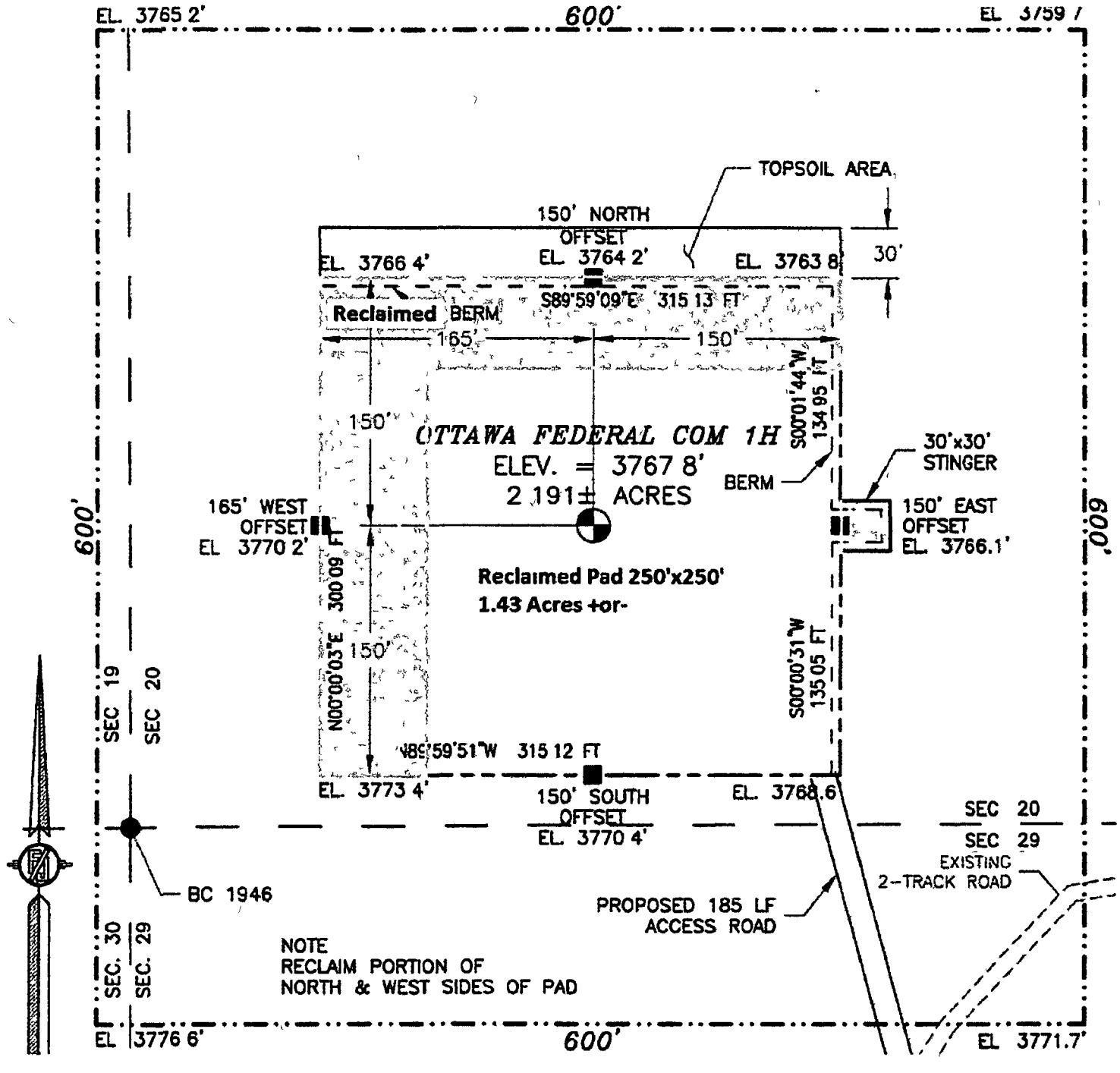
OTTAWA FEDERAL COM 1H

LOCATED 660 FT FROM THE SOUTH LINE AND 355 FT FROM THE WEST LINE OF SECTION 20, TOWNSHIP 15 SOUTH, RANGE 29 EAST, N M P M CHAVES COUNTY, STATE OF NEW MEXICO

MARCH 1, 2018

SURVEY NO 5310B

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


EL. 3765.2'
600'
EL. 3759.7'
TOPSOIL AREA
150' NORTH OFFSET
EL. 3764.2'
EL. 3766.4'
EL. 3763.8'
30'
Reclaimed BERM
S89°59'09"E 315.13 FT
165'
150'
150'
OTTAWA FEDERAL COM 1H
ELEV. = 3767.8'
2.191± ACRES
S00°01'44"W 134.95 FT
BERM
30'x30' STINGER
165' WEST OFFSET
EL. 3770.2'
150' EAST OFFSET
EL. 3766.1'
N00°00'03"E 300.09 FT
Reclaimed Pad 250'x250'
1.43 Acres +or-
150'
S00°00'31"W 135.05 FT
600'
600'
N89°59'51"W 315.12 FT
EL. 3773.4'
150' SOUTH OFFSET
EL. 3770.4'
EL. 3768.6'
SEC 19
SEC 20
SEC 20
SEC 29
EXISTING 2-TRACK ROAD
BC 1946
PROPOSED 185 LF ACCESS ROAD
SEC. 30
SEC. 29
NOTE
RECLAIM PORTION OF
NORTH & WEST SIDES OF PAD
EL. 3776.6'
600'
EL. 3771.7'

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

Genera/Information A general information section has been included to supply support information

EMERGENCY PROCEDURES SECTION

f I In the event of any evidence of H2S level above l0ppm, take the following steps immediately

f I a Secure breathing apparatus

f I b Order non-essential personnel out of the danger zone

f I c Take steps to determine if the H2S level can be corrected or suppressed, and if so, proceed with normal operations

f II If uncontrollable conditions occur, proceed with the following

f II 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

f II b Remove all personnel to the Safe Briefing Area

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

f II 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*

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

a ii Check status of other personnel (buddy system)

a iii Secure breathing apparatus

a iv Wait for orders from supervisor

b *Drilling Foreman*

b 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

a i Sound the alarm immediately

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

a iii Stop the circulatory pump

a iv Close the drill pipe rams

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

b Drill No 2- Tripping Drill Pipe

b i Sound the alarm immediately

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

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

b iv Close the drill pipe rams

b v Record the shut-in annular pressure

II Crew Assignments

a Drill No. 1- Bottom Drilling

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

b v ii Derrick man

b v ii 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

b v iii Floor Man #1

b v iii 1 Close the pipe rams after receiving the signal from the Derrickman

2 Report to Driller for further instructions

b v iv Floor Man #2

b v iv 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

b v v Tool Pusher

b v v 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

b v vi Operator Representative

b v vi 1 Notify the Drilling Superintendent

2 Determine if an emergency exists and if so, activate the contingency plan

b Drill No 2- Tripping Pipe

b i Driller

b i 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

b ii Derrick man

b ii 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

b iii Floor Man #1

b iii 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

b iv Floor Man #2

b iv 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

b v Tool Pusher

b v 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

b vi Operator Representative

b vi 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 @ lOOppm)

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	1ppm	
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

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 ($S0_2$) 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 H2S

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 H2S {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

Attached to Form 3160-3
Mack Energy Corporation
Ottawa Federal Com #1H NMNM-131583
SHL 180 FSL & 280 FWL, SWSW, Sec 20 T15S R29E
BHL 270 FSL & 355 FWL, SWSW, Sec 29 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

Attached to Form 3160-3
Mack Energy Corporation
Ottawa Federal Com #1H NMNM-131583
SHL 180 FSL & 280 FWL, SWSW, Sec 20 T15S R29E
BHL 270 FSL & 355 FWL, SWSW, Sec 29 T15S R29F
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

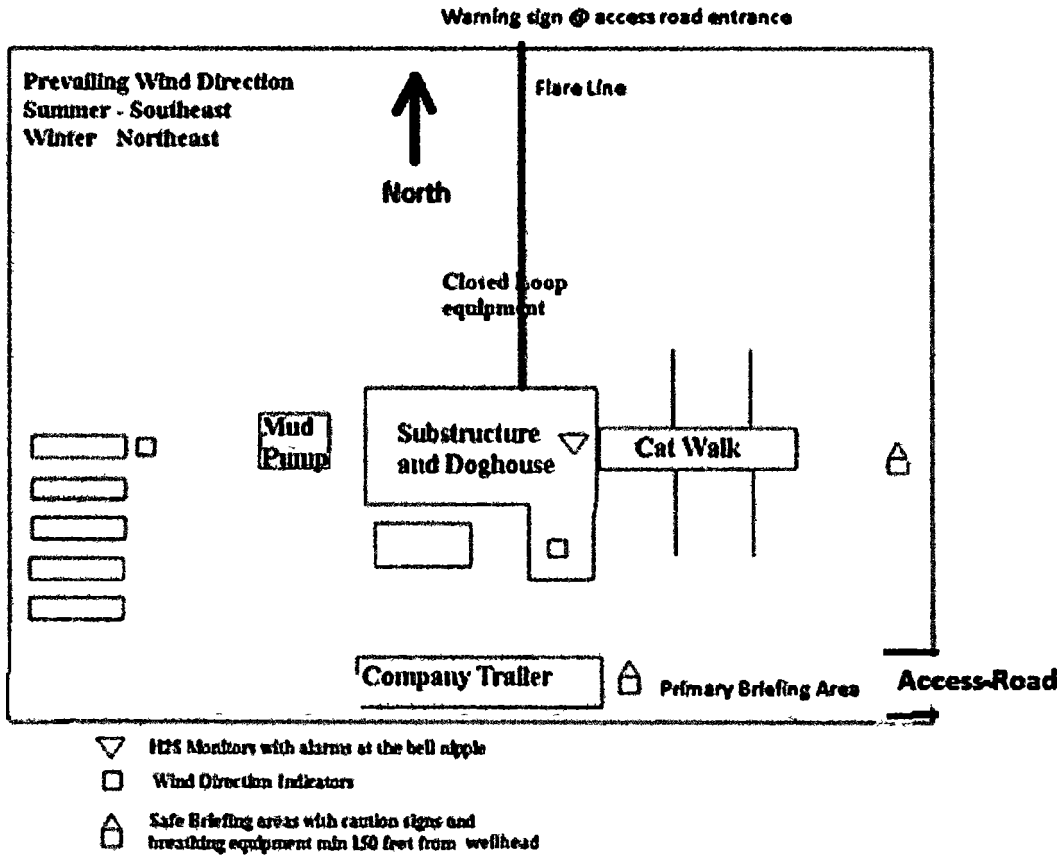
3 SMOKING IN DESIGNATED AREAS ONLY

4 BE WIND CONSCIOUS AT ALL TIMES

5 CHECK WITH MACK ENERGY FOREMAN AT OFFICE

MACK ENERGY CORPORATION

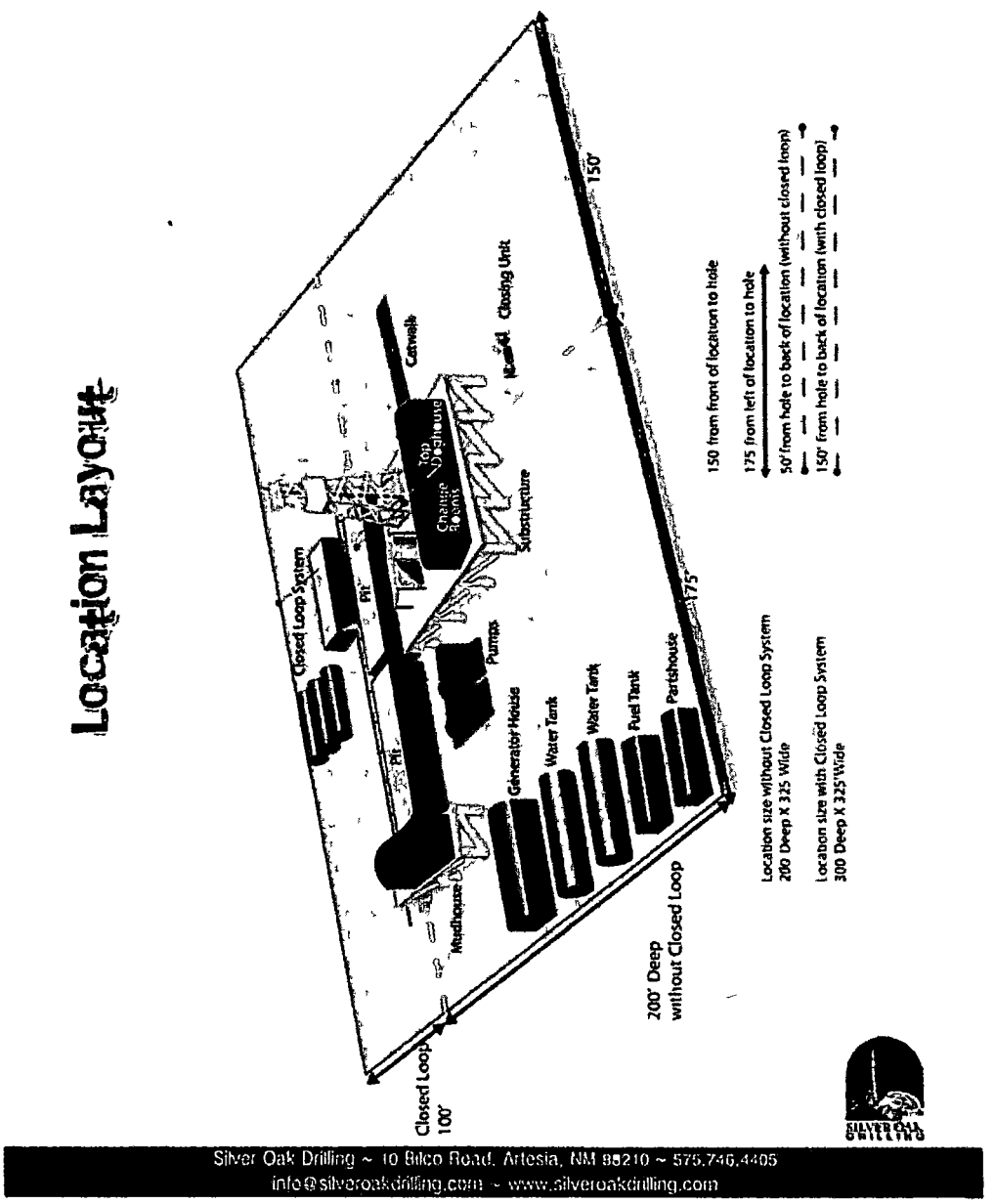
1-575-748-1288



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

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 HWY 82 and CR 217, go North on CR 217 for approx 10 miles, go West on 20 caliche lease rd approx, 3 8 miles go North on 15 caliche lease rd for approx 0 4 miles to end of caliche lease road Cont, North-Northeast on 2 track rd for approx 0 2 mile to begin road survey follow road survey North approx 659 to the Southeast 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

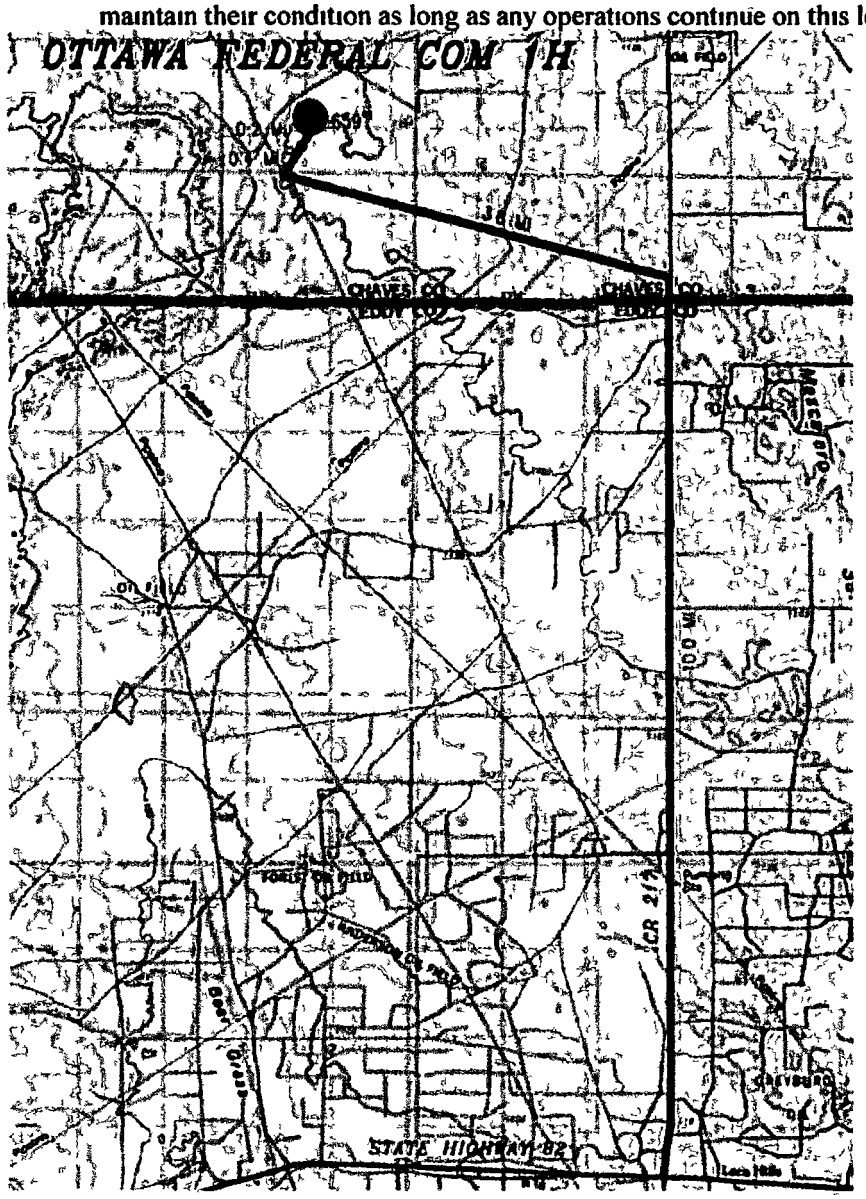


Exhibit #6

1. **Proposed Access Road:**

Vicinity Map shows this location with existing road and 659' of new road exiting the Southeast 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-132973 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

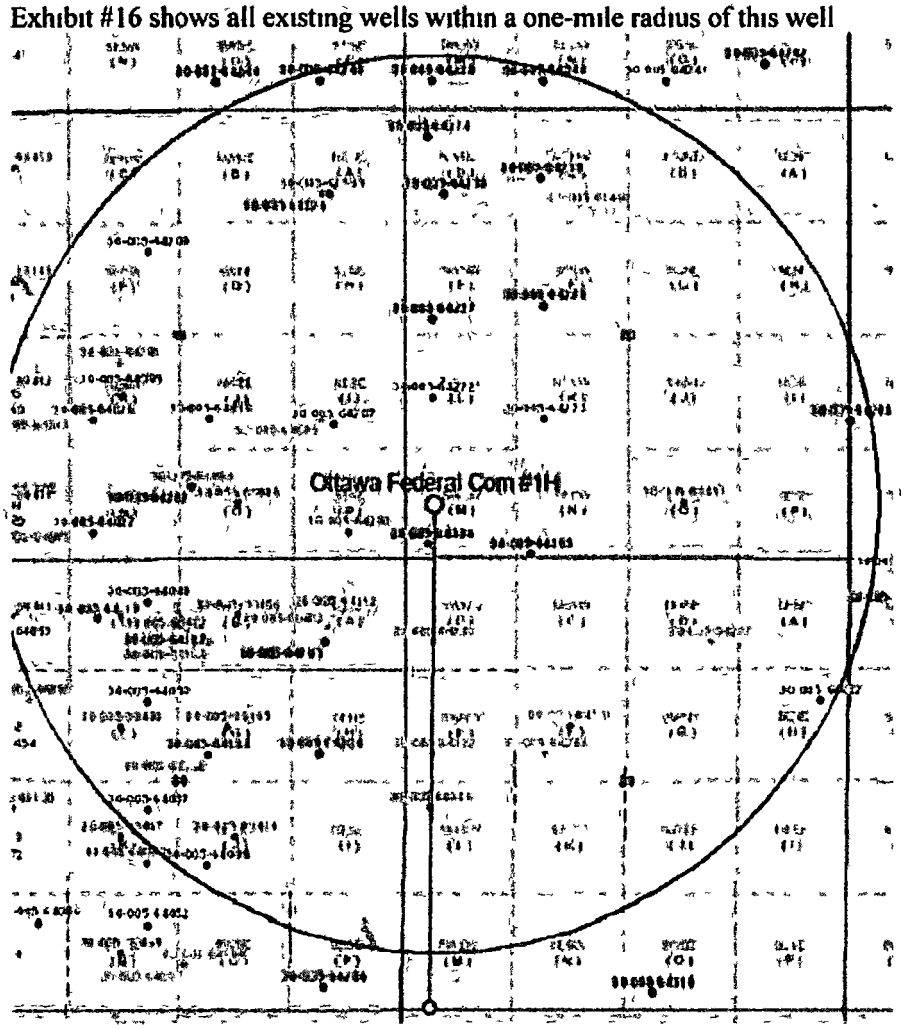


Exhibit #16

3 Location of Existing and/or Proposed Facilities:

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

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

1) San Andres Completion Will be sent to the Prince Rupert Federal CTB located at the #1 well 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 trein North to the Prince Rupert CTB Flowline will be a 4" poly surface line 1146 91' in length with a 40 psi working pressure

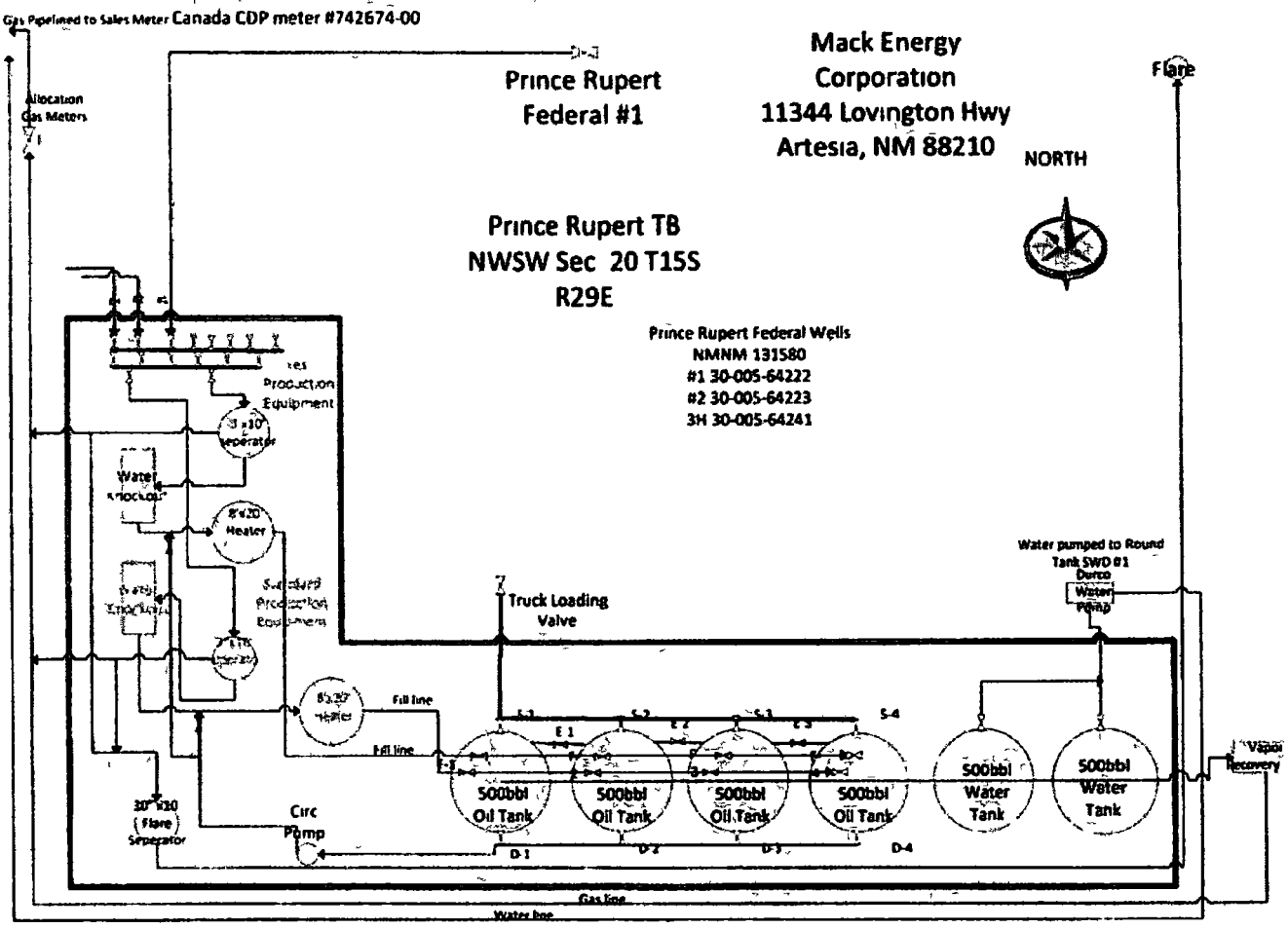


Exhibit #13

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:

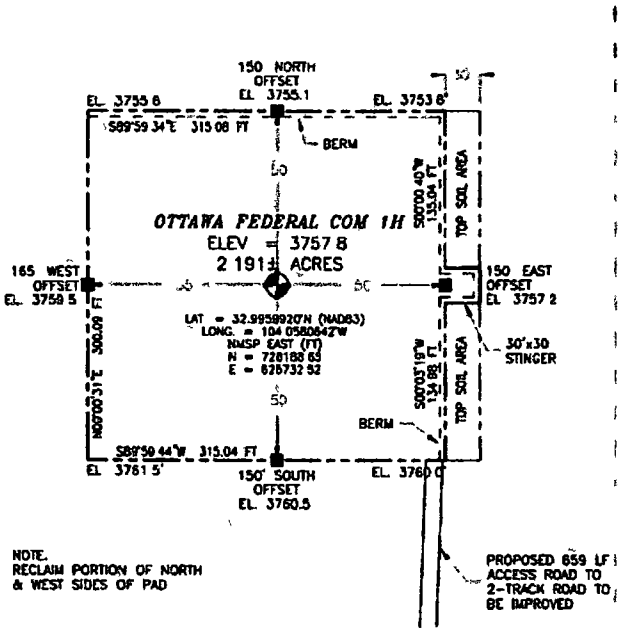
No airstrip, campsite or other facilities will be built as a result of the operation on this well

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

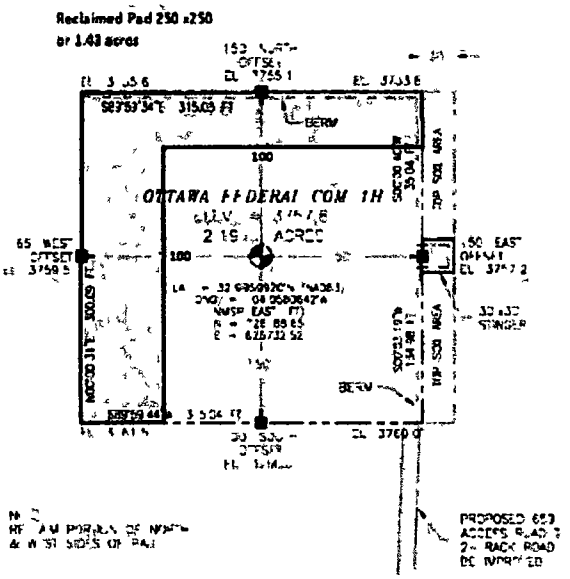


Exhibit #15

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 3.16.18 **Signed** Deana Weaver

Deana Weaver

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