Form 3160-3
(June 2015)

RECEIVED
JUN 04 2019
DISTRICT II-ARTESIA O.C.D.

FORM APPROVED
OMB No. 1004-0137
Expires: January 31, 2018

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

APPLICATION FOR PERMIT TO DRILL OR REENTER

5. Lease Serial No.
NMNM014758

6. If Indian, Allotee or Tribe Name

1a. Type of work: [✓] DRILL [ ] REENTER

1b. Type of Well: [✓] Oil Well [ ] Gas Well [ ] Other

1c. Type of Completion: [ ] Hydraulic Fracturing [✓] Single Zone [ ] Multiple Zone

7. If Unit or CA Agreement, Name and No.

8. Lease Name and Well No.
LAKEWOOD FEDERAL COM
17H 324926

2. Name of Operator
PERCUSSION PETROLEUM OPERATING LLC

9. API Well No.
30-015-46066

3a. Address	3b. Phone No. *(include area code)*	10. Field and Pool, or Exploratory
919 Milam Street, Suite 2475 Houston TX 77002	(713)589-2337	N. SEVEN RIVERS; GLORIETA -YESO

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*

At surface LOT 4 / 555 FNL / 645 FWL / LAT 32.608193 / LONG -104.479162

At proposed prod. zone NWNW / 20 FNL / 900 FWL / LAT 32.624184 / LONG -104.478198

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 3 / T20S / R25E / NMP

14. Distance in miles and direction from nearest town or post office*	12. County or Parish	13. State
16 miles	EDDY	NM

15. Distance from proposed* location to nearest property or lease line, ft. (Also to nearest drig. unit line, if any)	16. No of acres in lease	17. Spacing Unit dedicated to this well
555 feet	1442.36	160

18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft.	19. Proposed Depth	20. BLM/BIA Bond No. in file
617 feet	2989 feet / 8541 feet	FED: NMB001424

21. Elevations (Show whether DF, KDB, RT, GL, etc.)	22. Approximate date work will start*	23. Estimated duration
3524 feet	12/31/2018	30 days

24. Attachments

The following, completed in accordance with the requirements of Onshore Oil and Gas Order No. 1, and the Hydraulic Fracturing rule per 43 CFR 3162.3-3 (as applicable)

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 requested by the BLM.

25. Signature	Name *(Printed/Typed)*	Date
(Electronic Submission)	Brian Wood / Ph: (505)466-8120	10/15/2018

Title
President

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	05/30/2019

Title	Office
Assistant Field Manager Lands & Minerals	CARLSBAD

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.

APPROVED WITH CONDITIONS

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 05/30/2019 RWP 6-11-19

INSTRUCTIONS

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

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

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

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

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

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

ITEM 24: If the proposal will involve hydraulic fracturing operations, you must comply with 43 CFR 3162.3-3, including providing information about the protection of usable water. Operators should provide the best available information about all formations containing water and their depths. This information could include data and interpretation of resistivity logs run on nearby wells. Information may also be obtained from state or tribal regulatory agencies and from local BLM offices.

NOTICES

The Privacy Act of 1974 and regulation in 43 CFR 2.48(d) provide that you be furnished the following information in connection with information required by this application.

AUTHORITY: 30 U.S.C. 181 et seq., 25 U.S.C. 396; 43 CFR 3160

PRINCIPAL PURPOSES: The information will be used to: (1) process and evaluate your application for a permit to drill a new oil, gas, or service wen or to reenter a plugged and abandoned well; and (2) document, for administrative use, information for the management, disposal and use of National Resource Lands and resources including (a) analyzing your proposal to discover and extract the Federal or Indian resources encountered; (b) reviewing procedures and equipment and the projected impact on the land involved; and (c) evaluating the effects of the proposed operation on the surface and subsurface water and other environmental impacts.

ROUTINE USE: Information from the record and/or the record win be transferred to appropriate Federal, State, and local or foreign agencies, when relevant to civil, criminal or regulatory investigations or prosecution, in connection with congressional inquiries and for regulatory responsibilities.

EFFECT OF NOT PROVIDING INFORMATION: Filing of this application and disclosure of the information is mandatory only if you elect to initiate a drilling or reentry operation on an oil and gas lease.

The Paperwork Reduction Act of 1995 requires us to inform you that:

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

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

(Continued on page 3)

Additional Operator Remarks

Location of Well

1. SHL: LOT 4 / 555 FNL / 645 FWL / TWSP: 20S / RANGE: 25E / SECTION: 3 / LAT: 32.608193 / LONG: -104.479162 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT 4 / 555 FNL / 645 FWL / TWSP: 20S / RANGE: 25E / SECTION: 3 / LAT: 32.608193 / LONG: -104.479162 (TVD: 0 feet, MD: 0 feet)
   PPP: SWSW / 0 FSL / 796 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.609682 / LONG: -104.478689 (TVD: 2950 feet, MD: 3198 feet)
   PPP: SWNW / 2640 FNL / 772 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.616964 / LONG: -104.478445 (TVD: 2973 feet, MD: 5680 feet)
   BHL: NWNW / 20 FNL / 900 FWL / TWSP: 19S / RANGE: 25E / SECTION: 34 / LAT: 32.624184 / LONG: -104.478198 (TVD: 2989 feet, MD: 8541 feet)

BLM Point of Contact

Name: Tanja Baca
Title: Admin Support Assistant
Phone: 5752345940
Email: tabaca@blm.gov

Review and Appeal Rights

A person contesting a decision shall request a State Director review. This request must be filed within 20 working days of receipt of the Notice with the appropriate State Director (see 43 CFR 3165.3). The State Director review decision may be appealed to the Interior Board of Land Appeals, 801 North Quincy Street, Suite 300, Arlington, VA 22203 (see 43 CFR 3165.4). Contact the above listed Bureau of Land Management office for further information.

PECOS DISTRICT DRILLING
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	**Percussion Petroleum Operating, LLC**
LEASE NO.:	**NMNM-014758**
WELL NAME & NO.:	**Lakewood Federal Com 17H**
SURFACE HOLE FOOTAGE:	**0555' FNL & 0645' FWL**
BOTTOM HOLE FOOTAGE	**0020' FNL & 0900' FWL Sec. 34, T. 19 S., R 25 E.**
LOCATION:	**Section 03, T. 20 S., R 25 E., NMPM**
COUNTY:	**County, New Mexico**

Communitization Agreement

- The operator will submit a Communitization Agreement to the Carlsbad Field Office, 620 E Greene St. Carlsbad, New Mexico 88220, at least 90 days before the anticipated date of first production from a well subject to a spacing order issued by the New Mexico Oil Conservation Division. The Communitization Agreement will include the signatures of all working interest owners in all Federal and Indian leases subject to the Communitization Agreement (i.e., operating rights owners and lessees of record), or certification that the operator has obtained the written signatures of all such owners and will make those signatures available to the BLM immediately upon request.
- If the operator does not comply with this condition of approval, the BLM may take enforcement actions that include, but are not limited to, those specified in 43 CFR 3163.1.
- In addition, the well sign shall include the surface and bottom hole lease numbers. When the Communitization Agreement number is known, it shall also be on the sign.

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)

☐ **Eddy County**
Call the Carlsbad Field Office, 620 East Greene St., Carlsbad, NM 88220, (575) 361-2822

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.

High Cave/Karst
Possibility of water flow sin the San Andres.
Possibility of lost circulation in the San Andres and Artesia Group.

A MINIMUM OF TWO CASING STRINGS CEMENTED TO SURFACE IS REQUIRED IN HIGH CAVE/KARST AREAS. THE CEMENT MUST BE IN A SOLID SHEATH. THEREFORE, ONE INCH OPERATIONS ARE NOT SUFFICIENT TO PROTECT CAVE KARST RESOURCES. A CASING DESIGN THAT HAS A ONE INCH JOB PERFORMED DOES NOT COUNT AS A SOLID SHEATH.

ON TWO STRING DESIGN – CONTINGENCY CASING WILL BE REQUIRED IF LOST CIRCULATION (TOTAL LOSS) OCCURS WHILE DRILLING THE SURFACE HOLE. THE SURFACE HOLE WILL HAVE TO BE REAMED AND A LARGER CASING INSTALLED AND THE BLM IS TO BE CONTACTED PRIOR TO RUNNING THE CASING. NOTE: A DEEP CONDUCTOR WILL BE TREATED AND CEMENTED AS A CONTINGENCY CASING.

ON TWO STRING DESIGN WHERE THE SURACE CASING HAD A SUCCESSFUL CEMENT JOB; IF LOST CIRCULATION (TOTAL LOSS) OCCURS WHILE DRILLING THE PRODUCTION 8-3/4" HOLE, THE CEMENT PROGRAM FOR THE PRODUCTION 7" CASING WILL NEED TO BE MODIFIED AND THE BLM IS TO BE CONTACTED PRIOR TO RUNNING THE CASING. A DV TOOL WILL BE REQUIRED.

ON A THREE STRING DESIGN; IF THE PRIMARY CEMENT JOB ON THE SURFACE CASING DOES NOT CIRCULATE, THEN THE NEXT TWO CASING STRINGS MUST BE CEMENTED TO SURFACE.

Contingency Surface Casing Plan:

1. The **13-3/8** inch surface casing shall be set at approximately **400** feet and cemented to the surface.

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

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

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

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

Casing Plan without Contingency:

2. The **9-5/8** inch surface casing shall be set at approximately **1279** feet and cemented to the surface **(If contingency casing is used the 9-5/8" casing will become the intermediate casing).**

    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.

3. 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.

4. If hardband drill pipe is rotated inside casing, returns will be monitored for metal. If metal is found in samples, drill pipe will be pulled and rubber protectors which have a larger diameter than the tool joints of the drill pipe will be installed prior to continuing drilling operations.

C. PRESSURE CONTROL

1. All blowout preventer (BOP) and related equipment (BOPE) shall comply with well control requirements as described in Onshore Oil and Gas Order No. 2 and API 53.

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

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 052819

Lakewood Federal Com 12H-19H Master COAs

Lakewood Federal Com 12H
Surface Hole Location: 755 ft. FNSL and 1820 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1865 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 13H
Surface Hole Location: 775 ft. FNL and 1820 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1765 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 14H
Surface Hole Location: 430 ft. FNSL and 1290 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1545 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 15H
Surface Hole Location: 430 ft. FNL and 1270 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 1205 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 16H
Surface Hole Location: 430 ft. FNSL and 1250 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 985 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 17H
Surface Hole Location: 555 ft. FNSL and 645 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 900 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 18H
Surface Hole Location: 555 ft. FNSL and 825 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 700 ft. FWL; Section 34, T. 19 S., R. 25 E.

Lakewood Federal Com 19H
Surface Hole Location: 555 ft. FNSL and 605 ft. FWL; Section 3, T. 20 S., R. 25 E.
Bottom Hole Location: 20 ft. FNL and 360 ft. FWL; Section 34, T. 19 S., R. 25 E.

TABLE OF CONTENTS

Standard Conditions of Approval (COA) apply to this APD. If any deviations to these standards exist or special COAs are required, the section with the deviation or requirement will be checked below.

I. GENERAL PROVISIONS

The approval of the Application For Permit To Drill (APD) is in compliance with all applicable laws and regulations: 43 Code of Federal Regulations 3160, the lease terms, Onshore Oil and Gas Orders, Notices To Lessees, New Mexico Oil Conservation Division (NMOCD) Rules, National Historical Preservation Act As Amended, and instructions and orders of the Authorized Officer. Any request for a variance shall be submitted to the Authorized Officer on Form 3160-5, Sundry Notices and Report on Wells.

II. PERMIT EXPIRATION

If the permit terminates prior to drilling and drilling cannot be commenced within 60 days after expiration, an operator is required to submit Form 3160-5, Sundry Notices and Reports on Wells, requesting surface reclamation requirements for any surface disturbance. However, if the operator will be able to initiate drilling within 60 days after the expiration of the permit, the operator must have set the conductor pipe in order to allow for an extension of 60 days beyond the expiration date of the APD. (Filing of a Sundry Notice is required for this 60 day extension.)

III. ARCHAEOLOGICAL, PALEONTOLOGY & HISTORICAL SITES

Any cultural and/or paleontological resource discovered by the operator or by any person working on the operator's behalf shall immediately report such findings to the Authorized Officer. The operator is fully accountable for the actions of their contractors and subcontractors. The operator shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery shall be made by the Authorized Officer to determine the appropriate actions that shall be required to prevent the loss of significant cultural or scientific values of the discovery. The operator shall be held responsible for the cost of the proper mitigation measures that the Authorized Officer assesses after consultation with the operator on the evaluation and decisions of the discovery. Any unauthorized collection or disturbance of cultural or paleontological resources may result in a shutdown order by the Authorized Officer.

IV. NOXIOUS WEEDS

The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, pads, associated pipeline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

V. SPECIAL REQUIREMENT(S)

Cave/Karst Surface Mitigation

The following stipulations will be applied to minimize impacts during construction, drilling and production:

Construction:

General Construction:

- No blasting
- The BLM, Carlsbad Field Office, will be informed immediately if any subsurface drainage channels, cave passages, or voids are penetrated during construction, and no additional construction shall occur until clearance has been issued by the Authorized Officer.
- All linear surface disturbance activities will avoid sinkholes and other karst features to lessen the possibility of encountering near surface voids during construction, minimize changes to runoff, and prevent untimely leaks and spills from entering the karst drainage system.
- All spills or leaks will be reported to the BLM immediately for their immediate and proper treatment.

Pad Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- The entire perimeter of the well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad.
- The compacted berm shall be constructed at a minimum of 12 inches high with impermeable mineral material (e.g., caliche).
- No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad.
- The topsoil stockpile shall be located outside the bermed well pad.
- Topsoil, either from the well pad or surrounding area, shall not be used to construct the berm.
- No storm drains, tubing or openings shall be placed in the berm.
- If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.
- The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim reclamation has been completed.
- Any access road entering the well pad shall be constructed so that the integrity of the berm height surrounding the well pad is not compromised (i.e. an access road crossing the berm cannot be lower than the berm height).
- Following a rain event, all fluids will vacuumed off of the pad and hauled off-site and disposed at a proper disposal facility.

Tank Battery Construction:

- The pad will be constructed and leveled by adding the necessary fill and caliche – no blasting.
- All tank battery locations and facilities will be lined and bermed.
- The liner should be at least 20 mil in thickness and installed with a 4 oz. felt backing, or equivalent, to prevent tears or punctures.
- Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank.

Road Construction:

- Turnout ditches and drainage leadoffs will not be constructed in such a manner as to increase or decrease the natural flow of water into or out of cave or karst features.
- Special restoration stipulations or realignment may be required if subsurface features are discovered during construction.

Buried Pipeline/Cable Construction:

- Rerouting of the buried line(s) may be required if a subsurface void is encountered during construction to minimize the potential subsidence/collapse of a feature(s) as well as the possibility of leaks/spills from entering the karst drainage system.

Powerline Construction:

- Smaller powerlines will be routed around sinkholes and other karst features to avoid or lessen the possibility of encountering near surface voids and to minimize changes to runoff or possible leaks and spills from entering karst systems.
- Larger powerlines will adjust their pole spacing to avoid cave and karst features.
- Special restoration stipulations or realignment may be required if subsurface voids are encountered.

Surface Flowlines Installation:

- Flowlines will be routed around sinkholes and other karst features to minimize the possibility of leaks/spills from entering the karst drainage system.

Leak Detection System:

- A method of detecting leaks is required. The method could incorporate gauges to measure loss, situating values and lines so they can be visually inspected, or installing electronic sensors to alarm when a leak is present.
- A leak detection plan will be submitted to BLM that incorporates an automatic shut off system (see below) to minimize the effects of an undesirable event that could negatively sensitive cave/karst resources.
- Well heads, pipelines (surface and buried), storage tanks, and all supporting equipment should be monitored regularly after installation to promptly identify and fix leaks.

Automatic Shut-off Systems:

- Automatic shut off, check values, or similar systems will be installed for pipelines and tanks to minimize the effects of catastrophic line failures used in production or drilling.

Cave/Karst Subsurface Mitigation

The following stipulations will be applied to protect cave/karst and groundwater concerns:

Rotary Drilling with Fresh Water:

- Fresh water will be used as a circulating medium in zones where caves or karst features are expected. SEE ALSO: Drilling COAs for this well.

Directional Drilling:

- The kick off point for directional drilling will occur at least 100 feet below the bottom of the cave occurrence zone. SEE ALSO: Drilling COAs for this well.

Lost Circulation:

- ALL lost circulation zones between surface and the base of the cave occurrence zone will be logged and reported in the drilling report.
- If a void of four feet or more and circulation losses greater than 70 percent occur simultaneously while drilling in any cave-bearing zone, regardless of the type of drilling machinery used, the BLM will be notified immediately by the operator. The BLM will assess the situation and work with the operator on corrective actions to resolve the problem.

Abandonment Cementing:

- Additional plugging conditions of approval may be required upon well abandonment in high and medium karst potential occurrence zones.
- The BLM will assess the situation and work with the operator to ensure proper plugging of the wellbore.

Pressure Testing:

- The operator will perform annual pressure monitoring on all casing annuli and reported in a sundry notice.
- If the test results indicated a casing failure has occurred, remedial action will be undertaken to correct the problem to the BLM's approval.

Rangeland Mitigation:

Any damage to fences, cattle guards, and pipelines or structures that provide water to livestock during construction, throughout the life of the project, and caused by its operation, must be immediately corrected by the Applicant. The Applicant must notify the surface landowners and grazing allotment holders any damage occurs to pipelines or structures that provide water to livestock.

Hydrology Mitigation:

The entire well pad will be bermed to prevent oil, salt, and other chemical contaminants from leaving the well pad. The compacted berm shall be constructed at a minimum of 12 inches with impermeable mineral material (e.g. caliche). Topsoil shall not be used to construct the berm. No water flow from the uphill side(s) of the pad shall be allowed to enter the well pad. The integrity of the berm shall be maintained around the surfaced pad throughout the life of the well and around the downsized pad after interim

reclamation has been completed. Any water erosion that may occur due to the construction of the well pad during the life of the well will be quickly corrected and proper measures will be taken to prevent future erosion. Stockpiling of topsoil is required. The top soil shall be stockpiled in an appropriate location to prevent loss of soil due to water or wind erosion and not used for berming or erosion control. If fluid collects within the bermed area, the fluid must be vacuumed into a safe container and disposed of properly at a state approved facility.

Tank battery locations will be lined and bermed. A 20 mil permanent liner will be installed with a 4 oz. felt backing to prevent tears or punctures. Tank battery berms must be large enough to contain 1 ½ times the content of the largest tank or 24 hour production, whichever is greater. Automatic shut off, check valves, or similar systems will be installed for tanks to minimize the effects of catastrophic line failures used in production or drilling.

A leak detection plan will be submitted to the BLM Carlsbad Field Office for approval prior to pipeline installation. The method could incorporate gauges to detect pressure drops, situating valves and lines so they can be visually inspected periodically or installing electronic sensors to alarm when a leak is present. The leak detection plan will incorporate an automatic shut off system that will be installed for proposed pipelines to minimize the effects of an undesirable event.

Electric Lines: Any water erosion that may occur due to the construction of overhead electric line and during the life of the power line will be quickly corrected and proper measures will be taken to prevent future erosion.

VI. CONSTRUCTION

A. NOTIFICATION

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

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

B. TOPSOIL

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

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

C. CLOSED LOOP SYSTEM

Tanks are required for drilling operations: No Pits.

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

D. FEDERAL MINERAL MATERIALS PIT

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

E. WELL PAD SURFACING

Surfacing of the well pad is not required.

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

F. EXCLOSURE FENCING (CELLARS & PITS)

Exclosure Fencing
The operator will install and maintain exclosure fencing for all open well cellars to prevent access to public, livestock, and large forms of wildlife before and after drilling

operations until the pit is free of fluids and the operator initiates backfilling. (For examples of exclosure fencing design, refer to BLM's Oil and Gas Gold Book, Exclosure Fence Illustrations, Figure 1, Page 18.)

G. ON LEASE ACCESS ROADS

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

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

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

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

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

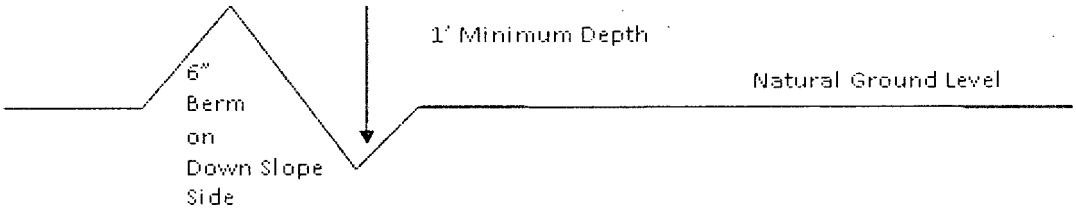
Ditching
Ditching shall be required on both sides of the road.

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

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

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

Cross Section of a Typical Lead-off Ditch



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

Formula for Spacing Interval of Lead-off Ditches

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

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

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

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

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

Construction Steps

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

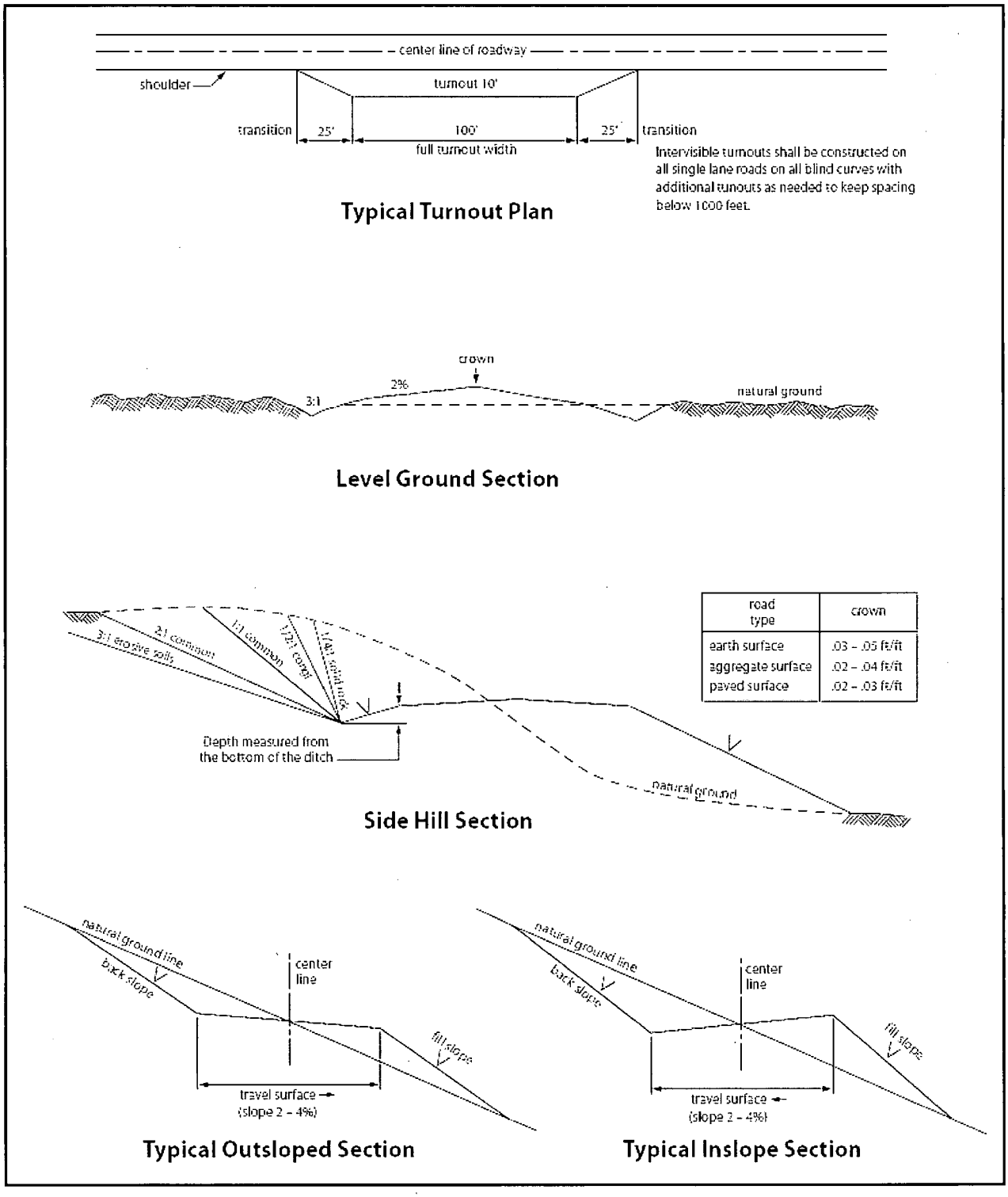


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

VII. PRODUCTION (POST DRILLING)

A. WELL STRUCTURES & FACILITIES

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

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

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

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

Containment Structures
Proposed production facilities such as storage tanks and other vessels will have a secondary containment structure that is constructed to hold the capacity of 1.5 times the largest tank, plus freeboard to account for precipitation, unless more stringent protective requirements are deemed necessary.

Painting Requirement

All above-ground structures including meter housing that are not subject to safety requirements shall be painted a flat non-reflective paint color, **Shale Green** from the BLM Standard Environmental Color Chart (CC-001: June 2008).

B. PIPELINES

STANDARD STIPULATIONS FOR SURFACE INSTALLED PIPELINES

A copy of the application (Grant, Sundry Notice, APD) and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to activity of the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

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

a. Activities of the holder including, but not limited to construction, operation, maintenance, and termination of the facility.
b. Activities of other parties including, but not limited to:

(1) Land clearing.
(2) Earth-disturbing and earth-moving work.
(3) Blasting.
(4) Vandalism and sabotage.

c. Acts of God.

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

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

5. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil, salt water, or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil, salt water, or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of the holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve the holder of any responsibility as provided herein.

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

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

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

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

10. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

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

13. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. Signs will be maintained in a legible condition for the life of the pipeline.

14. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway.

15. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.

16. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes the roads, powerline corridor, and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

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

BURIED PIPELINE STIPULATIONS

A copy of the application (Grant, APD, or Sundry Notice) and attachments, including conditions of approval, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The Holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The Holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C.6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. If, during any phase of the construction, operation, maintenance, or termination of the pipeline, any oil or other pollutant should be discharged from the pipeline system, impacting Federal lands, the control and total removal, disposal, and cleaning up of such oil or other pollutant, wherever found, shall be the responsibility of holder, regardless of fault. Upon failure of holder to control, dispose of, or clean up such discharge on or affecting Federal lands, or to repair all damages resulting therefrom, on the Federal lands, the Authorized Officer may take such measures as he deems necessary to control and clean up the discharge and restore the area, including where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the Authorized Officer shall not relieve holder of any responsibility as provided herein.

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

6. The pipeline will be buried with a minimum cover of **36** inches between the top of the pipe and ground level.

7. The maximum allowable disturbance for construction in this right-of-way will be **30** feet:

- Blading of vegetation within the right-of-way will be allowed: maximum width of blading operations will not exceed **20** feet. The trench is included in this area. (*Blading is defined as the complete removal of brush and ground vegetation.*)

- Clearing of brush species within the right-of-way will be allowed: maximum width of clearing operations will not exceed **30** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

- The remaining area of the right-of-way (if any) shall only be disturbed by compressing the vegetation. (*Compressing can be caused by vehicle tires, placement of equipment, etc.*)

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

9. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting of the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

10. Vegetation, soil, and rocks left as a result of construction or maintenance activity will be randomly scattered on this right-of-way and will not be left in rows, piles, or berms, unless otherwise approved by the Authorized Officer. The entire right-of-way shall be recontoured to match the surrounding landscape. The backfilled soil shall be compacted and a 6 inch berm will be left over the ditch line to allow for settling back to grade.

11. In those areas where erosion control structures are required to stabilize soil conditions, the holder will install such structures as are suitable for the specific soil conditions being encountered and which are in accordance with sound resource management practices.

12. The holder will reseed all disturbed areas. Seeding will be done according to the attached seeding requirements, using the following seed mix.

(X) seed mixture 1	( ) seed mixture 3
( ) seed mixture 2	( ) seed mixture 4
( ) seed mixture 2/LPC	( ) Aplomado Falcon Mixture

13. All above-ground structures not subject to safety requirements shall be painted by the holder to blend with the natural color of the landscape. The paint used shall be color which simulates "Standard Environmental Colors" – **Shale Green**, Munsell Soil Color No. 5Y 4/2.

14. The pipeline will be identified by signs at the point of origin and completion of the right-of-way and at all road crossings. At a minimum, signs will state the holder's name, BLM serial number, and the product being transported. All signs and information thereon will be posted in a permanent, conspicuous manner, and will be maintained in a legible condition for the life of the pipeline.

15. The holder shall not use the pipeline route as a road for purposes other than routine maintenance as determined necessary by the Authorized Officer in consultation with the holder before maintenance begins. The holder will take whatever steps are necessary to ensure that the pipeline route is not used as a roadway. As determined necessary during the life of the pipeline, the Authorized Officer may ask the holder to construct temporary deterrence structures.

16. Any cultural and/or paleontological resources (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

17. The operator shall be held responsible if noxious weeds become established within the areas of operations. Weed control shall be required on the disturbed land where noxious weeds exist, which includes associated roads, pipeline corridor and adjacent land affected by the establishment of weeds due to this action. The operator shall consult with the Authorized Officer for acceptable weed control methods, which include following EPA and BLM requirements and policies.

18. Escape Ramps - The operator will construct and maintain pipeline/utility trenches [that are not otherwise fenced, screened, or netted] to prevent livestock, wildlife, and humans from becoming entrapped. At a minimum, the operator will construct and maintain escape ramps,

ladders, or other methods of avian and terrestrial wildlife escape in the trenches according to the following criteria:

a. Any trench left open for eight (8) hours or less is not required to have escape ramps; however, before the trench is backfilled, the contractor/operator shall inspect the trench for wildlife, remove all trapped wildlife, and release them at least 100 yards from the trench.
b. For trenches left open for eight (8) hours or more, earthen escape ramps (built at no more than a 30 degree slope and spaced no more than 500 feet apart) shall be placed in the trench.

C. ELECTRIC LINES

STANDARD STIPULATIONS FOR OVERHEAD ELECTRIC DISTRIBUTION LINES

A copy of the grant and attachments, including stipulations, survey plat and/or map, will be on location during construction. BLM personnel may request to you a copy of your permit during construction to ensure compliance with all stipulations.

Holder agrees to comply with the following stipulations to the satisfaction of the Authorized Officer:

1. The holder shall indemnify the United States against any liability for damage to life or property arising from the occupancy or use of public lands under this grant.

2. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder shall comply with the Toxic Substances Control Act of 1976 as amended, 15 USC 2601 et seq. (1982) with regards to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation, and Liability Act, section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.

3. The holder agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq. or the Resource Conservation and Recovery Act, 42 U.S.C. 6901, et seq.) on the Right-of-Way (unless the release or threatened release is wholly unrelated to the Right-of-Way holder's activity on the Right-of-Way), or resulting from the activity of the Right-of-Way holder on the Right-of-Way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.

4. There will be no clearing or blading of the right-of-way unless otherwise agreed to in writing by the Authorized Officer.

5. Power lines shall be constructed and designed in accordance to standards outlined in

"Suggested Practices for Avian Protection on Power lines: The State of the Art in 2006" Edison Electric Institute, APLIC, and the California Energy Commission 2006 . The holder shall assume the burden and expense of proving that pole designs not shown in the above publication deter raptor perching, roosting, and nesting. Such proof shall be provided by a raptor expert approved by the Authorized Officer. The BLM reserves the right to require modification or additions to all powerline structures placed on this right-of-way, should they be necessary to ensure the safety of large perching birds. Such modifications and/or additions shall be made by the holder without liability or expense to the United States.

Raptor deterrence will consist of but not limited to the following: triangle perch discouragers shall be placed on each side of the cross arms and a nonconductive perching deterrence shall be placed on all vertical poles that extend past the cross arms.

6. The holder shall minimize disturbance to existing fences and other improvements on public lands. The holder is required to promptly repair improvements to at least their former state. Functional use of these improvements will be maintained at all times. The holder will contact the owner of any improvements prior to disturbing them. When necessary to pass through a fence line, the fence shall be braced on both sides of the passageway prior to cutting the fence. No permanent gates will be allowed unless approved by the Authorized Officer.

7. The BLM serial number assigned to this authorization shall be posted in a permanent, conspicuous manner where the power line crosses roads and at all serviced facilities. Numbers will be at least two inches high and will be affixed to the pole nearest the road crossing and at the facilities served.

8. Upon cancellation, relinquishment, or expiration of this grant, the holder shall comply with those abandonment procedures as prescribed by the Authorized Officer.

9. All surface structures (poles, lines, transformers, etc.) shall be removed within 180 days of abandonment, relinquishment, or termination of use of the serviced facility or facilities or within 180 days of abandonment, relinquishment, cancellation, or expiration of this grant, whichever comes first. This will not apply where the power line extends service to an active, adjoining facility or facilities.

10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the Authorized Officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the Authorized Officer. An evaluation of the discovery will be made by the Authorized Officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the Authorized Officer after consulting with the holder.

11. Special Stipulations:
- For reclamation remove poles, lines, transformer, etc. and dispose of properly.
- Fill in any holes from the poles removed.

VIII. INTERIM RECLAMATION

During the life of the development, all disturbed areas not needed for active support of production operations should undergo interim reclamation in order to minimize the environmental impacts of development on other resources and uses.

Within six (6) months of well completion, operators should work with BLM surface management specialists (Jim Amos: 575-234-5909) to devise the best strategies to reduce the size of the location. Interim reclamation should allow for remedial well operations, as well as safe and efficient removal of oil and gas.

During reclamation, the removal of caliche is important to increasing the success of revegetating the site. Removed caliche that is free of contaminants may be used for road repairs, fire walls or for building other roads and locations. In order to operate the well or complete workover operations, it may be necessary to drive, park and operate on restored interim vegetation within the previously disturbed area. Disturbing revegetated areas for production or workover operations will be allowed. If there is significant disturbance and loss of vegetation, the area will need to be revegetated. Communicate with the appropriate BLM office for any exceptions/exemptions if needed.

All disturbed areas after they have been satisfactorily prepared need to be reseeded with the seed mixture provided below.

Upon completion of interim reclamation, the operator shall submit a Sundry Notices and Reports on Wells, Subsequent Report of Reclamation (Form 3160-5).

IX. FINAL ABANDONMENT & RECLAMATION

At final abandonment, well locations, production facilities, and access roads must undergo "final" reclamation so that the character and productivity of the land are restored.

Earthwork for final reclamation must be completed within six (6) months of well plugging. All pads, pits, facility locations and roads must be reclaimed to a satisfactory revegetated, safe, and stable condition, unless an agreement is made with the landowner or BLM to keep the road and/or pad intact.

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

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

Seed Mixture 1 for Loamy Sites

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

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

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

Species	lb/acre
Plains lovegrass (Eragrostis intermedia)	0.5
Sand dropseed (Sporobolus cryptandrus)	1.0
Sideoats grama (Bouteloua curtipendula)	5.0
Plains bristlegrass (Setaria macrostachya)	2.0

*Pounds of pure live seed:

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

AFMSS

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

Operator Certification Data Report

05/31/2019

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: Brian Wood **Signed on:** 10/15/2018

Title: President

Street Address: 37 Verano Loop

City: Santa Fe **State:** NM **Zip:** 87508

Phone: (505)466-8120

Email address: afmss@permitswest.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

05/31/2019

APD ID: 10400035226 **Submission Date:** 10/15/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - General

APD ID: 10400035226 **Tie to previous NOS?** **Submission Date:** 10/15/2018

BLM Office: CARLSBAD **User:** Brian Wood **Title:** President

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

Lease number: NMNM014758 **Lease Acres:** 1442.36

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

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

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? YES **APD Operator:** PERCUSSION PETROLEUM OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: PERCUSSION PETROLEUM OPERATING LLC

Operator Address: 919 Milam Street, Suite 2475 **Zip:** 77002

Operator PO Box:

Operator City: Houston **State:** TX

Operator Phone: (713)589-2337

Operator Internet Address:

Section 2 - Well Information

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

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

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

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H **Well API Number:**

Field/Pool or Exploratory? Field and Pool **Field Name:** N. SEVEN RIVERS; **Pool Name:** GLORIETA -YESO

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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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: MULTIPLE WELL **Multiple Well Pad Name:** LAKEWOOD FEDERAL COM **Number:** 17H

Well Class: HORIZONTAL **Number of Legs:** 1

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 16 Miles **Distance to nearest well:** 617 FT **Distance to lease line:** 555 FT

Reservoir well spacing assigned acres Measurement: 160 Acres

Well plat: Lake_17H_Plat_GasCap_Plan_20181015130156.pdf

Well work start Date: 12/31/2018 **Duration:** 30 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

Survey number: 3239

	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	555	FNL	645	FWL	20S	25E	3	Lot 4	32.608193	-104.479162	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 014758	3524	0	0
KOP Leg #1	470	FNL	843	FWL	20S	25E	3	Lot 4	32.608465	-104.478196	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 014758	1110	2426	2414
PPP Leg #1	555	FNL	645	FWL	20S	25E	3	Lot 4	32.608193	-104.479162	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 014758	3524	0	0

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

	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
PPP Leg #1	0	FSL	796	FWL	19S	25E	34	Aliquot SWSW	32.609682	-104.478689	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 015291	574	3198	2950
PPP Leg #1	2640	FNL	772	FWL	19S	25E	34	Aliquot SWNW	32.616964	-104.478445	EDDY	NEW MEXICO	NEW MEXICO	F	NMNM 050436 4B	551	5680	2973
EXIT Leg #1	20	FNL	900	FWL	19S	25E	34	Aliquot NWNW	32.624184	-104.478198	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	535	8541	2989
BHL Leg #1	20	FNL	900	FWL	19S	25E	34	Aliquot NWNW	32.624184	-104.478198	EDDY	NEW MEXICO	NEW MEXICO	F	FEE	535	8541	2989

Drilling Plan Data Report

05/31/2019

APD ID: 10400035226 **Submission Date:** 10/15/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	QUATERNARY	3524	0	0	OTHER : Caliche	USEABLE WATER	No
2	GRAYBURG	2870	654	655	DOLOMITE	NATURAL GAS,OIL	No
3	SAN ANDRES	2685	839	841	DOLOMITE	NATURAL GAS,OIL	No
4	GLORIETA	1125	2399	2411	DOLOMITE	NATURAL GAS,OIL	No
5	YESO	970	2554	2569	DOLOMITE	NATURAL GAS,OIL	Yes

Section 2 - Blowout Prevention

Pressure Rating (PSI): 3M **Rating Depth:** 5000

Equipment: A 3000-psi 5000' rated BOP stack consisting of annular preventer and double (blind and pipe) ram will be used below surface casing to TD.

Requesting Variance? NO

Variance request:

Testing Procedure: Pressure tests will be conducted before drilling out from under all casing strings. Third party test crews will conduct all tests. All tests will be recorded for 10-minutes on low pressure (500 psi) and 10-minutes on high pressure (3000-psi). After BOP testing is complete, test casing (without test plug) to 2000-psi for 30 minutes. All tests will be charted on a plot. BOPs will be function tested every day.

Choke Diagram Attachment:

Lake_17H_Choke_20181015131209.pdf

BOP Diagram Attachment:

Lake_17H_BOP_20181015131217.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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	12.25	9.625	NEW	API	N	0	1279	0	1274	3524		1279	J-55	36	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
2	PRODUCTION	8.75	7.0	NEW	API	Y	0	2700	0	2674	3524		2700	L-80	32	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8
3	PRODUCTION	8.75	5.5	NEW	API	Y	2700	8541	2674	2989			5841	L-80	17	OTHER - BTC	1.125	1.125	DRY	1.8	DRY	1.8

Casing Attachments

Casing ID: 1 **String Type:** SURFACE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Lake_17H_Casing_Design_Assumptions_20181015131320.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Casing Attachments

Casing ID: 2 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Lake_17H_Casing_Design_Assumptions_20181015131455.pdf

Casing Design Assumptions and Worksheet(s):

Lake_17H_Casing_Design_Assumptions_20181015131444.pdf

Casing ID: 3 **String Type:** PRODUCTION

Inspection Document:

Spec Document:

Tapered String Spec:

Lake_17H_Casing_Design_Assumptions_20181015131924.pdf

Casing Design Assumptions and Worksheet(s):

Lake_17H_Casing_Design_Assumptions_20181015131931.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		0	1279	636	1.32	14.8	840	100	Class C	2% CaCl + ¼ pound per sack celloflake
PRODUCTION	Lead		0	2700	495	1.97	12.6	975	50	65/65/6 Class C	6% gel + 5% salt + ¼ pound per sack celloflake + 0.2% C41-P
PRODUCTION	Tail		0	2700	1434	1.32	14.8	1892	50	Class C	2% CaCl + ¼ pound per sack celloflake
PRODUCTION	Lead		2700	8541	495	1.97	12.6	975	50	65/65/6 Class C	6% gel + 5% salt + ¼ pound per sack

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
											celloflake + 0.2% C41-P
PRODUCTION	Tail		2700	8541	1434	1.32	14.8	1892	50	Class C	2% CaCl + ¼ pound per sack celloflake

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: All necessary mud products (LCM) will be on site to handle any abnormal hole condition that may be encountered while drilling this well.

Describe the mud monitoring system utilized: An electronic/mechanical mud monitor with a minimum pit volume totalizer, stroke counter, and flow sensor will be used.

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
1279	2426	OTHER : Fresh water/cut brine	8.3	9.2							
2426	8541	OTHER : Cut brine	8.6	9.2							
0	1279	OTHER : Fresh water/gel	8.4	9.2							

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Section 6 - Test, Logging, Coring

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

A mud logger will be used from GL to TD. Samples will be collected every 10' in the lateral pay zone.

No electric logs are planned at this time.

List of open and cased hole logs run in the well:

MUDLOG

Coring operation description for the well:

No core or drill stem test is planned.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 1279 **Anticipated Surface Pressure:** 621.41

Anticipated Bottom Hole Temperature(F): 115

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

Lake_17H_H2S_Plan_20181015132437.pdf

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Lake_17H_Horizontal_Drill_Plan_20181015132459.pdf

Other proposed operations facets description:

Other proposed operations facets attachment:

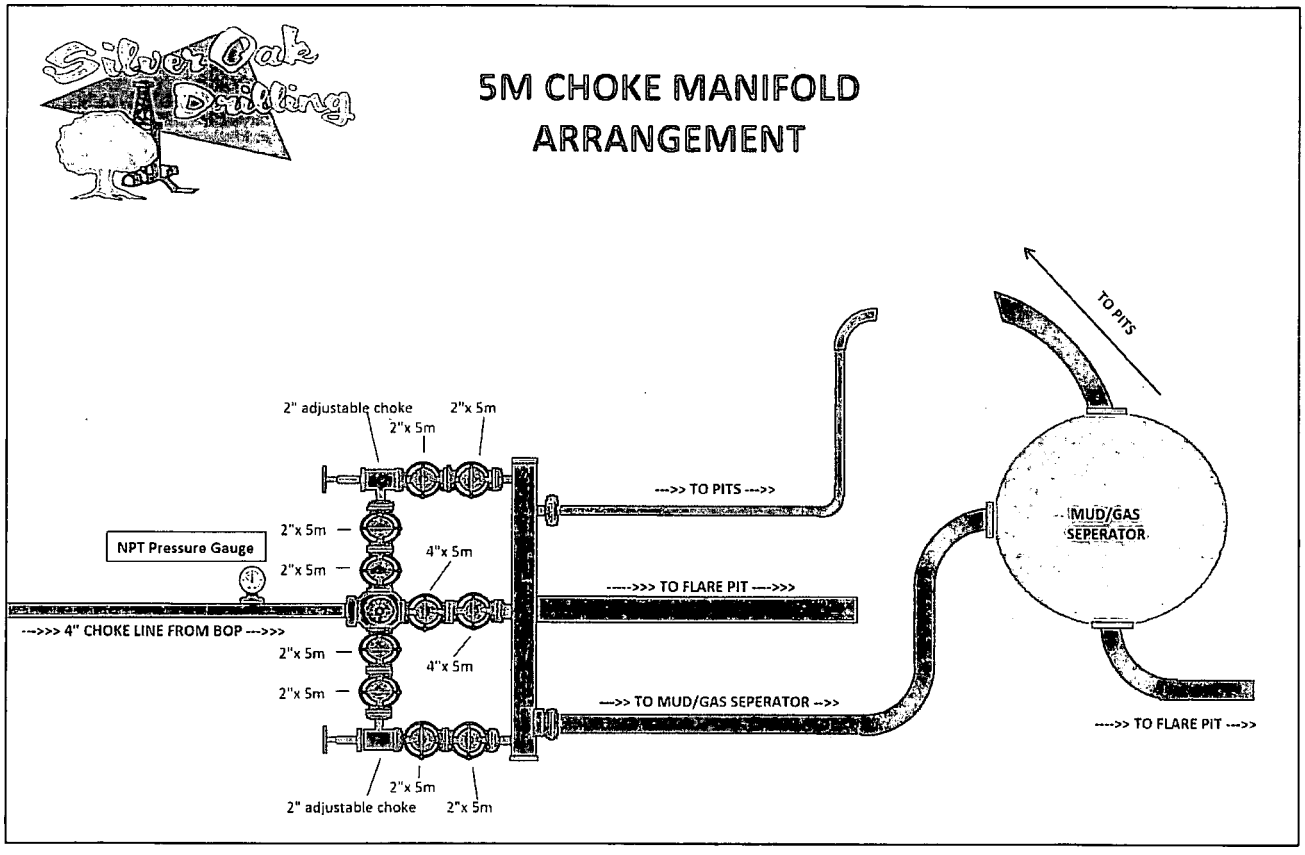
Lake_17H_Drill_Plan_20181015132508.pdf

Lake_17H_Contingency_Plan_20181015132516.pdf

Other Variance attachment:

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002



Pressure Testing

a. All testing to be done with 3rd party testing crews
b. All tests should be done for each BOP/Valve/Choke Manifold:
    1. Recorded for 10 minutes on low pressure (500 psi)
    2. Recorded for 10 minutes on high pressure (3000 psi)
    3. All BOP testing will be completed with a test plug in place in wellhead
c. After BOP testing is complete, test casing (without test plug) to 2000 psi for 30 minutes
d. Company representative to email all copies of all plots to Drilling Engineer as well as save in the well file.
e. BOP's shall be function tested every day.

Gas Buster Operation

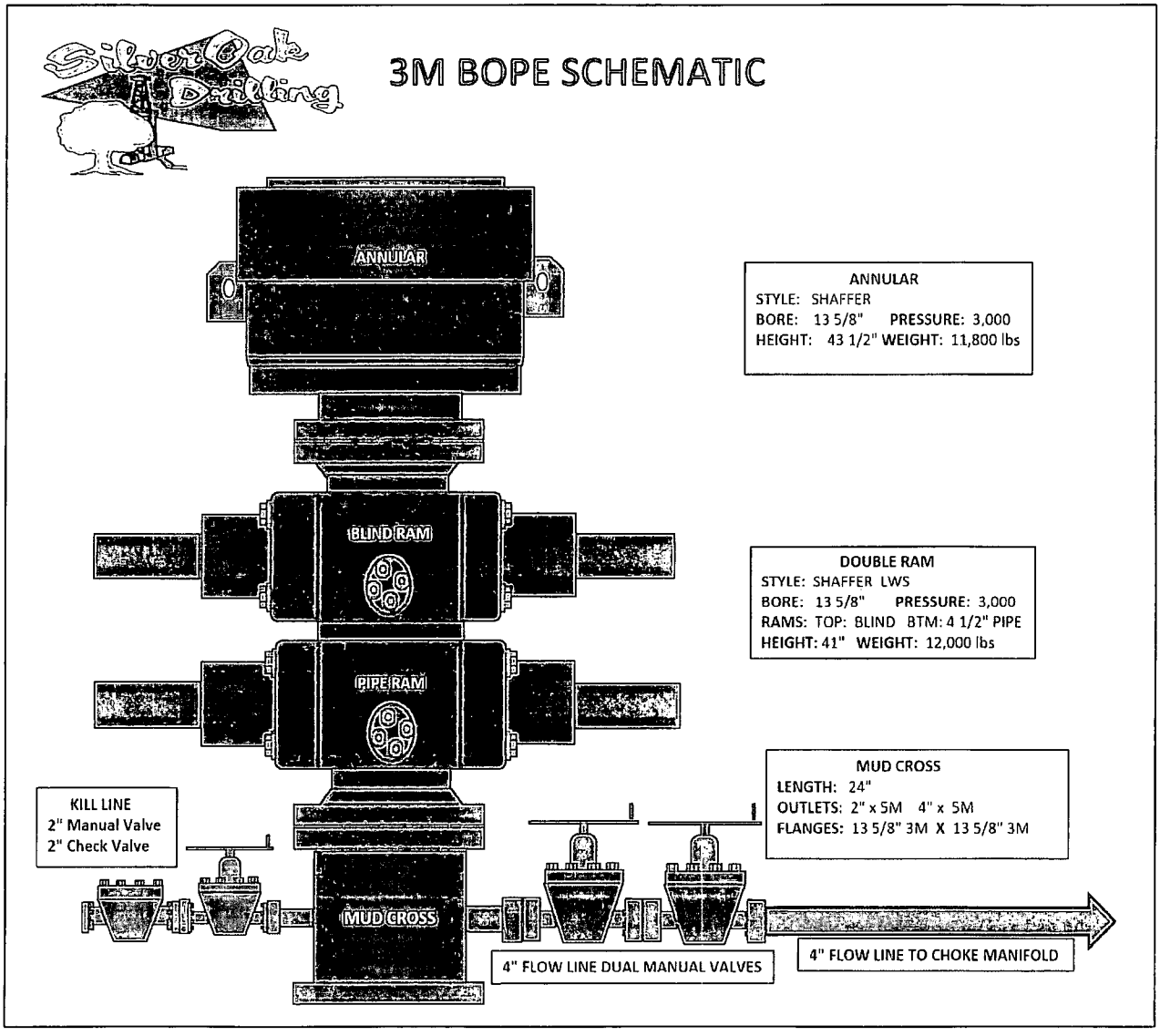
a. Flow should be directed to pits unless choke is needed to control gas
b. Adjustable choke to adjusted only by Percussion Rep on location
c. Flare should remain burning (pilot lit) anytime fluid is going through gas buster
d. Choke needs to be monitored to not overrun gas buster

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

Nipple-Up

a. Raise stack and center over the wellhead
b. Install DSA and ring gaskets
c. Lower stack onto DSA
d. Torque DSA flange bolts in a star pattern to the specified torque
e. Verify BOP is centered to the rotary table
f. Install rotating head
g. Install hydraulic lines to BOP
h. Verify manifold line-up
i. Test BOP & manifold



PERCUSSION PETROLEUM LLC

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

Lakewood Federal Com horizontal Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)

2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

3. Tensile: DF_T=1.8
   a. Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

PERCUSSION PETROLEUM LLC

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM LLC

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

Lakewood Federal Com horizontal Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)

2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

3. Tensile: DF_T=1.8
   a. Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

PERCUSSION PETROLEUM LLC

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM LLC

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

Lakewood Federal Com horizontal Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)

2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

3. Tensile: DF_T=1.8
   a. Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

PERCUSSION PETROLEUM LLC

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM LLC

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

Lakewood Federal Com horizontal Wells

1. Collapse: DF_C=1.125
   a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
   b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)

2. Burst: DF_B=1.125
   a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
   b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

3. Tensile: DF_T=1.8
   a. Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773
Safety Factors									
	API Rec. SF	**ACTUAL SF**	Case		External Fluids		Internal Fluids		
Collapse	1.125	**3.30**	Lost Circulation		Mud		*None*		
Burst	1.125	**1.46**	Plug Bump		Green Cement + 2ksi surf pressure		Displacement Fluid/Mud		
Tension	1.8	**2.80**	100 klbs Overpull		Mud		Mud		

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

PERCUSSION PETROLEUM LLC

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

PERCUSSION PETROLEUM LLC

Casing Design Criteria and Load Case Assumptions

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

Lakewood Federal Com horizontal Wells

1. Collapse: DF_C=1.125
    a. Full Internal Evacuation: Collapse force equal to the mud gradient in which the casing will be run (0.65 psi/ft). The effects of axial load on collapse will be considered.
    b. Cementing: Collapse force equal to the gradient of planned cement slurries to planned depths and minimum mud gradient in which the casing will be run above that (0.65 psi/ft) and an internal force equal to mud gradient of displacement fluid (0.43 psi/ft)

2. Burst: DF_B=1.125
    a. Pressure Test: psi casing test with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.
    b. Injection Down Casing: psi surface injection pressure plus an internal pressure gradient of 0.65 psi/ft with an external force equal to the mud gradient in which the casing will be run (0.65 psi/ft), which is a more conservative backup force than pore pressure.

3. Tensile: DF_T=1.8
    a. Overpull: A downward force of 100,000 lbs is applied at the shoe along with the weight of the casing string utilizing the effects of buoyancy (10.5 ppg).

4. Surface Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
9-5/8"	36	J-55	STC	8.921	8.765	2,020	3,520	394	0.0773

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.30**	Lost Circulation	Mud	*None*
Burst	1.125	**1.46**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.80**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***40,798 lbs (assuming 8.4 ppg fluid and 1,300' casing-worst case scenario)***

PERCUSSION PETROLEUM LLC

Production Casing Program									
Casing Size (in)	**Weight (ppf)**	**Grade**	**Connection**	**ID**	**ID (drift)**	**Collapse (psi)**	**Burst (psi)**	**Tension (1,000 lbs)**	**Capacity (bbl/ft)**
7"	32	L-80	BTC	6.094	5.969	8,600	9,060	745	0.0361
5-1/2"	17	L-80	BTC	4.892	4.767	6,280	7,740	348	0.0232

Safety Factors					
	API Rec. SF	**ACTUAL SF**	Case	External Fluids	Internal Fluids
Collapse	1.125	**3.75**	Lost Circulation	Mud	*None*
Burst	1.125	**2.47**	Plug Bump	Green Cement + 2ksi surf pressure	Displacement Fluid/Mud
Tension	1.8	**2.29**	100 klbs Overpull	Mud	Mud

Buoyed Casing Weight: ***86,522 lbs (assuming 8.4 ppg fluid and 3,500' TVD-worst case scenario)***

Hydrogen Sulfide Drilling Operations Plan

Percussion Petroleum Operating, LLC.
919 Milam Street, Suite 2475
Houston, TX 77002

1. H_2S Safety Instructions to the following:
    - Characteristics of H_2S.
    - Physical effects and hazards.
    - Principal and operation of H_2S detectors, warning system and briefing areas.
    - Evacuation procedures, routes and First Aid.
    - Proper use of safety equipment and life support systems.
    - Essential personnel meeting medical evaluation criteria will receive additional training on the proper use of 30 min pressure demand air packs.

2. H_2S Detection & Alarm Systems:
    - H_2S sensor/detectors to be located on the drilling rig floor, in the base of the sub structure/cellar area, on the mud returns pits by the shale shaker. Additional H_2S monitors may be placed as deemed necessary.
    - An audio alarm system will be installed on the derrick, the floor, and in the doghouse.

3. Windsocks and Wind Streamers:
    - Windsocks at mud pit area should be high enough to be visible.
    - Windsock on the rig floor/top of doghouse should be high enough to be visible.

4. Condition Flags & Signs:
    - Warning sign on access road to location
    - Flags to be displayed on sign at entrance to location
        i. Green Flag – Normal Safe Operation Condition
        ii. Yellow Flag – Potential Pressure and Danger
        iii. Red Flag – Danger (H_2S present in dangerous concentrations) Only H_2S trained personnel admitted on location

5. Well Control Equipment:
    - See attached APD

6. Communications:
    - While working under masks, chalkboards will be used for communications
    - Hand signals will be used where chalk board is inappropriate
    - Two-way radio will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at drilling foreman's trailer or living quarters.

7. Drilling Stem Testing:
    - No Drill Stem Tests or hole coring is planned at this time.

8. Drilling contractor supervisor will be required to be familiar with the effects H_2S has on tubular goods and other mechanical equipment.

9. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavenger chemicals if necessary.

10. Emergency Contacts:

Emergency Contact Information - H2S Contingency Plan				
Precussion Petroleum Operating, LLC	**713-518-1331**			
Key Parties at Percussion Petroleum		**Office**	**Mobile**	**Email**
Lelan J Anders	Vice President of Operations	713-429-1291	281-908-1752	Lelan@PercussionPetroleum.com
Lupe Carrillo	Chief Operating Officer	713-589-9509	832-776-1869	Lupe@PercussionPetroleum.com
John H. Campbell III	Chief Executive Officer	713-589-4683	936-718-6488	John@PercussionPetroleum.com

Artesia, New Mexico:	
Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283

Carlsbad, New Mexico:	
Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
New Mexico Oil Conservation Division	575-887-6544

PERCUSSION PETROLEUM LLC

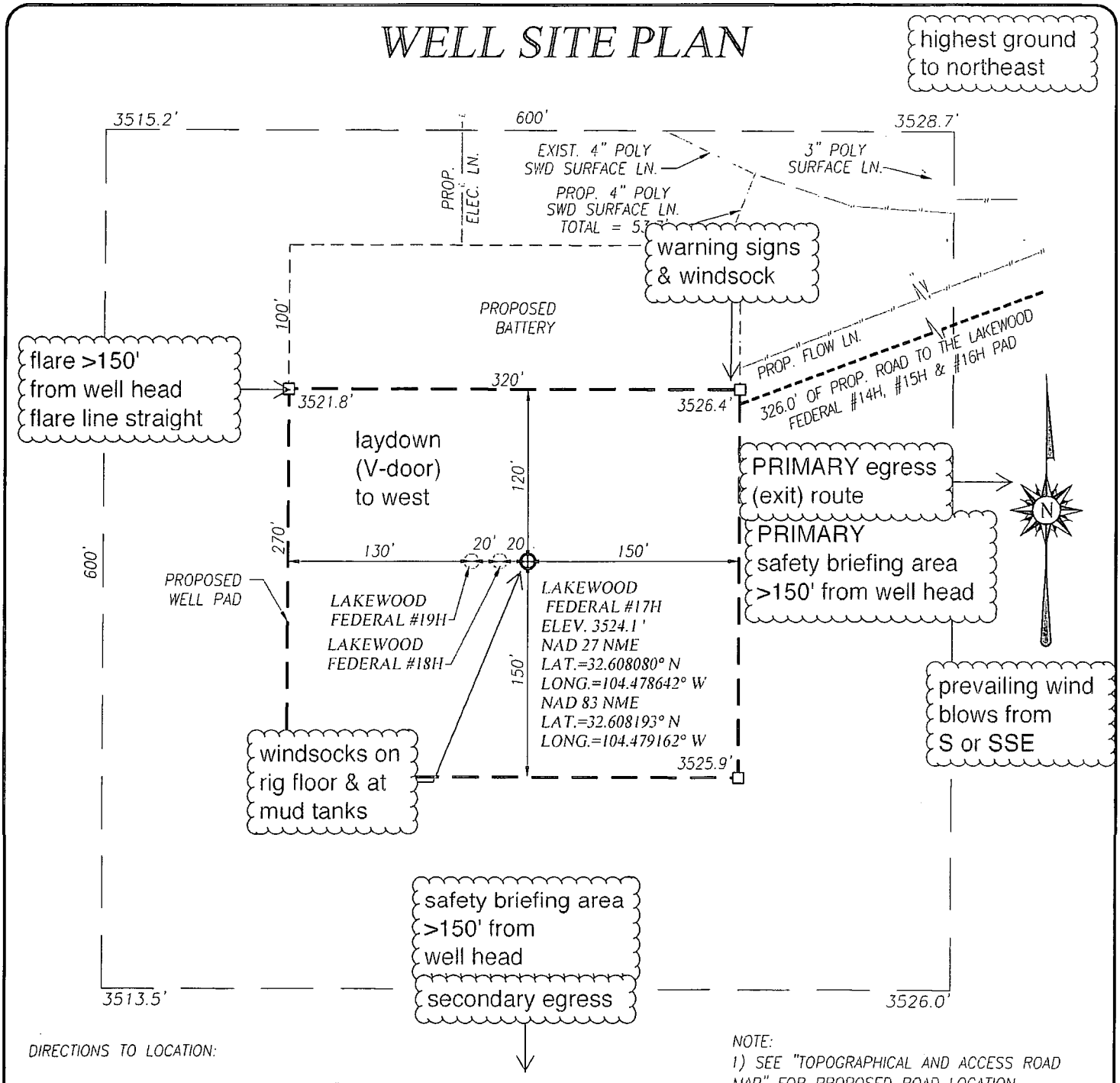
Santa Fe, New Mexico:	
New Mexico Emergency Response Commission	505-476-9600
New Mexico Emergency Response Commission (24 hr)	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635

Federal Contacts:	
Carlsbad BLM Office	575-234-5972
National Emergency Response Center (Washington, DC)	800-424-8802

Medical:	
Flight for Life - Lubbock, TX	806-743-9911
AeroCare - Lubbock, TX	806-747-8923
Med Flight Air Ambulance - Albuquerque, NM	505-842-4433
SB Air Med Service - Albuquerque, NM	505-842-4949

Well Control/Other:	
Wild Well Control	281-784-4700
Boots & Coots IWC	800-256-9688
B.J. Services	575-746-3569
Halliburton	575-746-2757

WELL SITE PLAN



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1

Percussion Petroleum Operating, LLC

Lakewood Federal 17H/18H/19H
H_2S Contingency Plan:
Radius Map

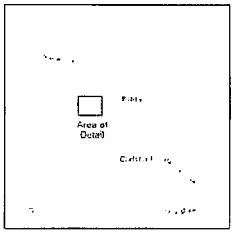
Section 3, Township 20S, Range 25E
Eddy County, New Mexico

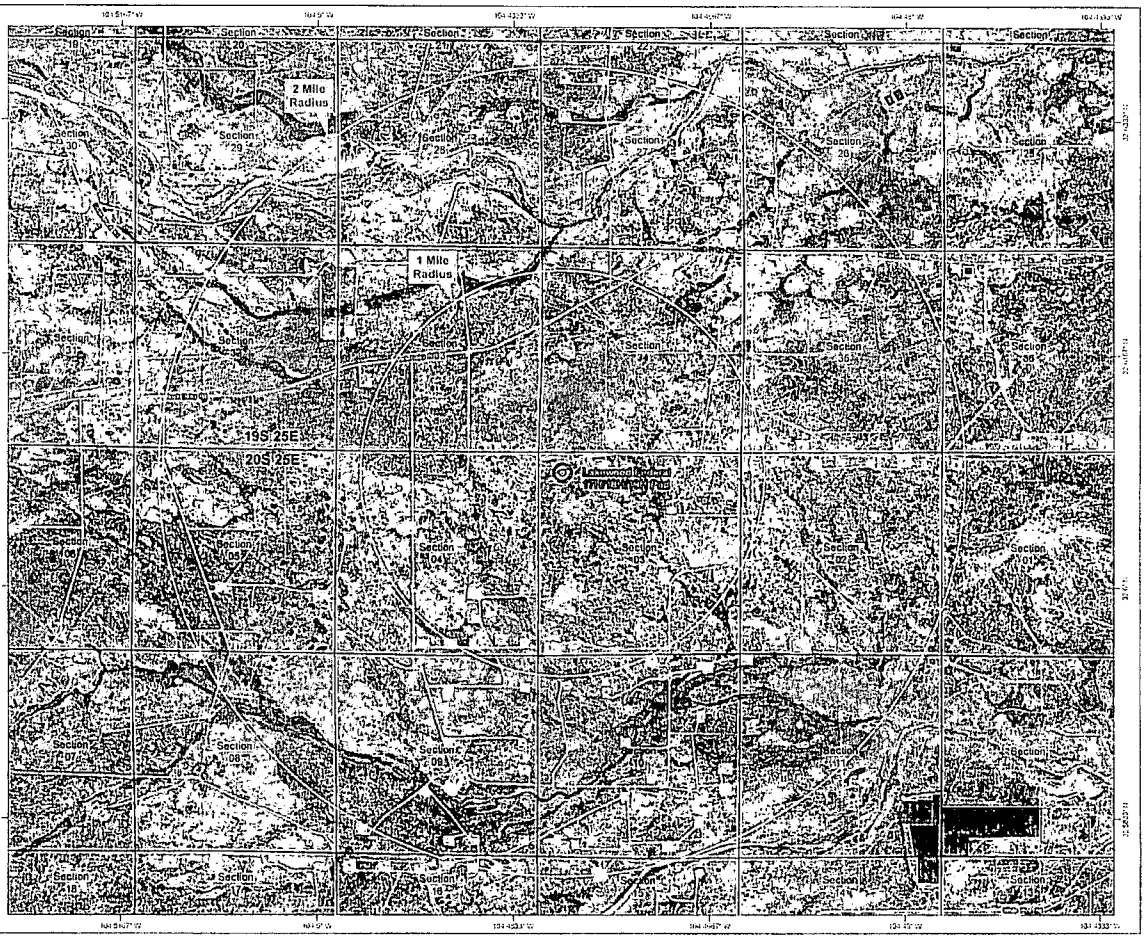
Surface Hole Location

1:27,000
0 0.25 0.5 1
Miles

NAD 1983 New Mexico State Plane East
FIPS 3001 Feet

Prepared by Permits West, Inc., September 14, 2018
for Percussion Petroleum Operating, LLC





PERCUSSION PETROLEUM LLC

Company: Percussion Petroleum, LLC
Project: Eddy County, NM
Site: Lakewood Federal
Well: 17H
Wellbore: OH
Rig: Silver Oak 1
Design: Plan #2 / 9:28, May 02 2018

WELLBENDERS DIRECTIONAL SERVICES LLC

PROJECT DETAILS: Eddy County, NM

Geodetic System: US State Plane 1983
Datum: North American Datum 1983
Ellipsoid: GRS 1980
Zone: New Mexico Eastern Zone
System Datum: Mean Sea Level

TOTAL CORRECTION

Magnetic North is 7.39° East of Grid North (Magnetic Convergence)

WELL DETAILS: 17H

RKB=17' @ 3541.00usft (Silver Oak 1)
3524.00

+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
0.00	0.00	585022.10	496433.30	32.608193	-104.479162

SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	VSect
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	415.00	0.00	360.00	415.00	0.00	0.00	0.00	0.00
3	477.48	6.25	66.68	477.35	1.35	3.12	10.00	1.38
4	2425.85	6.25	66.68	2413.96	85.28	197.82	0.00	87.11
5	3297.17	89.67	0.53	2959.00	653.90	257.30	10.00	556.25
6	8460.87	89.67	0.53	2988.54	5817.30	304.67	0.00	5819.87
7	8540.88	89.67	0.53	2989.00	5897.30	305.40	0.00	5899.87

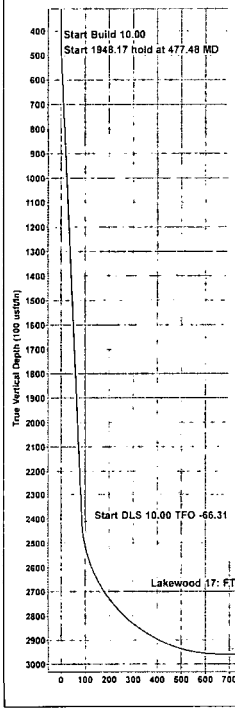
WELLBORE TARGET DETAILS (MAP CO-ORDINATES)

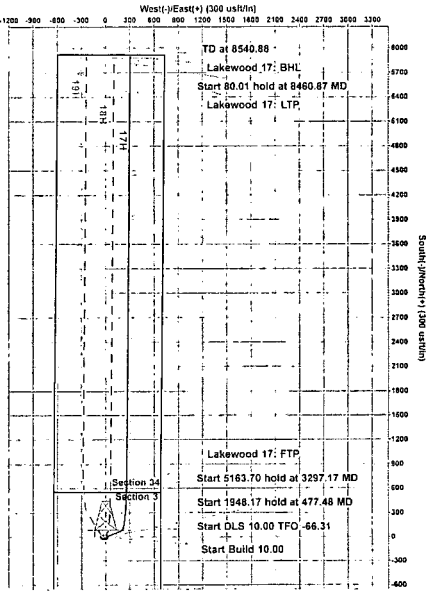
Name	TVD	+N/-S	+E/-W	Northing	Easting	Shape
Lakewood 17: FTP	2959.00	653.90	257.30	585676.00	496690.60	Point
Lakewood 17: BHL	2989.00	5897.30	305.40	590919.40	496738.70	Point
Lakewood 17: LTP	2989.00	5817.30	304.50	590839.40	496737.90	Point

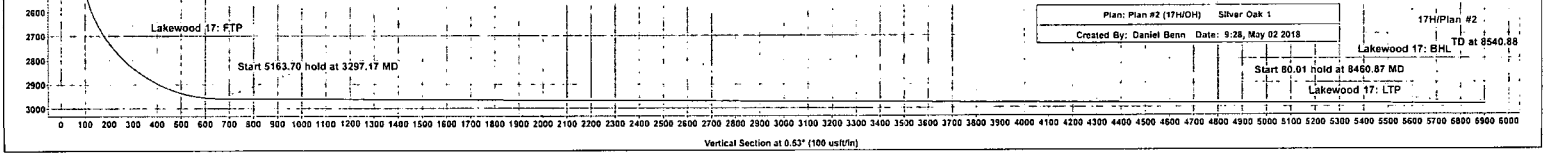
Azimuths to Grid North
True North: 0.08°
Magnetic North: 7.39°

Magnetic Field
Strength: 47977.1snT
Dip Angle: 60.26°
Date: 5/1/2018
Model: IGRF2015

Disclaimer:
All Plan Details, bearings, lines and offset well location/ survey data is provided by customer and subject to customer approval.







Plan: Plan #2 (17H/OH) Silver Oak 1
Created By: Daniel Benn Date: 9:28, May 02 2018

17H/Plan #2
TD at 8540.88
Lakewood 17: BHL
Start 80.01 hold at 8460.87 MD
Lakewood 17: LTP

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 17H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Project	Eddy County, NM		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	Lakewood Federal				
Site Position:		**Northing:**	590,773.07 usft	**Latitude:**	32.624012
From:	Lat/Long	**Easting:**	499,537.28 usft	**Longitude:**	-104.469106
Position Uncertainty:	0.00 usft	**Slot Radius:**	13.200 in	**Grid Convergence:**	-0.07 °

Well	17H					
Well Position	**+N/-S**	-5,750.96 usft	**Northing:**	585,022.10 usft	**Latitude:**	32.608193
	+E/-W	-3,103.98 usft	**Easting:**	496,433.30 usft	**Longitude:**	-104.479162
Position Uncertainty		0.00 usft	**Wellhead Elevation:**		**Ground Level:**	3,524.00 usft

Wellbore	OH				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	5/1/2018	7.31	60.26	47,977.11623391

Design	Plan #2				
Audit Notes:					
Version:		**Phase:**	PLAN	**Tie On Depth:**	0.00
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.00	0.00	0.00	0.53	

Plan Survey Tool Program **Date** 5/2/2018

	Depth From (usft)	Depth To (usft)	Survey (Wellbore)	Tool Name	Remarks
1	0.00	8,540.88	Plan #2 (OH)	MWD+IGRF	
				OWSG MWD + IGRF or WM	

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)	TFO (°)	Target
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
415.00	0.00	360.00	415.00	0.00	0.00	0.00	0.00	0.00	360.00	
477.48	6.25	66.68	477.35	1.35	3.12	10.00	10.00	0.00	66.68	
2,425.65	6.25	66.68	2,413.96	85.28	197.82	0.00	0.00	0.00	0.00	
3,297.17	89.67	0.53	2,959.00	653.90	257.30	10.00	9.57	-7.59	-66.31	Lakewood 17: FTP
8,460.87	89.67	0.53	2,988.54	5,817.30	304.67	0.00	0.00	0.00	0.00	Lakewood 17: LTP
8,540.88	89.67	0.53	2,989.00	5,897.30	305.40	0.00	0.00	0.00	0.00	Lakewood 17: BHL

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 17H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
100.00	0.00	0.00	100.00	0.00	0.00	0.00	0.00	0.00	0.00
200.00	0.00	0.00	200.00	0.00	0.00	0.00	0.00	0.00	0.00
300.00	0.00	0.00	300.00	0.00	0.00	0.00	0.00	0.00	0.00
400.00	0.00	0.00	400.00	0.00	0.00	0.00	0.00	0.00	0.00
415.00	0.00	360.00	415.00	0.00	0.00	0.00	0.00	0.00	0.00
450.00	3.50	66.68	449.98	0.42	0.98	0.43	10.00	10.00	0.00
477.48	6.25	66.68	477.35	1.35	3.12	1.38	10.00	10.00	0.00
500.00	6.25	66.68	499.74	2.32	5.38	2.37	0.00	0.00	0.00
600.00	6.25	66.68	599.15	6.63	15.37	6.77	0.00	0.00	0.00
700.00	6.25	66.68	698.55	10.93	25.36	11.17	0.00	0.00	0.00
800.00	6.25	66.68	797.96	15.24	35.36	15.57	0.00	0.00	0.00
900.00	6.25	66.68	897.37	19.55	45.35	19.97	0.00	0.00	0.00
1,000.00	6.25	66.68	996.77	23.86	55.34	24.37	0.00	0.00	0.00
1,100.00	6.25	66.68	1,096.18	28.17	65.34	28.77	0.00	0.00	0.00
1,200.00	6.25	66.68	1,195.58	32.48	75.33	33.17	0.00	0.00	0.00
1,300.00	6.25	66.68	1,294.99	36.78	85.32	37.57	0.00	0.00	0.00
1,400.00	6.25	66.68	1,394.40	41.09	95.32	41.97	0.00	0.00	0.00
1,500.00	6.25	66.68	1,493.80	45.40	105.31	46.37	0.00	0.00	0.00
1,600.00	6.25	66.68	1,593.21	49.71	115.31	50.77	0.00	0.00	0.00
1,700.00	6.25	66.68	1,692.62	54.02	125.30	55.17	0.00	0.00	0.00
1,800.00	6.25	66.68	1,792.02	58.33	135.29	59.58	0.00	0.00	0.00
1,900.00	6.25	66.68	1,891.43	62.63	145.29	63.98	0.00	0.00	0.00
2,000.00	6.25	66.68	1,990.83	66.94	155.28	68.38	0.00	0.00	0.00
2,100.00	6.25	66.68	2,090.24	71.25	165.27	72.78	0.00	0.00	0.00
2,200.00	6.25	66.68	2,189.65	75.56	175.27	77.18	0.00	0.00	0.00
2,300.00	6.25	66.68	2,289.05	79.87	185.26	81.58	0.00	0.00	0.00
2,400.00	6.25	66.68	2,388.46	84.18	195.25	85.98	0.00	0.00	0.00
2,425.65	6.25	66.68	2,413.96	85.28	197.82	87.11	0.00	0.00	0.00
2,450.00	7.56	49.48	2,438.13	86.85	200.25	88.70	10.00	5.39	-70.63
2,500.00	11.47	30.08	2,487.45	93.29	205.25	95.18	10.00	7.81	-38.79
2,550.00	15.99	20.96	2,536.01	104.03	210.20	105.97	10.00	9.04	-18.26
2,600.00	20.72	15.84	2,583.46	118.98	215.08	120.96	10.00	9.48	-10.23
2,650.00	25.56	12.58	2,629.42	138.03	219.85	140.05	10.00	9.67	-6.52
2,700.00	30.44	10.30	2,673.56	161.03	224.47	163.10	10.00	9.77	-4.55
2,750.00	35.36	8.61	2,715.52	187.82	228.90	189.93	10.00	9.83	-3.39
2,800.00	40.29	7.28	2,755.01	218.18	233.12	220.32	10.00	9.87	-2.66
2,850.00	45.24	6.19	2,791.70	251.88	237.09	254.07	10.00	9.89	-2.17
2,900.00	50.19	5.28	2,825.33	288.68	240.77	290.89	10.00	9.91	-1.82
2,950.00	55.15	4.49	2,855.64	328.28	244.15	330.52	10.00	9.92	-1.58
3,000.00	60.12	3.79	2,882.40	370.39	247.19	372.66	10.00	9.93	-1.40
3,050.00	65.09	3.16	2,905.40	414.69	249.87	416.98	10.00	9.94	-1.27
3,100.00	70.06	2.58	2,924.47	460.83	252.18	463.14	10.00	9.94	-1.17
3,150.00	75.03	2.03	2,939.46	508.48	254.09	510.80	10.00	9.95	-1.10
3,200.00	80.00	1.50	2,950.27	557.26	255.59	559.60	10.00	9.95	-1.05
3,250.00	84.98	1.00	2,956.80	606.80	256.67	609.15	10.00	9.95	-1.01
3,297.17	89.67	0.53	2,959.00	653.90	257.30	656.25	10.00	9.95	-1.00
3,300.00	89.67	0.53	2,959.02	656.73	257.33	659.08	0.00	0.00	0.00
3,400.00	89.67	0.53	2,959.59	756.72	258.24	759.08	0.00	0.00	0.00
3,500.00	89.67	0.53	2,960.16	856.72	259.16	859.08	0.00	0.00	0.00
3,600.00	89.67	0.53	2,960.73	956.71	260.08	959.08	0.00	0.00	0.00
3,700.00	89.67	0.53	2,961.30	1,056.71	261.00	1,059.08	0.00	0.00	0.00
3,800.00	89.67	0.53	2,961.88	1,156.70	261.91	1,159.07	0.00	0.00	0.00
3,900.00	89.67	0.53	2,962.45	1,256.69	262.83	1,259.07	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 17H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100ft)	Build Rate (°/100ft)	Turn Rate (°/100ft)
4,000.00	89.67	0.53	2,963.02	1,356.69	263.75	1,359.07	0.00	0.00	0.00
4,100.00	89.67	0.53	2,963.59	1,456.68	264.66	1,459.07	0.00	0.00	0.00
4,200.00	89.67	0.53	2,964.17	1,556.68	265.58	1,559.07	0.00	0.00	0.00
4,300.00	89.67	0.53	2,964.74	1,656.67	266.50	1,659.07	0.00	0.00	0.00
4,400.00	89.67	0.53	2,965.31	1,756.67	267.42	1,759.06	0.00	0.00	0.00
4,500.00	89.67	0.53	2,965.88	1,856.66	268.33	1,859.06	0.00	0.00	0.00
4,600.00	89.67	0.53	2,966.45	1,956.65	269.25	1,959.06	0.00	0.00	0.00
4,700.00	89.67	0.53	2,967.03	2,056.65	270.17	2,059.06	0.00	0.00	0.00
4,800.00	89.67	0.53	2,967.60	2,156.64	271.09	2,159.06	0.00	0.00	0.00
4,900.00	89.67	0.53	2,968.17	2,256.64	272.00	2,259.06	0.00	0.00	0.00
5,000.00	89.67	0.53	2,968.74	2,356.63	272.92	2,359.05	0.00	0.00	0.00
5,100.00	89.67	0.53	2,969.31	2,456.62	273.84	2,459.05	0.00	0.00	0.00
5,200.00	89.67	0.53	2,969.89	2,556.62	274.75	2,559.05	0.00	0.00	0.00
5,300.00	89.67	0.53	2,970.46	2,656.61	275.67	2,659.05	0.00	0.00	0.00
5,400.00	89.67	0.53	2,971.03	2,756.61	276.59	2,759.05	0.00	0.00	0.00
5,500.00	89.67	0.53	2,971.60	2,856.60	277.51	2,859.05	0.00	0.00	0.00
5,600.00	89.67	0.53	2,972.17	2,956.60	278.42	2,959.04	0.00	0.00	0.00
5,700.00	89.67	0.53	2,972.75	3,056.59	279.34	3,059.04	0.00	0.00	0.00
5,800.00	89.67	0.53	2,973.32	3,156.58	280.26	3,159.04	0.00	0.00	0.00
5,900.00	89.67	0.53	2,973.89	3,256.58	281.18	3,259.04	0.00	0.00	0.00
6,000.00	89.67	0.53	2,974.46	3,356.57	282.09	3,359.04	0.00	0.00	0.00
6,100.00	89.67	0.53	2,975.04	3,456.57	283.01	3,459.04	0.00	0.00	0.00
6,200.00	89.67	0.53	2,975.61	3,556.56	283.93	3,559.03	0.00	0.00	0.00
6,300.00	89.67	0.53	2,976.18	3,656.55	284.84	3,659.03	0.00	0.00	0.00
6,400.00	89.67	0.53	2,976.75	3,756.55	285.76	3,759.03	0.00	0.00	0.00
6,500.00	89.67	0.53	2,977.32	3,856.54	286.68	3,859.03	0.00	0.00	0.00
6,600.00	89.67	0.53	2,977.90	3,956.54	287.60	3,959.03	0.00	0.00	0.00
6,700.00	89.67	0.53	2,978.47	4,056.53	288.51	4,059.03	0.00	0.00	0.00
6,800.00	89.67	0.53	2,979.04	4,156.53	289.43	4,159.02	0.00	0.00	0.00
6,900.00	89.67	0.53	2,979.61	4,256.52	290.35	4,259.02	0.00	0.00	0.00
7,000.00	89.67	0.53	2,980.18	4,356.51	291.27	4,359.02	0.00	0.00	0.00
7,100.00	89.67	0.53	2,980.76	4,456.51	292.18	4,459.02	0.00	0.00	0.00
7,200.00	89.67	0.53	2,981.33	4,556.50	293.10	4,559.02	0.00	0.00	0.00
7,300.00	89.67	0.53	2,981.90	4,656.50	294.02	4,659.02	0.00	0.00	0.00
7,400.00	89.67	0.53	2,982.47	4,756.49	294.93	4,759.01	0.00	0.00	0.00
7,500.00	89.67	0.53	2,983.05	4,856.48	295.85	4,859.01	0.00	0.00	0.00
7,600.00	89.67	0.53	2,983.62	4,956.48	296.77	4,959.01	0.00	0.00	0.00
7,700.00	89.67	0.53	2,984.19	5,056.47	297.69	5,059.01	0.00	0.00	0.00
7,800.00	89.67	0.53	2,984.76	5,156.47	298.60	5,159.01	0.00	0.00	0.00
7,900.00	89.67	0.53	2,985.33	5,256.46	299.52	5,259.01	0.00	0.00	0.00
8,000.00	89.67	0.53	2,985.91	5,356.46	300.44	5,359.01	0.00	0.00	0.00
8,100.00	89.67	0.53	2,986.48	5,456.45	301.36	5,459.00	0.00	0.00	0.00
8,200.00	89.67	0.53	2,987.05	5,556.44	302.27	5,559.00	0.00	0.00	0.00
8,300.00	89.67	0.53	2,987.62	5,656.44	303.19	5,659.00	0.00	0.00	0.00
8,400.00	89.67	0.53	2,988.19	5,756.43	304.11	5,759.00	0.00	0.00	0.00
8,460.87	89.67	0.53	2,988.54	5,817.30	304.67	5,819.87	0.00	0.00	0.00
8,500.00	89.67	0.53	2,988.77	5,856.43	305.03	5,859.00	0.00	0.00	0.00
8,540.88	89.67	0.53	2,989.00	5,897.30	305.40	5,899.87	0.00	0.00	0.00

Database:	WBDS_SQL_2	**Local Co-ordinate Reference:**	Well 17H
Company:	Percussion Petroleum, LLC	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Project:	Eddy County, NM	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site:	Lakewood Federal	**North Reference:**	Grid
Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	OH		
Design:	Plan #2		

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Lakewood 17: FTP - plan hits target center - Point	0.00	360.00	2,959.00	653.90	257.30	585,676.00	496,690.60	32.609991	-104.478329
Lakewood 17: LTP - plan misses target center by 0.46usft at 8460.87usft MD (2988.54 TVD, 5817.30 N, 304.67 E) - Point	0.00	360.00	2,989.00	5,817.30	304.60	590,839.40	496,737.90	32.624184	-104.478199
Lakewood 17: BHL - plan hits target center - Point	0.00	360.00	2,989.00	5,897.30	305.40	590,919.40	496,738.70	32.624404	-104.478196

PERCUSSION PETROLEUM LLC

Percussion Petroleum, LLC

Eddy County, NM
Lakewood Federal
17H

OH
Plan #2

Anticollision Report

02 May, 2018

WELLBENDERS DIRECTIONAL SERVICES LLC

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Reference	Plan #2		
Filter type:	NO GLOBAL FILTER: Using user defined selection & filtering criteria		
Interpolation Method:	MD + Stations Interval 100.00usft	**Error Model:**	ISCWSA
Depth Range:	Unlimited	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 9,999.00 us	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 5/2/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	8,540.88	Plan #2 (OH)	MWD+IGRF	OWSG MWD + IGRF or WMM

Summary

Site Name Offset Well - Wellbore - Design	Reference Measured Depth (usft)	Offset Measured Depth (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Separation Factor	Warning
Lakewood Federal						
18H - OH - Plan #2	415.00	415.00	19.90	17.34	7.786	CC, ES
18H - OH - Plan #2	8,540.88	8,241.60	344.90	195.56	2.310	SF
19H - OH - Plan #2	300.00	299.00	40.00	38.27	23.150	CC, ES
19H - OH - Plan #2	8,540.88	8,113.86	579.67	366.98	2.725	SF

Offset Design Lakewood Federal - 18H - OH - Plan #2 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	0.00	0.00	0.00	0.00	-90.00	0.00	-19.90	19.90				
100.00	100.00	100.00	100.00	0.15	0.15	-90.00	0.00	-19.90	19.90	19.60	0.30	66.884	
200.00	200.00	200.00	200.00	0.51	0.51	-90.00	0.00	-19.90	19.90	18.89	1.01	19.616	
300.00	300.00	300.00	300.00	0.87	0.87	-90.00	0.00	-19.90	19.90	18.17	1.73	11.493	
400.00	400.00	400.00	400.00	1.22	1.22	-90.00	0.00	-19.90	19.90	17.45	2.45	8.128	
415.00	415.00	415.00	415.00	1.28	1.28	-90.00	0.00	-19.90	19.90	17.34	2.56	7.786	CC, ES
450.00	449.98	449.98	449.98	1.40	1.40	-157.80	0.00	-19.90	20.89	18.08	2.81	7.439	
477.48	477.35	477.35	477.35	1.52	1.50	-159.92	0.00	-19.90	23.06	20.05	3.02	7.649	
500.00	499.74	500.26	499.74	1.60	1.58	-161.82	0.00	-19.90	25.38	22.20	3.18	7.974	
600.00	599.15	600.85	599.15	1.95	1.94	-167.25	0.00	-19.90	35.89	31.99	3.89	9.220	
700.00	698.55	700.76	700.70	2.34	2.31	-168.32	1.83	-18.79	45.13	40.53	4.59	9.823	
800.00	797.96	800.54	800.24	2.73	2.66	-165.06	7.78	-15.17	51.13	45.81	5.31	9.625	
900.00	897.37	900.33	899.78	3.13	3.02	-162.50	13.73	-11.56	57.25	51.22	6.04	9.485	
1,000.00	996.77	1,000.11	999.32	3.53	3.39	-160.43	19.68	-7.94	63.48	56.71	6.77	9.380	
1,100.00	1,096.18	1,100.11	1,098.86	3.93	3.76	-158.74	25.63	-4.33	69.76	62.26	7.50	9.298	
1,200.00	1,195.58	1,200.33	1,198.40	4.33	4.13	-157.32	31.58	-0.71	76.10	67.86	8.24	9.232	
1,300.00	1,294.99	1,300.54	1,297.94	4.74	4.51	-156.13	37.53	2.90	82.48	73.49	8.99	9.179	
1,400.00	1,394.40	1,400.76	1,397.48	5.15	4.88	-155.10	43.48	6.51	88.89	79.16	9.73	9.134	
1,500.00	1,493.80	1,500.98	1,497.02	5.55	5.26	-154.22	49.43	10.13	95.32	84.84	10.48	9.097	
1,600.00	1,593.21	1,601.20	1,596.56	5.96	5.63	-153.44	55.37	13.74	101.78	90.55	11.23	9.065	
1,700.00	1,692.62	1,701.41	1,696.10	6.37	6.01	-152.76	61.32	17.36	108.24	96.27	11.98	9.038	
1,800.00	1,792.02	1,801.63	1,795.64	6.77	6.38	-152.16	67.27	20.97	114.73	102.00	12.73	9.014	
1,900.00	1,891.43	1,901.85	1,895.18	7.18	6.76	-151.62	73.22	24.59	121.22	107.74	13.48	8.993	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion Petroleum, LLC	Local Co-ordinate Reference:	Well 17H
Project:	Eddy County, NM	TVD Reference:	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	MD Reference:	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	North Reference:	Grid
Reference Well:	17H	Survey Calculation Method:	Minimum Curvature
Well Error:	0.00 usft	Output errors are at	2.00 sigma
Reference Wellbore	OH	Database:	WBDS_SQL_2
Reference Design:	Plan #2	Offset TVD Reference:	Reference Datum

Offset Design Lakewood Federal - 18H - OH - Plan #2 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi-Major Axis Reference (usft)	Semi-Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
2,000.00	1,990.83	2,002.06	1,994.72	7.59	7.14	-151.13	79.17	28.20	127.73	113.49	14.23	8.974	
2,100.00	2,090.24	2,102.28	2,094.26	8.00	7.52	-150.69	85.12	31.81	134.24	119.25	14.99	8.958	
2,200.00	2,189.65	2,195.69	2,191.66	8.41	7.88	-148.93	94.34	35.38	141.16	125.42	15.74	8.968	
2,300.00	2,289.05	2,288.92	2,281.83	8.81	8.30	-141.97	117.37	38.81	151.35	134.76	16.58	9.127	
2,400.00	2,388.46	2,374.02	2,359.90	9.22	8.75	-132.20	150.91	41.90	169.66	152.36	17.31	9.803	
2,425.65	2,413.96	2,394.23	2,377.65	9.33	8.87	-129.62	160.56	42.62	176.27	158.83	17.43	10.111	
2,450.00	2,438.13	2,412.98	2,393.79	9.43	8.98	-109.61	170.06	43.29	183.11	165.58	17.53	10.446	
2,500.00	2,487.45	2,450.84	2,425.41	9.65	9.23	-85.10	190.83	44.60	197.91	180.25	17.67	11.204	
2,550.00	2,536.01	2,487.93	2,454.99	9.88	9.49	-71.67	213.16	45.86	213.27	195.53	17.74	12.021	
2,600.00	2,583.46	2,524.36	2,482.58	10.12	9.77	-62.97	236.91	47.06	228.73	210.97	17.77	12.874	
2,650.00	2,629.42	2,560.21	2,508.20	10.37	10.07	-56.72	261.95	48.20	243.96	226.21	17.76	13.740	
2,700.00	2,673.56	2,595.56	2,531.89	10.65	10.38	-51.97	288.17	49.28	258.70	240.98	17.72	14.599	
2,750.00	2,715.52	2,630.48	2,553.65	10.95	10.72	-48.23	315.45	50.30	272.75	255.08	17.68	15.429	
2,800.00	2,755.01	2,665.01	2,573.50	11.27	11.07	-45.22	343.68	51.26	285.96	268.33	17.63	16.220	
2,850.00	2,791.70	2,700.00	2,591.84	11.63	11.45	-42.76	373.46	52.18	298.19	280.57	17.62	16.925	
2,900.00	2,825.33	2,733.14	2,607.50	12.03	11.84	-40.78	402.64	53.00	309.35	291.78	17.57	17.609	
2,950.00	2,855.64	2,766.82	2,621.67	12.47	12.25	-39.14	433.18	53.78	319.36	301.79	17.57	18.177	
3,000.00	2,882.40	2,800.00	2,633.85	12.95	12.66	-37.82	464.03	54.49	328.15	310.56	17.59	18.654	
3,050.00	2,905.40	2,833.60	2,644.34	13.48	13.11	-36.75	495.94	55.14	335.67	317.98	17.68	18.983	
3,100.00	2,924.47	2,866.76	2,652.85	14.04	13.56	-35.91	527.98	55.73	341.87	324.07	17.81	19.196	
3,150.00	2,939.46	2,900.00	2,659.50	14.65	14.03	-35.28	560.54	56.26	346.74	328.74	18.00	19.266	
3,200.00	2,950.27	2,932.80	2,664.21	15.29	14.51	-34.84	592.99	56.72	350.23	331.99	18.24	19.202	
3,250.00	2,956.80	2,965.72	2,667.06	15.95	14.99	-34.58	625.79	57.11	352.33	333.78	18.55	18.991	
3,297.17	2,959.00	3,002.09	2,668.03	16.60	15.54	-34.49	657.95	57.43	353.03	334.04	18.99	18.591	
3,300.00	2,959.02	3,000.74	2,668.05	16.64	15.51	-34.49	660.78	57.46	353.03	334.02	19.00	18.578	
3,400.00	2,959.59	3,100.74	2,668.81	18.10	17.07	-34.51	760.77	58.37	352.87	331.89	20.98	16.817	
3,500.00	2,960.16	3,200.74	2,669.57	19.63	18.70	-34.52	860.76	59.29	352.71	329.64	23.07	15.287	
3,600.00	2,960.73	3,300.74	2,670.34	21.22	20.37	-34.54	960.76	60.20	352.56	327.31	25.24	13.966	
3,700.00	2,961.30	3,400.74	2,671.10	22.86	22.08	-34.56	1,060.75	61.12	352.40	324.92	27.48	12.825	
3,800.00	2,961.88	3,500.74	2,671.86	24.54	23.83	-34.58	1,160.74	62.03	352.25	322.49	29.76	11.836	
3,900.00	2,962.45	3,600.74	2,672.62	26.25	25.60	-34.60	1,260.74	62.95	352.09	320.01	32.08	10.974	
4,000.00	2,963.02	3,700.74	2,673.39	27.99	27.38	-34.61	1,360.73	63.86	351.93	317.50	34.44	10.220	
4,100.00	2,963.59	3,800.74	2,674.15	29.75	29.19	-34.63	1,460.72	64.78	351.78	314.96	36.82	9.555	
4,200.00	2,964.17	3,900.74	2,674.91	31.53	31.00	-34.65	1,560.71	65.69	351.62	312.41	39.22	8.966	
4,300.00	2,964.74	4,000.74	2,675.67	33.32	32.83	-34.67	1,660.71	66.61	351.47	309.83	41.63	8.442	
4,400.00	2,965.31	4,100.73	2,676.44	35.13	34.67	-34.69	1,760.70	67.52	351.31	307.25	44.07	7.972	
4,500.00	2,965.88	4,200.73	2,677.20	36.94	36.51	-34.70	1,860.69	68.44	351.16	304.64	46.51	7.550	
4,600.00	2,966.45	4,300.73	2,677.96	38.77	38.36	-34.72	1,960.68	69.36	351.00	302.03	48.97	7.168	
4,700.00	2,967.03	4,400.73	2,678.73	40.60	40.22	-34.74	2,060.68	70.27	350.85	299.41	51.44	6.821	
4,800.00	2,967.60	4,500.73	2,679.49	42.44	42.08	-34.76	2,160.67	71.19	350.69	296.78	53.91	6.505	
4,900.00	2,968.17	4,600.73	2,680.25	44.29	43.94	-34.78	2,260.66	72.10	350.53	294.14	56.40	6.215	
5,000.00	2,968.74	4,700.73	2,681.01	46.14	45.81	-34.79	2,360.66	73.02	350.38	291.49	58.89	5.950	
5,100.00	2,969.31	4,800.73	2,681.78	47.99	47.69	-34.81	2,460.65	73.93	350.22	288.84	61.39	5.705	
5,200.00	2,969.89	4,900.73	2,682.54	49.86	49.56	-34.83	2,560.64	74.85	350.07	286.18	63.89	5.479	
5,300.00	2,970.46	5,000.73	2,683.30	51.72	51.44	-34.85	2,660.63	75.76	349.91	283.52	66.40	5.270	
5,400.00	2,971.03	5,100.73	2,684.06	53.59	53.32	-34.87	2,760.63	76.68	349.76	280.85	68.91	5.076	
5,500.00	2,971.60	5,200.73	2,684.83	55.46	55.21	-34.88	2,860.62	77.59	349.60	278.17	71.43	4.894	
5,600.00	2,972.17	5,300.73	2,685.59	57.33	57.09	-34.90	2,960.61	78.51	349.45	275.50	73.95	4.725	
5,700.00	2,972.75	5,400.73	2,686.35	59.21	58.98	-34.92	3,060.60	79.42	349.29	272.82	76.48	4.567	
5,800.00	2,973.32	5,500.73	2,687.12	61.09	60.87	-34.94	3,160.60	80.34	349.14	270.13	79.00	4.419	
5,900.00	2,973.89	5,600.73	2,687.88	62.97	62.76	-34.96	3,260.59	81.25	348.98	267.44	81.54	4.280	
6,000.00	2,974.46	5,700.73	2,688.64	64.85	64.65	-34.97	3,360.58	82.17	348.83	264.75	84.07	4.149	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Lakewood Federal - 18H - OH - Plan #2 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
6,100.00	2,975.04	5,800.73	2,689.40	66.73	66.54	-34.99	3,460.58	83.08	348.67	262.06	86.61	4.026	
6,200.00	2,975.61	5,900.73	2,690.17	68.62	68.44	-35.01	3,560.57	84.00	348.52	259.36	89.15	3.909	
6,300.00	2,976.18	6,000.73	2,690.93	70.51	70.33	-35.03	3,660.56	84.92	348.36	256.66	91.70	3.799	
6,400.00	2,976.75	6,100.73	2,691.69	72.40	72.23	-35.05	3,760.55	85.83	348.21	253.96	94.25	3.695	
6,500.00	2,977.32	6,200.73	2,692.45	74.29	74.12	-35.07	3,860.55	86.75	348.05	251.25	96.80	3.596	
6,600.00	2,977.90	6,300.73	2,693.22	76.18	76.02	-35.08	3,960.54	87.66	347.90	248.55	99.35	3.502	
6,700.00	2,978.47	6,400.73	2,693.98	78.07	77.92	-35.10	4,060.53	88.58	347.74	245.83	101.91	3.412	
6,800.00	2,979.04	6,500.73	2,694.74	79.96	79.82	-35.12	4,160.52	89.49	347.59	243.12	104.47	3.327	
6,900.00	2,979.61	6,600.73	2,695.51	81.85	81.72	-35.14	4,260.52	90.41	347.43	240.41	107.03	3.246	
7,000.00	2,980.18	6,700.73	2,696.27	83.75	83.62	-35.16	4,360.51	91.32	347.28	237.69	109.59	3.169	
7,100.00	2,980.76	6,800.73	2,697.03	85.64	85.52	-35.18	4,460.50	92.24	347.12	234.97	112.15	3.095	
7,200.00	2,981.33	6,900.73	2,697.79	87.54	87.42	-35.19	4,560.49	93.15	346.97	232.25	114.72	3.024	
7,300.00	2,981.90	7,000.73	2,698.56	89.44	89.32	-35.21	4,660.49	94.07	346.81	229.52	117.29	2.957	
7,400.00	2,982.47	7,100.73	2,699.32	91.34	91.22	-35.23	4,760.48	94.98	346.66	226.80	119.86	2.892	
7,500.00	2,983.05	7,200.73	2,700.08	93.23	93.13	-35.25	4,860.47	95.90	346.50	224.07	122.43	2.830	
7,600.00	2,983.62	7,300.73	2,700.84	95.13	95.03	-35.27	4,960.47	96.81	346.35	221.34	125.01	2.771	
7,700.00	2,984.19	7,400.73	2,701.61	97.03	96.93	-35.29	5,060.46	97.73	346.20	218.61	127.59	2.713	
7,800.00	2,984.76	7,500.73	2,702.37	98.93	98.84	-35.31	5,160.45	98.64	346.04	215.88	130.17	2.658	
7,900.00	2,985.33	7,600.73	2,703.13	100.83	100.74	-35.32	5,260.44	99.56	345.89	213.14	132.75	2.606	
8,000.00	2,985.91	7,700.73	2,703.90	102.73	102.64	-35.34	5,360.44	100.47	345.73	210.40	135.33	2.555	
8,100.00	2,986.48	7,800.73	2,704.66	104.63	104.55	-35.36	5,460.43	101.39	345.58	207.66	137.92	2.506	
8,200.00	2,987.05	7,900.73	2,705.42	106.54	106.45	-35.38	5,560.42	102.31	345.42	204.92	140.50	2.458	
8,300.00	2,987.62	8,000.73	2,706.18	108.44	108.36	-35.40	5,660.41	103.22	345.27	202.18	143.09	2.413	
8,400.00	2,988.19	8,100.73	2,706.95	110.34	110.26	-35.42	5,760.41	104.14	345.12	199.43	145.68	2.369	
8,460.87	2,988.54	8,161.60	2,707.41	111.50	111.42	-35.43	5,821.27	104.69	345.02	197.76	147.26	2.343	
8,500.00	2,988.77	8,200.73	2,707.71	112.24	112.17	-35.44	5,860.40	105.05	344.96	196.69	148.27	2.327	
8,540.88	2,989.00	8,241.60	2,708.02	113.02	112.95	-35.44	5,901.27	105.43	344.90	195.56	149.33	2.310 SF	

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Lakewood Federal - 19H - OH - Plan #2 — Offset Site Error: 0.00 usft

Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
0.00	0.00	1.00	0.00	0.00	0.00	-89.86	0.10	-40.00	40.00				
100.00	100.00	101.00	100.00	0.15	0.15	-89.86	0.10	-40.00	40.00	39.70	0.30	132.839	
200.00	200.00	201.00	200.00	0.51	0.51	-89.86	0.10	-40.00	40.00	38.98	1.02	39.291	
300.00	300.00	299.00	300.00	0.87	0.86	-89.86	0.10	-40.00	40.00	38.27	1.73	23.150	CC, ES
400.00	400.00	395.02	395.67	1.22	1.25	-82.15	6.01	-43.57	44.19	41.74	2.45	18.027	
415.00	415.00	409.09	409.54	1.28	1.32	-79.85	8.02	-44.78	45.82	43.26	2.56	17.879	
450.00	449.98	442.84	442.65	1.40	1.46	-141.30	13.60	-48.16	51.40	48.57	2.83	18.157	
477.48	477.35	469.62	468.91	1.52	1.55	-138.66	18.09	-50.87	57.16	54.11	3.05	18.712	
500.00	499.74	508.49	490.38	1.60	1.69	-137.47	21.76	-53.09	62.32	59.03	3.30	18.906	
600.00	599.15	588.70	585.68	1.95	2.06	-133.92	38.06	-62.94	85.45	81.50	3.95	21.617	
700.00	698.55	685.89	680.99	2.34	2.52	-131.88	54.36	-72.78	108.75	104.06	4.69	23.189	
800.00	797.96	783.08	776.30	2.73	3.00	-130.56	70.65	-82.63	132.14	126.70	5.44	24.279	
900.00	897.37	880.27	871.60	3.13	3.48	-129.64	86.95	-92.48	155.57	149.37	6.20	25.082	
1,000.00	996.77	977.46	966.91	3.53	3.96	-128.96	103.24	-102.32	179.03	172.06	6.97	25.695	
1,100.00	1,096.18	1,074.65	1,062.22	3.93	4.44	-128.44	119.54	-112.17	202.51	194.77	7.74	26.171	
1,200.00	1,195.58	1,171.84	1,157.52	4.33	4.93	-128.03	135.84	-122.02	226.00	217.49	8.51	26.554	
1,300.00	1,294.99	1,269.03	1,252.83	4.74	5.42	-127.69	152.13	-131.86	249.50	240.22	9.29	26.869	
1,400.00	1,394.40	1,366.22	1,348.14	5.15	5.91	-127.41	168.43	-141.71	273.01	262.95	10.06	27.132	
1,500.00	1,493.80	1,463.41	1,443.44	5.55	6.40	-127.18	184.72	-151.56	296.53	285.69	10.84	27.354	
1,600.00	1,593.21	1,560.60	1,538.75	5.96	6.89	-126.98	201.02	-161.40	320.04	308.42	11.62	27.544	
1,700.00	1,692.62	1,657.79	1,634.06	6.37	7.38	-126.81	217.31	-171.25	343.56	331.16	12.40	27.708	
1,800.00	1,792.02	1,754.98	1,729.36	6.77	7.87	-126.66	233.61	-181.10	367.09	353.91	13.18	27.852	
1,900.00	1,891.43	1,852.17	1,824.67	7.18	8.36	-126.53	249.91	-190.94	390.61	376.65	13.96	27.979	
2,000.00	1,990.83	1,949.36	1,919.98	7.59	8.85	-126.41	266.20	-200.79	414.14	399.39	14.74	28.091	
2,100.00	2,090.24	2,046.55	2,015.28	8.00	9.35	-126.30	282.50	-210.63	437.66	422.14	15.52	28.192	
2,200.00	2,189.65	2,143.74	2,110.59	8.41	9.84	-126.21	298.79	-220.48	461.19	444.89	16.31	28.282	
2,300.00	2,289.05	2,240.93	2,205.90	8.81	10.33	-126.13	315.09	-230.33	484.72	467.63	17.09	28.364	
2,400.00	2,388.46	2,326.44	2,289.63	9.22	10.78	-125.99	330.06	-238.97	508.70	490.92	17.78	28.603	
2,425.65	2,413.96	2,343.64	2,306.29	9.33	10.87	-125.87	333.99	-240.68	515.49	497.57	17.92	28.764	
2,450.00	2,438.13	2,359.85	2,321.87	9.43	10.97	-108.09	338.16	-242.28	522.02	503.97	18.05	28.915	
2,500.00	2,487.45	2,393.04	2,353.38	9.65	11.18	-87.65	348.06	-245.49	534.83	516.49	18.34	29.166	
2,550.00	2,536.01	2,426.10	2,384.16	9.88	11.41	-77.67	359.74	-248.60	546.76	528.12	18.65	29.325	
2,600.00	2,583.46	2,459.10	2,414.15	10.12	11.66	-71.90	373.14	-251.62	557.74	538.77	18.97	29.394	
2,650.00	2,629.42	2,492.05	2,443.29	10.37	11.92	-68.16	388.24	-254.53	567.71	548.37	19.34	29.359	
2,700.00	2,673.56	2,525.00	2,471.51	10.65	12.21	-65.58	405.00	-257.32	576.60	556.86	19.74	29.213	
2,750.00	2,715.52	2,557.98	2,498.76	10.95	12.50	-63.75	423.37	-260.00	584.38	564.20	20.18	28.958	
2,800.00	2,755.01	2,591.01	2,524.96	11.27	12.82	-62.46	443.33	-262.55	591.02	570.35	20.68	28.583	
2,850.00	2,791.70	2,624.13	2,550.03	11.63	13.17	-61.58	464.83	-264.97	596.50	575.26	21.24	28.087	
2,900.00	2,825.33	2,657.38	2,573.91	12.03	13.52	-61.03	487.83	-267.25	600.80	578.94	21.86	27.481	
2,950.00	2,855.64	2,690.77	2,596.53	12.47	13.90	-60.77	512.30	-269.38	603.91	581.35	22.57	26.763	
3,000.00	2,882.40	2,724.33	2,617.80	12.95	14.30	-60.77	538.18	-271.35	605.85	582.50	23.35	25.943	
3,050.00	2,905.40	2,758.11	2,637.64	13.48	14.72	-61.00	565.45	-273.17	606.62	582.40	24.22	25.043	
3,100.00	2,924.47	2,792.12	2,655.98	14.04	15.16	-61.45	594.04	-274.81	606.26	581.07	25.19	24.070	
3,150.00	2,939.46	2,826.40	2,672.72	14.65	15.62	-62.11	623.92	-276.26	604.78	578.53	26.25	23.043	
3,200.00	2,950.27	2,860.99	2,687.78	15.29	16.10	-62.98	655.02	-277.53	602.23	574.84	27.39	21.984	
3,250.00	2,956.80	2,895.92	2,701.07	15.95	16.60	-64.06	687.30	-278.61	598.67	570.04	28.63	20.909	
3,297.17	2,959.00	2,929.21	2,711.89	16.60	17.09	-65.27	718.77	-279.43	594.43	564.55	29.88	19.893	
3,300.00	2,959.02	2,931.22	2,712.49	16.64	17.12	-65.33	720.69	-279.47	594.16	564.20	29.96	19.832	
3,400.00	2,959.59	3,004.72	2,729.59	18.10	18.24	-66.88	792.11	-280.55	586.90	554.17	32.73	17.933	
3,500.00	2,960.16	3,081.51	2,737.60	19.63	19.45	-67.59	868.42	-280.63	583.99	548.51	35.48	16.459	
3,600.00	2,960.73	3,176.54	2,738.62	21.22	20.98	-67.64	963.44	-279.79	583.81	545.33	38.48	15.171	
3,602.22	2,960.75	3,178.76	2,738.64	21.25	21.02	-67.64	965.66	-279.77	583.81	545.26	38.55	15.144	

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Lakewood Federal - 19H - OH - Plan #2 — Offset Site Error: 0.00 usft

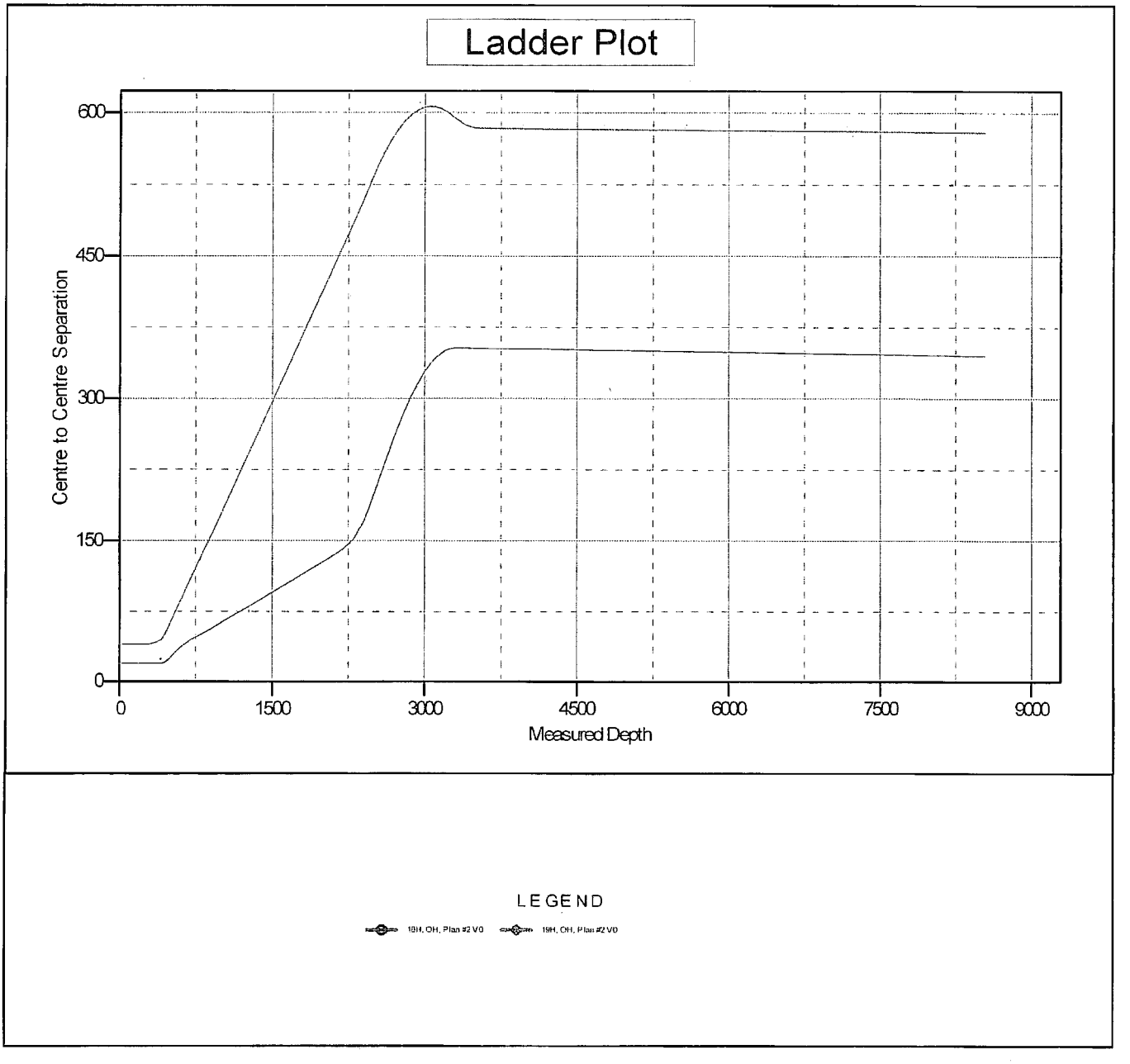
Survey Program: 0-MWD+IGRF — Offset Well Error: 0.00 usft

Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
3,700.00	2,961.30	3,276.54	2,739.42	22.86	22.64	-67.66	1,063.43	-278.87	583.72	542.08	41.64	14.018	
3,800.00	2,961.88	3,376.54	2,740.22	24.54	24.34	-67.68	1,163.42	-277.95	583.64	538.77	44.87	13.009	
3,900.00	2,962.45	3,476.53	2,741.01	26.25	26.07	-67.70	1,263.41	-277.04	583.55	535.41	48.14	12.121	
4,000.00	2,963.02	3,576.53	2,741.81	27.99	27.82	-67.72	1,363.41	-276.12	583.47	532.00	51.46	11.337	
4,100.00	2,963.59	3,676.53	2,742.61	29.75	29.59	-67.74	1,463.40	-275.20	583.38	528.56	54.82	10.642	
4,200.00	2,964.17	3,776.53	2,743.41	31.53	31.38	-67.76	1,563.39	-274.28	583.30	525.09	58.21	10.021	
4,300.00	2,964.74	3,876.53	2,744.20	33.32	33.18	-67.78	1,663.38	-273.37	583.21	521.59	61.62	9.465	
4,400.00	2,965.31	3,976.53	2,745.00	35.13	34.99	-67.80	1,763.38	-272.45	583.13	518.08	65.05	8.964	
4,500.00	2,965.88	4,076.53	2,745.80	36.94	36.82	-67.82	1,863.37	-271.53	583.04	514.54	68.50	8.512	
4,600.00	2,966.45	4,176.53	2,746.60	38.77	38.65	-67.84	1,963.36	-270.61	582.96	510.99	71.96	8.101	
4,700.00	2,967.03	4,276.53	2,747.39	40.60	40.49	-67.86	2,063.35	-269.70	582.87	507.43	75.44	7.726	
4,800.00	2,967.60	4,376.53	2,748.19	42.44	42.33	-67.88	2,163.34	-268.78	582.79	503.85	78.93	7.383	
4,900.00	2,968.17	4,476.53	2,748.99	44.29	44.19	-67.90	2,263.34	-267.86	582.70	500.27	82.43	7.069	
5,000.00	2,968.74	4,576.53	2,749.79	46.14	46.04	-67.92	2,363.33	-266.95	582.62	496.67	85.94	6.779	
5,100.00	2,969.31	4,676.53	2,750.58	47.99	47.90	-67.95	2,463.32	-266.03	582.53	493.07	89.46	6.512	
5,200.00	2,969.89	4,776.53	2,751.38	49.86	49.77	-67.97	2,563.31	-265.11	582.45	489.46	92.98	6.264	
5,300.00	2,970.46	4,876.53	2,752.18	51.72	51.64	-67.99	2,663.31	-264.19	582.36	485.85	96.52	6.034	
5,400.00	2,971.03	4,976.53	2,752.98	53.59	53.51	-68.01	2,763.30	-263.28	582.28	482.22	100.05	5.820	
5,500.00	2,971.60	5,076.53	2,753.77	55.46	55.38	-68.03	2,863.29	-262.36	582.19	478.60	103.60	5.620	
5,600.00	2,972.17	5,176.53	2,754.57	57.33	57.26	-68.05	2,963.28	-261.44	582.11	474.96	107.15	5.433	
5,700.00	2,972.75	5,276.53	2,755.37	59.21	59.14	-68.07	3,063.28	-260.53	582.02	471.32	110.70	5.258	
5,800.00	2,973.32	5,376.53	2,756.17	61.09	61.02	-68.09	3,163.27	-259.61	581.94	467.68	114.26	5.093	
5,900.00	2,973.89	5,476.53	2,756.96	62.97	62.90	-68.11	3,263.26	-258.69	581.86	464.04	117.82	4.939	
6,000.00	2,974.46	5,576.53	2,757.76	64.85	64.79	-68.13	3,363.25	-257.77	581.77	460.39	121.38	4.793	
6,100.00	2,975.04	5,676.53	2,758.56	66.73	66.67	-68.15	3,463.25	-256.86	581.69	456.74	124.95	4.655	
6,200.00	2,975.61	5,776.53	2,759.36	68.62	68.56	-68.17	3,563.24	-255.94	581.60	453.08	128.53	4.525	
6,300.00	2,976.18	5,876.53	2,760.16	70.51	70.45	-68.19	3,663.23	-255.02	581.52	449.42	132.10	4.402	
6,400.00	2,976.75	5,976.53	2,760.95	72.40	72.34	-68.21	3,763.22	-254.10	581.44	445.76	135.68	4.285	
6,500.00	2,977.32	6,076.53	2,761.75	74.29	74.23	-68.23	3,863.21	-253.19	581.35	442.09	139.26	4.175	
6,600.00	2,977.90	6,176.53	2,762.55	76.18	76.12	-68.25	3,963.21	-252.27	581.27	438.43	142.84	4.069	
6,700.00	2,978.47	6,276.53	2,763.35	78.07	78.02	-68.27	4,063.20	-251.35	581.19	434.76	146.43	3.969	
6,800.00	2,979.04	6,376.53	2,764.14	79.96	79.91	-68.30	4,163.19	-250.44	581.10	431.09	150.02	3.874	
6,900.00	2,979.61	6,476.53	2,764.94	81.85	81.81	-68.32	4,263.18	-249.52	581.02	427.41	153.61	3.783	
7,000.00	2,980.18	6,576.53	2,765.74	83.75	83.70	-68.34	4,363.18	-248.60	580.94	423.74	157.20	3.696	
7,100.00	2,980.76	6,676.53	2,766.54	85.64	85.60	-68.36	4,463.17	-247.68	580.85	420.06	160.79	3.612	
7,200.00	2,981.33	6,776.53	2,767.33	87.54	87.50	-68.38	4,563.16	-246.77	580.77	416.38	164.39	3.533	
7,300.00	2,981.90	6,876.53	2,768.13	89.44	89.40	-68.40	4,663.15	-245.85	580.69	412.70	167.99	3.457	
7,400.00	2,982.47	6,976.53	2,768.93	91.34	91.30	-68.42	4,763.15	-244.93	580.60	409.02	171.59	3.384	
7,500.00	2,983.05	7,076.53	2,769.73	93.23	93.19	-68.44	4,863.14	-244.01	580.52	405.33	175.19	3.314	
7,600.00	2,983.62	7,176.53	2,770.52	95.13	95.09	-68.46	4,963.13	-243.10	580.44	401.65	178.79	3.246	
7,700.00	2,984.19	7,276.53	2,771.32	97.03	96.99	-68.48	5,063.12	-242.18	580.36	397.96	182.40	3.182	
7,800.00	2,984.76	7,376.53	2,772.12	98.93	98.90	-68.50	5,163.12	-241.26	580.27	394.27	186.00	3.120	
7,900.00	2,985.33	7,476.52	2,772.92	100.83	100.80	-68.52	5,263.11	-240.35	580.19	390.58	189.61	3.060	
8,000.00	2,985.91	7,576.52	2,773.71	102.73	102.70	-68.54	5,363.10	-239.43	580.11	386.89	193.22	3.002	
8,100.00	2,986.48	7,676.52	2,774.51	104.63	104.60	-68.56	5,463.09	-238.51	580.03	383.19	196.83	2.947	
8,200.00	2,987.05	7,776.52	2,775.31	106.54	106.50	-68.59	5,563.08	-237.59	579.94	379.50	200.45	2.893	
8,300.00	2,987.62	7,876.52	2,776.11	108.44	108.41	-68.61	5,663.08	-236.68	579.86	375.80	204.06	2.842	
8,400.00	2,988.19	7,976.52	2,776.90	110.34	110.31	-68.63	5,763.07	-235.76	579.78	372.10	207.68	2.792	
8,460.87	2,988.54	8,037.39	2,777.39	111.50	111.47	-68.64	5,823.94	-235.20	579.73	369.85	209.88	2.762	
8,500.00	2,988.77	8,076.52	2,777.70	112.24	112.21	-68.65	5,863.06	-234.84	579.70	368.40	211.29	2.744	
8,537.19	2,988.98	8,113.71	2,778.00	112.95	112.92	-68.66	5,900.25	-234.50	579.67	367.03	212.64	2.726	
8,540.88	2,989.00	8,113.86	2,778.00	113.02	112.92	-68.66	5,900.40	-234.50	579.67	366.98	212.70	2.725	SF

CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=17' @ 3541.00usft (Silver Oak 1Coordinates are relative to: 17H
Offset Depths are relative to Offset Datum
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334
Grid Convergence at Surface is: -0.08°

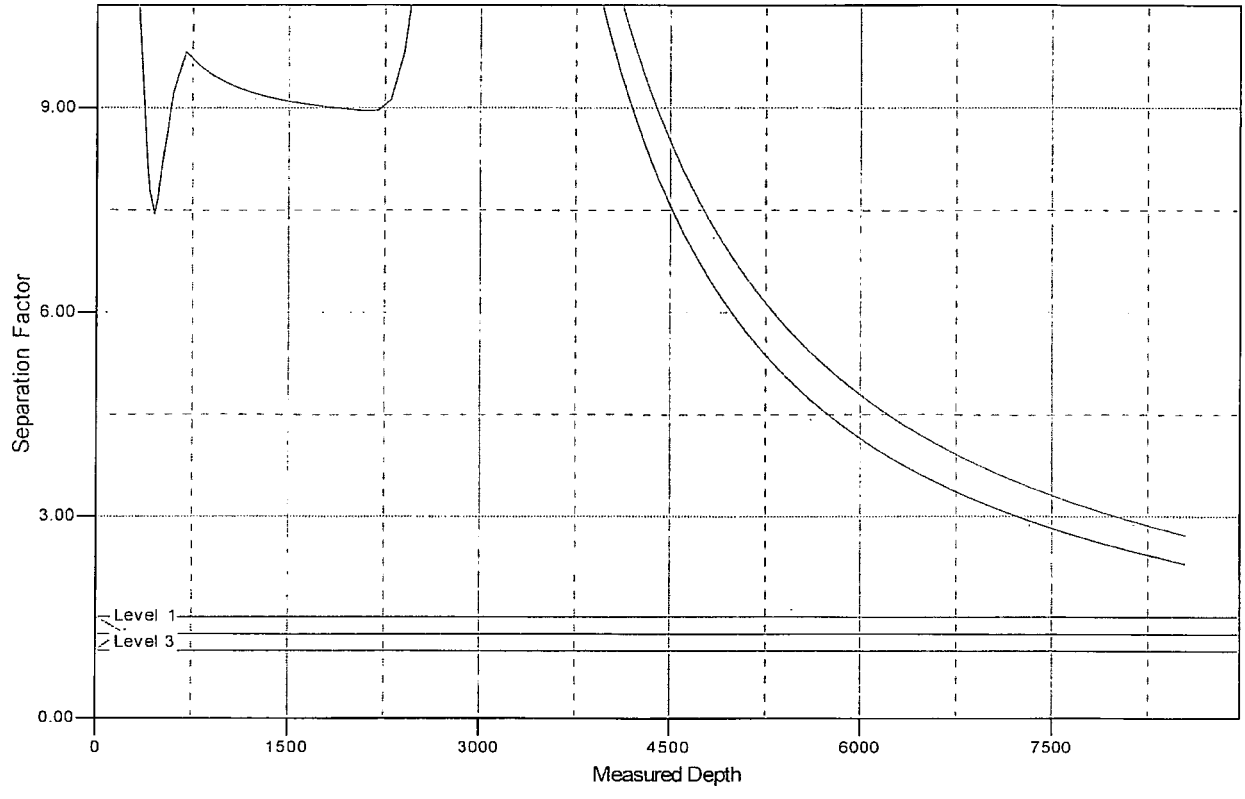


CC - Min centre to center distance or covergent point, SF - min separation factor, ES - min ellipse separation

Company:	Percussion Petroleum, LLC	**Local Co-ordinate Reference:**	Well 17H
Project:	Eddy County, NM	**TVD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Reference Site:	Lakewood Federal	**MD Reference:**	RKB=17' @ 3541.00usft (Silver Oak 1)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	17H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	OH	**Database:**	WBDS_SQL_2
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Reference Depths are relative to RKB=17' @ 3541.00usft (Silver Oak 1Coordinates are relative to: 17H
Offset Depths are relative to Offset Datum
Coordinate System is US State Plane 1983, New Mexico Eastern Zone
Central Meridian is -104.333334
Grid Convergence at Surface is: -0.08°

Separation Factor Plot



LEGEND

Percussion Petroleum Operating, LLC
Lakewood Federal Com 17H
SHL 555' FNL & 645' FWL 3-20S-25E
BHL 20' FNL & 900' FWL 34-19S-25E
Eddy County, NM

Drilling Program

1. ESTIMATED TOPS

Formation/Lithology	TVD	MD	Contents
Quaternary caliche	000'	000'	water
Grayburg dolomite	654'	655'	hydrocarbons
San Andres dolomite	839'	841'	hydrocarbons
Glorieta silty dolomite	2399'	2411'	hydrocarbons
(KOP	2414'	2426'	hydrocarbons)
Yeso dolomite & goal	2554'	2569'	hydrocarbons
TD	2989'	8541	hydrocarbons

2. NOTABLE ZONES

Yeso is the goal. Closest water well (RA 02958) is 3663' northeast. Depth to water was not reported in this 450' deep well.

3. PRESSURE CONTROL

A 3000-psi 5000' rated BOP stack consisting of annular preventer and double (blind and pipe) ram will be used below surface casing to TD. See attached BOP and choke manifold diagrams.

Pressure tests will be conducted before drilling out from under all casing strings. Third party test crews will conduct all tests. All tests will be recorded for 10-minutes on low pressure (500 psi) and 10-minutes on high pressure (3000-psi). After BOP testing is complete, test casing (without test plug) to 2000-psi for 30 minutes. All tests will be charted on a plot. BOPs will be function tested every day.

4. CASING & CEMENT

All casing will be API and new. A contingency plan is attached.

Hole O. D.	Set MD	Set TVD	Casing O. D.	Weight (lb/ft)	Grade	Joint	Collapse	Burst	Tension
12.25"	0' - 1279'	0' - 1274'	Surface 9.625"	36	J-55	LTC	1.125	1.125	1.8
8.75"	0' - 2700'	0' - 2674'	Prod. 1 7"	32	L-80	BTC	1.125	1.125	1.8
8.75"	2700' - 8541'	2674' - 2989'	Prod. 2 5.5"	17	L-80	BTC	1.125	1.125	1.8

Casing Name	Type	Sacks	Yield	Cu. Ft.	Weight	Blend
Surface	Lead	636	1.32	840	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		100% Excess			Stop collar 10' above shoe with centralizer. One on 1st collar and every 4th collar to GL.	
Production	Lead	495	1.97	975	12.6	65/65/6 Class C + 6% gel + 5% salt + ¼ pound per sack celloflake + 0.2% C41-P
	Tail	1434	1.32	1892	14.8	Class C + 2% CaCl + ¼ pound per sack celloflake
TOC = GL		50% Excess			Stop collar 10' above shoe with centralizer. One on 1st collar and every 10 collars to 1200' with 1 centralizer in 9.625" casing.	

5. MUD PROGRAM

An electronic/mechanical mud monitor with a minimum pit volume totalizer, stroke counter, and flow sensor will be used. All necessary mud products (LCM) will be on site to handle any abnormal hole condition that may be encountered while drilling this well. A closed loop system will be used.

Type	Interval (MD)	lb/gal	Viscosity	Fluid Loss	Plastic Viscosity	Yield Point
fresh water/gel	0' - 1279'	8.4 - 9.2	36-42	NC	3-5	5-7
fresh water/cut brine	1279' - 2426'	8.3 - 9.2	28-30	NC	1	1
cut brine	2426' - 8541'	8.6 - 9.2	29-32	NC	4-5	6-10

6. CORES, TESTS, & LOGS

No core or drill stem test is planned.

A mud logger will be used from GL to TD. Samples will be collected every 10' in the lateral pay zone.

No electric logs are planned at this time.

7. DOWN HOLE CONDITIONS

No abnormal pressure or temperature is expected. Maximum expected bottom hole pressure is ≈1279 psi. Expected bottom hole temperature is ≈115° F.

A Hydrogen Sulfide Drilling Operation Plan is attached.

8. OTHER INFORMATION

Anticipated spud date is upon approval. It is expected it will take ≈1 month to drill and complete the well.

St. Devote LLC has operating rights in all three leases that will be penetrated. St. Devote LLC is a subsidiary of Percussion.

PERCUSSION PETROLEUM LLC

919 Milam Street, Suite 2475
Houston, TX 77002

Contingency Planning – Lakewood Federal Area Wells

Prepared by Lelan J. Anders, Percussion Petroleum Operating, LLC.

INTRODUCTION:

This document is designed to address the issues that could arise at any time drilling horizontal Yeso wells. Percussion Petroleum Operating (PPO) is going to follow regularly used practices and procedures in order to drill the wells to TD and still keep them economical to operate.

SCENARIO:

If a complete loss of circulation occurs while drilling above 400 ft MD.

CORRECTIVE ACTIONS:

1. Pump an LCM sweep and attempt to regain circulation – if unsuccessful go to step 2

2. Continue drilling at attempt to seal off lost circulation zone with drill cuttings
    1. Monitor torque and drag on drill string to determine if pipe is sticking
    2. Have contingency plan to 'drill dry' – have plenty of water on hand and well control in place
    3. Continue to 'dry drill' until torque and drag dictate a different plan

3. If 'dry drilling' is unsuccessful – Run contingency surface casing string
    1. Ream out 12-1/4" open hole to 17-1/2" open hole
    2. Run contingency 13-3/8" 48# H-40, STC casing to no more than 400' MD
    3. Cement 13-3/8" casing using Class C cement
        i. Pump at minimum 200% excess cement
            1. 400 sks 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk to be used on initial cement job.
        ii. Top off cement from surface using 1" if necessary
            1. Top off will be 200 sks of 65/35/6 Class C Cement, 12.8 ppg, 1.87 yield, 10.15 gal/sk
            2. Second top off will be performed with same cement if needed.
        iii. Insure that cement has cured for a minimum of 12 hours prior to drilling out
    4. Install 13-3/8" 3M wellhead and drill to surface casing depth with 12-1/4" OD bit
    5. Run and cement surface casing as planned

APD ID: 10400035226 **Submission Date:** 10/15/2018

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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

Highlighted data reflects the most recent changes

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

Lake_17H_Road_Map_20181015132723.pdf

Existing Road Purpose: ACCESS **Row(s) Exist?** NO

ROW ID(s)

ID:

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:

Lake_17H_New_Road_Map_20181015132746.pdf

New road type: RESOURCE

Length: 1616.4 Feet **Width (ft.):** 30

Max slope (%): 0 **Max grade (%):** 4

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 14

New road access erosion control: Crowned and ditched; Borrow ditches will turn out every 100 yards.

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

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information:

Access miscellaneous information:

Number of access turnouts: **Access turnout map:**

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and ditched; Borrow ditches will turn out every 100 yards.

Road Drainage Control Structures (DCS) description: None

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:

Lake_17H_Well_Map_20181015132905.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: A 281.7' long overhead raptor safe 3-phase power line will be built north to Percussion's existing power line. A 53.7' long 4" O D. HDPE SWD line will be laid on the surface northeast to an existing Percussion's SWD line. SWD line maximum operating pressure will be 100 psi. A central tank battery will be built on the north side of the pad. Process equipment (separators, heater-treaters, meters, compressor) will be on the south side of the battery portion of the pad. CBU or flare will be on the northwest corner. Oil and water tanks will be on the north side. Tanks will be bermed.
Production Facilities map:

Lake_17H_Production_Facilities_20181015132917.pdf

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Section 5 - Location and Types of Water Supply

Water Source Table

Water source use type: INTERMEDIATE/PRODUCTION CASING, STIMULATION, SURFACE CASING

Water source type: GW WELL

Describe type:

Source latitude:

Source longitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

Water source transport method: PIPELINE

Source transportation land ownership: FEDERAL

Water source volume (barrels): 10000

Source volume (acre-feet): 1.288931

Source volume (gal): 420000

Water source and transportation map:

Lake_17H_Water_Source_Map_20181015133023.pdf

Water source comments: Two temporary 10" Kevlar lay flat surface pipelines will be laid 5600' along roads from Percussion's existing Huber 3H pond* to the pad. Pipeline route will not be bladed or excavated. *Pond will be supplied via one previously approved (30-015-44712 et al) temporary surface 12" Kevlar lay flat pipeline from one or two water wells on private land. Pipeline routes will not be bladed or excavated. Primary source will be Seven Rivers' well RA 10949 in NWNE 6-20s-29e. That route is 14,750' long (2950' private + 5350' State + 6450' BLM). Secondary source will be Seven Rivers' well RA 10918 in NESE 11-20s-25e. That route is 14,000' long (6850' of private land + 7150' of BLM).

New water well? NO

New Water Well Info

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

Well target aquifer:

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

Aquifer comments:

Aquifer documentation:

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:**

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

Construction Materials description: NM One Call (811) will be notified before construction starts. Top 6" of soil and brush will be stockpiled west of the pad. V-door will face west. Closed loop drilling system will be used. Caliche will be hauled from existing caliche pits on private land. Arkland caliche pit is in NWNE 23-19s-25e. Seven Rivers caliche pit is in SWSW 6-20s-26e. A berm will be built on the fill (west) side of the pad to contain any spills.

Construction Materials source location attachment:

Lake_17H_Construction_Methods_20181015133053.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

Waste content description: Drill cuttings, mud, salts, and other chemicals

Amount of waste: 1000 barrels

Waste disposal frequency : Daily

Safe containment description: Steel tanks

Safe containmant attachment:

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

Disposal type description:

Disposal location description: R360's state approved (NM-01-0006) disposal site at Halfway, NM.

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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Are you storing cuttings on location? YES

Description of cuttings location Steel tanks on pad

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:

Lake_17H_Well_Site_Layout_20181015133221.pdf

Comments:

Section 10 - Plans for Surface Reclamation

Type of disturbance: New Surface Disturbance **Multiple Well Pad Name:** LAKEWOOD FEDERAL COM

Multiple Well Pad Number: 17H

Recontouring attachment:

Lake_17H_Interim_Reclamation_Diagram_20181015133235.pdf

Lake_17H_Recontour_Plat_20181015133244.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Well pad proposed disturbance (acres): 2.72
Road proposed disturbance (acres): 1.11
Powerline proposed disturbance (acres): 0.19
Pipeline proposed disturbance (acres): 2.61
Other proposed disturbance (acres): 0

Total proposed disturbance: 6.63

Well pad interim reclamation (acres): 0.37
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0.19
Pipeline interim reclamation (acres): 2.61
Other interim reclamation (acres): 0

Total interim reclamation: 3.17

Well pad long term disturbance (acres): 2.35
Road long term disturbance (acres): 1.11
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 0
Other long term disturbance (acres): 0

Total long term disturbance: 3.46

Disturbance Comments:

Reconstruction method: Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the well pad 0.37 acre by removing caliche and reclaiming 50' on the south side of the pad. This will leave 2.35 acres for the central tank battery, anchors, pump jacks, and tractor-trailer turn around. Disturbed areas will be contoured to match pre-construction grades. Once the wells are plugged and all production equipment removed, then reclamation will be completed within 6 months of plugging the last well. Reclamation will consist of removing caliche and deeply ripping on the contour. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements. Noxious weeds will be controlled.
Topsoil redistribution: Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements.
Soil treatment: None

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

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? NO

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: **Seed source:**

Seed name:

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location:

PLS pounds per acre: **Proposed seeding season:**

Total pounds/Acre:

Seed Summary	
Seed Type	**Pounds/Acre**

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: **Last Name:**

Phone: **Email:**

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: To BLM standards

Weed treatment plan attachment:

Monitoring plan description: To BLM standards

Monitoring plan attachment:

Success standards: To BLM satisfaction

Pit closure description: No pit

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

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:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: NEW ACCESS ROAD

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:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: EXISTING ACCESS ROAD

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:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: PIPELINE

Describe:

Surface Owner: BUREAU OF LAND MANAGEMENT

Other surface owner description:

BIA Local Office:

BOR Local Office:

COE Local Office:

DOD Local Office:

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

NPS Local Office:

State Local Office:

Military Local Office:

USFWS Local Office:

Other Local Office:

USFS Region:

USFS Forest/Grassland: **USFS Ranger District:**

Disturbance type: OTHER

Describe: Power Line

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:

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

Operator Name: PERCUSSION PETROLEUM OPERATING LLC

Well Name: LAKEWOOD FEDERAL COM **Well Number:** 17H

SUPO Additional Information:

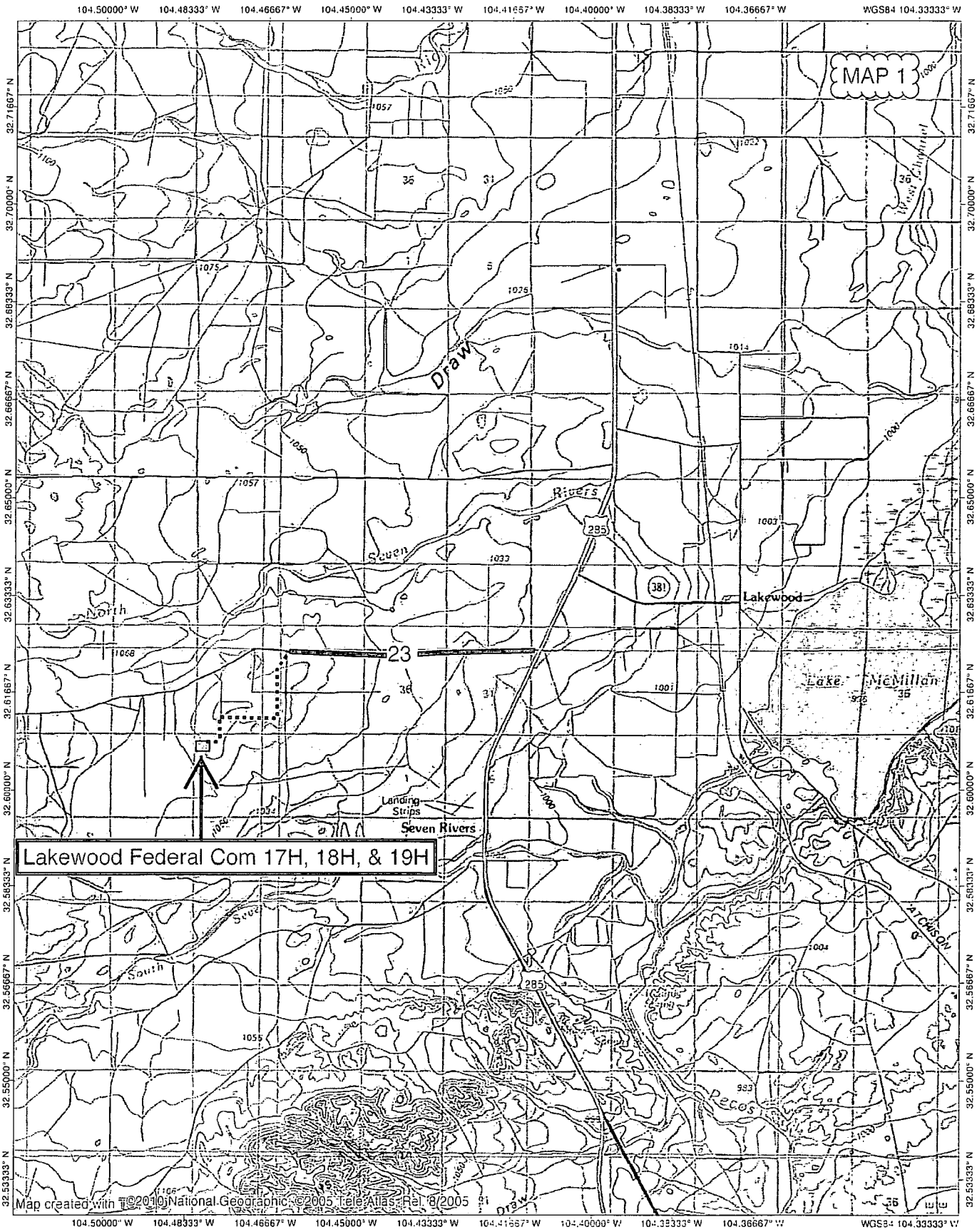
Use a previously conducted onsite? YES

Previous Onsite information: On-site inspection was held with Jessie Bassett (BLM) on April 3, 2018. Lone Mountain Archaeological consulted (FAR 2523) with BLM on April 5, 2018. It was determined that no survey work was needed due to previous surveys covering the project area.

Other SUPO Attachment

Lake_17H_SUPO_20181015133851.pdf

TOPO! map printed on 09/29/18 from "Untitled.tpo"

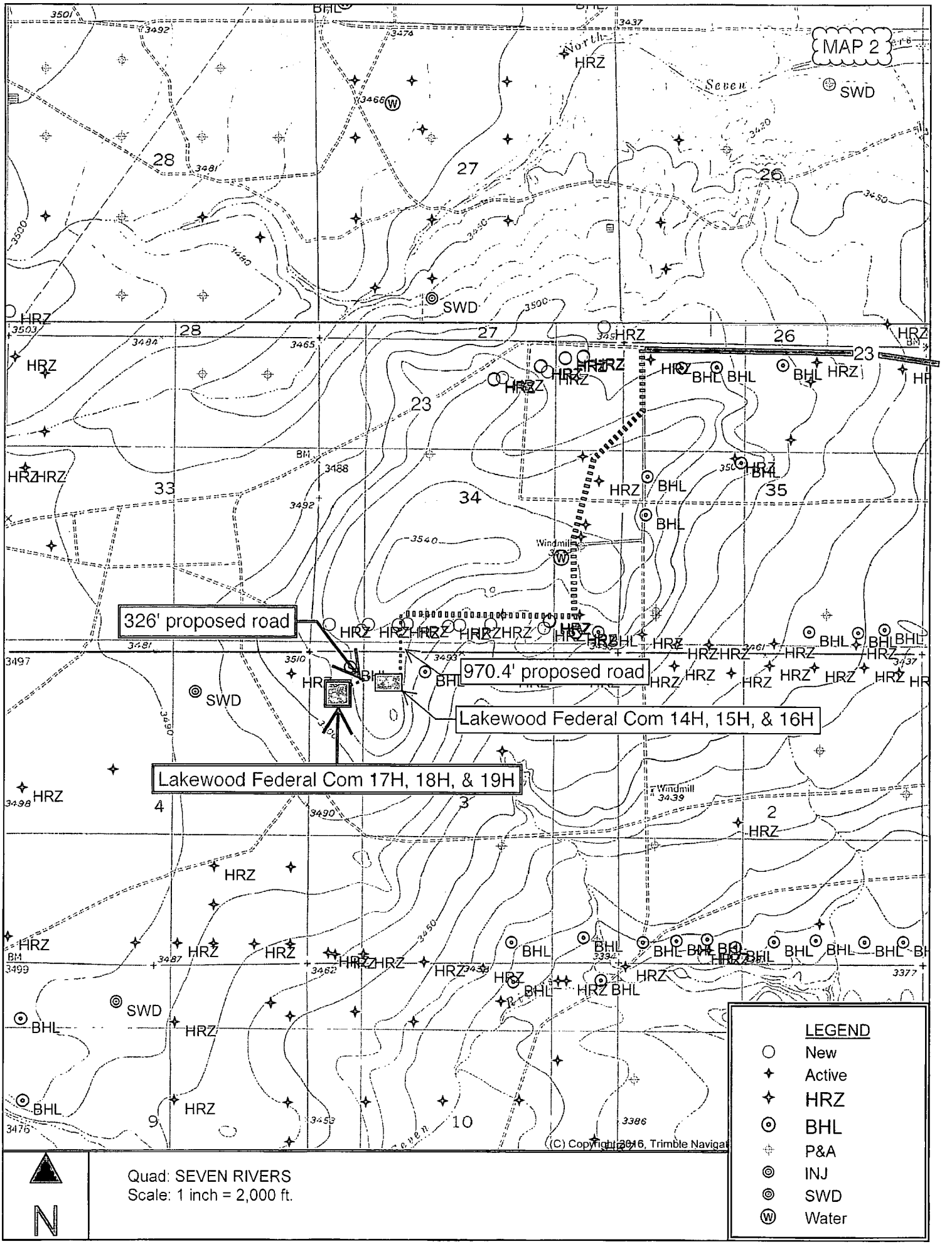


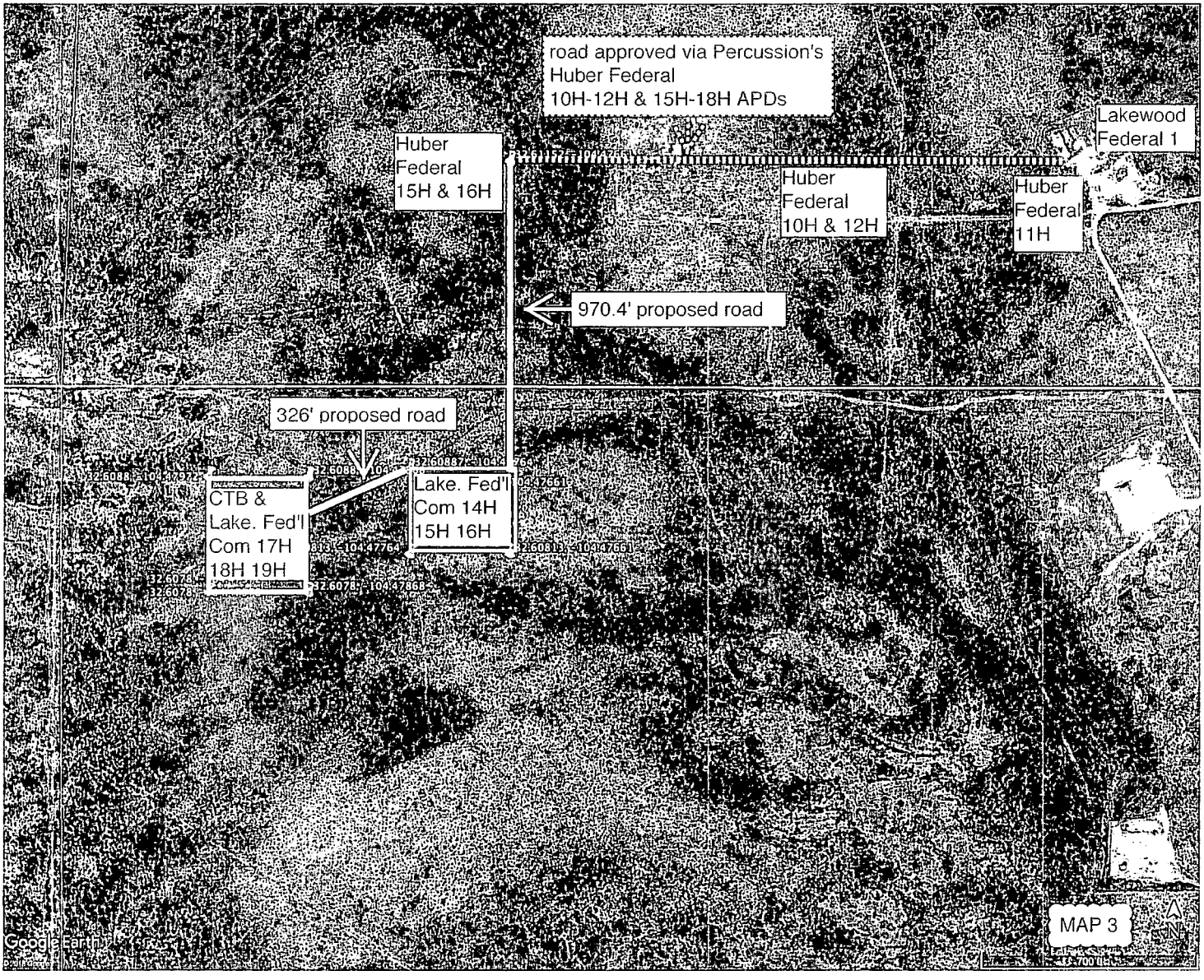
NATIONAL GEOGRAPHIC

0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km

TN ↑ MN
7°

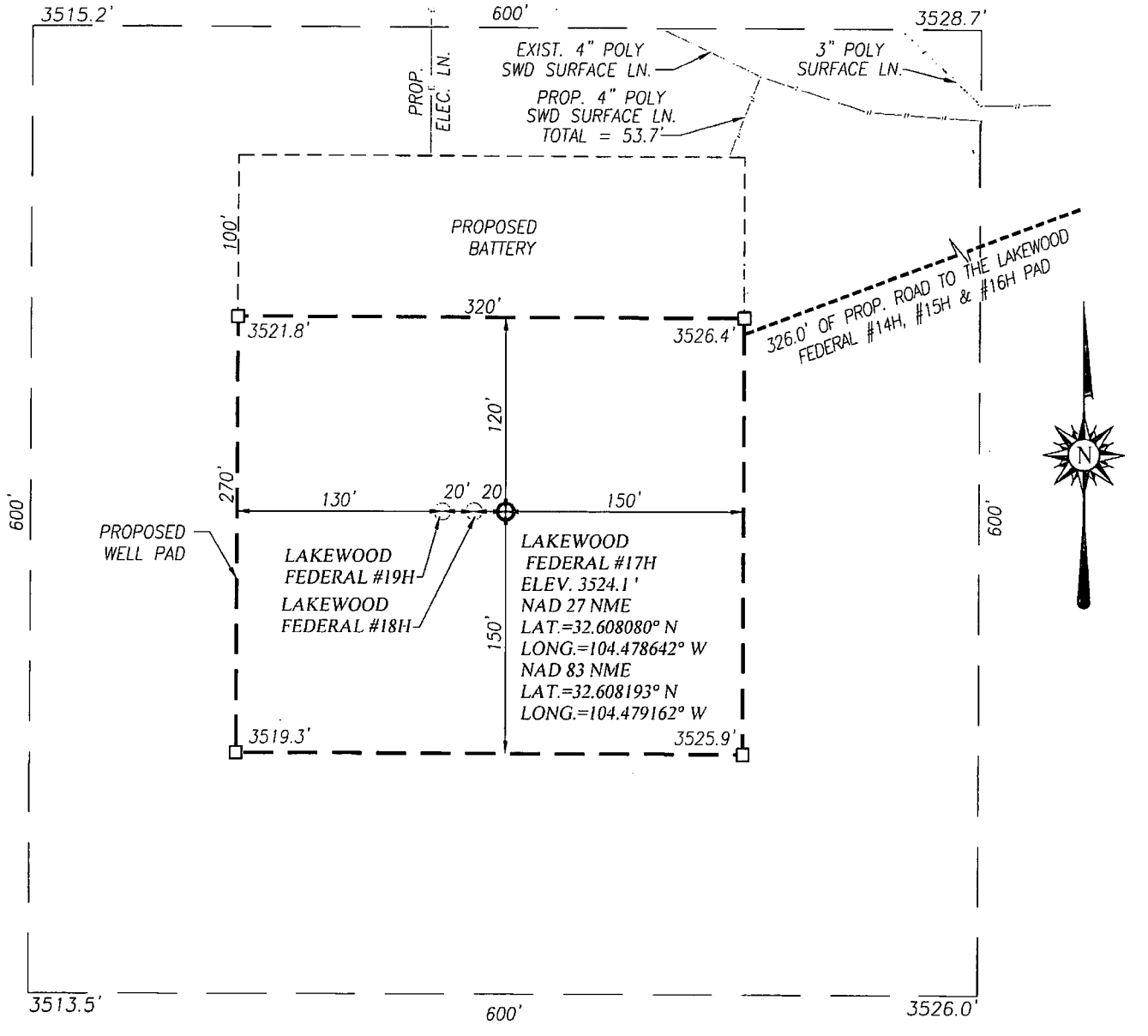
09/29/18


MAP 2
326' proposed road
970.4' proposed road
Lakewood Federal Com 14H, 15H, & 16H
Lakewood Federal Com 17H, 18H, & 19H
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
Quad: SEVEN RIVERS
Scale: 1 inch = 2,000 ft.
N
(C) Copyright 2016, Trimble Navigat


road approved via Percussion's
Huber Federal
10H-12H & 15H-18H APDs
Huber
Federal
15H & 16H
Huber
Federal
10H & 12H
Huber
Federal
11H
Lakewood
Federal 1
970.4' proposed road
326' proposed road
CTB &
Lake. Fed'l
Com 17H
18H 19H
Lake. Fed'l
Com 14H
15H 16H
MAP 3
N

WELL SITE PLAN

MAP 4



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

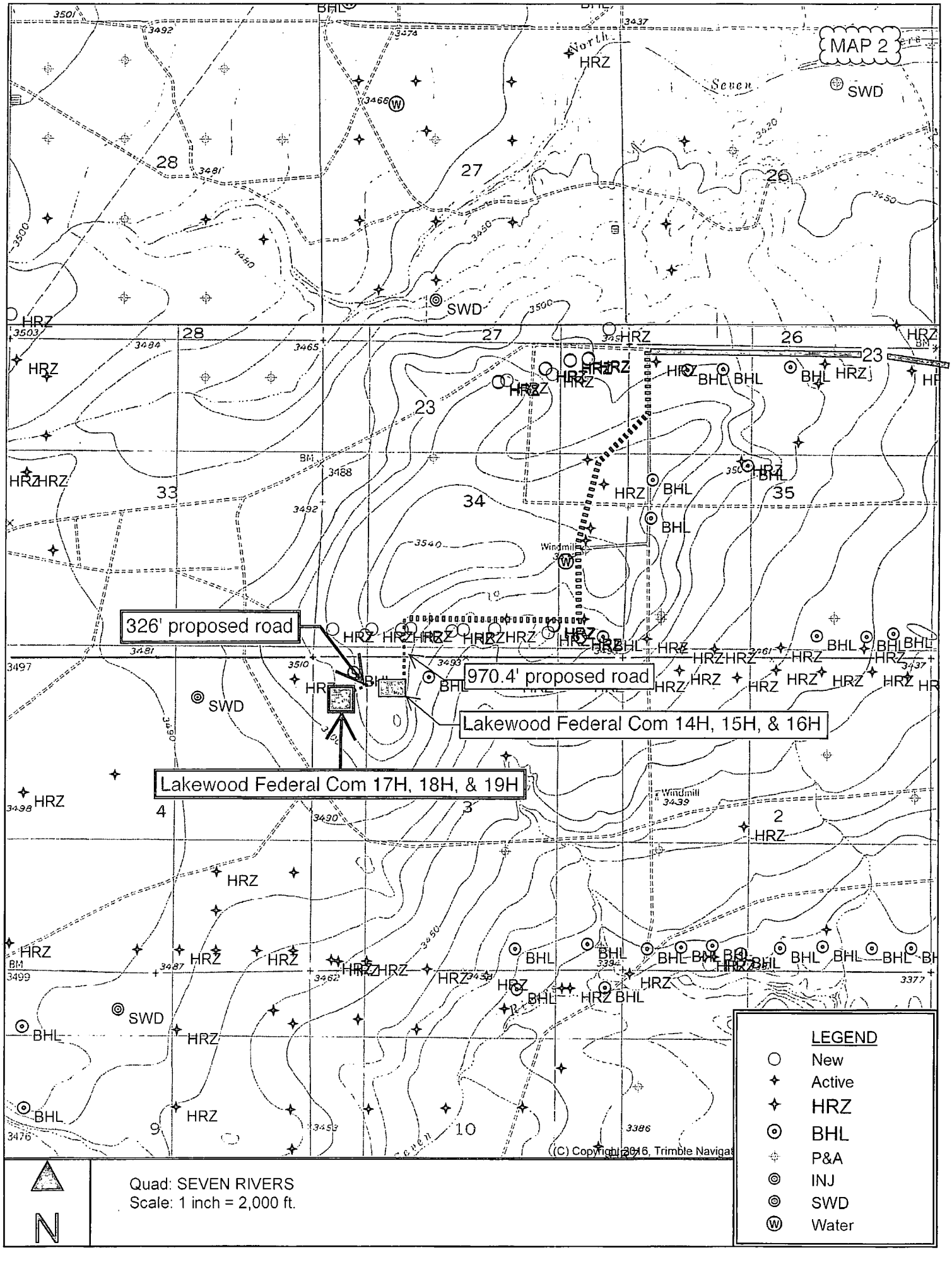
Scale: 1"=100'

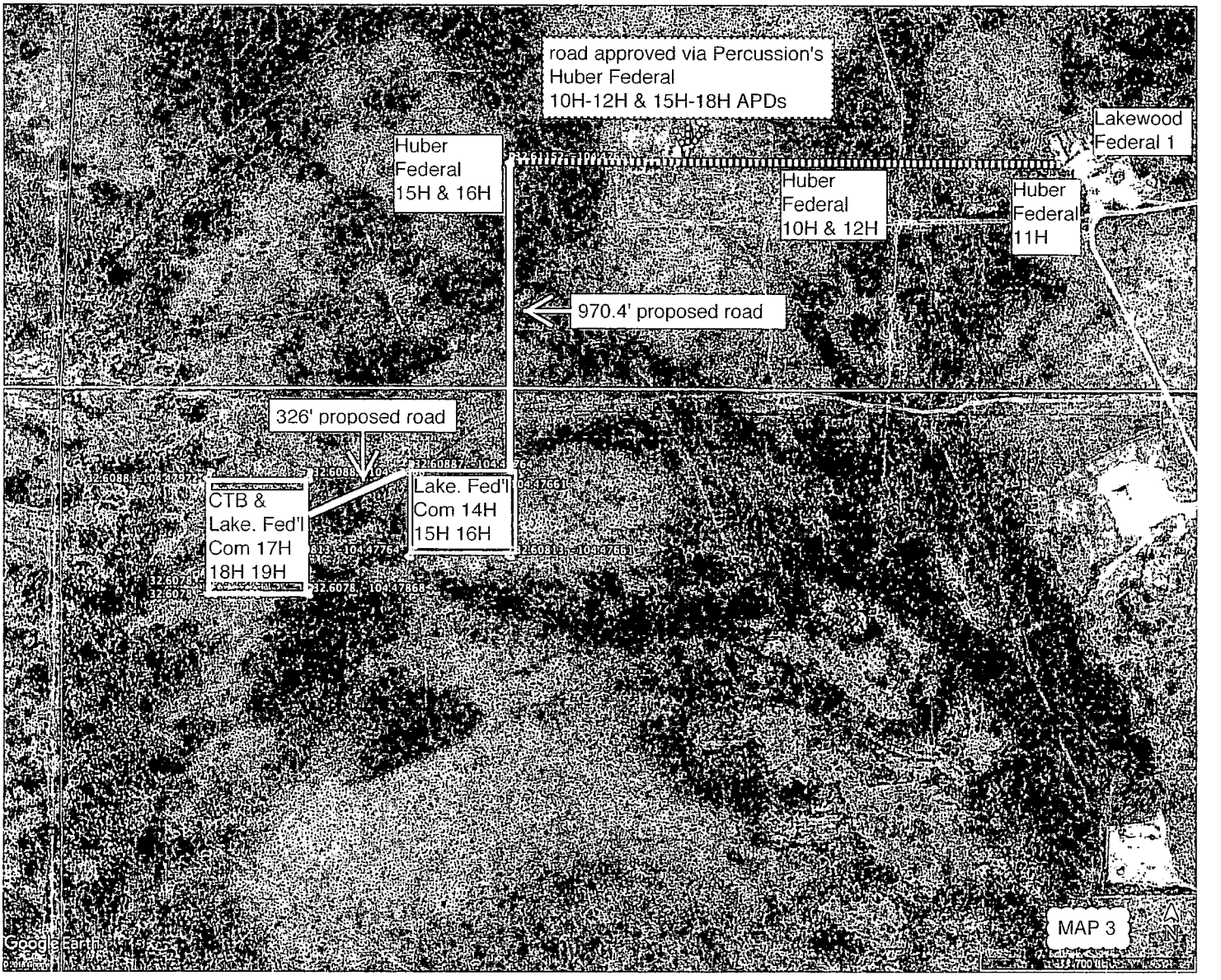
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

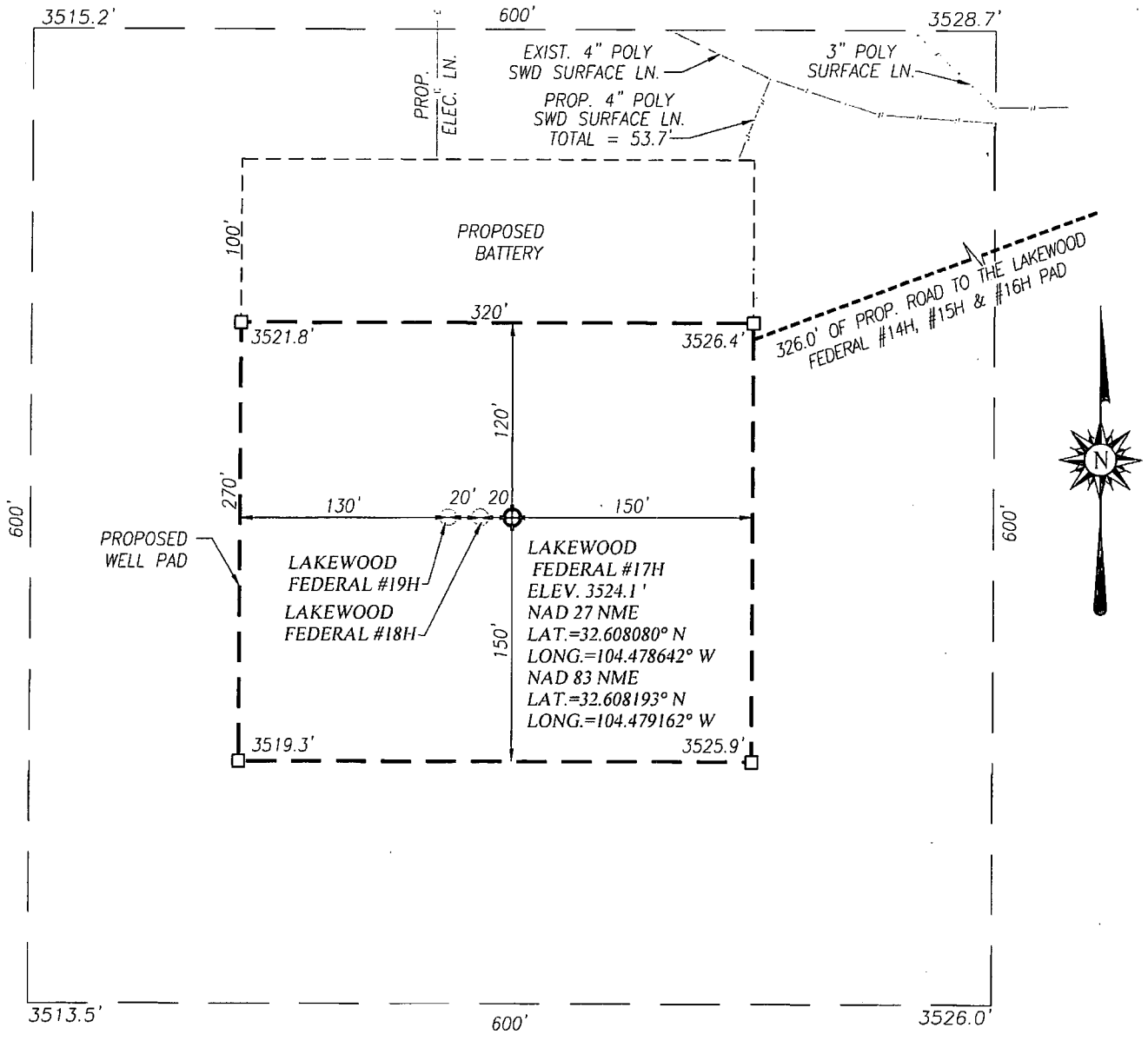
Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1


MAP 2
326' proposed road
970.4' proposed road
Lakewood Federal Com 14H, 15H, & 16H
Lakewood Federal Com 17H, 18H, & 19H
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
Quad: SEVEN RIVERS
Scale: 1 inch = 2,000 ft.
N


road approved via Percussion's
Huber Federal
10H-12H & 15H-18H APDs
Huber
Federal
15H & 16H
Huber
Federal
10H & 12H
Huber
Federal
11H
Lakewood
Federal 1
970.4' proposed road
326' proposed road
CTB &
Lake. Fed'l
Com 17H
18H 19H
Lake. Fed'l
Com 14H
15H 16H
MAP 3
N

WELL SITE PLAN

MAP 4



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

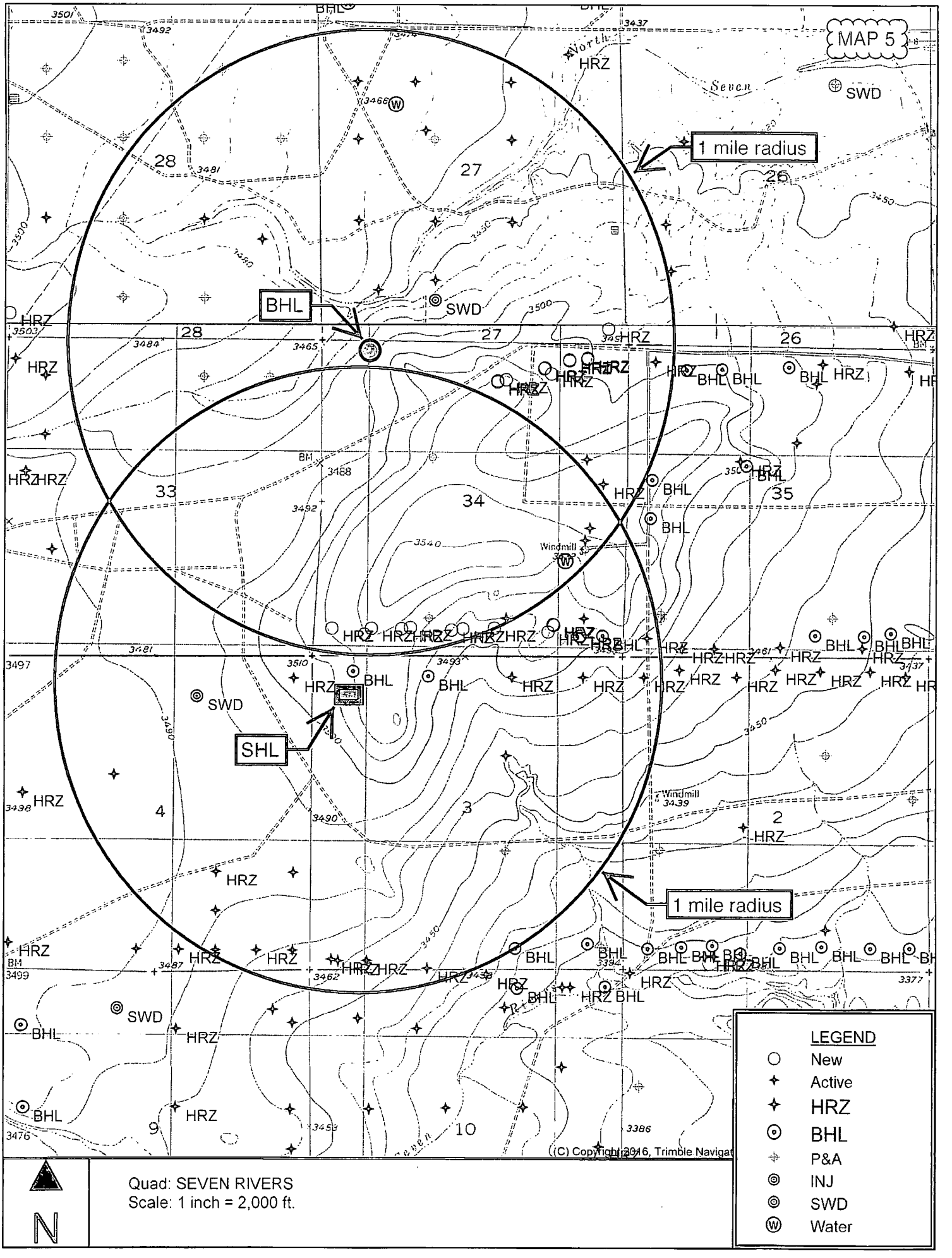
Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

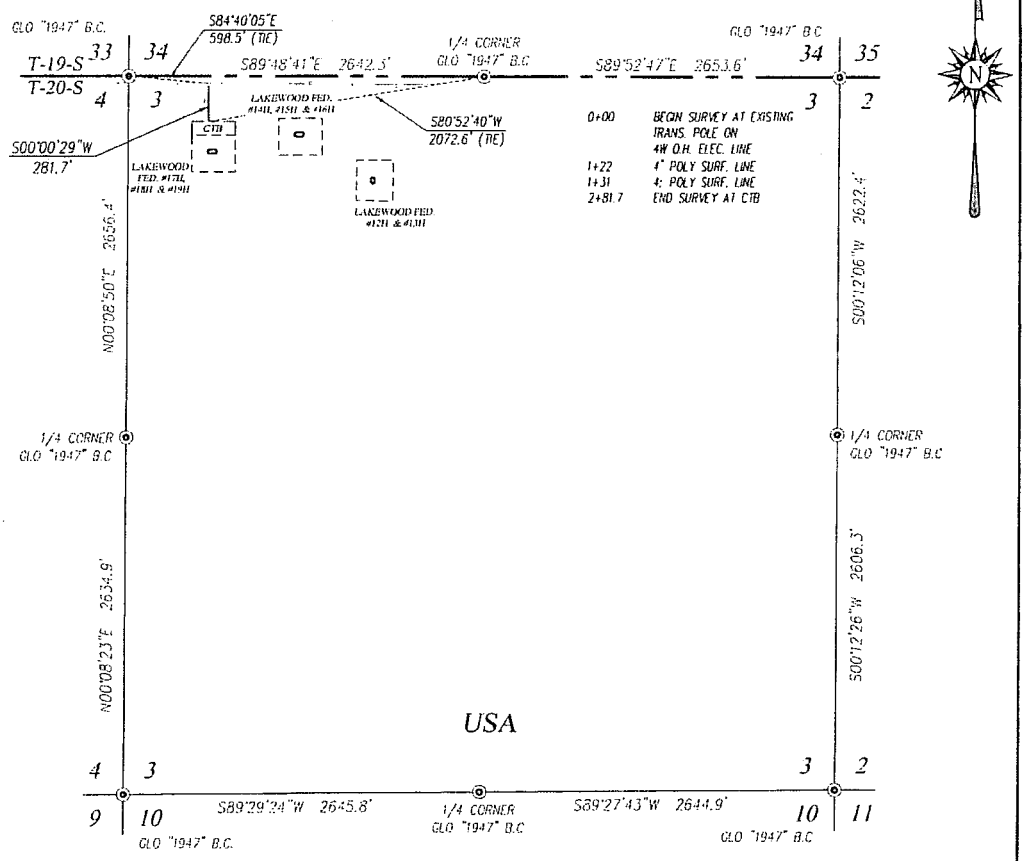
LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1


MAP 5
1 mile radius
BHL
SHL
1 mile radius
LEGEND
New
Active
HRZ
BHL
P&A
INJ
SWD
Water
Quad: SEVEN RIVERS
Scale: 1 inch = 2,000 ft.
N
(C) Copyright 2016, Trimble Navigat

MAP 6



DESCRIPTION

SURVEY FOR A STRIP OF LAND 30.0 FEET WIDE AND 281.7 FEET OR 0.053 MILES IN LENGTH CROSSING USA LAND IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO, AND BEING 15.0 FEET LEFT AND 15.0 FEET RIGHT OF THE ABOVE PLATTED CENTERLINE SURVEY.

NOTE

1) BEARINGS SHOWN HEREON ARE MERCATOR GRID AND CONFORM TO THE NEW MEXICO COORDINATE SYSTEM "NEW MEXICO EAST ZONE" NORTH AMERICAN DATUM 1983. DISTANCES ARE SURFACE VALUES.

2) LATITUDE AND LONGITUDE VALUES SHOWN HEREON ARE RELATIVE TO THE NORTH AMERICAN DATUM 1983 (NAD83).

I, RONALD J. EIDSON, NEW MEXICO PROFESSIONAL SURVEYOR No. 3239, DO HEREBY CERTIFY THAT THIS SURVEY PLAT AND THE ACTUAL SURVEY ON THE GROUND UPON WHICH IT IS BASED WERE PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION; THAT I AM RESPONSIBLE FOR THIS SURVEY; THAT THIS SURVEY MEETS THE MINIMUM STANDARDS FOR SURVEYING IN NEW MEXICO; AND THAT IT IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF.

RONALD J. EIDSON

DATE: 6/18/2018

LEGEND

◎ – DENOTES FOUND CORNER AS NOTED

——— – DENOTES CENTERLINE SURVEY

1000 0 1000 2000 FEET

Scale: 1"=1000'

PERCUSSION PETROLEUM OPERATING, LLC

SURVEY FOR AN ELECTRIC LINE TO THE LAKEWOOD FEDERAL #17H, #18H & #19H AND CTB CROSSING SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M. EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946

JOHN WEST SURVEYING COMPANY

412 N. DAL PASO HOBBS, N.M. 88240

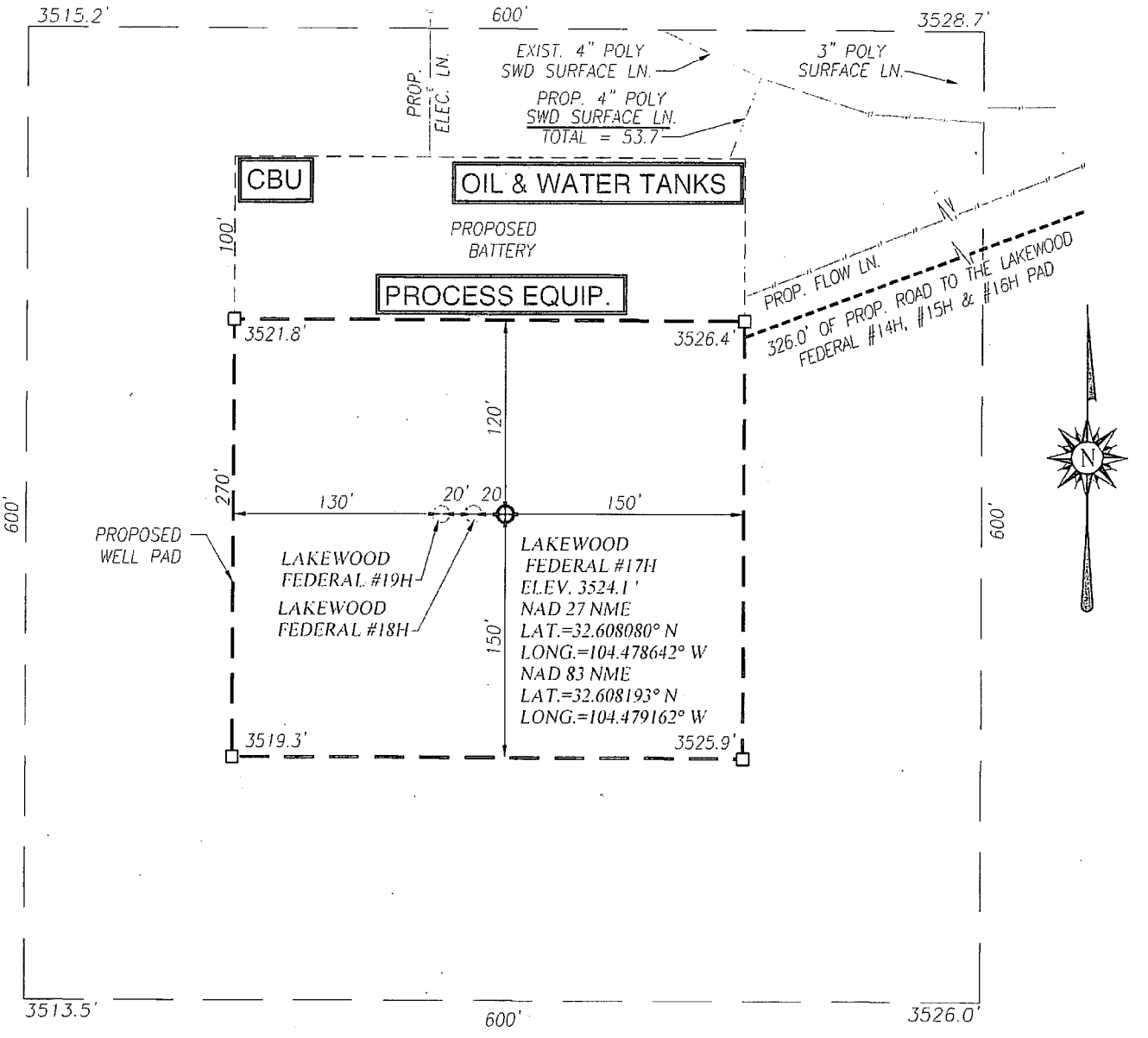
(575) 393-3117 www.jwsc.biz

TBPLS# 10021000

Survey Date: 06/11/18	CAD Date: 06/15/18	Drawn By: LSL
W.O. No.: 18110697	Rev: .	Rel. W.O.:	Sheet 1 of 1

WELL SITE PLAN

MAP 7



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

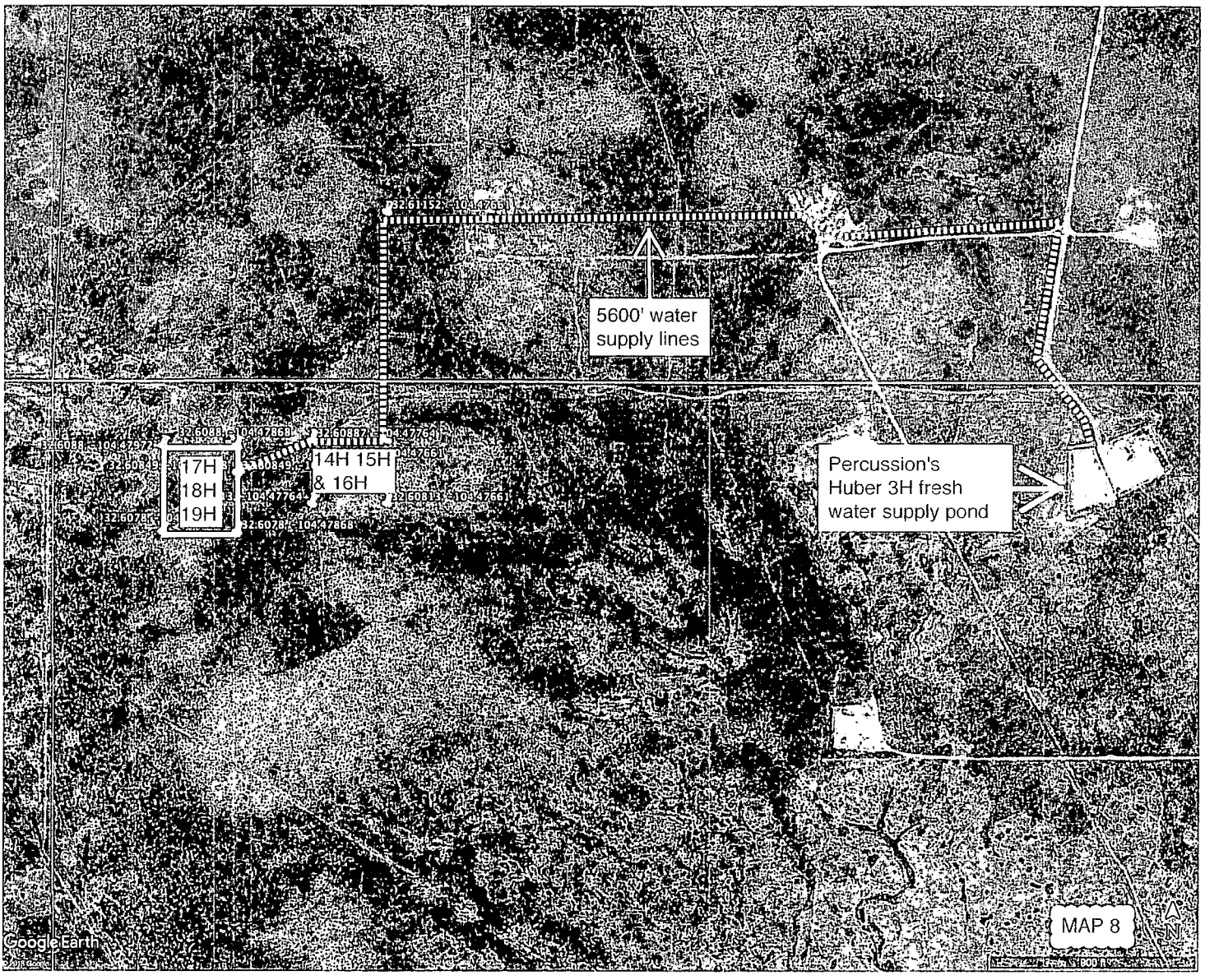
Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

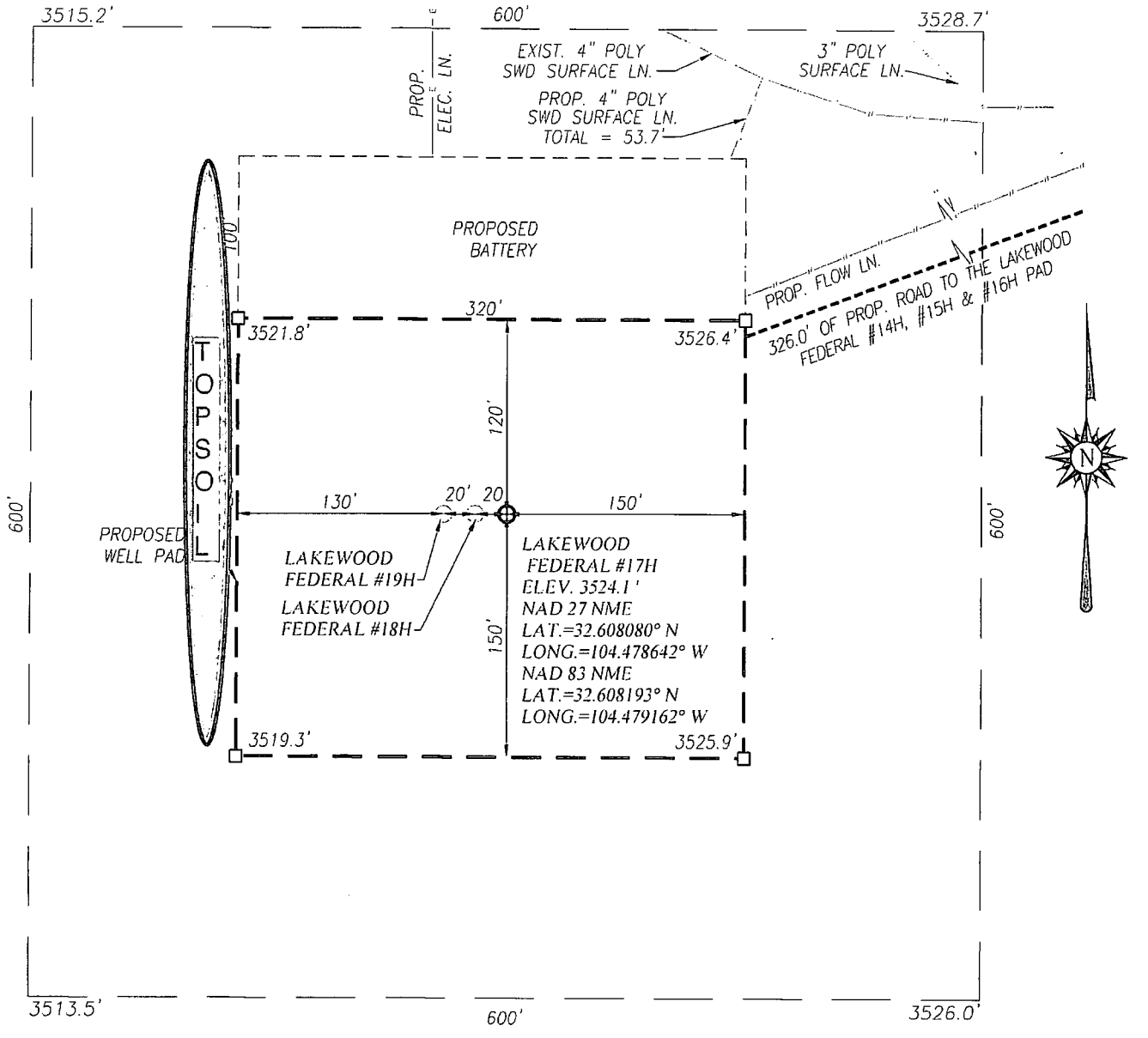
PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1


5600' water
supply lines
17H
18H
19H
14H 15H
& 16H
Percussion's
Huber 3H fresh
water supply pond
MAP 8
Google Earth

WELL SITE PLAN

MAP 9



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

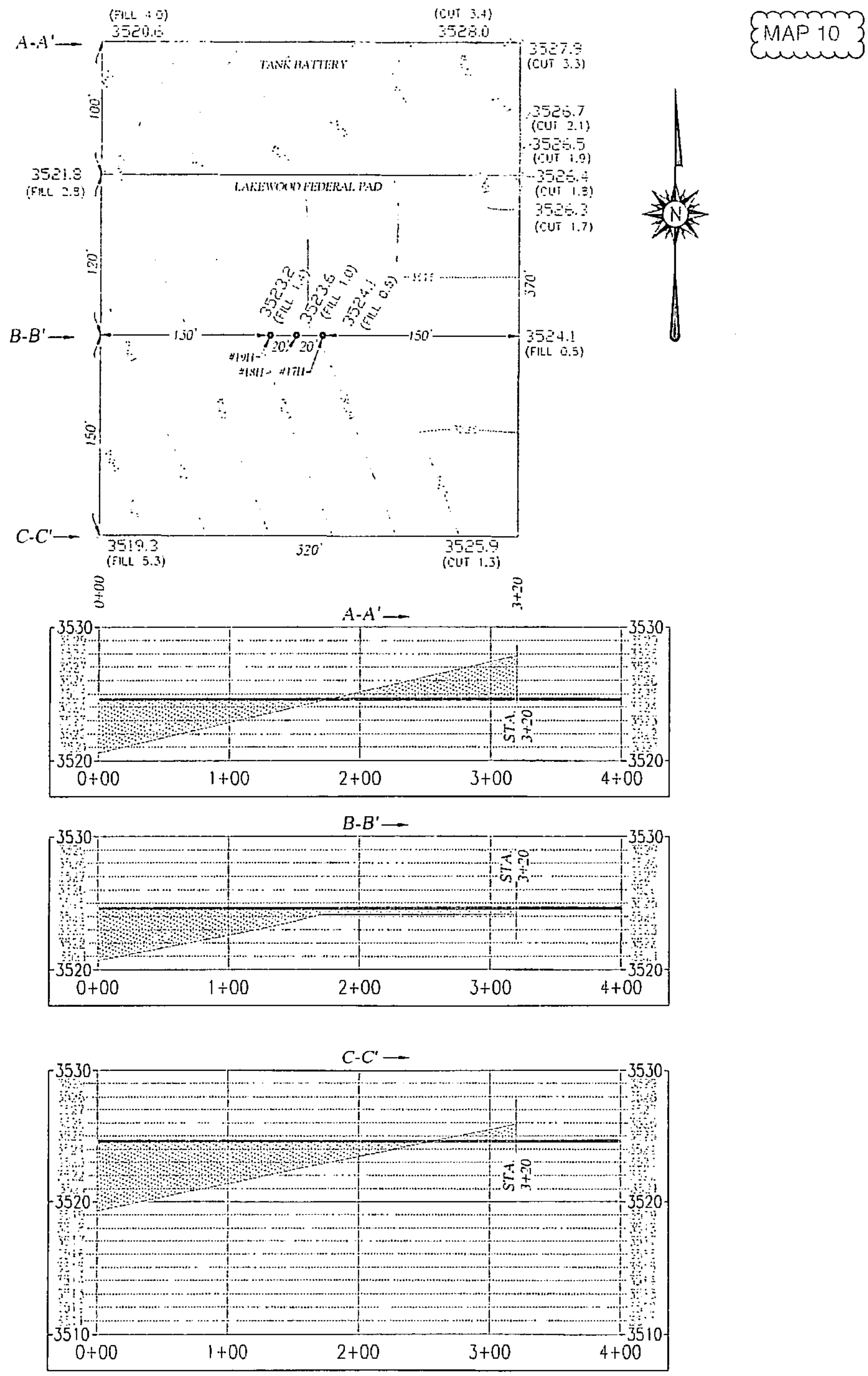
Scale: 1"=100'

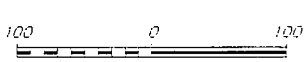
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1





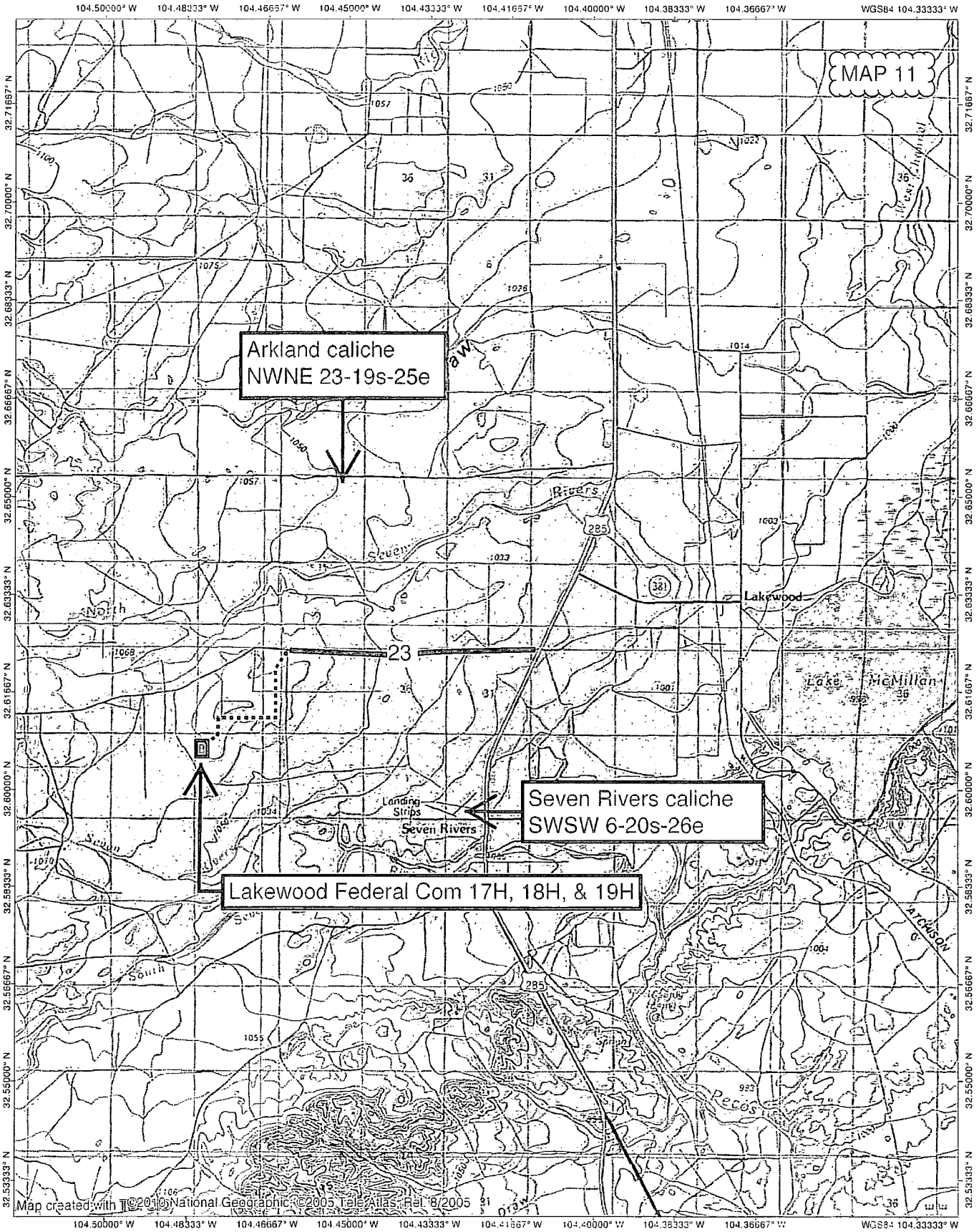
PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #19H, #18H & #17H WELL PAD IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

Survey Date: 2/21/18	CAD Date: 6/29/18	Drawn By: ACK	
W.O. No.: 18130756	Rev: .	Rel. W.O.:18110120	Sheet 1 of 1

TOPO! map printed on 09/29/18 from "Untitled.tpo"



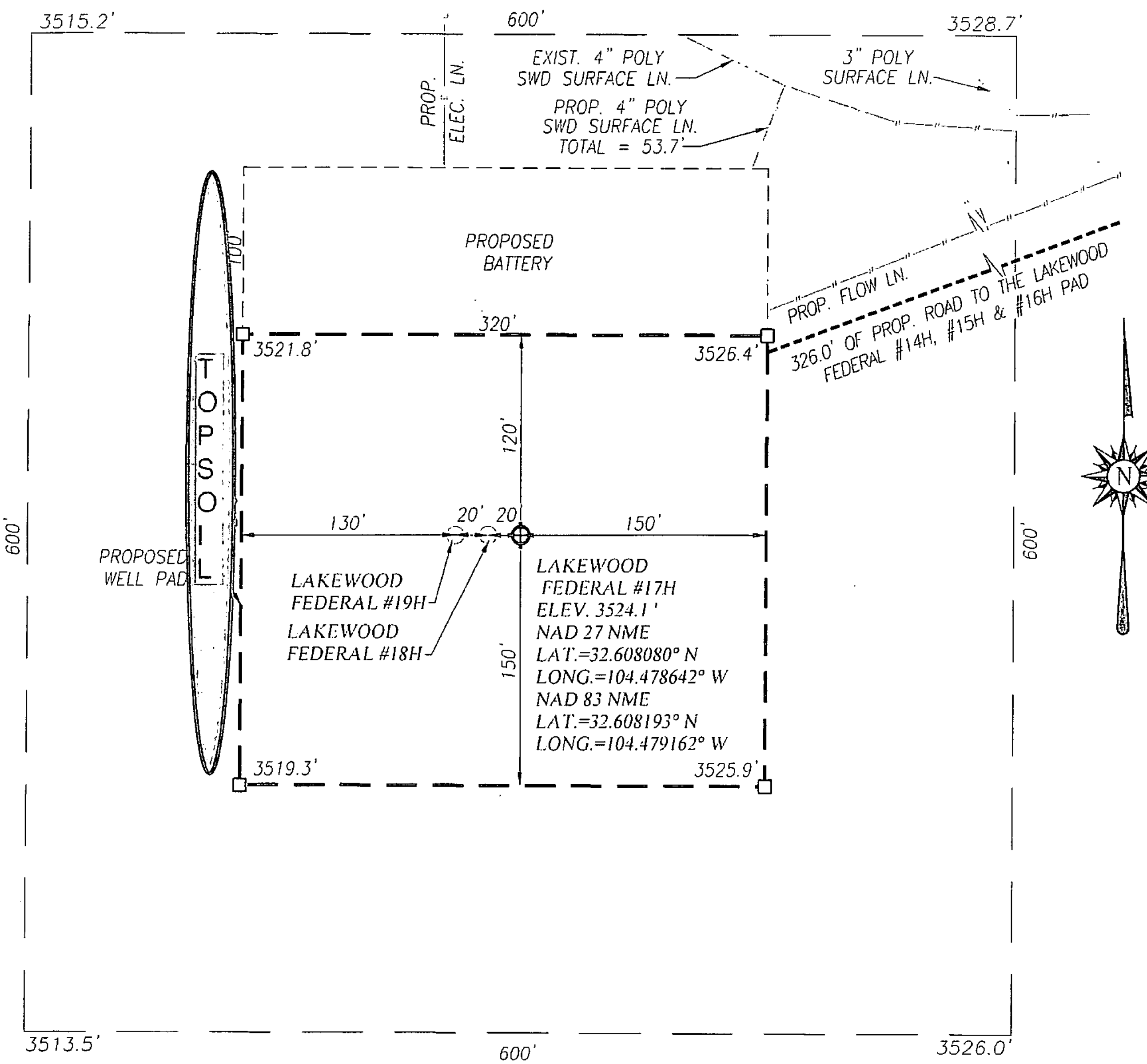
NATIONAL GEOGRAPHIC

0.0 0.5 1.0 1.5 2.0 2.5 3.0 miles
0 1 2 3 4 5 km

TN MN
7°
09/29/18

WELL SITE PLAN

MAP 12



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

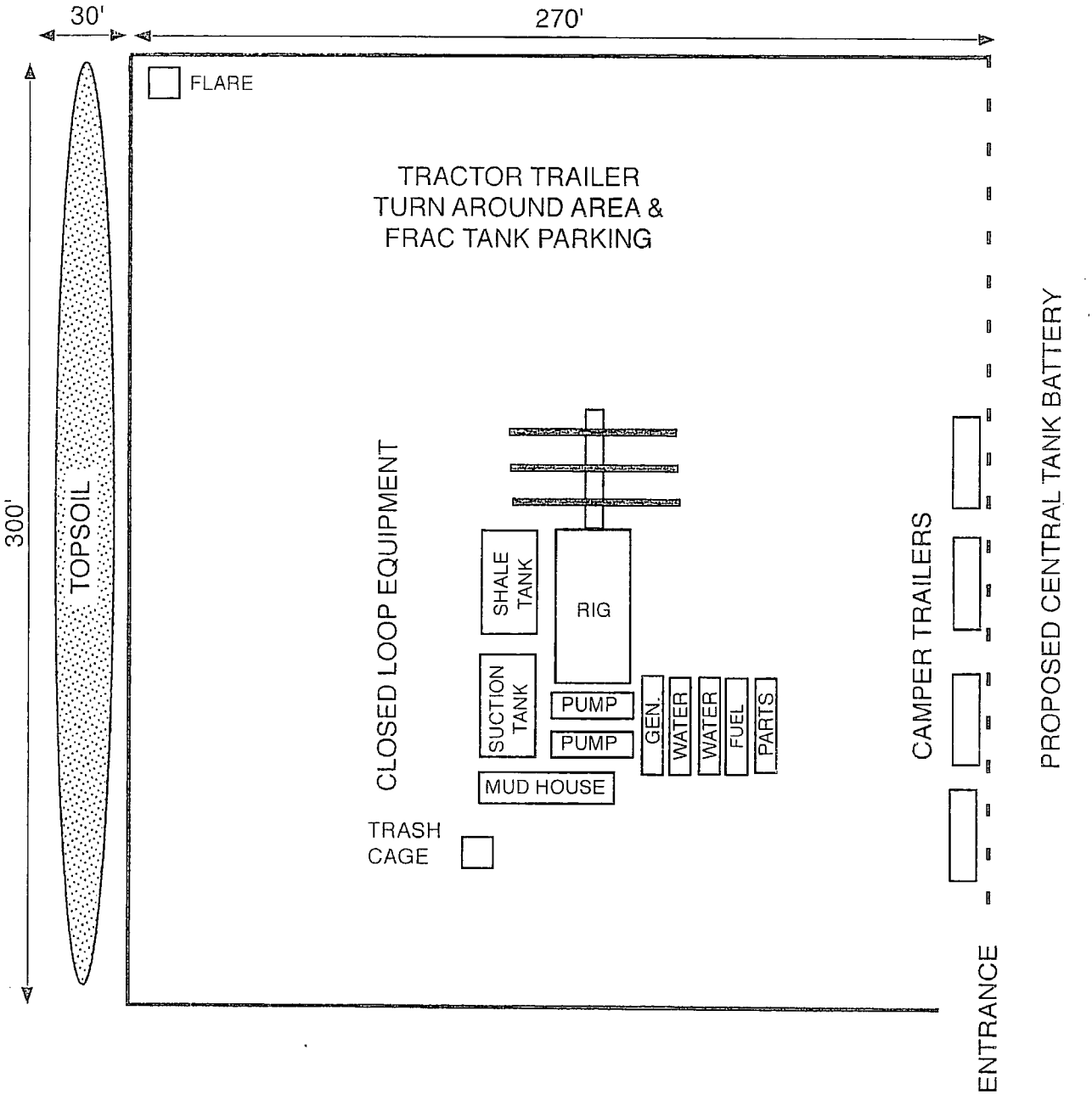
Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1

Percussion's
Lakewood Federal Com 17H
rig diagram

Prevailing Wind out of South or SSE

1" = 50'

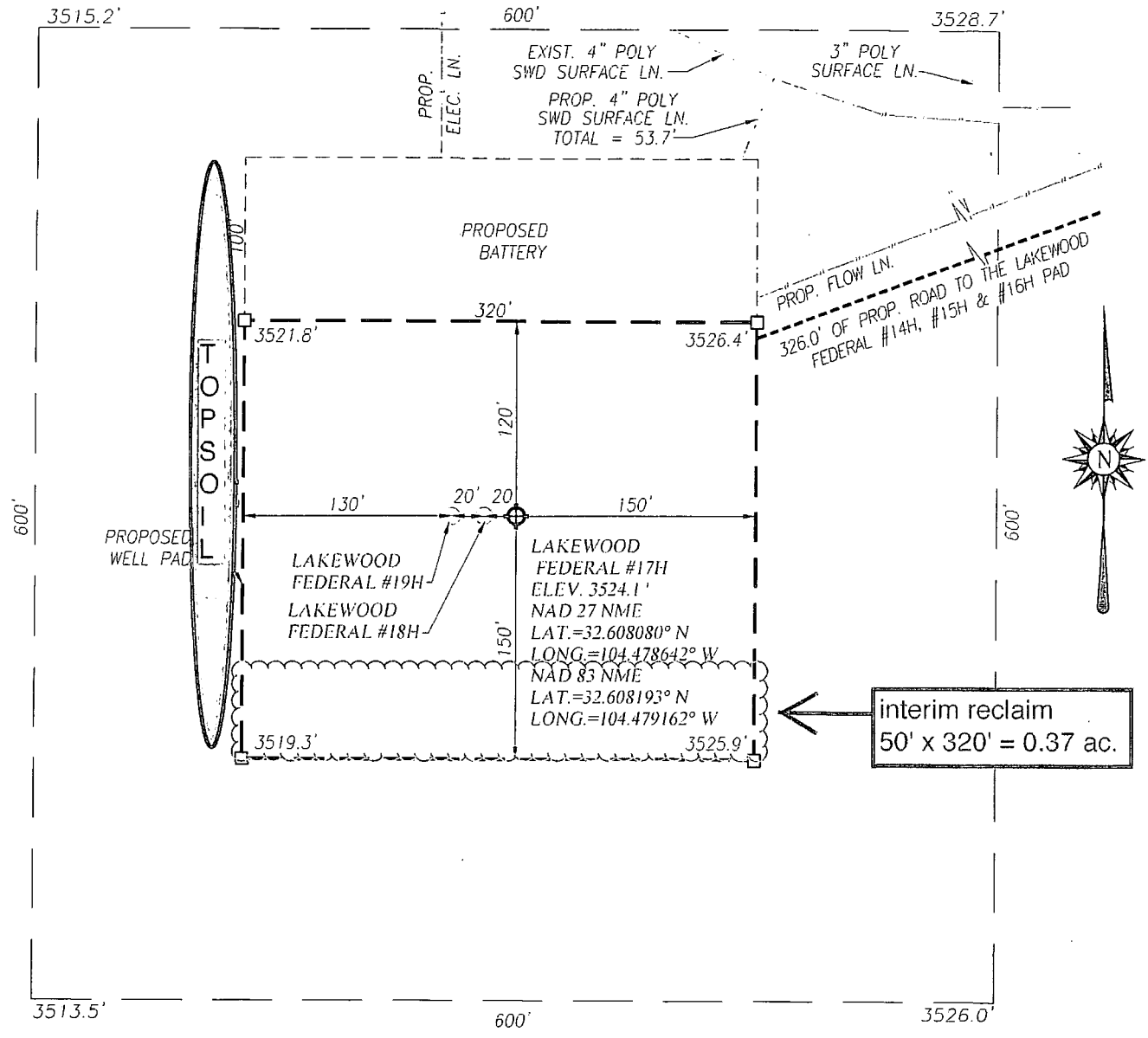
NORTH



PERMITS WEST, INC.
PROVIDING PERMITS for LAND USERS

WELL SITE PLAN

MAP 13



DIRECTIONS TO LOCATION:

FROM THE INTERSECTION OF U.S. HWY. #285 AND CO. RD. 23 (ROCK DAISEY) GO WEST ON CO. RD. 23 APPROX. 3.1 MILES. TURN LEFT AND GO SOUTH APPROX. 0.61 MILES, TURN RIGHT AND GO WEST APPROX. 0.15 MILES TO Y INTERSECTION. VEER LEFT AND GO SOUTHWEST THEN SOUTH APPROX. 0.25 MILES TO PREV. ROAD SURVEY BY BASIN SURVEYS FOLLOW BASIN ROAD SURVEY WEST APPROX. 0.45 MILES TO PROP. ROAD SURVEY FOLLOW ROAD SURVEY SOUTH 1052 FEET TO THE NORTH EDGE OF LAKEWOOD FEDERAL #12H & #13H PAD FROM THE WEST EDGE FOLLOW ROAD SURVEY SOUTHWEST 263.8 FEET TO EAST EDGE OF LAKEWOOD FEDERAL #14H, #15H & #16H PAD FROM THE WEST EDGE OF PAD CONT. ROAD SURVEY 326.0 FEET TO THE EAST EDGE OF LAKEWOOD FEDERAL #17H, #18H & #19H PAD. THIS LOCATION IS APPROX. 185 FEET SOUTHWEST.

NOTE:
1) SEE "TOPOGRAPHICAL AND ACCESS ROAD MAP" FOR PROPOSED ROAD LOCATION.

100 0 100 200 Feet

Scale: 1"=100'

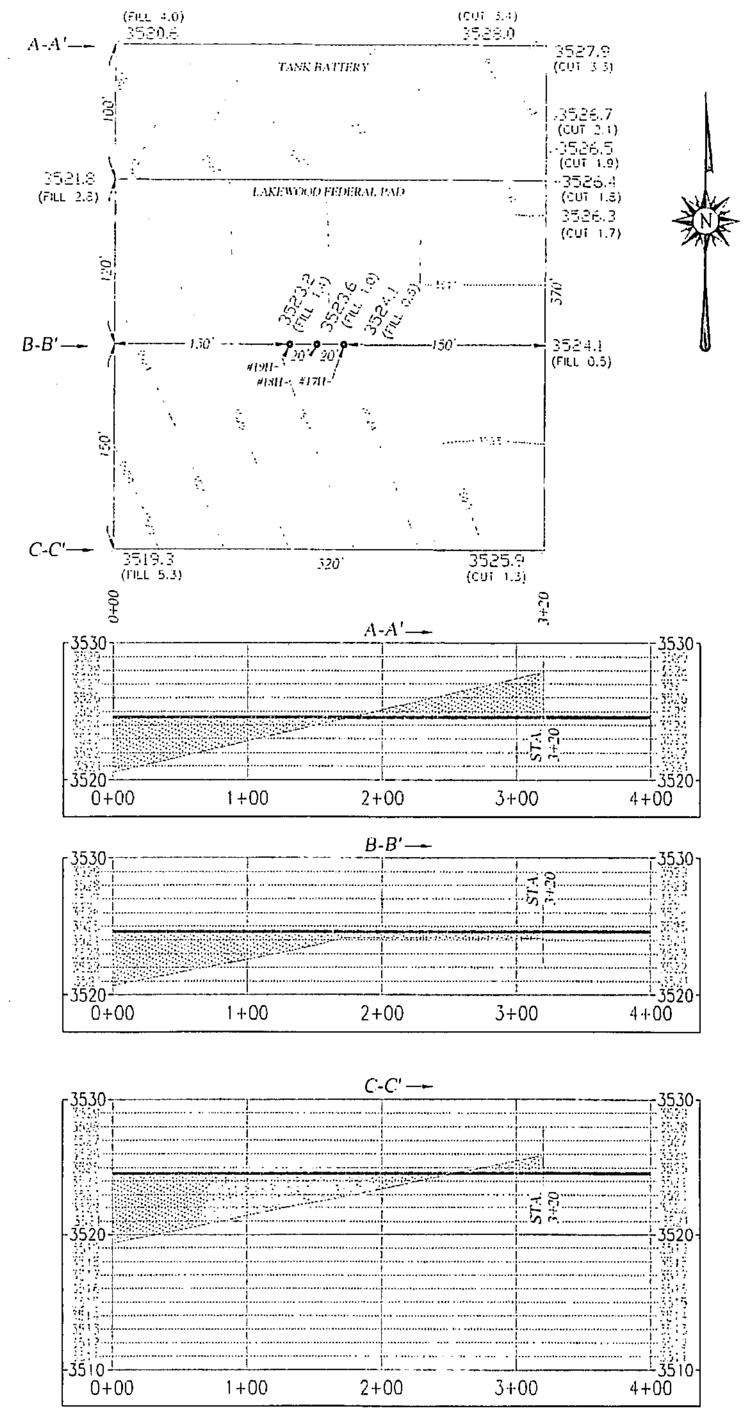
PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #17H WELL LOCATED 555 FEET FROM THE NORTH LINE AND 645 FEET FROM THE WEST LINE OF SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 02/28/18	CAD Date: 03/14/18	Drawn By: LSL
W.O. No.: 18110120	Rev: 09/19/18	Rel. W.O.:	Sheet 1 of 1

MAP 14



PERCUSSION PETROLEUM OPERATING, LLC

LAKEWOOD FEDERAL #19H, #18H & #17H WELL PAD IN SECTION 3, TOWNSHIP 20 SOUTH, RANGE 25 EAST, N.M.P.M., EDDY COUNTY, NEW MEXICO

PROVIDING SURVEYING SERVICES
SINCE 1946
JOHN WEST SURVEYING COMPANY
412 N. DAL PASO HOBBS, N.M. 88240
(575) 393-3117 www.jwsc.biz
TBPLS# 10021000

Survey Date: 2/21/18	CAD Date: 6/29/18	Drawn By: ACK	
W.O. No.: 18130756	Rev: .	Rel. W.O.:18110120	Sheet 1 of 1

Percussion Petroleum Operating, LLC
Lakewood Federal Com 17H
SHL 555' FNL & 645' FWL 3-20S-25E
Eddy County, NM

Surface Use Plan

1. ROAD DIRECTIONS & DESCRIPTIONS (See MAPS 1 - 4)

From the junction of US 82 & US 285 in Artesia....
Go South 15.2 miles on US 285 to the equivalent of Mile Post 54.1
Then turn right and go West 3.05 miles on paved County Road 23 (Rock Daisy)
Then turn left and go S 0.2 mile on a caliche road
Then bear right and go SW 0.75 mile on a caliche road
Then turn right and go West 0.56 mile on a jeep trail*
Then turn left and go S 970.4' cross-country to the proposed 14/15/16H pad
Then turn right and cross that pad for 320'
Then bear left and go SW 326' cross country to the 17H 18H 19H pad
*Described and authorized in Huber Federal 17H, 18H, et al. Likely to be built before Lakewood spud.

Non-county roads will be maintained as needed to Gold Book standards. This includes pulling ditches, preserving the crown, and cleaning culverts. This will be done at least once a year, and more often as needed.

2. ROAD TO BE BUILT OR UPGRADED (See MAPS 2 - 4)

The 1616.4' of new resource road will be crowned and ditched, have a 14' wide driving surface, and be surfaced with caliche. Borrow ditches will turn out every ≈100 yards. Maximum disturbed width = 30'. Maximum grade = 4%. Maximum cut or fill = 2'.

3. EXISTING WELLS (See MAP 5)

Existing oil, gas, disposal, water, and P & A wells are within a mile. No injection well is within a mile radius.

4. PROPOSED PRODUCTION FACILITIES (See MAPS 6 & 7)

A 281.7' long overhead raptor safe 3-phase power line will be built north to Percussion's existing power line. A 53.7' long ≈4" O D. HDPE SWD line will be laid on the surface northeast to an existing Percussion's SWD line. SWD line maximum operating pressure will be <100 psi.

A central tank battery will be built on the north side of the pad. Process equipment (separators, heater-treaters, meters, compressor) will be on the south side of the battery portion of the pad. CBU or flare will be on the northwest corner. Oil and water tanks will be on the north side. Tanks will be bermed.

5. WATER SUPPLY (See MAP 8)

Two temporary 10" Kevlar lay flat surface pipelines will be laid ≈5600' along roads from Percussion's existing Huber 3H pond* to the pad. Pipeline route will not be bladed or excavated.

*Pond will be supplied via one previously approved (30-015-44712 et al) temporary surface 12" Kevlar lay flat pipeline from one or two water wells on private land. Pipeline routes will not be bladed or excavated.

Primary source will be Seven Rivers' well RA 10949 in NWNE 6-20s-29e. That route is ≈14,750' long (≈2950' private + ≈5350' State + ≈6450' BLM).

Secondary source will be Seven Rivers' well RA 10918 in NESE 11-20s-25e. That route is ≈14,000' long (≈6850' of private land + ≈7150' of BLM).

6. CONSTRUCTION MATERIALS & METHODS (See MAPS 9 - 11)

NM One Call (811) will be notified before construction starts. Top ≈6" of soil and brush will be stockpiled west of the pad. V-door will face west. Closed loop drilling system will be used. Caliche will be hauled from existing caliche pits on private land. Arkland caliche pit is in NWNE 23-19s-25e. Seven Rivers caliche pit is in SWSW 6-20s-26e. A berm will be built on the fill (west) side of the pad to contain any spills.

7. WASTE DISPOSAL

All trash will be placed in a portable trash cage. It will be hauled to the Eddy County landfill. There will be no trash burning. Contents (drill cuttings, mud, salts, and other chemicals) of the mud tanks will be hauled to R360's state approved (NM-01-0006) disposal site at Halfway. Human waste will be disposed of in chemical toilets and hauled to the Artesia wastewater treatment plant.

8. ANCILLARY FACILITIES

There will be no airstrip or camp. Camper trailers will be on location for the company man, tool pusher, and mud logger.

9. WELL SITE LAYOUT (See MAP 12)

Also see Rig Layout diagram for depictions of the well pad, trash cage, access onto the location, parking, living facilities, and rig orientation.

10. RECLAMATION (See MAPS 13 & 14)

Interim reclamation will be completed within 6 months of completing the well. Interim reclamation will consist of shrinking the well pad 0.37 acre by removing

caliche and reclaiming 50' on the south side of the pad. This will leave 2.35 acres for the central tank battery, anchors, pump jacks, and tractor-trailer turn around. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements.

Once the wells are plugged and all production equipment removed, then reclamation will be completed within 6 months of plugging the last well. Reclamation will consist of removing caliche and deeply ripping on the contour. Disturbed areas will be contoured to match pre-construction grades. Soil and brush will be evenly spread over disturbed areas and harrowed on the contour. Disturbed areas will be seeded in accordance with BLM's requirements. Noxious weeds will be controlled.

Land use:

1616.4' x 30' road = 1.11 acres
53.7' x 30' SWD line = 0.04 acres
281.7' x 30' power line = 0.19 acres
20' x 5600' water line from pond = 2.57 acres
+ 370' x 320' pad = 2.72 acres
6.63 acres short term
- 0.04 acres SWD line
- 0.19 acres power line
- 0.37 acres interim reclamation
- 2.57 acres water line from pond
3.46 acres long term (1.11 ac. road + 2.35 ac. pad)

11. SURFACE OWNER

All construction will be on BLM land managed by the Carlsbad Field Office, 620 E. Greene St., Carlsbad NM 88220. Phone number is 575 234-5972.

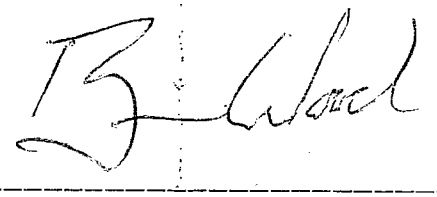
12. OTHER INFORMATION

On-site inspection was held with Jessie Bassett (BLM) on April 3, 2018.

Lone Mountain Archaeological consulted (FAR 2523) with BLM on April 5, 2018. It was determined that no survey work was needed due to previous surveys covering the project area.

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. Executed this 13th day of October, 2017.



Brian Wood, Consultant
Permits West, Inc.
37 Verano Loop, Santa Fe, NM 87508
(505) 466-8120 FAX: (505) 466-9682 Cellular: (505) 699-2276

Field representative will be:

Lelan Anders, Operations Manager
Percussion Petroleum Operating, LLC
919 Milam, Suite 2475
Houston TX 77002
Office: (713) 429-1291
Mobile: (281) 908-1752

AFMSS

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

PWD Data Report

05/31/2019

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

05/31/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001424

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: