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Form 3160-3
(June 2015)

HOBBS OCD
FEB 28 2019
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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.
NMNM136223

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.
PITCHBLENDE ~~FED~~ 19-30 FED
458H (325021)

2. Name of Operator
ENERGEN RESOURCES CORPORATION (162928)

9. API Well No.
30-025-45663

3a. Address
3510 North A Street Bldg A & B Midland TX 79705

3b. Phone No. *(include area code)*
(432)687-1155

10. Field and Pool, or Exploratory
~~Wildcat~~ FIVE RIVER MILLS; BS (96340)

4. Location of Well *(Report location clearly and in accordance with any State requirements.*)*
At surface LOT A / 250 FNL / 635 FEL / LAT 32.1224624 / LONG -103.4001425
At proposed prod. zone LOT H / 2539 FNL / 330 FEL / LAT 32.1016533 / LONG -103.3991398

11. Sec., T. R. M. or Blk. and Survey or Area
SEC 19 / T25S / R35E / NMP

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

12. County or Parish
LEA

13. State
NM

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

16. No of acres in lease
2160.08

17. Spacing Unit dedicated to this well
240

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

19. Proposed Depth
12465 feet / 19535 feet

20. BLM/BIA Bond No. in file
FED: NM2707

21. Elevations (Show whether DF, KDB, RT, GL, etc.)
3331 feet

22. Approximate date work will start*
01/01/2019

23. Estimated duration
60 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)	Jenifer Sorley / Ph: (432)818-1732	05/31/2018

Title
Asst Supervisor Regulatory Compliance

Approved by *(Signature)*	Name *(Printed/Typed)*	Date
(Electronic Submission)	Cody Layton / Ph: (575)234-5959	02/07/2019
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.

GCP Rec 02/28/19

APPROVED WITH CONDITIONS

KZ 03/01/19

(Continued on page 2)

*(Instructions on page 2)

Approval Date: 02/07/2019

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 A / 250 FNL / 635 FEL / TWSP: 25S / RANGE: 35E / SECTION: 19 / LAT: 32.1224624 / LONG: -103.4001425 (TVD: 0 feet, MD: 0 feet)
   PPP: LOT A / 100 FNL / 330 FEL / TWSP: 25S / RANGE: 35E / SECTION: 19 / LAT: 32.1228722 / LONG: -103.3991578 (TVD: 12465 feet, MD: 12873 feet)
   BHL: LOT H / 2539 FNL / 330 FEL / TWSP: 25S / RANGE: 35E / SECTION: 30 / LAT: 32.1016533 / LONG: -103.3991398 (TVD: 12465 feet, MD: 19535 feet)

BLM Point of Contact

Name: Candy Vigil
Title: Admin Support Assistant
Phone: 5752345982
Email: cvigil@blm.gov

Approval Date: 02/07/2019

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:	**Energen Resources Corporation**
LEASE NO.:	**NMNM-136223**
WELL NAME & NO.:	**Pitchblende Fed 19-30 458H**
SURFACE HOLE FOOTAGE:	**0250' FNL & 0635' FEL**
BOTTOM HOLE FOOTAGE	**2539' FNL & 0330' FEL Sec. 30, T. 25 S., R 35 E.**
LOCATION:	**Section 19, T. 25 S., R 35 E., NMPM**
COUNTY:	**County, New Mexico**

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)

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

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.

Possibility of water flows in the Castile and Salado.
Possibility of lost circulation in the Red Beds, Rustler, and Delaware.
Abnormal pressures may be encountered within the Wolfcamp Formation.

1. The **13-3/8** inch surface casing shall be set at approximately **1010** feet (in a competent bed below the Magenta Dolomite, which is a Member of the Rustler, and if salt is encountered, set casing at least 25 feet above the salt) and cemented to the surface.

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

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

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

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

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

10-3/4'' 1st Intermediate casing shall be kept fluid filled while running into hole to meet BLM minimum collapse requirements.

2. The minimum required fill of cement behind the **10-3/4** inch 1st intermediate casing is:

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

Formation below the 10-3/4" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe (not the mud weight required to prevent dissolving the salt formation) and the mud weight for the bottom of the hole. Report results to BLM office.

3. The minimum required fill of cement behind the **7-5/8** inch 2nd intermediate casing is:

Operator has proposed DV tool at depth of 5350', but will adjust cement proportionately if moved. DV tool shall be set a minimum of 50' below previous shoe and a minimum of 200' above current shoe. Operator shall submit sundry if DV tool depth cannot be set in this range. If an ECP is used, it is to be set a minimum of 50' below the shoe to provide cement across the shoe. If it cannot be set below the shoe, a CBL shall be run to verify cement coverage.

a. First stage to DV tool:___

☒ Cement to circulate. If cement does not circulate, contact the appropriate BLM office before proceeding with second stage cement job. Operator should have plans as to how they will achieve approved top of cement on the next stage. **Excess calculates to 1% - Additional cement may be required.**

b. Second stage above DV tool:

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

Formation below the 7-5/8" shoe to be tested according to Onshore Order 2.III.B.1.i. Test to be done as a mud equivalency test using the mud weight necessary for the pore pressure of the formation below the shoe and the mud weight for the bottom of the hole. Report results to BLM office.

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

4. The minimum required fill of cement behind the **5-1/2 X 4-1/2** inch production casing is:

☐ Cement as proposed by operator. Operator shall provide method of verification.

5. 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. Variance approved to use flex line from BOP to choke manifold. Check condition of flexible line from BOP to choke manifold, replace if exterior is damaged or if line fails test. Line to be as straight as possible with no hard bends and is to be anchored according to Manufacturer's requirements. The flexible hose can be exchanged with a hose of equal size and equal or greater pressure rating. **Anchor requirements, specification sheet and hydrostatic pressure test certification matching the hose in service, to be onsite for review. These documents shall be posted in the company man's trailer and on the rig floor.** If the BLM inspector questions the straightness of the hose, a BLM engineer will be contacted and will review in the field or via picture supplied by inspector to determine if changes are required (operator shall expect delays if this occurs).

3. **Operator has proposed a multi-bowl wellhead assembly for after surface casing and after 10-3/4 1st intermediate casings. This assembly will only be tested when installed on the surface casing. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be psi.**
    a. **Wellhead shall be installed by manufacturer's representatives, submit documentation with subsequent sundry.**
    b. **If the welding is performed by a third party, the manufacturer's representative shall monitor the temperature to verify that it does not exceed the maximum temperature of the seal.**
    c. **Manufacturer representative shall install the test plug for the initial BOP test.**
    d. **Operator shall perform the 1st intermediate casing integrity test to 70% of the casing burst. This will test the multi-bowl seals.**
    e. **If the cement does not circulate and one inch operations would have been possible with a standard wellhead, the well head shall be cut off, cementing operations performed and another wellhead installed.**

5M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.

4. Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the **7-5/8** 2nd intermediate casing shoe shall be psi. **10M system requires an HCR valve, remote kill line and annular to match. The remote kill line is to be installed prior to testing the system and tested to stack pressure.**

5. 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 111918

PECOS DISTRICT
SURFACE USE
CONDITIONS OF APPROVAL

OPERATOR'S NAME:	ENERGEN RESOURCES
LEASE NO.:	NMNM136223
WELL NAME & NO.:	458H:PITCHBLENDE FED 19-30
SURFACE HOLE FOOTAGE:	250'/N & 635'/E
BOTTOM HOLE FOOTAGE	2969'/S & 330'/E
LOCATION:	T-25S, R-35E, S19. NMPM
COUNTY:	LEA, NM

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)

Wildlife Management Mitigation:

Timing Limitation Stipulation/Condition of Approval for Lesser Prairie-Chicken:

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

Timing Limitation Exceptions:

The Carlsbad Field Office will publish an annual map of where the LPC timing and noise stipulations and conditions of approval (Limitations) will apply for the identified year (between March 1 and June 15) based on the latest survey information. The LPC Timing Area map will identify areas which are Habitat Areas (HA), Isolated Population Area (IPA), and Primary Population Area (PPA). The LPC Timing Area map will also have an area in red crosshatch. The red crosshatch area is the only area where an operator is required to submit a request for exception to the LPC Limitations. If an operator is operating outside the red crosshatch area, the LPC Limitations do not apply for that year and an exception to LPC Limitations is not required.

Ground-level Abandoned Well Marker to avoid raptor perching:

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

Rangeland Management Mitigation:

Livestock Watering Requirement:

Any damage to structures that provide water to livestock throughout the life of the well, caused by operations from the well site, must be immediately corrected by the operator. The operator must notify the BLM office (575-234-5972) and the private surface landowner or the grazing allotment holder if any damage occurs to structures that provide water to livestock.

Watershed Management Mitigation:

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.

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.

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

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.

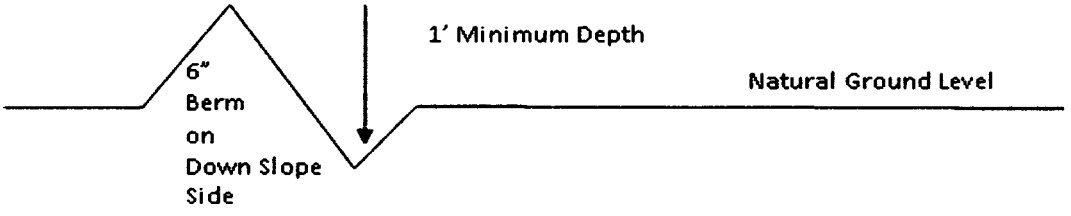
Ditching
Ditching shall be required on both sides of the road.

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:

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

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

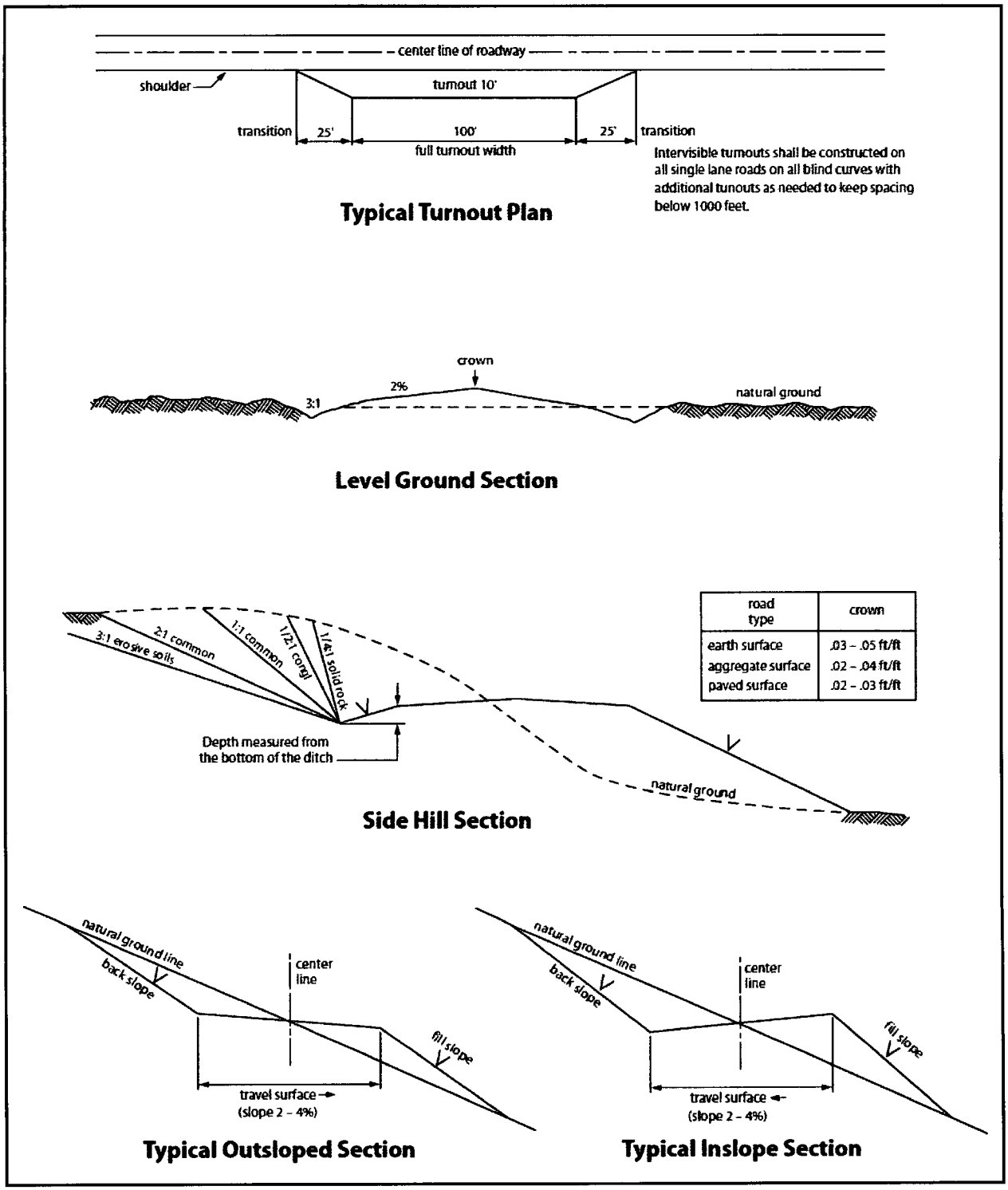


Figure 1. Cross-sections and plans for typical road sections representative of BLM resource or FS local and higher-class roads.

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

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 **20** feet. The trench and bladed area are included in this area. (*Clearing is defined as the removal of brush while leaving ground vegetation (grasses, weeds, etc.) intact. Clearing is best accomplished by holding the blade 4 to 6 inches above the ground surface.*)

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

8. The holder shall stockpile an adequate amount of topsoil where blading is allowed. The topsoil to be stripped is approximately 6 inches in depth. The topsoil will be

segregated from other spoil piles from trench construction. The topsoil will be evenly distributed over the bladed area for the preparation of seeding.

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

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

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

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

( ) seed mixture 1	( ) seed mixture 3
( ) seed mixture 2	( ) seed mixture 4
(X) 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).

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

Seed Mixture for LPC Sand/Shinnery Sites

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

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

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

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

*Pounds of pure live seed:

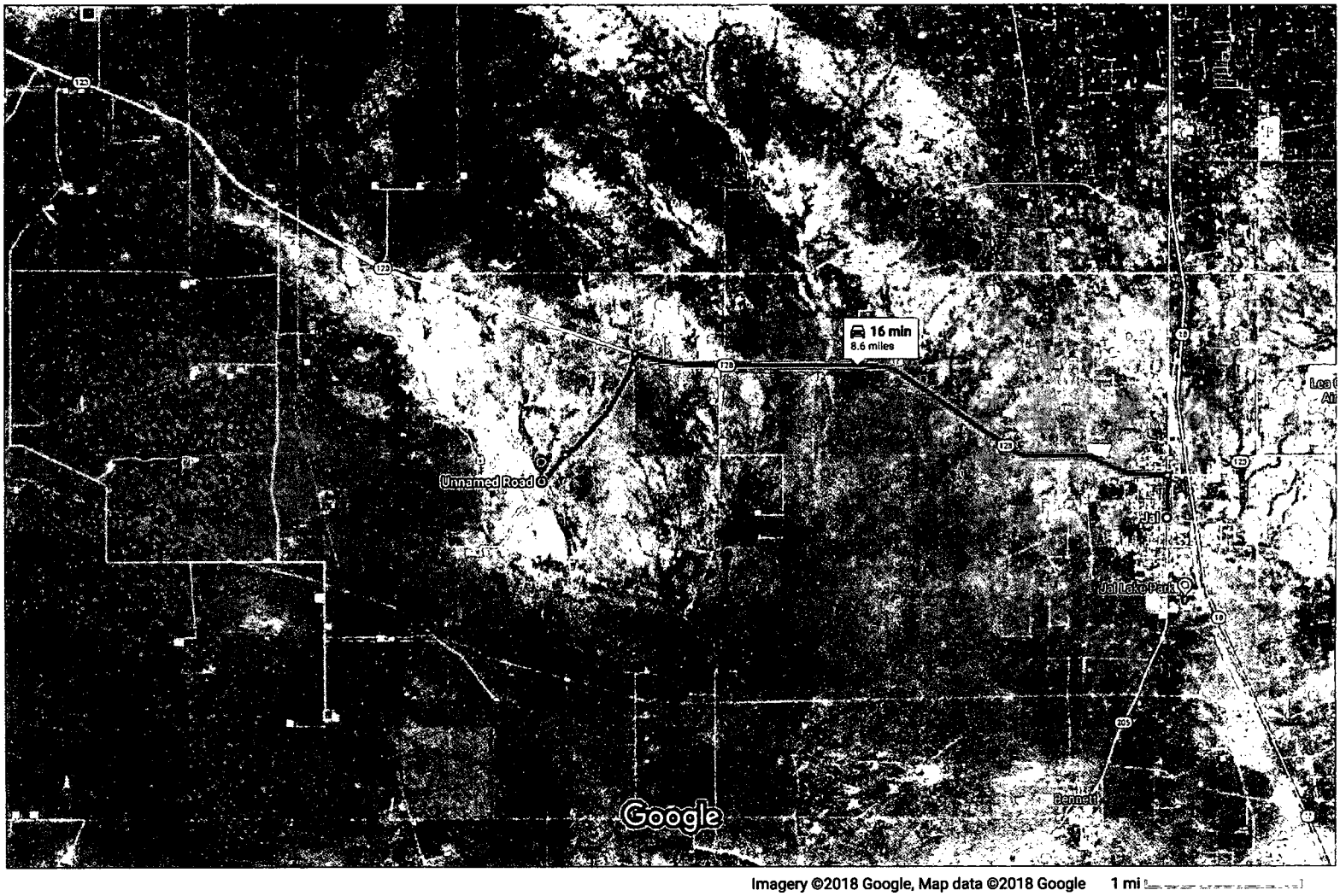
Pounds of seed **x** percent purity **x** percent germination = pounds pure live seed

Google Maps

Jal, NM to Unnamed Road, Jal, NM 88252

Pitchblende Lease enterance

Drive 8.6 miles, 16 min



Imagery ©2018 Google, Map data ©2018 Google 1 mi

Jal

New Mexico 88252

1. **Head east toward S 3rd St**

46 ft

2. **Turn left onto S 3rd St**

0.5 mi

3. **Turn left onto NM-128 W/W Kansas Ave**
   Continue to follow NM-128 W

6.3 mi

4. **Turn left**

0.2 mi

5. **Slight right**

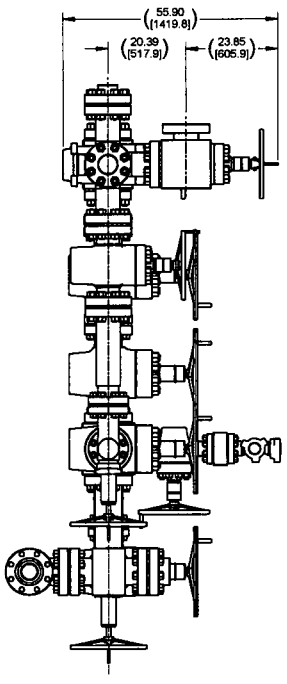
1.2 mi

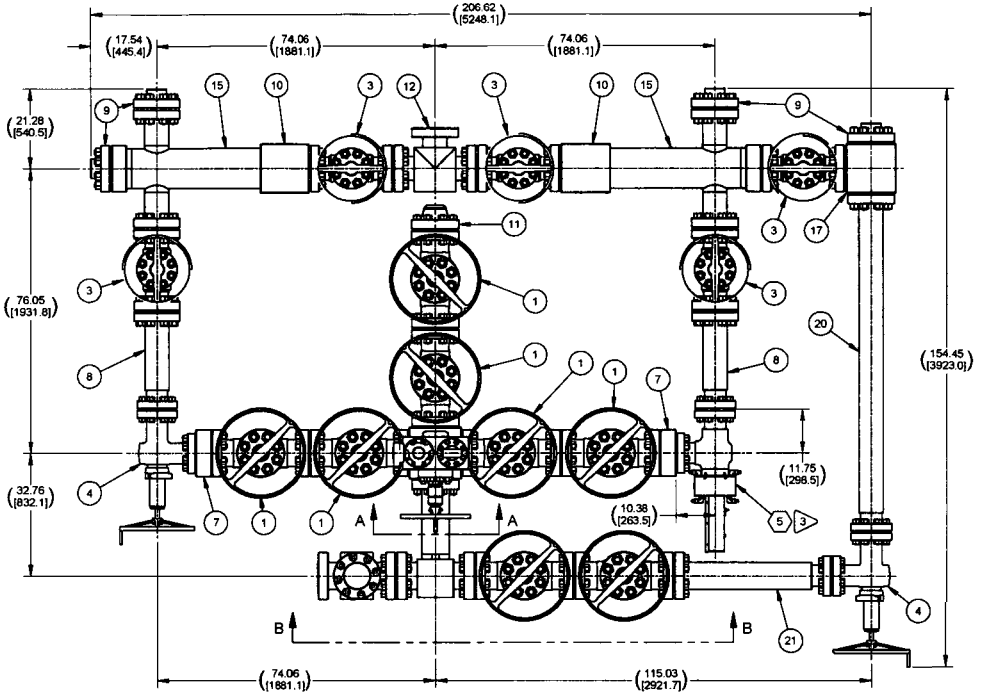
6. **Slight left**
   Destination will be on the right

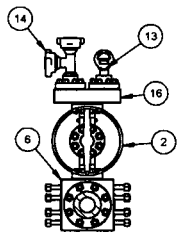
0.4 mi

Unnamed Road

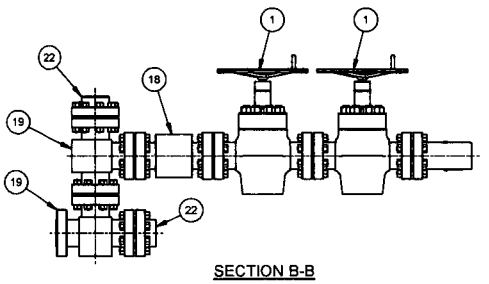
Jal, NM 88252



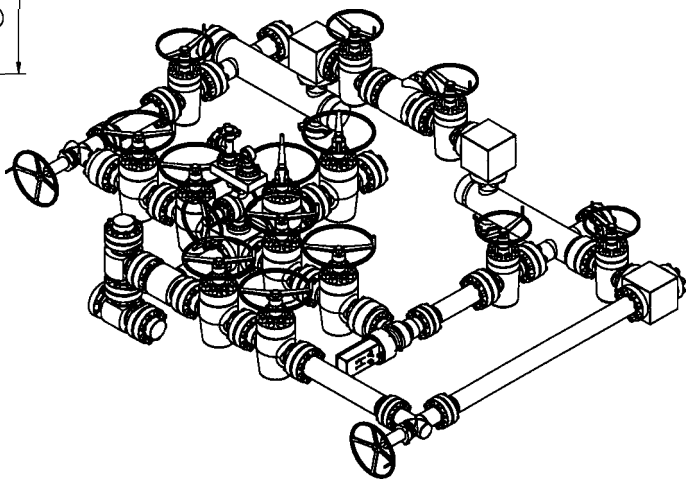




VIEW A-A



SECTION B-B



PARTS LIST		
ITEM	QTY	DESCRIPTION
1	8	GATE VALVE, MANUAL, 4.06"-10M FLANGED CONNECTIONS
2	1	GATE VALVE, MANUAL, 2.06"-10M FLANGED CONNECTIONS
3	5	GATE VALVE, MANUAL, 4.06"-5M FLANGED CONNECTIONS
4	2	ADJUSTABLE CHOKE, 3.06"-10M FLANGED INLET & OUTLET
5	1	DRILLING CHOKE, ACTUATED, 3.06"-10M FLANGED INLET & OUTLET
6	1	CROSS, 5 WAY, 4.06"-10M THRU X 4.06"-10M THRU X 2.06"-10M
7	2	DSA, 4.06-10M X 3.06-10M, 4.045" THK
8	2	ADAPTER SPOOL, 4.06"-5M X 3.06"-10M FLANGED CONNECTIONS, 26" LG
9	4	FLANGE, W/ RECESSED BUFFER CAVITY, 4.06"-5M
10	2	CONNECTING BLOCK, 4.06"-5M X 4.06"-5M 90 DEG
11	1	WELDNECK FLANGE,4.06"-10M X 5" XXS
12	1	TEE, FLANGED, 4.06"-5M THRU X 4.06"-5M
13	1	PRESSURE GAUGE, 0-15,000 PSI, W/ 2.06"-10M FLANGE
14	1	ASSY, INSTRUMENT TEE WITH 2-10M FLG INLET & (2) 2" KEMPER FIG 1502 FEMALE OUTLETS
15	2	BUFFER TANK, 10.75"OD X 9.25"ID X "56.50LG, W/ (3) 4.06-5M FLANGED SIDE OUTLETS, (1) 5"-1002 MALE UNION SIDE OUTLET, (1) 4-1/16 5M STUDDED END, (1) 10.75" OD BLIND END CAP
16	1	INSTRUMENT BLOCK, W/ (2) 2.06"-10M TOP AND (1) 2.06"-10M BOTTOM CONNECTIONS
17	1	TEE, 4.06"-5M THRU X 4.06"-5M
18	1	WELDMENT, TEE, 4-1/16 10M
19	2	TEE, FLANGED, 4.06"-10M THRU X 4.06"-10M
20	1	ADAPTER SPOOL, 4.06"-5M X 3.06"-10M FLANGED CONNECTIONS, 90.10" LG
21	1	SPACER SPOOL, 4.06"-10M X 3.06"-10M FLANGED CONNECTIONS,41.55" LG
22	2	FLANGE, W/ RECESSED BUFFER CAVITY, 4.06"-10M
23	32	STUD, AT, 1-8 UNC-2A, 6.75" LG
24	88	STUD, AT, 1 1/8-8 UN-2A, 8" LG
25	64	STUD, AT, 1 1/4-8 UN-2A, 8" LG
26	64	NUT, HEAVY HEX, 1-8 UNC-2B
27	176	NUT, HEAVY HEX, 1 1/8-8 UN-2B
28	128	NUT, HEAVY HEX, 1 1/4-8 UN-2B
29	17	RING GASKET, RX-39
30	4	RING GASKET, BX-152
31	6	RING GASKET, BX-154
32	9	RING GASKET, BX-155

NOTES:
1. STUDS, NUTS, RING GASKETS AND NAME PLATE ARE NOT REFERENCED ON DRAWING.
2. BOLT HOLES STRADDLE COMMON CENTERLINE.
3. CUSTOMER SUPPLIED; 3-1/16" 10M HYD CHOKE; MUST FIT THESE DIMENSIONS.

CUSTOMER REVIEW/APPROVAL	
☐ CN	Correct As Noted. Submit revised document. Proceed with fabrication.
☐ NF	Not for Fabrication. Do not start fabricating equipment represented until design is corrected. Correct and resubmit design.
☐ FD	Final Design Document. Design document is accepted.
REVIEWED BY:	DATE:

THIRD ANGLE | DESIGNED IN INCHES | DIMENSIONAL UNITS: INCHES [MILLIMETERS] | MACHINING TOLERANCES UNLESS OTHERWISE SPECIFIED: X [0] ± = [] | XX [0.0] ± = [] | XXX [0.00] ± = [] | ANGLES ± ° | ALL MACHINED SURFACES

MACHINED FILLET RADII: #19-#69 [0.30-1.37]. BREAK ALL SHARP EDGES .01-.03 [0.3-0.8] RADII OR 45°. SURFACE FINISH IN MICRO µin [RMS]. INTERPRET DRAWING PER ASME Y14.5, ASME Y14.36, AND ANSI A2.4 STANDARDS. SEE BOM FOR MATERIAL AND SPECIAL REQUIREMENTS. ITEM NUMBERS NOT APPEARING ON BAR DO NOT APPLY.

SURFACE TREATMENT: DO NOT SCALE

MATERIAL & HEAT TREAT | Drawn By: H. VO | Date: 31 Dec 14 | Checked By: H. VO | Date: 31 Dec 14 | Approved By: K. HICKMAN | Date: 31 Dec 14

ESTIMATED WEIGHT: 21046.6 LBS 9546.6 KG | INITIAL USE BM:

CAMERON — DRILLING SYSTEMS

CHOKE & KILL MANIFOLD, 4-1/16 10M X 4-1/16 5M, W/ (2) 3-1/16 10M ADJ. CHOKE & (1) 3-1/16 10M HYD. CHOKE

SHEET 1 of 1 | LO-085014-34-35-03 | REV 00B

INVENTOR - D

Midwest Hose & Specialty, Inc.

Internal Hydrostatic Test Graph

November 19, 2013

Customer: Cactus

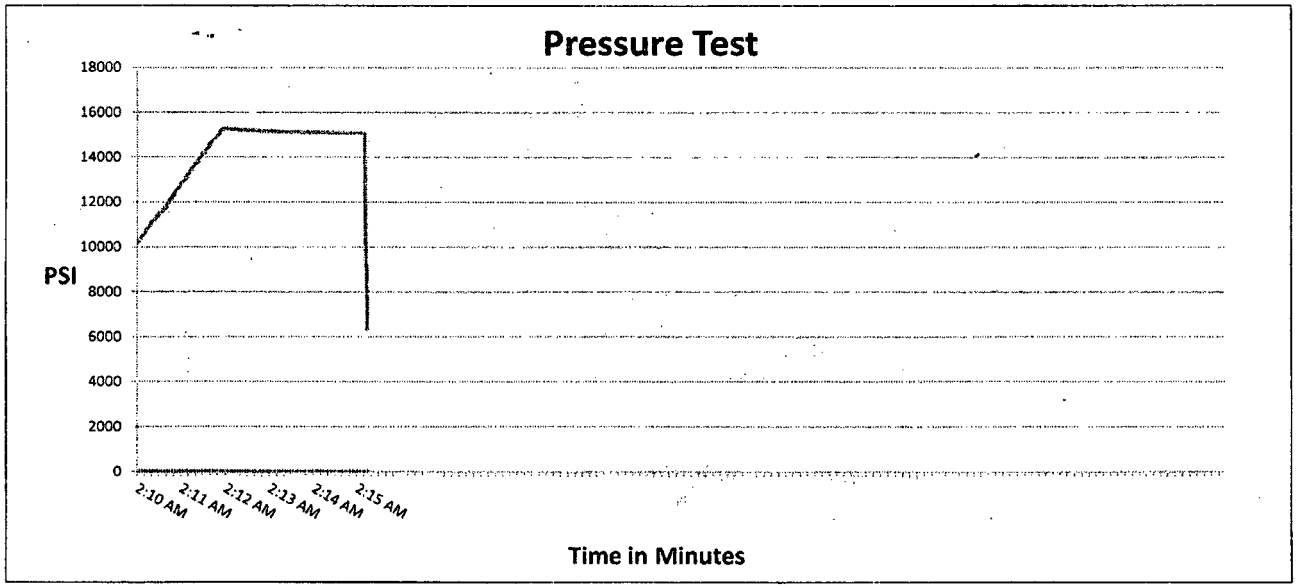
Pick Ticket #: 226672

Hose Specifications

Hose Type	Length
Mud&Cement	10'
I.D.	**O.D.**
4"	6.05"
Working Pressure	**Burst Pressure**
10000 PSI	Standard Safety Multiplier Applies

Verification

Type of Fitting	Coupling Method
4 1/16 10K	Swage
Die Size	**Final O.D.**
5.56"	6.54"
Hose Serial #	**Hose Assembly Serial #**
10768	226672



Test Pressure	Time Held at Test Pressure	Actual Burst Pressure	Peak Pressure
15000 PSI	3 2/4 Minutes		15307 PSI

Comments: Hose assembly pressure tested with water at ambient temperature.

Tested By: *Ryan Malone*

Approved By: *Joe Proctor*

Midwest Hose
& Specialty, Inc.

Internal Hydrostatic Test Certificate

General Information		Hose Specifications	
Customer	**CACTUS DRILLING**	*Hose Assembly Type*	**Choke & Kill**
MWH Sales Representative	**EVAN SPARKMAN**	*Certification*	**API 7K**
Date Assembled	**11/18/2013**	*Hose Grade*	**MUD**
Location Assembled	**OKC**	*Hose Working Pressure*	**10,000**
Sales Order #	**189325**	*Hose Lot # and Date Code*	**10768-06/13**
Customer Purchase Order #	**RIG#144 M12395**	*Hose I.D. (Inches)*	**4"**
Assembly Serial # (Pick Ticket #)	**226672**	*Hose O.D. (Inches)*	**6.52"**
Hose Assembly Length	**10'**	*Armor (yes/no)*	YES

Fittings			
End A		**End B**	
Stem (Part and Revision #)	**R.4.0X64WB**	*Stem (Part and Revision #)*	**R.4.0X64WB**
Stem (Heat #)	**3A9956**	*Stem (Heat #)*	**R3A9956**
Ferrule (Part and Revision #)	**RF.4.0**	*Ferrule (Part and Revision #)*	**RF.4.0**
Ferrule (Heat #)	**120368**	*Ferrule (Heat #)*	**120368**
Connection (Part #)	**4-1/16 10K**	*Connection (Part #)*	**4-1/16 10K**
Connection (Heat #)		*Connection (Heat #)*	
Dies Used	**6.56"**	*Dies Used*	**6.62"**

Hydrostatic Test Requirements		
Test Pressure (psi)	**15,000**	***Hose assembly was tested with ambient water temperature.***
Test Pressure Hold Time (minutes)	**3 1/2**	

Date Tested	*Tested By*	*Approved By*
11/19/2013		

Midwest Hose
& Specialty, Inc.

Certificate of Conformity

Customer: **CACTUS DRILLING**	*Customer P.O.#* **RIG#144 M12395**
Sales Order # **189325**	*Date Assembled:* **11/18/2013**

Specifications

Hose Assembly Type:	**Choke & Kill**		
Assembly Serial #	**226672**	*Hose Lot # and Date Code*	**10768-06/13**
Hose Working Pressure (psi)	**10,000**	*Test Pressure (psi)*	**15000**

We hereby certify that the above material supplied for the referenced purchase order to be true according to the requirements of the purchase order and current industry standards.

Supplier:
Midwest Hose & Specialty, Inc.
3312 S I-35 Service Rd
Oklahoma City, OK 73129

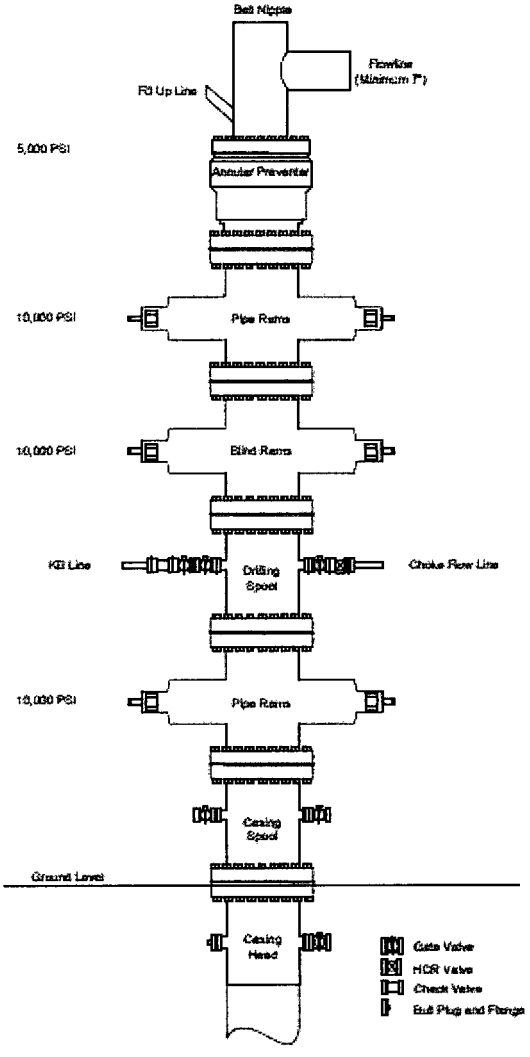
Comments:

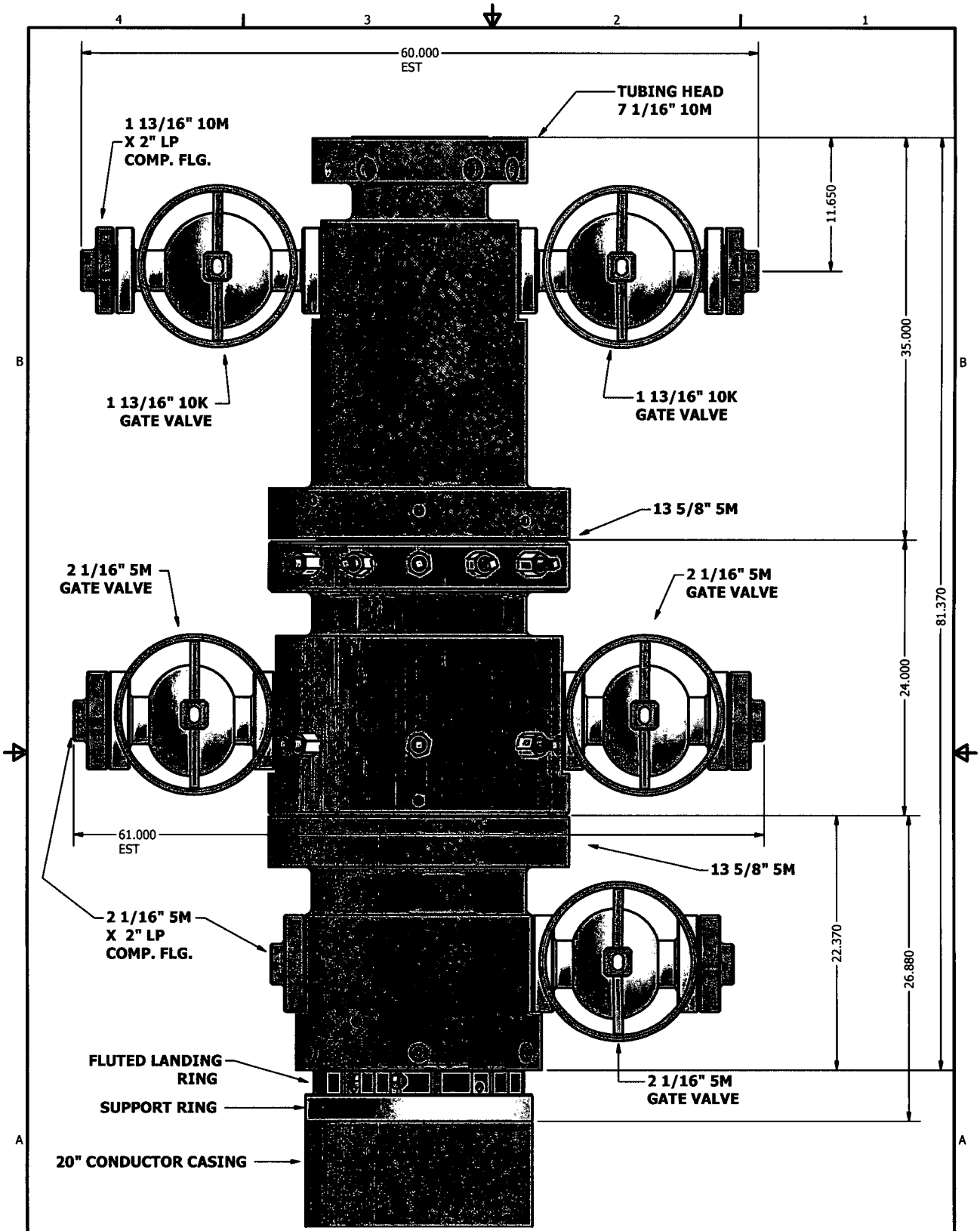
Approved By	***Date***
Joe Porter	**11/19/2013**

ENERGEN

RESOURCES

10,000# - 13-5/8" - 3R BOP





DRAWN	J.PERKINS	
CHECKED	J. PERKINS	
QA		
MFG		
APPROVED		

McClinton Energy Group

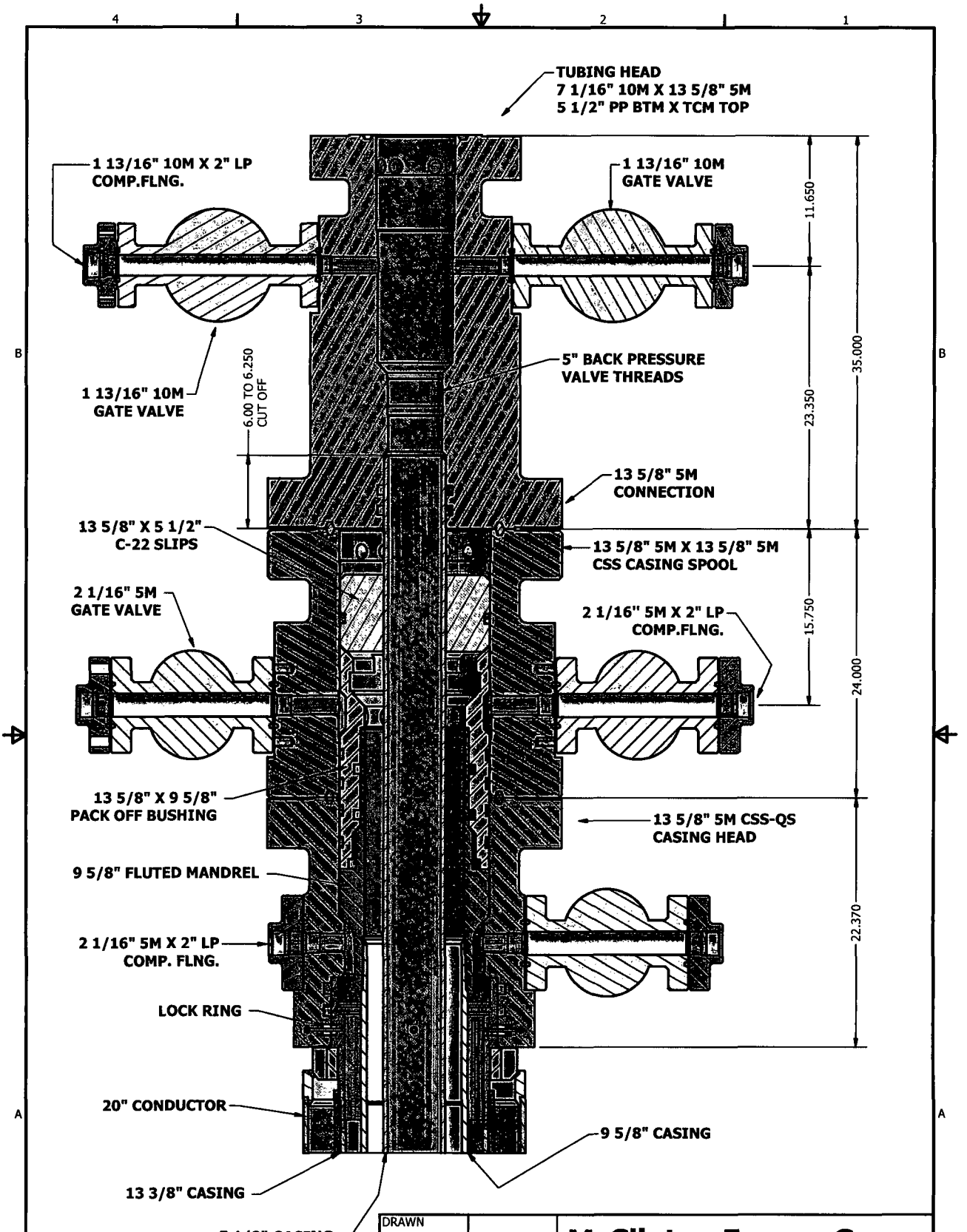
TITLE

ENERGEN
13 3/8" 9 5/8" 5 1/2"

SIZE	DWG NO	REV
B	ENERGEN STACK UP 01	

SCALE

SHEET 1 OF 2



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McClinton Energy Group

TITLE

ENERGEN
13 3/8" 9 5/8" 5 1/2"

SIZE	DWG NO	REV
B	ENERGEN STACK UP 01	

SCALE

SHEET 2 OF 2

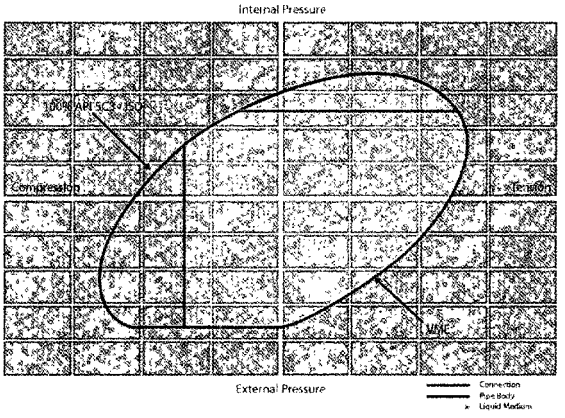
TECHNICAL DATA SHEET TMK UP DQXHT 4.5 X 15.1 P110 CY

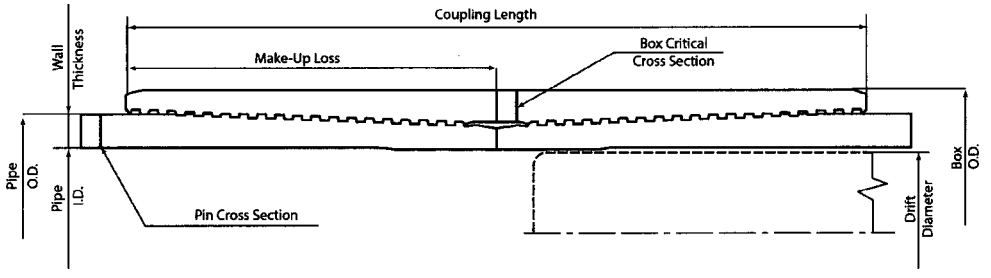
TUBULAR PARAMETERS	
Nominal OD, (inch)	4.500
Wall Thickness, (inch)	0.337
Pipe Grade	P110 CY
Coupling	Regular
Coupling Grade	P110 CY
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	5.00
Connection ID, (inch)	3.789
Make-Up Loss, (inch)	3.772
Connection Critical Area, (sq inch)	4.407
Yield Strength in Tension, (klbs)	485
Yeld Strength in Compression, (klbs)	485
Tension Efficiency	100%
Compression Efficiency	100%
Min. Internal Yield Pressure, (psi)	14 420
Collapse Pressure, (psi)	14 340
Uniaxial Bending (deg/100ft)	112.0

MAKE-UP TORQUES	
Yield Torque, (ft-lb)	15 400
Minimum Make-Up Torque, (ft-lb)	8 600
Optimum Make-Up Torque, (ft-lb)	9 600
Maximum Make-Up Torque, (ft-lb)	10 500

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	14.98
Nominal Weight, (lbs/ft)	15.10
Nominal ID, (inch)	3.826
Drift Diameter, (inch)	3.701
Nominal Pipe Body Area, (sq inch)	4.407
Yield Strength in Tension, (klbs)	485
Min. Internal Yield Pressure, (psi)	14 420
Collapse Pressure, (psi)	14 340





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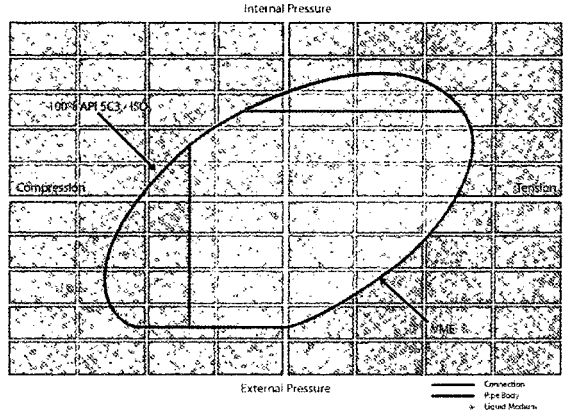
TECHNICAL DATA SHEET TMK UP DQXHT 5.5 X 23 P110 CY

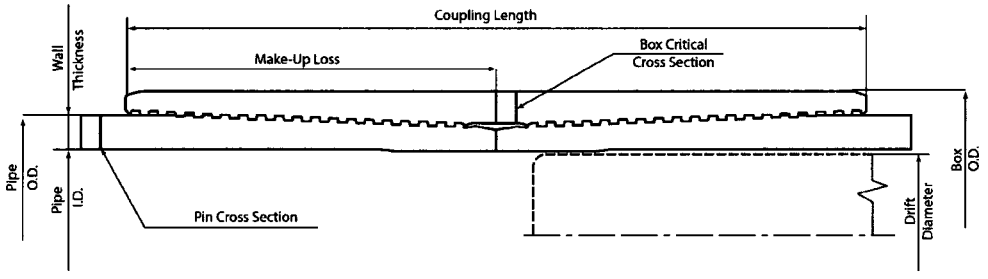
TUBULAR PARAMETERS	
Nominal OD, (inch)	5.500
Wall Thickness, (inch)	0.415
Pipe Grade	P110 CY
Coupling	Regular
Coupling Grade	P110 CY
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	6.05
Connection ID, (inch)	4.633
Make-Up Loss, (inch)	4.122
Connection Critical Area, (sq inch)	5.919
Yield Strength in Tension, (klbs)	693
Yeld Strength in Compression, (klbs)	685
Tension Efficiency	94%
Compression Efficiency	94%
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540
Uniaxial Bending (deg/100ft)	86.0

MAKE-UP TORQUES	
Yield Torque, (ft-lb)	28 500
Minimum Make-Up Torque, (ft-lb)	16 000
Optimum Make-Up Torque, (ft-lb)	17 800
Maximum Make-Up Torque, (ft-lb)	19 500

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	22.54
Nominal Weight, (lbs/ft)	23.00
Nominal ID, (inch)	4.670
Drift Diameter, (inch)	4.545
Nominal Pipe Body Area, (sq inch)	6.630
Yield Strength in Tension, (klbs)	729
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540





Print date: 05/04/2018 19:58

U. S. Steel Tubular Products

5/4/2018 11:45:18 AM

13.375" 61.00lbs/ft (0.430" Wall) J55

MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.430	--	--	--	in.
Inside Diameter	12.515	12.515	--	12.515	in.
Standard Drift	12.359	12.359	--	12.359	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	61.00	--	--	--	lbs/ft
Plain End Weight	59.50	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,540	1,540	--	1,540	psi
Minimum Internal Yield Pressure	3,090	3,090	--	3,090	psi
Minimum Pipe Body Yield Strength	962	--	--	--	1,000 lbs
Joint Strength	--	1,025	--	595	1,000 lbs
Reference Length	--	11,204	--	6,504	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	4,460	ft-lbs
Maximum Make-Up Torque	--	--	--	7,440	ft-lbs

U. S. Steel Tubular Products
460 Wildwood Forest Drive, Suite 300S
Spring, Texas 77380

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

ENERGEN®

Well: Pitchblende Fed 19-30 458H

Casing Assumptions

Section	Hole Size	Csg Size	Drift	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/Buoyant	Mud Weight (ppg)
Surface	17.500	13.375	12.359	0	1010	0	1010	No	61	J-55	BTC	1540	3090	962	1025	Dry	8.4
Intermediate #1	12.250	10.75	9.875	0	5300	0	5300	No	45.5	HCN-80	BTC	3020	5210	1040.00	1097	Dry	9.7
Intermediate #2	9.875	7.625	6.875	0	11904	0	11892	No	29.7	HCP110	BTC	6700	9460	940.00	960	Dry	9
Production	6.750	5.5	4.545	0	11804	0	11792	Yes	23	CYP110	DQXHT	14540	14530	729.00	693	Dry	11
Production	6.750	4.5	3.701	11804	20034	11792	12465	Yes	15.1	CYP110	DQXHT	14340	14420	485.00	485	Dry	11

Safety Factors

Section	Csg Size	Weight (lbs)	Grade	Collapse	Burst	Body Tension	Joint Tension
Surface	13.375	61	J-55	3.491	7.004	15.614	16.637
Intermediate #1	10.75	45.5	HCN-80	1.130	1.949	4.313	4.549
Intermediate #2	7.625	29.7	HCP110	1.204	1.700	2.659	2.715
Production	5.5	23	CYP110	2.156	2.154	2.685	2.553
Production	4.5	15.1	CYP110	2.011	2.022	2.724	2.724

Criteria	
Collapse	1.125
Burst	1.125
Body Tension	2
Joint Tension	2

U. S. Steel Tubular Products

5/4/2018 11:45:18 AM

13.375" 61.00lbs/ft (0.430" Wall) J55

MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.430	--	--	--	in.
Inside Diameter	12.515	12.515	--	12.515	in.
Standard Drift	12.359	12.359	--	12.359	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	61.00	--	--	--	lbs/ft
Plain End Weight	59.50	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,540	1,540	--	1,540	psi
Minimum Internal Yield Pressure	3,090	3,090	--	3,090	psi
Minimum Pipe Body Yield Strength	962	--	--	--	1,000 lbs
Joint Strength	--	1,025	--	595	1,000 lbs
Reference Length	--	11,204	--	6,504	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	4,460	ft-lbs
Maximum Make-Up Torque	--	--	--	7,440	ft-lbs

U. S. Steel Tubular Products
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Spring, Texas 77380

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Well: Pitchblende Fed 19-30 458H

Casing Assumptions

Section	Hole Size	Csg Size	Drift	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/Buoyant	Mud Weight (ppg)
Surface	17.500	13.375	12.359	0	1010	0	1010	No	61	J-55	BTC	1540	3090	962	1025	Dry	8.4
Intermediate #1	12.250	10.75	9.875	0	5300	0	5300	No	45.5	HCN-80	BTC	3020	5210	1040.00	1097	Dry	9.7
Intermediate #2	9.875	7.625	6.875	0	11904	0	11892	No	29.7	HCP110	BTC	6700	9460	940.00	960	Dry	9
Production	6.750	5.5	4.545	0	11804	0	11792	Yes	23	CYP110	DQXHT	14540	14530	729.00	693	Dry	11
Production	6.750	4.5	3.701	11804	20034	11792	12465	Yes	15.1	CYP110	DQXHT	14340	14420	485.00	485	Dry	11

Safety Factors

Section	Csg Size	Weight (lbs)	Grade	Collapse	Burst	Body Tension	Joint Tension
Surface	13.375	61	J-55	3.491	7.004	15.614	16.637
Intermediate #1	10.75	45.5	HCN-80	1.130	1.949	4.313	4.549
Intermediate #2	7.625	29.7	HCP110	1.204	1.700	2.659	2.715
Production	5.5	23	CYP110	2.156	2.154	2.685	2.553
Production	4.5	15.1	CYP110	2.011	2.022	2.724	2.724

Criteria	
Collapse	1.125
Burst	1.125
Body Tension	2
Joint Tension	2

U. S. Steel Tubular Products

5/4/2018 11:45:18 AM

13.375" 61.00lbs/ft (0.430" Wall) J55

MECHANICAL PROPERTIES	Pipe	BTC	LTC	STC	
Minimum Yield Strength	55,000	--	--	--	psi
Maximum Yield Strength	80,000	--	--	--	psi
Minimum Tensile Strength	75,000	--	--	--	psi
DIMENSIONS	**Pipe**	**BTC**	**LTC**	**STC**	
Outside Diameter	13.375	14.375	--	14.375	in.
Wall Thickness	0.430	--	--	--	in.
Inside Diameter	12.515	12.515	--	12.515	in.
Standard Drift	12.359	12.359	--	12.359	in.
Alternate Drift	--	--	--	--	in.
Nominal Linear Weight, T&C	61.00	--	--	--	lbs/ft
Plain End Weight	59.50	--	--	--	lbs/ft
PERFORMANCE	**Pipe**	**BTC**	**LTC**	**STC**	
Minimum Collapse Pressure	1,540	1,540	--	1,540	psi
Minimum Internal Yield Pressure	3,090	3,090	--	3,090	psi
Minimum Pipe Body Yield Strength	962	--	--	--	1,000 lbs
Joint Strength	--	1,025	--	595	1,000 lbs
Reference Length	--	11,204	--	6,504	ft
MAKE-UP DATA	**Pipe**	**BTC**	**LTC**	**STC**	
Make-Up Loss	--	4.81	--	3.50	in.
Minimum Make-Up Torque	--	--	--	4,460	ft-lbs
Maximum Make-Up Torque	--	--	--	7,440	ft-lbs

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Well: Pitchblende Fed 19-30 458H

Casing Assumptions

Section	Hole Size	Csg Size	Drift	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/Buoyant	Mud Weight (ppg)
Surface	17.500	13.375	12.359	0	1010	0	1010	No	61	J-55	BTC	1540	3090	962	1025	Dry	8.4
Intermediate #1	12.250	10.75	9.875	0	5300	0	5300	No	45.5	HCN-80	BTC	3020	5210	1040.00	1097	Dry	9.7
Intermediate #2	9.875	7.625	6.875	0	11904	0	11892	No	29.7	HCP110	BTC	6700	9460	940.00	960	Dry	9
Production	6.750	5.5	4.545	0	11804	0	11792	Yes	23	CYP110	DQXHT	14540	14530	729.00	693	Dry	11
Production	6.750	4.5	3.701	11804	20034	11792	12465	Yes	15.1	CYP110	DQXHT	14340	14420	485.00	485	Dry	11

Safety Factors

Section	Csg Size	Weight (lbs)	Grade	Collapse	Burst	Body Tension	Joint Tension
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Intermediate #2	7.625	29.7	HCP110	1.204	1.700	2.659	2.715
Production	5.5	23	CYP110	2.156	2.154	2.685	2.553
Production	4.5	15.1	CYP110	2.011	2.022	2.724	2.724

Criteria	
Collapse	1.125
Burst	1.125
Body Tension	2
Joint Tension	2

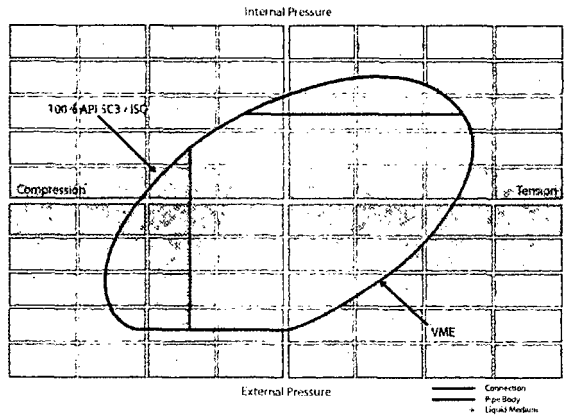
TECHNICAL DATA SHEET TMK UP DQXHT 5.5 X 23 P110 CY

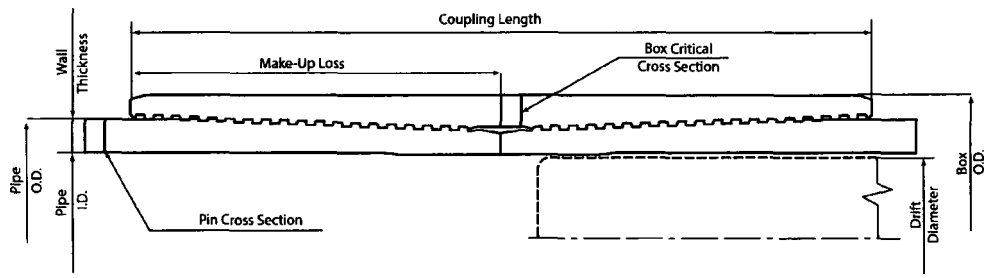
TUBULAR PARAMETERS	
Nominal OD, (inch)	5.500
Wall Thickness, (inch)	0.415
Pipe Grade	P110 CY
Coupling	Regular
Coupling Grade	P110 CY
Drift	Standard

CONNECTION PARAMETERS	
Connection OD (inch)	6.05
Connection ID, (inch)	4.633
Make-Up Loss, (inch)	4.122
Connection Critical Area, (sq inch)	5.919
Yield Strength in Tension, (klbs)	693
Yeld Strength in Compression, (klbs)	685
Tension Efficiency	94%
Compression Efficiency	94%
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540
Uniaxial Bending (deg/100ft)	86.0

MAKE-UP TORQUES	
Yield Torque, (ft-lb)	28 500
Minimum Make-Up Torque, (ft-lb)	16 000
Optimum Make-Up Torque, (ft-lb)	17 800
Maximum Make-Up Torque, (ft-lb)	19 500

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	22.54
Nominal Weight, (lbs/ft)	23.00
Nominal ID, (inch)	4.670
Drift Diameter, (inch)	4.545
Nominal Pipe Body Area, (sq inch)	6.630
Yield Strength in Tension, (klbs)	729
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540





NOTE: The content of this Technical Data Sheet is for general information only and does not guarantee performance or imply fitness for a particular purpose, which only a competent drilling professional can determine considering the specific installation and operation parameters. This information supersede all prior versions for this connection. Information that is printed or downloaded is no longer controlled by TMK and might not be the latest information. Anyone using the information herein does so at their own risk. To verify that you have the latest technical information, please contact PAO "TMK" Technical Sales in Russia (Tel: +7 (495) 775-76-00, Email: techsales@tmk-group.com) and TMK IPSCO in North America (Tel: +1 (281)949-1044, Email: techsales@tmk-ipsco.com).

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ENERGEN®

Well: Pitchblende Fed 19-30 458H

Casing Assumptions

Section	Hole Size	Csg Size	Drift	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/Buoyant	Mud Weight (ppg)
Surface	17.500	13.375	12.359	0	1010	0	1010	No	61	J-55	BTC	1540	3090	962	1025	Dry	8.4
Intermediate #1	12.250	10.75	9.875	0	5300	0	5300	No	45.5	HCN-80	BTC	3020	5210	1040.00	1097	Dry	9.7
Intermediate #2	9.875	7.625	6.875	0	11904	0	11892	No	29.7	HCP110	BTC	6700	9460	940.00	960	Dry	9
Production	6.750	5.5	4.545	0	11804	0	11792	Yes	23	CYP110	DQXHT	14540	14530	729.00	693	Dry	11
Production	6.750	4.5	3.701	11804	20034	11792	12465	Yes	15.1	CYP110	DQXHT	14340	14420	485.00	485	Dry	11

Safety Factors

Section	Csg Size	Weight (lbs)	Grade	Collapse	Burst	Body Tension	Joint Tension
Surface	13.375	61	J-55	3.491	7.004	15.614	16.637
Intermediate #1	10.75	45.5	HCN-80	1.130	1.949	4.313	4.549
Intermediate #2	7.625	29.7	HCP110	1.204	1.700	2.659	2.715
Production	5.5	23	CYP110	2.156	2.154	2.685	2.553
Production	4.5	15.1	CYP110	2.011	2.022	2.724	2.724

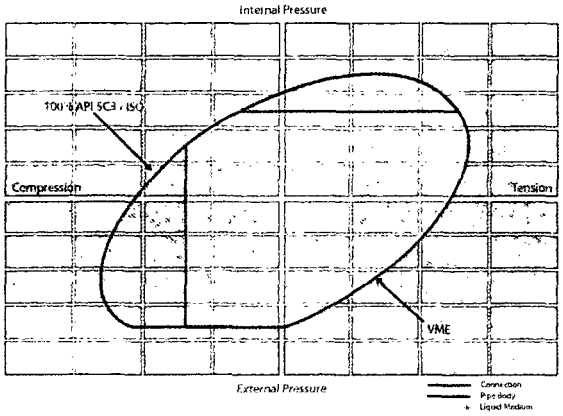
Criteria	
Collapse	1.125
Burst	1.125
Body Tension	2
Joint Tension	2

TECHNICAL DATA SHEET TMK UP DQXHT 5.5 X 23 P110 CY

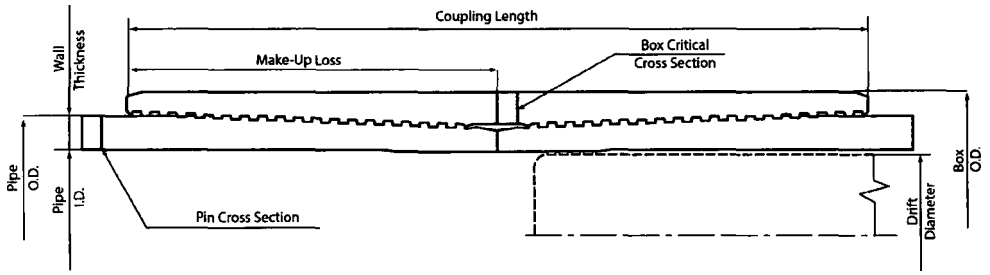
TUBULAR PARAMETERS	
Nominal OD, (inch)	5.500
Wall Thickness, (inch)	0.415
Pipe Grade	P110 CY
Coupling	Regular
Coupling Grade	P110 CY
Drift	Standard

PIPE BODY PROPERTIES	
PE Weight, (lbs/ft)	22.54
Nominal Weight, (lbs/ft)	23.00
Nominal ID, (inch)	4.670
Drift Diameter, (inch)	4.545
Nominal Pipe Body Area, (sq inch)	6.630
Yield Strength in Tension, (klbs)	729
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540

CONNECTION PARAMETERS	
Connection OD (inch)	6.05
Connection ID, (inch)	4.633
Make-Up Loss, (inch)	4.122
Connection Critical Area, (sq inch)	5.919
Yield Strength in Tension, (klbs)	693
Yeld Strength in Compression, (klbs)	685
Tension Efficiency	94%
Compression Efficiency	94%
Min. Internal Yield Pressure, (psi)	14 530
Collapse Pressure, (psi)	14 540
Uniaxial Bending (deg/100ft)	86.0



MAKE-UP TORQUES	
Yield Torque, (ft-lb)	28 500
Minimum Make-Up Torque, (ft-lb)	16 000
Optimum Make-Up Torque, (ft-lb)	17 800
Maximum Make-Up Torque, (ft-lb)	19 500



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ENERGEN®

Well: Pitchblende Fed 19-30 458H

Casing Assumptions

Section	Hole Size	Csg Size	Drift	From (MD)	To (MD)	From (TVD)	To (TVD)	Tapered String	Weight (lbs)	Grade	Conn.	Collapse	Burst	Body Tension	Joint Tension	Dry/Buoyant	Mud Weight (ppg)
Surface	17.500	13.375	12.359	0	1010	0	1010	No	61	J-55	BTC	1540	3090	962	1025	Dry	8.4
Intermediate #1	12.250	10.75	9.875	0	5300	0	5300	No	45.5	HCN-80	BTC	3020	5210	1040.00	1097	Dry	9.7
Intermediate #2	9.875	7.625	6.875	0	11904	0	11892	No	29.7	HCP110	BTC	6700	9460	940.00	960	Dry	9
Production	6.750	5.5	4.545	0	11804	0	11792	Yes	23	CYP110	DQXHT	14540	14530	729.00	693	Dry	11
Production	6.750	4.5	3.701	11804	20034	11792	12465	Yes	15.1	CYP110	DQXHT	14340	14420	485.00	485	Dry	11

Safety Factors

Section	Csg Size	Weight (lbs)	Grade	Collapse	Burst	Body Tension	Joint Tension
Surface	13.375	61	J-55	3.491	7.004	15.614	16.637
Intermediate #1	10.75	45.5	HCN-80	1.130	1.949	4.313	4.549
Intermediate #2	7.625	29.7	HCP110	1.204	1.700	2.659	2.715
Production	5.5	23	CYP110	2.156	2.154	2.685	2.553
Production	4.5	15.1	CYP110	2.011	2.022	2.724	2.724

Criteria	
Collapse	1.125
Burst	1.125
Body Tension	2
Joint Tension	2

ENERGEN®

Hydrogen Sulfide Drilling Operations Plan

1. Hydrogen Sulfide Training

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

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

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

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

There will be an initial training session just prior to encountering a known or probable H2S zone (within 3 days or 500') and weekly H2S and well control drills for all personnel in each crew. The initial training session shall include a review of the site specific H2S Drilling Operations Plan and the Public Protection Plan. This plan shall be available at the well site. All personnel will be required to carry documentation that they have received the proper training.

2. H2S Safety Equipment and systems

Note: All H2S safety equipment and systems will be installed, tested, and operational when drilling reaches a depth of 500' above, or three days prior to penetrating the first zone containing or reasonably expected to contain H2S. If H2S greater than 100 ppm is encountered in the gas stream, we will shut in the install H2S equipment.

- Well Control Equipment:
    - Flare Line.

- Choke manifold with remotely operated choke.
- Blind rams and pipe rams to accommodate all pipe sizes with properly sized closing unit.
- Auxiliary equipment to include: annular preventer, mud-gas, separator, rotating head.

- Protective equipment for essential personnel:
  - Mark II Surviveair 30 minute units located in the dog house and at briefing areas.
- H2S detection and monitoring equipment:
  - 2 portable H2S monitors positioned on location for best coverage and response. These units have warning lights and audible sirens when H2S levels of 20 ppm are reached.
- Visual warning systems:
  - Caution/Danger signs shall be posted on roads providing direct access to location. Signs will be painted a high visibility yellow with black lettering of sufficient size to be readable at a reasonable distance from the immediate location. Bilingual signs will be used, when appropriate.
- Mud program:
  - The mud program has been designed to minimize the volume of H2S circulated to the surface.

Energen has conducted a review to determine if an H2S contingency plan is required for the above referenced well. We were able to conclude that any potential hazardous volume would be minimal.

ENERGEN®

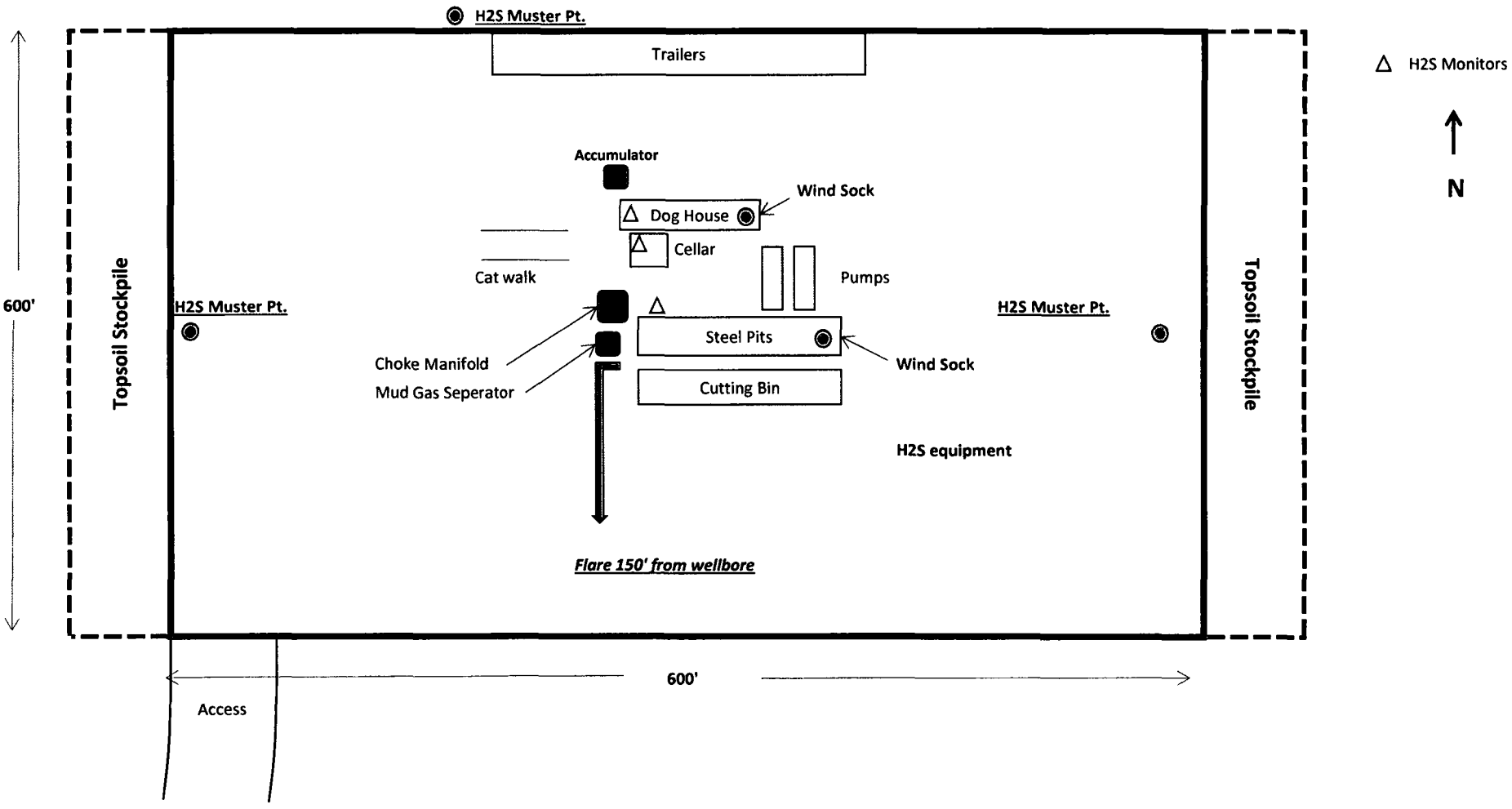
Contact Information

In at this time the supervising person determines the release of H2S cannot be contained to the site loction and the general public is in harm's way he will take the necessary steps to protect the workers and the public.

Key Personnel	Title	Office	Mobile
Richard Adams	Drilling Manager	432-818-1747	432-557-1864
Manny Heald	Drilling Supt.	432-688-3330	432-967-5016
Santos Moroles	Drilling Supt.	432-818-1722	432-238-0031
Andy Cobb	Dir EH&S	432-686-3599	432-557-3145
Callie Marsh	Sr. Cood E&S	432-688-3337	432-634-3752

Lea County	Contact
Ambulance	911
Nor Lea General Hospital (Hobbs)	575-397-0560
State Police (Hobbs)	575-392-5580
City Police (Hobbs)	575-397-9625
Sheriff's Office (Lovington)	575-396-3611
Fire Marshall (Lovington)	575-391-2983
Volunteer Fire Dept. (Jal)	575-395-2221
Emergency Management (Lovington)	575-391-2983
New Mexico Oil Conservation Division (Hobbls)	575-393-6161
BLM (Hobbs)	575-393-3612
Hobbs Animal Clinic	575-392-5563
Dal Paso Animal Hospital (Hobbs)	575-397-2286
Mountain States Equine (Hobbs)	575-392-7488
Carlsbad	
BLM	575-234-5972
Santa Fe	
New Mexico Emergency Response Commission	505-476-9600
New Mexico Emergency Response Commission (24 hrs)	505-827-9126
New Mexico State Emergency Operations Center	505-476-9635
National	
National Emergency Response Center (Washington, D.C.)	800-424-8802
Medical	
Flight for Life - 4000 24th Lubbock, Tx	806-743-9911
Aerocare - R3, Box 49F; Lubbock, Tx	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd SD, D3; Albuquerque, NM	505-842-4433
SB Air Med Service - 2505 Clark Carr Loop SE; Albuquerque, NM	505-842-4949
Other	
Boots & Coots IWC	800-256-9688
Cudd Pressure Control	432-699-0139
NM Dept. of Transportation (Roswell)	575-637-7200

5/10/2015


H2S Muster Pt.
Trailers
Topsoil Stockpile
600'
H2S Muster Pt.
Accumulator
Wind Sock
Dog House
Cellar
Cat walk
Pumps
Choke Manifold
Mud Gas Seperator
Steel Pits
Wind Sock
Cutting Bin
H2S Muster Pt.
H2S equipment
Topsoil Stockpile
Flare 150' from wellbore
600'
Access
H2S Monitors
N

Anticollision Report

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
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:	0.00 to 20,034.96usft	**Scan Method:**	Closest Approach 3D
Results Limited by:	Maximum center-center distance of 2,000.00 usft	**Error Surface:**	Pedal Curve
Warning Levels Evaluated at:	2.00 **Sigma**	**Casing Method:**	Not applied

Survey Tool Program **Date** 9/14/2018

From (usft)	To (usft)	Survey (Wellbore)	Tool Name	Description
0.00	20,034.96	Plan #2 (Lateral)	MWD+HRGM	OWSG MWD + HRGM

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
Pitchblende Fed 19-30 038H,208H,358H,458H,608H						
038H - Lateral - Plan #2	5,300.00	5,298.00	213.36	175.81	5.683	CC
038H - Lateral - Plan #2	5,400.00	5,401.31	213.84	175.57	5.588	ES
038H - Lateral - Plan #2	6,100.00	6,114.10	232.20	188.95	5.369	SF
208H - Lateral - Plan #2	7,755.55	7,776.98	99.79	44.28	1.798	CC
208H - Lateral - Plan #2	7,800.00	7,821.25	99.87	44.03	1.789	ES
208H - Lateral - Plan #2	10,100.00	10,129.87	124.48	52.28	1.724	SF
358H - Lateral - Plan #2	5,300.00	5,299.00	201.67	164.12	5.371	CC
358H - Lateral - Plan #2	5,400.00	5,401.58	201.95	163.68	5.278	ES
358H - Lateral - Plan #2	10,500.00	10,491.77	288.54	213.81	3.861	SF
608H - Lateral - Plan #2	5,300.00	5,298.00	50.04	12.50	1.333	Level 3, CC, ES, SF

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 038H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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	2.00	0.00	0.00	0.00	-159.94	-200.41	-73.18	213.36				
100.00	100.00	102.00	100.00	0.13	0.14	-159.94	-200.41	-73.18	213.36	213.08	0.28	772.961	
200.00	200.00	202.00	200.00	0.49	0.50	-159.94	-200.41	-73.18	213.36	212.36	0.99	214.867	
300.00	300.00	302.00	300.00	0.85	0.86	-159.94	-200.41	-73.18	213.36	211.65	1.71	124.776	
400.00	400.00	402.00	400.00	1.21	1.22	-159.94	-200.41	-73.18	213.36	210.93	2.43	87.914	
500.00	500.00	502.00	500.00	1.57	1.58	-159.94	-200.41	-73.18	213.36	210.21	3.14	67.866	
600.00	600.00	602.00	600.00	1.93	1.93	-159.94	-200.41	-73.18	213.36	209.49	3.86	55.263	
700.00	700.00	702.00	700.00	2.29	2.29	-159.94	-200.41	-73.18	213.36	208.78	4.58	46.608	
800.00	800.00	802.00	800.00	2.64	2.65	-159.94	-200.41	-73.18	213.36	208.06	5.29	40.297	
900.00	900.00	902.00	900.00	3.00	3.01	-159.94	-200.41	-73.18	213.36	207.34	6.01	35.491	
1,000.00	1,000.00	1,002.00	1,000.00	3.36	3.37	-159.94	-200.41	-73.18	213.36	206.63	6.73	31.709	
1,100.00	1,100.00	1,102.00	1,100.00	3.72	3.73	-159.94	-200.41	-73.18	213.36	205.91	7.45	28.656	
1,200.00	1,200.00	1,202.00	1,200.00	4.08	4.08	-159.94	-200.41	-73.18	213.36	205.19	8.16	26.139	
1,300.00	1,300.00	1,302.00	1,300.00	4.44	4.44	-159.94	-200.41	-73.18	213.36	204.48	8.88	24.028	
1,400.00	1,400.00	1,402.00	1,400.00	4.79	4.80	-159.94	-200.41	-73.18	213.36	203.76	9.60	22.233	
1,500.00	1,500.00	1,502.00	1,500.00	5.15	5.16	-159.94	-200.41	-73.18	213.36	203.04	10.31	20.688	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 038H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
1,600.00	1,600.00	1,602.00	1,600.00	5.51	5.52	-159.94	-200.41	-73.18	213.36	202.33	11.03	19.343	
1,700.00	1,700.00	1,702.00	1,700.00	5.87	5.88	-159.94	-200.41	-73.18	213.36	201.61	11.75	18.162	
1,800.00	1,800.00	1,802.00	1,800.00	6.23	6.24	-159.94	-200.41	-73.18	213.36	200.89	12.46	17.118	
1,900.00	1,900.00	1,902.00	1,900.00	6.59	6.59	-159.94	-200.41	-73.18	213.36	200.17	13.18	16.187	
2,000.00	2,000.00	2,002.00	2,000.00	6.95	6.95	-159.94	-200.41	-73.18	213.36	199.46	13.90	15.352	
2,100.00	2,100.00	2,102.00	2,100.00	7.30	7.31	-159.94	-200.41	-73.18	213.36	198.74	14.61	14.599	
2,200.00	2,200.00	2,202.00	2,200.00	7.66	7.67	-159.94	-200.41	-73.18	213.36	198.02	15.33	13.916	
2,300.00	2,300.00	2,302.00	2,300.00	8.02	8.03	-159.94	-200.41	-73.18	213.36	197.31	16.05	13.294	
2,400.00	2,400.00	2,402.00	2,400.00	8.38	8.39	-159.94	-200.41	-73.18	213.36	196.59	16.77	12.726	
2,500.00	2,500.00	2,502.00	2,500.00	8.74	8.74	-159.94	-200.41	-73.18	213.36	195.87	17.48	12.204	
2,600.00	2,600.00	2,602.00	2,600.00	9.10	9.10	-159.94	-200.41	-73.18	213.36	195.16	18.20	11.723	
2,700.00	2,700.00	2,702.00	2,700.00	9.45	9.46	-159.94	-200.41	-73.18	213.36	194.44	18.92	11.279	
2,800.00	2,800.00	2,802.00	2,800.00	9.81	9.82	-159.94	-200.41	-73.18	213.36	193.72	19.63	10.867	
2,900.00	2,900.00	2,902.00	2,900.00	10.17	10.18	-159.94	-200.41	-73.18	213.36	193.01	20.35	10.484	
3,000.00	3,000.00	3,002.00	3,000.00	10.53	10.54	-159.94	-200.41	-73.18	213.36	192.29	21.07	10.127	
3,100.00	3,100.00	3,102.00	3,100.00	10.89	10.90	-159.94	-200.41	-73.18	213.36	191.57	21.78	9.794	
3,200.00	3,200.00	3,202.00	3,200.00	11.25	11.25	-159.94	-200.41	-73.18	213.36	190.85	22.50	9.482	
3,300.00	3,300.00	3,302.00	3,300.00	11.61	11.61	-159.94	-200.41	-73.18	213.36	190.14	23.22	9.189	
3,400.00	3,400.00	3,402.00	3,400.00	11.96	11.97	-159.94	-200.41	-73.18	213.36	189.42	23.94	8.914	
3,500.00	3,500.00	3,502.00	3,500.00	12.32	12.33	-159.94	-200.41	-73.18	213.36	188.70	24.65	8.655	
3,600.00	3,600.00	3,602.00	3,600.00	12.68	12.69	-159.94	-200.41	-73.18	213.36	187.99	25.37	8.410	
3,700.00	3,700.00	3,702.00	3,700.00	13.04	13.05	-159.94	-200.41	-73.18	213.36	187.27	26.09	8.179	
3,800.00	3,800.00	3,802.00	3,800.00	13.40	13.41	-159.94	-200.41	-73.18	213.36	186.55	26.80	7.960	
3,900.00	3,900.00	3,902.00	3,900.00	13.76	13.76	-159.94	-200.41	-73.18	213.36	185.84	27.52	7.753	
4,000.00	4,000.00	4,002.00	4,000.00	14.11	14.12	-159.94	-200.41	-73.18	213.36	185.12	28.24	7.556	
4,100.00	4,100.00	4,102.00	4,100.00	14.47	14.48	-159.94	-200.41	-73.18	213.36	184.40	28.95	7.369	
4,200.00	4,200.00	4,202.00	4,200.00	14.83	14.84	-159.94	-200.41	-73.18	213.36	183.68	29.67	7.191	
4,300.00	4,300.00	4,302.00	4,300.00	15.19	15.20	-159.94	-200.41	-73.18	213.36	182.97	30.39	7.021	
4,400.00	4,400.00	4,402.00	4,400.00	15.55	15.56	-159.94	-200.41	-73.18	213.36	182.25	31.10	6.859	
4,500.00	4,500.00	4,502.00	4,500.00	15.91	15.91	-159.94	-200.41	-73.18	213.36	181.53	31.82	6.705	
4,600.00	4,600.00	4,602.00	4,600.00	16.27	16.27	-159.94	-200.41	-73.18	213.36	180.82	32.54	6.557	
4,700.00	4,700.00	4,702.00	4,700.00	16.62	16.63	-159.94	-200.41	-73.18	213.36	180.10	33.26	6.416	
4,800.00	4,800.00	4,802.00	4,800.00	16.98	16.99	-159.94	-200.41	-73.18	213.36	179.38	33.97	6.280	
4,900.00	4,900.00	4,902.00	4,900.00	17.34	17.35	-159.94	-200.41	-73.18	213.36	178.67	34.69	6.150	
5,000.00	5,000.00	5,002.00	5,000.00	17.70	17.71	-159.94	-200.41	-73.18	213.36	177.95	35.41	6.026	
5,100.00	5,100.00	5,102.00	5,100.00	18.06	18.07	-159.94	-200.41	-73.18	213.36	177.23	36.12	5.906	
5,200.00	5,200.00	5,202.00	5,200.00	18.42	18.42	-159.94	-200.41	-73.18	213.36	176.52	36.84	5.791	
5,300.00	5,300.00	5,298.00	5,300.00	18.77	18.77	-159.94	-200.41	-73.18	213.36	175.81	37.54	5.683	CC
5,400.00	5,399.99	5,401.31	5,403.30	19.13	19.14	162.14	-199.30	-73.93	213.84	175.57	38.26	5.588	ES
5,500.00	5,499.91	5,504.54	5,506.44	19.49	19.50	163.36	-195.86	-76.23	215.29	176.31	38.97	5.524	
5,600.00	5,599.69	5,607.46	5,609.12	19.84	19.87	165.35	-190.14	-80.07	217.89	178.21	39.68	5.491	
5,633.44	5,633.01	5,641.77	5,643.32	19.96	19.99	166.18	-187.72	-81.70	219.06	179.15	39.92	5.488	
5,700.00	5,699.32	5,709.95	5,711.17	20.20	20.23	168.02	-182.16	-85.43	221.37	180.99	40.38	5.482	
5,800.00	5,798.94	5,812.00	5,812.47	20.55	20.60	171.22	-171.95	-92.27	224.23	183.14	41.09	5.457	
5,900.00	5,898.56	5,913.47	5,912.83	20.91	20.96	174.92	-159.59	-100.56	226.68	184.89	41.80	5.423	
6,000.00	5,998.18	6,014.21	6,012.06	21.26	21.32	179.13	-145.12	-110.27	229.17	186.66	42.52	5.390	
6,100.00	6,097.80	6,114.10	6,109.96	21.62	21.68	-176.19	-128.63	-121.32	232.20	188.95	43.25	5.369	SF
6,200.00	6,197.42	6,212.48	6,205.91	21.98	22.04	-171.21	-110.63	-133.40	236.37	192.39	43.98	5.375	
6,300.00	6,297.04	6,310.19	6,301.17	22.34	22.40	-166.41	-92.55	-145.52	242.28	197.58	44.71	5.420	
6,400.00	6,396.66	6,407.90	6,396.42	22.69	22.76	-161.86	-74.47	-157.65	249.88	204.46	45.42	5.501	
6,500.00	6,496.28	6,505.61	6,491.67	23.05	23.13	-157.59	-56.38	-169.78	259.00	212.87	46.13	5.615	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 038H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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
6,600.00	6,595.90	6,603.32	6,586.92	23.41	23.50	-153.63	-38.30	-181.91	269.50	222.67	46.83	5.755	
6,700.00	6,695.52	6,701.03	6,682.18	23.77	23.87	-149.96	-20.21	-194.04	281.22	233.69	47.53	5.917	
6,800.00	6,795.13	6,801.26	6,777.43	24.13	24.25	-146.60	-2.13	-206.16	294.01	245.78	48.23	6.096	
6,900.00	6,894.75	6,903.55	6,872.68	24.49	24.65	-143.51	15.95	-218.29	307.75	258.81	48.94	6.288	
7,000.00	6,994.37	7,005.85	6,967.93	24.86	25.05	-140.69	34.04	-230.42	322.31	272.66	49.65	6.492	
7,100.00	7,093.99	7,108.14	7,063.18	25.22	25.45	-138.12	52.12	-242.55	337.58	287.22	50.36	6.703	
7,200.00	7,193.61	7,189.57	7,158.44	25.58	25.77	-135.76	70.20	-254.68	353.47	302.48	50.99	6.932	
7,300.00	7,293.23	7,287.28	7,253.69	25.94	26.16	-133.61	88.29	-266.81	369.91	318.22	51.69	7.156	
7,400.00	7,392.85	7,384.99	7,348.94	26.31	26.55	-131.64	106.37	-278.93	386.82	334.43	52.39	7.383	
7,500.00	7,492.47	7,482.70	7,444.19	26.67	26.94	-129.84	124.45	-291.06	404.14	351.05	53.09	7.612	
7,600.00	7,592.09	7,580.41	7,539.44	27.03	27.34	-128.18	142.54	-303.19	421.82	368.03	53.79	7.841	
7,700.00	7,691.71	7,684.86	7,641.55	27.40	27.76	-126.70	160.79	-315.43	439.10	384.50	54.60	8.042	
7,800.00	7,791.33	7,790.54	7,745.44	27.76	28.18	-125.61	176.89	-326.23	455.01	399.59	55.42	8.210	
7,900.00	7,890.95	7,897.08	7,850.67	28.13	28.60	-124.89	190.69	-335.49	469.38	413.15	56.23	8.347	
8,000.00	7,990.57	8,004.31	7,957.01	28.49	29.01	-124.49	202.12	-343.15	482.13	425.09	57.04	8.452	
8,100.00	8,090.19	8,112.08	8,064.23	28.85	29.41	-124.39	211.11	-349.18	493.19	435.35	57.84	8.527	
8,200.00	8,189.80	8,220.21	8,172.07	29.22	29.81	-124.57	217.59	-353.53	502.53	443.91	58.62	8.572	
8,300.00	8,289.42	8,328.53	8,280.28	29.59	30.20	-125.02	221.55	-356.18	510.18	450.79	59.39	8.590	
8,400.00	8,389.04	8,436.87	8,388.61	29.95	30.58	-125.73	222.95	-357.12	516.17	456.03	60.14	8.583	
8,500.00	8,488.66	8,536.92	8,488.66	30.32	30.93	-126.51	222.95	-357.12	521.32	460.46	60.86	8.566	
8,599.98	8,588.26	8,637.91	8,589.21	30.68	31.24	-128.15	215.00	-357.05	526.43	464.88	61.54	8.554	
8,603.72	8,591.99	8,641.57	8,592.81	30.70	31.25	-128.24	214.38	-357.04	526.62	465.05	61.57	8.553	
8,700.00	8,688.00	8,731.68	8,679.99	31.05	31.48	-131.27	191.94	-356.83	531.68	469.50	62.18	8.551	
8,800.00	8,787.87	8,815.39	8,756.91	31.41	31.67	-135.16	159.10	-356.53	538.43	475.74	62.68	8.589	
8,900.00	8,887.84	8,888.30	8,819.39	31.77	31.81	-139.30	121.62	-356.18	549.01	486.10	62.91	8.726	
8,937.16	8,925.00	8,912.74	8,839.21	31.90	31.85	-102.51	107.32	-356.04	554.33	491.44	62.89	8.814	
9,000.00	8,987.84	8,950.00	8,868.20	32.12	31.91	-104.89	83.92	-355.82	565.78	503.10	62.68	9.027	
9,100.00	9,087.84	9,000.00	8,904.59	32.48	31.98	-108.27	49.66	-355.50	591.56	529.73	61.83	9.568	
9,200.00	9,187.84	9,050.00	8,937.86	32.83	32.04	-111.81	12.36	-355.15	626.91	566.29	60.62	10.341	
9,300.00	9,287.84	9,085.02	8,959.17	33.19	32.08	-114.35	-15.42	-354.89	671.51	612.64	58.87	11.408	
9,400.00	9,387.84	9,116.58	8,976.88	33.54	32.11	-116.64	-41.54	-354.65	724.44	667.48	56.96	12.718	
9,500.00	9,487.84	9,150.00	8,994.04	33.90	32.14	-119.06	-70.21	-354.38	784.63	729.44	55.19	14.217	
9,600.00	9,587.84	9,166.64	9,001.96	34.26	32.16	-120.26	-84.85	-354.25	850.77	797.57	53.19	15.993	
9,700.00	9,687.84	9,186.68	9,010.92	34.61	32.18	-121.68	-102.77	-354.08	921.99	870.47	51.51	17.897	
9,800.00	9,787.84	9,200.00	9,016.52	34.97	32.19	-122.62	-114.85	-353.97	997.36	947.42	49.94	19.972	
9,900.00	9,887.84	9,219.53	9,024.23	35.32	32.21	-123.98	-132.79	-353.80	1,076.10	1,027.37	48.73	22.083	
10,000.00	9,987.84	9,233.11	9,029.23	35.68	32.22	-124.91	-145.42	-353.68	1,157.67	1,110.05	47.63	24.308	
10,100.00	10,087.84	9,250.00	9,035.03	36.03	32.24	-126.05	-161.28	-353.53	1,241.60	1,194.82	46.77	26.544	
10,200.00	10,187.84	9,250.00	9,035.03	36.39	32.24	-126.05	-161.28	-353.53	1,327.45	1,281.63	45.82	28.971	
10,300.00	10,287.84	9,250.00	9,035.03	36.75	32.24	-126.05	-161.28	-353.53	1,415.16	1,370.12	45.05	31.417	
10,400.00	10,387.84	9,274.52	9,042.61	37.10	32.27	-127.66	-184.59	-353.31	1,503.72	1,458.97	44.75	33.600	
10,500.00	10,487.84	9,282.49	9,044.85	37.46	32.28	-128.18	-192.24	-353.24	1,593.74	1,549.40	44.34	35.946	
10,600.00	10,587.84	9,300.00	9,049.42	37.82	32.30	-129.30	-209.14	-353.08	1,684.87	1,640.74	44.13	38.177	
10,700.00	10,687.84	9,300.00	9,049.42	38.17	32.30	-129.30	-209.14	-353.08	1,776.65	1,732.84	43.80	40.559	
10,800.00	10,787.84	9,300.00	9,049.42	38.53	32.30	-129.30	-209.14	-353.08	1,869.27	1,825.71	43.56	42.912	
10,900.00	10,887.84	9,300.00	9,049.42	38.88	32.30	-129.30	-209.14	-353.08	1,962.61	1,919.22	43.39	45.233	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 208H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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	-173.40	-200.14	-23.17	201.48				
100.00	100.00	101.00	100.00	0.13	0.14	-173.40	-200.14	-23.17	201.48	201.20	0.27	739.533	
200.00	200.00	201.00	200.00	0.49	0.50	-173.40	-200.14	-23.17	201.48	200.49	0.99	203.640	
300.00	300.00	301.00	300.00	0.85	0.85	-173.40	-200.14	-23.17	201.48	199.77	1.71	118.077	
400.00	400.00	401.00	400.00	1.21	1.21	-173.40	-200.14	-23.17	201.48	199.05	2.42	83.143	
500.00	500.00	501.00	500.00	1.57	1.57	-173.40	-200.14	-23.17	201.48	198.34	3.14	64.160	
600.00	600.00	601.00	600.00	1.93	1.93	-173.40	-200.14	-23.17	201.48	197.62	3.86	52.235	
700.00	700.00	701.00	700.00	2.29	2.29	-173.40	-200.14	-23.17	201.48	196.90	4.57	44.047	
800.00	800.00	801.00	800.00	2.64	2.65	-173.40	-200.14	-23.17	201.48	196.19	5.29	38.079	
900.00	900.00	901.00	900.00	3.00	3.01	-173.40	-200.14	-23.17	201.48	195.47	6.01	33.535	
1,000.00	1,000.00	1,001.00	1,000.00	3.36	3.36	-173.40	-200.14	-23.17	201.48	194.75	6.72	29.960	
1,100.00	1,100.00	1,101.00	1,100.00	3.72	3.72	-173.40	-200.14	-23.17	201.48	194.04	7.44	27.073	
1,200.00	1,200.00	1,201.00	1,200.00	4.08	4.08	-173.40	-200.14	-23.17	201.48	193.32	8.16	24.694	
1,300.00	1,300.00	1,301.00	1,300.00	4.44	4.44	-173.40	-200.14	-23.17	201.48	192.60	8.88	22.700	
1,400.00	1,400.00	1,401.00	1,400.00	4.79	4.80	-173.40	-200.14	-23.17	201.48	191.88	9.59	21.003	
1,500.00	1,500.00	1,501.00	1,500.00	5.15	5.16	-173.40	-200.14	-23.17	201.48	191.17	10.31	19.543	
1,600.00	1,600.00	1,601.00	1,600.00	5.51	5.52	-173.40	-200.14	-23.17	201.48	190.45	11.03	18.272	
1,700.00	1,700.00	1,701.00	1,700.00	5.87	5.87	-173.40	-200.14	-23.17	201.48	189.73	11.74	17.156	
1,800.00	1,800.00	1,801.00	1,800.00	6.23	6.23	-173.40	-200.14	-23.17	201.48	189.02	12.46	16.169	
1,900.00	1,900.00	1,901.00	1,900.00	6.59	6.59	-173.40	-200.14	-23.17	201.48	188.30	13.18	15.290	
2,000.00	2,000.00	2,001.00	2,000.00	6.95	6.95	-173.40	-200.14	-23.17	201.48	187.58	13.89	14.501	
2,100.00	2,100.00	2,101.00	2,100.00	7.30	7.31	-173.40	-200.14	-23.17	201.48	186.87	14.61	13.789	
2,200.00	2,200.00	2,201.00	2,200.00	7.66	7.67	-173.40	-200.14	-23.17	201.48	186.15	15.33	13.144	
2,300.00	2,300.00	2,301.00	2,300.00	8.02	8.02	-173.40	-200.14	-23.17	201.48	185.43	16.05	12.557	
2,400.00	2,400.00	2,401.00	2,400.00	8.38	8.38	-173.40	-200.14	-23.17	201.48	184.72	16.76	12.020	
2,500.00	2,500.00	2,501.00	2,500.00	8.74	8.74	-173.40	-200.14	-23.17	201.48	184.00	17.48	11.527	
2,600.00	2,600.00	2,601.00	2,600.00	9.10	9.10	-173.40	-200.14	-23.17	201.48	183.28	18.20	11.073	
2,700.00	2,700.00	2,701.00	2,700.00	9.45	9.46	-173.40	-200.14	-23.17	201.48	182.56	18.91	10.653	
2,800.00	2,800.00	2,801.00	2,800.00	9.81	9.82	-173.40	-200.14	-23.17	201.48	181.85	19.63	10.264	
2,900.00	2,900.00	2,901.00	2,900.00	10.17	10.18	-173.40	-200.14	-23.17	201.48	181.13	20.35	9.902	
3,000.00	3,000.00	3,001.00	3,000.00	10.53	10.53	-173.40	-200.14	-23.17	201.48	180.41	21.06	9.565	
3,100.00	3,100.00	3,101.00	3,100.00	10.89	10.89	-173.40	-200.14	-23.17	201.48	179.70	21.78	9.250	
3,200.00	3,200.00	3,201.00	3,200.00	11.25	11.25	-173.40	-200.14	-23.17	201.48	178.98	22.50	8.955	
3,300.00	3,300.00	3,301.00	3,300.00	11.61	11.61	-173.40	-200.14	-23.17	201.48	178.26	23.21	8.679	
3,400.00	3,400.00	3,401.00	3,400.00	11.96	11.97	-173.40	-200.14	-23.17	201.48	177.55	23.93	8.419	
3,500.00	3,500.00	3,501.00	3,500.00	12.32	12.33	-173.40	-200.14	-23.17	201.48	176.83	24.65	8.174	
3,600.00	3,600.00	3,601.00	3,600.00	12.68	12.68	-173.40	-200.14	-23.17	201.48	176.11	25.37	7.943	
3,700.00	3,700.00	3,701.00	3,700.00	13.04	13.04	-173.40	-200.14	-23.17	201.48	175.39	26.08	7.725	
3,800.00	3,800.00	3,801.00	3,800.00	13.40	13.40	-173.40	-200.14	-23.17	201.48	174.68	26.80	7.518	
3,900.00	3,900.00	3,901.00	3,900.00	13.76	13.76	-173.40	-200.14	-23.17	201.48	173.96	27.52	7.322	
4,000.00	4,000.00	4,001.00	4,000.00	14.11	14.12	-173.40	-200.14	-23.17	201.48	173.24	28.23	7.136	
4,100.00	4,100.00	4,101.00	4,100.00	14.47	14.48	-173.40	-200.14	-23.17	201.48	172.53	28.95	6.959	
4,200.00	4,200.00	4,201.00	4,200.00	14.83	14.84	-173.40	-200.14	-23.17	201.48	171.81	29.67	6.791	
4,300.00	4,300.00	4,301.00	4,300.00	15.19	15.19	-173.40	-200.14	-23.17	201.48	171.09	30.38	6.631	
4,400.00	4,400.00	4,401.00	4,400.00	15.55	15.55	-173.40	-200.14	-23.17	201.48	170.38	31.10	6.478	
4,500.00	4,500.00	4,501.00	4,500.00	15.91	15.91	-173.40	-200.14	-23.17	201.48	169.66	31.82	6.332	
4,600.00	4,600.00	4,601.00	4,600.00	16.27	16.27	-173.40	-200.14	-23.17	201.48	168.94	32.53	6.193	
4,700.00	4,700.00	4,701.00	4,700.00	16.62	16.63	-173.40	-200.14	-23.17	201.48	168.23	33.25	6.059	
4,800.00	4,800.00	4,801.00	4,800.00	16.98	16.99	-173.40	-200.14	-23.17	201.48	167.51	33.97	5.931	
4,900.00	4,900.00	4,901.00	4,900.00	17.34	17.34	-173.40	-200.14	-23.17	201.48	166.79	34.69	5.809	
5,000.00	5,000.00	5,001.00	5,000.00	17.70	17.70	-173.40	-200.14	-23.17	201.48	166.07	35.40	5.691	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 208H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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
5,100.00	5,100.00	5,101.00	5,100.00	18.06	18.06	-173.40	-200.14	-23.17	201.48	165.36	36.12	5.578	
5,200.00	5,200.00	5,201.00	5,200.00	18.42	18.42	-173.40	-200.14	-23.17	201.48	164.64	36.84	5.469	
5,300.00	5,300.00	5,299.00	5,300.00	18.77	18.77	-173.40	-200.14	-23.17	201.48	163.93	37.55	5.366	
5,400.00	5,399.99	5,403.70	5,404.69	19.13	19.14	148.29	-199.02	-22.32	201.44	163.17	38.27	5.264	
5,500.00	5,499.91	5,508.44	5,509.34	19.49	19.52	148.28	-195.62	-19.72	201.27	162.30	38.97	5.165	
5,600.00	5,599.69	5,613.18	5,613.83	19.84	19.89	148.27	-189.94	-15.38	200.97	161.32	39.65	5.069	
5,633.44	5,633.01	5,648.20	5,648.72	19.96	20.01	148.26	-187.54	-13.54	200.84	160.96	39.87	5.037	
5,700.00	5,699.32	5,717.90	5,718.07	20.20	20.26	148.15	-181.99	-9.31	200.05	159.73	40.31	4.962	
5,800.00	5,798.94	5,822.49	5,821.86	20.55	20.63	147.63	-171.79	-1.51	196.91	155.95	40.96	4.807	
5,900.00	5,898.56	5,926.80	5,924.99	20.91	21.00	146.64	-159.36	7.98	191.47	149.87	41.60	4.603	
6,000.00	5,998.18	6,028.26	6,024.94	21.26	21.36	145.22	-145.47	18.58	184.20	141.92	42.28	4.357	
6,100.00	6,097.80	6,127.87	6,123.02	21.62	21.72	143.67	-131.65	29.15	176.85	133.85	43.00	4.112	
6,200.00	6,197.42	6,227.48	6,221.10	21.98	22.08	141.99	-117.82	39.71	169.64	125.91	43.73	3.879	
6,300.00	6,297.04	6,327.10	6,319.17	22.34	22.45	140.16	-103.99	50.27	162.60	118.13	44.47	3.656	
6,400.00	6,396.66	6,426.71	6,417.25	22.69	22.81	138.16	-90.16	60.83	155.73	110.52	45.21	3.445	
6,500.00	6,496.28	6,526.32	6,515.33	23.05	23.18	135.99	-76.34	71.39	149.06	103.12	45.95	3.244	
6,600.00	6,595.90	6,625.93	6,613.41	23.41	23.55	133.62	-62.51	81.95	142.63	95.94	46.70	3.055	
6,700.00	6,695.52	6,725.54	6,711.49	23.77	23.92	131.03	-48.68	92.52	136.47	89.02	47.45	2.876	
6,800.00	6,795.13	6,825.15	6,809.57	24.13	24.29	128.20	-34.85	103.08	130.62	82.41	48.21	2.710	
6,900.00	6,894.75	6,924.76	6,907.65	24.49	24.67	125.11	-21.03	113.64	125.11	76.14	48.97	2.555	
7,000.00	6,994.37	7,024.37	7,005.73	24.86	25.04	121.76	-7.20	124.20	119.99	70.26	49.74	2.413	
7,100.00	7,093.99	7,123.98	7,103.81	25.22	25.42	118.12	6.63	134.76	115.33	64.82	50.51	2.283	
7,200.00	7,193.61	7,223.59	7,201.88	25.58	25.80	114.19	20.46	145.32	111.17	59.89	51.28	2.168	
7,300.00	7,293.23	7,323.20	7,299.96	25.94	26.18	109.98	34.28	155.88	107.58	55.52	52.05	2.067	
7,400.00	7,392.85	7,422.81	7,398.04	26.31	26.56	105.51	48.11	166.45	104.60	51.78	52.83	1.980	
7,500.00	7,492.47	7,522.42	7,496.12	26.67	26.94	100.81	61.94	177.01	102.31	48.71	53.59	1.909	
7,600.00	7,592.09	7,622.03	7,594.20	27.03	27.33	95.92	75.77	187.57	100.73	46.38	54.35	1.853	
7,700.00	7,691.71	7,721.64	7,692.28	27.40	27.71	90.93	89.59	198.13	99.91	44.81	55.10	1.813	
7,755.55	7,747.05	7,776.98	7,746.77	27.60	27.93	88.13	97.27	204.00	99.79	44.28	55.51	1.798 CC	
7,800.00	7,791.33	7,821.25	7,790.36	27.76	28.10	85.89	103.42	208.69	99.87	44.03	55.83	1.789 ES	
7,900.00	7,890.95	7,920.86	7,888.44	28.13	28.49	80.88	117.25	219.25	100.60	44.05	56.56	1.779	
8,000.00	7,990.57	8,020.47	7,986.52	28.49	28.87	75.98	131.08	229.82	102.09	44.83	57.27	1.783	
8,100.00	8,090.19	8,120.08	8,084.60	28.85	29.26	71.26	144.90	240.38	104.31	46.35	57.96	1.800	
8,200.00	8,189.80	8,219.69	8,182.67	29.22	29.65	66.76	158.73	250.94	107.21	48.56	58.65	1.828	
8,300.00	8,289.42	8,319.30	8,280.75	29.59	30.05	62.52	172.56	261.50	110.74	51.41	59.33	1.866	
8,400.00	8,389.04	8,419.62	8,379.58	29.95	30.44	58.65	186.26	271.97	114.70	54.67	60.03	1.911	
8,500.00	8,488.66	8,521.05	8,479.87	30.32	30.83	55.95	198.32	281.18	117.89	57.12	60.78	1.940	
8,599.98	8,588.26	8,622.74	8,580.77	30.68	31.22	54.43	208.28	288.78	119.79	58.26	61.53	1.947	
8,603.72	8,591.99	8,626.54	8,584.56	30.70	31.24	54.39	208.61	289.04	119.84	58.28	61.56	1.947	
8,700.00	8,688.00	8,724.58	8,682.13	31.05	31.60	53.55	216.11	294.76	120.94	58.67	62.28	1.942	
8,800.00	8,787.87	8,826.46	8,783.76	31.41	31.98	52.71	221.79	299.10	122.12	59.12	63.01	1.938	
8,900.00	8,887.84	8,928.39	8,885.59	31.77	32.34	51.92	225.32	301.80	123.34	59.61	63.72	1.936	
8,937.16	8,925.00	8,966.29	8,923.47	31.90	32.48	89.96	226.08	302.38	123.79	59.81	63.98	1.935	
9,000.00	8,987.84	9,030.39	8,987.58	32.12	32.70	89.68	226.69	302.84	124.25	59.83	64.42	1.929	
9,100.00	9,087.84	9,130.66	9,087.84	32.48	33.05	89.67	226.70	302.86	124.26	59.14	65.12	1.908	
9,200.00	9,187.84	9,230.66	9,187.84	32.83	33.40	89.67	226.70	302.86	124.26	58.43	65.83	1.888	
9,300.00	9,287.84	9,330.66	9,287.84	33.19	33.75	89.67	226.70	302.86	124.26	57.72	66.54	1.868	
9,400.00	9,387.84	9,430.66	9,387.84	33.54	34.10	89.67	226.70	302.86	124.26	57.02	67.25	1.848	
9,500.00	9,487.84	9,530.66	9,487.84	33.90	34.45	89.67	226.70	302.86	124.26	56.31	67.95	1.829	
9,600.00	9,587.84	9,630.66	9,587.84	34.26	34.80	89.67	226.70	302.86	124.26	55.60	68.66	1.810	
9,700.00	9,687.84	9,730.66	9,687.84	34.61	35.15	89.67	226.70	302.86	124.26	54.89	69.37	1.791	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 208H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
9,800.00	9,787.84	9,830.66	9,787.84	34.97	35.50	89.67	226.70	302.86	124.26	54.19	70.08	1.773	
9,900.00	9,887.84	9,930.66	9,887.84	35.32	35.85	89.67	226.70	302.86	124.26	53.48	70.78	1.756	
10,000.00	9,987.84	10,030.66	9,987.84	35.68	36.20	89.67	226.70	302.86	124.26	52.77	71.49	1.738	
10,005.95	9,993.80	10,036.61	9,993.80	35.70	36.22	89.67	226.70	302.86	124.26	52.73	71.53	1.737	
10,100.00	10,087.84	10,129.87	10,086.69	36.03	36.51	92.85	219.80	302.92	124.48	52.28	72.20	1.724 SF	
10,200.00	10,187.84	10,224.01	10,178.09	36.39	36.76	102.81	197.68	303.13	128.08	55.24	72.84	1.758	
10,300.00	10,287.84	10,308.98	10,256.48	36.75	36.96	116.00	165.11	303.43	142.39	69.97	72.42	1.966	
10,400.00	10,387.84	10,382.94	10,320.16	37.10	37.11	128.17	127.59	303.78	173.02	102.95	70.07	2.469	
10,500.00	10,487.84	10,445.90	10,370.18	37.46	37.21	137.41	89.41	304.14	219.69	153.10	66.59	3.299	
10,600.00	10,587.84	10,500.00	10,409.60	37.82	37.28	144.05	52.38	304.49	278.86	215.65	63.21	4.412	
10,700.00	10,687.84	10,543.50	10,438.65	38.17	37.33	148.51	20.02	304.79	347.06	286.97	60.09	5.776	
10,800.00	10,787.84	10,581.06	10,461.69	38.53	37.37	151.78	-9.63	305.07	421.77	364.13	57.64	7.318	
10,900.00	10,887.84	10,612.87	10,479.66	38.88	37.40	154.18	-35.88	305.31	501.25	445.56	55.68	9.002	
11,000.00	10,987.84	10,640.01	10,493.81	39.24	37.42	156.00	-59.03	305.53	584.31	530.16	54.15	10.791	
11,100.00	11,087.84	10,663.34	10,505.09	39.60	37.44	157.40	-79.45	305.72	670.11	617.17	52.95	12.656	
11,200.00	11,187.84	10,683.55	10,514.18	39.95	37.45	158.52	-97.49	305.89	758.07	706.04	52.02	14.572	
11,300.00	11,287.84	10,700.00	10,521.11	40.31	37.47	159.37	-112.41	306.03	847.72	796.45	51.27	16.533	
11,400.00	11,387.84	10,716.65	10,527.69	40.67	37.48	160.17	-127.71	306.17	938.75	887.97	50.78	18.486	
11,500.00	11,487.84	10,730.35	10,532.76	41.02	37.49	160.79	-140.43	306.29	1,030.90	980.51	50.39	20.458	
11,600.00	11,587.84	10,750.00	10,539.50	41.38	37.50	161.62	-158.89	306.46	1,124.06	1,073.76	50.29	22.349	
11,700.00	11,687.84	10,750.00	10,539.50	41.74	37.50	161.62	-158.89	306.46	1,217.86	1,167.98	49.87	24.419	
11,800.00	11,787.84	10,750.00	10,539.50	42.09	37.50	161.62	-158.89	306.46	1,312.57	1,262.96	49.61	26.460	
11,899.98	11,887.82	10,772.06	10,546.31	42.45	37.52	162.49	-179.87	306.66	1,407.40	1,357.58	49.82	28.252	
11,904.20	11,892.04	10,772.42	10,546.42	42.46	37.52	162.50	-180.21	306.66	1,411.42	1,361.60	49.82	28.332	
11,950.00	11,937.80	10,776.67	10,547.63	42.62	37.52	-6.27	-184.28	306.70	1,454.56	1,404.76	49.80	29.207	
12,000.00	11,987.40	10,782.17	10,549.16	42.77	37.53	-5.03	-189.57	306.75	1,500.27	1,450.52	49.75	30.154	
12,050.00	12,036.28	10,800.00	10,553.77	42.93	37.54	-4.00	-206.79	306.91	1,544.47	1,494.63	49.85	30.984	
12,100.00	12,084.05	10,800.00	10,553.77	43.07	37.54	-3.49	-206.79	306.91	1,586.49	1,536.84	49.65	31.953	
12,150.00	12,130.37	10,800.00	10,553.77	43.20	37.54	-3.11	-206.79	306.91	1,626.53	1,577.09	49.45	32.895	
12,200.00	12,174.88	10,800.00	10,553.77	43.33	37.54	-2.81	-206.79	306.91	1,664.46	1,615.22	49.24	33.805	
12,250.00	12,217.23	10,820.43	10,558.39	43.44	37.56	-2.40	-226.69	307.09	1,699.63	1,650.39	49.24	34.516	
12,300.00	12,257.11	10,829.75	10,560.26	43.54	37.57	-2.15	-235.82	307.18	1,732.37	1,683.26	49.11	35.272	
12,350.00	12,294.20	10,850.00	10,563.81	43.63	37.59	-1.87	-255.76	307.37	1,762.51	1,713.43	49.08	35.910	
12,400.00	12,328.24	10,850.00	10,563.81	43.71	37.59	-1.77	-255.76	307.37	1,789.54	1,740.67	48.87	36.617	
12,450.00	12,358.96	10,850.00	10,563.81	43.82	37.59	-1.69	-255.76	307.37	1,813.86	1,765.17	48.69	37.252	
12,500.00	12,386.12	10,870.67	10,566.70	43.93	37.62	-1.50	-276.22	307.56	1,834.91	1,786.24	48.67	37.704	
12,550.00	12,409.53	10,881.58	10,567.93	44.04	37.63	-1.40	-287.06	307.66	1,852.95	1,804.35	48.59	38.132	
12,600.00	12,428.99	10,900.00	10,569.54	44.15	37.65	-1.26	-305.41	307.83	1,867.85	1,819.28	48.57	38.454	
12,650.00	12,444.37	10,900.00	10,569.54	44.25	37.65	-1.24	-305.41	307.83	1,879.40	1,830.90	48.51	38.745	
12,700.00	12,455.55	10,915.27	10,570.43	44.36	37.67	-1.14	-320.65	307.97	1,887.70	1,839.17	48.53	38.899	
12,750.00	12,462.44	10,940.86	10,571.00	44.47	37.70	-1.01	-346.23	308.21	1,892.92	1,844.32	48.59	38.955	
12,799.97	12,464.98	10,940.86	10,571.00	44.57	37.70	-1.01	-346.23	308.21	1,894.36	1,845.70	48.65	38.938	
12,804.19	12,465.00	10,940.86	10,571.00	44.58	37.70	-1.01	-346.23	308.21	1,894.34	1,845.68	48.66	38.931	
12,900.00	12,465.00	11,028.27	10,571.00	44.80	37.85	-0.65	-433.64	309.03	1,894.12	1,845.22	48.90	38.732	
13,000.00	12,465.00	11,127.71	10,571.00	45.08	38.08	-0.33	-533.08	309.96	1,894.03	1,844.82	49.22	38.483	
13,100.00	12,465.00	11,227.46	10,571.00	45.38	38.35	-0.12	-632.82	310.89	1,894.00	1,844.42	49.59	38.197	
13,200.00	12,465.00	11,327.39	10,571.00	45.73	38.68	-0.01	-732.74	311.82	1,894.00	1,843.99	50.01	37.874	
13,242.85	12,465.00	11,370.24	10,571.00	45.89	38.84	0.00	-775.59	312.22	1,894.00	1,843.80	50.20	37.726	
13,252.43	12,465.00	11,379.82	10,571.00	45.92	38.88	0.00	-785.17	312.31	1,894.00	1,843.75	50.25	37.693	
13,300.00	12,465.00	11,427.39	10,571.00	46.11	39.06	0.00	-832.74	312.76	1,894.00	1,843.52	50.48	37.520	
13,400.00	12,465.00	11,527.39	10,571.00	46.52	39.49	0.00	-932.73	313.69	1,894.00	1,843.00	51.00	37.139	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 208H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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
13,500.00	12,465.00	11,627.39	10,571.00	46.98	39.96	0.00	-1,032.73	314.63	1,894.00	1,842.44	51.56	36.736	
13,600.00	12,465.00	11,727.39	10,571.00	47.48	40.48	0.00	-1,132.72	315.56	1,894.00	1,841.84	52.16	36.312	
13,700.00	12,465.00	11,827.39	10,571.00	48.01	41.04	0.00	-1,232.72	316.49	1,894.00	1,841.20	52.80	35.870	
13,800.00	12,465.00	11,927.39	10,571.00	48.58	41.64	0.00	-1,332.71	317.43	1,894.00	1,840.52	53.48	35.414	
13,900.00	12,465.00	12,027.39	10,571.00	49.19	42.28	0.00	-1,432.71	318.36	1,894.00	1,839.80	54.20	34.945	
14,000.00	12,465.00	12,127.39	10,571.00	49.82	42.96	0.00	-1,532.71	319.30	1,894.00	1,839.05	54.95	34.467	
14,100.00	12,465.00	12,227.39	10,571.00	50.50	43.68	0.00	-1,632.70	320.23	1,894.00	1,838.26	55.74	33.980	
14,200.00	12,465.00	12,327.39	10,571.00	51.20	44.43	0.00	-1,732.70	321.17	1,894.00	1,837.44	56.56	33.488	
14,300.00	12,465.00	12,427.39	10,571.00	51.93	45.21	0.00	-1,832.69	322.10	1,894.00	1,836.59	57.41	32.992	
14,400.00	12,465.00	12,527.39	10,571.00	52.69	46.03	0.00	-1,932.69	323.04	1,894.00	1,835.71	58.29	32.494	
14,500.00	12,465.00	12,627.39	10,571.00	53.48	46.87	0.00	-2,032.68	323.97	1,894.00	1,834.80	59.20	31.995	
14,600.00	12,465.00	12,727.39	10,571.00	54.30	47.75	0.00	-2,132.68	324.90	1,894.00	1,833.87	60.13	31.497	
14,700.00	12,465.00	12,827.39	10,571.00	55.14	48.65	0.00	-2,232.68	325.84	1,894.00	1,832.91	61.09	31.001	
14,800.00	12,465.00	12,927.39	10,571.00	56.01	49.57	0.00	-2,332.67	326.77	1,894.00	1,831.92	62.08	30.509	
14,900.00	12,465.00	13,027.39	10,571.00	56.90	50.52	0.00	-2,432.67	327.71	1,894.00	1,830.91	63.09	30.021	
15,000.00	12,465.00	13,127.39	10,571.00	57.81	51.49	0.00	-2,532.66	328.64	1,894.00	1,829.88	64.12	29.538	
15,100.00	12,465.00	13,227.39	10,571.00	58.74	52.48	0.00	-2,632.66	329.58	1,894.00	1,828.83	65.17	29.061	
15,200.00	12,465.00	13,327.39	10,571.00	59.69	53.49	0.00	-2,732.65	330.51	1,894.00	1,827.75	66.25	28.590	
15,300.00	12,465.00	13,427.39	10,571.00	60.66	54.53	0.00	-2,832.65	331.44	1,894.00	1,826.66	67.34	28.126	
15,400.00	12,465.00	13,527.39	10,571.00	61.65	55.58	0.00	-2,932.64	332.38	1,894.00	1,825.55	68.45	27.670	
15,500.00	12,465.00	13,627.39	10,571.00	62.66	56.64	0.00	-3,032.64	333.31	1,894.00	1,824.42	69.58	27.221	
15,600.00	12,465.00	13,727.39	10,571.00	63.68	57.72	0.00	-3,132.64	334.25	1,894.00	1,823.28	70.72	26.780	
15,700.00	12,465.00	13,827.39	10,571.00	64.72	58.82	0.00	-3,232.63	335.18	1,894.00	1,822.12	71.88	26.348	
15,800.00	12,465.00	13,927.39	10,571.00	65.78	59.93	0.00	-3,332.63	336.12	1,894.00	1,820.94	73.06	25.924	
15,900.00	12,465.00	14,027.39	10,571.00	66.84	61.06	0.00	-3,432.62	337.05	1,894.00	1,819.75	74.25	25.508	
16,000.00	12,465.00	14,127.39	10,571.00	67.93	62.20	0.00	-3,532.62	337.99	1,894.00	1,818.54	75.46	25.101	
16,100.00	12,465.00	14,227.39	10,571.00	69.02	63.35	0.00	-3,632.61	338.92	1,894.00	1,817.33	76.67	24.702	
16,200.00	12,465.00	14,327.39	10,571.00	70.13	64.51	0.00	-3,732.61	339.85	1,894.00	1,816.10	77.90	24.313	
16,300.00	12,465.00	14,427.39	10,571.00	71.25	65.68	0.00	-3,832.61	340.79	1,894.00	1,814.86	79.14	23.931	
16,400.00	12,465.00	14,527.39	10,571.00	72.38	66.86	0.00	-3,932.60	341.72	1,894.00	1,813.60	80.40	23.558	
16,500.00	12,465.00	14,627.39	10,571.00	73.52	68.06	0.00	-4,032.60	342.66	1,894.00	1,812.34	81.66	23.194	
16,600.00	12,465.00	14,727.39	10,571.00	74.67	69.26	0.00	-4,132.59	343.59	1,894.00	1,811.07	82.93	22.837	
16,700.00	12,465.00	14,827.39	10,571.00	75.83	70.47	0.00	-4,232.59	344.53	1,894.00	1,809.78	84.22	22.489	
16,800.00	12,465.00	14,927.39	10,571.00	77.00	71.69	0.00	-4,332.58	345.46	1,894.00	1,808.49	85.51	22.149	
16,900.00	12,465.00	15,027.39	10,571.00	78.18	72.91	0.00	-4,432.58	346.40	1,894.00	1,807.19	86.81	21.817	
17,000.00	12,465.00	15,127.39	10,571.00	79.37	74.15	0.00	-4,532.57	347.33	1,894.00	1,805.88	88.12	21.492	
17,100.00	12,465.00	15,227.39	10,571.00	80.56	75.39	0.00	-4,632.57	348.26	1,894.00	1,804.56	89.44	21.175	
17,200.00	12,465.00	15,327.39	10,571.00	81.76	76.64	0.00	-4,732.57	349.20	1,894.00	1,803.23	90.77	20.866	
17,300.00	12,465.00	15,427.39	10,571.00	82.97	77.89	0.00	-4,832.56	350.13	1,894.00	1,801.89	92.11	20.563	
17,400.00	12,465.00	15,527.39	10,571.00	84.19	79.15	0.00	-4,932.56	351.07	1,894.00	1,800.55	93.45	20.268	
17,500.00	12,465.00	15,627.39	10,571.00	85.42	80.42	0.00	-5,032.55	352.00	1,894.00	1,799.20	94.80	19.980	
17,600.00	12,465.00	15,727.39	10,571.00	86.65	81.69	0.00	-5,132.55	352.94	1,894.00	1,797.85	96.15	19.698	
17,700.00	12,465.00	15,827.39	10,571.00	87.88	82.97	0.00	-5,232.54	353.87	1,894.00	1,796.49	97.51	19.423	
17,800.00	12,465.00	15,927.39	10,571.00	89.13	84.26	0.00	-5,332.54	354.80	1,894.00	1,795.12	98.88	19.154	
17,900.00	12,465.00	16,027.39	10,571.00	90.38	85.54	0.00	-5,432.54	355.74	1,894.00	1,793.74	100.26	18.892	
18,000.00	12,465.00	16,127.39	10,571.00	91.63	86.84	0.00	-5,532.53	356.67	1,894.00	1,792.37	101.63	18.635	
18,100.00	12,465.00	16,227.39	10,571.00	92.89	88.13	0.00	-5,632.53	357.61	1,894.00	1,790.98	103.02	18.385	
18,200.00	12,465.00	16,327.39	10,571.00	94.16	89.43	0.00	-5,732.52	358.54	1,894.00	1,789.59	104.41	18.140	
18,300.00	12,465.00	16,427.39	10,571.00	95.43	90.74	0.00	-5,832.52	359.48	1,894.00	1,788.20	105.80	17.901	
18,400.00	12,465.00	16,527.39	10,571.00	96.70	92.05	0.00	-5,932.51	360.41	1,894.00	1,786.80	107.20	17.667	
18,500.00	12,465.00	16,627.39	10,571.00	97.98	93.36	0.00	-6,032.51	361.35	1,894.00	1,785.39	108.61	17.439	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 208H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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
18,600.00	12,465.00	16,727.39	10,571.00	99.26	94.68	0.00	-6,132.51	362.28	1,894.00	1,783.98	110.02	17.216	
18,700.00	12,465.00	16,827.39	10,571.00	100.55	96.00	0.00	-6,232.50	363.21	1,894.00	1,782.57	111.43	16.997	
18,800.00	12,465.00	16,927.39	10,571.00	101.84	97.32	0.00	-6,332.50	364.15	1,894.00	1,781.15	112.85	16.784	
18,900.00	12,465.00	17,027.39	10,571.00	103.14	98.65	0.00	-6,432.49	365.08	1,894.00	1,779.73	114.27	16.575	
19,000.00	12,465.00	17,127.39	10,571.00	104.44	99.98	0.00	-6,532.49	366.02	1,894.00	1,778.31	115.69	16.371	
19,100.00	12,465.00	17,227.39	10,571.00	105.74	101.31	0.00	-6,632.48	366.95	1,894.00	1,776.88	117.12	16.171	
19,200.00	12,465.00	17,327.39	10,571.00	107.04	102.64	0.00	-6,732.48	367.89	1,894.00	1,775.45	118.55	15.976	
19,300.00	12,465.00	17,427.39	10,571.00	108.35	103.98	0.00	-6,832.47	368.82	1,894.00	1,774.01	119.99	15.785	
19,400.00	12,465.00	17,527.39	10,571.00	109.66	105.32	0.00	-6,932.47	369.75	1,894.00	1,772.57	121.43	15.598	
19,500.00	12,465.00	17,627.39	10,571.00	110.98	106.67	0.00	-7,032.47	370.69	1,894.00	1,771.13	122.87	15.415	
19,600.00	12,465.00	17,727.39	10,571.00	112.30	108.01	0.00	-7,132.46	371.62	1,894.00	1,769.68	124.32	15.235	
19,700.00	12,465.00	17,827.39	10,571.00	113.62	109.36	0.00	-7,232.46	372.56	1,894.00	1,768.24	125.76	15.060	
19,800.00	12,465.00	17,927.39	10,571.00	114.94	110.71	0.00	-7,332.45	373.49	1,894.00	1,766.79	127.21	14.888	
19,900.00	12,465.00	18,027.39	10,571.00	116.27	112.06	0.00	-7,432.45	374.43	1,894.00	1,765.33	128.67	14.720	
20,000.00	12,465.00	18,127.39	10,571.00	117.60	113.42	0.00	-7,532.44	375.36	1,894.00	1,763.88	130.12	14.555	
20,034.96	12,465.00	18,162.34	10,571.00	118.06	113.89	0.00	-7,567.40	375.69	1,894.00	1,763.37	130.63	14.499	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 358H - Lateral - Plan #2

Offset Site Error: 0.00 usft

Survey Program: 0-MWD+HRGM

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	172.35	-199.88	26.85	201.67				
100.00	100.00	101.00	100.00	0.13	0.14	172.35	-199.88	26.85	201.67	201.40	0.27	740.244	
200.00	200.00	201.00	200.00	0.49	0.50	172.35	-199.88	26.85	201.67	200.68	0.99	203.835	
300.00	300.00	301.00	300.00	0.85	0.85	172.35	-199.88	26.85	201.67	199.96	1.71	118.190	
400.00	400.00	401.00	400.00	1.21	1.21	172.35	-199.88	26.85	201.67	199.25	2.42	83.223	
500.00	500.00	501.00	500.00	1.57	1.57	172.35	-199.88	26.85	201.67	198.53	3.14	64.222	
600.00	600.00	601.00	600.00	1.93	1.93	172.35	-199.88	26.85	201.67	197.81	3.86	52.285	
700.00	700.00	701.00	700.00	2.29	2.29	172.35	-199.88	26.85	201.67	197.10	4.57	44.090	
800.00	800.00	801.00	800.00	2.64	2.65	172.35	-199.88	26.85	201.67	196.38	5.29	38.116	
900.00	900.00	901.00	900.00	3.00	3.01	172.35	-199.88	26.85	201.67	195.66	6.01	33.567	
1,000.00	1,000.00	1,001.00	1,000.00	3.36	3.36	172.35	-199.88	26.85	201.67	194.95	6.72	29.989	
1,100.00	1,100.00	1,101.00	1,100.00	3.72	3.72	172.35	-199.88	26.85	201.67	194.23	7.44	27.100	
1,200.00	1,200.00	1,201.00	1,200.00	4.08	4.08	172.35	-199.88	26.85	201.67	193.51	8.16	24.718	
1,300.00	1,300.00	1,301.00	1,300.00	4.44	4.44	172.35	-199.88	26.85	201.67	192.80	8.88	22.722	
1,400.00	1,400.00	1,401.00	1,400.00	4.79	4.80	172.35	-199.88	26.85	201.67	192.08	9.59	21.023	
1,500.00	1,500.00	1,501.00	1,500.00	5.15	5.16	172.35	-199.88	26.85	201.67	191.36	10.31	19.561	
1,600.00	1,600.00	1,601.00	1,600.00	5.51	5.52	172.35	-199.88	26.85	201.67	190.64	11.03	18.290	
1,700.00	1,700.00	1,701.00	1,700.00	5.87	5.87	172.35	-199.88	26.85	201.67	189.93	11.74	17.173	
1,800.00	1,800.00	1,801.00	1,800.00	6.23	6.23	172.35	-199.88	26.85	201.67	189.21	12.46	16.185	
1,900.00	1,900.00	1,901.00	1,900.00	6.59	6.59	172.35	-199.88	26.85	201.67	188.49	13.18	15.304	
2,000.00	2,000.00	2,001.00	2,000.00	6.95	6.95	172.35	-199.88	26.85	201.67	187.78	13.89	14.515	
2,100.00	2,100.00	2,101.00	2,100.00	7.30	7.31	172.35	-199.88	26.85	201.67	187.06	14.61	13.802	
2,200.00	2,200.00	2,201.00	2,200.00	7.66	7.67	172.35	-199.88	26.85	201.67	186.34	15.33	13.157	
2,300.00	2,300.00	2,301.00	2,300.00	8.02	8.02	172.35	-199.88	26.85	201.67	185.63	16.05	12.569	
2,400.00	2,400.00	2,401.00	2,400.00	8.38	8.38	172.35	-199.88	26.85	201.67	184.91	16.76	12.031	
2,500.00	2,500.00	2,501.00	2,500.00	8.74	8.74	172.35	-199.88	26.85	201.67	184.19	17.48	11.538	
2,600.00	2,600.00	2,601.00	2,600.00	9.10	9.10	172.35	-199.88	26.85	201.67	183.48	18.20	11.083	
2,700.00	2,700.00	2,701.00	2,700.00	9.45	9.46	172.35	-199.88	26.85	201.67	182.76	18.91	10.663	
2,800.00	2,800.00	2,801.00	2,800.00	9.81	9.82	172.35	-199.88	26.85	201.67	182.04	19.63	10.274	
2,900.00	2,900.00	2,901.00	2,900.00	10.17	10.18	172.35	-199.88	26.85	201.67	181.32	20.35	9.912	
3,000.00	3,000.00	3,001.00	3,000.00	10.53	10.53	172.35	-199.88	26.85	201.67	180.61	21.06	9.574	
3,100.00	3,100.00	3,101.00	3,100.00	10.89	10.89	172.35	-199.88	26.85	201.67	179.89	21.78	9.259	
3,200.00	3,200.00	3,201.00	3,200.00	11.25	11.25	172.35	-199.88	26.85	201.67	179.17	22.50	8.964	
3,300.00	3,300.00	3,301.00	3,300.00	11.61	11.61	172.35	-199.88	26.85	201.67	178.46	23.21	8.687	
3,400.00	3,400.00	3,401.00	3,400.00	11.96	11.97	172.35	-199.88	26.85	201.67	177.74	23.93	8.427	
3,500.00	3,500.00	3,501.00	3,500.00	12.32	12.33	172.35	-199.88	26.85	201.67	177.02	24.65	8.182	
3,600.00	3,600.00	3,601.00	3,600.00	12.68	12.68	172.35	-199.88	26.85	201.67	176.31	25.37	7.951	
3,700.00	3,700.00	3,701.00	3,700.00	13.04	13.04	172.35	-199.88	26.85	201.67	175.59	26.08	7.732	
3,800.00	3,800.00	3,801.00	3,800.00	13.40	13.40	172.35	-199.88	26.85	201.67	174.87	26.80	7.525	
3,900.00	3,900.00	3,901.00	3,900.00	13.76	13.76	172.35	-199.88	26.85	201.67	174.15	27.52	7.329	
4,000.00	4,000.00	4,001.00	4,000.00	14.11	14.12	172.35	-199.88	26.85	201.67	173.44	28.23	7.143	
4,100.00	4,100.00	4,101.00	4,100.00	14.47	14.48	172.35	-199.88	26.85	201.67	172.72	28.95	6.966	
4,200.00	4,200.00	4,201.00	4,200.00	14.83	14.84	172.35	-199.88	26.85	201.67	172.00	29.67	6.798	
4,300.00	4,300.00	4,301.00	4,300.00	15.19	15.19	172.35	-199.88	26.85	201.67	171.29	30.38	6.637	
4,400.00	4,400.00	4,401.00	4,400.00	15.55	15.55	172.35	-199.88	26.85	201.67	170.57	31.10	6.484	
4,500.00	4,500.00	4,501.00	4,500.00	15.91	15.91	172.35	-199.88	26.85	201.67	169.85	31.82	6.338	
4,600.00	4,600.00	4,601.00	4,600.00	16.27	16.27	172.35	-199.88	26.85	201.67	169.14	32.53	6.199	
4,700.00	4,700.00	4,701.00	4,700.00	16.62	16.63	172.35	-199.88	26.85	201.67	168.42	33.25	6.065	
4,800.00	4,800.00	4,801.00	4,800.00	16.98	16.99	172.35	-199.88	26.85	201.67	167.70	33.97	5.937	
4,900.00	4,900.00	4,901.00	4,900.00	17.34	17.34	172.35	-199.88	26.85	201.67	166.99	34.69	5.814	
5,000.00	5,000.00	5,001.00	5,000.00	17.70	17.70	172.35	-199.88	26.85	201.67	166.27	35.40	5.696	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 358H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
5,100.00	5,100.00	5,101.00	5,100.00	18.06	18.06	172.35	-199.88	26.85	201.67	165.55	36.12	5.583	
5,200.00	5,200.00	5,201.00	5,200.00	18.42	18.42	172.35	-199.88	26.85	201.67	164.83	36.84	5.475	
5,300.00	5,300.00	5,299.00	5,300.00	18.77	18.77	172.35	-199.88	26.85	201.67	164.12	37.55	5.371	CC
5,400.00	5,399.99	5,401.58	5,402.57	19.13	19.14	133.97	-199.07	27.94	201.95	163.68	38.26	5.278	ES
5,500.00	5,499.91	5,504.17	5,505.07	19.49	19.50	133.76	-196.64	31.24	202.76	163.78	38.97	5.203	
5,600.00	5,599.69	5,606.75	5,607.42	19.84	19.86	133.41	-192.57	36.76	204.10	164.42	39.68	5.144	
5,633.44	5,633.01	5,640.85	5,641.40	19.96	19.98	133.27	-190.86	39.08	204.67	164.76	39.91	5.128	
5,700.00	5,699.32	5,707.39	5,707.69	20.20	20.21	133.02	-187.42	43.75	205.93	165.54	40.38	5.099	
5,800.00	5,798.94	5,807.37	5,807.28	20.55	20.57	132.65	-182.25	50.77	207.82	166.73	41.09	5.057	
5,900.00	5,898.56	5,907.34	5,906.87	20.91	20.92	132.28	-177.08	57.79	209.73	167.92	41.80	5.017	
6,000.00	5,998.18	6,007.31	6,006.47	21.26	21.27	131.93	-171.91	64.80	211.64	169.12	42.52	4.978	
6,100.00	6,097.80	6,107.29	6,106.06	21.62	21.63	131.57	-166.74	71.82	213.56	170.33	43.23	4.940	
6,200.00	6,197.42	6,207.26	6,205.65	21.98	21.99	131.23	-161.57	78.84	215.49	171.54	43.94	4.904	
6,300.00	6,297.04	6,307.23	6,305.24	22.34	22.34	130.89	-156.40	85.86	217.42	172.76	44.66	4.869	
6,400.00	6,396.66	6,407.21	6,404.84	22.69	22.70	130.56	-151.22	92.88	219.37	173.99	45.38	4.835	
6,500.00	6,496.28	6,507.18	6,504.43	23.05	23.06	130.23	-146.05	99.89	221.32	175.22	46.09	4.802	
6,600.00	6,595.90	6,607.15	6,604.02	23.41	23.42	129.91	-140.88	106.91	223.27	176.46	46.81	4.770	
6,700.00	6,695.52	6,707.13	6,703.61	23.77	23.78	129.59	-135.71	113.93	225.24	177.71	47.53	4.739	
6,800.00	6,795.13	6,807.10	6,803.21	24.13	24.14	129.28	-130.54	120.95	227.21	178.96	48.25	4.709	
6,900.00	6,894.75	6,907.07	6,902.80	24.49	24.50	128.98	-125.37	127.97	229.19	180.22	48.97	4.680	
7,000.00	6,994.37	7,007.04	7,002.39	24.86	24.86	128.68	-120.20	134.98	231.17	181.48	49.69	4.652	
7,100.00	7,093.99	7,107.02	7,101.98	25.22	25.22	128.38	-115.03	142.00	233.16	182.75	50.41	4.625	
7,200.00	7,193.61	7,206.99	7,201.57	25.58	25.58	128.10	-109.86	149.02	235.16	184.02	51.14	4.599	
7,300.00	7,293.23	7,306.96	7,301.17	25.94	25.94	127.81	-104.68	156.04	237.16	185.30	51.86	4.573	
7,400.00	7,392.85	7,406.94	7,400.76	26.31	26.30	127.53	-99.51	163.05	239.17	186.58	52.59	4.548	
7,500.00	7,492.47	7,506.91	7,500.35	26.67	26.66	127.26	-94.34	170.07	241.18	187.87	53.31	4.524	
7,600.00	7,592.09	7,606.88	7,599.94	27.03	27.03	126.98	-89.17	177.09	243.20	189.17	54.04	4.501	
7,700.00	7,691.71	7,706.86	7,699.54	27.40	27.39	126.72	-84.00	184.11	245.23	190.46	54.76	4.478	
7,800.00	7,791.33	7,806.83	7,799.13	27.76	27.75	126.46	-78.83	191.13	247.26	191.77	55.49	4.456	
7,900.00	7,890.95	7,906.80	7,898.72	28.13	28.12	126.20	-73.66	198.14	249.29	193.07	56.22	4.434	
8,000.00	7,990.57	8,006.78	7,998.31	28.49	28.48	125.95	-68.49	205.16	251.33	194.39	56.95	4.413	
8,100.00	8,090.19	8,104.45	8,095.72	28.85	28.84	125.97	-64.18	211.01	253.83	196.16	57.67	4.401	
8,200.00	8,189.80	8,202.03	8,193.17	29.22	29.19	126.51	-61.35	214.85	257.24	198.86	58.39	4.406	
8,300.00	8,289.42	8,299.36	8,290.48	29.59	29.53	127.54	-60.00	216.68	261.64	202.55	59.09	4.428	
8,400.00	8,389.04	8,402.07	8,389.04	29.95	29.90	128.96	-59.88	216.85	266.96	207.15	59.81	4.463	
8,500.00	8,488.66	8,502.45	8,488.66	30.32	30.26	130.39	-59.88	216.85	272.54	212.01	60.53	4.503	
8,599.98	8,588.26	8,602.85	8,588.26	30.68	30.61	131.75	-59.88	216.85	278.28	217.04	61.25	4.544	
8,603.72	8,591.99	8,600.87	8,591.99	30.70	30.61	131.80	-59.88	216.85	278.50	217.25	61.25	4.547	
8,700.00	8,688.00	8,703.12	8,688.00	31.05	30.97	132.94	-59.88	216.85	283.35	221.39	61.96	4.573	
8,800.00	8,787.87	8,803.24	8,787.87	31.41	31.33	133.69	-59.88	216.85	286.71	224.04	62.67	4.575	
8,900.00	8,887.84	8,903.27	8,887.84	31.77	31.68	134.03	-59.88	216.85	288.29	224.90	63.39	4.548	
8,937.16	8,925.00	8,933.89	8,925.00	31.90	31.79	172.38	-59.88	216.85	288.42	224.79	63.63	4.533	
9,000.00	8,987.84	9,003.27	8,987.84	32.12	32.04	172.38	-59.88	216.85	288.42	224.32	64.10	4.500	
9,100.00	9,087.84	9,103.27	9,087.84	32.48	32.39	172.38	-59.88	216.85	288.42	223.61	64.81	4.450	
9,200.00	9,187.84	9,203.27	9,187.84	32.83	32.75	172.38	-59.88	216.85	288.42	222.89	65.52	4.402	
9,300.00	9,287.84	9,303.27	9,287.84	33.19	33.11	172.38	-59.88	216.85	288.42	222.18	66.24	4.354	
9,400.00	9,387.84	9,403.27	9,387.84	33.54	33.46	172.38	-59.88	216.85	288.42	221.47	66.95	4.308	
9,500.00	9,487.84	9,503.27	9,487.84	33.90	33.82	172.38	-59.88	216.85	288.42	220.76	67.66	4.263	
9,600.00	9,587.84	9,603.27	9,587.84	34.26	34.17	172.38	-59.88	216.85	288.42	220.04	68.37	4.218	
9,700.00	9,687.84	9,703.27	9,687.84	34.61	34.53	172.38	-59.88	216.85	288.42	219.33	69.09	4.175	
9,800.00	9,787.84	9,803.27	9,787.84	34.97	34.89	172.38	-59.88	216.85	288.42	218.62	69.80	4.132	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 358H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
9,900.00	9,887.84	9,903.27	9,887.84	35.32	35.24	172.38	-59.88	216.85	288.42	217.90	70.51	4.090	
10,000.00	9,987.84	10,003.27	9,987.84	35.68	35.60	172.38	-59.88	216.85	288.42	217.19	71.23	4.049	
10,100.00	10,087.84	10,103.27	10,087.84	36.03	35.96	172.38	-59.88	216.85	288.42	216.48	71.94	4.009	
10,200.00	10,187.84	10,203.27	10,187.84	36.39	36.31	172.38	-59.88	216.85	288.42	215.76	72.65	3.970	
10,300.00	10,287.84	10,303.27	10,287.84	36.75	36.67	172.38	-59.88	216.85	288.42	215.05	73.37	3.931	
10,400.00	10,387.84	10,403.27	10,387.84	37.10	37.03	172.38	-59.88	216.85	288.42	214.34	74.08	3.893	
10,410.87	10,398.72	10,407.60	10,398.72	37.14	37.04	172.38	-59.88	216.85	288.42	214.28	74.13	3.890	
10,500.00	10,487.84	10,491.77	10,482.89	37.46	37.34	172.38	-59.96	216.86	288.54	213.81	74.73	3.861 SF	
10,600.00	10,587.84	10,557.84	10,548.73	37.82	37.55	172.38	-64.86	217.49	296.03	221.27	74.77	3.960	
10,700.00	10,687.84	10,621.95	10,611.68	38.17	37.75	172.39	-76.76	219.03	314.80	240.65	74.15	4.245	
10,800.00	10,787.84	10,682.68	10,669.71	38.53	37.93	172.41	-94.40	221.30	344.14	271.13	73.01	4.713	
10,900.00	10,887.84	10,739.06	10,721.63	38.88	38.09	172.42	-116.15	224.11	383.09	311.58	71.51	5.357	
11,000.00	10,987.84	10,790.57	10,766.98	39.24	38.22	172.44	-140.35	227.23	430.53	360.72	69.81	6.168	
11,100.00	11,087.84	10,837.10	10,805.90	39.60	38.33	172.45	-165.60	230.49	485.32	417.28	68.04	7.133	
11,200.00	11,187.84	10,878.80	10,838.93	39.95	38.42	172.46	-190.83	233.74	546.38	480.07	66.31	8.240	
11,300.00	11,287.84	10,916.01	10,866.77	40.31	38.49	172.47	-215.31	236.90	612.74	548.05	64.69	9.472	
11,400.00	11,387.84	10,950.00	10,890.76	40.67	38.56	172.48	-239.19	239.98	683.56	620.31	63.25	10.807	
11,500.00	11,487.84	10,978.68	10,909.86	41.02	38.62	172.49	-260.40	242.71	758.13	696.24	61.89	12.249	
11,600.00	11,587.84	11,000.00	10,923.35	41.38	38.66	172.50	-276.77	244.83	835.89	775.36	60.53	13.809	
11,700.00	11,687.84	11,028.53	10,940.43	41.74	38.73	172.50	-299.44	247.75	916.24	856.49	59.75	15.334	
11,800.00	11,787.84	11,050.00	10,952.51	42.09	38.78	172.51	-317.04	250.02	998.88	939.95	58.93	16.952	
11,899.98	11,887.82	11,068.58	10,962.43	42.45	38.83	172.51	-332.62	252.03	1,083.41	1,025.21	58.21	18.614	
11,904.20	11,892.04	11,069.34	10,962.82	42.46	38.83	172.51	-333.26	252.11	1,087.02	1,028.84	58.18	18.684	
11,950.00	11,937.80	11,077.87	10,967.20	42.62	38.85	1.78	-340.53	253.05	1,125.37	1,067.51	57.86	19.448	
12,000.00	11,987.40	11,100.00	10,978.02	42.77	38.91	1.60	-359.66	255.52	1,165.49	1,107.66	57.84	20.151	
12,050.00	12,036.28	11,100.00	10,978.02	42.93	38.91	1.45	-359.66	255.52	1,203.06	1,145.95	57.11	21.064	
12,100.00	12,084.05	11,100.00	10,978.02	43.07	38.91	1.33	-359.66	255.52	1,238.63	1,182.25	56.38	21.969	
12,150.00	12,130.37	11,121.60	10,987.87	43.20	38.96	1.25	-378.73	257.98	1,271.50	1,215.32	56.18	22.631	
12,200.00	12,174.88	11,133.82	10,993.11	43.33	38.99	1.19	-389.67	259.39	1,301.94	1,246.22	55.71	23.369	
12,250.00	12,217.23	11,150.00	10,999.69	43.44	39.03	1.14	-404.34	261.28	1,329.72	1,274.41	55.31	24.039	
12,300.00	12,257.11	11,150.00	10,999.69	43.54	39.03	1.08	-404.34	261.28	1,354.83	1,300.29	54.54	24.840	
12,350.00	12,294.20	11,172.60	11,008.18	43.63	39.09	1.06	-425.11	263.96	1,376.91	1,322.65	54.26	25.378	
12,400.00	12,328.24	11,200.00	11,017.36	43.71	39.16	1.06	-450.71	267.26	1,396.42	1,342.37	54.04	25.838	
12,450.00	12,358.96	11,200.00	11,017.36	43.82	39.16	1.03	-450.71	267.26	1,412.48	1,359.18	53.30	26.500	
12,500.00	12,386.12	11,200.00	11,017.36	43.93	39.16	1.00	-450.71	267.26	1,426.00	1,373.39	52.61	27.105	
12,550.00	12,409.53	11,227.60	11,025.34	44.04	39.23	1.02	-476.91	270.64	1,436.01	1,383.60	52.40	27.404	
12,600.00	12,428.99	11,250.00	11,030.88	44.15	39.28	1.04	-498.44	273.42	1,443.23	1,391.12	52.11	27.694	
12,650.00	12,444.37	11,250.00	11,030.88	44.25	39.28	1.03	-498.44	273.42	1,447.23	1,395.69	51.54	28.082	
12,700.00	12,455.55	11,269.97	11,035.09	44.36	39.33	1.06	-517.80	275.92	1,448.10	1,396.83	51.27	28.243	
12,750.00	12,462.44	11,300.00	11,040.15	44.47	39.41	1.11	-547.15	279.70	1,446.19	1,395.05	51.15	28.275	
12,799.97	12,464.98	11,300.00	11,040.15	44.57	39.41	1.12	-547.15	279.70	1,440.57	1,389.83	50.74	28.393	
12,804.19	12,465.00	11,300.00	11,040.15	44.58	39.41	1.12	-547.15	279.70	1,439.97	1,389.26	50.71	28.398	
12,900.00	12,465.00	11,326.57	11,043.33	44.80	39.48	0.91	-573.31	283.08	1,428.50	1,378.12	50.38	28.355	
13,000.00	12,465.00	11,350.00	11,045.11	45.08	39.54	0.76	-596.48	286.07	1,421.36	1,371.09	50.27	28.274	
13,100.00	12,465.00	11,388.71	11,046.00	45.38	39.64	0.64	-634.86	291.01	1,419.09	1,368.63	50.46	28.125	
13,200.00	12,465.00	11,488.07	11,046.00	45.73	39.92	0.39	-733.62	301.77	1,419.03	1,368.25	50.79	27.941	
13,252.43	12,465.00	11,540.25	11,046.00	45.92	40.09	0.25	-785.63	306.05	1,419.01	1,368.03	50.98	27.835	
13,300.00	12,465.00	11,587.66	11,046.00	46.11	40.25	0.15	-832.94	309.12	1,419.00	1,367.84	51.16	27.735	
13,400.00	12,465.00	11,687.55	11,046.00	46.52	40.62	0.03	-932.75	313.02	1,419.00	1,367.42	51.58	27.509	
13,447.85	12,465.00	11,735.39	11,046.00	46.74	40.81	0.02	-980.58	313.68	1,419.00	1,367.20	51.80	27.394	
13,500.00	12,465.00	11,787.54	11,046.00	46.98	41.03	0.02	-1,032.73	314.17	1,419.00	1,366.96	52.04	27.266	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 358H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
13,600.00	12,465.00	11,887.54	11,046.00	47.48	41.48	0.02	-1,132.73	315.11	1,419.00	1,366.45	52.55	27.004	
13,700.00	12,465.00	11,987.54	11,046.00	48.01	41.98	0.02	-1,232.72	316.05	1,419.00	1,365.91	53.09	26.727	
13,800.00	12,465.00	12,087.54	11,046.00	48.58	42.52	0.02	-1,332.72	317.00	1,419.00	1,365.32	53.68	26.435	
13,900.00	12,465.00	12,187.54	11,046.00	49.19	43.10	0.02	-1,432.71	317.94	1,419.00	1,364.69	54.31	26.130	
14,000.00	12,465.00	12,287.54	11,046.00	49.82	43.72	0.02	-1,532.71	318.88	1,419.00	1,364.03	54.97	25.814	
14,100.00	12,465.00	12,387.54	11,046.00	50.50	44.38	0.02	-1,632.71	319.82	1,419.00	1,363.33	55.67	25.489	
14,200.00	12,465.00	12,487.54	11,046.00	51.20	45.07	0.02	-1,732.70	320.76	1,419.00	1,362.59	56.41	25.157	
14,300.00	12,465.00	12,587.54	11,046.00	51.93	45.80	0.02	-1,832.70	321.70	1,419.00	1,361.82	57.18	24.818	
14,400.00	12,465.00	12,687.54	11,046.00	52.69	46.56	0.02	-1,932.69	322.64	1,419.00	1,361.02	57.98	24.474	
14,500.00	12,465.00	12,787.54	11,046.00	53.48	47.36	0.02	-2,032.69	323.59	1,419.00	1,360.19	58.81	24.127	
14,600.00	12,465.00	12,887.54	11,046.00	54.30	48.18	0.02	-2,132.68	324.53	1,419.00	1,359.32	59.68	23.778	
14,700.00	12,465.00	12,987.54	11,046.00	55.14	49.03	0.02	-2,232.68	325.47	1,419.00	1,358.43	60.57	23.428	
14,800.00	12,465.00	13,087.54	11,046.00	56.01	49.91	0.02	-2,332.67	326.41	1,419.00	1,357.51	61.49	23.077	
14,900.00	12,465.00	13,187.54	11,046.00	56.90	50.81	0.01	-2,432.67	327.35	1,419.00	1,356.57	62.43	22.728	
15,000.00	12,465.00	13,287.54	11,046.00	57.81	51.74	0.01	-2,532.67	328.29	1,419.00	1,355.60	63.41	22.380	
15,100.00	12,465.00	13,387.54	11,046.00	58.74	52.69	0.01	-2,632.66	329.23	1,419.00	1,354.60	64.40	22.034	
15,200.00	12,465.00	13,487.54	11,046.00	59.69	53.66	0.01	-2,732.66	330.17	1,419.00	1,353.58	65.42	21.692	
15,300.00	12,465.00	13,587.54	11,046.00	60.66	54.65	0.01	-2,832.65	331.12	1,419.00	1,352.55	66.45	21.353	
15,400.00	12,465.00	13,687.54	11,046.00	61.65	55.66	0.01	-2,932.65	332.06	1,419.00	1,351.49	67.51	21.018	
15,500.00	12,465.00	13,787.54	11,046.00	62.66	56.69	0.01	-3,032.64	333.00	1,419.00	1,350.41	68.59	20.688	
15,600.00	12,465.00	13,887.54	11,046.00	63.68	57.74	0.01	-3,132.64	333.94	1,419.00	1,349.31	69.69	20.362	
15,700.00	12,465.00	13,987.54	11,046.00	64.72	58.80	0.01	-3,232.63	334.88	1,419.00	1,348.20	70.80	20.041	
15,800.00	12,465.00	14,087.54	11,046.00	65.78	59.88	0.01	-3,332.63	335.82	1,419.00	1,347.06	71.94	19.726	
15,900.00	12,465.00	14,187.54	11,046.00	66.84	60.97	0.01	-3,432.63	336.76	1,419.00	1,345.92	73.08	19.416	
16,000.00	12,465.00	14,287.54	11,046.00	67.93	62.08	0.01	-3,532.62	337.71	1,419.00	1,344.75	74.25	19.112	
16,100.00	12,465.00	14,387.54	11,046.00	69.02	63.20	0.01	-3,632.62	338.65	1,419.00	1,343.57	75.43	18.813	
16,200.00	12,465.00	14,487.54	11,046.00	70.13	64.34	0.01	-3,732.61	339.59	1,419.00	1,342.38	76.62	18.520	
16,300.00	12,465.00	14,587.54	11,046.00	71.25	65.48	0.01	-3,832.61	340.53	1,419.00	1,341.18	77.82	18.233	
16,400.00	12,465.00	14,687.54	11,046.00	72.38	66.64	0.01	-3,932.60	341.47	1,419.00	1,339.96	79.04	17.952	
16,500.00	12,465.00	14,787.54	11,046.00	73.52	67.81	0.01	-4,032.60	342.41	1,419.00	1,338.73	80.27	17.677	
16,600.00	12,465.00	14,887.54	11,046.00	74.67	68.98	0.01	-4,132.59	343.35	1,419.00	1,337.48	81.52	17.408	
16,700.00	12,465.00	14,987.54	11,046.00	75.83	70.17	0.01	-4,232.59	344.29	1,419.00	1,336.23	82.77	17.144	
16,800.00	12,465.00	15,087.54	11,046.00	77.00	71.37	0.01	-4,332.59	345.24	1,419.00	1,334.97	84.03	16.886	
16,900.00	12,465.00	15,187.54	11,046.00	78.18	72.57	0.01	-4,432.58	346.18	1,419.00	1,333.69	85.31	16.634	
17,000.00	12,465.00	15,287.54	11,046.00	79.37	73.79	0.01	-4,532.58	347.12	1,419.00	1,332.41	86.59	16.387	
17,100.00	12,465.00	15,387.54	11,046.00	80.56	75.01	0.01	-4,632.57	348.06	1,419.00	1,331.12	87.88	16.146	
17,200.00	12,465.00	15,487.54	11,046.00	81.76	76.24	0.01	-4,732.57	349.00	1,419.00	1,329.81	89.19	15.911	
17,300.00	12,465.00	15,587.54	11,046.00	82.97	77.47	0.01	-4,832.56	349.94	1,419.00	1,328.50	90.50	15.680	
17,400.00	12,465.00	15,687.54	11,046.00	84.19	78.72	0.01	-4,932.56	350.88	1,419.00	1,327.19	91.81	15.455	
17,500.00	12,465.00	15,787.54	11,046.00	85.42	79.97	0.01	-5,032.55	351.83	1,419.00	1,325.86	93.14	15.235	
17,600.00	12,465.00	15,887.54	11,046.00	86.65	81.22	0.01	-5,132.55	352.77	1,419.00	1,324.53	94.47	15.020	
17,700.00	12,465.00	15,987.54	11,046.00	87.88	82.48	0.01	-5,232.55	353.71	1,419.00	1,323.19	95.81	14.810	
17,800.00	12,465.00	16,087.54	11,046.00	89.13	83.75	0.01	-5,332.54	354.65	1,419.00	1,321.84	97.16	14.604	
17,900.00	12,465.00	16,187.54	11,046.00	90.38	85.02	0.01	-5,432.54	355.59	1,419.00	1,320.48	98.52	14.404	
18,000.00	12,465.00	16,287.54	11,046.00	91.63	86.30	0.01	-5,532.53	356.53	1,419.00	1,319.12	99.88	14.208	
18,100.00	12,465.00	16,387.54	11,046.00	92.89	87.58	0.01	-5,632.53	357.47	1,419.00	1,317.76	101.24	14.016	
18,200.00	12,465.00	16,487.54	11,046.00	94.16	88.87	0.01	-5,732.52	358.41	1,419.00	1,316.38	102.62	13.828	
18,300.00	12,465.00	16,587.54	11,046.00	95.43	90.16	0.01	-5,832.52	359.36	1,419.00	1,315.01	103.99	13.645	
18,400.00	12,465.00	16,687.54	11,046.00	96.70	91.46	0.00	-5,932.51	360.30	1,419.00	1,313.62	105.38	13.466	
18,500.00	12,465.00	16,787.54	11,046.00	97.98	92.76	0.00	-6,032.51	361.24	1,419.00	1,312.24	106.76	13.291	
18,600.00	12,465.00	16,887.54	11,046.00	99.26	94.06	0.00	-6,132.51	362.18	1,419.00	1,310.84	108.16	13.120	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 358H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
18,700.00	12,465.00	16,987.54	11,046.00	100.55	95.37	0.00	-6,232.50	363.12	1,419.00	1,309.44	109.56	12.952	
18,800.00	12,465.00	17,087.54	11,046.00	101.84	96.68	0.00	-6,332.50	364.06	1,419.00	1,308.04	110.96	12.789	
18,900.00	12,465.00	17,187.54	11,046.00	103.14	98.00	0.00	-6,432.49	365.00	1,419.00	1,306.64	112.36	12.629	
19,000.00	12,465.00	17,287.54	11,046.00	104.44	99.32	0.00	-6,532.49	365.95	1,419.00	1,305.22	113.78	12.472	
19,100.00	12,465.00	17,387.54	11,046.00	105.74	100.64	0.00	-6,632.48	366.89	1,419.00	1,303.81	115.19	12.319	
19,200.00	12,465.00	17,487.54	11,046.00	107.04	101.96	0.00	-6,732.48	367.83	1,419.00	1,302.39	116.61	12.169	
19,300.00	12,465.00	17,587.54	11,046.00	108.35	103.29	0.00	-6,832.47	368.77	1,419.00	1,300.97	118.03	12.022	
19,400.00	12,465.00	17,687.54	11,046.00	109.66	104.62	0.00	-6,932.47	369.71	1,419.00	1,299.54	119.46	11.878	
19,500.00	12,465.00	17,787.54	11,046.00	110.98	105.95	0.00	-7,032.47	370.65	1,419.00	1,298.11	120.89	11.738	
19,600.00	12,465.00	17,887.54	11,046.00	112.30	107.29	0.00	-7,132.46	371.59	1,419.00	1,296.68	122.32	11.600	
19,700.00	12,465.00	17,987.54	11,046.00	113.62	108.63	0.00	-7,232.46	372.53	1,419.00	1,295.24	123.76	11.466	
19,800.00	12,465.00	18,087.54	11,046.00	114.94	109.97	0.00	-7,332.45	373.48	1,419.00	1,293.80	125.20	11.334	
19,900.00	12,465.00	18,187.54	11,046.00	116.27	111.31	0.00	-7,432.45	374.42	1,419.00	1,292.36	126.64	11.205	
20,000.00	12,465.00	18,287.54	11,046.00	117.60	112.66	0.00	-7,532.44	375.36	1,419.00	1,290.91	128.09	11.078	
20,034.96	12,465.00	18,322.50	11,046.00	118.06	113.13	0.00	-7,567.40	375.69	1,419.00	1,290.40	128.60	11.035	

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 608H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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	2.00	0.00	0.00	0.00	-90.34	-0.30	-50.04	50.04				
100.00	100.00	102.00	100.00	0.13	0.14	-90.34	-0.30	-50.04	50.04	49.77	0.28	181.293	
200.00	200.00	202.00	200.00	0.49	0.50	-90.34	-0.30	-50.04	50.04	49.05	0.99	50.396	
300.00	300.00	302.00	300.00	0.85	0.86	-90.34	-0.30	-50.04	50.04	48.33	1.71	29.265	
400.00	400.00	402.00	400.00	1.21	1.22	-90.34	-0.30	-50.04	50.04	47.61	2.43	20.620	
500.00	500.00	502.00	500.00	1.57	1.58	-90.34	-0.30	-50.04	50.04	46.90	3.14	15.917	
600.00	600.00	602.00	600.00	1.93	1.93	-90.34	-0.30	-50.04	50.04	46.18	3.86	12.962	
700.00	700.00	702.00	700.00	2.29	2.29	-90.34	-0.30	-50.04	50.04	45.46	4.58	10.932	
800.00	800.00	802.00	800.00	2.64	2.65	-90.34	-0.30	-50.04	50.04	44.75	5.29	9.451	
900.00	900.00	902.00	900.00	3.00	3.01	-90.34	-0.30	-50.04	50.04	44.03	6.01	8.324	
1,000.00	1,000.00	1,002.00	1,000.00	3.36	3.37	-90.34	-0.30	-50.04	50.04	43.31	6.73	7.437	
1,100.00	1,100.00	1,102.00	1,100.00	3.72	3.73	-90.34	-0.30	-50.04	50.04	42.60	7.45	6.721	
1,200.00	1,200.00	1,202.00	1,200.00	4.08	4.08	-90.34	-0.30	-50.04	50.04	41.88	8.16	6.131	
1,300.00	1,300.00	1,302.00	1,300.00	4.44	4.44	-90.34	-0.30	-50.04	50.04	41.16	8.88	5.636	
1,400.00	1,400.00	1,402.00	1,400.00	4.79	4.80	-90.34	-0.30	-50.04	50.04	40.44	9.60	5.215	
1,500.00	1,500.00	1,502.00	1,500.00	5.15	5.16	-90.34	-0.30	-50.04	50.04	39.73	10.31	4.852	
1,600.00	1,600.00	1,602.00	1,600.00	5.51	5.52	-90.34	-0.30	-50.04	50.04	39.01	11.03	4.537	
1,700.00	1,700.00	1,702.00	1,700.00	5.87	5.88	-90.34	-0.30	-50.04	50.04	38.29	11.75	4.260	
1,800.00	1,800.00	1,802.00	1,800.00	6.23	6.24	-90.34	-0.30	-50.04	50.04	37.58	12.46	4.015	
1,900.00	1,900.00	1,902.00	1,900.00	6.59	6.59	-90.34	-0.30	-50.04	50.04	36.86	13.18	3.796	
2,000.00	2,000.00	2,002.00	2,000.00	6.95	6.95	-90.34	-0.30	-50.04	50.04	36.14	13.90	3.601	
2,100.00	2,100.00	2,102.00	2,100.00	7.30	7.31	-90.34	-0.30	-50.04	50.04	35.43	14.61	3.424	
2,200.00	2,200.00	2,202.00	2,200.00	7.66	7.67	-90.34	-0.30	-50.04	50.04	34.71	15.33	3.264	
2,300.00	2,300.00	2,302.00	2,300.00	8.02	8.03	-90.34	-0.30	-50.04	50.04	33.99	16.05	3.118	
2,400.00	2,400.00	2,402.00	2,400.00	8.38	8.39	-90.34	-0.30	-50.04	50.04	33.28	16.77	2.985	
2,500.00	2,500.00	2,502.00	2,500.00	8.74	8.74	-90.34	-0.30	-50.04	50.04	32.56	17.48	2.862	
2,600.00	2,600.00	2,602.00	2,600.00	9.10	9.10	-90.34	-0.30	-50.04	50.04	31.84	18.20	2.750	
2,700.00	2,700.00	2,702.00	2,700.00	9.45	9.46	-90.34	-0.30	-50.04	50.04	31.12	18.92	2.645	
2,800.00	2,800.00	2,802.00	2,800.00	9.81	9.82	-90.34	-0.30	-50.04	50.04	30.41	19.63	2.549	
2,900.00	2,900.00	2,902.00	2,900.00	10.17	10.18	-90.34	-0.30	-50.04	50.04	29.69	20.35	2.459	
3,000.00	3,000.00	3,002.00	3,000.00	10.53	10.54	-90.34	-0.30	-50.04	50.04	28.97	21.07	2.375	
3,100.00	3,100.00	3,102.00	3,100.00	10.89	10.90	-90.34	-0.30	-50.04	50.04	28.26	21.78	2.297	
3,200.00	3,200.00	3,202.00	3,200.00	11.25	11.25	-90.34	-0.30	-50.04	50.04	27.54	22.50	2.224	
3,300.00	3,300.00	3,302.00	3,300.00	11.61	11.61	-90.34	-0.30	-50.04	50.04	26.82	23.22	2.155	
3,400.00	3,400.00	3,402.00	3,400.00	11.96	11.97	-90.34	-0.30	-50.04	50.04	26.11	23.94	2.091	
3,500.00	3,500.00	3,502.00	3,500.00	12.32	12.33	-90.34	-0.30	-50.04	50.04	25.39	24.65	2.030	
3,600.00	3,600.00	3,602.00	3,600.00	12.68	12.69	-90.34	-0.30	-50.04	50.04	24.67	25.37	1.973	
3,700.00	3,700.00	3,702.00	3,700.00	13.04	13.05	-90.34	-0.30	-50.04	50.04	23.96	26.09	1.918	
3,800.00	3,800.00	3,802.00	3,800.00	13.40	13.41	-90.34	-0.30	-50.04	50.04	23.24	26.80	1.867	
3,900.00	3,900.00	3,902.00	3,900.00	13.76	13.76	-90.34	-0.30	-50.04	50.04	22.52	27.52	1.818	
4,000.00	4,000.00	4,002.00	4,000.00	14.11	14.12	-90.34	-0.30	-50.04	50.04	21.80	28.24	1.772	
4,100.00	4,100.00	4,102.00	4,100.00	14.47	14.48	-90.34	-0.30	-50.04	50.04	21.09	28.95	1.728	
4,200.00	4,200.00	4,202.00	4,200.00	14.83	14.84	-90.34	-0.30	-50.04	50.04	20.37	29.67	1.687	
4,300.00	4,300.00	4,302.00	4,300.00	15.19	15.20	-90.34	-0.30	-50.04	50.04	19.65	30.39	1.647	
4,400.00	4,400.00	4,402.00	4,400.00	15.55	15.56	-90.34	-0.30	-50.04	50.04	18.94	31.10	1.609	
4,500.00	4,500.00	4,502.00	4,500.00	15.91	15.91	-90.34	-0.30	-50.04	50.04	18.22	31.82	1.573	
4,600.00	4,600.00	4,602.00	4,600.00	16.27	16.27	-90.34	-0.30	-50.04	50.04	17.50	32.54	1.538	
4,700.00	4,700.00	4,702.00	4,700.00	16.62	16.63	-90.34	-0.30	-50.04	50.04	16.79	33.26	1.505	
4,800.00	4,800.00	4,802.00	4,800.00	16.98	16.99	-90.34	-0.30	-50.04	50.04	16.07	33.97	1.473	Level 3
4,900.00	4,900.00	4,902.00	4,900.00	17.34	17.35	-90.34	-0.30	-50.04	50.04	15.35	34.69	1.443	Level 3
5,000.00	5,000.00	5,002.00	5,000.00	17.70	17.71	-90.34	-0.30	-50.04	50.04	14.63	35.41	1.413	Level 3

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 608H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
5,100.00	5,100.00	5,102.00	5,100.00	18.06	18.07	-90.34	-0.30	-50.04	50.04	13.92	36.12	1.385	Level 3
5,200.00	5,200.00	5,202.00	5,200.00	18.42	18.42	-90.34	-0.30	-50.04	50.04	13.20	36.84	1.358	Level 3
5,300.00	5,300.00	5,298.00	5,300.00	18.77	18.77	-90.34	-0.30	-50.04	50.04	12.50	37.54	1.333	Level 3, CC, ES, SF
5,400.00	5,399.99	5,397.13	5,399.12	19.13	19.12	-128.74	0.62	-50.87	51.69	13.44	38.25	1.351	Level 3
5,500.00	5,499.91	5,496.07	5,497.99	19.49	19.47	-128.87	3.44	-53.40	56.69	17.75	38.94	1.456	Level 3
5,600.00	5,599.69	5,594.69	5,596.40	19.84	19.82	-129.01	8.15	-57.64	65.03	25.42	39.61	1.642	
5,633.44	5,633.01	5,627.56	5,629.16	19.96	19.94	-129.06	10.14	-59.43	68.56	28.73	39.84	1.721	
5,700.00	5,699.32	5,706.58	5,694.74	20.20	20.22	-129.03	14.57	-63.41	76.18	35.84	40.34	1.888	
5,800.00	5,798.94	5,807.25	5,793.66	20.55	20.58	-128.94	21.33	-69.49	87.69	46.64	41.05	2.136	
5,900.00	5,898.56	5,907.91	5,892.58	20.91	20.93	-128.87	28.10	-75.57	99.19	57.44	41.76	2.376	
6,000.00	5,998.18	6,008.58	5,991.50	21.26	21.29	-128.82	34.86	-81.66	110.70	68.24	42.46	2.607	
6,100.00	6,097.80	6,109.24	6,090.42	21.62	21.65	-128.78	41.62	-87.74	122.21	79.04	43.17	2.831	
6,200.00	6,197.42	6,209.91	6,189.34	21.98	22.01	-128.74	48.38	-93.82	133.72	89.83	43.89	3.047	
6,300.00	6,297.04	6,289.43	6,288.26	22.34	22.30	-128.71	55.15	-99.90	145.23	100.70	44.52	3.262	
6,400.00	6,396.66	6,388.77	6,387.17	22.69	22.66	-128.68	61.91	-105.98	156.73	111.50	45.23	3.465	
6,500.00	6,496.28	6,488.10	6,486.09	23.05	23.01	-128.66	68.67	-112.06	168.24	122.30	45.94	3.662	
6,600.00	6,595.90	6,587.44	6,585.01	23.41	23.37	-128.64	75.43	-118.14	179.75	133.10	46.65	3.853	
6,700.00	6,695.52	6,686.77	6,683.93	23.77	23.73	-128.63	82.19	-124.22	191.26	143.90	47.36	4.038	
6,800.00	6,795.13	6,786.11	6,782.85	24.13	24.09	-128.61	88.96	-130.30	202.77	154.69	48.07	4.218	
6,900.00	6,894.75	6,885.44	6,881.77	24.49	24.45	-128.60	95.72	-136.38	214.27	165.49	48.78	4.392	
7,000.00	6,994.37	6,984.78	6,980.68	24.86	24.81	-128.59	102.48	-142.47	225.78	176.29	49.50	4.562	
7,100.00	7,093.99	7,084.12	7,079.60	25.22	25.17	-128.57	109.24	-148.55	237.29	187.08	50.21	4.726	
7,200.00	7,193.61	7,183.45	7,178.52	25.58	25.53	-128.57	116.00	-154.63	248.80	197.87	50.93	4.886	
7,300.00	7,293.23	7,282.79	7,277.44	25.94	25.89	-128.56	122.77	-160.71	260.31	208.67	51.64	5.041	
7,400.00	7,392.85	7,382.12	7,376.36	26.31	26.25	-128.55	129.53	-166.79	271.81	219.46	52.36	5.192	
7,500.00	7,492.47	7,481.46	7,475.28	26.67	26.62	-128.54	136.29	-172.87	283.32	230.25	53.07	5.338	
7,600.00	7,592.09	7,580.79	7,574.20	27.03	26.98	-128.53	143.05	-178.95	294.83	241.04	53.79	5.481	
7,700.00	7,691.71	7,680.13	7,673.11	27.40	27.34	-128.53	149.82	-185.03	306.34	251.83	54.51	5.620	
7,800.00	7,791.33	7,779.46	7,772.03	27.76	27.70	-128.52	156.58	-191.11	317.85	262.62	55.23	5.755	
7,900.00	7,890.95	7,878.80	7,870.95	28.13	28.07	-128.52	163.34	-197.19	329.36	273.41	55.94	5.887	
8,000.00	7,990.57	7,978.14	7,969.87	28.49	28.43	-128.51	170.10	-203.27	340.86	284.20	56.66	6.016	
8,100.00	8,090.19	8,077.47	8,068.79	28.85	28.79	-128.51	176.86	-209.36	352.37	294.99	57.38	6.141	
8,200.00	8,189.80	8,176.81	8,167.71	29.22	29.16	-128.50	183.63	-215.44	363.88	305.78	58.10	6.263	
8,300.00	8,289.42	8,276.14	8,266.62	29.59	29.52	-128.50	190.39	-221.52	375.39	316.57	58.82	6.382	
8,400.00	8,389.04	8,375.48	8,365.54	29.95	29.89	-128.49	197.15	-227.60	386.90	327.35	59.54	6.498	
8,500.00	8,488.66	8,474.81	8,464.46	30.32	30.25	-128.49	203.91	-233.68	398.40	338.14	60.26	6.611	
8,599.98	8,588.26	8,574.13	8,563.36	30.68	30.62	-128.49	210.67	-239.76	409.91	348.92	60.99	6.721	
8,603.72	8,591.99	8,577.84	8,567.06	30.70	30.63	-128.49	210.93	-239.99	410.34	349.33	61.01	6.726	
8,700.00	8,688.00	8,680.30	8,669.17	31.05	31.01	-128.57	217.08	-245.52	419.99	358.22	61.77	6.799	
8,800.00	8,787.87	8,788.01	8,776.73	31.41	31.40	-128.62	221.35	-249.37	426.59	364.04	62.55	6.820	
8,900.00	8,887.84	8,896.00	8,884.68	31.77	31.78	-128.64	223.38	-251.19	429.69	366.39	63.30	6.788	
8,937.16	8,925.00	8,936.16	8,924.84	31.90	31.93	-90.33	223.55	-251.34	429.95	366.37	63.58	6.762	
9,000.00	8,987.84	9,000.84	8,987.84	32.12	32.16	-90.33	223.55	-251.34	429.95	365.91	64.03	6.715	
9,100.00	9,087.84	9,100.84	9,087.84	32.48	32.51	-90.33	223.55	-251.34	429.95	365.20	64.74	6.641	
9,200.00	9,187.84	9,200.84	9,187.84	32.83	32.87	-90.33	223.55	-251.34	429.95	364.49	65.46	6.569	
9,300.00	9,287.84	9,300.84	9,287.84	33.19	33.22	-90.33	223.55	-251.34	429.95	363.78	66.17	6.498	
9,400.00	9,387.84	9,400.84	9,387.84	33.54	33.58	-90.33	223.55	-251.34	429.95	363.07	66.88	6.429	
9,500.00	9,487.84	9,500.84	9,487.84	33.90	33.93	-90.33	223.55	-251.34	429.95	362.36	67.59	6.361	
9,600.00	9,587.84	9,600.84	9,587.84	34.26	34.29	-90.33	223.55	-251.34	429.95	361.64	68.30	6.295	
9,700.00	9,687.84	9,700.84	9,687.84	34.61	34.64	-90.33	223.55	-251.34	429.95	360.93	69.01	6.230	
9,800.00	9,787.84	9,800.84	9,787.84	34.97	35.00	-90.33	223.55	-251.34	429.95	360.22	69.73	6.166	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 608H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
9,900.00	9,887.84	9,900.84	9,887.84	35.32	35.35	-90.33	223.55	-251.34	429.95	359.51	70.44	6.104	
10,000.00	9,987.84	10,000.84	9,987.84	35.68	35.71	-90.33	223.55	-251.34	429.95	358.80	71.15	6.043	
10,100.00	10,087.84	10,100.84	10,087.84	36.03	36.06	-90.33	223.55	-251.34	429.95	358.08	71.86	5.983	
10,200.00	10,187.84	10,200.84	10,187.84	36.39	36.42	-90.33	223.55	-251.34	429.95	357.37	72.58	5.924	
10,300.00	10,287.84	10,300.84	10,287.84	36.75	36.78	-90.33	223.55	-251.34	429.95	356.66	73.29	5.866	
10,400.00	10,387.84	10,400.84	10,387.84	37.10	37.13	-90.33	223.55	-251.34	429.95	355.95	74.00	5.810	
10,500.00	10,487.84	10,500.84	10,487.84	37.46	37.49	-90.33	223.55	-251.34	429.95	355.23	74.71	5.755	
10,600.00	10,587.84	10,600.84	10,587.84	37.82	37.84	-90.33	223.55	-251.34	429.95	354.52	75.43	5.700	
10,700.00	10,687.84	10,700.84	10,687.84	38.17	38.20	-90.33	223.55	-251.34	429.95	353.81	76.14	5.647	
10,800.00	10,787.84	10,800.84	10,787.84	38.53	38.56	-90.33	223.55	-251.34	429.95	353.09	76.85	5.594	
10,900.00	10,887.84	10,900.84	10,887.84	38.88	38.91	-90.33	223.55	-251.34	429.95	352.38	77.57	5.543	
11,000.00	10,987.84	11,000.84	10,987.84	39.24	39.27	-90.33	223.55	-251.34	429.95	351.67	78.28	5.492	
11,100.00	11,087.84	11,100.84	11,087.84	39.60	39.62	-90.33	223.55	-251.34	429.95	350.95	78.99	5.443	
11,200.00	11,187.84	11,200.84	11,187.84	39.95	39.98	-90.33	223.55	-251.34	429.95	350.24	79.71	5.394	
11,300.00	11,287.84	11,300.84	11,287.84	40.31	40.34	-90.33	223.55	-251.34	429.95	349.53	80.42	5.346	
11,400.00	11,387.84	11,400.84	11,387.84	40.67	40.69	-90.33	223.55	-251.34	429.95	348.81	81.13	5.299	
11,500.00	11,487.84	11,500.84	11,487.84	41.02	41.05	-90.33	223.55	-251.34	429.95	348.10	81.85	5.253	
11,600.00	11,587.84	11,600.84	11,587.84	41.38	41.40	-90.33	223.55	-251.34	429.95	347.39	82.56	5.208	
11,700.00	11,687.84	11,700.84	11,687.84	41.74	41.76	-90.33	223.55	-251.34	429.95	346.67	83.27	5.163	
11,800.00	11,787.84	11,800.84	11,787.84	42.09	42.12	-90.33	223.55	-251.34	429.95	345.96	83.99	5.119	
11,899.98	11,887.82	11,900.86	11,887.82	42.45	42.47	-90.33	223.55	-251.34	429.95	345.25	84.70	5.076	
11,904.20	11,892.04	11,903.36	11,892.04	42.46	42.48	-90.33	223.55	-251.34	429.95	345.22	84.72	5.075	
11,950.00	11,937.80	11,949.11	11,937.80	42.62	42.65	99.39	223.55	-251.34	430.24	345.20	85.04	5.059	
12,000.00	11,987.40	12,001.28	11,987.40	42.77	42.83	100.08	223.55	-251.34	431.29	345.91	85.38	5.051	
12,050.00	12,036.28	12,047.59	12,036.28	42.93	43.00	101.22	223.55	-251.34	433.27	347.58	85.70	5.056	
12,100.00	12,084.05	12,104.63	12,084.05	43.07	43.20	102.72	223.55	-251.34	436.46	350.41	86.04	5.073	
12,150.00	12,130.37	12,141.69	12,130.37	43.20	43.33	104.47	223.55	-251.34	441.21	354.90	86.31	5.112	
12,200.00	12,174.88	12,187.02	12,175.68	43.33	43.49	106.27	222.39	-251.49	447.93	361.34	86.59	5.173	
12,250.00	12,217.23	12,233.68	12,222.06	43.44	43.64	107.91	217.56	-252.12	456.69	369.84	86.85	5.258	
12,300.00	12,257.11	12,281.93	12,269.46	43.54	43.78	109.38	208.64	-253.28	467.39	380.30	87.09	5.367	
12,350.00	12,294.20	12,331.97	12,317.63	43.63	43.93	110.67	195.25	-255.02	479.89	392.60	87.29	5.497	
12,400.00	12,328.24	12,383.99	12,366.25	43.71	44.07	111.76	176.97	-257.39	494.00	406.57	87.43	5.650	
12,450.00	12,358.96	12,438.22	12,414.94	43.82	44.21	112.65	153.34	-260.46	509.51	422.02	87.49	5.824	
12,500.00	12,386.12	12,494.91	12,463.20	43.93	44.34	113.33	123.88	-264.29	526.21	438.76	87.45	6.017	
12,550.00	12,409.53	12,554.33	12,510.36	44.04	44.46	113.80	88.08	-268.94	543.84	456.53	87.31	6.229	
12,600.00	12,428.99	12,616.77	12,555.62	44.15	44.57	114.06	45.47	-274.47	562.15	475.08	87.08	6.456	
12,650.00	12,444.37	12,682.50	12,597.91	44.25	44.66	114.08	-4.39	-280.95	580.87	494.11	86.76	6.695	
12,700.00	12,455.55	12,751.79	12,635.95	44.36	44.78	113.88	-61.77	-288.40	599.71	513.31	86.40	6.941	
12,750.00	12,462.44	12,824.81	12,668.17	44.47	44.93	113.43	-126.70	-296.83	618.40	532.33	86.07	7.185	
12,799.97	12,464.98	12,901.60	12,692.80	44.57	45.09	112.71	-198.77	-306.19	636.62	550.81	85.81	7.419	
12,804.19	12,465.00	12,908.26	12,694.47	44.58	45.10	112.64	-205.16	-307.02	638.13	552.33	85.80	7.437	
12,900.00	12,465.00	13,062.58	12,712.00	44.80	45.39	112.42	-356.75	-326.68	666.37	580.29	86.08	7.742	
13,000.00	12,465.00	13,187.72	12,712.00	45.08	45.66	111.40	-481.22	-339.56	686.50	599.69	86.81	7.908	
13,100.00	12,465.00	13,315.68	12,712.00	45.38	45.99	110.77	-608.95	-347.08	699.44	611.88	87.56	7.988	
13,200.00	12,465.00	13,445.24	12,712.00	45.73	46.40	110.51	-738.48	-348.89	704.96	616.60	88.36	7.979	
13,252.43	12,465.00	13,501.83	12,712.00	45.92	46.60	110.50	-791.41	-348.39	705.40	616.67	88.73	7.950	
13,300.00	12,465.00	13,545.74	12,712.00	46.11	46.76	110.50	-838.98	-347.94	705.40	616.34	89.06	7.920	
13,400.00	12,465.00	13,645.74	12,712.00	46.52	47.16	110.50	-938.98	-346.99	705.39	615.55	89.84	7.852	
13,500.00	12,465.00	13,745.74	12,712.00	46.98	47.59	110.50	-1,038.97	-346.05	705.38	614.69	90.69	7.778	
13,600.00	12,465.00	13,845.74	12,712.00	47.48	48.07	110.50	-1,138.97	-345.10	705.37	613.75	91.61	7.699	
13,700.00	12,465.00	13,945.74	12,712.00	48.01	48.58	110.50	-1,238.96	-344.16	705.36	612.75	92.61	7.616	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 608H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

Survey Program: 0-MWD+HRGM — **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
13,800.00	12,465.00	14,045.74	12,712.00	48.58	49.13	110.50	-1,338.96	-343.21	705.35	611.67	93.68	7.529	
13,900.00	12,465.00	14,145.74	12,712.00	49.19	49.71	110.50	-1,438.95	-342.27	705.34	610.52	94.81	7.439	
14,000.00	12,465.00	14,245.74	12,712.00	49.82	50.33	110.50	-1,538.95	-341.32	705.32	609.31	96.02	7.346	
14,100.00	12,465.00	14,345.74	12,712.00	50.50	50.98	110.50	-1,638.95	-340.38	705.31	608.04	97.28	7.250	
14,200.00	12,465.00	14,445.74	12,712.00	51.20	51.67	110.50	-1,738.94	-339.43	705.30	606.70	98.60	7.153	
14,300.00	12,465.00	14,545.74	12,712.00	51.93	52.38	110.50	-1,838.94	-338.49	705.29	605.31	99.98	7.054	
14,400.00	12,465.00	14,645.74	12,712.00	52.69	53.12	110.50	-1,938.93	-337.54	705.28	603.86	101.42	6.954	
14,500.00	12,465.00	14,745.74	12,712.00	53.48	53.89	110.50	-2,038.93	-336.60	705.27	602.36	102.91	6.853	
14,600.00	12,465.00	14,845.74	12,712.00	54.30	54.69	110.50	-2,138.92	-335.65	705.26	600.81	104.45	6.752	
14,700.00	12,465.00	14,945.74	12,712.00	55.14	55.51	110.50	-2,238.92	-334.70	705.25	599.21	106.05	6.650	
14,800.00	12,465.00	15,045.74	12,712.00	56.01	56.36	110.50	-2,338.91	-333.76	705.24	597.56	107.68	6.549	
14,900.00	12,465.00	15,145.74	12,712.00	56.90	57.23	110.50	-2,438.91	-332.81	705.23	595.87	109.36	6.448	
15,000.00	12,465.00	15,245.74	12,712.00	57.81	58.12	110.50	-2,538.91	-331.87	705.22	594.13	111.09	6.348	
15,100.00	12,465.00	15,345.74	12,712.00	58.74	59.04	110.50	-2,638.90	-330.92	705.21	592.36	112.85	6.249	
15,200.00	12,465.00	15,445.74	12,712.00	59.69	59.97	110.50	-2,738.90	-329.98	705.20	590.54	114.66	6.151	
15,300.00	12,465.00	15,545.74	12,712.00	60.66	60.93	110.50	-2,838.89	-329.03	705.19	588.69	116.50	6.053	
15,400.00	12,465.00	15,645.74	12,712.00	61.65	61.90	110.50	-2,938.89	-328.09	705.18	586.81	118.37	5.957	
15,500.00	12,465.00	15,745.74	12,712.00	62.66	62.89	110.50	-3,038.88	-327.14	705.17	584.89	120.28	5.863	
15,600.00	12,465.00	15,845.74	12,712.00	63.68	63.90	110.50	-3,138.88	-326.20	705.16	582.94	122.22	5.770	
15,700.00	12,465.00	15,945.74	12,712.00	64.72	64.93	110.50	-3,238.87	-325.25	705.15	580.95	124.19	5.678	
15,800.00	12,465.00	16,045.74	12,712.00	65.78	65.97	110.50	-3,338.87	-324.31	705.14	578.94	126.19	5.588	
15,900.00	12,465.00	16,145.74	12,712.00	66.84	67.02	110.51	-3,438.87	-323.36	705.13	576.90	128.22	5.499	
16,000.00	12,465.00	16,245.74	12,712.00	67.93	68.09	110.51	-3,538.86	-322.41	705.11	574.84	130.27	5.413	
16,100.00	12,465.00	16,345.74	12,712.00	69.02	69.17	110.51	-3,638.86	-321.47	705.10	572.75	132.35	5.327	
16,200.00	12,465.00	16,445.74	12,712.00	70.13	70.26	110.51	-3,738.85	-320.52	705.09	570.64	134.46	5.244	
16,300.00	12,465.00	16,545.74	12,712.00	71.25	71.37	110.51	-3,838.85	-319.58	705.08	568.50	136.58	5.162	
16,400.00	12,465.00	16,645.74	12,712.00	72.38	72.49	110.51	-3,938.84	-318.63	705.07	566.34	138.73	5.082	
16,500.00	12,465.00	16,745.74	12,712.00	73.52	73.62	110.51	-4,038.84	-317.69	705.06	564.16	140.90	5.004	
16,600.00	12,465.00	16,845.74	12,712.00	74.67	74.76	110.51	-4,138.83	-316.74	705.05	561.96	143.09	4.927	
16,700.00	12,465.00	16,945.74	12,712.00	75.83	75.91	110.51	-4,238.83	-315.80	705.04	559.74	145.30	4.852	
16,800.00	12,465.00	17,045.74	12,712.00	77.00	77.07	110.51	-4,338.83	-314.85	705.03	557.51	147.52	4.779	
16,900.00	12,465.00	17,145.74	12,712.00	78.18	78.24	110.51	-4,438.82	-313.91	705.02	555.25	149.77	4.707	
17,000.00	12,465.00	17,245.74	12,712.00	79.37	79.41	110.51	-4,538.82	-312.96	705.01	552.98	152.03	4.637	
17,100.00	12,465.00	17,345.74	12,712.00	80.56	80.60	110.51	-4,638.81	-312.02	705.00	550.70	154.30	4.569	
17,200.00	12,465.00	17,445.74	12,712.00	81.76	81.79	110.51	-4,738.81	-311.07	704.99	548.40	156.59	4.502	
17,300.00	12,465.00	17,545.74	12,712.00	82.97	82.99	110.51	-4,838.80	-310.12	704.98	546.08	158.90	4.437	
17,400.00	12,465.00	17,645.74	12,712.00	84.19	84.20	110.51	-4,938.80	-309.18	704.97	543.75	161.22	4.373	
17,500.00	12,465.00	17,745.74	12,712.00	85.42	85.42	110.51	-5,038.79	-308.23	704.96	541.41	163.55	4.310	
17,600.00	12,465.00	17,845.74	12,712.00	86.65	86.64	110.51	-5,138.79	-307.29	704.95	539.05	165.89	4.249	
17,700.00	12,465.00	17,945.74	12,712.00	87.88	87.87	110.51	-5,238.79	-306.34	704.94	536.69	168.25	4.190	
17,800.00	12,465.00	18,045.74	12,712.00	89.13	89.11	110.51	-5,338.78	-305.40	704.93	534.31	170.62	4.132	
17,900.00	12,465.00	18,145.74	12,712.00	90.38	90.35	110.51	-5,438.78	-304.45	704.92	531.92	173.00	4.075	
18,000.00	12,465.00	18,245.74	12,712.00	91.63	91.59	110.51	-5,538.77	-303.51	704.91	529.52	175.39	4.019	
18,100.00	12,465.00	18,345.74	12,712.00	92.89	92.85	110.51	-5,638.77	-302.56	704.89	527.10	177.79	3.965	
18,200.00	12,465.00	18,445.74	12,712.00	94.16	94.10	110.51	-5,738.76	-301.62	704.88	524.68	180.20	3.912	
18,300.00	12,465.00	18,545.74	12,712.00	95.43	95.37	110.51	-5,838.76	-300.67	704.87	522.25	182.62	3.860	
18,400.00	12,465.00	18,645.74	12,712.00	96.70	96.64	110.51	-5,938.75	-299.73	704.86	519.81	185.05	3.809	
18,500.00	12,465.00	18,745.74	12,712.00	97.98	97.91	110.51	-6,038.75	-298.78	704.85	517.36	187.49	3.759	
18,600.00	12,465.00	18,845.74	12,712.00	99.26	99.18	110.51	-6,138.74	-297.83	704.84	514.91	189.94	3.711	
18,700.00	12,465.00	18,945.74	12,712.00	100.55	100.47	110.51	-6,238.74	-296.89	704.83	512.44	192.39	3.664	
18,800.00	12,465.00	19,045.74	12,712.00	101.84	101.75	110.51	-6,338.74	-295.94	704.82	509.97	194.85	3.617	

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

Company:	ENERGEN RESOURCES CORPORATION	**Local Co-ordinate Reference:**	Well 458H - Slot 458H
Project:	Lea County, NM	**TVD Reference:**	3331+25 @ 3356.00usft (EST)
Reference Site:	Pitchblende Fed 19-30 038H,208H,358H,458H,608H	**MD Reference:**	3331+25 @ 3356.00usft (EST)
Site Error:	0.00 usft	**North Reference:**	Grid
Reference Well:	458H	**Survey Calculation Method:**	Minimum Curvature
Well Error:	0.00 usft	**Output errors are at**	2.00 sigma
Reference Wellbore	Lateral	**Database:**	EDM 5000.14 Multi User
Reference Design:	Plan #2	**Offset TVD Reference:**	Reference Datum

Offset Design Pitchblende Fed 19-30 038H,208H,358H,458H,608H - 608H - Lateral - Plan #2 — **Offset Site Error:** 0.00 usft

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

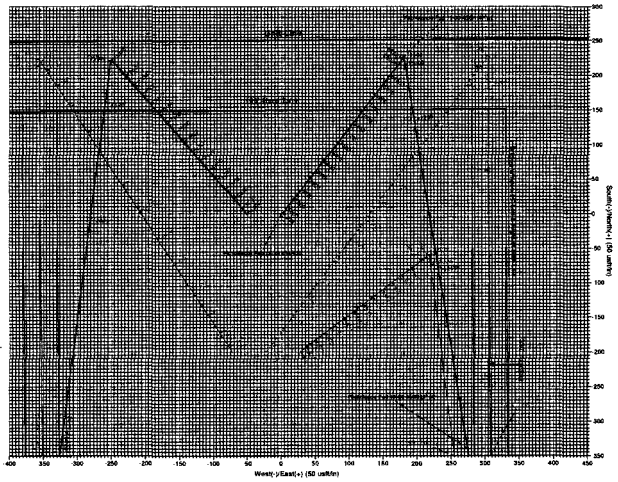
Reference Measured Depth (usft)	Reference Vertical Depth (usft)	Offset Measured Depth (usft)	Offset Vertical Depth (usft)	Semi Major Axis Reference (usft)	Semi Major Axis Offset (usft)	Highside Toolface (°)	Offset Wellbore Centre +N/-S (usft)	Offset Wellbore Centre +E/-W (usft)	Distance Between Centres (usft)	Distance Between Ellipses (usft)	Minimum Separation (usft)	Separation Factor	Warning
18,900.00	12,465.00	19,145.74	12,712.00	103.14	103.04	110.51	-6,438.73	-295.00	704.81	507.49	197.32	3.572	
19,000.00	12,465.00	19,245.74	12,712.00	104.44	104.33	110.52	-6,538.73	-294.05	704.80	505.00	199.80	3.528	
19,100.00	12,465.00	19,345.74	12,712.00	105.74	105.63	110.52	-6,638.72	-293.11	704.79	502.51	202.28	3.484	
19,200.00	12,465.00	19,445.74	12,712.00	107.04	106.93	110.52	-6,738.72	-292.16	704.78	500.00	204.78	3.442	
19,300.00	12,465.00	19,545.74	12,712.00	108.35	108.23	110.52	-6,838.71	-291.22	704.77	497.50	207.27	3.400	
19,400.00	12,465.00	19,645.74	12,712.00	109.66	109.54	110.52	-6,938.71	-290.27	704.76	494.98	209.78	3.360	
19,500.00	12,465.00	19,745.74	12,712.00	110.98	110.85	110.52	-7,038.70	-289.33	704.75	492.46	212.29	3.320	
19,600.00	12,465.00	19,845.74	12,712.00	112.30	112.17	110.52	-7,138.70	-288.38	704.74	489.94	214.80	3.281	
19,700.00	12,465.00	19,945.74	12,712.00	113.62	113.48	110.52	-7,238.70	-287.44	704.73	487.40	217.32	3.243	
19,800.00	12,465.00	20,045.74	12,712.00	114.94	114.80	110.52	-7,338.69	-286.49	704.72	484.87	219.85	3.205	
19,900.00	12,465.00	20,145.74	12,712.00	116.27	116.12	110.52	-7,438.69	-285.54	704.71	482.33	222.38	3.169	
20,000.00	12,465.00	20,245.74	12,712.00	117.60	117.45	110.52	-7,538.68	-284.60	704.70	479.78	224.92	3.133	
20,034.96	12,465.00	20,280.70	12,712.00	118.06	117.91	110.52	-7,573.64	-284.27	704.69	478.89	225.80	3.121	

ENERGEN RESOURCES CORPORATION

Project: Lea County, NM
Site: Pitchblende Fed 19-30 038H,208H,358H,458H,608H
Well: 458H
Wellbore: Lateral
Design: Plan #2
Rig: XXXXXX
Job: M18XXX

BOUNDARY LINES LEGEND
Lease/Unit Lines
Hard Lines
Drilling Window
Airstrip Line

ENERGEN RESOURCES



SECTION DETAILS

Sec	MD	Inc	Azi	TVD	+N/-S	+E/-W	Dleg	TFace	VSect	Target
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
2	5300.00	0.00	0.00	5300.00	0.00	0.00	0.00	0.00	0.00	
3	5633.44	5.00	38.32	5633.01	11.41	9.02	1.50	38.32	-11.32	
4	8803.72	5.00	38.32	8791.99	214.58	169.59	0.00	0.00	-212.98	
5	8997.16	0.00	0.00	8925.00	225.99	178.60	1.50	180.00	-224.30	Pitchblende Fed 19-30 458H NP p2
6	11904.20	0.00	0.00	11832.04	225.99	178.60	0.00	0.00	-224.30	
7	12864.19	90.00	170.50	12465.00	-339.11	273.16	10.00	170.50	341.66	
8	13252.43	90.00	179.46	12465.00	-765.17	312.33	2.00	90.00	769.08	
9	20034.95	90.00	179.46	12465.00	-7567.40	375.69	0.00	0.00	7570.60	Pitchblende Fed 19-30 458H PBHL p2

DESIGN TARGET DETAILS

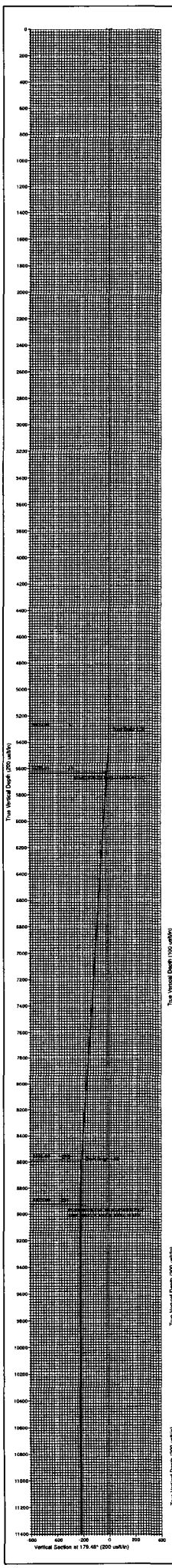
Name	TVD	+N/-S	+E/-W	Northing	Easting	Latitude	Longitude
Pitchblende Fed 19-30 458H SL	0.00	0.00	0.00	409480.85	789049.26	32° 7' 20.41 N	103° 23' 59.54 W
Pitchblende Fed 19-30 458H NP p2	8925.00	225.99	178.60	409706.85	789227.86	32° 7' 22.63 N	103° 23' 56.74 W
Pitchblende Fed 19-30 458H LP p2	12465.00	-339.10	273.16	409141.76	789320.42	32° 7' 17.05 N	103° 23' 55.69 W
Pitchblende Fed 19-30 458H PBHL p2	12465.00	-7567.40	375.69	401913.46	789424.95	32° 6' 5.50 N	103° 23' 55.23 W

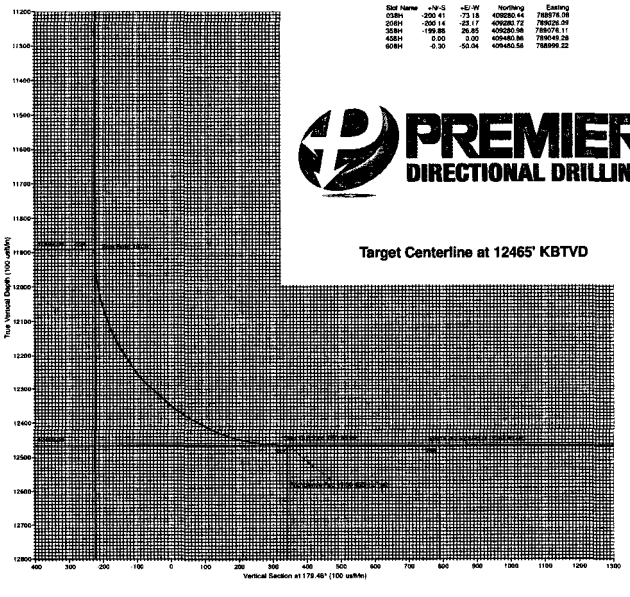
SLOTS

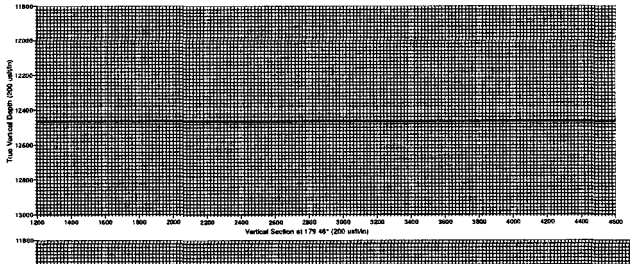
Slot Name	+N/-S	+E/-W	Northing	Easting
038H	-200.41	-73.18	409280.44	788976.08
208H	-200.14	-23.17	409280.72	789026.09
358H	-199.86	26.85	409280.98	789076.11
458H	0.00	0.00	409480.86	789049.26
608H	-0.30	-50.04	409480.56	788999.22

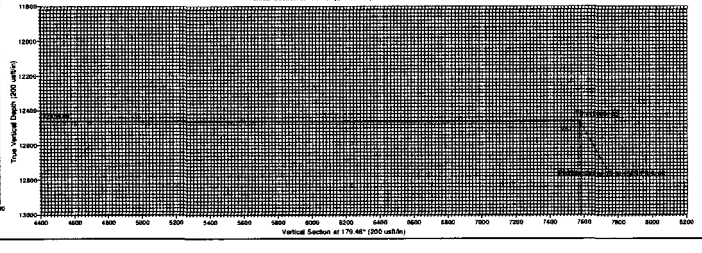
PREMIER DIRECTIONAL DRILLING

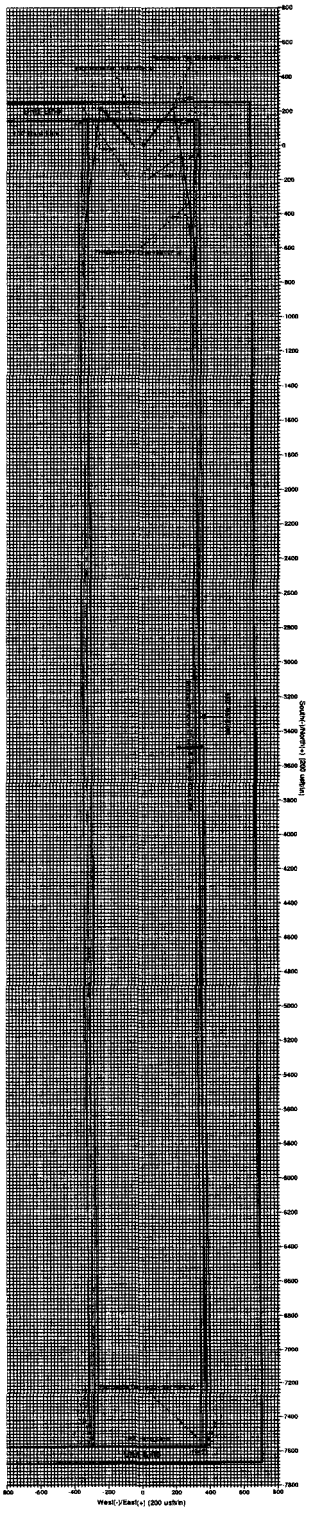
Target Centerline at 12465' KBTVD











Azimuths to Grid North
True North: -0.50°
Magnetic North: 6.20°

Magnetic Field
Strength: 47666.3snT
Dip Angle: 59.82°
Date: 9/5/2018
Model: HDGM

Project Details:	Lea County, NM
Geodetic System:	US State Plane 1927 (Exact solution)
Geodetic Datum:	NAD 1927 (NADCON CONUS)
Geodetic Ellipsoid:	Clarke 1866
Geodetic Zone:	New Mexico East 3001
System Datum:	Mean Sea Level

C&J ENERGY SERVICES

O-TEX CEMENTING

Energen Resources

Prepared For
Mr. Richard Hill

Pitchblende Fed 19-30 #458H

Surface Casing Cement
Located in
Lea County, New Mexico

Prepared by
Jonathan Smith
on
Thursday, May 10, 2018

Serviced from the Pecos, Texas facility
For Customer Service Call
432-755-4999

Proposal Version: 0

5/10/2018 15:00 3.36N032318

Energen Resources
Pitchblende Fed 19-30 #458H
Surface Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Job Data

Job Type	Surface Casing
Round Trip Mileage	200
Hole Size	17.5" to 1010'
Casing Size/Weight	13.375" 61# to 1010'
MD	1010
Est. BHST/BHCT	88-F BHST / 80-F BHCT (0.8-F/100-ft)

Volumes

	Length (ft)	OD (in)	ID (in)	Excess (%)	CF/FT	Vol. (cf)	Vol. (bbl)
Lead	808	17.500	13.375	150%	1.7365	1403.1	249.9
Tail	202	17.500	13.375	150%	1.7365	350.8	62.5

Fluid Requirements

Spacer

20-bbls. water

Lead

100% Class C+4% Gel+2% CaCl2+0.25#/sx Cello Flake+0.75-GAL/100-SX CF-41L

Volume (sx)	805	251 (bbls)
Weight (ppg)	13.50	
Yield (cf/sx)	1.75	
Water (gps)	9.18	
Top of Cement (ft)	0	
Excess (%)	150%	
Compressive Strengths (psi)	12/352, 24/719, 72/1311	

Tail

100% Class C+2% CaCl2+0.75-GAL/100-SX CF-41L

Volume (sx)	265	64 (bbls)
Weight (ppg)	14.80	
Yield (cf/sx)	1.35	
Water (gps)	6.36	
Top of Cement (ft)	808	
Excess (%)	150%	
Compressive Strengths (psi)	500 psi: 6:48, 12/1136, 24/1953, 72/3169	

Energen Resources
Pitchblende Fed 19-30 #458H
Surface Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Displacement

153.7-bbls. water

Energen Resources **Rig: RIG**

Pitchblende Fed 19-30 #458H

Surface Casing

5/10/2018

REF. #	DESCRIPTION	QUANTITY	UNIT PRICE	DISCOUNT	GROSS	NET TOTAL
CP001	C (Premium Plus Cement) (94 lbs/ft3)	1070	$ 30.80	60.00%	$ 32,956.04	$ 13,182.42
CP018	Calcium Chloride	2013	$ 1.22	60.00%	$ 2,455.86	$ 982.34
CP010	Cello Flake	202	$ 4.20	60.00%	$ 848.40	$ 339.36
CP005	GEL	3027	$ 0.68	60.00%	$ 2,058.36	$ 823.34
CP009	CF-41 (Foam Preventer)	9	$ 86.06	60.00%	$ 774.54	$ 309.82
CC002	Pump Charge 1000'-2000'	1	$ 3,070.98	60.00%	$ 3,070.98	$ 1,228.39
JM001	Data Acquisition System	1	$ 1,437.48	60.00%	$ 1,437.48	$ 574.99
AE001	Hi Volume Air compressor	1	$ 457.38	60.00%	$ 457.38	$ 182.95
AE007	1" to 2" valves	1	$ 424.71	60.00%	$ 424.71	$ 169.88
PC003	Employee/Supervisor Retention/perdiem	1	$ 1,306.80	0.00%	$ 1,306.80	$ 1,306.80
RP001	Reserve (standby) Pump	1	$ 3,267.00	60.00%	$ 3,267.00	$ 1,306.80
AE002	Cement Head with manifold	1	$ 1,176.12	60.00%	$ 1,176.12	$ 470.45
AE003	Circulation Equipment(40' of equipment)	1	$ 1,633.50	60.00%	$ 1,633.50	$ 653.40
AE004	Portable Field Storage Bin (3 days)	1	$ 1,960.20	60.00%	$ 1,960.20	$ 784.08
ML014	Fuel Surcharge	3	$ 653.40	60.00%	$ 1,960.20	$ 784.08
CL021	13 3/8" Top Rubber Plug	1	$ 1,016.40	60.00%	$ 1,016.40	$ 406.56
ML001	Pickup Mileage	400	$ 4.26	60.00%	$ 1,704.00	$ 681.60
ML002	Pump Truck/Heavy Vehicle Mileage	600	$ 7.32	60.00%	$ 4,392.00	$ 1,756.80
ML003	Bulk Cement Delivery/Return	5292	$ 2.95	60.00%	$ 15,611.40	$ 6,244.56
MX001	Bulk Material Mixing Service Charge	1175	$ 3.27	60.00%	$ 3,842.25	$ 1,536.90
					GROSS/BOOK PRICE:	$ 82,353.62
					DISCOUNTED AMOUNT:	$ 48,628.09
					ESTIMATED JOB COST:	**$ 33,725.53**

0

The services and materials quoted are based on the best information available at the time that this quotation was prepared. When the actual work is performed the amounts and types of services and materials may require adjustments from this quotation. Actual amounts and types of services and materials will be charged at the time the work is performed. Unit prices from C&J's current price list and discounts quoted are applied as per this quotation, unless otherwise noted. This quotation is for the materials and services presented under this cover letter. The prices and discounts are based on C&J being awarded the work on a first call basis. Prices may be adjusted if the work is not on a first call basis. Prices are valid for a period of 30 days following this quotation. Taxes, if any, will be applied to the actual invoice. All services and materials sold and/or provided by C&J are subject to C&J's "Contractor's Standard Terms and Conditions" document, which contains provisions concerning risk allocation and warranties associated with C&J's services. The parties hereby agree that all materials and services will be furnished pursuant to C&J's "Contractor's Standard Terms and Conditions" document and a customary work order agreement.

C&J ENERGY SERVICES

O-TEX CEMENTING

Energen Resources

Prepared For
Mr. Richard Hill

Pitchblende Fed 19-30 #458H

First Intermediate Casing Cement
Located in
Lea County, New Mexico

Prepared by
Jonathan Smith
on
Thursday, May 10, 2018

Serviced from the Pecos, Texas facility
For Customer Service Call
432-755-4999

Energen Resources
Pitchblende Fed 19-30 #458H
First Intermediate Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Job Data

Job Type	First Intermediate Casing
Round Trip Mileage	200
Previous Casing	13.375" 61# to 1010'
Hole Size	12.25" to 5300'
Casing Size/Weight	10.75" 45.5# to 5300'
MD	5300
Est. BHST/BHCT	122-F BHST / 107-F BHCT (0.8-F/100-ft)

Volumes

	Length (ft)	OD (in)	ID (in)	Excess (%)	CF/FT	Vol. (cf)	Vol. (bbl)
Lead	1010	12.515	10.750	0%	0.2240	226.2	40.3
Lead	3230	12.250	10.750	100%	0.3763	1215.5	216.5
Tail	1060	12.250	10.750	25%	0.2352	249.3	44.4

Fluid Requirements

Spacer

20-bbls. water

Lead

50% Poz+50% Class C+10% Gel+0.25#/sx Cello Flake+3#/sx Kolseal+5% SALT+0.75-GAL/100-SX CF-41L

Volume (sx)	585	258 (bbls)
Weight (ppg)	11.80	
Yield (cf/sx)	2.47	
Water (gps)	14.01	
Top of Cement (ft)	0	
Excess (%)	100%	

Tail

100% Class C+0.15% O-TX20+0.75-GAL/100-SX CF-41L

Volume (sx)	190	45 (bbls)
Weight (ppg)	14.80	
Yield (cf/sx)	1.33	
Water (gps)	6.33	
Top of Cement (ft)	4240	
Excess (%)	25%	

Energen Resources
Pitchblende Fed 19-30 #458H
First Intermediate Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Displacement

509.7-bbls. water

Energen Resources **Rig: RIG**

Pitchblende Fed 19-30 #458H

First Intermediate Casing

5/10/2018

C&J ENERGY SERVICES
O-TEX CEMENTING

REF. #	DESCRIPTION	QUANTITY	UNIT PRICE	DISCOUNT	GROSS	NET TOTAL
CP001	C (Premium Plus Cement) (94 lbs/ft3)	483	$ 30.80	60.00%	$ 14,876.42	$ 5,950.57
CP003	POZ (Fly Ash) (74 lbs/ft3) -	293	$ 13.55	60.00%	$ 3,970.19	$ 1,588.08
CP010	Cello Flake	147	$ 4.20	60.00%	$ 617.40	$ 246.96
CP005	GEL	4914	$ 0.68	60.00%	$ 3,341.52	$ 1,336.61
CP011	Kolseal	1755	$ 1.02	60.00%	$ 1,790.10	$ 716.04
CP013	O-TX20 (CF-20) LS Retarder (below 220°)	27	$ 13.55	60.00%	$ 365.85	$ 146.34
CP020	Salt (NaCl), 100 mesh sacked	3417	$ 0.68	60.00%	$ 2,323.56	$ 929.42
CP009	CF-41 (Foam Preventer)	7	$ 86.06	60.00%	$ 602.42	$ 240.97
CC006	Pump Charge 5001-6000'	1	$ 4,671.81	60.00%	$ 4,671.81	$ 1,868.72
JM001	Data Acquisition System	1	$ 1,437.48	60.00%	$ 1,437.48	$ 574.99
AE001	Hi Volume Air compressor	1	$ 457.38	60.00%	$ 457.38	$ 182.95
AE007	1" to 2" valves	1	$ 424.71	60.00%	$ 424.71	$ 169.88
PC003	Employee/Supervisor Retention/perdiem	1	$ 1,306.80	0.00%	$ 1,306.80	$ 1,306.80
RP001	Reserve (standby) Pump	1	$ 3,267.00	60.00%	$ 3,267.00	$ 1,306.80
AE002	Cement Head with manifold	1	$ 1,176.12	60.00%	$ 1,176.12	$ 470.45
AE003	Circulation Equipment(40' of equipment)	1	$ 1,633.50	60.00%	$ 1,633.50	$ 653.40
AE004	Portable Field Storage Bin (3 days)	1	$ 1,960.20	60.00%	$ 1,960.20	$ 784.08
ML014	Fuel Surcharge	2	$ 653.40	60.00%	$ 1,306.80	$ 522.72
CL019	10 3/4" Top Rubber Plug	1	$ 453.99	60.00%	$ 453.99	$ 181.60
ML001	Pickup Mileage	400	$ 4.26	60.00%	$ 1,704.00	$ 681.60
ML002	Pump Truck/Heavy Vehicle Mileage	600	$ 7.32	60.00%	$ 4,392.00	$ 1,756.80
ML003	Bulk Cement Delivery/Return	3864	$ 2.95	60.00%	$ 11,398.80	$ 4,559.52
MX001	Bulk Material Mixing Service Charge	952	$ 3.27	60.00%	$ 3,113.04	$ 1,245.22
					GROSS/BOOK PRICE:	$ 66,591.09
					DISCOUNTED AMOUNT:	$ 39,170.57
					ESTIMATED JOB COST:	**$ 27,420.52**

0

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C&J ENERGY SERVICES

O-TEX CEMENTING

Energen Resources

Prepared For
Mr. Richard Hill

Pitchblende Fed 19-30 #458H

Second Intermediate Two Stage Casing Cement
Located in
Lea County, New Mexico

Prepared by
Jonathan Smith
on
Thursday, May 10, 2018

Serviced from the Pecos, Texas facility
For Customer Service Call
432-755-4999

Proposal Version: 0

5/10/2018 15:10 3.36N032318

Energen Resources
Pitchblende Fed 19-30 #458H
Second Intermediate Two Stage Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Job Data

Job Type	Second Intermediate Two Stage Casing
Round Trip Mileage	200
Previous Casing	10.75" 45.5# to 5300'
Hole Size	9.875" to 11893'
Casing Size/Weight	7.625" 29.7# to 11893'
MD	11893
Est. BHST/BHCT	176-F BHST / 140-F BHCT (0.8-F/100-ft)
DV Tool Depth	5200

Volumes

	Length (ft)	OD (in)	ID (in)	Excess (%)	CF/FT	Vol. (cf)	Vol. (bbl)
Stage 2 Lead	4160	9.950	7.625	20%	0.2674	1112.5	198.1
Stage 2 Tail	1040	9.950	7.625	20%	0.2674	278.1	49.5
Stage 1 Lead	200	9.950	7.625	100%	0.4457	89.1	15.9
Stage 1 Lead	4214	9.875	7.625	100%	0.4295	1809.9	322.3
Stage 1 Tail	2379	9.875	7.625	50%	0.3221	766.3	136.5

Fluid Requirements

Spacer

20-bbls. water

Stage 1 Lead

50% Poz+50% Class H+10% Gel+0.6% SMS+0.65% O-TX20+0.25#/sx Cello Flake+5#/sx Kolseal+5% SALT+0.75-GAL/100-SX CF-41L

Volume (sx)	640	339 (bbls)
Weight (ppg)	11.30	
Yield (cf/sx)	2.98	
Water (gps)	17.44	
Top of Cement (ft)	5100	
Excess (%)	100%	

Stage 1 Tail

100% Class H+0.5% FL-17+0.05% C-51+0.2% O-TX20+0.75-GAL/100-SX CF-41L

Volume (sx)	650	137 (bbls)
Weight (ppg)	15.60	
Yield (cf/sx)	1.19	
Water (gps)	5.21	
Top of Cement (ft)	9514	
Excess (%)	50%	

Energen Resources
Pitchblende Fed 19-30 #458H
Second Intermediate Two Stage Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Displacement

236.68-bbls. water

Spacer

20-bbls. water

Stage 2 Lead

50% Poz+50% Class C+10% Gel+0.6% SMS+0.3% O-TX20+5% SALT+0.75-GAL/100-SX CF-41L

Volume (sx)	385	200 (bbls)
Weight (ppg)	11.30	
Yield (cf/sx)	2.92	
Water (gps)	17.51	
Top of Cement (ft)	0	
Excess (%)	20%	

Stage 2 Tail

100% Class C+0.15% O-TX20+0.75-GAL/100-SX CF-41L

Volume (sx)	210	50 (bbls)
Weight (ppg)	14.80	
Yield (cf/sx)	1.33	
Water (gps)	6.33	
Top of Cement (ft)	4160	
Excess (%)	20%	

Displacement

236.68-bbls. water

Energen Resources **Rig: RIG**

Pitchblende Fed 19-30 #458H

Second Intermediate Two Stage Casing

5/10/2018

REF. #	DESCRIPTION	QUANTITY	UNIT PRICE	DISCOUNT	GROSS	NET TOTAL
CP001	C (Premium Plus Cement) (94 lbs/ft3)	403	$ 30.80	60.00%	$ 12,412.42	$ 4,964.97
CP002	H (Premium Cement) (94 lbs/ft3)	970	$ 30.80	60.00%	$ 29,876.04	$ 11,950.42
CP003	POZ (Fly Ash) (74 lbs/ft3) -	513	$ 13.55	60.00%	$ 6,951.22	$ 2,780.49
CP034	CF - 51 (Anti settling agent)	31	$ 27.10	60.00%	$ 840.10	$ 336.04
CP010	Cello Flake	160	$ 4.20	60.00%	$ 672.00	$ 268.80
CPC29	FL-17 Fluid Loss Additive	306	$ 40.00	60.00%	$ 12,240.00	$ 4,896.00
CP005	GEL	8610	$ 0.68	60.00%	$ 5,854.80	$ 2,341.92
CP011	Kolseal	3200	$ 1.02	60.00%	$ 3,264.00	$ 1,305.60
CP021	Sodium Metasilicate	518	$ 3.39	60.00%	$ 1,756.02	$ 702.41
CP013	O-TX20 (CF-20) LS Retarder (below 220°)	601	$ 13.55	60.00%	$ 8,143.55	$ 3,257.42
CP020	Salt (NaCl), 100 mesh sacked	7467	$ 0.68	60.00%	$ 5,077.56	$ 2,031.02
CP009	CF-41 (Foam Preventer)	15	$ 86.06	60.00%	$ 1,290.90	$ 516.36
CC011	Pump Charge 10,001-12,000'	1	$ 10,846.44	60.00%	$ 10,846.44	$ 4,338.58
MS001	Multiple Stage Cementing	1	$ 3,234.44	60.00%	$ 3,234.44	$ 1,293.78
JM001	Data Acquisition System	1	$ 1,437.48	60.00%	$ 1,437.48	$ 574.99
AE001	Hi Volume Air compressor	1	$ 457.38	60.00%	$ 457.38	$ 182.95
AE007	1" to 2" valves	1	$ 424.71	60.00%	$ 424.71	$ 169.88
PC003	Employee/Supervisor Retention/perdiem	1	$ 1,306.80	0.00%	$ 1,306.80	$ 1,306.80
RP001	Reserve (standby) Pump	1	$ 3,267.00	60.00%	$ 3,267.00	$ 1,306.80
AE002	Cement Head with manifold	1	$ 1,176.12	60.00%	$ 1,176.12	$ 470.45
AE003	Circulation Equipment(40' of equipment)	1	$ 1,633.50	60.00%	$ 1,633.50	$ 653.40
AE004	Portable Field Storage Bin (3 days)	2	$ 1,960.20	60.00%	$ 3,920.40	$ 1,568.16
ML014	Fuel Surcharge	4	$ 653.40	60.00%	$ 2,613.60	$ 1,045.44
AE006	Transfer Pump	1	$ 980.10	60.00%	$ 980.10	$ 392.04
ML001	Pickup Mileage	400	$ 4.26	60.00%	$ 1,704.00	$ 681.60
ML002	Pump Truck/Heavy Vehicle Mileage	800	$ 7.32	60.00%	$ 5,856.00	$ 2,342.40
ML003	Bulk Cement Delivery/Return	9394	$ 2.95	60.00%	$ 27,712.30	$ 11,084.92
MX001	Bulk Material Mixing Service Charge	2246	$ 3.27	60.00%	$ 7,344.42	$ 2,937.77
					GROSS/BOOK PRICE:	$ 162,293.30
					DISCOUNTED AMOUNT:	$ 96,591.90
					ESTIMATED JOB COST:	**$ 65,701.40**

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C&J ENERGY SERVICES

O-TEX CEMENTING

Energen Resources

Prepared For
Mr. Richard Hill

Pitchblende Fed 19-30 #458H

Production Casing Cement
Located in
Lea County, New Mexico

Prepared by
Jonathan Smith
on
Thursday, May 10, 2018

Serviced from the Pecos, Texas facility
For Customer Service Call
432-755-4999

Proposal Version: 0

5/10/2018 15:12 3.36N032318

Energen Resources
Pitchblende Fed 19-30 #458H
Production Casing
5/10/2018

Rig: RIG

C&J ENERGY SERVICES
O-TEX CEMENTING

Job Data

Job Type	Production Casing
Round Trip Mileage	200
Previous Casing	7.625" 29.7# to 11893'
Hole Size	6.75" to 20885'
Casing Size/Weight	5.5" 23# to 11793' 4.5" 15.1# to 20885'
MD	20885
TVD	12465
Mud	12.5# OBM
Est. BHST/BHCT	180-F BHST / 180-F BHCT (0.8-F/100-ft)
Kick off Point	10160
C-20L Needed for job	128-gals (20% extra)
Water needed for job	227-bbls. (20% extra)

Volumes

	Length (ft)	OD (in)	ID (in)	Excess (%)	CF/FT	Vol. (cf)	Vol. (bbl)
Tail	3793	6.875	5.500	0%	0.0928	352.0	62.7
Tail	100	6.875	4.500	0%	0.1473	14.7	2.6
Tail	8992	6.750	4.500	15%	0.1588	1427.6	254.3

Fluid Requirements

Spacer

40 bbls of 13.5 ppg Weighted Spacer: 30.13gpb (28.6bbl) Fresh Water + 281.23ppb (11249lbs) Barite + 1ppb (40lbs) Citric Acid + 8.99ppb (360lbs) C-65 + 1.5gpb (60gal) Plexaid 803 + 1.5gpb (60gal) Plexaid 830 + 1ppb (40lbs) C-40P

Tail

50% Poz+50% Class H+2% Gel+0.5% FL-17+0.75-GAL/100-SX CF-41L+0.07-GPS C-20L

Volume (sx)	1495	320 (bbls)
Weight (ppg)	14.50	
Yield (cf/sx)	1.20	
Water (gps)	5.20	
Top of Cement (ft)	8000	
Excess (%)	15%	

Displacement

20-bbls. water (300-lbs. sugar)

Displacement

359.1-bbls. CaCl2 water provided by rig + 0.25 gpt. Plexcide 24L (4 gal)

Energen Resources **Rig: RIG**

Pitchblende Fed 19-30 #458H

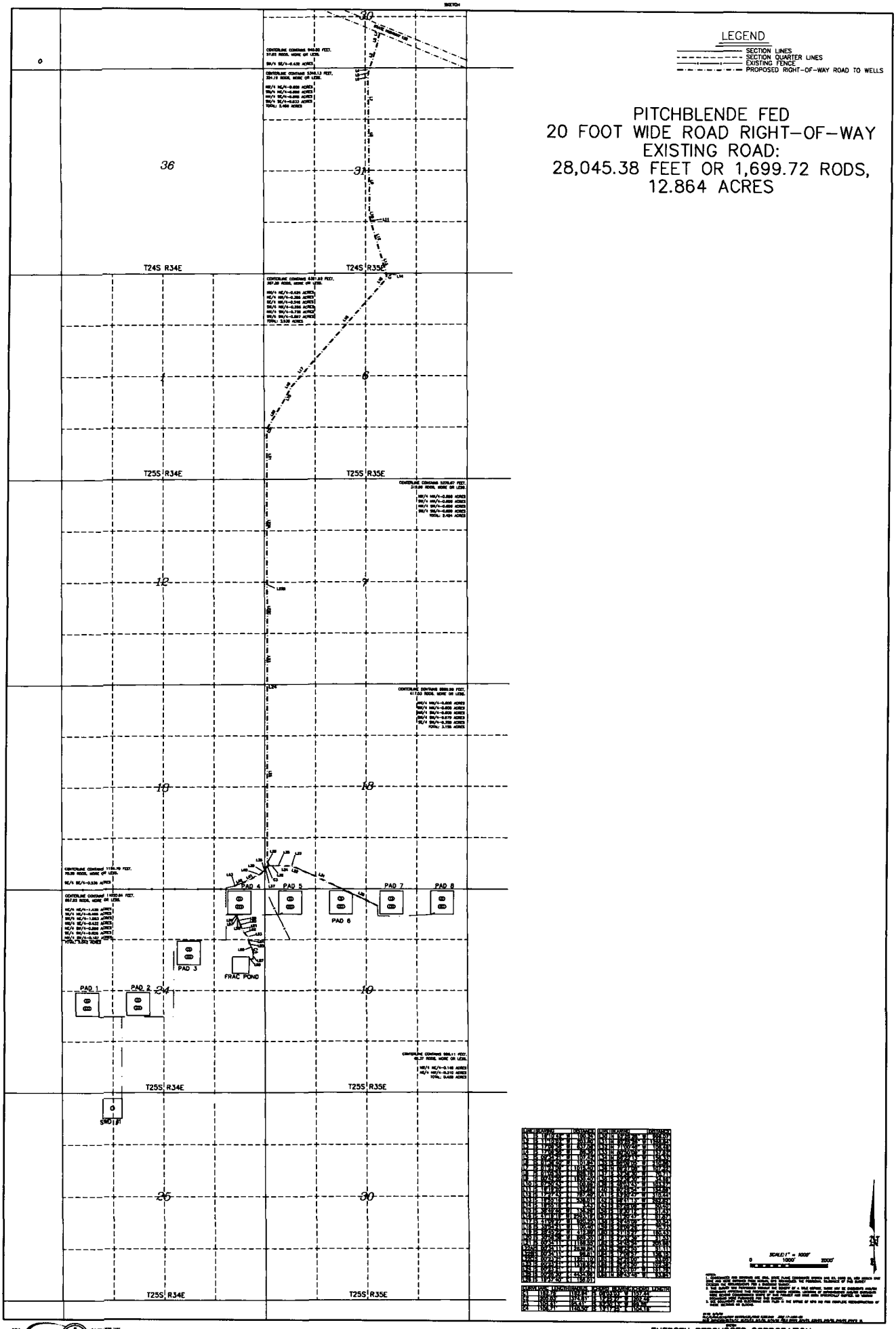
Production Casing

5/10/2018

REF. #	DESCRIPTION	QUANTITY	UNIT PRICE	DISCOUNT	GROSS	NET TOTAL
CP002	H (Premium Cement) (94 lbs/ft3)	748	$ 30.80	60.00%	$ 23,038.43	$ 9,215.37
CP003	POZ (Fly Ash) (74 lbs/ft3) -	748	$ 13.55	60.00%	$ 10,135.50	$ 4,054.20
CPC29	FL-17 Fluid Loss Additive	628	$ 40.00	60.00%	$ 25,120.00	$ 10,048.00
CP005	GEL	2512	$ 0.68	60.00%	$ 1,708.16	$ 683.26
CPC51	C-20L Liquid Retarder	105	$ 50.40	60.00%	$ 5,292.00	$ 2,116.80
CP009	CF-41 (Foam Preventer)	12	$ 86.06	60.00%	$ 1,032.72	$ 413.09
CP025	Barite (weighting material)	11249	$ 1.10	60.00%	$ 12,373.90	$ 4,949.56
CPC45	C-65 (Weighted Spacer Mix OBM)	360	$ 12.85	60.00%	$ 4,626.00	$ 1,850.40
CPC18	Plexaid 803	60	$ 60.98	60.00%	$ 3,658.80	$ 1,463.52
CPC35	Plexaid 830 Surfactant	60	$ 137.94	60.00%	$ 8,276.40	$ 3,310.56
RFC16	CI-Tric (powder citric acid)	40	$ 13.55	60.00%	$ 542.00	$ 216.80
CPC53	C-40P	40	$ 9.25	60.00%	$ 370.00	$ 148.00
CPC51	C-20L Liquid Retarder	21	$ 50.40	60.00%	$ 1,058.40	$ 423.36
CP031	Sugar	300	$ 3.39	60.00%	$ 1,017.00	$ 406.80
MC024	Plec-Cide 24L	5	$ 92.40	60.00%	$ 462.00	$ 184.80
CC013	Pump Charge 14001-15,000'	1	$ 21,954.24	60.00%	$ 21,954.24	$ 8,781.70
CC014	Pump Charge Every 1,000' Over 15,000'	6	$ 3,267.00	60.00%	$ 19,602.00	$ 7,840.80
JM001	Data Acquisition System	1	$ 1,437.48	60.00%	$ 1,437.48	$ 574.99
AE001	Hi Volume Air compressor	1	$ 457.38	60.00%	$ 457.38	$ 182.95
AE007	1" to 2" valves	1	$ 424.71	60.00%	$ 424.71	$ 169.88
PC003	Employee/Supervisor Retention/perdiem	1	$ 1,306.80	0.00%	$ 1,306.80	$ 1,306.80
RP001	Reserve (standby) Pump	1	$ 3,267.00	60.00%	$ 3,267.00	$ 1,306.80
BB001	Batch Mixer	1	$ 2,384.91	60.00%	$ 2,384.91	$ 953.96
AE002	Cement Head with manifold	1	$ 1,176.12	60.00%	$ 1,176.12	$ 470.45
AE003	Circulation Equipment(40' of equipment)	1	$ 1,633.50	60.00%	$ 1,633.50	$ 653.40
AE004	Portable Field Storage Bin (3 days)	2	$ 1,960.20	60.00%	$ 3,920.40	$ 1,568.16
ML014	Fuel Surcharge	4	$ 653.40	60.00%	$ 2,613.60	$ 1,045.44
CL036	4 1/2" x 5 1/2" Top Rubber Plugs	1	$ 360.00	60.00%	$ 360.00	$ 144.00
ML001	Pickup Mileage	400	$ 4.26	60.00%	$ 1,704.00	$ 681.60
ML002	Pump Truck/Heavy Vehicle Mileage	1000	$ 7.32	60.00%	$ 7,320.00	$ 2,928.00
ML003	Bulk Cement Delivery/Return	6442	$ 2.95	60.00%	$ 19,003.90	$ 7,601.56
MX001	Bulk Material Mixing Service Charge	1558	$ 3.27	60.00%	$ 5,094.66	$ 2,037.86
					GROSS/BOOK PRICE:	$ 192,372.01
					DISCOUNTED AMOUNT:	$ 114,639.13
					ESTIMATED JOB COST:	$ 77,732.89

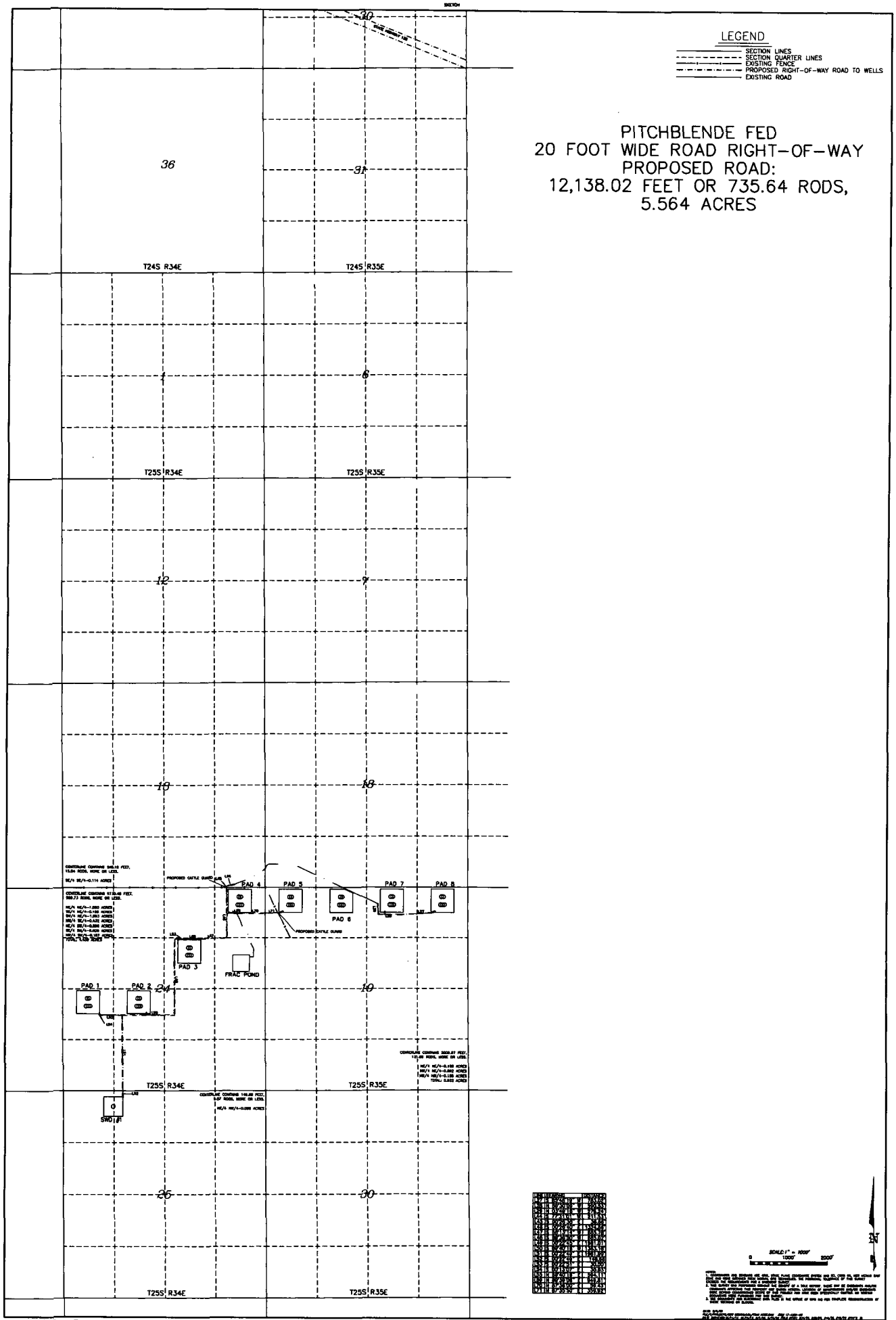
0

The services and materials quoted are based on the best information available at the time that this quotation was prepared. When the actual work is performed the amounts and types of services and materials may require adjustments from this quotation. Actual amounts and types of services and materials will be charged at the time the work is performed. Unit prices from C&J's current price list and discounts quoted are applied as per this quotation, unless otherwise noted. This quotation is for the materials and services presented under this cover letter. The prices and discounts are based on C&J being awarded the work on a first call basis. Prices may be adjusted if the work is not on a first call basis. Prices are valid for a period of 30 days following this quotation. Taxes, if any, will be applied to the actual invoice. All services and materials sold and/or provided by C&J are subject to C&J's "Contractor's Standard Terms and Conditions" document, which contains provisions concerning risk allocation and warranties associated with C&J's services. The parties hereby agree that all materials and services will be furnished pursuant to C&J's "Contractor's Standard Terms and Conditions" document and a customary work order agreement.



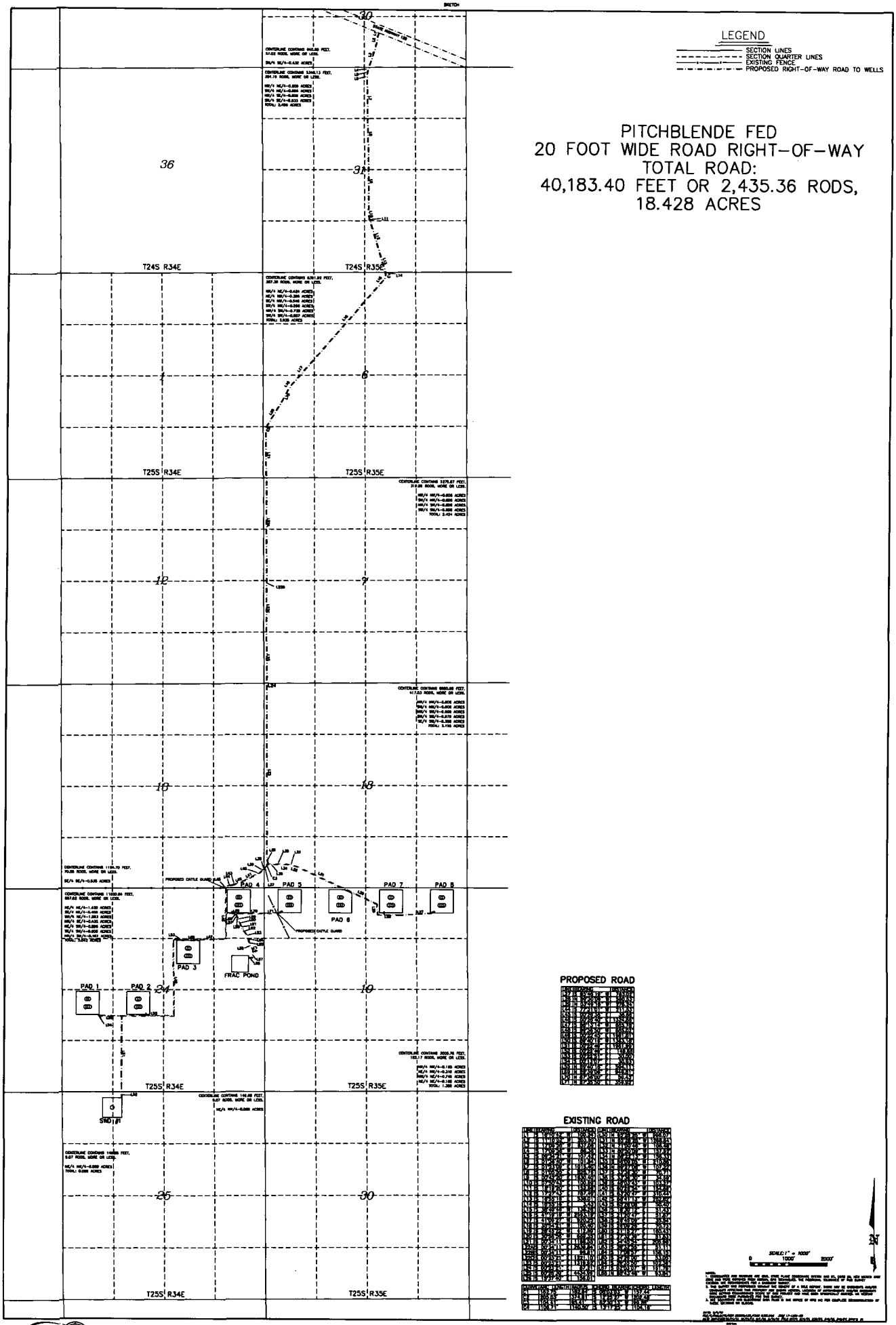
Watson Professional Group Inc

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED ROAD RIGHT-OF-WAY
SECTIONS 30 & 31, T24S, R35E,
SECTIONS 6, 7, 18, & 19, T25S, R35E,
SECTIONS 13 & 24, T25S, R34E
LEA COUNTY, NEW MEXICO

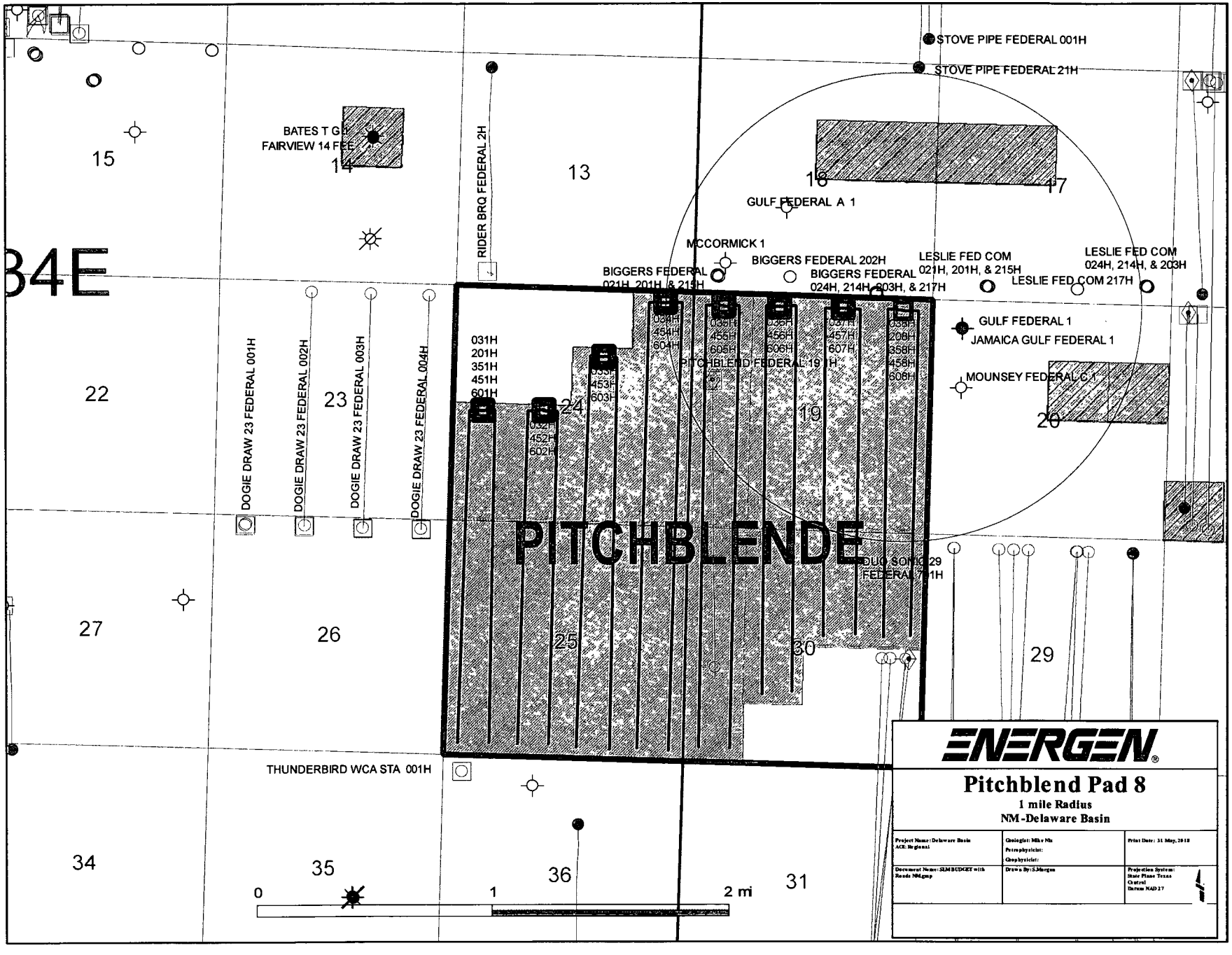


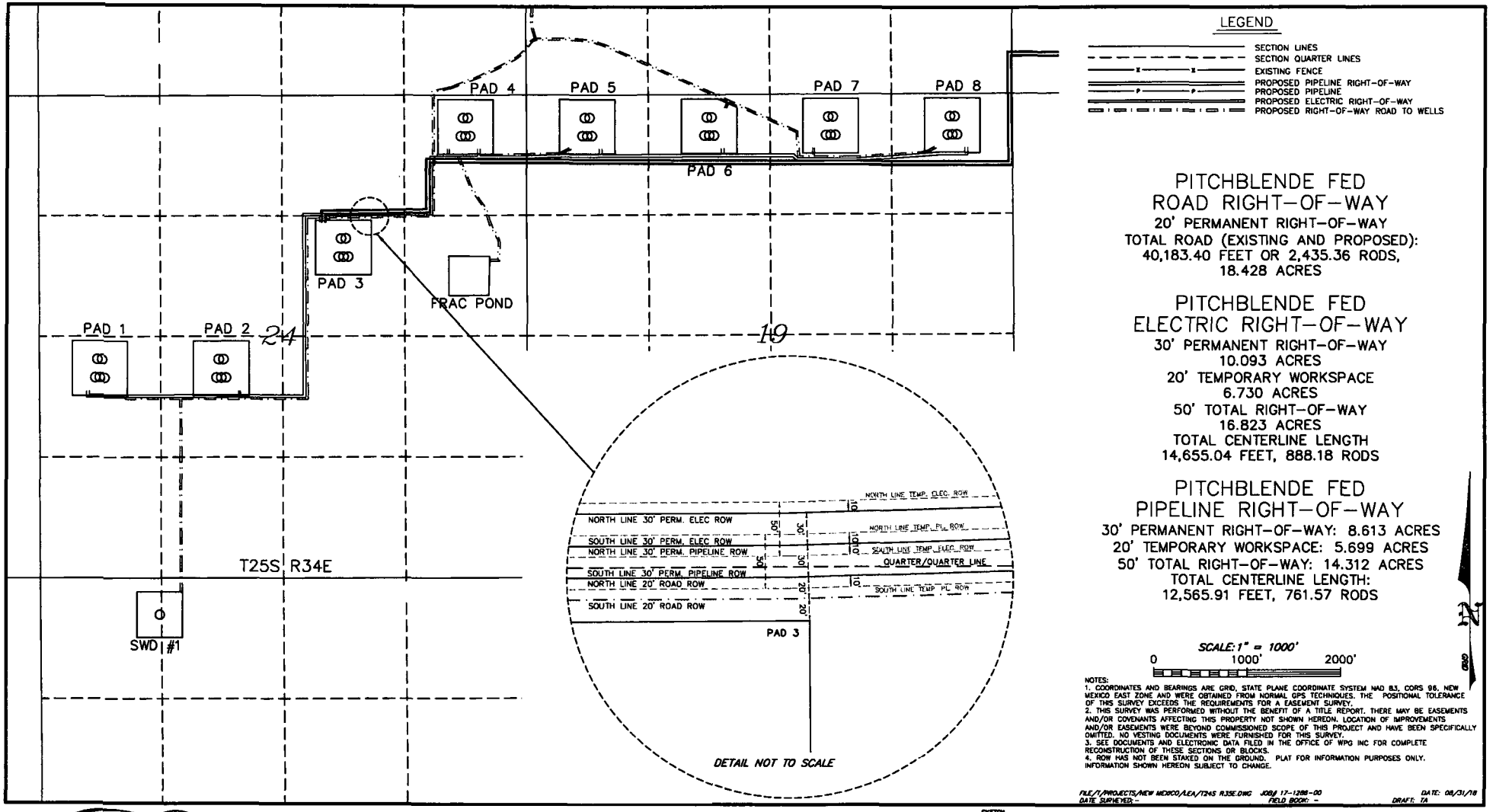
Watson Professional Group Inc

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED ROAD RIGHT-OF-WAY
SECTION 19, T25S, R35E,
SECTIONS 13, 24, & 25, T25S, R34E
LEA COUNTY, NEW MEXICO



ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED ROAD RIGHT-OF-WAY
SECTIONS 30 & 31, T24S, R35E,
SECTIONS 6, 7, 18, & 19, T25S, R35E,
SECTIONS 13, 24, & 25, T25S, R34E
LEA COUNTY, NEW MEXICO


STOVE PIPE FEDERAL 001H
STOVE PIPE FEDERAL 21H
BATES T GU
FAIRVIEW 14 FED
RIDER BRQ FEDERAL 2H
GULF FEDERAL A 1
MCCORMICK 1
BIGGERS FEDERAL 202H
BIGGERS FEDERAL
021H, 201H, & 213H
BIGGERS FEDERAL
024H, 214H, 203H, & 217H
LESLIE FED COM
021H, 201H, & 215H
LESLIE FED COM 217H
LESLIE FED COM
024H, 214H, & 203H
GULF FEDERAL 1
JAMAICA GULF FEDERAL 1
MOUNSEY FEDERAL C 1
DOGIE DRAW 23 FEDERAL 001H
DOGIE DRAW 23 FEDERAL 002H
DOGIE DRAW 23 FEDERAL 003H
DOGIE DRAW 23 FEDERAL 004H
031H
201H
351H
451H
601H
PITCHBLEND FEDERAL 19 1H
PITCHBLENDE
DUO SONIC 29
FEDERAL 1H
THUNDERBIRD WCA STA 001H
15
14
13
18
17
22
23
24
19
20
27
26
25
30
29
34
35
36
31
0
1
2 mi
ENERGEN
Pitchblend Pad 8
1 mile Radius
NM-Delaware Basin



LEGEND

- SECTION LINES
- SECTION QUARTER LINES
- EXISTING FENCE
- PROPOSED PIPELINE RIGHT-OF-WAY
- PROPOSED PIPELINE
- PROPOSED ELECTRIC RIGHT-OF-WAY
- PROPOSED RIGHT-OF-WAY ROAD TO WELLS

PITCHBLENDE FED ROAD RIGHT-OF-WAY

20' PERMANENT RIGHT-OF-WAY
TOTAL ROAD (EXISTING AND PROPOSED):
40,183.40 FEET OR 2,435.36 RODS,
18.428 ACRES

PITCHBLENDE FED ELECTRIC RIGHT-OF-WAY

30' PERMANENT RIGHT-OF-WAY
10.093 ACRES
20' TEMPORARY WORKSPACE
6.730 ACRES
50' TOTAL RIGHT-OF-WAY
16.823 ACRES
TOTAL CENTERLINE LENGTH
14,655.04 FEET, 888.18 RODS

PITCHBLENDE FED PIPELINE RIGHT-OF-WAY

30' PERMANENT RIGHT-OF-WAY: 8.613 ACRES
20' TEMPORARY WORKSPACE: 5.699 ACRES
50' TOTAL RIGHT-OF-WAY: 14.312 ACRES
TOTAL CENTERLINE LENGTH:
12,565.91 FEET, 761.57 RODS

SCALE: 1" = 1000'
0 1000' 2000'

NOTES:
1. COORDINATES AND BEARINGS ARE GRID, STATE PLANE COORDINATE SYSTEM NAD 83, CORS 96, NEW MEXICO EAST ZONE AND WERE OBTAINED FROM NORMAL GPS TECHNIQUES. THE POSITIONAL TOLERANCE OF THIS SURVEY EXCEEDS THE REQUIREMENTS FOR A EASEMENT SURVEY.
2. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. THERE MAY BE EASEMENTS AND/OR COVENANTS AFFECTING THIS PROPERTY NOT SHOWN HEREON. LOCATION OF IMPROVEMENTS AND/OR EASEMENTS WERE BEYOND COMMISSIONED SCOPE OF THIS PROJECT AND HAVE BEEN SPECIFICALLY OMITTED. NO VESTING DOCUMENTS WERE FURNISHED FOR THIS SURVEY.
3. SEE DOCUMENTS AND ELECTRONIC DATA FILED IN THE OFFICE OF WPG INC FOR COMPLETE RECONSTRUCTION OF THESE SECTIONS OR BLOCKS.
4. ROW HAS NOT BEEN STAKED ON THE GROUND. PLAT FOR INFORMATION PURPOSES ONLY. INFORMATION SHOWN HEREON SUBJECT TO CHANGE.

FILE/T/PROJECTS/NEW MEXICO/LEA/T24S R35E.DWG JOB# 17-1286-00 DATE: 08/31/18
DATE SURVEYED: - FIELD BOOK: - DRAFT: TA

Watson Professional Group Inc
P.O. DRAWER 11186
MIDLAND, TEXAS
79702
(432) 520-9200
FAX (432) 520-9212
wdwatson@wpg-usa.com
CONSULTING ENGINEERS, LAND SURVEYORS & PLANNERS

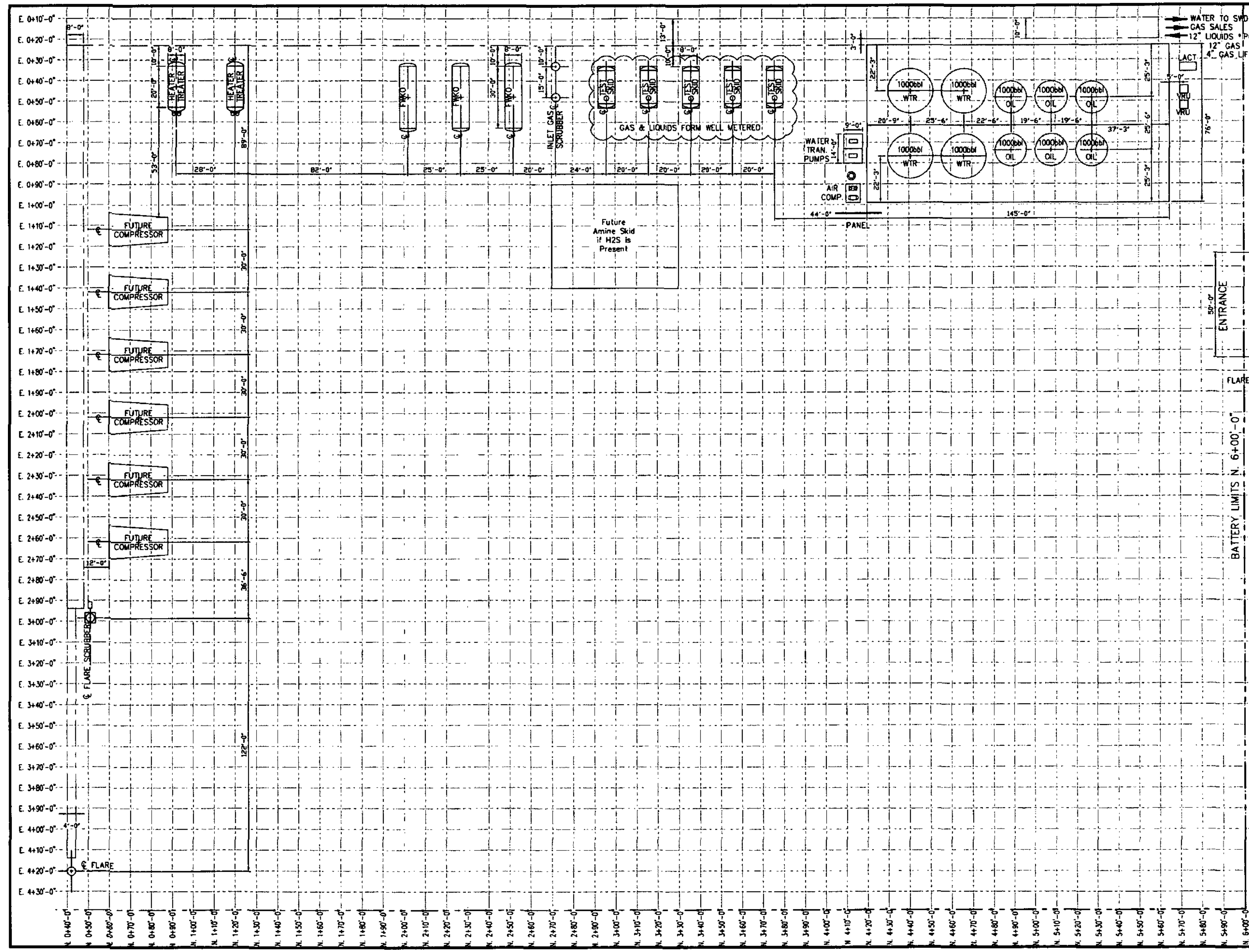
SKETCH

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED UTILITY & ROAD RIGHT-OF-WAYS
T24S R35E, T25S R34E, & T25S R35E
LEA COUNTY, NEW MEXICO

PITCHBLEND TANK BATTERY

NOTE: REFERENCE GRID AT 10'-0" SPACING

0 10 20



EQUIPMENT SPACING CHART

	PRESSURE VESSELS	LOAD CONN.	COMPRESSOR NOTES 3 & 4	WATER or GAS WELLS	OIL STORAGE	FIRED VESSEL with FLAME ARRESTOR NOTES 1&2
FLARE	150'	150'	150'	150'	150'	150'
PRESSURE VESSELS		75'	25'	50'	50'	75'
LOAD CONN.			75'	75'	50'	75'
COMPRESSOR NOTES 3 & 4				75'	75'	50'
WATER or GAS WELLS					75'	75'
OIL STORAGE						75'

NOTES:

1) FLAME ARRESTORS ARE MANDATORY FOR NEW *NATURAL DRAFT FIRED HEATER PURCHASES.* IF POSSIBLE, EXISTING HEATERS SHOULD BE RETROFITTED WITH FLAME ARRESTOR.

2) STABILIZERS WITH HEATING EQUIPMENT, GLYCOL ABSORBERS, RECONCENTRATORS, AND PACKAGED HEATER-SEPARATORS MAY BE CONSIDERED AS SINGLE FIRED VESSELS AND SPACED ACCORDINGLY.

3) WHEN PART OF A SKID UNIT, SCRUBBERS MAY BE LOCATED NEAR A COMPRESSOR AND ITS DRIVER CONTINGENT UPON APPROPRIATE SHUTDOWN INSTRUMENTATION AND ADEQUATE PSV VENT LOCATION.

4) FOR ELECTRIC DRIVEN COMPRESSORS, THE DISTANCE DOES NOT NECESSARILY APPLY. THE MOTOR SHALL BE APPROPRIATE FOR THE AREA OF CLASSIFICATION (i.e. VRU's & AIR COMPRESSORS).

5) LACTS & VRU SKIDS SHOULD BE LOCATED OUTSIDE BERM AND A MINIMUM OF 20' FROM STORAGE TANKS.

6) TRANSFER PUMPS SHOULD BE LOCATED OUTSIDE BERM AND A MINIMUM OF 20' FROM STORAGE TANKS.

7) ANY ELECTRICAL EQUIPMENT INSIDE THE BERM MUST MEET CLASS 1, DIV 1 ELECTRICAL AREA OF CLASSIFICATION SPECS.

FIELD VERIFY

ALL DIMENSIONS

NO.	BY	DATE	REVISION	APD	DATE
B	JT		Revised Water Tanks Size		9/18
A	JT		ISSUED FOR Bid		2/18

ENERGEN RESOURCES

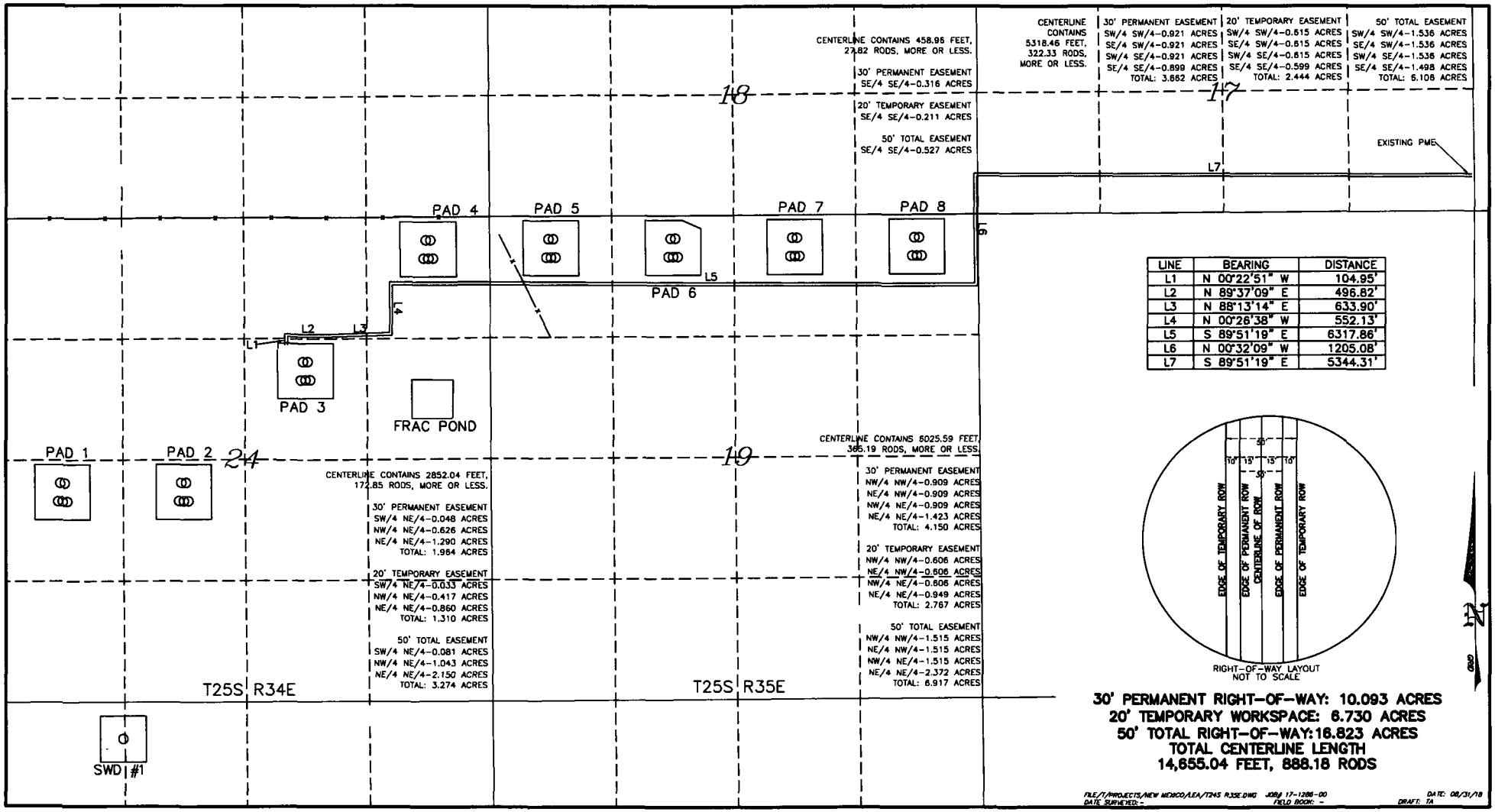
PLOT PLAN

Pitchblend Tank Battery

BATTERY

3510 NORTH A STREET MIDLAND, TX

DRAWN BY Jerry Thompson	CHECKED BY DATE
DATE 4/18	DESIGN ENGINEER
SCALE N/A	DWG NO Pitchblend PLOT PLAN _ B
CAD NO. PltPln-Pitchblend	SHEET 1 of 1



LINE	BEARING	DISTANCE
L1	N 00°22'51" W	104.95'
L2	N 89°37'09" E	496.82'
L3	N 88°13'14" E	633.90'
L4	N 00°26'38" W	552.13'
L5	S 89°51'19" E	6317.86'
L6	N 00°32'09" W	1205.08'
L7	S 89°51'19" E	5344.31'

RIGHT-OF-WAY LAYOUT
NOT TO SCALE

30' PERMANENT RIGHT-OF-WAY: 10.093 ACRES
20' TEMPORARY WORKSPACE: 6.730 ACRES
50' TOTAL RIGHT-OF-WAY: 16.823 ACRES
TOTAL CENTERLINE LENGTH
14,655.04 FEET, 888.18 RODS

FILE/T/PROJECTS/NEW MEXICO/LEA/T24S R35E.DWG JOB# 17-1286-00
DATE SURVEYED: - FIELD BOOK: -
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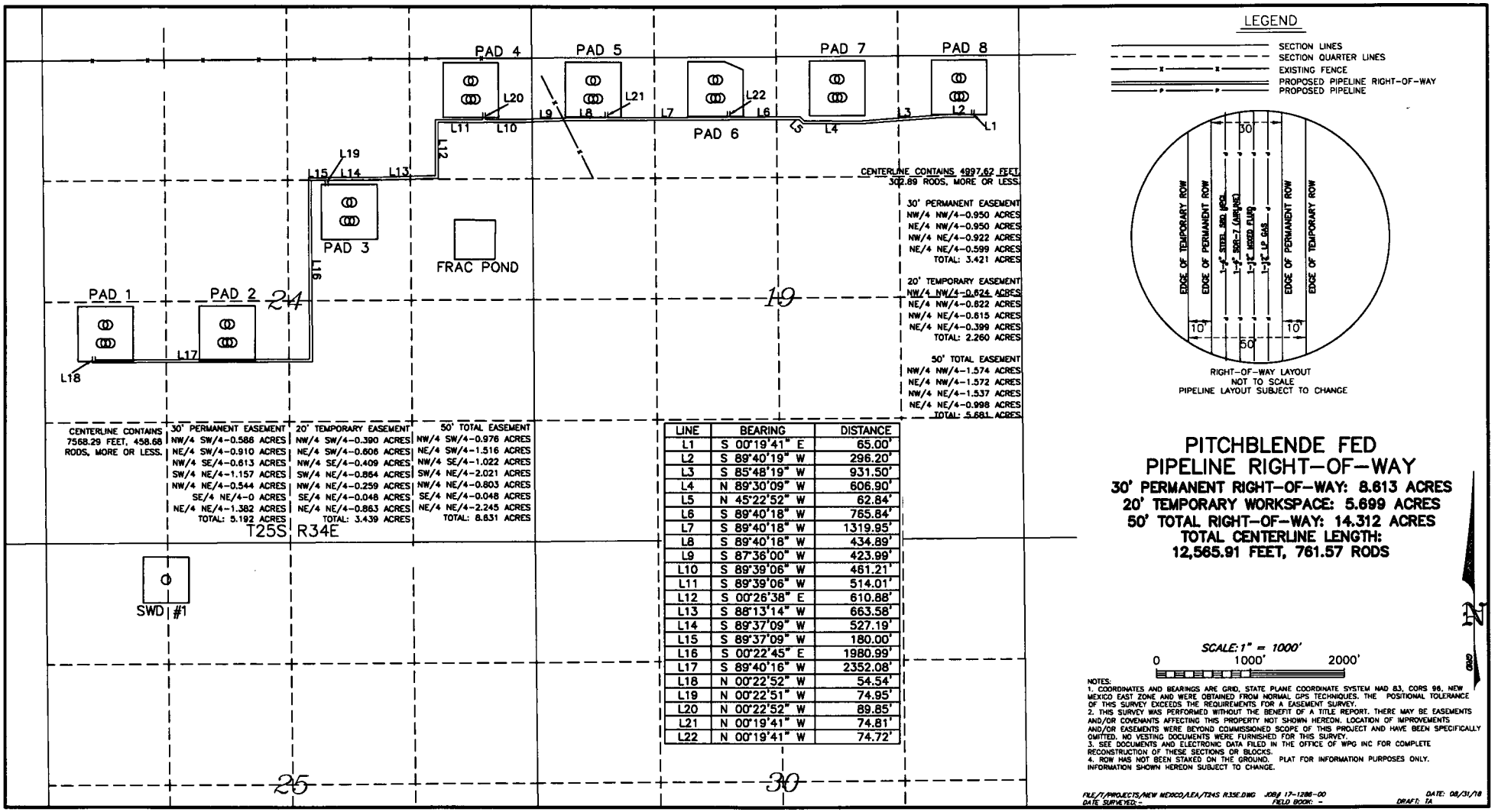
LEGEND
- SECTION LINES
- SECTION QUARTER LINES
- EXISTING FENCE
- PROPOSED ELECTRIC RIGHT-OF-WAY

SCALE: 1" = 1000'
0 1000' 2000'

SKETCH

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED ELECTRIC RIGHT-OF-WAY
SECTION 24, T25S, R34E &
SECTIONS 17, 18, & 19, T25S, R35E
LEA COUNTY, NEW MEXICO



CENTERLINE CONTAINS 4997.62 FEET, 302.89 RODS, MORE OR LESS.

30' PERMANENT EASEMENT
NW/4 NW/4–0.950 ACRES
NE/4 NW/4–0.950 ACRES
NW/4 NE/4–0.922 ACRES
NE/4 NE/4–0.599 ACRES
TOTAL: 3.421 ACRES

20' TEMPORARY EASEMENT
NW/4 NW/4–0.624 ACRES
NE/4 NW/4–0.822 ACRES
NW/4 NE/4–0.615 ACRES
NE/4 NE/4–0.399 ACRES
TOTAL: 2.260 ACRES

50' TOTAL EASEMENT
NW/4 NW/4–1.574 ACRES
NE/4 NW/4–1.572 ACRES
NW/4 NE/4–1.537 ACRES
NE/4 NE/4–0.998 ACRES
TOTAL: 5.681 ACRES

CENTERLINE CONTAINS 7568.29 FEET, 458.68 RODS, MORE OR LESS.

30' PERMANENT EASEMENT
NW/4 SW/4–0.586 ACRES
NE/4 SW/4–0.910 ACRES
NW/4 SE/4–0.613 ACRES
SW/4 NE/4–1.157 ACRES
NW/4 NE/4–0.544 ACRES
SE/4 NE/4–0 ACRES
NE/4 NE/4–1.382 ACRES
TOTAL: 5.192 ACRES

20' TEMPORARY EASEMENT
NW/4 SW/4–0.390 ACRES
NE/4 SW/4–0.606 ACRES
NW/4 SE/4–0.409 ACRES
SW/4 NE/4–0.864 ACRES
NW/4 NE/4–0.259 ACRES
SE/4 NE/4–0.048 ACRES
NE/4 NE/4–0.863 ACRES
TOTAL: 3.439 ACRES

50' TOTAL EASEMENT
NW/4 SW/4–0.976 ACRES
NE/4 SW/4–1.516 ACRES
NW/4 SE/4–1.022 ACRES
SW/4 NE/4–2.021 ACRES
NW/4 NE/4–0.803 ACRES
SE/4 NE/4–0.048 ACRES
NE/4 NE/4–2.245 ACRES
TOTAL: 8.631 ACRES

LINE	BEARING	DISTANCE
L1	S 00°19'41" E	65.00'
L2	S 89°40'19" W	296.20'
L3	S 85°48'19" W	931.50'
L4	N 89°30'09" W	606.90'
L5	N 45°22'52" W	62.84'
L6	S 89°40'18" W	765.84'
L7	S 89°40'18" W	1319.95'
L8	S 89°40'18" W	434.89'
L9	S 87°36'00" W	423.99'
L10	S 89°39'06" W	461.21'
L11	S 89°39'06" W	514.01'
L12	S 00°26'38" E	610.88'
L13	S 88°13'14" W	663.58'
L14	S 89°37'09" W	527.19'
L15	S 89°37'09" W	180.00'
L16	S 00°22'45" E	1980.99'
L17	S 89°40'16" W	2352.08'
L18	N 00°22'52" W	54.54'
L19	N 00°22'51" W	74.95'
L20	N 00°22'52" W	89.85'
L21	N 00°19'41" W	74.81'
L22	N 00°19'41" W	74.72'

LEGEND

SECTION LINES
SECTION QUARTER LINES
EXISTING FENCE
PROPOSED PIPELINE RIGHT-OF-WAY
PROPOSED PIPELINE

RIGHT-OF-WAY LAYOUT
NOT TO SCALE
PIPELINE LAYOUT SUBJECT TO CHANGE

PITCHBLENDE FED PIPELINE RIGHT-OF-WAY

30' PERMANENT RIGHT-OF-WAY: 8.613 ACRES
20' TEMPORARY WORKSPACE: 5.699 ACRES
50' TOTAL RIGHT-OF-WAY: 14.312 ACRES
TOTAL CENTERLINE LENGTH:
12,565.91 FEET, 761.57 RODS

SCALE: 1" = 1000'
0 1000' 2000'

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FILE/I:/PROJECTS/NEW MEXICO/LEA/T25S R35E.DWG JOB# 17-1286-00 DATE: 08/31/18
DATE SURVEYED: - FIELD BOOK: - DRAFT: TA

Watson Professional Group Inc
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wdwatson@wpg-us.com
CONSULTING ENGINEERS, LAND SURVEYORS & PLANNERS

SECTION

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED PIPELINE RIGHT-OF-WAY
SECTION 24, T25S, R34E & SECTION 19, T25S, R35E
LEA COUNTY, NEW MEXICO

Pitchblende - BLM Data Request

Air Line - 3" Poly - 150psig max → 100-150 NOP

Produced Water Line - 12" Poly - 250 psig Max → 125-250 psig NOP

Gas Line - 12" Poly - 12" Poly - 250psig max - 150-250 psig NOP

HP Gas - 4" Steel - 1480 Psig Max - 1000-1400 psig NOP

HT - 8'x20' MAWP - 250 psig NOP 40-110psig

Fwko - 8'x30' MAWP - 250 Psig NOP 60-140 psig

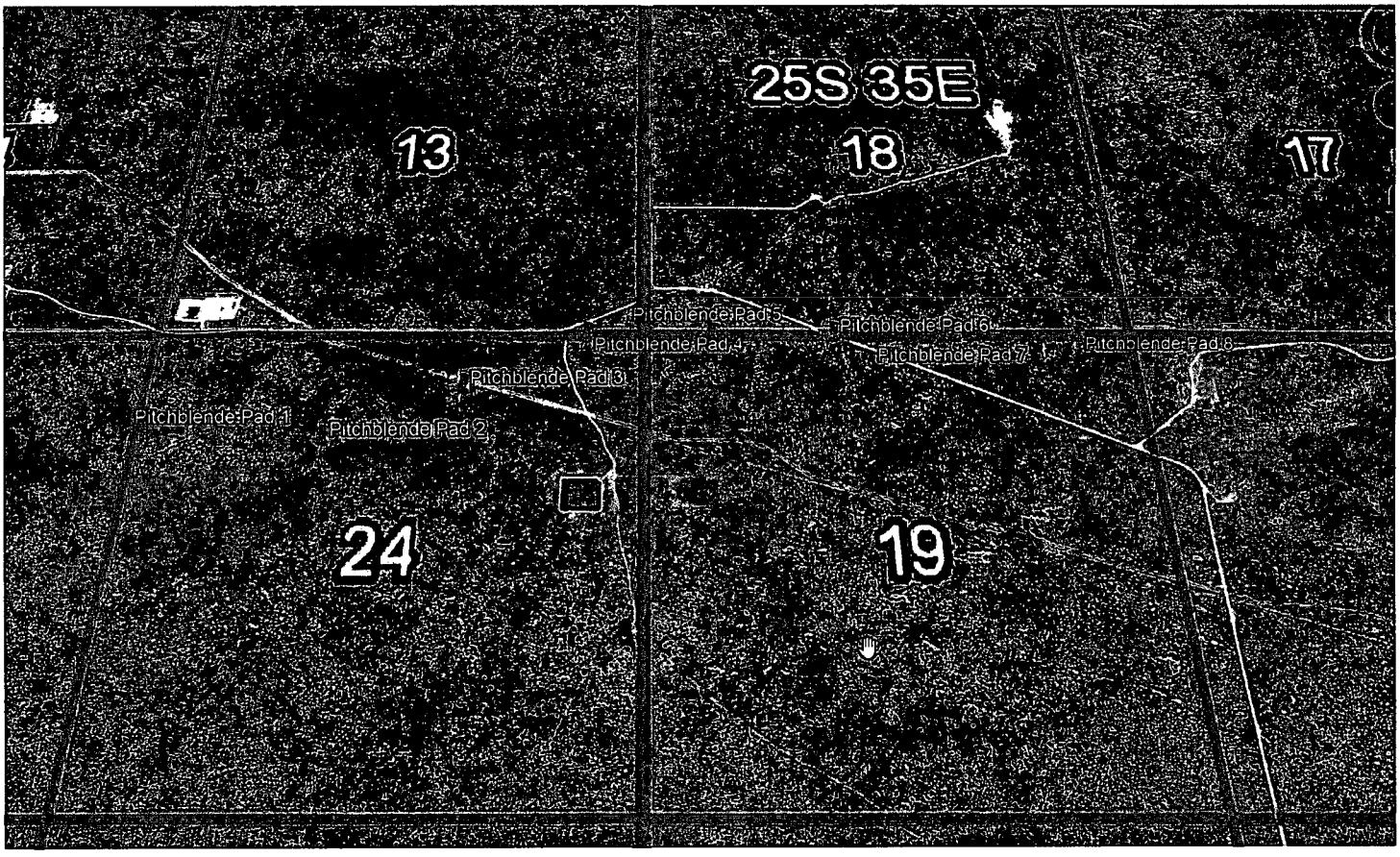
Inlet Separator - 4'x10' - MAWP-250Psig NOP 80-150 Psig

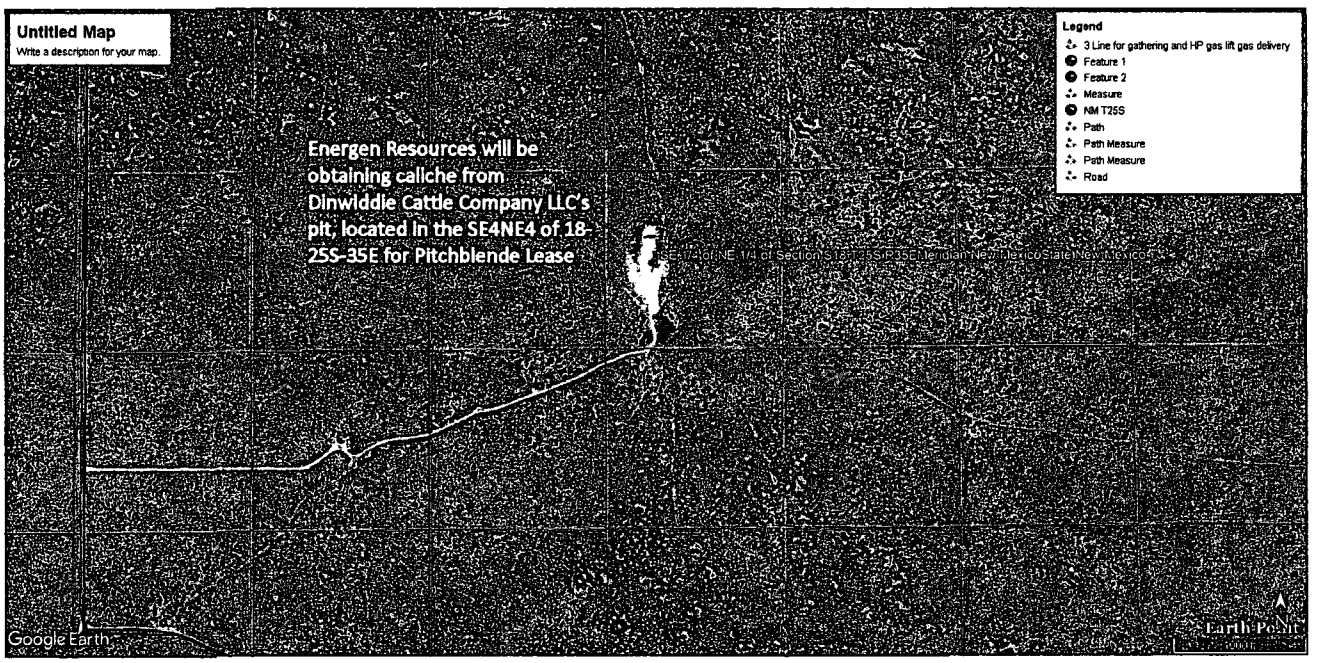
Flare Scrubber - 4'x10' - MAWP-125 Psig NOP 0-60 Psig

Produced Water Tanks - 21'6" x 21' - Fiberglass
MAWP - 4oz. Psig NOP - 0+4 psig

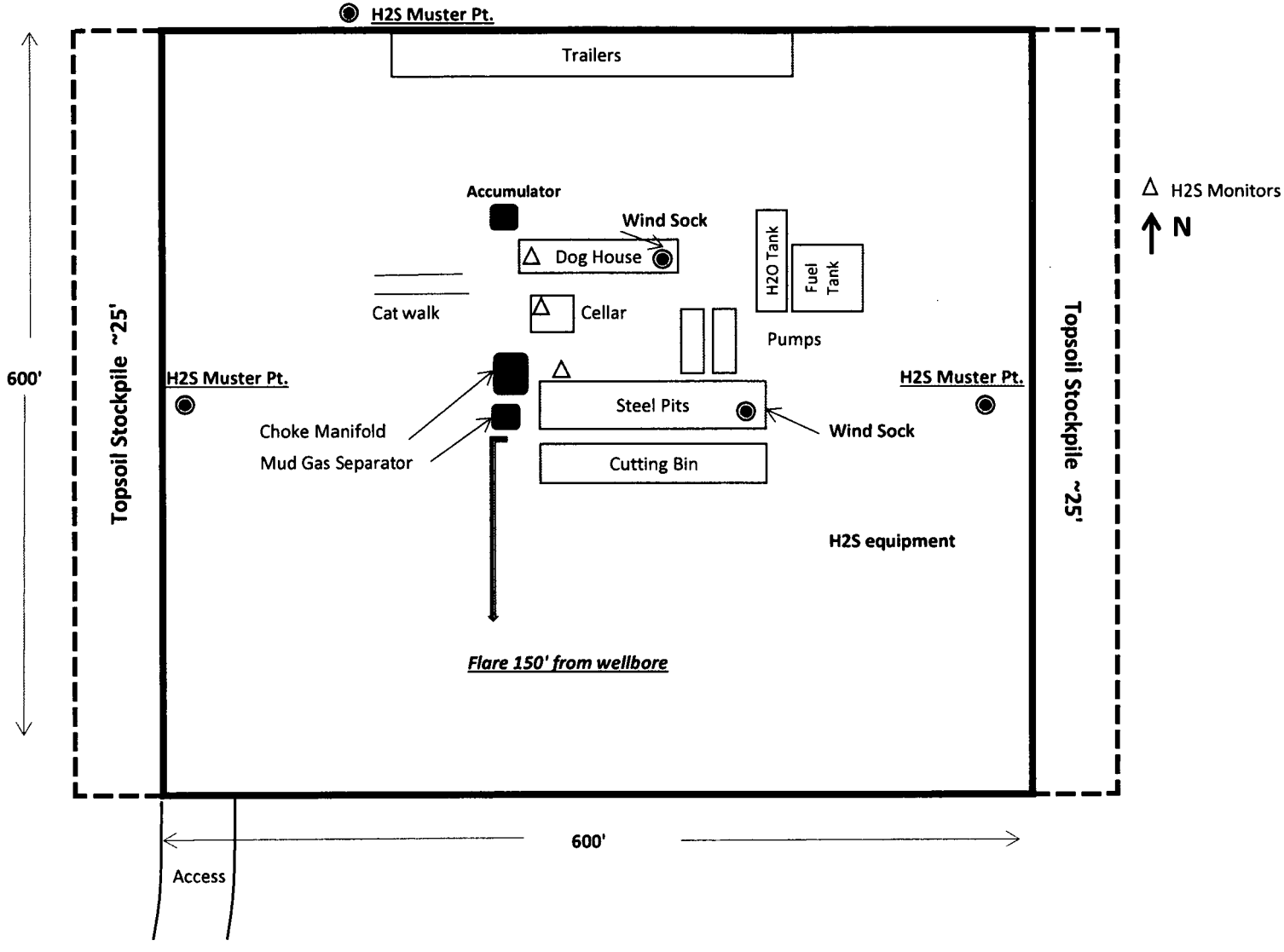
Crude Oil Tanks - 15'6' x 30' - Steel
MAWP - 8oz. Psig NOP - 0+0 8 psig

All pipelines will be buried w/36" of cover.


25S 35E
13
18
17
24
19
Pitchblende Pad 1
Pitchblende Pad 2
Pitchblende Pad 3
Pitchblende Pad 4
Pitchblende Pad 5
Pitchblende Pad 6
Pitchblende Pad 7
Pitchblende Pad 8

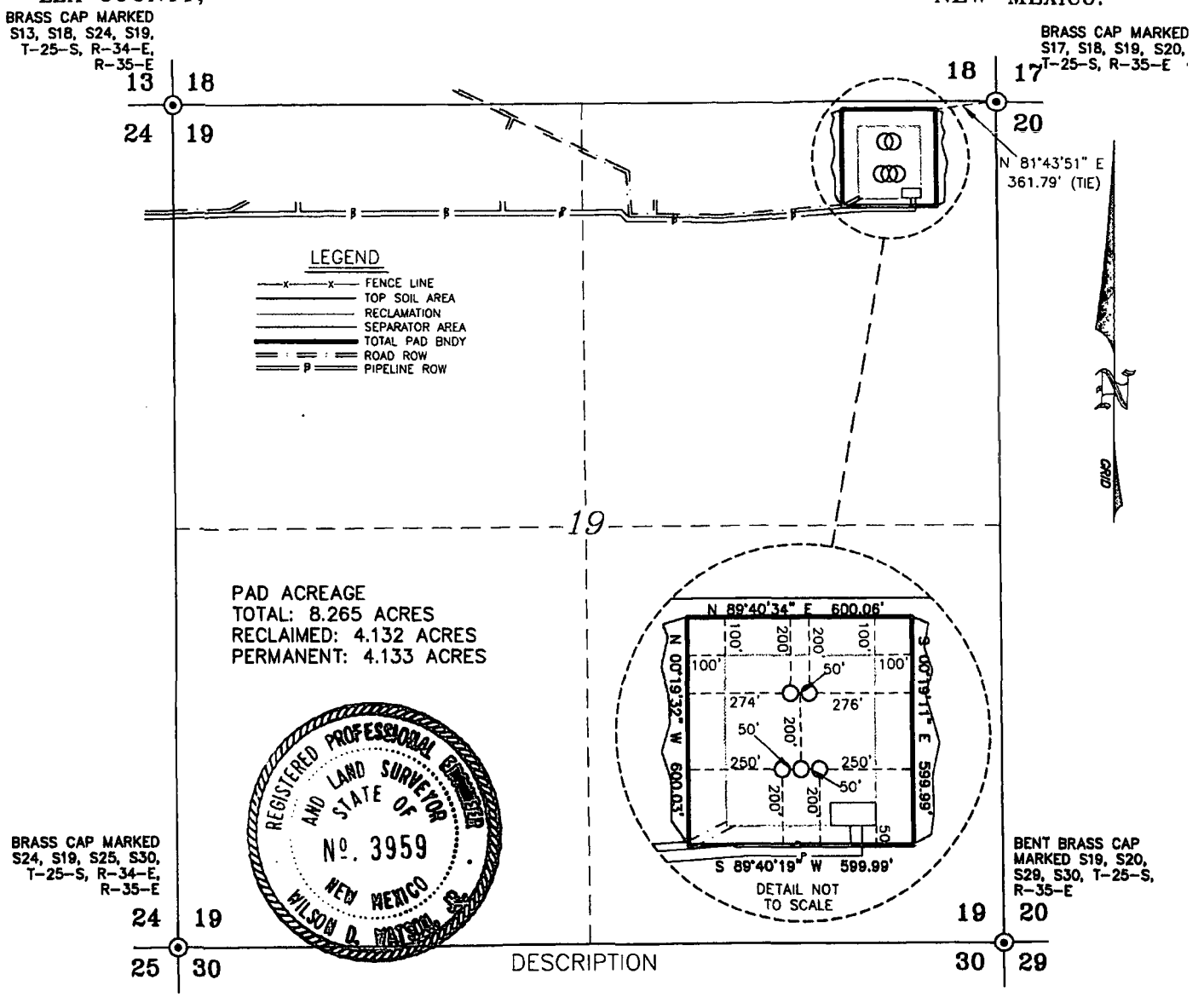

Untitled Map
Write a description for your map.
Energen Resources will be obtaining callche from Dinwiddie Cattle Company LLC's pit, located in the SE4NE4 of 18-25S-35E for Pitchblende Lease
Legend
3 Line for gathering and HP gas lift gas delivery
Feature 1
Feature 2
Measure
NM T25S
Path
Path Measure
Path Measure
Road
Google Earth
EarthPoint

Location Layout Pad 8 (*not to scale)*



SECTION 19, TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,

LEA COUNTY, NEW MEXICO.



DESCRIPTION

A TRACT OF LAND CONTAINING 8.265 ACRES, MORE OR LESS, SITUATED IN THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 19, T-25-S, R-35-E, LEA COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS;

BEGINNING AT A POINT FOR THE NORTHEAST CORNER HEREOF, FROM WHICH A BRASS CAP MARKED "S17, S18, S19, S20, T-25-S, R-35-E" FOUND, FOR THE COMMON CORNER OF SAID SECTION 19, AND SECTIONS 17, 18, AND 20, T-25-S, R-35-E, BEARS NORTH 81°43'51" EAST, 361.79 FEET; THENCE SOUTH 00°19'11" EAST, 599.99 FEET TO THE SOUTHEAST CORNER HEREOF; THENCE SOUTH 89°40'19" WEST, 599.99 FEET TO THE SOUTHWEST CORNER HEREOF; THENCE NORTH 00°19'32" WEST, 600.03 FEET TO THE NORTHWEST CORNER HEREOF; THENCE NORTH 89°40'34" EAST, 600.06 FEET TO THE POINT OF BEGINNING AND CONTAINING 8.265 ACRES OF LAND, MORE OR LESS.

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT THE FOREGOING DESCRIPTION AND PLAT HERETO IS A REPRESENTATION OF A SURVEY COMPLETED ON THE GROUND UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

MAY 27, 2018

W. D. WATSON JR. N.M. P.L.S. No. 3959

NOTES:
1. BASIS OF BEARING IS A TRANSVERSE MERCATOR PROJECTION OF THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, EAST ZONE (3001), NAD 83 (CORS96)
2. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. THERE MAY BE EASEMENTS AND/OR COVENANTS AFFECTING THIS PROPERTY NOT SHOWN HEREON. LOCATION OF IMPROVEMENTS AND/OR EASEMENTS WERE BEYOND COMMISSIONED SCOPE OF THIS PROJECT AND HAVE BEEN SPECIFICALLY OMITTED; THEREFORE, NO EFFORT HAS BEEN MADE TO LOCATE OBSERVABLE AND/OR RECORDED EASEMENTS WITHIN THE BOUNDS OF THIS SURVEY.
3. SEE DOCUMENTS AND ELECTRONIC DATA FILED IN THE OFFICE OF WPG INC FOR COMPLETE RECONSTRUCTION OF THESE SECTIONS OR BLOCKS.

1000 0 1000 2000 FEET

Watson Professional Group Inc

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CONSULTING ENGINEERS LAND SURVEYORS & PLANNERS

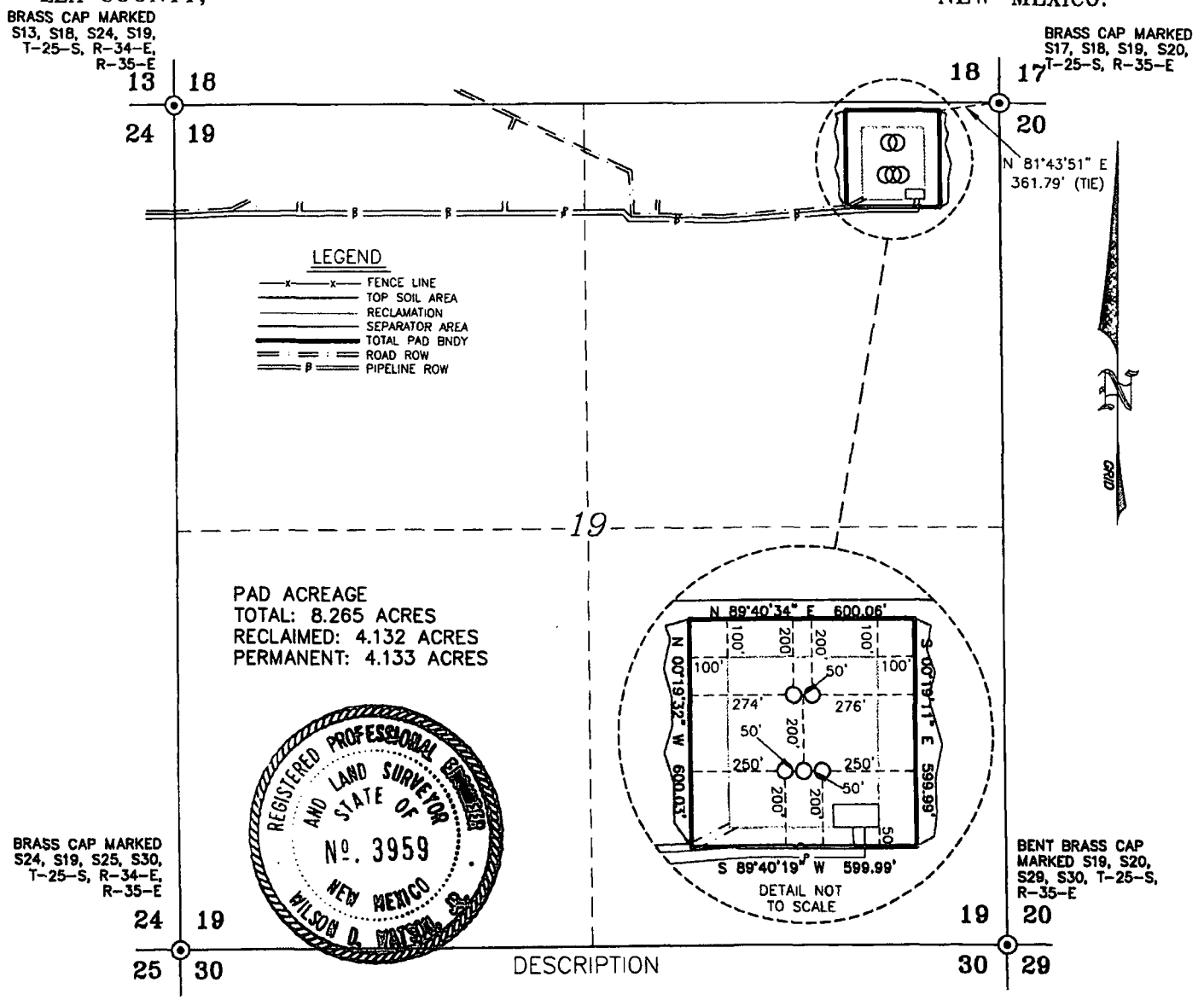
ENERGEN RESOURCES CORPORATION
SURVEY OF THE PITCHBLENDE FED 19-30
038H, 208H, 358H, 608H, AND 458H WELL PAD
IN SECTION 24, T. 24 S., R. 35 E., N.M.P.M.,
LEA COUNTY, NEW MEXICO.

SURVEY DATE: 12/14/17

JOB NO.: 17-1320-00 FIELD BOOK 838/25 834/51, DRAFT DM PAGE 1

SECTION 19, TOWNSHIP 25 SOUTH, RANGE 35 EAST, N.M.P.M.,

LEA COUNTY, NEW MEXICO.



DESCRIPTION

A TRACT OF LAND CONTAINING 8.265 ACRES, MORE OR LESS, SITUATED IN THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 19, T-25-S, R-35-E, LEA COUNTY, NEW MEXICO, AND BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS;

BEGINNING AT A POINT FOR THE NORTHEAST CORNER HEREOF, FROM WHICH A BRASS CAP MARKED "S17, S18, S19, S20, T-25-S, R-35-E" FOUND, FOR THE COMMON CORNER OF SAID SECTION 19, AND SECTIONS 17, 18, AND 20, T-25-S, R-35-E, BEARS NORTH 81°43'51" EAST, 361.79 FEET; THENCE SOUTH 00°19'11" EAST, 599.99 FEET TO THE SOUTHEAST CORNER HEREOF; THENCE SOUTH 89°40'19" WEST, 599.99 FEET TO THE SOUTHWEST CORNER HEREOF; THENCE NORTH 00°19'32" WEST, 600.03 FEET TO THE NORTHWEST CORNER HEREOF; THENCE NORTH 89°40'34" EAST, 600.06 FEET TO THE POINT OF BEGINNING AND CONTAINING 8.265 ACRES OF LAND, MORE OR LESS.

I, THE UNDERSIGNED, DO HEREBY CERTIFY THAT THE FOREGOING DESCRIPTION AND PLAT HERETO IS A REPRESENTATION OF A SURVEY COMPLETED ON THE GROUND UNDER MY SUPERVISION AND IS TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE AND BELIEF

MAY 27, 2018

W. D. WATSON JR. N.M. P.L.S. No. 3959

NOTES:
1. BASIS OF BEARING IS A TRANSVERSE MERCATOR PROJECTION OF THE NEW MEXICO STATE PLANE COORDINATE SYSTEM, EAST ZONE (3001), NAD 83 (CORS96)
2. THIS SURVEY WAS PERFORMED WITHOUT THE BENEFIT OF A TITLE REPORT. THERE MAY BE EASEMENTS AND/OR COVENANTS AFFECTING THIS PROPERTY NOT SHOWN HEREON. LOCATION OF IMPROVEMENTS AND/OR EASEMENTS WERE BEYOND COMMISSIONED SCOPE OF THIS PROJECT AND HAVE BEEN SPECIFICALLY OMITTED; THEREFORE, NO EFFORT HAS BEEN MADE TO LOCATE OBSERVABLE AND/OR RECORDED EASEMENTS WITHIN THE BOUNDS OF THIS SURVEY.
3. SEE DOCUMENTS AND ELECTRONIC DATA FILED IN THE OFFICE OF WPG INC FOR COMPLETE RECONSTRUCTION OF THESE SECTIONS OR BLOCKS.

1000 0 1000 2000 FEET

Watson Professional Group Inc
P.O. DRAWER 11686
MIDLAND, TEXAS 79702
(432) 520-9200
FAX (432) 520-9212
CONSULTING ENGINEERS LAND SURVEYORS & PLANNERS

ENERGEN RESOURCES CORPORATION
SURVEY OF THE PITCHBLENDE FED 19-30 038H, 208H, 358H, 608H, AND 458H WELL PAD IN SECTION 24, T. 24 S., R. 35 E., N.M.P.M., LEA COUNTY, NEW MEXICO.

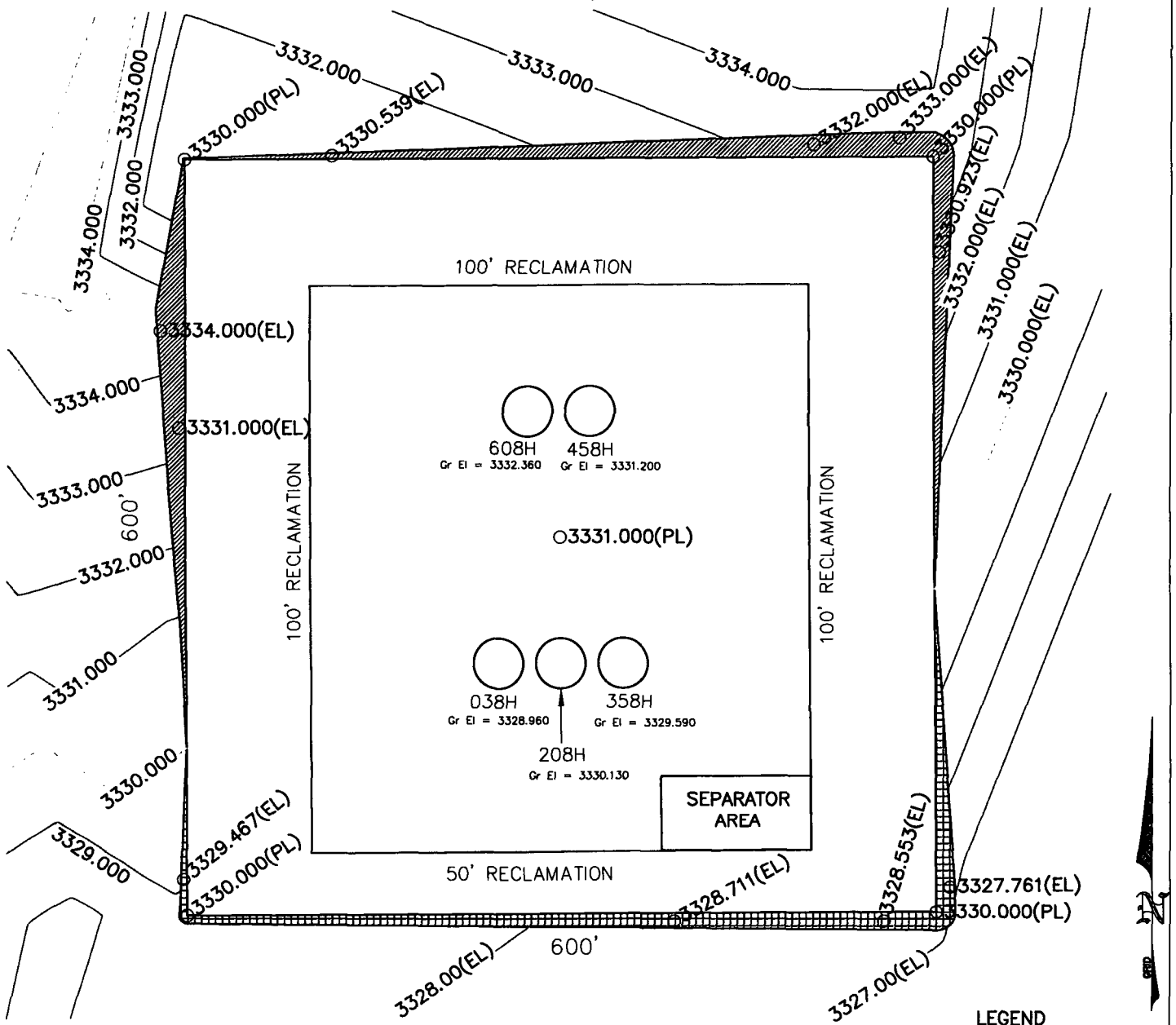
SURVEY DATE: 12/14/17

JOB NO.: 17-1320-00 FIELD BOOK 838/25, 834/51, DRAFT DM PAGE 1

SKETCH PLAT

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED #8 PAD – 608H, 458H, 038H, 208H & 358H
SECTION 19
T–24–S, R–35–E
LEA COUNTY, NEW MEXICO

NOTES:
1. RECLAIM ALL TOP SOIL TO TOPSOIL STOCK PILE.



Calculate Cut volume = 10357.22 Cu Yds

Calculate Fill Volume = 7263.14 Cu Yds

0 120' 240'

WO#17-1308-00

FILE/T/PROJECTS/NEW MEXICO/LEA/ENGINEERING/T24S R35E.DWG PRE-CONSTRUCTION AS SURVEYED IN 2018

LEGEND

EL – EXISTING ELEVATION

PL – PROPOSED ELEVATION

PRELIMINARY

THIS DOCUMENT SHALL NOT BE RECORDED FOR ANY PURPOSE AND SHALL NOT BE USED OR VIEWED OR RELIED UPON AS A FINAL SURVEY DOCUMENT.

Professional Group Inc
CONSULTING ENGINEERS, LAND SURVEYORS & PL
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MIDLAND, TEXAS 79702
(432) 520-9200
FAX (432)520-9212
wbwatson@wpg-us.com

DIRT WORK CALCULATIONS

ENERGEN RESOURCES CORPORATION

PITCHBLENDE FED #8 PAD

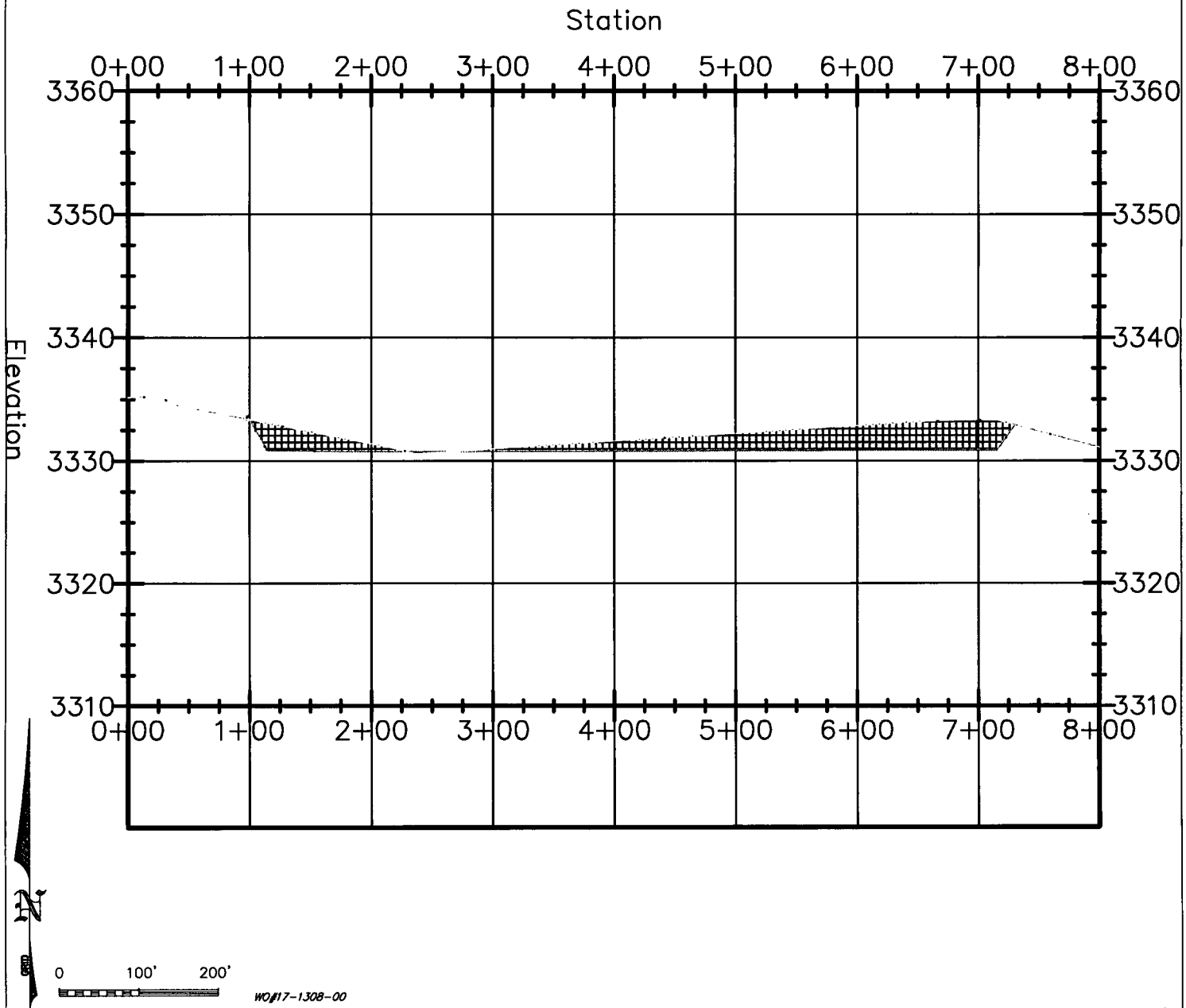
Location Pad Calculations
T–24–S, R–35–E
LEA COUNTY, NEW MEXICO.

SKETCH PLAT

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED #8 PAD
SECTION 19
T-24-S, R-35-E
LEA COUNTY, NEW MEXICO

LEGEND
FILL
CUT
EXISTING GRADE
FINISHED GRADE

Alignment top Cross Section PROFILE



WO#17-1308-00

FILE/T/PROJECTS/NEW MEXICO/LEA/ENGINEERING/T24S R35E.DWG PRE-CONSTRUCTION AS SURVEYED IN 2018

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LOCATION PAD PROFILES

ENERGEN RESOURCES CORPORATION

PITCHBLENDE FED #8 PAD

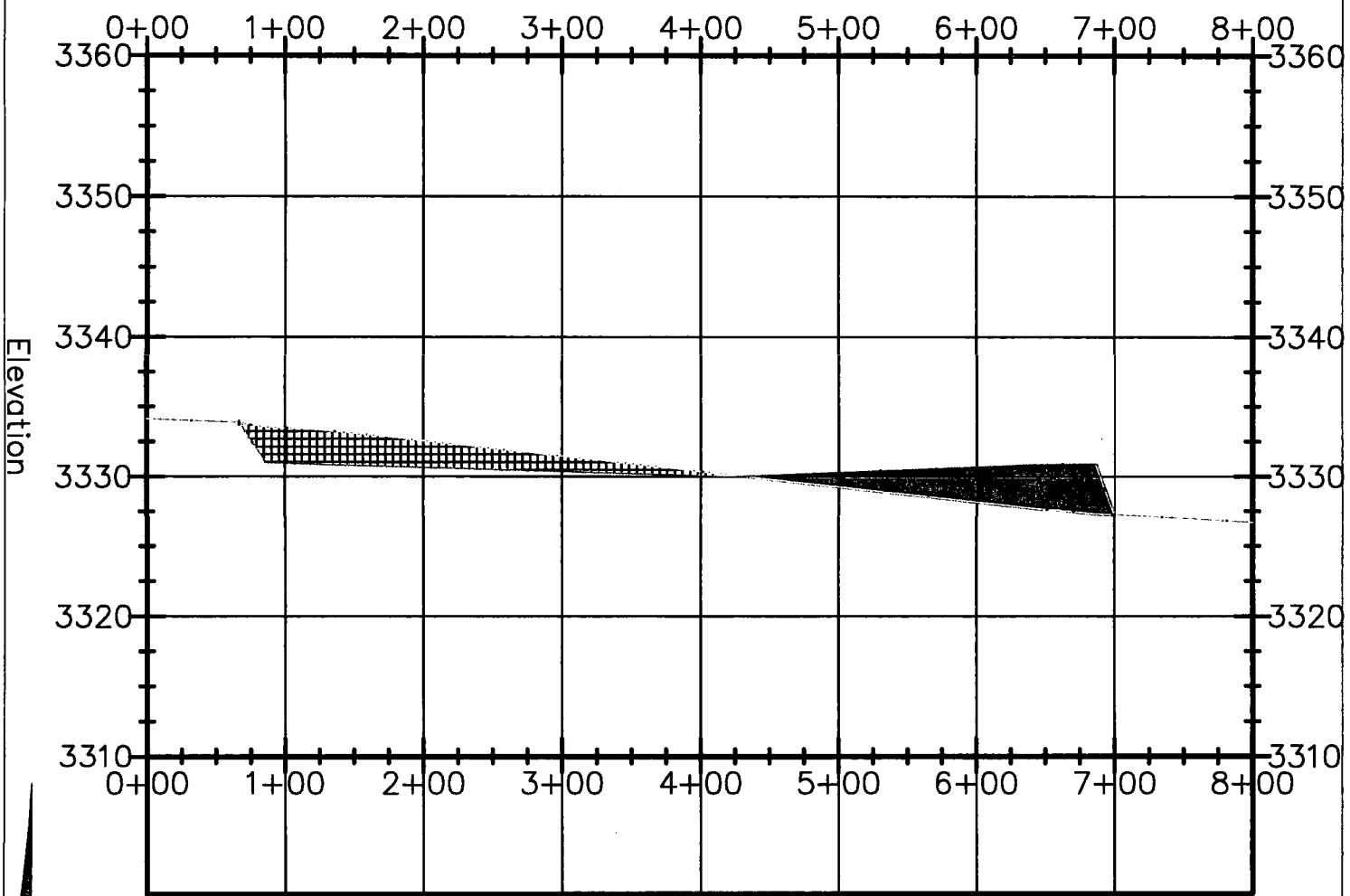
Location Pad Calculations
T-24-S, R-35-E
LEA COUNTY, NEW MEXICO.

SKETCH PLAT

ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED #8 PAD
SECTION 19
T-24-S, R-35-E
LEA COUNTY, NEW MEXICO

LEGEND
FILL CUT
EXISTING GRADE
FINISHED GRADE

Alignment Side Cross section PROFILE



0 100' 200'

WO#17-1308-00

FILE/T/PROJECTS/NEW MEXICO/LEA/ENGINEERING/T24S R35E.DWG PRE-CONSTRUCTION AS SURVEYED IN 2018

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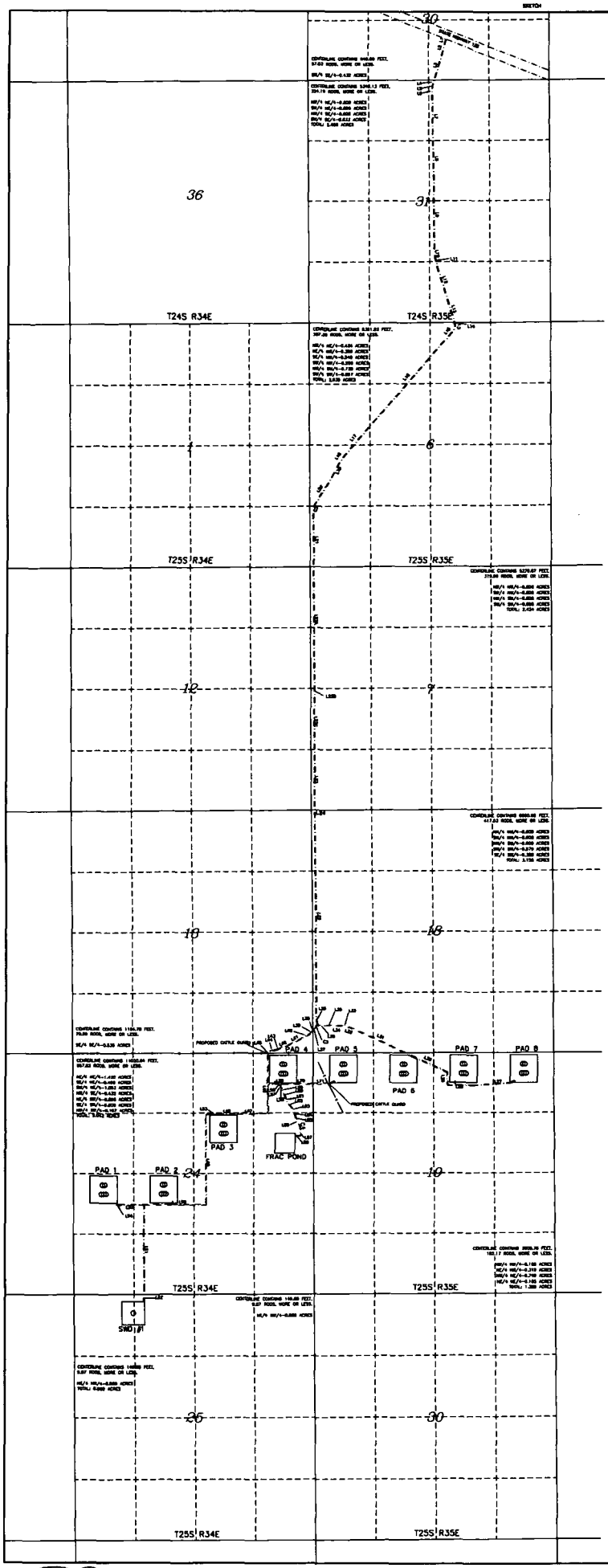
LOCATION PAD PROFILES
ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED #8 PAD
Location Pad Calculations T-24-S, R-35-E LEA COUNTY, NEW MEXICO.



ENERGEN RESOURCES CORPORATION
PITCHBLENDE FED ROAD RIGHT-OF-WAY
SECTIONS 30 & 31, T24S, R35E,
SECTIONS 6, 7, 18, & 19, T25S, R35E,
SECTIONS 13, 24, & 25, T25S, R34E
LEA COUNTY, NEW MEXICO

ENERGEN

September 17, 2018

ATTN: Cody Layton – Assistant Field Manager
Bureau of Land Management
Carlsbad Field Office
620 E. Greene St.
Carlsbad, NM 88220

Re: Energen Resources Pitchblende Federal Wells, Lea County NM

Dear Mr. Layton,

This letter is in response to the deficiency letter received by Energen Resources dated September 5, 2018. Energen has been, and remains in, good-faith negotiations with the surface owner of the private tract located in Section 24, Township 25 South, Range 34 East.

In addition to owning this private tract, the same surface owner is the lessee of BLM owned surface also located in Section 24, Township 25 South, Range 34 East and all of Section 19, Township 25 South, Range 35 East. The agreement is quite lengthy and contains numerous development provisions that we are working through with the landowner. It's our anticipation this will be resolved well in advance of the permits being approved.

An email from the surface owner is included supporting our good-faith negotiations. Please let us know if you have any questions.

Sincerely,

Tyler Humphries
Land - Permian Development
Energen Resources Corporation
3510 North "A" Street, Bldg. B
Midland,TX 79705
Office: 432.818.1731
Email: tyler.humphries@energen.com

Tyler Humphries

From: Tommy Dinwiddie <jtdinwiddie@gmail.com>
Sent: Monday, September 17, 2018 11:05 AM
To: Tyler Humphries
Subject: [EXTERNAL] Re: Energen/Pitchblende SUA

Yes
We are in negotiations at this time.
TD

On Sep 17, 2018, at 10:03 AM, Tyler Humphries <Tyler.Humphries@energen.com> wrote:

Mr. Dinwiddie,

As part of our permitting process with the BLM, they have requested a status update on the surface use agreement regarding the wells that will be drilled on your private land. I am going to let them know we have been in good-faith negotiations with you and are working towards a finalized agreement by the time the permits will be approved.

Would you mind replying and confirming such so that I can include this email with my letter?

Best,
Tyler

Thanks,
Tyler Humphries
Land - Permian Development
Energen Resources Corporation
3510 North "A" Street, Bldg. B
Midland,TX 79705
Office: 432.818.1731
Cell: 432.557.4245
Email: tyler.humphries@energen.com

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