Form 3160-3
(June 2015)

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

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

HOBBS OCD

APPLICATION FOR PERMIT TO DRILL OR REENTER

MAY 20 2019

RECEIVED

5. Lease Serial No. NMNM023199	
6. If Indian, Allotee or Tribe Name	
1a. Type of work: ☑ DRILL ☐ REENTER	7. If Unit or CA Agreement, Name and No.
1b. Type of Well: ☑ Oil Well ☐ Gas Well ☐ Other	8. Lease Name and Well No. CAMELLIA FED COM 26 36 21 083H (325400)
1c. Type of Completion: ☐ Hydraulic Fracturing ☑ Single Zone ☐ Multiple Zone	
2. Name of Operator AMEREDEV OPERATING LLC (372224)	9. API Well No. 30-025-45983
3a. Address 5707 Southwest Parkway, Building 1, Suite 275 Austin TX	3b. Phone No. *(include area code)* (737)300-4700
	10. Field and Pool, or Exploratory 98150 WC-025 G-08 S263620C / LWR BONE SI
4. Location of Well *(Report location clearly and in accordance with any State requirements.*)* At surface LOT C / 670 FNL / 1960 FWL / LAT 32.01968 / LONG -103.27226 At proposed prod. zone LOT C / 50 FNL / 1980 FWL / LAT 32.05041 / LONG -103.27221	11. Sec., T. R. M. or Blk. and Survey or Area SEC 28 / T26S / R36E / NMP

14. Distance in miles and direction from nearest town or post office* 5 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) 670 feet	16. No of acres in lease 320	17. Spacing Unit dedicated to this well 320
18. Distance from proposed location* to nearest well, drilling, completed, applied for, on this lease, ft. 977 feet	19. Proposed Depth 10250 feet / 21674 feet	20. BLM/BIA Bond No. in file FED: NMB001478
21. Elevations (Show whether DF, KDB, RT, GL, etc.) 2911 feet	22. Approximate date work will start* 12/01/2019	23. Estimated duration 90 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 (Electronic Submission)	Name *(Printed/Typed)* Christie Hanna / Ph: (737)300-4723	Date 06/13/2018
Title Senior Engineering Technician		
Approved by *(Signature)* (Electronic Submission)	Name *(Printed/Typed)* Christopher Walls / Ph: (575)234-2234	Date 05/15/2019
Title Petroleum Engineer	Office 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 05/20/19

APPROVED WITH CONDITIONS

Approval Date: 05/15/2019

KZ 05/20/19

(Continued on page 2)

*(Instructions on page 2)

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.

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Additional Operator Remarks

Location of Well

1. SHL: LOT C / 670 FNL / 1960 FWL / TWSP: 26S / RANGE: 36E / SECTION: 28 / LAT: 32.01968 / LONG: -103.27226 (TVD: 0 feet, MD: 0 feet)
   PPP: SESW / 0 FSL / 1969 FWL / TWSP: 26S / RANGE: 36E / SECTION: 21 / LAT: 32.02152 / LONG: -103.27221 (TVD: 10243 feet, MD: 11163 feet)
   BHL: LOT C / 50 FNL / 1980 FWL / TWSP: 26S / RANGE: 36E / SECTION: 16 / LAT: 32.05041 / LONG: -103.27221 (TVD: 10250 feet, MD: 21674 feet)

BLM Point of Contact

Name: Priscilla Perez
Title: Legal Instruments Examiner
Phone: 5752345934
Email: pperez@blm.gov

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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:	Ameredev Operating LLC
LEASE NO.:	NMNM023199
WELL NAME & NO.:	Camellia Fed Com 26 36 21 083H
SURFACE HOLE FOOTAGE:	670'/S & 1960'/W
BOTTOM HOLE FOOTAGE	50'/N & 1980'/W
LOCATION:	Section 28, T.26 S., R.36 E., NMPM
COUNTY:	Lea County, New Mexico

COA

H2S	○ Yes	◉ No	
Potash	◉ None	○ Secretary	○ R-111-P
Cave/Karst Potential	◉ Low	○ Medium	○ High
Variance	○ None	◉ Flex Hose	○ Other
Wellhead	○ Conventional	◉ Multibowl	○ Both
Other	☐ 4 String Area	☑ Capitan Reef	☐ WIPP

A. HYDROGEN SULFIDE

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.

B. CASING

Primary Casing Design:

1. The **13-3/8** inch surface casing shall be set at approximately **2025** feet (a minimum of 25 feet into the Rustler Anhydrite and 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 will be a minimum of **8 hours** or 500 pounds compressive strength, whichever is greater. (This is to include the lead cement)
    c. Wait on cement (WOC) time for a remedial job will be a minimum of 4 hours

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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.

❖ **Special Capitan Reef requirements.** If lost circulation (50% or greater) occurs below the Base of the Salt, the operator shall do the following:

- Switch to fresh water mud to protect the Capitan Reef and use fresh water mud until setting the intermediate casing. The appropriate BLM office is to be notified for a PET to witness the switch to fresh water.

- Daily drilling reports from the Base of the Salt to the setting of the intermediate casing are to be submitted to the BLM CFO engineering staff via e-mail by 0800 hours each morning. Any lost circulation encountered is to be recorded on these drilling reports. The daily drilling report should show mud volume per shift/tour. Failure to submit these reports will result in an Incidence of Non-Compliance being issued for failure to comply with the Conditions of Approval. If not already planned, the operator shall run a caliper survey for the intermediate well bore and submit to the appropriate BLM office.

Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

2. The minimum required fill of cement behind the **9-5/8** inch **1st intermediate** casing is:

   Operator has proposed a DV tool, the depth may be adjusted as long as the cement is changed proportionally. The DV tool may be cancelled if cement circulates to surface on the first stage.

   a. First stage to DV tool: Cement to circulate. If cement does not circulate off the DV tool, contact the appropriate BLM office before proceeding with second stage cement job.

   b. Second stage above DV tool:

      - Cement should tie-back at least **200 feet** into previous casing string. Operator shall provide method of verification.
        Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash.

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

Wait on cement (WOC) time for a primary cement job is to include the lead cement slurry due to cave/karst or potash. Excess calculates to 21% - additional cement might be required.

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

    - Cement should tie-back at least **50** feet on top of Capitan Reef Top. Operator shall provide method of verification. **Excess calculates to 23% - additional cement might be required.**

Alternate Casing Design:

2nd Intermediate casing must be kept fluid filled to meet BLM minimum collapse requirement.

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

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

    In the case of lost circulation, operator has proposed to pump down 9 5/8" X 7 5/8" annulus. Operator must run a CBL from TD of the 7 5/8" casing to surface. Submit results to the BLM.

    Pilot hole is required to have a plug at the bottom of the hole. If two plugs are set, the BLM is to be contacted (575-361-2822) prior to tag of bottom plug, which must be a minimum of 200' in length. Operator can set one plug from bottom of pilot hole to kick-off point and save the WOC time for tagging the first plug. Note plug tops on subsequent drilling report.

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

    - Cement should tie-back at least **50** feet on top of Capitan Reef Top. Operator shall provide method of verification. **Excess calculates to 14% - additional cement might be required.**

C. PRESSURE CONTROL

1. Variance approved to use flex line from BOP to choke manifold. Manufacturer's specification to be readily available. No external damage to flex line. Flex line to be installed as straight as possible (no hard bends).'

2.

Option 1:

Minimum working pressure of the blowout preventer (BOP) and related equipment (BOPE) required for drilling below the surface casing shoe shall be **10,000 (10M)** psi.

Option 2:

Operator has proposed a multi-bowl wellhead assembly. 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 10,000 (10M) 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. 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.
e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

Variance approved to use a 5M annular. The annular must be tested to full working pressure (5000 psi.)

D. SPECIAL REQUIREMENT(S)

Communitization Agreement

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

GENERAL REQUIREMENTS

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

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

☒ Chaves and Roosevelt Counties
Call the Roswell Field Office, 2909 West Second St., Roswell NM 88201.
During office hours call (575) 627-0272.
After office hours call (575)

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

☒ Lea County
Call the Hobbs Field Station, 414 West Taylor, Hobbs NM 88240, (575) 393-3612

1. 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.
   a. In the event the operator has proposed to drill multiple wells utilizing a skid/walking rig. Operator shall secure the wellbore on the current well, after installing and testing the wellhead, by installing a blind flange of like pressure rating to the wellhead and a pressure gauge that can be monitored while drilling is performed on the other well(s).
   b. When the operator proposes to set surface casing with Spudder Rig
      - Notify the BLM when moving in and removing the Spudder Rig.
      - Notify the BLM when moving in the 2nd Rig. Rig to be moved in within 90 days of notification that Spudder Rig has left the location.
      - BOP/BOPE test to be conducted per Onshore Oil and Gas Order No. 2 as soon as 2nd Rig is rigged up on well.

2. 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 are located, this does not include the dog house or stairway area.

3. The record of the drilling rate along with the GR/N well log (one log per well pad is acceptable) 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.

A. CASING

1. 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.

2. Wait on cement (WOC) for Potash Areas: 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 for all cement blends, 2) until cement has been in place at least 24 hours. WOC time will be recorded in the driller's log. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

3. 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. The casing intergrity test can be done (prior to the cement setting up) immediately after bumping the plug.

4. 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.

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

6. On that portion of any well approved for a 5M BOPE system or greater, a pressure integrity test of each casing shoe shall be performed. Formation at the shoe shall be tested to a minimum of the mud weight equivalent anticipated to control the formation pressure to the next casing depth or at total depth of the well. This test shall be performed before drilling more than 20 feet of new hole.

7. 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.

8. Whenever a casing string is cemented in the R-111-P potash area, the NMOCD requirements shall be followed.

B. 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 RP 53 Sec. 17.

2. If a variance is approved for a flexible hose to be installed from the BOP to the choke manifold, the following requirements apply: The flex line must meet the requirements of API 16C. 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.

3. 5M or higher 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. If the operator has proposed a multi-bowl wellhead assembly in the APD. The following requirements must be met:
    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. 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.
    e. Whenever any seal subject to test pressure is broken, all the tests in OOGO2.III.A.2.i must be followed.

5. The appropriate BLM office shall be notified a minimum of 4 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).

b. In potash areas, 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. For all casing strings, casing cut-off and BOP installation can be initiated at twelve hours after bumping the plug. However, **no tests** shall commence until the cement has had a minimum of 24 hours setup time, except the casing pressure test can be initiated immediately after bumping the plug (only applies to single stage cement jobs).

c. The tests shall be done by an independent service company utilizing a test plug. The results of the test shall be reported to the appropriate BLM office.

d. 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.

e. 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.

f. 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. This test shall be performed prior to the test at full stack pressure.

g. BOP/BOPE must be tested by an independent service company within 500 feet of the top of the Wolfcamp formation if the time between the setting of the intermediate casing and reaching this depth exceeds 20 days. This test does not exclude the test prior to drilling out the casing shoe as per Onshore Order No. 2.

C. DRILLING MUD

Mud system monitoring equipment, with derrick floor indicators and visual and audio alarms, shall be operating before drilling into the Wolfcamp formation, and shall be used until production casing is run and cemented.

D. 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.

Waste Minimization Plan (WMP)

In the interest of resource development, submission of additional well gas capture development plan information is deferred but may be required by the BLM Authorized Officer at a later date.

NMK4292019

263621M APD Camellia Fed Com 26 36 21 083H 30015 NMNM023199 Ameredev 12-55 03192019 NMK_ContigencyPlan

Cap

13 3/8	surface csg in a	17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight
"A"	54.50	J 55	BUTT	8.13	1.31	1.12	1,925	104,913
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	1,071		Tail Cmt	does not	circ to sfc.	Totals:	1,925	104,913

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946			1391		8.60	1345	2M	1.56

[illegible]

9 5/8	casing inside the	13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight
"A"	40.00	HCL 80	BUTT	4.57	1.73	0.82	5,013	200,520
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	5,013	200,520

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 1925 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look ↘	0	1684		9.40	4161	5M	0.81
D V Tool(s):			3262				sum of sx	Σ CuFt	Σ%excess
t by stage % :		315	37				1357	3882	130

Burst Frac Gradient(s) for Segment(s): A, B, C, D = 1.15, b, c, d

All > 0.70, OK.

Alt Burst = 1.38 > 1

7 5/8	casing inside the	9 5/8	A Buoyant		Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	29.70	HCL 80	BUTT	2.13	1.1	1.36	11,147	331,066
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,452					Totals:	11,147	331,066

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 5013 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 3/4	0.1005	683	1339	1172	14	10.50	3336	5M	0.56

Class 'H' tail cmt yld > 1.20

Alt Collapse = 1.65 > 1.125

Tail cmt

5 1/2	casing inside the	7 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"	20.00	P 110	BUTT	1.44	2.15	2.57	11,147	222,940
"B"	20.00	P 110	BUTT	∞	2.29	2.57	10,453	209,060
w/8.4#/g mud, 30min Sfc Csg Test psig:	2,255					Totals:	21,600	432,000

A segment Design Factors would be: 3.20 2.29 if it were a vertical wellbore.

	MTD	Max VTD	Csg VD	Curve KOP	Dogleg°	Severity°	MEOC
No Pilot Hole Planned	21600	10250	10250	9800	90	6	11300

The cement volume(s) are intended to achieve a top of 0 ft from surface or a 11147 overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
6 3/4	0.0835	1751	2346	1913	23	10.50			0.49

Class 'H' tail cmt yld > 1.20

263621M APD Camellia Fed Com 26 36 21 083H 30015 NMNM023199 Ameredev 12-55 03192019 NMK

Cap

13 3/8	surface csg in a	17 1/2	inch hole.		Design Factors		SURFACE	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight
"A"	68.00	J 55	BUTT	7.77	2.21	0.8	2,025	137,700
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig: 1,500			Tail Cmt	does not	circ to sfc.	Totals:	2,025	137,700

Comparison of Proposed to Minimum Required Cement Volumes

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
17 1/2	0.6946	1231	2083	1460	43	8.40	2155	3M	1.56

Burst Frac Gradient(s) for Segment(s) A, B = , b All > 0.70, OK.

9 5/8	casing inside the	13 3/8			Design Factors		INTERMEDIATE	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight
"A"	40.00	HCL 80	BUTT	2.36	0.99	1.03	9,725	389,000
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	9,725	389,000
The cement volume(s) are intended to achieve a top of			0	ft from surface or a			2025	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
12 1/4	0.3132	look ↘	0	3109		8.50	3336	5M	0.81
D V Tool(s):			4991				sum of sx	Σ CuFt	Σ%excess
t by stage % :		152	21				2564	5736	84

Class 'H' tail cmt yld > 1.20

Alt Collapse = 1.49 > 1.125

Tail cmt

5 1/2	casing inside the	9 5/8			Design Factors		PRODUCTION	
Segment	#/ft	Grade	Coupling	Body	Collapse	Burst	Length	Weight
"A"	20.00	HCP 110	BUTT	3.13	2.08	2.21	9,800	196,000
"B"	20.00	HCP 110	BUTT	12.68	1.87	2.21	11,800	236,000
w/8.4#/g mud, 30min Sfc Csg Test psig: 2,156						Totals:	21,600	432,000
The cement volume(s) are intended to achieve a top of			0	ft from surface or a			9725	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
8 1/2	0.2291	4829	6471	5262	23	10.50			1.23

Class 'H' tail cmt yld > 1.20

0		5 1/2			Design Factors			
Segment	#/ft	Grade	Coupling	Joint	Collapse	Burst	Length	Weight
"A"							0	0
"B"							0	0
w/8.4#/g mud, 30min Sfc Csg Test psig:						Totals:	0	0
Cmt vol calc below includes this csg, TOC intended			0	ft from surface or a			21600	overlap.

Hole Size	Annular Volume	1 Stage Cmt Sx	1 Stage CuFt Cmt	Min Cu Ft	1 Stage % Excess	Drilling Mud Wt	Calc MASP	Req'd BOPE	Min Dist Hole-Cplg
0			0	0					

Carlsbad Field Office

4/29/2019

Approval Date: 05/15/2019

AFMSS

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

Operator Certification Data Report

05/16/2019

Operator Certification

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

NAME: Christie Hanna **Signed on:** 04/05/2019

Title: Senior Engineering Technician

Street Address: 5707 Southwest Parkway, Building 1, Suite 275

City: Austin **State:** TX **Zip:** 78735

Phone: (737)300-4723

Email address: channa@ameredev.com

Field Representative

Representative Name: Zachary Boyd

Street Address: 5707 SOUTHWEST PARKWAY, BLDG 1, STE. 275

City: AUSTIN **State:** TX **Zip:** 78735

Phone: (737)300-4700

Email address: zboyd@ameredev.com

AFMSS

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

Application Data Report

05/16/2019

APD ID: 10400030726 **Submission Date:** 06/13/2018

Operator Name: AMEREDEV OPERATING LLC

[redacted] **Well Number:** 083H

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

[redacted]

Show Final Text

Section 1 - General

APD ID: 10400030726 **Tie to previous NOS?** 10400028718 **Submission Date:** 06/13/2018

BLM Office: CARLSBAD **User:** Christie Hanna **Title:** Senior Engineering Technician

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

Lease number: NMNM023199 **Lease Acres:** 320

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

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

Agreement number:

Agreement name:

Keep application confidential? NO

Permitting Agent? NO **APD Operator:** AMEREDEV OPERATING LLC

Operator letter of designation:

Operator Info

Operator Organization Name: AMEREDEV OPERATING LLC

Operator Address: 5707 Southwest Parkway, Building 1, Suite 275 **Zip:** 78735

Operator PO Box:

Operator City: Austin **State:** TX

Operator Phone: (737)300-4700

Operator Internet Address:

Section 2 - Well Information

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

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

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

[redacted] **Well Number:** 083H **Well API Number:**

Field/Pool or Exploratory? Field and Pool

[redacted]

Operator Name: AMEREDEV OPERATING LLC

[redacted] **Well Number:** 083H

Describe other minerals:

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

Type of Well Pad: MULTIPLE WELL [redacted]

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

Well Work Type: Drill

Well Type: OIL WELL

Describe Well Type:

Well sub-Type: INFILL

Describe sub-type:

Distance to town: 5 Miles **Distance to nearest well:** 977 FT [redacted]

Reservoir well spacing assigned acres Measurement: 320 Acres

Well plat: JEFF_20190405130213.pdf

CAMELLIA_FED_COM_26_36_21_083H___BLM_LEASE_MAP_20190405130250.pdf

CAMELLIA_FED_COM_26_36_21_083H___C_102_SIG_20190405130251.pdf

CAMELLIA_FED_COM_26_36_21_083H___EXH_2AB_20190405130252.pdf

CAMELLIA_FED_COM_26_36_21_083H___VICINITY_MAP_20190405130252.pdf

CAMELLIA_FED_COM_26_36_21_083H___GAS_CAPTURE_PLAN_20190405130311.pdf

[redacted] **Duration:** 90 DAYS

Section 3 - Well Location Table

Survey Type: RECTANGULAR

Describe Survey Type:

Datum: NAD83 **Vertical Datum:** NAVD88

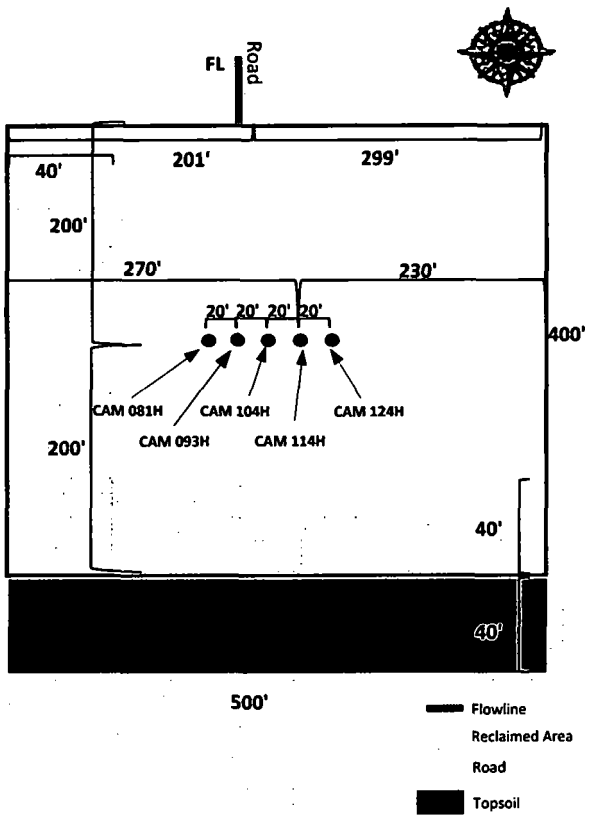
[redacted]

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
SHL Leg #1	[redacted]							Lot C							STATE			

Operator Name: AMEREDEV OPERATING LLC

[redacted] **Well Number:** 083H

	NS-Foot	NS Indicator	EW-Foot	EW Indicator	Twsp	Range	Section	Aliquot/Lot/Tract	Latitude	Longitude	County	State	Meridian	Lease Type	Lease Number	Elevation	MD	TVD
KOP Leg #1	[redacted]							Aliquot NENW							STATE			
PPP Leg #1								Aliquot SESW							NMNM 023199			
EXIT Leg #1								Aliquot NENW							STATE			
BHL Leg #1								Lot C							STATE			



Camellia Fed Com 26 36 21 083H SHL: SEC 28-26S-36E, 670' FNL 1960' FWL

Camellia Fed Com 26 36 21 093H SHL: SEC 28-26S-36E, 670' FNL 1980' FWL

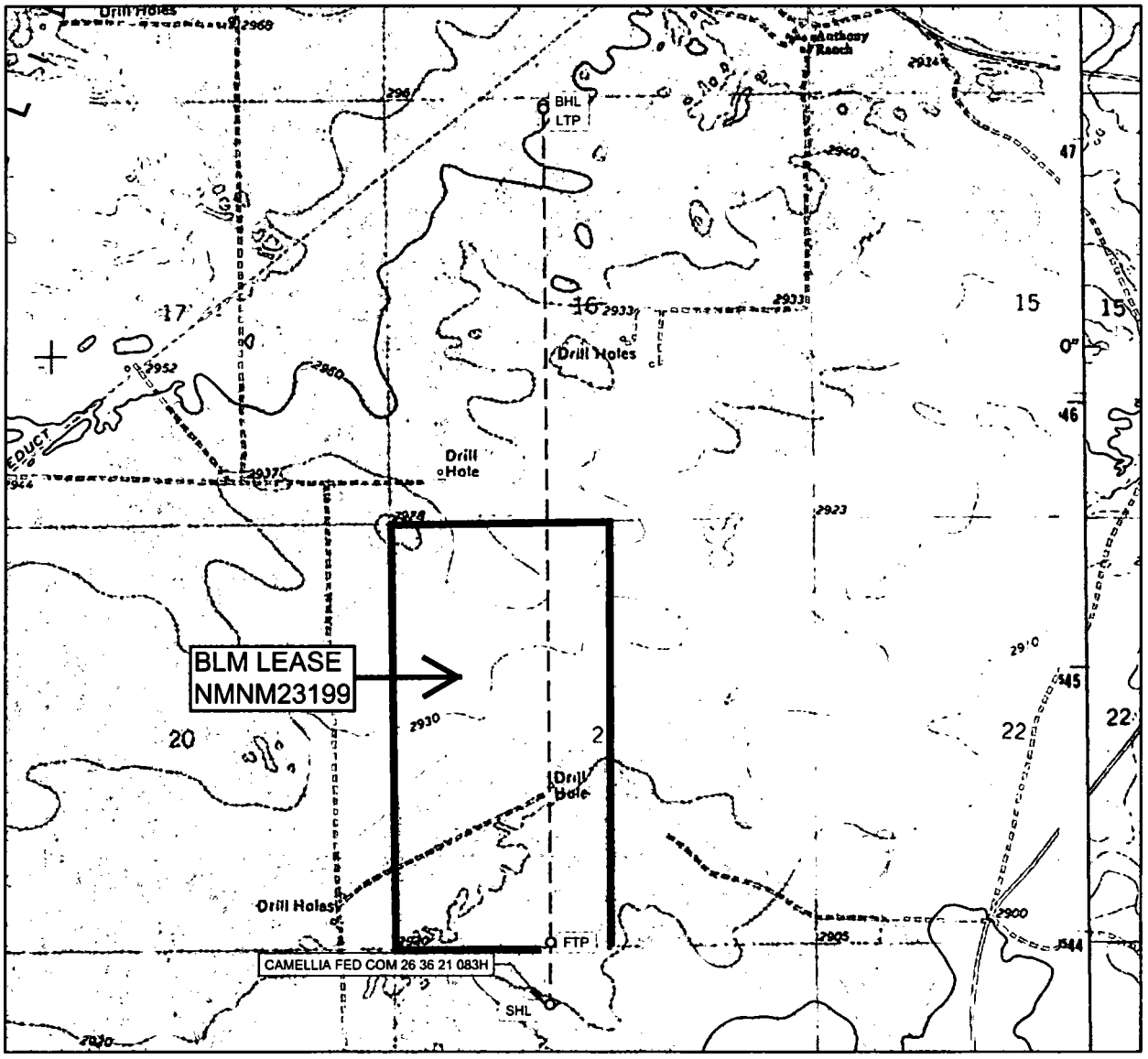
Camellia Fed Com 26 36 21 104H SHL: SEC 28-26S-36E, 670' FNL 2000' FWL

Camellia Fed Com 26 36 21 114H SHL: SEC 28-26S-36E, 670' FNL 2020' FWL

Camellia Fed Com 26 36 21 124H SHL: SEC 28-26S-36E, 670' FNL 2040' FWL

WELLSITE DIAGRAM

LOCATION & ELEVATION VERIFICATION MAP



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AMEREDEV OPERATING, LLC

LEASE NAME & WELL NO.: CAMELLIA FED COM 26 36 21 083H

SECTION 28 TWP 26-S RGE 36-E SURVEY N.M.P.M.
COUNTY LEA STATE NM ELEVATION 2911'
DESCRIPTION 670' FNL & 1960' FWL

LATITUDE N 32.0196814 LONGITUDE W 103.2722678

N

SCALE: 1" = 2000'

0' 1000' 2000'

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S:\SURVEY\AMEREDEV_OPERATING_LLC\CAMELLIA_FED_COM\FINAL_PRODUCTS\LO_CAMELLIA_FED_COM_26_36_21_083H_REV2.DWG 3/4/2019 12:42:49 PM ccaston

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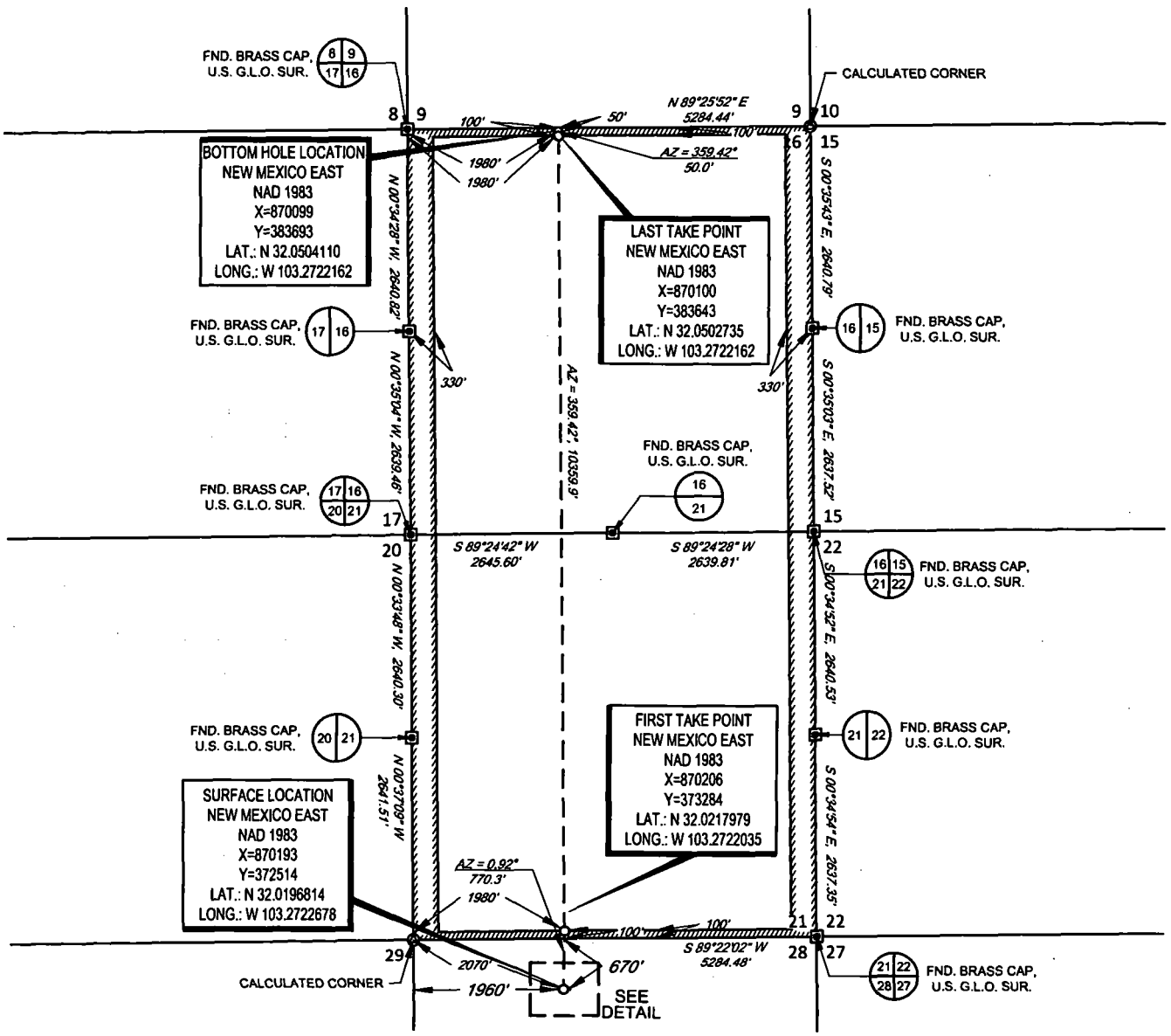
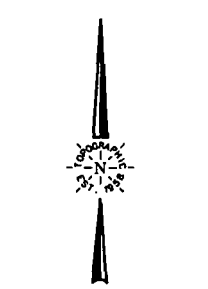
EXHIBIT 2A

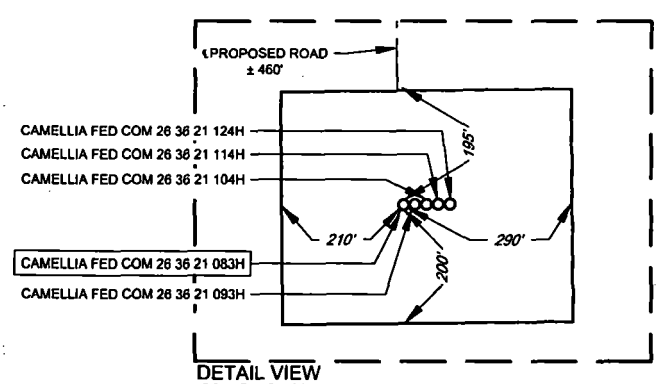
SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO





SCALE: 1" = 2000'

0' 1000' 2000'



DETAIL VIEW
SCALE: 1" = 300'

LEASE NAME & WELL NO.: CAMELLIA FED COM 26 36 21 083H

SECTION 28 TWP 26-S RGE 36-E SURVEY N.M.P.M.
COUNTY LEA STATE NM
DESCRIPTION 670' FNL & 1960' FWL

DISTANCE & DIRECTION
FROM INT. OF NM-205 & NM-128, HEAD SOUTH ON NM-205 +8.0 MILES

MICHAEL B. BROWN
NEW MEXICO
18329
PROFESSIONAL SURVEYOR

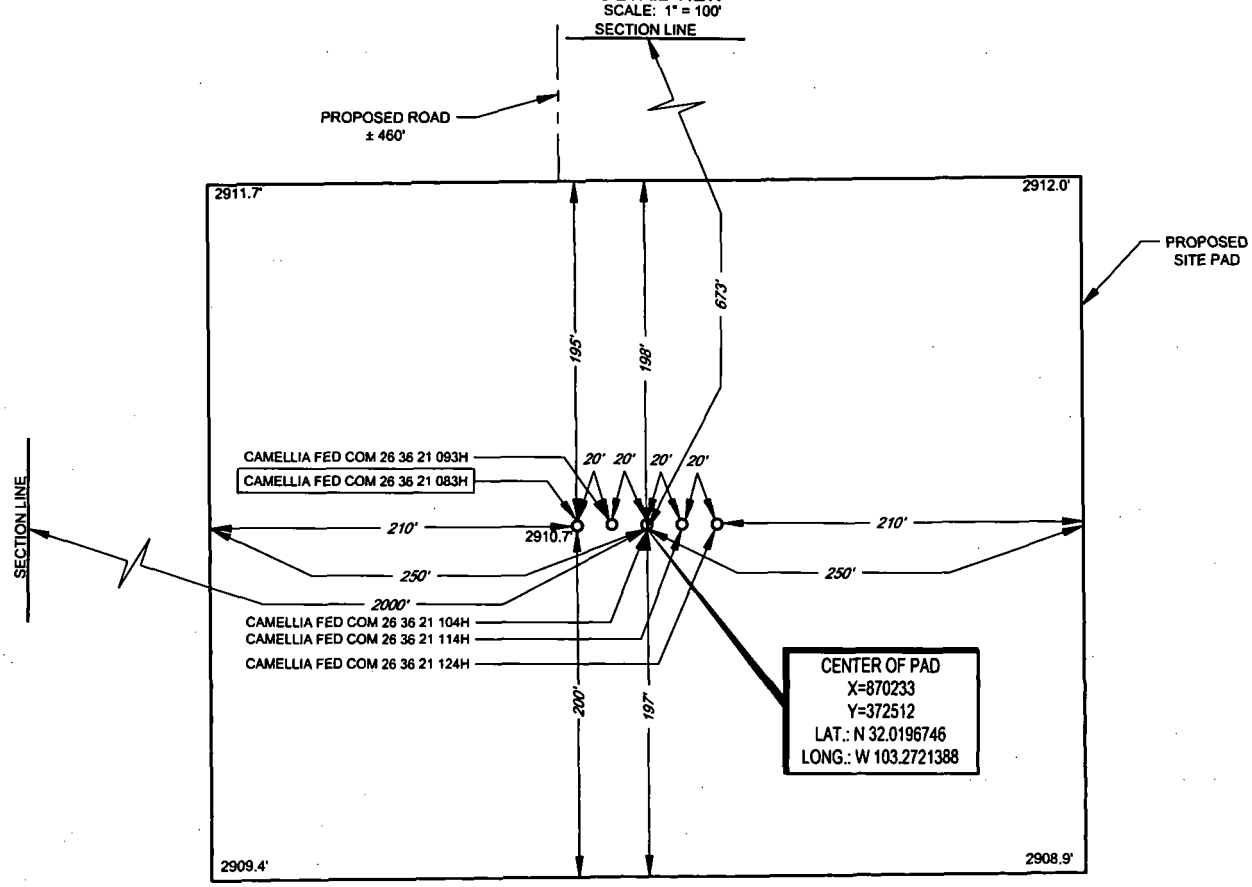
EXHIBIT 2B

AMEREDEV

AMEREDEV OPERATING, LLC

SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO

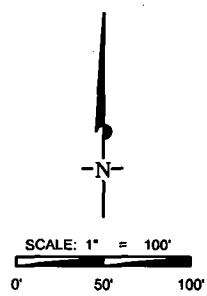
DETAIL VIEW
SCALE: 1" = 100'



LEASE NAME & WELL NO.: CAMELLIA FED COM 26 36 21 083H

083H LATITUDE N 32.0196814 083H LONGITUDE W 103.2722678

CENTER OF PAD IS 673' FNL & 2000' FWL



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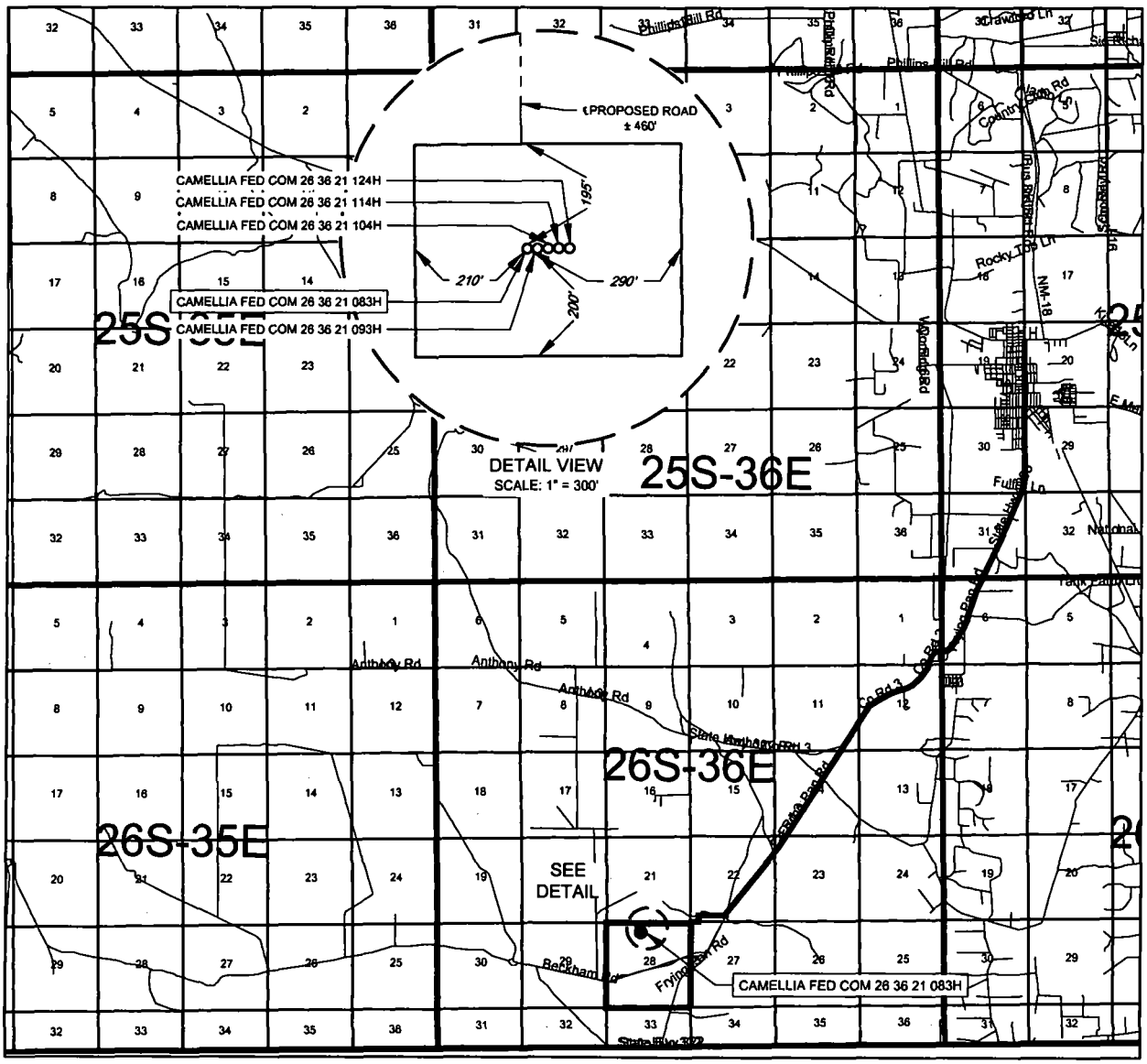
ORIGINAL DOCUMENT SIZE: 8.5" X 11"

S:\SURVEY\AMEREDEV_OPERATING_LLC\CAMELLIA_FED_COM\FINAL_PRODUCTS\LO_CAMELLIA_FED_COM_26_36_21_083H_REV2.DWG 3/4/2019 12:42:51 PM ccaston

EXHIBIT 2

VICINITY MAP



AMEREDEV

AMEREDEV OPERATING, LLC

LEASE NAME & WELL NO.: CAMELLIA FED COM 26 36 21 083H

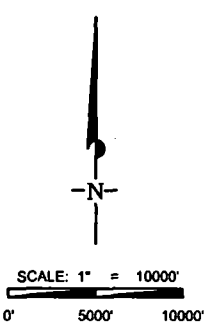
SECTION 28 TWP 26-S RGE 36-E SURVEY N.M.P.M.

COUNTY LEA STATE NM

DESCRIPTION 670' FNL & 1960' FWL

DISTANCE & DIRECTION

FROM INT. OF NM-205 & NM-128, HEAD SOUTH ON NM-205 ±8.0 MILES, THENCE WEST (RIGHT) ON A PROPOSED RD. ±1.2 MILES, THENCE SOUTH (LEFT) ON A PROPOSED RD. ±460 FEET TO A POINT ±195 FEET NORTHWEST OF THE LOCATION.



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APD ID: 10400030726 **Submission Date:** 06/13/2018

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

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

[redacted]

Show Final Text

Section 1 - Geologic Formations

Formation ID	Formation Name	Elevation	True Vertical Depth	Measured Depth	Lithologies	Mineral Resources	Producing Formation
1	[redacted]						
2							
3							
4							
5							
6							
7							
8							
9							
10							

Section 2 - Blowout Prevention

[redacted]

Requesting Variance? YES

[redacted]

Testing Procedure: See attachment

Choke Diagram Attachment:

10M_Choke_Manifold_REV_20190405131359.pdf

BOP Diagram Attachment:

10M_Choke_Manifold_REV_20190405131359.pdf

5M_Annular_Preventer_Variance_and_Well_Control_Plan_20190405131557.pdf

5M_BOP_System_20190405131557.pdf

Pressure_Control_Plan_Single_Well_MB4_3String_Big_Hole_BLM_20190405131557.pdf

4_String_MB_Ameredev_Wellhead_Drawing_net_REV_20190405131608.pdf

Section 3 - Casing

Casing ID	String Type	Hole Size	Csg Size	Condition	Standard	Tapered String	Top Set MD	Bottom Set MD	Top Set TVD	Bottom Set TVD	Top Set MSL	Bottom Set MSL	Calculated casing length MD	Grade	Weight	Joint Type	Collapse SF	Burst SF	Joint SF Type	Joint SF	Body SF Type	Body SF
1	SURFACE			NEW	API	N	0		0		2911					OTHER - BTC			DRY		DRY	
2	INTERMEDIATE			NEW	API	N	0		0							OTHER - BTC			DRY		DRY	
3	PRODUCTION			NEW	API	N	0		0							OTHER - BTC			DRY		DRY	

Casing Attachments

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

13.375_68.00__J55_BTC_20190405131817.pdf

Camellia_Fed_Com_26_36_21_083H___Wellbore_Diagram_and_CDA_20190405131826.pdf

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Casing Attachments

Casing ID: 2 **String Type:** INTERMEDIATE

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

Camellia_Fed_Com_26_36_21_083H___Wellbore_Diagram_and_CDA_20190405132004.pdf

9.625_40_SeAH80HC_4100_Collapse_20190405132014.pdf

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

Inspection Document:

Spec Document:

Tapered String Spec:

Casing Design Assumptions and Worksheet(s):

5.5_20_P110HP_Eagle_SFH_20190405132129.pdf

Camellia_Fed_Com_26_36_21_083H___Wellbore_Diagram_and_CDA_20190405132137.pdf

Section 4 - Cement

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
SURFACE	Lead		0	2026		1.76					
SURFACE	Tail		2026	2432							
INTERMEDIATE	Lead					2.47					Pozzol, Bentonite, Accelerator, Expansion

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

String Type	Lead/Tail	Stage Tool Depth	Top MD	Bottom MD	Quantity(sx)	Yield	Density	Cu Ft	Excess%	Cement type	Additives
INTERMEDIATE	Tail										
INTERMEDIATE	Lead					2.47					
INTERMEDIATE	Tail										
PRODUCTION	Lead					1.34					

Section 5 - Circulating Medium

Will an air or gas system be Used? NO

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

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

Describe what will be on location to control well or mitigate other conditions: All necessary supplies (e.g. bentonite, cedar bark) for fluid control will be on site.

Describe the mud monitoring system utilized: An electronic pit volume totalizer (PVT) will be utilized on the circulating system to monitor pit volume, flow rate, pump pressure, and pump rate.

Circulating Medium Table

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
2412	9725	SALT SATURATED	8.5	9.4							

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Top Depth	Bottom Depth	Mud Type	Min Weight (lbs/gal)	Max Weight (lbs/gal)	Density (lbs/cu ft)	Gel Strength (lbs/100 sqft)	PH	Viscosity (CP)	Salinity (ppm)	Filtration (cc)	Additional Characteristics
9725	10250	OIL-BASED MUD	10.5	12.5							
0	2412	WATER-BASED MUD	8.4	8.6							

Section 6 - Test, Logging, Coring

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

A directional survey, measurement while drilling and a mudlog/geologic lithology log will all be run from surface to TD.

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

DS,MWD,MUDLOG

Coring operation description for the well:

No coring will be done on this well.

Section 7 - Pressure

Anticipated Bottom Hole Pressure: 5000 **Anticipated Surface Pressure:** 2745

Anticipated Bottom Hole Temperature(F): 160

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

Describe:

Contingency Plans geoharzards description:

Contingency Plans geohazards attachment:

Hydrogen Sulfide drilling operations plan required? YES

Hydrogen sulfide drilling operations plan:

H2S_Plan_20180607152046.pdf

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Section 8 - Other Information

Proposed horizontal/directional/multi-lateral plan submission:

Cam083_DR_20190405132950.pdf

Cam083_LLR_20190405132950.pdf

5M_Annular_Preventer_Variance_and_Well_Control_Plan_20190405133106.pdf

Pressure_Control_Plan_Single_Well_MB4_3String_Big_Hole_BLM_20190405133106.pdf

Other proposed operations facets description:

[redacted]

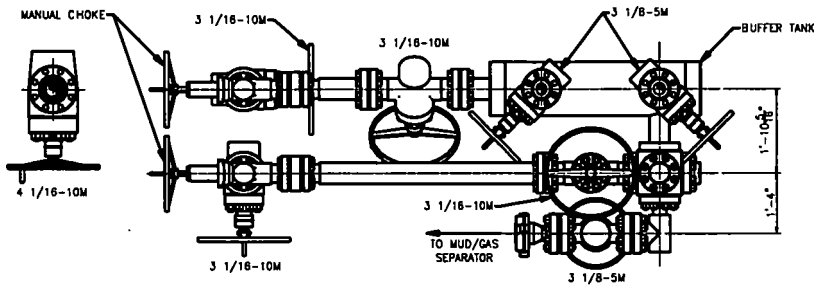
Other proposed operations facets attachment:

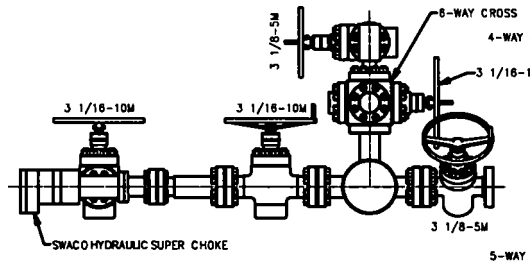
CAPITAN_PROTECTION_CONTINGENCY_PLAN_20190405133137.pdf

Other Variance attachment:

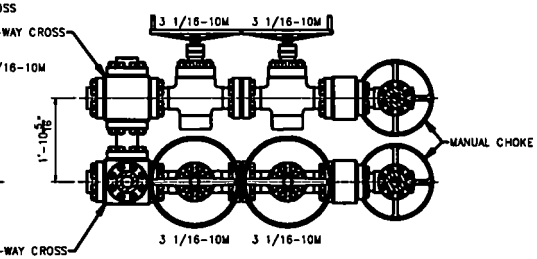
R616___CoC_for_hoses_12_18_17_20190405133201.pdf

Requested_Exceptions___3_String_Revised_03252019_20190405133202.pdf

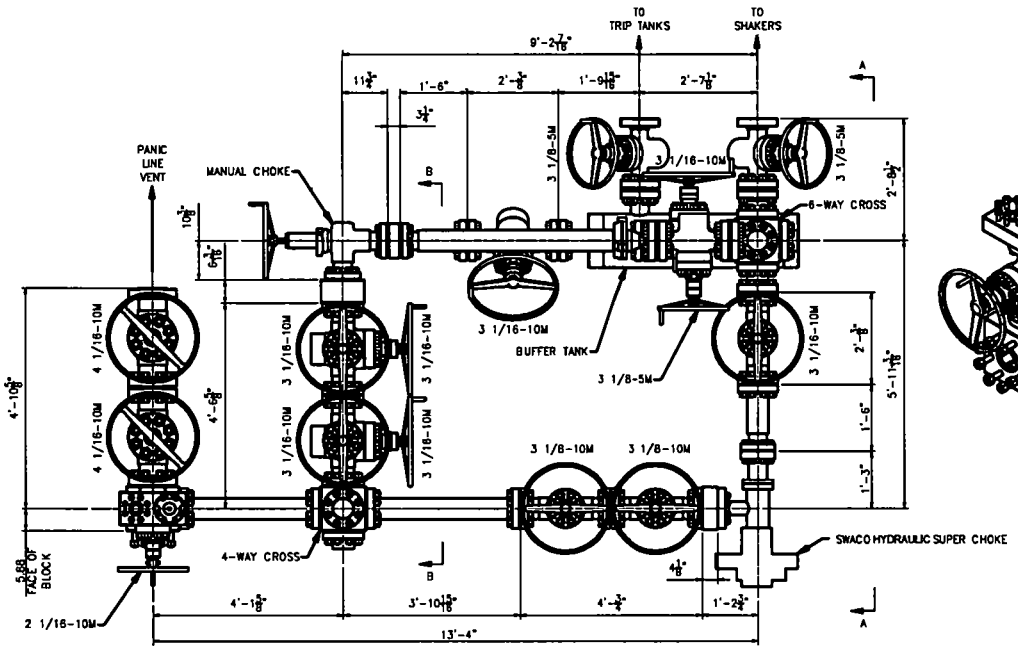




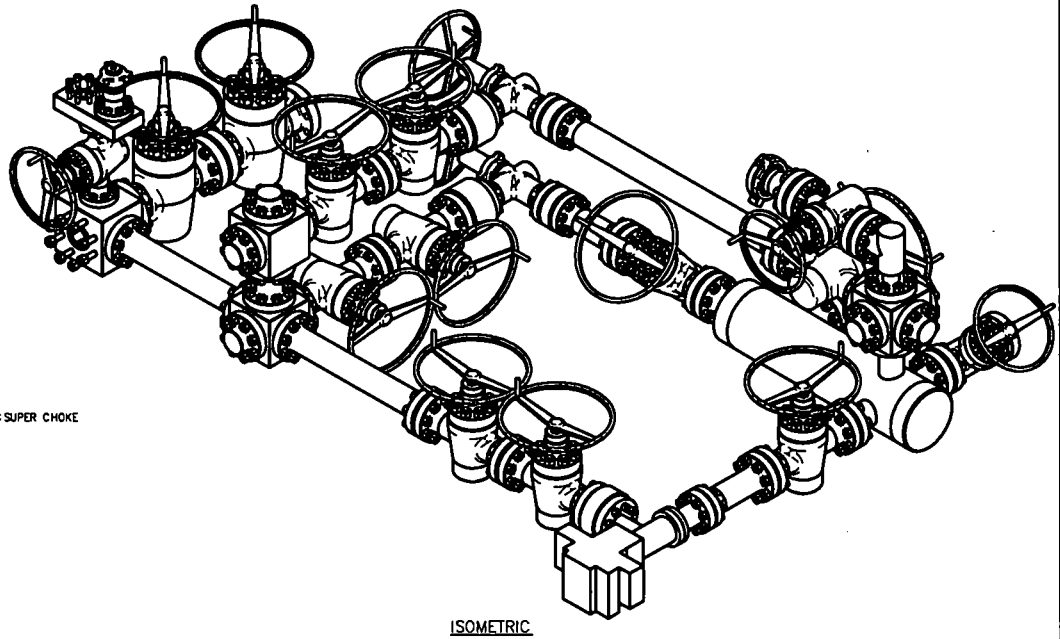
VIEW A-A



SECTION B-B



PLAN VIEW



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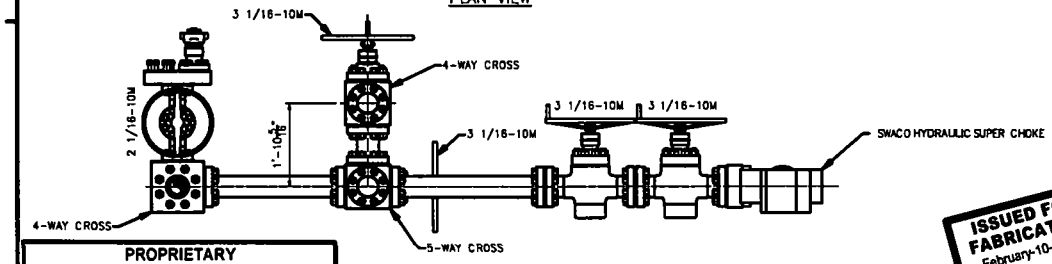


ISSUED FOR FABRICATION
February-10-2014
DRAFTSMAN _____
ENGINEER _____

STANDARD TOLERANCES
(UNLESS NOTED)

1. FABRICATION DIMENSIONS:	A-0° TO 24"	± 1/16"
	B-24" TO 120"	± 1/8"
	C-OVER 120"	± 1/4"
2. MACHINED DIMENSIONS:	A-ANGULAR	± 30'
	B-LINEAR (EXPRESSED AS FRACTION)	± .015
	LINEAR (EXPRESSED TO ONE DECIMAL)	± .1
	LINEAR (EXPRESSED TO TWO DECIMALS)	± .010
	LINEAR (EXPRESSED TO THREE DECIMALS)	± .005

REV	DATE	DESCRIPTION	BY

HELMERICH & PAYNE INTERNATIONAL DRILLING CO.

TITLE: 3 CHOKE, 3 LEVEL, 10M CHOKE MANIFOLD G.A.

CUSTOMER: H&P

PROJECT:

DRAWN	DATE	DWG. NO.	REV.
MWL	2/10/2014	HP-D1254	–
SCALE: 3/4"=1'-0"	SHEET: 1 OF 1		

AMEREDEV

5M Annular Preventer Variance Request and Well Control Procedures

Note: A copy of the Well Control Plan must be available at multiple locations on the rig for review by rig personnel, as well as review by the BLM PET/PE, and a copy must be maintained on the rig floor.

Dual Isolation Design for 5M Annular Exception

Ameredev will utilize 13-5/8" 10M (5M Annular) BOPE System consisting of:

- 13-5/8" 5M Annular
- 13-5/8" 10M Upper Pipe Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram
- 13-5/8" 10M Blind Rams
- 13-5/8" 10M Drilling Spool /w 2 - 4" 10M Outlets Double 10M Isolation Valves
- 13-5/8" 10M Lower Blind Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram

All drilling components and casing associated to exposure > 5000 psi BHP requiring a 10M system will have a double isolation (secondary barrier) below the 5M Annular that would provide a barrier to flow. The mud system will always be primary barrier, it will be maintained by adjusting values based on tourly mud tests and monitoring a PVT System to maintain static wellbore conditions, displacement procedures will be followed and recorded on daily drilling reports during tripping operations. Surge and swab pressure values will be calculated and maintained and static flow check will be monitored at previous casing shoe and verified static well conditions prior to tripping out of hole and again prior to pulling last joint of drill pipe through BOPE. The below table, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

Drill Components	Size	Primary Barrier	Secondary Barrier	Third Barrier
Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
HWDP Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Drill Collars	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Production Casing	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Open Hole	13-5/8	Drilling Fluid	Blind Rams	
All Drilling Components in 10M Environment will have OD that will allow full Operational RATED WORKING PRESSURE for system design. Kill line with minimum 2" ID will be available outside substructure with 10M Check Valve for OOH Kill Operations				

Well Control Procedures

Proper well control procedures are dependent to differentiating well conditions, to cover the basic well control operations there are will be standard drilling ahead, tripping pipe, tripping BHA, running casing, and pipe out of the hole/open hole scenarios that will be defined by procedures below. Initial Shut In Pressure can be taken against the Uppermost BOPE component the 5M Annular, pressure control can be transferred from the lesser 5M Annular to the 10M Upper Pipe Rams if needed. Shut In Pressures may be equal to or less than the Rated Working Pressure but at no time will the pressure on the annular preventer exceed the Rated Working Pressure of the annular. The annular will be tested to 5,000 psi. This will be the Rated Working Pressure of the annular preventer. All scenarios will be written such as shut in will be performed by closing the 10,000 psi Upper Pipe Rams for faster Accumulator pressure recovery to allow safer reaction to controlling wellbore pressure.

Shutting In While Drilling

1. Sound alarm signaling well control event to Rig Crew
2. Space out drill string to allow FOSV installation
3. Shut down pumps
4. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
5. Install open, full open safety valve and close valve, Close Chokes
6. Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure

Shutting In While Tripping

1. Sound alarm signaling well control event to Rig Crew
2. Space out drill string to allow FOSV installation
3. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install open, full open safety valve and close valve, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

Shutting In While Running Casing

1. Sound alarm signaling well control event to Rig Crew
2. Space out casing to allow circulating swedge installation
3. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install circulating swedge, Close high pressure, low torque valves, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold Pre-job safety meeting and discuss kill procedure

Shutting in while out of hole

1. Sound alarm signaling well control event to Rig Crew
2. Shut-in well: close blind rams and open HCR against Open Chokes and Valves Open to working pressure gauge
3. Close Chokes, Verify well is shut-in and monitor pressures
4. Notify supervisory personnel
5. Record data (SIDP, SICP, Pit Gain, and Time)
6. Hold Pre-job safety meeting and discuss kill procedure

Shutting in prior to pulling BHA through stack

Prior to pulling last joint of drill pipe thru the stack space out and check flow
If flowing see steps below.

1. Sound alarm signaling well control event to Rig Crew
2. Shut in upper pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
3. Install open, full open safety valve and close valve, Close Chokes
4. Verify well is shut-in and flow has stopped
5. Notify supervisory personnel
6. Record data (SIDP, SICP, Pit Gain, and Time)
7. Hold pre-job safety meeting and discuss kill procedure

Shutting in while BHA is in the stack and ram preventer and combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. Space out BHA with upset just beneath the compatible pipe ram
3. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install open, full open safety valve and close valve, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

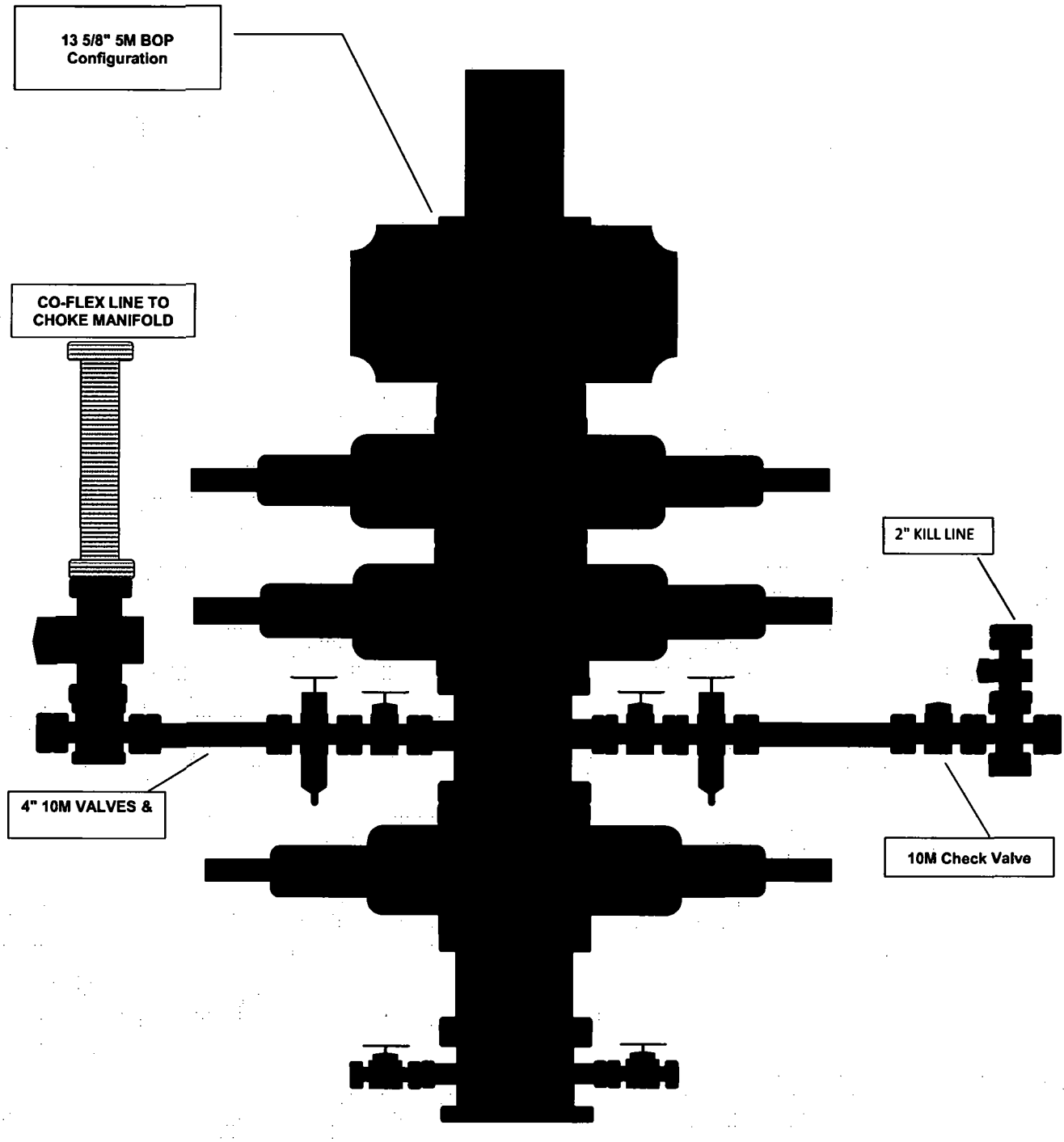
*FOSV will be on rig floor in open position with operating handle for each type of connection utilized and tested to 10,000 psi

Shutting in while BHA is in the stack and no ram preventer or combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. If possible pick up high enough, to pull string clear and follow "Open Hole" scenario

If not possible to pick up high enough:

3. Stab Crossover, make up one joint/stand of drill pipe, and install open, full open safety valve (Leave Open)
4. Space out drill string with upset just beneath the compatible pipe ram.
5. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
6. Close FOSV, Close Chokes, Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure


13 5/8" 5M BOP
Configuration
CO-FLEX LINE TO
CHOKE MANIFOLD
2" KILL LINE
4" 10M VALVES &
10M Check Valve

AMEREDEV

Pressure Control Plan

Pressure Control Equipment

- Following setting of 13-3/8" Surface Casing Ameredev will install 13-5/8 MB4 Multi Bowl Casing Head by welding on a 13-5/8 SOW x 13-5/8" 5M in combination with 13-5/8 5M x 13-5/8 10M B-Sec to Land Intm #1 and a 13-5/8 10M x 13-5/8 10M shouldered to land C-Sec to Land Intm #2 (Installation procedure witnessed and verified by a manufacturer's representative).

- Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Ameredev will install a 5M System Blowout Preventer (BOPE) with a 5M Annular Preventer and related equipment (BOPE). Full testing will be performed utilizing a full isolation test plug and limited to 5,000 psi MOP of MB4 Multi Bowl Casing Head. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 50% of approved working pressure (2,500 psi). Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Setting of 9-5/8" Intermediate will be done by landing a wellhead hanger in the 13-5/8" 5M Bowl, Cementing and setting Well Head Packing seals and testing same. (Installation procedure witnessed and verified by a manufacturer's representative) Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Full testing will be performed utilizing a full isolation test plug to 10,000 psi MOP of MB4 Multi Bowl B-Section. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 100% of approved working pressure (5,000 psi).

- Before drilling >20ft of new formation under the 9-5/8" Casing Shoe a pressure integrity test of the Casing Shoe will be performed to minimum of the MWE anticipated to control formation pressure to the next casing depth.

- Following setting of 5-1/2" Production Casing and adequate WOC time Ameredev will break 10M System Blowout Preventer (BOP) from 10M DOL-2 Casing Head, install annulus casing slips and test same (Installation procedure witnessed and verified by a manufacturer's representative) and install 11" 10M x 5-1/8" 15M Tubing Head (Installation procedure witnessed and verified by a manufacturer's representative). Ameredev will test head to 70% casing design and install Dry Hole cap with needle valve and pressure gauge to monitor well awaiting completion.

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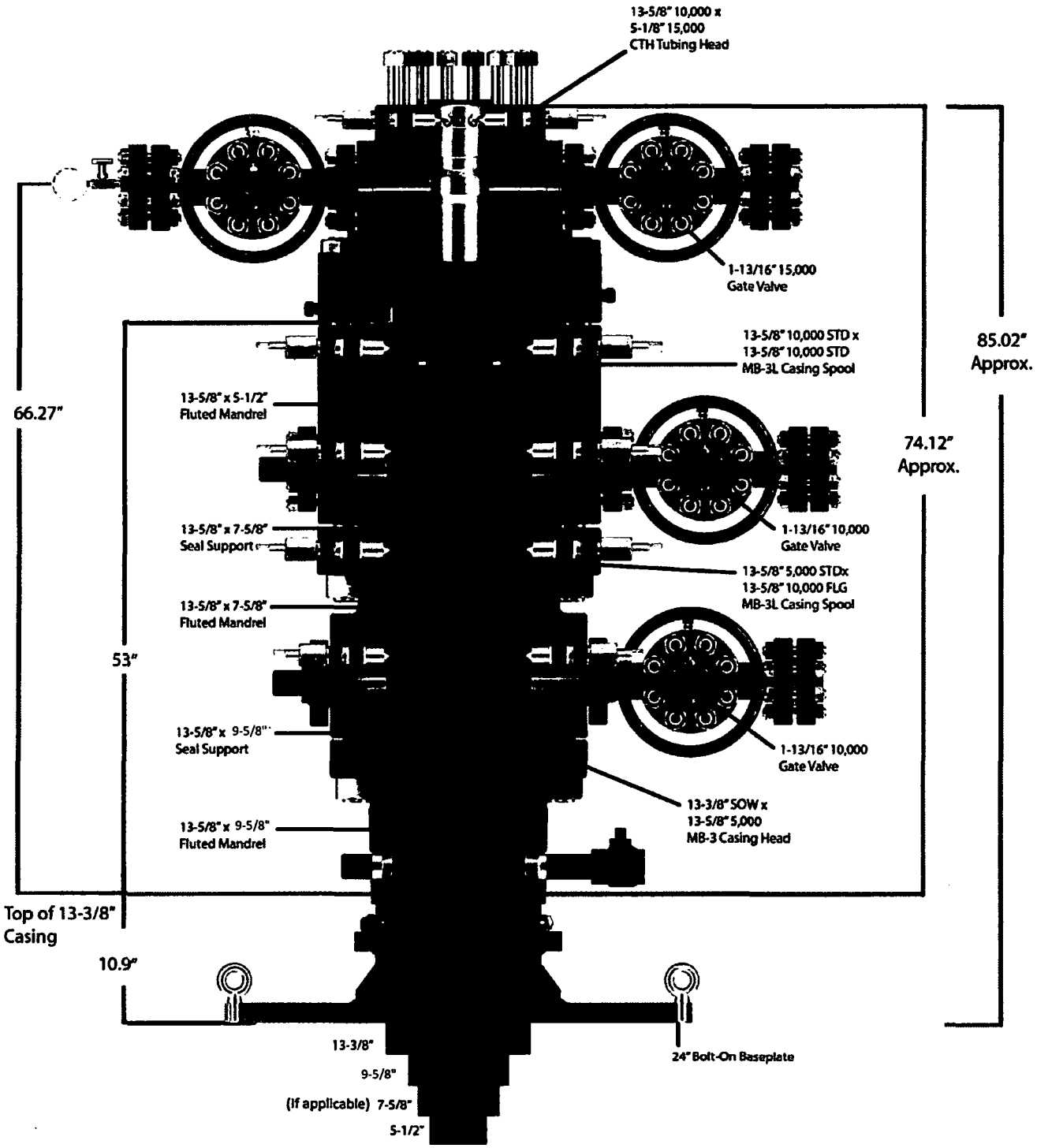
Pressure Control Plan

- Slow pump speeds will be taken daily by each crew and recorded on Daily Drilling Report after mudding up.
- A choke manifold and accumulator with floor and remote operating stations will be functional and in place after installation of BOPE, as well as full functioning mud gas separator.
- Weekly BOPE pit level drills will be conducted by each crew and recorded on Daily Drilling Report.
- BOP will be fully operated when out of hole and will be documented on the daily drilling log.
- All B.O.P.s and associated equipment will be tested in accordance with Onshore Order #2
- All B.O.P. testing will be done by an independent service company.
- The B.O.P. will be tested within 21 days of the original test if drilling takes more time than planned.
- Ameredev requests a variance to connect the B.O.P. choke outlet to the choke manifold using a co-flex hose with a 10,000 psi working pressure that has been tested to 15,000psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps. (certifications will be sent to Carlsbad BLM Office prior to install)
- Ameredev requests a variance to install a 5M Annular Preventer on the 10M System to drill the Production Hole below the 9-5/8" Intermediate Section. 5M Annular will be tested to 100% working pressure (5,000 psi). A full well control procedure will be included to isolate well bore.



Quotation

Downing Wellhead Equipment

Oklahoma City,
Oklahoma - USA

Reference Data:

16925 AMEREDEV

TITLE:

AMEREDEV

DRAWN			SIZE	DWG. NO.	REV.
CHECKED			A		
APPROVED			Scale:	Weight:	Sheet:

PERFORMANCE DATA

API BTC **13.375 in** **68.00 lbs/ft** **J-55**
Technical Data Sheet

Tubular Parameters					
Size	13.375	in	Minimum Yield	55,000	psi
Nominal Weight	68.00	lbs/ft	Minimum Tensile	75,000	psi
Grade	J-55		Yield Load	1,069,000	lbs
PE Weight	66.10	lbs/ft	Tensile Load	1,458,000	lbs
Wall Thickness	0.480	in	Min. Internal Yield Pressure	3,500	psi
Nominal ID	12.415	in	Collapse Pressure	1,950	psi
Drift Diameter	12.259	in			
Nom. Pipe Body Area	19.445	in²			

Connection Parameters		
Connection OD	14.375	in
Coupling Length	10.625	in
Threads Per Inch	5.000	in
Standoff Thread Turns	1.000	
Make-Up Loss	4.513	in
Yield Load In Tension	—	lbs
Min. Internal Yield Pressure	3,500	psi

Printed on: February-13-2015

IPSCO

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Wellbore Schematic

Well:	Camellia Fed Com 26-36-21 083H	**Co. Well ID:**	xxxxxx
SHL:	Sec. 28 26S-36E 670' FNL & 1960' FWL	**AFE No.:**	xxxx-xxx
BHL:	Sec. 16 26S-36E 50' FNL & 1980' FWL	**API No.:**	xxxxxxxxxx
	Lea, NM	**GL:**	2,911'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Second Bone Spring
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	10,250'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	21,674'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com

Hole Size	Formation Tops		Logs	Cement	Mud Weight
17.5"	Rustler	2,287'		1,475 Sacks TOC 0' 100% Excess	8.4-8.6 ppg WBM
	13.375" 68# J-55 BTC	**2,412'**			
12.25"	Salado	2,357'		883 Sacks TOC 0' 50% Excess	8.5 - 9.4 ppg Diesel Brine Emulsion
	Tansill	3,177'			
	Capitan Reef	3,638'			
	Lamar	4,941'			
	DV Tool	**4,991'**			
	Bell Canyon	5,102'		1,723 Sacks TOC 0' 50% Excess	
	Brushy Canyon	7,029'			
	Bone Spring Lime	8,065'			
	First Bone Spring	9,564'			
	9.625" 40# L-80HC BTC	**9,725'**			
8.5" 12° Build @ 9,725' MD thru 11,264' MD	Second Bone Spring	10,201'		4,628 Sacks TOC 0' 25% Excess	10.5 - 12.5 ppg OBM
	5.5" 20# P-110CYHP BTC	**21,674'**			
	Target Second Bone Spring 10250 TVD // 21674 MD				

Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,412'	13.375	68	J-55	BTC
Intermediate	12.25	9,725'	9.625	40	HCL-80	BTC
Prod Segment A	8.5	9,725'	5.5	20	CYHP-110	BTC
Prod Segment B	8.5	21,674'	5.5	20	CYHP-110	BTC

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.375	1,069	915	4,100	3,450
Safety Factors				
1.56	6.52	5.58	3.80	0.73
Check Intermediate Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
2.31	2.42	2.46	1.41	1.42
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	3.55	3.20	2.02	2.16
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.33	62.38	1.92	2.16

U. S. Steel Tubular Products

5 1/2 20.00 lb (0.361) P110 HP — USS-EAGLE SFH™

	PIPE	CONNECTION	
MECHANICAL PROPERTIES			
Minimum Yield Strength	**125,000**	**125,000**	*psi*
Maximum Yield Strength	**140,000**	**140,000**	*psi*
Minimum Tensile Strength	**130,000**	**130,000**	*psi*
DIMENSIONS			
Outside Diameter	**5.500**	**5.830**	*in.*
Wall Thickness	0.361		*in.*
Inside Diameter	4.778	4.693	*in.*
Drift - API	4.653	4.653	*in.*
Nominal Linear Weight, T&C	**19.83**		*lbs/ft*
Plain End Weight	19.83	19.83	*lbs/ft*
SECTION AREA			
Cross Sectional Area | Critical Area	5.828	5.054	*sq. in.*
Joint Efficiency		86.25	%
PERFORMANCE			
Minimum Collapse Pressure	13,150	13,150	*psi*
External Pressure Leak Resistance		10,000	*psi*
Minimum Internal Yield Pressure	14,360	14,360	*psi*
Minimum Pipe Body Yield Strength	729,000		*lbs*
Joint Strength		631,750	*lbs*
Compression Rating		631,750	*lbs*
Reference Length		21,240	*ft*
Maximum Uniaxial Bend Rating		89.9	*deg/100 ft*
Minimum Make-Up Torque		14,000	*ft-lbs*
Maximum Make-Up Torque		16,900	*ft-lbs*
Maximum Operating Torque		25,000	*ft-lbs*
Make-Up Loss		5.92	*in.*

Notes:

1) Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness, and Specified Minimum Yield Strength (SMYS).
2) Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3) Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4) Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
5) Reference length is calculated by joint strength divided by plain end weight with 1.5 safety factor.
6) Connection external pressure resistance has been verified to 10,000 psi (Application specific testing).

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064
1-877-893-9461
connections@uss.com
www.usstubular.com

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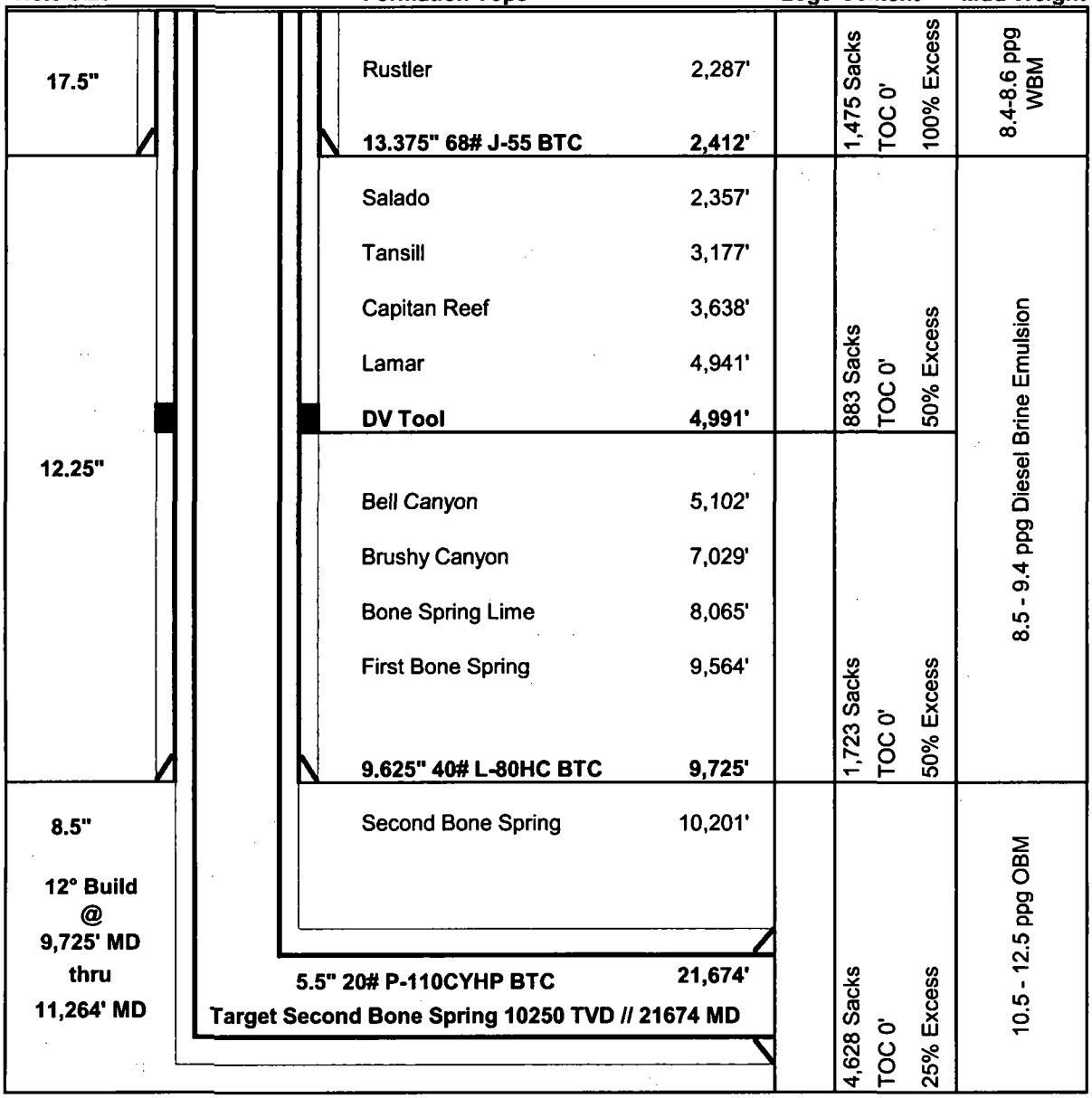
Wellbore Schematic

Well:	Camellia Fed Com 26-36-21 083H	**Co. Well ID:**	xxxxxx
SHL:	Sec. 28 26S-36E 670' FNL & 1960' FWL	**AFE No.:**	xxxx-xxx
BHL:	Sec. 16 26S-36E 50' FNL & 1980' FWL	**API No.:**	xxxxxxxxxx
	Lea, NM	**GL:**	2,911'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Second Bone Spring
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	10,250'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	21,674'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com



Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,412'	13.375	68	J-55	BTC
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Check Surface Casing				
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inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
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Safety Factors				
1.56	6.52	5.58	3.80	0.73
Check Intermediate Casing				
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Safety Factors				
2.31	2.42	2.46	1.41	1.42
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	3.55	3.20	2.02	2.16
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.33	62.38	1.92	2.16

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	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	10,250'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	21,674'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB:** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com

Hole Size	Formation Tops		Logs	Cement	Mud Weight
17.5"	Rustler	2,287'		1,475 Sacks TOC 0' 100% Excess	8.4-8.6 ppg WBM
	13.375" 68# J-55 BTC	**2,412'**			
12.25"	Salado	2,357'		883 Sacks TOC 0' 50% Excess	8.5 - 9.4 ppg Diesel Brine Emulsion
	Tansill	3,177'			
	Capitan Reef	3,638'			
	Lamar	4,941'			
	DV Tool	**4,991'**			
	Bell Canyon	5,102'		1,723 Sacks TOC 0' 50% Excess	
	Brushy Canyon	7,029'			
	Bone Spring Lime	8,065'			
	First Bone Spring	9,564'			
	9.625" 40# L-80HC BTC	**9,725'**			
8.5" 12° Build @ 9,725' MD thru 11,264' MD	Second Bone Spring	10,201'		4,628 Sacks TOC 0' 25% Excess	10.5 - 12.5 ppg OBM
	5.5" 20# P-110CYHP BTC	**21,674'**			
	Target Second Bone Spring 10250 TVD // 21674 MD				

Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	2,412'	13.375	68	J-55	BTC
Intermediate	12.25	9,725'	9.625	40	HCL-80	BTC
Prod Segment A	8.5	9,725'	5.5	20	CYHP-110	BTC
Prod Segment B	8.5	21,674'	5.5	20	CYHP-110	BTC

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.375	1,069	915	4,100	3,450
Safety Factors				
1.56	6.52	5.58	3.80	0.73
Check Intermediate Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
2.31	2.42	2.46	1.41	1.42
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	3.55	3.20	2.02	2.16
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
1.36	69.33	62.38	1.92	2.16

SĕAH

9.625" 40# .395" SEAH-80 HIGH COLLAPSE

(SEAH-80 IS A NON HEAT TREATED PRODUCT)

Dimensions (Nominal)

Outside Diameter	**9.625**	**in.**
Wall	**0.395**	**in.**
Inside Diameter	**8.835**	**in.**
Drift	**8.750**	**in.**
Weight, T&C	**40.000**	**lbs./ft.**
Weight, PE	**38.970**	**lbs./ft.**

Performance Properties

Collapse	**4100**	**psi**
Internal Yield Pressure at Minimum Yield		
PE	**5750**	**psi**
LTC	**5750**	**psi**
BTC	**5750**	**psi**
Yield Strength, Pipe Body	**916**	**1000 lbs.**
Joint Strength		
LTC	**717**	**1000 lbs.**
BTC	**915**	**1000 lbs.**

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H_2S Drilling Operation Plan

1. **All Company and Contract personnel admitted on location must be trained by a qualified H_2S safety instructor to the following:**
    a. Characteristics of H_2S
    b. Physical effects and hazards
    c. Principal and operation of H_2s detectors, warning system and briefing areas
    d. Evacuation procedure, routes and first aid
    e. Proper use of safety equipment and life support systems
    f. Essential personnel meeting Medical Evaluation criteria will receive additional training on the proper use of 30 minute pressure demand air packs.

2. **Briefing Area:**
    a. Two perpendicular areas will be designated by signs and readily accessible.
    b. Upon location entry there will be a designated area to establish all safety compliance criteria (1.) has been met.

3. **H_2S Detection and Alarm Systems:**
    a. H_2S sensors/detectors shall be located on the drilling rig floor, in the base of the sub structure/cellar area, and on the mud pits in the shale shaker area. Additional H_2S detectors may be placed as deemed necessary. All detectors will be set to initiate visual alarm at 10 ppm and visual with audible at 14 ppm and all equipment will be calibrated every 30 days or as needed.
    b. An audio alarm will be installed on the derrick floor and in the top doghouse.

4. **Protective Equipment for Essential Personnel:**
    a. **Breathing Apparatus:**
        i. Rescue Packs (SCBA) - 1 Unit shall be placed at each briefing area.
        ii. Two (SCBA) Units will be stored in safety trailer on location.
        iii. Work/Escape packs - 1 Unit will be available on rig floor in doghouse for emergency evacuation for driller.
    b. **Auxiliary Rescue Equipment:**
        i. Stretcher
        ii. 2 - OSHA full body harnesses
        iii. 100 ft. 5/8" OSHA approved rope
        iv. 1 - 20# class ABC fire extinguisher

5. **Windsock and/or Wind Streamers:**
    a. Windsock at mud pit area should be high enough to be visible.
    b. Windsock on the rig floor should be high enough to be visible.

6. **Communication:**
    a. While working under mask scripting boards will be used for communication where applicable.
    b. Hand signals will be used when script boards are not applicable.

c. Two way radios will be used to communicate off location in case of emergency help is required. In most cases cellular telephones will be available at Drilling Foreman's Office.

7. **Drill Stem Testing:** - No Planned DST at this time.

8. **Mud program:**
   a. If H2S is encountered, mud system will be altered if necessary to maintain control of formation. A mud gas separator will be brought into service along with H2S scavengers if necessary.

9. **Metallurgy:**

   a. All drill strings, casing, tubing, wellhead, blowout preventer, drilling spool, kill lines, choke manifold and lines, and valves shall be suitable for H_2S service.
   b. Drilling Contractor supervisor will be required to be familiar with the effect H_2S has on tubular goods and other mechanical equipment provided through contractor.

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H_2S Contingency Plan

Emergency Procedures

In the event of a release of H_2S, the first responder(s) must:

- Isolate the area and prevent entry by other persons into the 100 ppm ROE.
- Evacuate any public places encompassed by the 100 ppm ROE.
- Be equipped with H_2S monitors and air packs in order to control the release.
- Use the "buddy system" to ensure no injuries occur during the response.
- Take precautions to avoid personal injury during this operation.
- Contact Operator and/or local officials the aid in operation. See list of phone numbers attached.
- Have received training in the:
    - Detection of H_2S and
    - Measures for protection against the gas,
    - Equipment used for protection and emergency response.

Ignition of Gas Source

Should control of the well be considered lost and ignition considered, take care to protect against exposure to Sulfur Dioxide (SO_2). Intentional ignition must be coordinated with the NMOCD and local officials. Additionally, the NM State Police may become involved. NM State Police shall be the Incident Command on scene of any major release. Take care to protect downwind whenever there is an ignition of the gas.

Characteristics of H_2S and SO_2

Common Name	Chemical Formula	Specific Gravity	Threshold Limit	Hazardous Limit	Lethal Concentration
Hydrogen Sulfide	H_2S	1.189 Air=1	10 ppm	100 ppm/hr	600 ppm
Sulfur Dioxide	SO_2	2.21 Air=1	2 ppm	N/A	1000 ppm

Contacting Authorities

Ameredev Operating LLC personnel must liaise with local and state agencies to ensure a proper response to a major release. Additionally, the OCD must be notified of the release as soon as possible but no later than 4 hours. Agencies will ask for information such as type and volume of release, wind direction, location of release, etc. Be prepared with all information available including direction to site. The following call list of essential and potential responders has been prepared for use during a release. Ameredev Operating LLC's response must be in coordination with the State of New Mexico's "Hazardous Materials Emergency Response Plan" (HMER)

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H_2S Contingency Plan

Ameredev Operating LLC – Emergency Phone 737-300-4799			
Key Personnel:			
Name	Title	Office	Mobile
Floyd Hammond	Chief Operating officer	737-300-4724	512-783-6810
Zachary Boyd	Operations Superintendent	737-300-4725	432-385-6996
Blake Estrada	Construction Foreman		432-385-5831

Artesia	
Ambulance	911
State Police	575-746-2703
City Police	575-746-2703
Sheriff's Office	575-746-9888
Fire Department	575-746-2701
Local Emergency Planning Committee	575-746-2122
New Mexico Oil Conservation Division	575-748-1283
Carlsbad	
Ambulance	911
State Police	575-885-3137
City Police	575-885-2111
Sheriff's Office	575-887-7551
Fire Department	575-887-3798
Local Emergency Planning Committee	575-887-6544
US Bureau of Land Management	575-887-6544
Santa Fe	
New Mexico Emergency Response Commission (Santa Fe)	505-476-9600
New Mexico Emergency Response Commission (Santa Fe) 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 St.; Lubbock, TX	806-743-9911
Aerocare - R3, Box 49F; Lubbock, TX	806-747-8923
Med Flight Air Amb - 2301 Yale Blvd S.E., #D3; Albuquerque, NM	505-842-4433
.'SB Air Med Service - 2505 Clark Carr Loop S.E.; Albuquerque, NM	505-842-4949

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #5SX
Camellia 083H

Wellbore #1

Plan: Design #1

Standard Planning Report

05 March, 2019

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #5SX				
Site Position:		**Northing:**	372,513.64 usft	**Latitude:**	32° 1' 10.853 N
From:	Lat/Long	**Easting:**	870,193.17 usft	**Longitude:**	103° 16' 20.164 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16 "	**Grid Convergence:**	0.56 °

Well	Camellia 083H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	372,513.64 usft	**Latitude:**	32° 1' 10.853 N
	+E/-W	0.0 usft	**Easting:**	870,193.17 usft	**Longitude:**	103° 16' 20.164 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**		**Ground Level:**	2,911.0 usft

Wellbore	Wellbore #1				
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	3/5/2019	6.61	59.90	47,675.24429610

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	359.52	

Plan Survey Tool Program		**Date** 3/5/2019			
	Depth From (usft)	**Depth To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Remarks**
1	0.0	21,674.1	Design #1 (Wellbore #1)	MWD OWSG MWD - Standard	

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Plan Sections

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)	TFO (°)	Target
0.0	0.00	0.00	0.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.00	0.00	0.00	0.00	
2,300.0	6.00	186.00	2,299.5	-15.6	-1.6	2.00	2.00	0.00	186.00	
6,724.8	6.00	186.00	6,700.0	-475.6	-50.0	0.00	0.00	0.00	0.00	
7,024.8	0.00	0.00	6,999.5	-491.2	-51.6	2.00	-2.00	0.00	180.00	
9,725.3	0.00	0.00	9,700.0	-491.2	-51.6	0.00	0.00	0.00	0.00	
10,431.1	84.69	2.98	10,175.4	-58.5	-29.1	12.00	12.00	0.00	2.98	
11,211.0	84.69	2.98	10,247.5	717.0	11.3	0.00	0.00	0.00	0.00	
11,264.2	90.00	359.42	10,250.0	770.2	12.4	12.00	9.97	-6.69	-33.96	Cam083 FTP
21,674.1	90.00	359.42	10,250.0	11,179.5	-93.8	0.00	0.00	0.00	0.00	Cam083 BHL

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
0.0	0.00	0.00	0.0	0.0	0.0	0.0	0.00	0.00	0.00
100.0	0.00	0.00	100.0	0.0	0.0	0.0	0.00	0.00	0.00
200.0	0.00	0.00	200.0	0.0	0.0	0.0	0.00	0.00	0.00
300.0	0.00	0.00	300.0	0.0	0.0	0.0	0.00	0.00	0.00
400.0	0.00	0.00	400.0	0.0	0.0	0.0	0.00	0.00	0.00
500.0	0.00	0.00	500.0	0.0	0.0	0.0	0.00	0.00	0.00
600.0	0.00	0.00	600.0	0.0	0.0	0.0	0.00	0.00	0.00
700.0	0.00	0.00	700.0	0.0	0.0	0.0	0.00	0.00	0.00
800.0	0.00	0.00	800.0	0.0	0.0	0.0	0.00	0.00	0.00
900.0	0.00	0.00	900.0	0.0	0.0	0.0	0.00	0.00	0.00
1,000.0	0.00	0.00	1,000.0	0.0	0.0	0.0	0.00	0.00	0.00
1,100.0	0.00	0.00	1,100.0	0.0	0.0	0.0	0.00	0.00	0.00
1,200.0	0.00	0.00	1,200.0	0.0	0.0	0.0	0.00	0.00	0.00
1,300.0	0.00	0.00	1,300.0	0.0	0.0	0.0	0.00	0.00	0.00
1,400.0	0.00	0.00	1,400.0	0.0	0.0	0.0	0.00	0.00	0.00
1,500.0	0.00	0.00	1,500.0	0.0	0.0	0.0	0.00	0.00	0.00
1,600.0	0.00	0.00	1,600.0	0.0	0.0	0.0	0.00	0.00	0.00
1,700.0	0.00	0.00	1,700.0	0.0	0.0	0.0	0.00	0.00	0.00
1,800.0	0.00	0.00	1,800.0	0.0	0.0	0.0	0.00	0.00	0.00
1,900.0	0.00	0.00	1,900.0	0.0	0.0	0.0	0.00	0.00	0.00
2,000.0	0.00	0.00	2,000.0	0.0	0.0	0.0	0.00	0.00	0.00
2,100.0	2.00	186.00	2,100.0	-1.7	-0.2	-1.7	2.00	2.00	0.00
2,200.0	4.00	186.00	2,199.8	-6.9	-0.7	-6.9	2.00	2.00	0.00
2,300.0	6.00	186.00	2,299.5	-15.6	-1.6	-15.6	2.00	2.00	0.00
2,400.0	6.00	186.00	2,398.9	-26.0	-2.7	-26.0	0.00	0.00	0.00
2,500.0	6.00	186.00	2,498.4	-36.4	-3.8	-36.4	0.00	0.00	0.00
2,600.0	6.00	186.00	2,597.8	-46.8	-4.9	-46.8	0.00	0.00	0.00
2,700.0	6.00	186.00	2,697.3	-57.2	-6.0	-57.1	0.00	0.00	0.00
2,800.0	6.00	186.00	2,796.7	-67.6	-7.1	-67.5	0.00	0.00	0.00
2,900.0	6.00	186.00	2,896.2	-78.0	-8.2	-77.9	0.00	0.00	0.00
3,000.0	6.00	186.00	2,995.6	-88.4	-9.3	-88.3	0.00	0.00	0.00
3,100.0	6.00	186.00	3,095.1	-98.8	-10.4	-98.7	0.00	0.00	0.00
3,200.0	6.00	186.00	3,194.5	-109.2	-11.5	-109.1	0.00	0.00	0.00
3,300.0	6.00	186.00	3,294.0	-119.6	-12.6	-119.5	0.00	0.00	0.00
3,400.0	6.00	186.00	3,393.4	-130.0	-13.7	-129.8	0.00	0.00	0.00
3,500.0	6.00	186.00	3,492.9	-140.4	-14.8	-140.2	0.00	0.00	0.00
3,600.0	6.00	186.00	3,592.3	-150.8	-15.8	-150.6	0.00	0.00	0.00
3,700.0	6.00	186.00	3,691.8	-161.1	-16.9	-161.0	0.00	0.00	0.00
3,800.0	6.00	186.00	3,791.2	-171.5	-18.0	-171.4	0.00	0.00	0.00
3,900.0	6.00	186.00	3,890.7	-181.9	-19.1	-181.8	0.00	0.00	0.00
4,000.0	6.00	186.00	3,990.1	-192.3	-20.2	-192.2	0.00	0.00	0.00
4,100.0	6.00	186.00	4,089.6	-202.7	-21.3	-202.5	0.00	0.00	0.00
4,200.0	6.00	186.00	4,189.0	-213.1	-22.4	-212.9	0.00	0.00	0.00
4,300.0	6.00	186.00	4,288.5	-223.5	-23.5	-223.3	0.00	0.00	0.00
4,400.0	6.00	186.00	4,387.9	-233.9	-24.6	-233.7	0.00	0.00	0.00
4,500.0	6.00	186.00	4,487.4	-244.3	-25.7	-244.1	0.00	0.00	0.00
4,600.0	6.00	186.00	4,586.9	-254.7	-26.8	-254.5	0.00	0.00	0.00
4,700.0	6.00	186.00	4,686.3	-265.1	-27.9	-264.9	0.00	0.00	0.00
4,800.0	6.00	186.00	4,785.8	-275.5	-29.0	-275.2	0.00	0.00	0.00
4,900.0	6.00	186.00	4,885.2	-285.9	-30.0	-285.6	0.00	0.00	0.00
5,000.0	6.00	186.00	4,984.7	-296.3	-31.1	-296.0	0.00	0.00	0.00
5,100.0	6.00	186.00	5,084.1	-306.7	-32.2	-306.4	0.00	0.00	0.00
5,200.0	6.00	186.00	5,183.6	-317.1	-33.3	-316.8	0.00	0.00	0.00
5,300.0	6.00	186.00	5,283.0	-327.5	-34.4	-327.2	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
5,400.0	6.00	186.00	5,382.5	-337.9	-35.5	-337.6	0.00	0.00	0.00
5,500.0	6.00	186.00	5,481.9	-348.3	-36.6	-347.9	0.00	0.00	0.00
5,600.0	6.00	186.00	5,581.4	-358.7	-37.7	-358.3	0.00	0.00	0.00
5,700.0	6.00	186.00	5,680.8	-369.1	-38.8	-368.7	0.00	0.00	0.00
5,800.0	6.00	186.00	5,780.3	-379.5	-39.9	-379.1	0.00	0.00	0.00
5,900.0	6.00	186.00	5,879.7	-389.8	-41.0	-389.5	0.00	0.00	0.00
6,000.0	6.00	186.00	5,979.2	-400.2	-42.1	-399.9	0.00	0.00	0.00
6,100.0	6.00	186.00	6,078.6	-410.6	-43.2	-410.3	0.00	0.00	0.00
6,200.0	6.00	186.00	6,178.1	-421.0	-44.3	-420.6	0.00	0.00	0.00
6,300.0	6.00	186.00	6,277.5	-431.4	-45.3	-431.0	0.00	0.00	0.00
6,400.0	6.00	186.00	6,377.0	-441.8	-46.4	-441.4	0.00	0.00	0.00
6,500.0	6.00	186.00	6,476.4	-452.2	-47.5	-451.8	0.00	0.00	0.00
6,600.0	6.00	186.00	6,575.9	-462.6	-48.6	-462.2	0.00	0.00	0.00
6,700.0	6.00	186.00	6,675.3	-473.0	-49.7	-472.6	0.00	0.00	0.00
6,724.8	6.00	186.00	6,700.0	-475.6	-50.0	-475.2	0.00	0.00	0.00
6,800.0	4.50	186.00	6,774.9	-482.4	-50.7	-482.0	2.00	-2.00	0.00
6,900.0	2.50	186.00	6,874.7	-488.5	-51.3	-488.0	2.00	-2.00	0.00
7,000.0	0.50	186.00	6,974.7	-491.1	-51.6	-490.6	2.00	-2.00	0.00
7,024.8	0.00	0.00	6,999.5	-491.2	-51.6	-490.7	2.00	-2.00	0.00
7,100.0	0.00	0.00	7,074.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,200.0	0.00	0.00	7,174.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,300.0	0.00	0.00	7,274.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,400.0	0.00	0.00	7,374.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,500.0	0.00	0.00	7,474.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,600.0	0.00	0.00	7,574.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,700.0	0.00	0.00	7,674.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,800.0	0.00	0.00	7,774.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
7,900.0	0.00	0.00	7,874.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,000.0	0.00	0.00	7,974.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,100.0	0.00	0.00	8,074.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,200.0	0.00	0.00	8,174.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,300.0	0.00	0.00	8,274.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,400.0	0.00	0.00	8,374.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,500.0	0.00	0.00	8,474.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,600.0	0.00	0.00	8,574.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,700.0	0.00	0.00	8,674.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,800.0	0.00	0.00	8,774.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
8,900.0	0.00	0.00	8,874.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,000.0	0.00	0.00	8,974.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,100.0	0.00	0.00	9,074.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,200.0	0.00	0.00	9,174.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,300.0	0.00	0.00	9,274.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,400.0	0.00	0.00	9,374.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,500.0	0.00	0.00	9,474.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,600.0	0.00	0.00	9,574.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,700.0	0.00	0.00	9,674.7	-491.2	-51.6	-490.7	0.00	0.00	0.00
9,725.3	0.00	0.00	9,700.0	-491.2	-51.6	-490.7	0.00	0.00	0.00
Cam083 KOP									
9,800.0	8.96	2.98	9,774.4	-485.4	-51.3	-484.9	12.00	12.00	0.00
9,900.0	20.96	2.98	9,870.8	-459.6	-50.0	-459.2	12.00	12.00	0.00
10,000.0	32.96	2.98	9,959.8	-414.5	-47.6	-414.0	12.00	12.00	0.00
10,100.0	44.96	2.98	10,037.4	-351.8	-44.4	-351.4	12.00	12.00	0.00
10,200.0	56.96	2.98	10,100.3	-274.4	-40.3	-274.0	12.00	12.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
10,300.0	68.96	2.98	10,145.6	-185.6	-35.7	-185.3	12.00	12.00	0.00
10,400.0	80.96	2.98	10,171.5	-89.3	-30.7	-89.0	12.00	12.00	0.00
10,431.1	84.69	2.98	10,175.4	-58.5	-29.1	-58.2	12.00	12.00	0.00
10,500.0	84.69	2.98	10,181.8	10.0	-25.5	10.2	0.00	0.00	0.00
10,600.0	84.69	2.98	10,191.0	109.5	-20.4	109.6	0.00	0.00	0.00
10,700.0	84.69	2.98	10,200.3	208.9	-15.2	209.0	0.00	0.00	0.00
10,800.0	84.69	2.98	10,209.5	308.3	-10.0	308.4	0.00	0.00	0.00
10,900.0	84.69	2.98	10,218.8	407.8	-4.8	407.8	0.00	0.00	0.00
11,000.0	84.69	2.98	10,228.0	507.2	0.3	507.2	0.00	0.00	0.00
11,100.0	84.69	2.98	10,237.3	606.6	5.5	606.6	0.00	0.00	0.00
11,163.0	84.69	2.98	10,243.1	669.3	8.8	669.2	0.00	0.00	0.00
Cam083 Into NMNM23199									
11,200.0	84.69	2.98	10,246.5	706.1	10.7	706.0	0.00	0.00	0.00
11,211.0	84.69	2.98	10,247.5	717.0	11.3	716.9	0.00	0.00	0.00
11,264.2	90.00	359.42	10,250.0	770.2	12.4	770.0	12.00	9.97	-6.69
Cam083 FTP									
11,300.0	90.00	359.42	10,250.0	805.9	12.0	805.8	0.00	0.00	0.00
11,400.0	90.00	359.42	10,250.0	905.9	11.0	905.8	0.00	0.00	0.00
11,500.0	90.00	359.42	10,250.0	1,005.9	10.0	1,005.8	0.00	0.00	0.00
11,600.0	90.00	359.42	10,250.0	1,105.9	8.9	1,105.8	0.00	0.00	0.00
11,700.0	90.00	359.42	10,250.0	1,205.9	7.9	1,205.8	0.00	0.00	0.00
11,800.0	90.00	359.42	10,250.0	1,305.9	6.9	1,305.8	0.00	0.00	0.00
11,900.0	90.00	359.42	10,250.0	1,405.9	5.9	1,405.8	0.00	0.00	0.00
12,000.0	90.00	359.42	10,250.0	1,505.9	4.9	1,505.8	0.00	0.00	0.00
12,100.0	90.00	359.42	10,250.0	1,605.9	3.8	1,605.8	0.00	0.00	0.00
12,200.0	90.00	359.42	10,250.0	1,705.9	2.8	1,705.8	0.00	0.00	0.00
12,300.0	90.00	359.42	10,250.0	1,805.9	1.8	1,805.8	0.00	0.00	0.00
12,400.0	90.00	359.42	10,250.0	1,905.9	0.8	1,905.8	0.00	0.00	0.00
12,500.0	90.00	359.42	10,250.0	2,005.9	-0.2	2,005.8	0.00	0.00	0.00
12,600.0	90.00	359.42	10,250.0	2,105.9	-1.3	2,105.8	0.00	0.00	0.00
12,700.0	90.00	359.42	10,250.0	2,205.8	-2.3	2,205.8	0.00	0.00	0.00
12,800.0	90.00	359.42	10,250.0	2,305.8	-3.3	2,305.8	0.00	0.00	0.00
12,900.0	90.00	359.42	10,250.0	2,405.8	-4.3	2,405.8	0.00	0.00	0.00
13,000.0	90.00	359.42	10,250.0	2,505.8	-5.3	2,505.8	0.00	0.00	0.00
13,100.0	90.00	359.42	10,250.0	2,605.8	-6.4	2,605.8	0.00	0.00	0.00
13,200.0	90.00	359.42	10,250.0	2,705.8	-7.4	2,705.8	0.00	0.00	0.00
13,300.0	90.00	359.42	10,250.0	2,805.8	-8.4	2,805.8	0.00	0.00	0.00
13,400.0	90.00	359.42	10,250.0	2,905.8	-9.4	2,905.8	0.00	0.00	0.00
13,500.0	90.00	359.42	10,250.0	3,005.8	-10.4	3,005.8	0.00	0.00	0.00
13,600.0	90.00	359.42	10,250.0	3,105.8	-11.5	3,105.8	0.00	0.00	0.00
13,700.0	90.00	359.42	10,250.0	3,205.8	-12.5	3,205.8	0.00	0.00	0.00
13,800.0	90.00	359.42	10,250.0	3,305.8	-13.5	3,305.8	0.00	0.00	0.00
13,900.0	90.00	359.42	10,250.0	3,405.8	-14.5	3,405.8	0.00	0.00	0.00
14,000.0	90.00	359.42	10,250.0	3,505.8	-15.5	3,505.8	0.00	0.00	0.00
14,100.0	90.00	359.42	10,250.0	3,605.8	-16.6	3,605.8	0.00	0.00	0.00
14,200.0	90.00	359.42	10,250.0	3,705.8	-17.6	3,705.8	0.00	0.00	0.00
14,300.0	90.00	359.42	10,250.0	3,805.8	-18.6	3,805.8	0.00	0.00	0.00
14,400.0	90.00	359.42	10,250.0	3,905.8	-19.6	3,905.8	0.00	0.00	0.00
14,500.0	90.00	359.42	10,250.0	4,005.8	-20.6	4,005.8	0.00	0.00	0.00
14,600.0	90.00	359.42	10,250.0	4,105.7	-21.7	4,105.8	0.00	0.00	0.00
14,700.0	90.00	359.42	10,250.0	4,205.7	-22.7	4,205.8	0.00	0.00	0.00
14,800.0	90.00	359.42	10,250.0	4,305.7	-23.7	4,305.8	0.00	0.00	0.00
14,900.0	90.00	359.42	10,250.0	4,405.7	-24.7	4,405.8	0.00	0.00	0.00
15,000.0	90.00	359.42	10,250.0	4,505.7	-25.7	4,505.8	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
15,100.0	90.00	359.42	10,250.0	4,605.7	-26.8	4,605.8	0.00	0.00	0.00
15,200.0	90.00	359.42	10,250.0	4,705.7	-27.8	4,705.8	0.00	0.00	0.00
15,300.0	90.00	359.42	10,250.0	4,805.7	-28.8	4,805.8	0.00	0.00	0.00
15,400.0	90.00	359.42	10,250.0	4,905.7	-29.8	4,905.8	0.00	0.00	0.00
15,500.0	90.00	359.42	10,250.0	5,005.7	-30.8	5,005.8	0.00	0.00	0.00
15,600.0	90.00	359.42	10,250.0	5,105.7	-31.9	5,105.8	0.00	0.00	0.00
15,700.0	90.00	359.42	10,250.0	5,205.7	-32.9	5,205.8	0.00	0.00	0.00
15,800.0	90.00	359.42	10,250.0	5,305.7	-33.9	5,305.8	0.00	0.00	0.00
15,900.0	90.00	359.42	10,250.0	5,405.7	-34.9	5,405.8	0.00	0.00	0.00
16,000.0	90.00	359.42	10,250.0	5,505.7	-36.0	5,505.8	0.00	0.00	0.00
16,100.0	90.00	359.42	10,250.0	5,605.7	-37.0	5,605.8	0.00	0.00	0.00
16,200.0	90.00	359.42	10,250.0	5,705.7	-38.0	5,705.8	0.00	0.00	0.00
16,300.0	90.00	359.42	10,250.0	5,805.7	-39.0	5,805.8	0.00	0.00	0.00
16,400.0	90.00	359.42	10,250.0	5,905.7	-40.0	5,905.8	0.00	0.00	0.00
16,500.0	90.00	359.42	10,250.0	6,005.6	-41.1	6,005.8	0.00	0.00	0.00
16,600.0	90.00	359.42	10,250.0	6,105.6	-42.1	6,105.8	0.00	0.00	0.00
16,700.0	90.00	359.42	10,250.0	6,205.6	-43.1	6,205.8	0.00	0.00	0.00
16,800.0	90.00	359.42	10,250.0	6,305.6	-44.1	6,305.8	0.00	0.00	0.00
16,900.0	90.00	359.42	10,250.0	6,405.6	-45.1	6,405.8	0.00	0.00	0.00
17,000.0	90.00	359.42	10,250.0	6,505.6	-46.2	6,505.8	0.00	0.00	0.00
17,100.0	90.00	359.42	10,250.0	6,605.6	-47.2	6,605.8	0.00	0.00	0.00
17,200.0	90.00	359.42	10,250.0	6,705.6	-48.2	6,705.8	0.00	0.00	0.00
17,300.0	90.00	359.42	10,250.0	6,805.6	-49.2	6,805.8	0.00	0.00	0.00
17,400.0	90.00	359.42	10,250.0	6,905.6	-50.2	6,905.8	0.00	0.00	0.00
17,500.0	90.00	359.42	10,250.0	7,005.6	-51.3	7,005.8	0.00	0.00	0.00
17,600.0	90.00	359.42	10,250.0	7,105.6	-52.3	7,105.8	0.00	0.00	0.00
17,700.0	90.00	359.42	10,250.0	7,205.6	-53.3	7,205.8	0.00	0.00	0.00
17,800.0	90.00	359.42	10,250.0	7,305.6	-54.3	7,305.8	0.00	0.00	0.00
17,900.0	90.00	359.42	10,250.0	7,405.6	-55.3	7,405.8	0.00	0.00	0.00
18,000.0	90.00	359.42	10,250.0	7,505.6	-56.4	7,505.8	0.00	0.00	0.00
18,100.0	90.00	359.42	10,250.0	7,605.6	-57.4	7,605.8	0.00	0.00	0.00
18,200.0	90.00	359.42	10,250.0	7,705.6	-58.4	7,705.8	0.00	0.00	0.00
18,300.0	90.00	359.42	10,250.0	7,805.6	-59.4	7,805.8	0.00	0.00	0.00
18,400.0	90.00	359.42	10,250.0	7,905.6	-60.4	7,905.8	0.00	0.00	0.00
18,500.0	90.00	359.42	10,250.0	8,005.5	-61.5	8,005.8	0.00	0.00	0.00
18,600.0	90.00	359.42	10,250.0	8,105.5	-62.5	8,105.8	0.00	0.00	0.00
18,700.0	90.00	359.42	10,250.0	8,205.5	-63.5	8,205.8	0.00	0.00	0.00
18,800.0	90.00	359.42	10,250.0	8,305.5	-64.5	8,305.8	0.00	0.00	0.00
18,900.0	90.00	359.42	10,250.0	8,405.5	-65.5	8,405.8	0.00	0.00	0.00
19,000.0	90.00	359.42	10,250.0	8,505.5	-66.6	8,505.8	0.00	0.00	0.00
19,100.0	90.00	359.42	10,250.0	8,605.5	-67.6	8,605.8	0.00	0.00	0.00
19,200.0	90.00	359.42	10,250.0	8,705.5	-68.6	8,705.8	0.00	0.00	0.00
19,300.0	90.00	359.42	10,250.0	8,805.5	-69.6	8,805.8	0.00	0.00	0.00
19,400.0	90.00	359.42	10,250.0	8,905.5	-70.6	8,905.8	0.00	0.00	0.00
19,500.0	90.00	359.42	10,250.0	9,005.5	-71.7	9,005.8	0.00	0.00	0.00
19,600.0	90.00	359.42	10,250.0	9,105.5	-72.7	9,105.8	0.00	0.00	0.00
19,700.0	90.00	359.42	10,250.0	9,205.5	-73.7	9,205.8	0.00	0.00	0.00
19,800.0	90.00	359.42	10,250.0	9,305.5	-74.7	9,305.8	0.00	0.00	0.00
19,900.0	90.00	359.42	10,250.0	9,405.5	-75.7	9,405.8	0.00	0.00	0.00
20,000.0	90.00	359.42	10,250.0	9,505.5	-76.8	9,505.8	0.00	0.00	0.00
20,100.0	90.00	359.42	10,250.0	9,605.5	-77.8	9,605.8	0.00	0.00	0.00
20,200.0	90.00	359.42	10,250.0	9,705.5	-78.8	9,705.8	0.00	0.00	0.00
20,300.0	90.00	359.42	10,250.0	9,805.5	-79.8	9,805.8	0.00	0.00	0.00
20,400.0	90.00	359.42	10,250.0	9,905.4	-80.8	9,905.8	0.00	0.00	0.00

Database:	EDM5000	**Local Co-ordinate Reference:**	Well Camellia 083H
Company:	Ameredev Operating, LLC.	**TVD Reference:**	KB @ 2938.0usft
Project:	CAM/AZ	**MD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**North Reference:**	Grid
Well:	Camellia 083H	**Survey Calculation Method:**	Minimum Curvature
Wellbore:	Wellbore #1		
Design:	Design #1		

Planned Survey

Measured Depth (usft)	Inclination (°)	Azimuth (°)	Vertical Depth (usft)	+N/-S (usft)	+E/-W (usft)	Vertical Section (usft)	Dogleg Rate (°/100usft)	Build Rate (°/100usft)	Turn Rate (°/100usft)
20,500.0	90.00	359.42	10,250.0	10,005.4	-81.9	10,005.8	0.00	0.00	0.00
20,600.0	90.00	359.42	10,250.0	10,105.4	-82.9	10,105.8	0.00	0.00	0.00
20,700.0	90.00	359.42	10,250.0	10,205.4	-83.9	10,205.8	0.00	0.00	0.00
20,800.0	90.00	359.42	10,250.0	10,305.4	-84.9	10,305.8	0.00	0.00	0.00
20,900.0	90.00	359.42	10,250.0	10,405.4	-85.9	10,405.8	0.00	0.00	0.00
21,000.0	90.00	359.42	10,250.0	10,505.4	-87.0	10,505.8	0.00	0.00	0.00
21,100.0	90.00	359.42	10,250.0	10,605.4	-88.0	10,605.8	0.00	0.00	0.00
21,200.0	90.00	359.42	10,250.0	10,705.4	-89.0	10,705.8	0.00	0.00	0.00
21,300.0	90.00	359.42	10,250.0	10,805.4	-90.0	10,805.8	0.00	0.00	0.00
21,400.0	90.00	359.42	10,250.0	10,905.4	-91.0	10,905.8	0.00	0.00	0.00
21,500.0	90.00	359.42	10,250.0	11,005.4	-92.1	11,005.8	0.00	0.00	0.00
21,600.0	90.00	359.42	10,250.0	11,105.4	-93.1	11,105.8	0.00	0.00	0.00
Cam083 LTP									
21,674.1	90.00	359.42	10,250.0	11,179.5	-93.8	11,179.9	0.00	0.00	0.00
Cam083 BHL									

Design Targets

Target Name - hit/miss target - Shape	Dip Angle (°)	Dip Dir. (°)	TVD (usft)	+N/-S (usft)	+E/-W (usft)	Northing (usft)	Easting (usft)	Latitude	Longitude
Cam083 KOP - plan hits target center - Point	0.00	0.00	9,700.0	-491.2	-51.6	372,022.44	870,141.54	32° 1' 5.998 N	103° 16' 20.820 W
Cam083 BHL - plan hits target center - Point	0.00	0.00	10,250.0	11,179.5	-93.8	383,693.15	870,099.32	32° 3' 1.480 N	103° 16' 19.978 W
Cam083 LTP - plan misses target center by 24.1usft at 21600.0usft MD (10250.0 TVD, 11105.4 N, -93.1 E) - Point	0.00	0.00	10,250.0	11,129.5	-93.4	383,643.13	870,099.82	32° 3' 0.985 N	103° 16' 19.978 W
Cam083 FTP - plan hits target center - Point	0.00	0.00	10,250.0	770.2	12.4	373,283.81	870,205.53	32° 1' 18.472 N	103° 16' 19.933 W

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
11,163.0	10,243.1	669.3	8.8	Cam083 into NMNM23199

AMEREDEV

Ameredev Operating, LLC.

CAM/AZ
CAM/AZ #5SX
Camellia 083H
Wellbore #1

Plan: Design #1

Lease Penetration Section Line Foot

05 March, 2019

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Project	CAM/AZ		
Map System:	US State Plane 1983	**System Datum:**	Mean Sea Level
Geo Datum:	North American Datum 1983		
Map Zone:	New Mexico Eastern Zone		

Site	CAM/AZ #5SX				
Site Position:		**Northing:**	372,513.64 usft	**Latitude:**	32° 1' 10.853 N
From:	Lat/Long	**Easting:**	870,193.17 usft	**Longitude:**	103° 16' 20.164 W
Position Uncertainty:	0.0 usft	**Slot Radius:**	13-3/16"	**Grid Convergence:**	0.56 °

Well	Camellia 083H					
Well Position	**+N/-S**	0.0 usft	**Northing:**	372,513.64 usft	**Latitude:**	32° 1' 10.853 N
	+E/-W	0.0 usft	**Easting:**	870,193.17 usft	**Longitude:**	103° 16' 20.164 W
Position Uncertainty		0.0 usft	**Wellhead Elevation:**	usft	**Ground Level:**	2,911.0 usft

Wellbore	Wellbore #1			
Magnetics	**Model Name**	**Sample Date**	**Declination (°)**	**Dip Angle (°)**	**Field Strength (nT)**
	IGRF2015	3/5/2019	6.61	59.90	47,675.24429610

Design	Design #1				
Audit Notes:					
Version:		**Phase:**	PROTOTYPE	**Tie On Depth:**	0.0
Vertical Section:	**Depth From (TVD) (usft)**	**+N/-S (usft)**	**+E/-W (usft)**	**Direction (°)**	
	0.0	0.0	0.0	359.52	

Survey Tool Program		**Date** 3/5/2019		
From (usft)	**To (usft)**	**Survey (Wellbore)**	**Tool Name**	**Description**
0.0	21,674.1	Design #1 (Wellbore #1)	MWD	OWSG MWD - Standard

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
0.0	0.00	0.00	0.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
100.0	0.00	0.00	100.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
200.0	0.00	0.00	200.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
300.0	0.00	0.00	300.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
400.0	0.00	0.00	400.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
500.0	0.00	0.00	500.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
600.0	0.00	0.00	600.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
700.0	0.00	0.00	700.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
800.0	0.00	0.00	800.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
900.0	0.00	0.00	900.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,000.0	0.00	0.00	1,000.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,100.0	0.00	0.00	1,100.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
1,200.0	0.00	0.00	1,200.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,300.0	0.00	0.00	1,300.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,400.0	0.00	0.00	1,400.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,500.0	0.00	0.00	1,500.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,600.0	0.00	0.00	1,600.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,700.0	0.00	0.00	1,700.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,800.0	0.00	0.00	1,800.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
1,900.0	0.00	0.00	1,900.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
2,000.0	0.00	0.00	2,000.0	-670.0	1,960.0	32° 1' 10.853 N	103° 16' 20.164 W
2,100.0	2.00	186.00	2,100.0	-671.7	1,959.8	32° 1' 10.836 N	103° 16' 20.166 W
2,200.0	4.00	186.00	2,199.8	-676.9	1,959.3	32° 1' 10.784 N	103° 16' 20.173 W
2,300.0	6.00	186.00	2,299.5	-685.6	1,958.4	32° 1' 10.699 N	103° 16' 20.185 W
2,400.0	6.00	186.00	2,398.9	-696.0	1,957.3	32° 1' 10.596 N	103° 16' 20.199 W
2,500.0	6.00	186.00	2,498.4	-706.4	1,956.2	32° 1' 10.493 N	103° 16' 20.213 W
2,600.0	6.00	186.00	2,597.8	-716.8	1,955.1	32° 1' 10.391 N	103° 16' 20.227 W
2,700.0	6.00	186.00	2,697.3	-727.2	1,954.0	32° 1' 10.288 N	103° 16' 20.240 W
2,800.0	6.00	186.00	2,796.7	-737.6	1,952.9	32° 1' 10.185 N	103° 16' 20.254 W
2,900.0	6.00	186.00	2,896.2	-748.0	1,951.8	32° 1' 10.082 N	103° 16' 20.268 W
3,000.0	6.00	186.00	2,995.6	-758.4	1,950.7	32° 1' 9.979 N	103° 16' 20.282 W
3,100.0	6.00	186.00	3,095.1	-768.8	1,949.6	32° 1' 9.877 N	103° 16' 20.296 W
3,200.0	6.00	186.00	3,194.5	-779.2	1,948.5	32° 1' 9.774 N	103° 16' 20.310 W
3,300.0	6.00	186.00	3,294.0	-789.6	1,947.4	32° 1' 9.671 N	103° 16' 20.324 W
3,400.0	6.00	186.00	3,393.4	-800.0	1,946.3	32° 1' 9.568 N	103° 16' 20.338 W
3,500.0	6.00	186.00	3,492.9	-810.4	1,945.2	32° 1' 9.466 N	103° 16' 20.351 W
3,600.0	6.00	186.00	3,592.3	-820.8	1,944.2	32° 1' 9.363 N	103° 16' 20.365 W
3,700.0	6.00	186.00	3,691.8	-831.1	1,943.1	32° 1' 9.260 N	103° 16' 20.379 W
3,800.0	6.00	186.00	3,791.2	-841.5	1,942.0	32° 1' 9.157 N	103° 16' 20.393 W
3,900.0	6.00	186.00	3,890.7	-851.9	1,940.9	32° 1' 9.055 N	103° 16' 20.407 W
4,000.0	6.00	186.00	3,990.1	-862.3	1,939.8	32° 1' 8.952 N	103° 16' 20.421 W
4,100.0	6.00	186.00	4,089.6	-872.7	1,938.7	32° 1' 8.849 N	103° 16' 20.435 W
4,200.0	6.00	186.00	4,189.0	-883.1	1,937.6	32° 1' 8.746 N	103° 16' 20.449 W
4,300.0	6.00	186.00	4,288.5	-893.5	1,936.5	32° 1' 8.644 N	103° 16' 20.462 W
4,400.0	6.00	186.00	4,387.9	-903.9	1,935.4	32° 1' 8.541 N	103° 16' 20.476 W
4,500.0	6.00	186.00	4,487.4	-914.3	1,934.3	32° 1' 8.438 N	103° 16' 20.490 W
4,600.0	6.00	186.00	4,586.9	-924.7	1,933.2	32° 1' 8.335 N	103° 16' 20.504 W
4,700.0	6.00	186.00	4,686.3	-935.1	1,932.1	32° 1' 8.233 N	103° 16' 20.518 W
4,800.0	6.00	186.00	4,785.8	-945.5	1,931.0	32° 1' 8.130 N	103° 16' 20.532 W
4,900.0	6.00	186.00	4,885.2	-955.9	1,930.0	32° 1' 8.027 N	103° 16' 20.546 W
5,000.0	6.00	186.00	4,984.7	-966.3	1,928.9	32° 1' 7.924 N	103° 16' 20.560 W
5,100.0	6.00	186.00	5,084.1	-976.7	1,927.8	32° 1' 7.822 N	103° 16' 20.573 W
5,200.0	6.00	186.00	5,183.6	-987.1	1,926.7	32° 1' 7.719 N	103° 16' 20.587 W
5,300.0	6.00	186.00	5,283.0	-997.5	1,925.6	32° 1' 7.616 N	103° 16' 20.601 W
5,400.0	6.00	186.00	5,382.5	-1,007.9	1,924.5	32° 1' 7.513 N	103° 16' 20.615 W
5,500.0	6.00	186.00	5,481.9	-1,018.3	1,923.4	32° 1' 7.411 N	103° 16' 20.629 W

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
5,600.0	6.00	186.00	5,581.4	-1,028.7	1,922.3	32° 1' 7.308 N	103° 16' 20.643 W
5,700.0	6.00	186.00	5,680.8	-1,039.1	1,921.2	32° 1' 7.205 N	103° 16' 20.657 W
5,800.0	6.00	186.00	5,780.3	-1,049.5	1,920.1	32° 1' 7.102 N	103° 16' 20.671 W
5,900.0	6.00	186.00	5,879.7	-1,059.8	1,919.0	32° 1' 7.000 N	103° 16' 20.684 W
6,000.0	6.00	186.00	5,979.2	-1,070.2	1,917.9	32° 1' 6.897 N	103° 16' 20.698 W
6,100.0	6.00	186.00	6,078.6	-1,080.6	1,916.8	32° 1' 6.794 N	103° 16' 20.712 W
6,200.0	6.00	186.00	6,178.1	-1,091.0	1,915.7	32° 1' 6.691 N	103° 16' 20.726 W
6,300.0	6.00	186.00	6,277.5	-1,101.4	1,914.7	32° 1' 6.589 N	103° 16' 20.740 W
6,400.0	6.00	186.00	6,377.0	-1,111.8	1,913.6	32° 1' 6.486 N	103° 16' 20.754 W
6,500.0	6.00	186.00	6,476.4	-1,122.2	1,912.5	32° 1' 6.383 N	103° 16' 20.768 W
6,600.0	6.00	186.00	6,575.9	-1,132.6	1,911.4	32° 1' 6.280 N	103° 16' 20.782 W
6,700.0	6.00	186.00	6,675.3	-1,143.0	1,910.3	32° 1' 6.178 N	103° 16' 20.795 W
6,724.8	6.00	186.00	6,700.0	-1,145.6	1,910.0	32° 1' 6.152 N	103° 16' 20.799 W
6,800.0	4.50	186.00	6,774.9	-1,152.4	1,909.3	32° 1' 6.084 N	103° 16' 20.808 W
6,900.0	2.50	186.00	6,874.7	-1,158.5	1,908.7	32° 1' 6.025 N	103° 16' 20.816 W
7,000.0	0.50	186.00	6,974.7	-1,161.1	1,908.4	32° 1' 5.999 N	103° 16' 20.820 W
7,024.8	0.00	0.00	6,999.5	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,100.0	0.00	0.00	7,074.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,200.0	0.00	0.00	7,174.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,300.0	0.00	0.00	7,274.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,400.0	0.00	0.00	7,374.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,500.0	0.00	0.00	7,474.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,600.0	0.00	0.00	7,574.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,700.0	0.00	0.00	7,674.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,800.0	0.00	0.00	7,774.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
7,900.0	0.00	0.00	7,874.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,000.0	0.00	0.00	7,974.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,100.0	0.00	0.00	8,074.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,200.0	0.00	0.00	8,174.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,300.0	0.00	0.00	8,274.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,400.0	0.00	0.00	8,374.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,500.0	0.00	0.00	8,474.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,600.0	0.00	0.00	8,574.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,700.0	0.00	0.00	8,674.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,800.0	0.00	0.00	8,774.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
8,900.0	0.00	0.00	8,874.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,000.0	0.00	0.00	8,974.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,100.0	0.00	0.00	9,074.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,200.0	0.00	0.00	9,174.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,300.0	0.00	0.00	9,274.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,400.0	0.00	0.00	9,374.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,500.0	0.00	0.00	9,474.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,600.0	0.00	0.00	9,574.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
9,700.0	0.00	0.00	9,674.7	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
9,725.3	0.00	0.00	9,700.0	-1,161.2	1,908.4	32° 1' 5.998 N	103° 16' 20.820 W
Cam083 KOP							
9,800.0	8.96	2.98	9,774.4	-1,155.4	1,908.7	32° 1' 6.055 N	103° 16' 20.815 W
9,900.0	20.96	2.98	9,870.8	-1,129.6	1,910.0	32° 1' 6.310 N	103° 16' 20.797 W
10,000.0	32.96	2.98	9,959.8	-1,084.5	1,912.4	32° 1' 6.757 N	103° 16' 20.765 W
10,100.0	44.96	2.98	10,037.4	-1,021.8	1,915.6	32° 1' 7.377 N	103° 16' 20.720 W
10,200.0	56.96	2.98	10,100.3	-944.4	1,919.7	32° 1' 8.142 N	103° 16' 20.664 W
10,300.0	68.96	2.98	10,145.6	-855.6	1,924.3	32° 1' 9.020 N	103° 16' 20.600 W
10,400.0	80.96	2.98	10,171.5	-759.3	1,929.3	32° 1' 9.972 N	103° 16' 20.531 W
10,431.1	84.69	2.98	10,175.4	-728.5	1,930.9	32° 1' 10.277 N	103° 16' 20.509 W
10,500.0	84.69	2.98	10,181.8	-660.0	1,934.5	32° 1' 10.955 N	103° 16' 20.460 W
10,600.0	84.69	2.98	10,191.0	-560.5	1,939.6	32° 1' 11.938 N	103° 16' 20.388 W
10,700.0	84.69	2.98	10,200.3	-461.1	1,944.8	32° 1' 12.921 N	103° 16' 20.317 W
10,800.0	84.69	2.98	10,209.5	-361.7	1,950.0	32° 1' 13.905 N	103° 16' 20.245 W
10,900.0	84.69	2.98	10,218.8	-262.2	1,955.2	32° 1' 14.888 N	103° 16' 20.174 W
11,000.0	84.69	2.98	10,228.0	-162.8	1,960.3	32° 1' 15.872 N	103° 16' 20.102 W
11,100.0	84.69	2.98	10,237.3	-63.4	1,965.5	32° 1' 16.855 N	103° 16' 20.031 W
11,163.0	84.69	2.98	10,243.1	-0.7	1,968.8	32° 1' 17.475 N	103° 16' 19.986 W
Cam083 Into NMNM23199							
11,200.0	84.69	2.98	10,246.5	36.1	1,970.7	32° 1' 17.838 N	103° 16' 19.959 W
11,211.0	84.69	2.98	10,247.5	47.0	1,971.3	32° 1' 17.947 N	103° 16' 19.952 W
11,264.3	90.00	359.42	10,250.0	100.2	1,972.4	32° 1' 18.472 N	103° 16' 19.933 W
Cam083 FTP							
11,300.0	90.00	359.42	10,250.0	135.9	1,972.0	32° 1' 18.826 N	103° 16' 19.933 W
11,400.0	90.00	359.42	10,250.0	235.9	1,971.0	32° 1' 19.816 N	103° 16' 19.933 W
11,500.0	90.00	359.42	10,250.0	335.9	1,970.0	32° 1' 20.805 N	103° 16' 19.934 W
11,600.0	90.00	359.42	10,250.0	435.9	1,968.9	32° 1' 21.795 N	103° 16' 19.934 W
11,700.0	90.00	359.42	10,250.0	535.9	1,967.9	32° 1' 22.784 N	103° 16' 19.935 W
11,800.0	90.00	359.42	10,250.0	635.9	1,966.9	32° 1' 23.774 N	103° 16' 19.935 W
11,900.0	90.00	359.42	10,250.0	735.9	1,965.9	32° 1' 24.763 N	103° 16' 19.935 W
12,000.0	90.00	359.42	10,250.0	835.9	1,964.9	32° 1' 25.753 N	103° 16' 19.936 W
12,100.0	90.00	359.42	10,250.0	935.9	1,963.8	32° 1' 26.742 N	103° 16' 19.936 W
12,200.0	90.00	359.42	10,250.0	1,035.9	1,962.8	32° 1' 27.732 N	103° 16' 19.937 W
12,300.0	90.00	359.42	10,250.0	1,135.9	1,961.8	32° 1' 28.721 N	103° 16' 19.937 W
12,400.0	90.00	359.42	10,250.0	1,235.9	1,960.8	32° 1' 29.711 N	103° 16' 19.938 W
12,500.0	90.00	359.42	10,250.0	1,335.9	1,959.8	32° 1' 30.700 N	103° 16' 19.938 W
12,600.0	90.00	359.42	10,250.0	1,435.9	1,958.7	32° 1' 31.690 N	103° 16' 19.939 W
12,700.0	90.00	359.42	10,250.0	1,535.8	1,957.7	32° 1' 32.679 N	103° 16' 19.939 W
12,800.0	90.00	359.42	10,250.0	1,635.8	1,956.7	32° 1' 33.669 N	103° 16' 19.939 W
12,900.0	90.00	359.42	10,250.0	1,735.8	1,955.7	32° 1' 34.658 N	103° 16' 19.940 W
13,000.0	90.00	359.42	10,250.0	1,835.8	1,954.7	32° 1' 35.648 N	103° 16' 19.940 W
13,100.0	90.00	359.42	10,250.0	1,935.8	1,953.6	32° 1' 36.637 N	103° 16' 19.941 W
13,200.0	90.00	359.42	10,250.0	2,035.8	1,952.6	32° 1' 37.627 N	103° 16' 19.941 W
13,300.0	90.00	359.42	10,250.0	2,135.8	1,951.6	32° 1' 38.616 N	103° 16' 19.942 W
13,400.0	90.00	359.42	10,250.0	2,235.8	1,950.6	32° 1' 39.606 N	103° 16' 19.942 W

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
13,500.0	90.00	359.42	10,250.0	2,335.8	1,949.6	32° 1' 40.596 N	103° 16' 19.942 W
13,600.0	90.00	359.42	10,250.0	2,435.8	1,948.5	32° 1' 41.585 N	103° 16' 19.943 W
13,700.0	90.00	359.42	10,250.0	2,535.8	1,947.5	32° 1' 42.575 N	103° 16' 19.943 W
13,800.0	90.00	359.42	10,250.0	2,635.8	1,946.5	32° 1' 43.564 N	103° 16' 19.944 W
13,900.0	90.00	359.42	10,250.0	2,735.8	1,945.5	32° 1' 44.554 N	103° 16' 19.944 W
14,000.0	90.00	359.42	10,250.0	2,835.8	1,944.5	32° 1' 45.543 N	103° 16' 19.945 W
14,100.0	90.00	359.42	10,250.0	2,935.8	1,943.4	32° 1' 46.533 N	103° 16' 19.945 W
14,200.0	90.00	359.42	10,250.0	3,035.8	1,942.4	32° 1' 47.522 N	103° 16' 19.946 W
14,300.0	90.00	359.42	10,250.0	3,135.8	1,941.4	32° 1' 48.512 N	103° 16' 19.946 W
14,400.0	90.00	359.42	10,250.0	3,235.8	1,940.4	32° 1' 49.501 N	103° 16' 19.946 W
14,500.0	90.00	359.42	10,250.0	3,335.8	1,939.4	32° 1' 50.491 N	103° 16' 19.947 W
14,600.0	90.00	359.42	10,250.0	3,435.7	1,938.3	32° 1' 51.480 N	103° 16' 19.947 W
14,700.0	90.00	359.42	10,250.0	3,535.7	1,937.3	32° 1' 52.470 N	103° 16' 19.948 W
14,800.0	90.00	359.42	10,250.0	3,635.7	1,936.3	32° 1' 53.459 N	103° 16' 19.948 W
14,900.0	90.00	359.42	10,250.0	3,735.7	1,935.3	32° 1' 54.449 N	103° 16' 19.949 W
15,000.0	90.00	359.42	10,250.0	3,835.7	1,934.3	32° 1' 55.438 N	103° 16' 19.949 W
15,100.0	90.00	359.42	10,250.0	3,935.7	1,933.2	32° 1' 56.428 N	103° 16' 19.950 W
15,200.0	90.00	359.42	10,250.0	4,035.7	1,932.2	32° 1' 57.417 N	103° 16' 19.950 W
15,300.0	90.00	359.42	10,250.0	4,135.7	1,931.2	32° 1' 58.407 N	103° 16' 19.950 W
15,400.0	90.00	359.42	10,250.0	4,235.7	1,930.2	32° 1' 59.396 N	103° 16' 19.951 W
15,500.0	90.00	359.42	10,250.0	4,335.7	1,929.2	32° 2' 0.386 N	103° 16' 19.951 W
15,600.0	90.00	359.42	10,250.0	4,435.7	1,928.1	32° 2' 1.375 N	103° 16' 19.952 W
15,700.0	90.00	359.42	10,250.0	4,535.7	1,927.1	32° 2' 2.365 N	103° 16' 19.952 W
15,800.0	90.00	359.42	10,250.0	4,635.7	1,926.1	32° 2' 3.354 N	103° 16' 19.953 W
15,900.0	90.00	359.42	10,250.0	4,735.7	1,925.1	32° 2' 4.344 N	103° 16' 19.953 W
16,000.0	90.00	359.42	10,250.0	4,835.7	1,924.0	32° 2' 5.333 N	103° 16' 19.954 W
16,100.0	90.00	359.42	10,250.0	4,935.7	1,923.0	32° 2' 6.323 N	103° 16' 19.954 W
16,200.0	90.00	359.42	10,250.0	5,035.7	1,922.0	32° 2' 7.312 N	103° 16' 19.954 W
16,300.0	90.00	359.42	10,250.0	5,135.7	1,921.0	32° 2' 8.302 N	103° 16' 19.955 W
16,400.0	90.00	359.42	10,250.0	5,235.7	1,920.0	32° 2' 9.291 N	103° 16' 19.955 W
16,500.0	90.00	359.42	10,250.0	5,335.6	1,918.9	32° 2' 10.281 N	103° 16' 19.956 W
16,600.0	90.00	359.42	10,250.0	5,435.6	1,917.9	32° 2' 11.270 N	103° 16' 19.956 W
16,700.0	90.00	359.42	10,250.0	5,535.6	1,916.9	32° 2' 12.260 N	103° 16' 19.957 W
16,800.0	90.00	359.42	10,250.0	5,635.6	1,915.9	32° 2' 13.249 N	103° 16' 19.957 W
16,900.0	90.00	359.42	10,250.0	5,735.6	1,914.9	32° 2' 14.239 N	103° 16' 19.957 W
17,000.0	90.00	359.42	10,250.0	5,835.6	1,913.8	32° 2' 15.229 N	103° 16' 19.958 W
17,100.0	90.00	359.42	10,250.0	5,935.6	1,912.8	32° 2' 16.218 N	103° 16' 19.958 W
17,200.0	90.00	359.42	10,250.0	6,035.6	1,911.8	32° 2' 17.208 N	103° 16' 19.959 W
17,300.0	90.00	359.42	10,250.0	6,135.6	1,910.8	32° 2' 18.197 N	103° 16' 19.959 W
17,400.0	90.00	359.42	10,250.0	6,235.6	1,909.8	32° 2' 19.187 N	103° 16' 19.960 W
17,500.0	90.00	359.42	10,250.0	6,335.6	1,908.7	32° 2' 20.176 N	103° 16' 19.960 W
17,600.0	90.00	359.42	10,250.0	6,435.6	1,907.7	32° 2' 21.166 N	103° 16' 19.961 W
17,700.0	90.00	359.42	10,250.0	6,535.6	1,906.7	32° 2' 22.155 N	103° 16' 19.961 W
17,800.0	90.00	359.42	10,250.0	6,635.6	1,905.7	32° 2' 23.145 N	103° 16' 19.961 W

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Planned Survey

MD (usft)	Inc (°)	Azi (azimuth) (°)	TVD (usft)	+FSL/-FNL (usft)	+FWL/-FEL (usft)	Latitude	Longitude
17,900.0	90.00	359.42	10,250.0	6,735.6	1,904.7	32° 2' 24.134 N	103° 16' 19.962 W
18,000.0	90.00	359.42	10,250.0	6,835.6	1,903.6	32° 2' 25.124 N	103° 16' 19.962 W
18,100.0	90.00	359.42	10,250.0	6,935.6	1,902.6	32° 2' 26.113 N	103° 16' 19.963 W
18,200.0	90.00	359.42	10,250.0	7,035.6	1,901.6	32° 2' 27.103 N	103° 16' 19.963 W
18,300.0	90.00	359.42	10,250.0	7,135.6	1,900.6	32° 2' 28.092 N	103° 16' 19.964 W
18,400.0	90.00	359.42	10,250.0	7,235.6	1,899.6	32° 2' 29.082 N	103° 16' 19.964 W
18,500.0	90.00	359.42	10,250.0	7,335.5	1,898.5	32° 2' 30.071 N	103° 16' 19.964 W
18,600.0	90.00	359.42	10,250.0	7,435.5	1,897.5	32° 2' 31.061 N	103° 16' 19.965 W
18,700.0	90.00	359.42	10,250.0	7,535.5	1,896.5	32° 2' 32.050 N	103° 16' 19.965 W
18,800.0	90.00	359.42	10,250.0	7,635.5	1,895.5	32° 2' 33.040 N	103° 16' 19.966 W
18,900.0	90.00	359.42	10,250.0	7,735.5	1,894.5	32° 2' 34.029 N	103° 16' 19.966 W
19,000.0	90.00	359.42	10,250.0	7,835.5	1,893.4	32° 2' 35.019 N	103° 16' 19.967 W
19,100.0	90.00	359.42	10,250.0	7,935.5	1,892.4	32° 2' 36.008 N	103° 16' 19.967 W
19,200.0	90.00	359.42	10,250.0	8,035.5	1,891.4	32° 2' 36.998 N	103° 16' 19.968 W
19,300.0	90.00	359.42	10,250.0	8,135.5	1,890.4	32° 2' 37.987 N	103° 16' 19.968 W
19,400.0	90.00	359.42	10,250.0	8,235.5	1,889.4	32° 2' 38.977 N	103° 16' 19.968 W
19,500.0	90.00	359.42	10,250.0	8,335.5	1,888.3	32° 2' 39.966 N	103° 16' 19.969 W
19,600.0	90.00	359.42	10,250.0	8,435.5	1,887.3	32° 2' 40.956 N	103° 16' 19.969 W
19,700.0	90.00	359.42	10,250.0	8,535.5	1,886.3	32° 2' 41.945 N	103° 16' 19.970 W
19,800.0	90.00	359.42	10,250.0	8,635.5	1,885.3	32° 2' 42.935 N	103° 16' 19.970 W
19,900.0	90.00	359.42	10,250.0	8,735.5	1,884.3	32° 2' 43.924 N	103° 16' 19.971 W
20,000.0	90.00	359.42	10,250.0	8,835.5	1,883.2	32° 2' 44.914 N	103° 16' 19.971 W
20,100.0	90.00	359.42	10,250.0	8,935.5	1,882.2	32° 2' 45.903 N	103° 16' 19.971 W
20,200.0	90.00	359.42	10,250.0	9,035.5	1,881.2	32° 2' 46.893 N	103° 16' 19.972 W
20,300.0	90.00	359.42	10,250.0	9,135.5	1,880.2	32° 2' 47.882 N	103° 16' 19.972 W
20,400.0	90.00	359.42	10,250.0	9,235.4	1,879.2	32° 2' 48.872 N	103° 16' 19.973 W
20,500.0	90.00	359.42	10,250.0	9,335.4	1,878.1	32° 2' 49.861 N	103° 16' 19.973 W
20,600.0	90.00	359.42	10,250.0	9,435.4	1,877.1	32° 2' 50.851 N	103° 16' 19.974 W
20,700.0	90.00	359.42	10,250.0	9,535.4	1,876.1	32° 2' 51.840 N	103° 16' 19.974 W
20,800.0	90.00	359.42	10,250.0	9,635.4	1,875.1	32° 2' 52.830 N	103° 16' 19.975 W
20,900.0	90.00	359.42	10,250.0	9,735.4	1,874.1	32° 2' 53.819 N	103° 16' 19.975 W
21,000.0	90.00	359.42	10,250.0	9,835.4	1,873.0	32° 2' 54.809 N	103° 16' 19.975 W
21,100.0	90.00	359.42	10,250.0	9,935.4	1,872.0	32° 2' 55.799 N	103° 16' 19.976 W
21,200.0	90.00	359.42	10,250.0	10,035.4	1,871.0	32° 2' 56.788 N	103° 16' 19.976 W
21,300.0	90.00	359.42	10,250.0	10,135.4	1,870.0	32° 2' 57.778 N	103° 16' 19.977 W
21,400.0	90.00	359.42	10,250.0	10,235.4	1,869.0	32° 2' 58.767 N	103° 16' 19.977 W
21,500.0	90.00	359.42	10,250.0	10,335.4	1,867.9	32° 2' 59.757 N	103° 16' 19.978 W
21,600.0	90.00	359.42	10,250.0	10,435.4	1,866.9	32° 3' 0.746 N	103° 16' 19.978 W
Cam083 LTP							
21,674.1	90.00	359.42	10,250.0	10,509.5	1,866.2	32° 3' 1.480 N	103° 16' 19.978 W
Cam083 BHL							

AMEREDEV

Ameredev Operating, LLC

Lease Penetration Section Line Footages

Company:	Ameredev Operating, LLC.	**Local Co-ordinate Reference:**	Well Camellia 083H
Project:	CAM/AZ	**TVD Reference:**	KB @ 2938.0usft
Site:	CAM/AZ #5SX	**MD Reference:**	KB @ 2938.0usft
Well:	Camellia 083H	**North Reference:**	Grid
Wellbore:	Wellbore #1	**Survey Calculation Method:**	Minimum Curvature
Design:	Design #1	**Database:**	EDM5000

Plan Annotations

Measured Depth (usft)	Vertical Depth (usft)	Local Coordinates +N/-S (usft)	Local Coordinates +E/-W (usft)	Comment
11,163.0	10,243.1	669.3	8.8	Cam083 into NMNM23199

Checked By: _____ Approved By: _____ Date: _____

AMEREDEV

5M Annular Preventer Variance Request and Well Control Procedures

Note: A copy of the Well Control Plan must be available at multiple locations on the rig for review by rig personnel, as well as review by the BLM PET/PE, and a copy must be maintained on the rig floor.

Dual Isolation Design for 5M Annular Exception

Ameredev will utilize 13-5/8" 10M (5M Annular) BOPE System consisting of:

- 13-5/8" 5M Annular
- 13-5/8" 10M Upper Pipe Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram
- 13-5/8" 10M Blind Rams
- 13-5/8" 10M Drilling Spool /w 2 - 4" 10M Outlets Double 10M Isolation Valves
- 13-5/8" 10M Lower Blind Rams
  - 3-1/2" – 5-1/2" Variable Bore Ram

All drilling components and casing associated to exposure > 5000 psi BHP requiring a 10M system will have a double isolation (secondary barrier) below the 5M Annular that would provide a barrier to flow. The mud system will always be primary barrier, it will be maintained by adjusting values based on tourly mud tests and monitoring a PVT System to maintain static wellbore conditions, displacement procedures will be followed and recorded on daily drilling reports during tripping operations. Surge and swab pressure values will be calculated and maintained and static flow check will be monitored at previous casing shoe and verified static well conditions prior to tripping out of hole and again prior to pulling last joint of drill pipe through BOPE. The below table, documents that two barriers to flow can be maintained at all times, independent of the rating of the annular preventer.

Drill Components	Size	Primary Barrier	Secondary Barrier	Third Barrier
Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
HWDP Drillpipe	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Drill Collars	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Production Casing	3-1/2"-5-1/2"	Drilling Fluid	Upper Pipe Rams	Lower Pipe Rams
Open Hole	13-5/8	Drilling Fluid	Blind Rams	
All Drilling Components in 10M Environment will have OD that will allow full Operational RATED WORKING PRESSURE for system design. Kill line with minimum 2" ID will be available outside substructure with 10M Check Valve for OOH Kill Operations				

Well Control Procedures

Proper well control procedures are dependent to differentiating well conditions, to cover the basic well control operations there are will be standard drilling ahead, tripping pipe, tripping BHA, running casing, and pipe out of the hole/open hole scenarios that will be defined by procedures below. Initial Shut In Pressure can be taken against the Uppermost BOPE component the 5M Annular, pressure control can be transferred from the lesser 5M Annular to the 10M Upper Pipe Rams if needed. Shut In Pressures may be equal to or less than the Rated Working Pressure but at no time will the pressure on the annular preventer exceed the Rated Working Pressure of the annular. The annular will be tested to 5,000 psi. This will be the Rated Working Pressure of the annular preventer. All scenarios will be written such as shut in will be performed by closing the 10,000 psi Upper Pipe Rams for faster Accumulator pressure recovery to allow safer reaction to controlling wellbore pressure.

Shutting In While Drilling

1. Sound alarm signaling well control event to Rig Crew
2. Space out drill string to allow FOSV installation
3. Shut down pumps
4. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
5. Install open, full open safety valve and close valve, Close Chokes
6. Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure

Shutting In While Tripping

1. Sound alarm signaling well control event to Rig Crew
2. Space out drill string to allow FOSV installation
3. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install open, full open safety valve and close valve, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

Shutting In While Running Casing

1. Sound alarm signaling well control event to Rig Crew
2. Space out casing to allow circulating swedge installation
3. Shut in Upper Pipe Rams and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install circulating swedge, Close high pressure, low torque valves, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold Pre-job safety meeting and discuss kill procedure

Shutting in while out of hole

1. Sound alarm signaling well control event to Rig Crew
2. Shut-in well: close blind rams and open HCR against Open Chokes and Valves Open to working pressure gauge
3. Close Chokes, Verify well is shut-in and monitor pressures
4. Notify supervisory personnel
5. Record data (SIDP, SICP, Pit Gain, and Time)
6. Hold Pre-job safety meeting and discuss kill procedure

Shutting in prior to pulling BHA through stack

Prior to pulling last joint of drill pipe thru the stack space out and check flow
If flowing see steps below.

1. Sound alarm signaling well control event to Rig Crew
2. Shut in upper pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
3. Install open, full open safety valve and close valve, Close Chokes
4. Verify well is shut-in and flow has stopped
5. Notify supervisory personnel
6. Record data (SIDP, SICP, Pit Gain, and Time)
7. Hold pre-job safety meeting and discuss kill procedure

Shutting in while BHA is in the stack and ram preventer and combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. Space out BHA with upset just beneath the compatible pipe ram
3. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
4. Install open, full open safety valve and close valve, Close Chokes
5. Verify well is shut-in and flow has stopped
6. Notify supervisory personnel
7. Record data (SIDP, SICP, Pit Gain, and Time)
8. Hold pre-job safety meeting and discuss kill procedure

*FOSV will be on rig floor in open position with operating handle for each type of connection utilized and tested to 10,000 psi

Shutting in while BHA is in the stack and no ram preventer or combo immediately available

1. Sound alarm signaling well control event to Rig Crew
2. If possible pick up high enough, to pull string clear and follow "Open Hole" scenario

If not possible to pick up high enough:

3. Stab Crossover, make up one joint/stand of drill pipe, and install open, full open safety valve (Leave Open)
4. Space out drill string with upset just beneath the compatible pipe ram.
5. Shut in upper compatible pipe ram and open HCR against Open Chokes and Valves Open to working pressure gauge
6. Close FOSV, Close Chokes, Verify well is shut-in and flow has stopped
7. Notify supervisory personnel
8. Record data (SIDP, SICP, Pit Gain, and Time)
9. Hold pre-job safety meeting and discuss kill procedure

AMEREDEV

Pressure Control Plan

Pressure Control Equipment

- Following setting of 13-3/8" Surface Casing Ameredev will install 13-5/8 MB4 Multi Bowl Casing Head by welding on a 13-5/8 SOW x 13-5/8" 5M in combination with 13-5/8 5M x 13-5/8 10M B-Sec to Land Intm #1 and a 13-5/8 10M x 13-5/8 10M shouldered to land C-Sec to Land Intm #2 (Installation procedure witnessed and verified by a manufacturer's representative).

- Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Ameredev will install a 5M System Blowout Preventer (BOPE) with a 5M Annular Preventer and related equipment (BOPE). Full testing will be performed utilizing a full isolation test plug and limited to 5,000 psi MOP of MB4 Multi Bowl Casing Head. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 50% of approved working pressure (2,500 psi). Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Setting of 9-5/8" Intermediate will be done by landing a wellhead hanger in the 13-5/8" 5M Bowl, Cementing and setting Well Head Packing seals and testing same. (Installation procedure witnessed and verified by a manufacturer's representative) Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- Full testing will be performed utilizing a full isolation test plug to 10,000 psi MOP of MB4 Multi Bowl B-Section. Pressure will be held for 10 min or until provisions of test are met on all valves and rams. The 5M Annular Preventer will be tested to 100% of approved working pressure (5,000 psi).

- Before drilling >20ft of new formation under the 9-5/8" Casing Shoe a pressure integrity test of the Casing Shoe will be performed to minimum of the MWE anticipated to control formation pressure to the next casing depth.

- Following setting of 5-1/2" Production Casing and adequate WOC time Ameredev will break 10M System Blowout Preventer (BOP) from 10M DOL-2 Casing Head, install annulus casing slips and test same (Installation procedure witnessed and verified by a manufacturer's representative) and install 11" 10M x 5-1/8" 15M Tubing Head (Installation procedure witnessed and verified by a manufacturer's representative). Ameredev will test head to 70% casing design and install Dry Hole cap with needle valve and pressure gauge to monitor well awaiting completion.

AMEREDEV

Pressure Control Plan

- Slow pump speeds will be taken daily by each crew and recorded on Daily Drilling Report after mudding up.

- A choke manifold and accumulator with floor and remote operating stations will be functional and in place after installation of BOPE, as well as full functioning mud gas separator.

- Weekly BOPE pit level drills will be conducted by each crew and recorded on Daily Drilling Report.

- BOP will be fully operated when out of hole and will be documented on the daily drilling log.

- All B.O.P.s and associated equipment will be tested in accordance with Onshore Order #2

- All B.O.P. testing will be done by an independent service company.

- The B.O.P. will be tested within 21 days of the original test if drilling takes more time than planned.

- Ameredev requests a variance to connect the B.O.P. choke outlet to the choke manifold using a co-flex hose with a 10,000 psi working pressure that has been tested to 15,000psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps. (certifications will be sent to Carlsbad BLM Office prior to install)

- Ameredev requests a variance to install a 5M Annular Preventer on the 10M System to drill the Production Hole below the 9-5/8" Intermediate Section. 5M Annular will be tested to 100% working pressure (5,000 psi). A full well control procedure will be included to isolate well bore.

Ameredev Drilling Plan: 3 String with 4 String Contingency

- Contingency Plan If Losses Exceed 50% in Intermediate Interval
  - We will utilize a MB4 wellhead that will enable us to convert a 3 string design to a 4 string design. (Schematic Attached)
  - We will displace well with FW and drill or condition to run 9-5/8" Casing at the Lamar Limestone, we will utilize DV Tool w/ ACP @ the Tansill to Isolate Capitan Reef and cement to surface.
  - Casing will be tested to 1500 psi or .22 psi/ft whichever is greater for 30 minutes with <10% leak off, but will not exceed 70% of the burst rating per Onshore Order No. 2.

- 7.625 Casing will be Additional 4th String
  - Drill remaining hole section to 10,670'
  - Run 7.625 29.7# HCL80 FJM Casing

AMEREDEV

4-String Contingency Wellbore Schematic

Well:	(Well Name)	**Co. Well ID:**	xxxxxx
SHL:	(SHL)	**AFE No.:**	xxxx-xxx
BHL:	(BHL)	**API No.:**	xxxxxxxxxx
	Lea, NM	**GL:**	(Elevation)'
Wellhead:	A - 13-5/8" 10M x 13-5/8" SOW	**Field:**	Delaware
	B - 13-5/8" 10M x 13-5/8" 10M	**Objective:**	Wolfcamp B
	C - 13-5/8" 10M x 13-5/8" 10M	**TVD:**	(TVD)'
	Tubing Spool - 5-1/8" 15M x 13-3/8" 10M	**MD:**	(MD)'
Xmas Tree:	2-9/16" 10M	**Rig:**	TBD **KB** 27'
Tubing:	2-7/8" L-80 6.5# 8rd EUE	**E-Mail:**	Wellsite2@ameredev.com

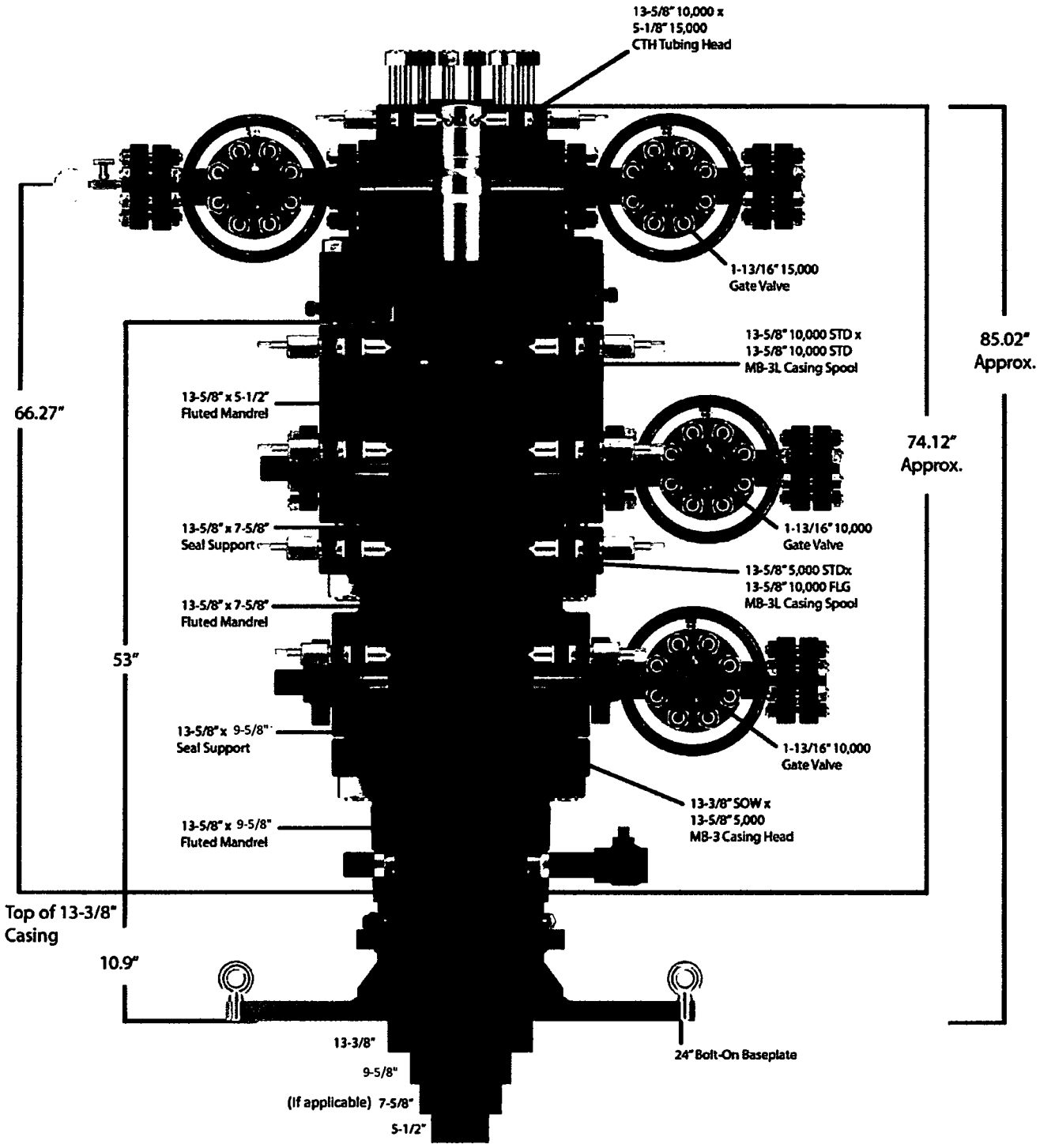
Hole Size	Formation Tops		Logs	Cement	Mud Weight
17.5"	Rustler	125' below Rustler		TOC 0' 100% Excess	8.4-8.6 ppg WBM
	13.375" 54.5# J-55 BTC				
12.25"	Salado			TOC 0' 50% Excess	8.3-10.2 Fresh Water
	DV Tool with ACP	At Tansill			
	Tansill			TOC 0' 50% Excess	
	Capitan Reef				
	Lamar	50' below Lamar			
	9.625" 40# L-80HC BTC				
8.75"	Bell Canyon			TOC 0' 25% Excess	8.5-9.4 Diesel Brine Emulsion
	Brushy Canyon				
	Bone Spring Lime				
	First Bone Spring				
	Second Bone Spring				
	Third Bone Spring Upper	125' below TBSG Upper			
	7.625" 29.7# L-80HC FJM				
6.75" 12° Build @ KOP	Third Bone Spring			TOC 0' 25% Excess	10.5-14 ppg OBM
	Wolfcamp				
	Wolfcamp B (If Applicable)				
	5.5" 20# P-110CYHP TMK UP SF TORQ	**(MD)**			
	Target Wolfcamp B TVD // MD				

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Contingency Casing Design and Safety Factor Check

Casing Specifications						
Segment	**Hole ID**	**Depth**	**OD**	**Weight**	**Grade**	**Coupling**
Surface	17.5	1,888'	13.375	54.5	J-55	BTC
Int #1	12.25	5,013'	9.625	40	HCL-80	BTC
Int #2	8.75	11,147'	7.625	29.7	HCL-80	FJM
Prod Segment A	6.75	11,147'	5.5	20	CYHP-110	TMK UPSF
Prod Segment B	6.75	22,496'	5.5	20	CYHP-110	TMK UPSF

Check Surface Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
14.38	853	909	1,130	2,730
Safety Factors				
1.56	8.29	8.83	1.15	0.91
Check Int #1 Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
10.625	916	1042	4230	5750
Safety Factors				
0.81	4.57	5.20	1.41	0.95
Check Int #2 Casing				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
7.625	940	558	6700	9460
Safety Factors				
0.56	2.84	1.96	1.10	1.24
Check Prod Casing, Segment A				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
0.49	3.11	2.79	1.77	1.89
Check Prod Casing, Segment B				
OD Cplg	Body	Joint	Collapse	Burst
inches	*1000 lbs*	*1000 lbs*	*psi*	*psi*
5.777	728	655	12780	14360
Safety Factors				
0.49	63.53	57.16	1.68	1.89



Quotation

Downing Wellhead Equipment

Oklahoma City, Oklahoma - USA

Reference Data:

16925 AMEREDEV

TITLE:

AMEREDEV

DRAWN			SIZE	DWG. NO.	REV.
CHECKED			A		
APPROVED			Scale:	Weight:	Sheet:

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
17.5	13.375	1888	[redacted]	1.76	13.5

Bbl/Sk	0.31372549
bbls	419.402246
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	1502
Cement Type	C
Additves	Bentonite, Accelerator, Kolseal, Defoamer, Celloflake
Quantity (sks)	1,337
Yield (cu ft/sk)	1.76
Density (lbs/gal)	13.5
Volume (cu ft)	2,352.85
Percent Excess	100%
Column Height	3,389.88

Target % 100% [redacted]

Target TOC 0

Calc TOC	-1888	bbl	25% Excess	100%
calc vol	0.12372195	233.587041	291.9838012	467.174082

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
17.5	13.375	1888	[redacted]	1.34	14.8

Bbl/Sk	0.23885918
bbls	47.77183601
Top MD of Segment	1502
Bottom MD of Segment	1888
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.34
Density (lbs/gal)	14.8
Volume (cu ft)	268
Percent Excess	100%
Column Height	386.1225606

SURFACE CEMENT

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	5013	[redacted]	3.5	9

Bbl/Sk	0.623885918
bbls	372.0365733
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	4163
Cement Type	C
Additves	Bentonite,Salt,Kolseal,Defoamer,Celloclake
Quantity (sks)	596
Yield (cu ft/sk)	3.5
Density (lbs/gal)	9
Volume (cu ft)	2,087.13
Percent Excess	50%
Column Height	6,669.49

Target % 50% [redacted]

Target TOC	0			
Calc TOC	-2506.5	bbl	25% Excess	50%
calc vol	0.055781888	279.6346021	349.5432526	419.4519031

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	5013	[redacted]	1.33	14.8

Bbl/Sk	0.237076649
bbls	47.41532977
Top MD of Segment	4163
Bottom MD of Segment	5013
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.33
Density (lbs/gal)	14.8
Volume (cu ft)	266
Percent Excess	25%
Column Height	850.013004

INTERMEDIATE 1 CEMENT - STAGE 1

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 2 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	3262	[redacted]	3.5	9

Bbl/Sk	0.623885918		
bbls	225.5254458		
Stage Tool Depth	N/A		
Top MD of Segment	0		
Bottom MD of Segment	2412		
Cement Type	C		
Additves	Bentonite,Salt,Kolseal,Defoamer,Celloclake		
Quantity (sks)	361		
Yield (cu ft/sk)	3.5		
Density (lbs/gal)	9		
Volume (cu ft)	1,265.20		
Percent Excess	50%	Target %	50% [redacted]
Column Height	4,042.99		

Target TOC	0			
Calc TOC	-1631	bbl	25% Excess	50%
calc vol	0.055781888	181.960517	227.4506463	272.9407756

Stage 2 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
12.25	9.625	3262	[redacted]	1.33	14.8

Bbl/Sk	0.237076649
bbls	47.41532977
Top MD of Segment	2412
Bottom MD of Segment	3262
Cement Type	C
Additives	
Quantity (sks)	200
Yield (cu ft/sk)	1.33
Density (lbs/gal)	14.8
Volume (cu ft)	266
Percent Excess	25%
Column Height	850.013004

INTERMEDIATE 1 CEMENT - STAGE 2

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
8.75	7.625	10670	[redacted]	2.47	9

Bbl/Sk	0.440285205
bbls	168.6309595
Stage Tool Depth	N/A
Top MD of Segment	0
Bottom MD of Segment	6755
Cement Type	H
Additves	Bentonite,Retarder,Kolseal,Defoamer,Celloflake, Anti-Settling
Expansion Additive	
Quantity (sks)	383
Yield (cu ft/sk)	2.47
Density (lbs/gal)	9
Volume (cu ft)	946.02
Percent Excess	25%
Column Height	9,422.97

Target % 25% [redacted]

Target TOC	0			
Calc TOC	-2667.5	bbl	25% Excess	25%
calc vol	0.01789574	190.9475483	238.6844354	238.6844354

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
8.75	7.625	10670	[redacted]	1.31	14.2

Bbl/Sk	0.233511586
bbls	70.05347594
Top MD of Segment	6755
Bottom MD of Segment	10670
Cement Type	H
Additves	Salt,Bentonite,Retarder,Dispersant,Fluid Loss
Quantity (sks)	300
Yield (cu ft/sk)	1.31
Density (lbs/gal)	14.2
Volume (cu ft)	393
Percent Excess	25%
Column Height	3914.533571

INTERMEDIATE 2 CEMENT

EXAMPLE ONLY - NOT FOR CONSTRUCTION

Stage 1 Lead

Hole Size	Casing Size	Depth	Sacks	Yield	Density
6.75	5.5	22496	[redacted]	1.34	14.2

Bbl/Sk		0.23885918	
bbls		418.2897805	
Stage Tool Depth		N/A	
Top MD of Segment		0	
Bottom MD of Segment		22496	
Cement Type		H	
Additves	Salt, Bentonite, Fluid Loss, Dispersant, Retarder, Defoamer		
Quantity (sks)		1,751	
Yield (cu ft/sk)		1.34	
Density (lbs/gal)		14.2	
Volume (cu ft)		2,346.61	
Percent Excess		25%	Target % 25% [redacted]
Column Height		28,120.00	

Target TOC	0			
Calc TOC	-5624	bbl	25% Excess	25%
calc vol	0.01487517	334.6318244	418.2897805	418.2897805

Stage 1 Tail

Hole Size	Casing Size	Depth	Sacks	Yield	Density
6.75	5.5	22496	0	0	0

Bbl/Sk	0
bbls	0
Top MD of Segment	22496
Bottom MD of Segment	22496
Cement Type	H
Additives	
Quantity (sks)	0
Yield (cu ft/sk)	0
Density (lbs/gal)	0
Volume (cu ft)	0
Percent Excess	
Column Height	0

PRODUCTION CEMENT

HALLIBURTON

Permian Basin, Ft Stockton

Lab Results- Lead

Job Information

Request/Slurry	2488456/2	**Rig Name**		**Date**	18/DEC/2018
Submitted By	Dillon Briers	**Job Type**	Intermediate Casing	**Bulk Plant**	
Customer	Ameredev	**Location**	Lea	**Well**	

Well Information

Casing/Liner Size	7.625 in	**Depth MD**	5013 ft	**BHST**	165°F
Hole Size	8.75 in	**Depth TVD**	5013 ft	**BHCT**	130°F

Cement Information - Lead Design

Conc	UOM	Cement/Additive
100	% BWOC	NeoCem
14.68	gal/sack	Heated Fresh Water

Cement Properties		
Slurry Density	9	lbm/gal
Slurry Yield	3.5	ft3/sack
Water Requirement	14.68	gal/sack

Pilot Test Results Request ID 2488456/1

API Rheology, Request Test ID:35665340

Temp (degF)	300	200	100	60	30	6	3	Cond Time (min)
80 (up)	82	67	49	42	39	36	28	0
80 (down)	82	59	35	26	18	10	9	0
80 (avg.)	82	63	42	34	29	23	19	0

PV (cP) & YP (lbs/100ft2): 61.73 22.32 (Least-squares method)

PV (cP) & YP (lbs/100ft2): 60 22 (Traditional method (300 & 100 rpm based))

Generalized Herschel-Bulkley 4: YP(lbf/100ft2)=20.33 MuInf(cP)=52.39 m=0.81 n=0.81

API Rheology, Request Test ID:35665341

Temp (degF)	300	200	100	60	30	6	3	Cond Time (min)	Cond Temp (degF)
134 (up)	63	47	29	21	15	7	6	30	134
134 (down)	63	46	29	21	14	7	4	30	134
134 (avg.)	63	47	29	21	15	7	5	30	134

PV (cP) & YP (lbs/100ft2): 57.12 7.98 (Least-squares method)

PV (cP) & YP (lbs/100ft2): 51 12 (Traditional method (300 & 100 rpm based))

Generalized Herschel-Bulkley 4: YP(lbf/100ft2)=2.26 MuInf(cP)=30.64 m=0.41 n=0.41

API Fluid Loss, Request Test ID:35665342

Test Temp (degF)	Test Pressure (psi)	Test Time (min)	Meas. Vol.	Calculated FL (<30 min)	Conditioning time (min)	Conditioning Temp (degF)
134	1000	9.12	52	189	30	134

Free Fluid API 10B-2, Request Test ID:35665343

Con. Temp (degF)	Cond. Time (min)	Static T. (F)	Static time (min)	Incl. (deg)	% Fluid
134	30	80	120	0	0

Pilot Test Results Request ID 2504116/5

Thickening Time - ON-OFF-ON, Request Test ID:35852392

Test Temp (degF)	Pressure (psi)	Reached in (min)	70 Bc (hh:min)	Start Bc
126	5800	40	6:18	16

UCA Comp. Strength, Request Test ID:35852394

End Temp (degF)	Pressure (psi)	50 psi (hh:mm)	500 psi (hh:mm)	12 hr CS (psi)	24 hr CS (psi)	48 hr CS (psi)
159	4000	8:55	12:23	456	749	681

U. S. Steel Tubular Products

6/6/2017 6:18:53 PM

7.625" 29.70lbs/ft (0.375" Wall) HCL80 USS-LIBERTY FJM®

MECHANICAL PROPERTIES	Pipe	USS-LIBERTY FJM®	
Minimum Yield Strength	110,000	--	psi
Maximum Yield Strength	140,000	--	psi
Minimum Tensile Strength	125,000	--	psi
DIMENSIONS	**Pipe**	**USS-LIBERTY FJM®**	
Outside Diameter	7.625	7.625	in.
Wall Thickness	0.375	--	in.
Inside Diameter	6.875	6.789	in.
Standard Drift	6.750	6.750	in.
Alternate Drift	--	--	in.
Nominal Linear Weight, T&C	29.70	--	lbs/ft
Plain End Weight	29.06	--	lbs/ft
SECTION AREA	**Pipe**	**USS-LIBERTY FJM®**	
Critical Area	8.541	5.074	sq. in.
Joint Efficiency	--	59.4	%
PERFORMANCE	**Pipe**	**USS-LIBERTY FJM®**	
Minimum Collapse Pressure	6,700	6,700	psi
Minimum Internal Yield Pressure	9,460	9,460	psi
Minimum Pipe Body Yield Strength	940,000	--	lbs
Joint Strength	--	558,000	lbs
Compression Rating	--	558,000	lbs
Reference Length	--	12,810	ft
Maximum Uniaxial Bend Rating	--	39.3	deg/100 ft
Make-Up Loss	--	3.92	in.
Minimum Make-Up Torque	--	10,800	ft-lbs
Maximum Make-Up Torque	--	15,250	ft-lbs

1. Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness and Specified Minimum Yield Strength (SMYS).
2. Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3. Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4. USS-LIBERTY FJM™ connections are optimized for each combination of OD and wall thickness and cannot be interchanged.
5. Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
6. Reference length is calculated by joint strength divided by nominal plain end weight with 1.5 safety factor.
7. Connection external pressure leak resistance has been verified to 100% API pipe body collapse pressure following the guidelines of API 5C5 Cal III.

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

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

U. S. Steel Tubular Products

5 1/2 20.00 lb (0.361) P110 HP — USS-EAGLE SFH™

	PIPE	CONNECTION	
MECHANICAL PROPERTIES			
Minimum Yield Strength	**125,000**	**125,000**	*psi*
Maximum Yield Strength	**140,000**	**140,000**	*psi*
Minimum Tensile Strength	**130,000**	**130,000**	*psi*
DIMENSIONS			
Outside Diameter	**5.500**	**5.830**	*in.*
Wall Thickness	0.361		*in.*
Inside Diameter	4.778	4.693	*in.*
Drift - API	4.653	4.653	*in.*
Nominal Linear Weight, T&C	**19.83**		*lbs/ft*
Plain End Weight	19.83	19.83	*lbs/ft*
SECTION AREA			
Cross Sectional Area | Critical Area	5.828	5.054	*sq. in.*
Joint Efficiency		86.25	%
PERFORMANCE			
Minimum Collapse Pressure	13,150	13,150	*psi*
External Pressure Leak Resistance		10,000	*psi*
Minimum Internal Yield Pressure	14,360	14,360	*psi*
Minimum Pipe Body Yield Strength	729,000		*lbs*
Joint Strength		631,750	*lbs*
Compression Rating		631,750	*lbs*
Reference Length		21,240	*ft*
Maximum Uniaxial Bend Rating		89.9	*deg/100 ft*
Minimum Make-Up Torque		14,000	*ft-lbs*
Maximum Make-Up Torque		16,900	*ft-lbs*
Maximum Operating Torque		25,000	*ft-lbs*
Make-Up Loss		5.92	*in.*

Notes:

1) Other than proprietary collapse and connection values, performance properties have been calculated using standard equations defined by API 5C3 and do not incorporate any additional design or safety factors. Calculations assume nominal pipe OD, nominal wall thickness, and Specified Minimum Yield Strength (SMYS).
2) Compressive & Tensile Connection Efficiencies are calculated by dividing the connection critical area by the pipe body area.
3) Uniaxial bending rating shown is structural only, and equal to compression efficiency.
4) Torques have been calculated assuming a thread compound friction factor of 1.0 and are recommended only. Field make-up torques may require adjustment based on actual field conditions (e.g. make-up speed, temperature, thread compound, etc.).
5) Reference length is calculated by joint strength divided by plain end weight with 1.5 safety factor.
6) Connection external pressure resistance has been verified to 10,000 psi (Application specific testing).

Manuel USS Product Data Sheet 2017 rev25 (April)

U. S. Steel Tubular Products
10343 Sam Houston Park Dr., #120
Houston, TX 77064

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

Continental
CONTITECH

QUALITY CONTROL	No.: QC-DB- 651 / 2013
	Page : 1 / 44
Hose No.: 66551, 66552, 66553, 66554	Revision : 0
	Date: 14. November 2013.
	Prepared by : Szalai Sándor
	Appr. by: [signature]

CHOKE AND KILL HOSES

id.: 3" 69 MPa x 35 ft (10,67 m)

DATA BOOK

Purchaser: H&P STOCK
Purchaser Order No.:
ContiTech Rubber Order No.: 537587
ContiTech Oil & Marine Corp. Order No.:
4500370505

NOT DESIGNED FOR WELL TESTING

ContiTech Rubber Industrial Kft.
Budapesti út 10., Szeged H-6728
P.O.Box 152 Szeged H-6701
Hungary

Phone: +36 62 566 737
Fax: +36 62 566 738
e-mail: info@fluid.contitech.hu
Internet: www.contitech-rubber.hu

The Court of Csongrád County as
Registry Court
Registry Court No: HU 06-09-002502
EU VAT No: HU11087209

Bank data
Commercial and Creditbank
Szeged
10402805-28014250-00000000

CONTENT

ContiTech Rubber
Industrial Kft.
Quality Control Dept.
(1)

QMS REGISTERED

Certificate of Registration

APIQR REGISTRATION NUMBER

0760

This certifies that the quality management system of

CONTITECH RUBBER INDUSTRIAL LTD.
Budapesti ut 10
Szeged
Hungary

has been assessed by the American Petroleum Institute Quality Registrar (APIQR®) and found it to be in conformance with the following standard:

ISO 9001:2008

The scope of this registration and the approved quality management system applies to the

Design and Manufacture of High Pressure Hoses

APIQR® approves the organization's justification for excluding:

No Exclusions Identified as Applicable

Effective Date: October 15, 2013
Expiration Date: October 15, 2016
Registered Since: October 15, 2007

W. Dan Whittaker
Manager of Operations, APIQR

Accredited by Members of the International Accreditation Forum Multilateral Recognition Arrangement for Quality Management Systems

ANAB IAF

This certificate is valid for the period specified herein. The registered organization must continually meet all requirements of APIQR's Registration Program and the requirements of the Registration Agreement. Registration is maintained and regularly monitored through annual full system audits. Further clarifications regarding the scope of this certificate and the applicability of ISO 9001 standard requirements may be obtained by contacting the registered organization. This certificate has been issued from APIQR offices located at 1220 L Street, N.W., Washington, D.C. 20005-4070, U.S.A., it is the property of APIQR, and must be returned upon request. To verify the authenticity of this certificate, go to www.api.org/compositelist.

QUALITY REGISTRAR

Certificate of Authority to use the Official API Monogram

License Number: 16C-0004 **ORIGINAL**

The American Petroleum Institute hereby grants to

CONTITECH RUBBER INDUSTRIAL LTD.
Budapesti ut 10
Szeged
Hungary

the right to use the Official API Monogram® on manufactured products under the conditions in the official publications of the American Petroleum Institute entitled API Spec Q1® and API Spec 16C and in accordance with the provisions of the License Agreement.

In all cases where the Official API Monogram is applied, the API Monogram should be used in conjunction with this certificate number: 16C-0004

The American Petroleum Institute reserves the right to revoke this authorization to use the Official API Monogram for any reason satisfactory to the Board of Directors of the American Petroleum Institute.

The scope of this license includes the following product: Flexible Choke and Kill Lines

QMS Exclusions: No Exclusions Identified as Applicable

American Petroleum Institute

Effective Date: OCTOBER 15, 2013
Expiration Date: OCTOBER 15, 2016

To verify the authenticity of this license, go to www.api.org/compositelist.

Director of Global Industry Services

American Petroleum Institute

AMERICAN PETROLEUM INSTITUTE CORPORATE SEAL INCORPORATED 1919

2011-113

CONTITECH RUBBER Industrial Kft. | No:QC-DB- 651 /2013 | Page: 4 / 44

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE				CERT. N°: 1905	
PURCHASER: ContiTech Oil & Marine Corp.				P.O. N°: 4500370505	
CONTITECH RUBBER order N°: 537587		HOSE TYPE: 3" ID		Choke and Kill Hose	
HOSE SERIAL N°: 66551		NOMINAL / ACTUAL LENGTH:		10,67 m / 10,75 m	
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi	Duration: 60	min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	8084	8083	AISI 4130	24613
4 1/16" 10K API Flange end			AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

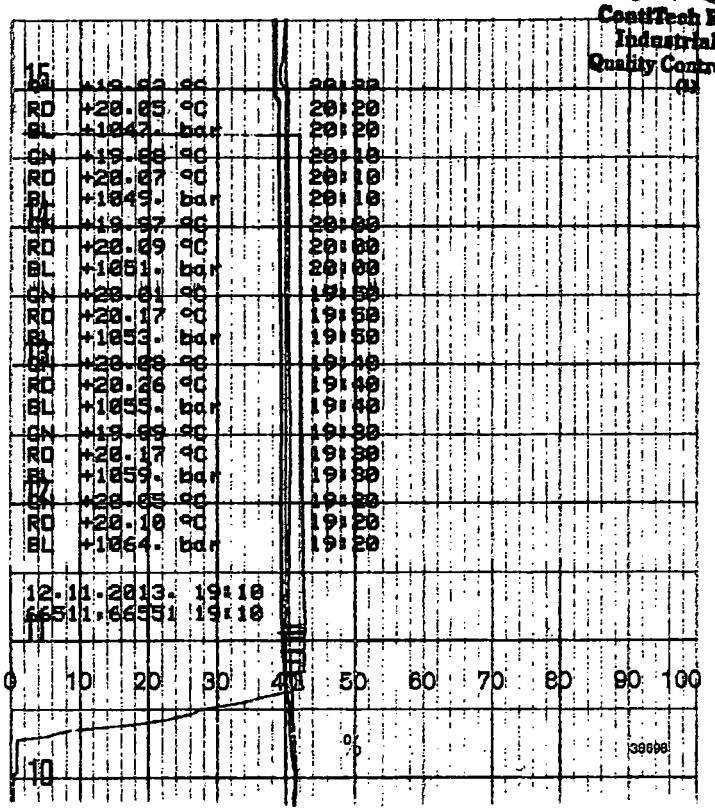
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No: 1904, 1905*

CentiTech Rubber Industrial Kft.
Quality Control Dept.



QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°:	1906	
PURCHASER:	ContiTech Oil & Marine Corp.				P.O. N°:	4500370505	
CONTITECH RUBBER order N°:	537587		HOSE TYPE:	3" ID		Choke and Kill Hose	
HOSE SERIAL N°:	66552		NOMINAL / ACTUAL LENGTH:			10,67 m / 10,73 m	
W.P. 68,9 MPa	10000 psi		T.P. 103,4 MPa	15000 psi	Duration:	60	min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°		Quality	Heat N°
3" coupling with	8088	8085	AISI 4130	24613
4 1/16" 10K API Flange end			AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°: 1907
PURCHASER: ContiTech Oil & Marine Corp.					P.O. N°: 4500370505
CONTITECH RUBBER order N°: 537587		HOSE TYPE: 3" ID		Choke and Kill Hose	
HOSE SERIAL N°: 66553		NOMINAL / ACTUAL LENGTH:		10,67 m / 10,745 m	
W.P. 68,9 MPa 10000 psi		T.P. 103,4 MPa 15000 psi		Duration: 60 min.	

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with	8089 8087	AISI 4130	23171 24613
4 1/16" 10K API Flange end		AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

QUALITY CONTROL INSPECTION AND TEST CERTIFICATE					CERT. N°:	1908	
PURCHASER:	ContiTech Oil & Marine Corp.				P.O. N°:	4500370505	
CONTITECH RUBBER order N°:	537587	HOSE TYPE:	3"	ID	Choke and Kill Hose		
HOSE SERIAL N°:	66554	NOMINAL / ACTUAL LENGTH:			10,67 m / 10,71 m		
W.P. 68,9 MPa	10000 psi	T.P. 103,4 MPa	15000 psi		Duration:	60	min.

Pressure test with water at ambient temperature

See attachment. (1 page)

↑ 10 mm = 10 Min.

→ 10 mm = 25 MPa

COUPLINGS Type	Serial N°	Quality	Heat N°
3" coupling with	8090 8086	AISI 4130	23171 24613
4 1/16" 10K API Flange end		AISI 4130	034939

NOT DESIGNED FOR WELL TESTING **API Spec 16 C**

Temperature rate:"B"

All metal parts are flawless

WE CERTIFY THAT THE ABOVE HOSE HAS BEEN MANUFACTURED IN ACCORDANCE WITH THE TERMS OF THE ORDER INSPECTED AND PRESSURE TESTED AS ABOVE WITH SATISFACTORY RESULT.

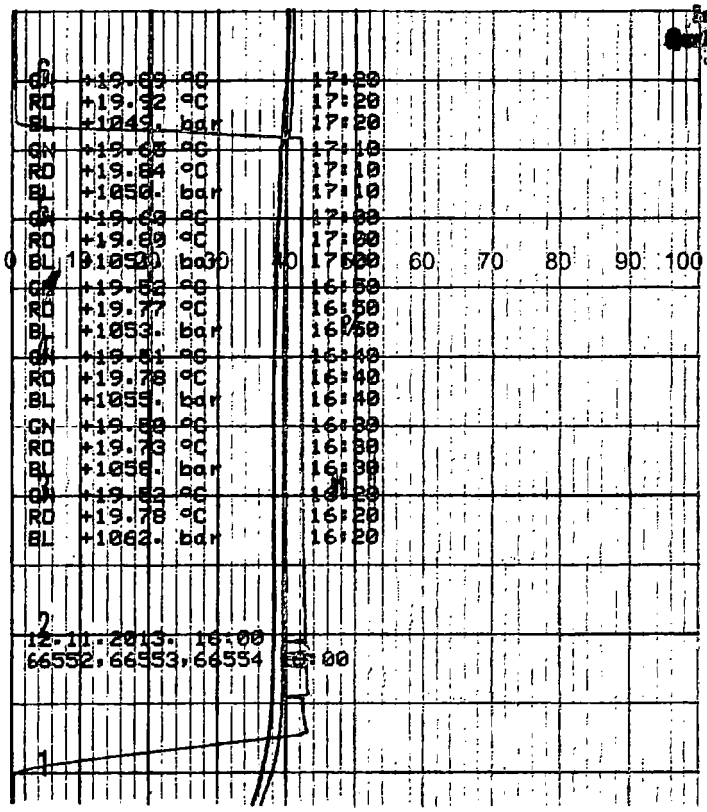
STATEMENT OF CONFORMITY: We hereby certify that the above items/equipment supplied by us are in conformity with the terms, conditions and specifications of the above Purchaser Order and that these items/equipment were fabricated inspected and tested in accordance with the referenced standards, codes and specifications and meet the relevant acceptance criteria and design requirements.

COUNTRY OF ORIGIN HUNGARY/EU

Date:	Inspector	Quality Control
13. November 2013.		ContiTech Rubber Industrial Kft. Quality Control Dept.

ATTACHMENT OF QUALITY CONTROL INSPECTION AND TEST CERTIFICATE *No:1906, 1907, 1908*

ContiTech Rubber
Industrial Kft.
Quality Control Dept.
(1)



Continental CONTITECH

Hose Data Sheet

CRI Order No.	537587
Customer	ContiTech Oil & Marine Corp.
Customer Order No	4500370505
Item No.	1
Hose Type	Flexible Hose
Standard	**API SPEC 16 C**
Inside dia in inches	3
Length	35 ft
Type of coupling one end	FLANGE 4.1/16" 10KPSI API SPEC 6A TYPE 6BX FLANGE C/W BX155STANDARD RING GROOVE
Type of coupling other end	FLANGE 4.1/16" 10KPSI API SPEC 6A TYPE 6BX FLANGE C/W BX155 STANDARD RING GROOVE
H2S service NACE MR0175	Yes
Working Pressure	10 000 psi
Design Pressure	10 000 psi
Test Pressure	15 000 psi
Safety Factor	2,25
Marking	USUAL PHOENIX
Cover	NOT FIRE RESISTANT
Outside protection	St.steel outer wrap
Internal stripwound tube	No
Lining	OIL RESISTANT
Safety clamp	No
Lifting collar	No
Element C	No
Safety chain	No
Safety wire rope	No
Max.design temperature [°C]	100
Min.design temperature [°C]	-20
Min. Bend Radius operating [m]	0,90
Min. Bend Radius storage [m]	0,90
Electrical continuity	The Hose is electrically continuous
Type of packing	WOODEN CRATE ISPM-15

Body

8083 - 8088

Customer:	ContiTech Rubber Industrial Kft
Order Number:	32258500
Part Number:	4205160045
Our Ref:	SO84201
Date:	11th February 2013
Certificate Number:	TR070687 (Rev. 18/06/2013)
Approved Signatories:	R M Greaves A Cocking J Jarvis A Pears S Selman

TM steels

3451 - 3466

4205160045

CERTIFICATE OF CONFORMITY

Description	Heat Treatment
AISI4130 BLACK ROLLED BAR, HEAT TREATED & TESTED TO 197-238 BHN, 655MPA MIN TENSILE, 517MPA MIN YIELD, 18% MIN ELONGATION, CHARPY IMPACT TESTING 27J MIN @ -30C (OR COLDER) LATERAL EXPANSION 0.38 MIN, ROLLING REDUCTION 3:1 MIN, NI 1% MAX & CE 0.62 MAX, TESTS MAY BE TAKEN FROM A 4" SQR QTC AS PER API 6A/PSL 3 QTC SIZE. MECHANICAL TEST SPECIMEN TO ASTM A370 NACE MR0175/ISO15156 APPLIES APPROX 20 TONNES 210 MM DIA CERTS TO EN10204 3.1	HARDENED FROM 880°C FOR 5:30 HOURS (WATER QUENCH) TEMPERED AT 670°C FOR 10 HOURS (AIR COOL) WATER TEMPERATURE BEFORE QUENCH, 28°C, AFTER, 35°C. TEMP. MEASUREMENT, FURNACE ATMOSPHERE THERMOCOUPLE COMPONENT HARDNESS E10 - 211 HBW10/3000 TEST COUPON - 4" SQ X 8" LONG, TESTED AT ¼ T LOCATION REDUCTION RATIO - 6,2 REDUCTION RATIO & HT APPLY TO BOTH JOB & TEST PIECE FURNACE CALIBRATION: API6A 20th ed, annex M C/E = 0.693

CAST 24613

C	Si	Mn	S	P	Ni	Cr	Mo	Al	Cu	Sn	Nb
0.3200	0.2590	0.5680	0.0090	0.0100	0.1660	1.0560	0.2350	0.0200	0.1420	0.0070	0.0010
V	**Ta**	**Ti**	**Nb+Ta**	**Co**	**N**	**B**	**W**	**Ce**	**Fe**	**As**	**Sb**
0.0010		0.0010			0.0078	0.0001					
Pb	**Ca**	**H (ppm)**	**CEV**								
		1.20	0.69								

TEST SPECIFICATION 517 N/mm2 MIN YIELD

Temperature	Re	Rp 0.2	Rm	A %	Z %	Impact	Temp.	Hardness
RT		517.000						
	N/mm2	N/mm2	N/mm2	4d				

TEST RESULTS

Test Number	Dir./Temp.	Re	Rp	Rm	A %	Z %	Joules	Charpy Direction	
ST22561N	20,0°C		524.000	696.000	G/L 50.00mm 27.60	67.70	KCV -46°C 80 50 78	LONG	HBW10/3000 211
Specimen Ø 12.500mm							KCV -60°C 50 50 46	LONG	
							% Shear Surface 62.0% 52.0% 60.0%		
							Lateral Expansion (mm) 0.840 0.740 1.020	LONG	

ContiTech Rubber Industrial Kft. CERTIFICATE ACCEPTABLE
QC INSPECTOR
DATE: 11.06.21.

For and on Behalf of TM Steels Ltd. A Cocking

TM Steels Ltd
Foxwood Way
Foxwood Road
Chesterfield
S41 9RA

Steel for the Oil and Engineering Industries
Machining and Boring Facilities

Tel +44 (0)1246 268312
Sales Fax +44 (0)1246 268313
Production Fax. +44 (0)1246 269841
email sales@tmsteels.co.uk
Co Reg No: 3523526 Vat No: GB 706 2614 57

HOWCO GROUP
HOWCO METALS MANAGEMENT

Carbrook Street
Sheffield S9 2JN
Telephone: +44 114 244 6711
Facsimile: +44 114 244 7469

Cert No.

'Body

8089 - 8090

Test Certificate

Customer Order Number	32252193 - 01	Test Number	402483
Customer Order Date	27Feb12	Part Number	4205160045
Sales Order Number	EUR-352067-1	Cast Number	23171
Report Date	25Sep12	Cert Number	EUR-285844
Quantity	14 Pcs 17402 Kgs 210 mm Dia		

To:
CONTITECH RUBBER INDUSTRIAL KFT
H-6728,
SZEGED,
BUDAPESTI UT 10, K.1562 - K1575
HUNGARY,
HUNGARY
4205160045

Description AISI 4130 75KSI .2% PS API QTC — Steel Type ALLOY 4130

Results quoted only refer to the items tested.

Material Specification	AISI4130				
Heat Treatment Spec	197-237BHN	Test Spec	517N/MM2MIN.YLD	Test Spec	
Melt Practice	EF/VD	Production Method	FORGED		

Heat Treatment	Temp(°C)	Soak	Coolant	Charge Ref.	Init	Max(°C)	Batch							
								Temp recorded using	CONTACT THERMOCOUPLE					
HARDEN	860	3 HRS	WATER QUENCH	SHF-158284	20	30	0912091308	Nature of T/P	Separate					
TEMPER	650	4 HRS	TABLE COOL	SHF-158284			1012091319	Qtc size	4Inch SQ X 6Inch LONG					
									Req. Min/Max			Achieved		
								Hardness on T/P	197	237	HBW	229	229	HBW
								Hardness on Material	197	237	HBW	218	235	HBW

Tensile - / Impacts -

Location	Direction	Rp 0.20%	Rm	A%	Z%	Location	Direction	CVN	Lat. Exp. (mm)	% Shear
1/4T	LONGITUDINAL	517 Min	655 to 800	18 Min (4d)	0 Min	1/4T	LONGITUDINAL	27 Min Ave	0.380 Min	0
Results (N/mm2)		580	765	25 (50.0mm)	64.0 (12.56mm)	Results (Joules)	-30 Centigrade	106 104 102	1.44 1.42 1.4	40 40 40
Results						Results				

Corrosion					
Pitting Resistance		Ferrite		Microstructure	
Carbon Equivalent	.671	Grain Size	Min 6	Max 6	

C	Si	Mn	P	S	Cr	Mo	Ni	Cu
0.2940	0.2920	0.5370	0.0110	0.0050	1.0620	0.2260	0.1660	0.2430

Certs to BSEN10204.2004 3.1
NACE MR-01-75
FE = BAL
REDUCTION RATIO 6.5:1

ContiTech Rubber Industrial Kft.
CERTIFICATE ACCEPTABLE
QC INSPECTOR
DATE: 12.10.04.

All furnace Calibration conforms to API6A 20th Edition ANNEX M.
Hardness load/penetration depth - HBW 10 diameter (mm)/3000 kgf test force per ASTM E10.

Third party inspection :

Names of Approved Signatories : S.Maxted G.Smith S.Suter P.Rogers M.Brown

Signature

CONTITECH RUBBER
Industrial Kft.
No:QC-DB- 651 /2013
Page: 11 / 44

Flange

HÁMOR zRt.

8083-8090 3386 4205140284

FORGING, MACHINING, HEAT-TREATING

ÉMI-TÜV ISO9001

H-3531 Miskolc, Kiss Ernő u. 17. Phone: 36/46/401-033 Fax: 36/46/379-199

INSPECTION CERTIFICATE

ACCEPTANCE ACCORDING EN 10204-05/3.1 | Certificate No.: 86989/13-0

Date of issue: 2013.03.27 | Hámor No.: **98-39B5263** | Order No.: 32259784/13/2

Customer: **Contitech Rubber Industrial Kft.**
6728 Szeged Budapesti út 10

Quality: **AISI 4130/CONTI** Spec.No.: **API 6A PSL3** 315/191 x 182
Dimension: **MSO-100597-002/A/H** mm
Final dim.:**MSO-100597-002/A(4 1/16")** Heat-treatment:Quenched & tempered

Quantity: **30** pcs | Weight: **73.0** kg/pc | Total weight: **2190.00** kg

nomination of product: **Forged,machined disc**

Chemical analysis %

Heat No.: 034939
Steelmaker: **CELSA Hutaostrowiec POLA**

	Spec. value	C	MN	SI	P	S	CR	MO	V	Ce
Test No.	Min.									
	Max.	0.45	1.80	1.00	0.025	0.025	2.75	1.500	0.300	0.82
	Result	0.28	0.56	0.20	0.006	0.003	0.99	0.170	0.003	0.62

Mechanical properties:

	Spec. value	HB	Rp0.2 MPa	Rm MPa	A5 %	KV-J -30°C
Test No.	Min.	197	517	655	18	27
	Max.	238				
	Result	235 238				
L13314	Result		525	662	19.50	35 52 82

ContiTech Rubber Industrial Kft. CERTIFICATE ACCEPTABLE
QC INSPECTOR
DATE: 11.01.29

Test bar from product.
Dimensional and visual control: passed
Ultrasonic test acc. to SEP 1921-84 spec. is satisfactory C/c
Steel making (melting) process: UHP-ASEA vacuum-treated.
NACE MR 0175/ISO 15156+API 17K + API 6A PSL3.
HB-E10,Mechanika:ASTM A370 acc.
Grade Of forging: 9.81 30 pc/series.

Executive

Hámor zRt. Minőség ellenőrzési Osztály

Expert

MŰ-4-10/1/96 HÁMOR zRt. FIALKA ERŐF.

HÁMOR ZRt.

MISKOLC Kiss Ernő u. 17. sz. H-3531 tel:36/46/401-033 fax:36/46/379-199 e-mail: hamor@t-online.hu

PROTOCOL NUMMER: 98-39B5263

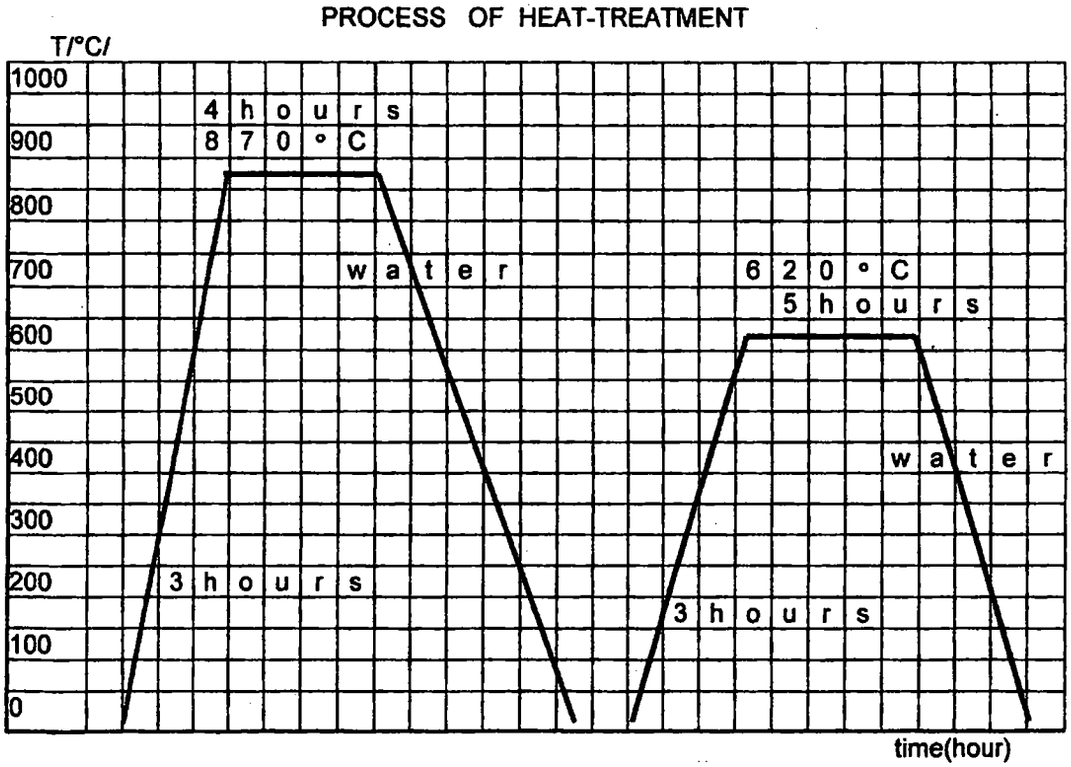
HEAT-TREATMENT PROTOCOL

BUYER: CONTITECH RUBBER INDUSTRIAL Kft. Szeged Budapesti út 10. sz.	Order No. of Buyer: 32259784/13/2	
	Work No. of Buyer:	
PRODUCT: forged	QUANTITY: PIECE 30	No. of drawing: MSO-100597-002/A/H
MATERIAL QUALITY: AISI 4130 CONTI API 6A PSL3	Charge No.: 34939	Test No.:

HEAT-TREATMENT: quenching and tempering

Typ of furnace: electric furnace Hardening medium: water

PROCESS OF HEAT-TREATMENT



Miskolc, Hámor ZRt. 2013-03-26.

Kanó

head of heat-treatment

Hámor zRt. Minőség ellenőrzés Osztály

winword\doc\HOKEZ-K\CONTITECH\4130-620

Felado : 61344 gamma controll kft 19/18/13 12:54 Lap: 2

GAMMA-CONTROLL	HARDNESS TEST REPORT	Report No: 561/13.

CLIENT:	**JE-ZO KFT. SZEGED, KÜLTERÜLET, 01408/22.**
TEST EQUIPMENT:	**TH 160-D Hardness tester**
PROCEDURE:	**QCP-45-R1**
DESCRIPTION OF COUPLING:	**coupling(s) after PWHT**
DRAWING NUMBER:	**MT-3121-3000**
SERIAL NUMBER:	**8083; 8084; 8085; 8086**

BRINELL HARDNESS REQUIREMENT	SERIAL NO OF COUPLING	PART OF THE COUPLING	ACTUAL HARDNESS RESULT (HB)
Min HB 197 Max HB 238	✓ 8083	body	224
		weld	222
		flange	236
		connection face	238
	✓ 8084	body	213
		weld	208
		flange	220
		connection face	238
	✓ 8085	body	214
		weld	214
		flange	219
		connection face	222
	✓ 8086	body	232
		weld	237
		flange	238
		connection face	197

The coupling(s) conform to API Spec 6A requirements.

DATE:	PREPARED:	APPROVED:
2013. október 30.	Ménesi István	GAMMA-CONTROLL KFT. 6750 Algyő, Külterület 0188/14. hrsz Adószám: 11094574-2-06 www.gamma-controll.hu

QCP-03 HB/11

Felado : 61344 gamma controll kft 19/10/13 12:54 Lap: 3

GAMMA-CONTROLL	HARDNESS TEST REPORT	Report No: 562/13.

CLIENT:	**JE-ZO KFT. SZEGED, KÜLTERÜLET, 01408/22.**
TEST EQUIPMENT:	**TH 160-D Hardness tester**
PROCEDURE:	**QCP-45-R1**
DESCRIPTION OF COUPLING:	**coupling(s) after PWHT**
DRAWING NUMBER:	**MT-3121-3000**
SERIAL NUMBER:	**8087; 8088; 8089; 8090**

BRINELL HARDNESS REQUIREMENT	SERIAL NO OF COUPLING	PART OF THE COUPLING	ACTUAL HARDNESS RESULT (HB)
Min HB 197 Max HB 238	✓ 8087	body	213
		weld	216
		flange	220
		connection face	225
	✓ 8088	body	229
		weld	212
		flange	223
		connection face	213
	✓ 8089	body	219
		weld	229
		flange	231
		connection face	238
	✓ 8090	body	207
		weld	210
		flange	226
		connection face	234

The coupling(s) conform to API Spec 6A requirements.

DATE:	PREPARED:	APPROVED:
2013. október 30.	Ménesi István	GAMMA CONTROLL KFT. 6750 Algyő, Külterület 0438/14. hrsz. Adószám 11024814-2-06 www.gamma-controll.hu Varga Miklós

QCP-03 HB/11

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, Kőtárület 01694/14. hrsz.
Tel./Fax.: +36 62/517-400 / 51344
A NAT által #NAT-1-1143/2010 számon akkreditált vizsgálólaboratórium

ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV

ULTRASONIC EXAMINATION REPORT

Vizsgálati szám: Report No.: **513/13**

Vizsgálat tárgya / Object of test		**Coupling (Body)**	
Gyártó Manufacturer		Megrendelő Customer	**JE-ZO Kft. Szeged**
Gyáriszám Serial-No.		Rendelési szám Order-No.	—
Azonosító jel Identification	**8083-8088**	Követelmény Requirement	**ASTM A388**
Geometriai kialakítás / Rajzszám Geometric configuration / Drawing-No. **MT-3121-3000**	**ø200xø70x491**	Vizsgálati hőkezelés Test heat treatment	előtt prior
Anyagminőség Material	**AISI 4130**	Letapogatási irányok Direction of scanning	**axiális és radiális**
Adagszám Heat-No.	**24613**		
Vizsgálati felület állapota Surface condition	forgácsolt machined	Vizsgálati terjedelem Exted of Test	**100%**
Vizsgált darabszám Testing pieces	**6 db**		

Vizsgálati adatok / Examination data

Készülék típusa Type of US-equipment	**USM25**	Készülék gyári száma Serial-No. Of US-equipment	**7875f**	
Vizsgálófej(ek) Searc unit(s)	SEB-2, SEB4H	Frekvencia(k) Frequency(ies)		2 MHz 4 MHz MHz MHz
Kalibrációs blokk Calibration standard identfication	**ET1,ET2**	Erősítés(ek) Gain	axiálisan	18 dB dB dB
			radiálisan	6 dB
Csatoló közeg Couplant	olaj oil	Hanggyengülés Attenuation		dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés Evaluation	X	megfelelő satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek)
Remark(s)

Hely / kelt Place / date		
Gamma-Controll Kft. Algyő, 2013.10.17	..... Vizsgálatot végezte Tested by	GAMMA-CONTROLL KFT. 6750 Algyő, Kőtárület 01694/14. hrsz. Adószám: 11094614-2-06 www.gamma-controll.hu Tel.: 06-30-218-2640 Jóváhagyta Approved by
	Tóth Ákos UT20103090307	Benkő Péter - Felelős vezetőh.

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, külterület 01584/14. hrsz.
Tel./Fax.: +36 62/517-400 / 61344

ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV

ULTRASONIC EXAMINATION REPORT

Vizsgálati szám: Report No.: **514/13**

Vizsgálat tárgya / Object of test		**Coupling (Body)**	
Gyártó / Manufacturer		Megrendelő / Customer	**JE-ZO Kft. Szeged**
Gyáriszám / Serial-No.		Rendelési szám / Order-No.	—
Azonosító jel / Identification	**8089-8090**	Követelmény / Requirement	**ASTM A388**
Geometrial kialakítás / Rajzszám Geometric configuration / Drawing-No. **MT-3121-3000**	**ø200xø70x491**	Vizsgálati hőkezelés előtt Test heat treatment prior	
Anyagminőség / Material	**AISI 4130**	Letapogatási irányok / Direction of scanning	**axiális és radiális**
Adagszám / Heat-No.	**23171**		
Vizsgálati felület állapota / Surface condition	forgácsolt / machined	Vizsgálati terjedelem / Exted of Test	**100%**
Vizsgált darabszám / Testing pieces	**2 db**		

Vizsgálati adatok / Examination data

Készülék típusa / Type of US-equipment	**USM25**	Készülék gyári száma / Serial-No. Of US-equipment	**7875f**
Vizsgálófej(ek) / Searc unit(s)	**SEB-2, SEB4H**	Frekvencia(k) / Frequency(ies)	**2 MHz** **4 MHz** MHz MHz
Kalibrációs blokk / Calibration standard identfication	**ET1,ET2**	Erősítés(ek) / Gain	**axiállsan 18 dB** dB dB **radiállsan 6 dB**
Csatoló közeg / Couplant	**olaj / oil**	Hanggyengülés / Attenuation	dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés / Evaluation	X	megfelelő / satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek) / Remark(s)

Hely / kelt / Place / date		
Gamma-Controll Kft. Algyő, 2013.10.17	Vizsgálatot végezte / Tested by	GAMMA - CONTROLL KFT. 6750 Algyő, külterület 01584/14. hrsz. Adószám: 24094614-2-06 www.gamma-controll.hu Tel.: 06-30/278-2640 / Approved by
	Tóth Ákos UT20103090307	Benkő Péter - Felelős vezetőh.

GAMMA-CONTROLL www.gamma-controll.hu	ULTRAHANG VIZSGÁLATI JEGYZŐKÖNYV ULTRASONIC EXAMINATION REPORT	Vizsgálati szám: Report No.: 516/13

Vizsgálat tárgya / Object of test		Flange	
Gyártó Manufacturer		Megrendelő Customer	JE-ZO Kft. Szeged
Gyártszám Serial-No.		Rendelési szám Order-No.	---
Azonosító jel Identification	8083-8090	Követelmény Requirement	ASTM A388
Geometriai kialakítás / Rajzszám Geometric configuration / Drawing-No. MT-3121-3000	ø315xø85xø190x94xø70	Vizsgálati hőkezelés Test heat treatment	előtt prior
Anyagminőség Material	AISI 4130	Letapogatási irányok Direction of scanning	axiális és radiális
Adagszám Heat-No.	034939		
Vizsgálati felület állapota Surface condition	forgácsolt machined	Vizsgálati terjedelem Extend of Test	100%
Vizsgált darabszám Testing pieces	8 db		

Vizsgálati adatok / Examination data

Készülék típusa Type of US-equipment	USM25	Készülék gyári száma Serial-No. Of US-equipment	7875f
Vizsgálófej(ek) Searc unit(s)	SEB-2, SEB4H	Frekvencia(k) Frequency(ies)	2 MHz 4 MHz MHz MHz
Kalibrációs blokk Calibration standard identfication	ET1,ET2	Erősítés(ek) Gain	axiálisan 6 dB dB dB radiálisan 6 dB
Csatoló közeg Couplant	olaj oil	Hanggyengülés Attenuation	dB/m

Értékelés / észlelt kijelzések / Evaluation / recordable indications

Értékelés Evaluation	X	megfelelő satisfactory		nem megfelelő / not acceptable

Megjegyzés(ek) Remark(s)

Hely / kelt Place / date Gamma-Controll Kft. Algyő, 2013.10.17	Vizsgálatot végezte Tested by Tóth Ákos UT20103090307	GAMMA-CONTROLL KFT. 6750 Algyő, Kültelek ... Adószám ... www.gamma-controll.hu Jóváhagyta Approved by: Benkő Péter - Felelős vezető

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **UT20103090307**

A tanúsított neve: (The name and forename of the certificated individual): *Tóth Ákos József*

Születési hely/idő: (Place and date of birth): *Hódmezővásárhely, 1987. 09. 19.*

A tanúsított személy aláírása (The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): *Ultrahangos anyagvizsgálat (Ultrasonic testing)*

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): *(c)+Fv, (w)+Fv, (wp)+Fv, (f)+Fv*

A minősítés fokozata: (The level of certification): *UT2*

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): *Budapest, 2009. 12. 07.*

A tanúsítás érvényes: (The date upon which certification expires): *2014. 12. 06.*

Tanúsító Testület nevében (On behalf of certifying body)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to): 9/2001 GM, 97/23 EC

Kijelölés: 9/2001 GM 067/2004 GM

Dátum (Date): 2009.12.04.

Vizsgáztató (Examiner)

A tanúsítás érvényessége -ig megújítva (MSZ EN 473 9.):
(Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date):_____

Tanúsító Testület nevében (On behalf of certification body)

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint a Nemzeti Akkreditáló Testület által a NAT-5-0013/2006 számon akkreditált tanúsító testület az MSZ EN 473 számú szabvány szerint eredményes vizsgája alapján a nevezett személyt tanúsítja a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an accredited by the National Accreditation Board (under No. NAT-5-0013/2006) certification body, on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett kötések-termékek (welded products); t - csövek (tubes); wp - alakított termékek (wrought products); p - műanyag termékek (plastics products); k - kompozitok (composites products).

UT20103090307

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN 473 3.21)

(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21)

GAMMA - CONTROLL KFT
6722 Szeged, Gyertyámos u. 14-16/A
Adószám: [illegible]
OTP Bank: 11735005-20406154
www.gamma-controll.hu
Tel.: 06 30 218-2640

Munkáltató aláírása: (Signature of the employer:)

Dátum: 2009.12.07. (Date:)

Folyamatos munkavégzés igazolása (MSZ EN 473 9.) (Evidence of continued work activity (MSZ EN 473 9.))			
Sorsz.:	Munkáltató aláírása (Signature of the employer)	Bélyegző (Stamp)	Dátum (Date)
1.	[signature]	"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2010.01.04.
2.	[signature]	"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2011.01.06.
3.	[signature]	"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2012.01.09.
4.	[signature]	"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2013.01.09.
5.			
6.			
7.			
8.			
9.			
10.			

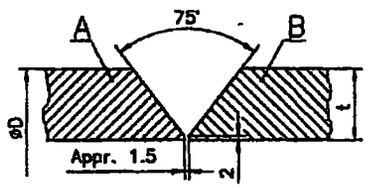
Kiegészítések:
(Additional remarks:)

* A tanúsítvány a munkáltató aláírásával érvényes
(This certificate is valid with the signature of the employer.)

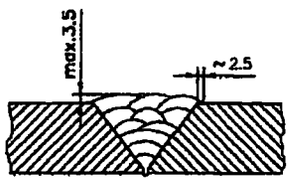
PHOENIX RUBBER INDUSTRIAL LTD.	TECHNICAL DATA SHEET	TDS	Page
	WELDING PROCEDURE SPECIFICATION	WPS	N° 1 of 2

CLIENT IDENTITY CODE	THIS SPECIFICATION IS BASED ON ASME CODE SECTION IX	WPS N° 140–71 REV 4 SUPPORTING PQR N° BUD 0700002/1
ITEM Qty DATA FOR ACCEPTANCE	WELDING PROCESS: GTAW-SMAW TYPES: MANUAL	PERFORMED BY: WELDER'S STAMP

JOINTS (QW–402)



JOINT DESIGN BACKING: YES/NO



Sequences of weld see on addendum

WELD SEQUENCE

BASE METALS (QW–403) DRW N°		PART „A"	PART „B"
GRADE:	WNo.:1.7220	ASTM A 322-91: AISI 4130 / 34CrMo4 (MSZ EN 10083-1) *	
CARBON EQUIVALENT	max.C_e =	0.82	0.82
MECHANICAL PROPERTIES: TENSILE STRENGTH	N/mm^2 min.	655	655
DUCTILITY	% min.	18	18
HARDNESS	HB max.	238	238
IMPACT TEST -30°C	J Average	27	27
THICKNESS:	t = 5-38 mm	OUTSIDE DIAMETER :	ØD = 60-280 mm

FILLER METALS (QW–404)

WELD MATERIAL	DIAMETER	BRAND	STANDARD	SUPPLIER
Rod	2.4 mm	EML 5	AWS A5.18-01: ER70S-3	Böhler
Electrode	3.2; 4.0	T-PUT NiMo 100**	AWS A 5.5-96: E 10018-D2 (mod.)	Böhler

LAPSE BETWEEN OF PASSES MIN./min

POSITIONS (QW–405)	PREHEAT (QW–406)
POSITIONS: 1G Rotated (horizontal)	PREHEAT TEMP.: 300-330 °C
WELDING PROGRESSION: Weld flat at or near to the top	INTERPASS TEMP.: max. 350 °C
POSITION OF FILLET	PREHEAT MAINTENANCE: Till the begining of postweld heat threating
OTHER	METHOD OF PREHEATING: Furnace

CONTINUATION OF WPS N° 140–71 Rev.4							Page N° 2 of 2
POSTWELD HEAT TREATMENT (QW–407)				GAS (QW–408)			
HOLDING TEMP. RANG 620 +20 / -0 C°				SHIELDING GAS Argon for root			
HOLDING TEMP. TIME 4 HR							
HEATING RATE MAX.:				PERCENTAGE COMPOSION (MIXTURE)			
COOLING RATE MAX.: 80 °C/HR				99.995 %			
LOCATION OF THERMOCOUPLE				FLOW RATE 10-12 LITRES/min.			
				GAS BACKING: Argon (for 1st and 2nd passes)			
FURNACE ATMOSPHERE Air				FLOW RATE 7-9 Litres/min			
TYPE:				TRAILING SHIELDING GAS COMP.			
ELECTRICAL CHARACTERISTICS (QW–409)						1st pass: -	
CURRENT DC				ELECTRODE POLARITY :		2nd-28th passes: +	
TUNGSTEN ELEKTRODE SIZE/TYPE: Ø3.2 mm thoriated tungsten							
MODE OF TRANSFER FOR GMAW							
ELECTRODE / WIRE FEED SPEED RANGE							

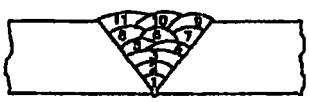
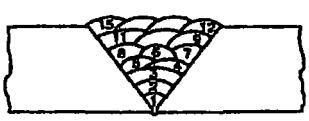
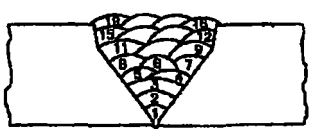
WELD LAYERS	PROCESS	FILLER METAL CLASS	FILLER METAL DIAMETER	CURRENT TYPE POLAR.	CURRENT AMP. RANGE	VOLT RANGE	HEAT INPUT (KJ/cm)
1	GTAW	EML 5	2.4 mm	-	110-130	11-12	5-8.4
2-3	SMAW	T-PUT NiMo 100	3.2 mm	+	120-140	24-26	12-19.6
4-28	SMAW	T-PUT NiMo 100	4.0 mm	+	150-170	26-30	16.2-27.5

TRAVEL SPEED RANGE 100-130 mm/min							
TECHNIQUE (QW–410)							
STRING OR WEAVE BEAD				ORIFACE OR GAS CUP SIZE Ø9mm			
INITAL/INTERPASS CLEANING: Brushing, Grinding							
EQUIPMENTS FOR WELDING:							
OTHER:							

EXAMINATION –	REMARKS
Acc. to the acceptance instruction N° MIO-FB 2 Based on ASME IX.	- * Formerly CMo3 (MSZ 61) - ** Ni content less than 1 % - Before welding bake electrodes for 2 hours at 350 °C

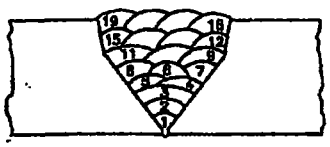
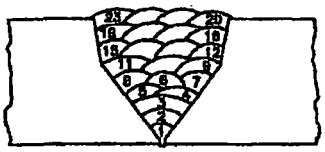
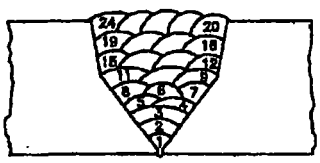
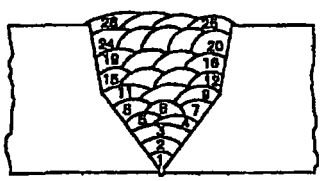
	BY	DATE	TECHNICAL DATA SHEET	
Desig.	Bozó	14.06.2007	WELDING PROCEDURE SPECIFICATION	HOSETECHNICAL DEPARTMENT
Appr.	Tóth	14.06.2007	SUBJECT: Butt weld of hose coupling for H2S service; Strenght 75K	WPS N° 140-71 Rev.4
Chek'd				

PHOENIX RUBBER Industrial Ltd. Hose Division	N°:	WPS 140-71 Addendum
	Revision:	4
	Page N°:	1/2
ADDENDUM for the approved wall thickness range 5-38 mm	Date:	2007-06-12
	Designed:	
	Checked:	
Based on WPS 140-71 Rev.4, PQR No.: BUD 0700002/1	Approval:	

No.	Wall thickness [mm]	Weld layers		Electrode Ø [mm]
1.	5-7		1 2	3,2 3,2
2.	7-9		1 2-3	3,2 3,2
3.	9-11		1 2-3 4-5	3,2 3,2 4,0
4.	11-13		1 2-3 4-6	3,2 3,2 4,0
5.	13-15		1 2-3 4-8	3,2 3,2 4,0
6.	15-18		1 2-3 4-10	3,2 3,2 4,0
7.	18-20		1 2-3 4-11	3,2 3,2 4,0
8.	20-22,22		1 2-3 4-15	3,2 3,2 4,0
9.	22,2-26		1 2-3 4-19	3,2 3,2 4,0

Remarks: - Process for layer No1 GTAW with Ø3,2 mm thoriated tungsten electrode and Ø2,4 mm Rod EML 5;
for the others: SMAW with electrode T-PUT NiMo 100

PHOENIX RUBBER Industrial Ltd.	N°:	WPS 140-71 Addendum
ADDENDUM for the approved wall thickness range 5-38 mm Based on WPS 140-71Rev.4, PQR No.: BUD 0700002/1	Revision:	4
	Page N°:	2/2

No.	Wall thickness [mm]	Weld layers		Electrode Ø [mm]
10.	26-29		1 2-3 4-19	3,2 3,2 4,0
11.	29-32		1 2-3 4-23	3,2 3,2 4,0
12.	32-35		1 2-3 4-24	3,2 3,2 4,0
13.	35-38		1 2-3 4-28	3,2 3,2 4,0

Remarks: - Process for layer No1 GTAW with Ø3,2 mm thoriated tungsten electrode and Ø2,4 mm wire EML 5;
for the others: SMAW with electrode T-PUT NiMo 100

Certificate no: BUD 0700002/1
Page 1 of 2

Welding Procedure Qualification Record (PQR) ASME IX

Energy and Transportation

Company Name: Phoenix Rubber Gumilpari Kft. SZEGED

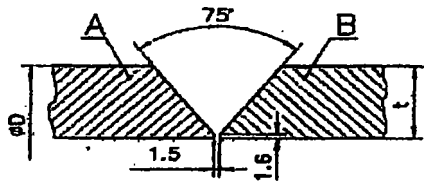
Procedure Qualification Record No. BUD 0700002/1 Date 28 February 2007

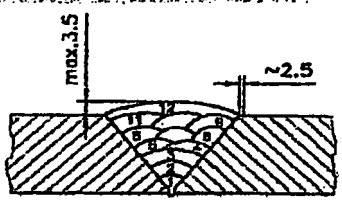
WPS No. 140-71

Welding Process(es) GTAW/SMAW

Types (Manual, Automatic, Semi-Auto.) Manual

Joints (QW-402)





Groove Design for Test Coupon
(For combination qualifications, the deposited weld metal thickness shall be recorded for each filler metal or process used.)

Base Metals (QW-403)

Material Spec. ASTM A 322-91, AISI 4130

Type or Grade AISI 4130

P.No. AISI 4130 to P-No. AISI 4130

Thickness of Test Coupon 19 mm

Diameter of Test Coupon 72 mm

Other

Postweld Heat Treatment (QW-407)

Temperature 620 +20-0 °C

Time 4 hours

Other

Gas (QW-408)

	Percent Composition Gas(es)	(Mixture)	Flow Rate
Shielding	Ar 99.95%		10-12 l/min
Trailing			
Backing	Ar 99.95%		7-9 l/min

Filler Metals (QW-404)

	GTAW	SMAW
SFA Specification	ER 70S-3	E 10018-G
AWS Classification	A5.18	A5.5
Filler Metal F-No.	6	4
Weld Metal Analysis A-No.	1	2
Size of Filler Metal	2.4 mm	3.2, 4.0 mm
Other		
Weld Metal Thickness	3 mm	16 mm

Position (QW-405)

Position of Groove 1G rotated

Weld Progression (Uphill, Downhill)

Other

Preheat (QW-406)

Preheat Temp. 300-330 °C

Interpass Temp max 350 °C

Other

Electrical Characteristics (QW-409)

Current DC

Polarity GTAW DCEN, SMAW DCEP

Amps. Layer 1 120, Layer 2-3 127, Layer 4-12 156

Volts Layer 1 11-12, Layer 2-3 24-25, Layer 4-12 28-30

Tungsten Electrode Size 3.2 mm

Other

Technique (QW-410)

Travel Speed Layer 1-11 100-130 Layer 12 mm/min

String or Weave Bead Layer 1-11 String Layer 12 Weave

	GTAW	SMAW
Multipass or Single Pass (per side)	S	M
Single or Multiple Electrodes	S	M

Heat Input Layer 1 6.0-8.8 KJ/cm
Layer 2-3 14.1-19.8 KJ/cm
Layer 4-12 18.7-28.1 KJ/cm

Certificate no: BUD 0700002/1
Page 2 of 2

Tensile Test (QW-150) PQR No. BUD 0700002/1

Specimen No.	Width mm	Thickness mm	Area mm²	Ultimate Total Load kN	Ultimate Unit Stress MPa	Type of Failure & Location
39/1	18.9	15.8			657	Base material
39/2	18.9	15.7			664	Base material

Guided Bend Tests (QW-160)

Type and Figure No.	Results
180° Bend roller dia. 36 mm 2+2 pcs.	Satisfactory

Toughness Tests (QW-170)

Specimen No.	Notch Location	Specimen Size mm	Test Temp. °C	Impact Value J	% Shear	Mils	Drop Weight Break (Y/N)
39	S	10x10x55	-30	33			
39	S	10x10x55	-30	49			
39	S	10x10x55	-30	41			
39	HAZ	10x10x55	-30	38			
39	HAZ	10x10x55	-30	97			
39	HAZ	10x10x55	-30	62			

Comments:

Fillet Weld Test (QW-180)

Result– Satisfactory: Yes ☐ No ☐ Penetration into Parent Metal: Yes ☐ No ☐

Macro - Results

Other Tests

Type of Test	Hardness test
Deposit Analysis	
Other	Macro - Satisfactory X-ray - Satisfactory

Welder's Name: Tivadar Szabo DC-II. 378258 Clock No. (BC 15) Stamp No.

Test Conducted By: DKG EAST Anyagvizsgalati Labor. Laboratory Test No: TMO 007-7/07 VJK 1207/2007

We certify that the statements in this record are correct and that the test welds were prepared, welded, and tested in accordance with the requirements of Section IX of the ASME Code.

Date Issued: 28 February 2007

Lloyd's Register EMEA Budapest Office

Manufacturer's Representative Laszlo Bajusz

Manufacturer Phoenix Rubber Gumipari Kft, SZEGED

Laszlo Penzes
Surveyor to Lloyd's Register EMEA

A member of the Lloyd's Register Group

Form 4106 (2006.12)

LLOYD'S REGISTER GROUP PAPER 01/1/2005

CONTITECH

Fluid Technology

WELDER'S APPROVAL TEST CERTIFICATE - ASME CODE IX

Examiner or test body: ABS Registration No.: RK1825997.R1

Designation ASME IX: GTAW / SMAW Pipe BW s19 1G

Welder's name: Tivadar Szabó (BC15)

Identification card No: 517278EA

Date and place of birth: 19. August 1949; SZEGED

		Weld test details	Range of approval	Photo (if required)
Welding process		GTAW/SMAW		
Filler metal	Type	Rod / Electrode		
	Designation	AWS 5.18: ER70S-3 AWS 5.5: E9018		
Parent metal group(s)		ASTM A 322-91; AISI 4130	ASTM A 322-91; AISI 4130	
Plate or pipe		Pipe	Pipe/Plate	
Welding position		1G	1G/Flat	
Outside diameter (mm)		72 mm	> 25 mm	Identification of test pieces:
Test piece thickness (mm)		19	Max to be welded	
Single/ both side welding		Single		WPS No.: ***140-60 Rev.4***
Gouging/ backing				
Joint type		Groove	Groove / Fillet	Testing standard: ***ASME IX***
Shielding/ backing gas(ses)		Argon (99,95%)		

Welding carried out, place: Szeged Date: 29 April 2010
Welding Engineer: László Bajusz

Type of test	Performed and accepted	Not required
Visual	Accepted (Vjk-1739/10)	
Radiography	Accepted (Vjk-1739/10)	
Ultrasonic		+
Magnetic particle		+
Penetrant		+
Macro		+
Fracture		+
Bend		+
Additional tests		+

Place and date:

Szeged, 18-Jun-2010

Surveyor:

Péter Szabó

Stamp and signature:

ABS

See attached page(s) for prolongation by employer every 6 months

Continental
CONTITECH

Fluid Technology

WELDER'S APPROVAL TEST CERTIFICATE - ASME CODE IX

Examiner or test body: ABS Registration No.: RK1825997.R1

Welder's name: Tivadar Szabó (BC15)

Identification card No.: 517278AE

Date and place of birth: 19. August 1949; SZEGED

PROLONGATION OF APPROVAL BY EMPLOYER			
Place	Date	Name/ position/ title	Stamp and signature
Szeged	29.10.2010.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2011.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2011.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2012.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2012.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.04.2013.	Laszlo Bajusz / Welding technologist	Bacsel
Szeged	29.10.2013	Laszlo Bajusz / Welding technologist	Bacsel

JE-ZO KFT. 6728 Szeged, Külterület 01408/22 hrsz. Adószám: 13341039-2-06 Bankszámlaszám: 12067008-00127077-00100001	**WELDING LOG SHEET** **HEGESZTÉSI MUNKALAP**	WLS Nº. Száma: 2013./ 2898. PAGE /oldal 1/1

CLIENT Megrendelő	CONTITECH RUBBER Industrial Kft.	PURCH.ORDER Nº. Rendelésszám	32261598.
CONTRACT Nº. Kötésszám	SPOOL/JOB Nº. Üzemi m.szám 2898 – 2905.	WPS Nº. Heg.ut.száma	HD-71. Rev. 4. /.7
NAME OF WEDED PARTS Heg. alkatrész megnevezése	Body + Flange	DRWG Nº. Rajzszám	HT 3121-3000.
NAME/ Nº. OF WELDER Hegesztő neve és száma	Szabó Tivador László. B.C. 15.	LOCATION/SHOP Munkavégzés helye	Szeged. Tápé Széle 6.
DATE Dátum 2013. 10. 25	QUANTITY Darabszám 8.	SERIAL NUMBERS Sorszámok	8083 – 8090.

1. MATERIAL CONTROL Anyag megfelelőség azonosítása	SUBJECT 1 Tárgy 1	body	MATERIAL Anyag	AISI. 4130.	CAST Nº. Adagszám	24613, 8083-8088 27171, 8085-8090
	SUBJECT 2 Tárgy 2	Flange	MATERIAL Anyag	AISI. 4130.	CAST Nº. Adagszám	034939.

2. FILLER METAL Elektróda minőség és méret	WELD LAYERS Varratszám	1.	2-3.	4 – 11.	
	TYPE Típus	Thl. 5.	NIMO. 100.	NIMO. 100.	
	DIAMETER Átmérő	2.4.	3.2.	4.	
	FILLER CAST Nº. Elektr.adagszám	800303.	1124075	1127750.	
3. ELECTRICAL CHARACTERISTICS Elektromos adatok	TYPE POLAR Polaritás	–	+	+	
	VOLT (V)	12.	24.	26.	
	AMPERE (A)	180.	140.	180.	

4. PRE HEAT TREATMENT OF ELECTRODES Elektróda felhasználást megelőző hőkezelése	300. C°	8. Hours

5. APPLIED SHILDING GAS Alkalmazott védőgáz	TYPE Típus Argon.	Percentage Composition Tisztaság. 99.95. %	Flow Rate Áramlási sab l/min 8.
6. HEAT TREATMENT (pre-weld) Előmelegítés 300. C°		7. POSITION Helyzet Forgatott.	
8. SPEED OF TRAVELS Hegesztési sebesség 100÷130. mm/min		9. LAPSE BEETWEN OF PASSES Varratfelrakási szünetek 8. min	

10.POSTWELD HEAT TREATMENT Utóhőkezelési adatok	Time Idő 240. min	Temperature Hőmérséklet 620. C°	Furnace atmosph. Hűtőközeg Levegő.	Cooling rate Hűlési sebesség 80. C°/H

11. RADIOGRAPHIC TEST CERT. Nº. Radiográfiai vizsg. biz. száma: 2450/13, 2451/13

REPAIR Javítás	YES/ Igen	X NO/ Nem
	PLACE OF DEFECT Hiba helye	TYPE OF DEFECT Hiba típusa
	METHOD OF REPAIR Javítási módszer	

VISUAL INSPECTION Szemrevételezés: Megfelelő / Satisfactory.

REMARKS Megjegyzés: Fronius. Magic. Wave. 2600.

Date, end of coling down time Dátum, kihűlés vége 2013. 10. 26. – 13. óra	WELDER Hegesztő MINŐSÍTETT HEGESZTŐ KÖZKERESETI TÁRSASÁG 6725 Szeged, Tápé széle 6. Isv.: 6753 Szeged, Heller köz 1. Adószám: 09747290-2-06 (BC 15)	INSPECTOR Ellenőr JE-ZO KFT. 6728 Szeged, Külterület 01408/22 hrsz. Adószám: 13341039-2-06 Bankszámlaszám: 12067008-00127077-00100001 DATE Dátum 2013 NOV 04

WLS-13

GAMMA-CONTROLL	SZEMREVÉTELEZÉSES VIZSGÁLATI JEGYZŐKÖNYV VISUAL EXAMINATION REPORT	Record No. Jegyzőkönyv száma: 813/13

Object Tárgy	Coupling welding Csatlakozó hegesztés	Serial No. Gyári szám	8083-8090
Customer Megrendel	JE-ZO Kft. Szeged	Drawing No. Rajzszám	MT-3121-3000
Job Nr. Munkaszá	002/13	Material/Dimension Anyagminőség/méret	AISI 4130 118/77
Quantity Mennyisé	8 db	Extent of examination Vizsgálat terjedelme	100%
Requirements Követelmények	ASME code VIII/1	Heat treatment Hőkezelés	after PWHT
Written Procedure No. Vizsgálati eljárás száma	QCP-09-1	Welder Hegesztő	BC15

Visual examination / Szemrevételezéses vizsgálat

Technique Módszer	Direct visual	-
Instrument Készülék	-	-
Visual aids Segédeszközök	3x magnifiying lens	-

Measurement / Mérés

Equipment Készülék	-		-
Instrument Készülék	-		-
Surface temperature A felület hőmérséklete	20 °C	Surface condition Felület állapota: machined	Lighting intensity Megvilágítás: 1000lx

Test results
Eredmények :

SATISFACTORY
megfelelő............8 pc(s)/db

not accepted
nem megfelelő........0 pc(s)/db

Vizsgálat helye és ideje: Place and date of test: Gamma-Controll Kft. Algyő, 2013.10.30. (10h)	Vizsgálatot végezte: Tested by: Kis Gábor VT20103130102	Áttekintette és jóváhagyta: Reviewed and approved by: GAMMA - CONTROLL KFT. 6750 Algyő, Külterület 01834/14 Adószám: 11094612-2-06 www.gamma-controll.hu Tel.Fax: 62/517-400

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **VT20103130102**

A tanúsított neve: (The name and forename of the certificated individual): ***Kis Gábor Balázs***

Születési hely/idő: (Place and date of birth): ***Szeged, 1980. 02. 29.***

A tanúsított személy aláírása
(The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Szemrevételezéses anyagvizsgáló (Visual testing)***

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): ***(c), (w), (wp), (f)***

A minősítés fokozata: (The level of certification): ***VT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2013. 02. 19.***

A tanúsítás érvényes: (The date upon which certification expires): ***2018. 02. 18.***

Tanúsító Testület nevében
(On behalf of certifying body)

Vizsgáztató
(Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certifying body)

A tanúsítás érvényessége -ig megújítva (MSZ EN ISO 9712 10.):
(Renewed the validity of the certification until (MSZ EN ISO 9712 10.):)

Dátum
(Date): _____

Tanúsító Testület nevében
(On behalf of certification body)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett és forrasztott termékek (welded products); t - csövek és csővezetékek (tubes); wp - alakított termékek (wrought products); k – kompozit anyagok (composites products).

VT20103130102

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

* **Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN ISO 9712 3.21)**
(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN ISO 9712 3.21))

"GAMMA-CONTROLL" KFT.
6726 Szeged, Tűzok u. 8/A.
Adószám: 11094614-2-06
OTP Bank: 11735005-20400134
www.gamma-controll.hu
Tel.: 06-30-216-5510

Munkáltató aláírása: (Signature of the employer)　　**Dátum:** (Date:) 2013.03.06.

	Folyamatos munkavégzés igazolása (MSZ EN ISO 9712 10.) (Evidence of continued work activity (MSZ EN ISO 9712 10.))		
Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph.	Dátum (Date)
1.	[signature]	"GAMMA-CONTROLL" Anyagvizsgáló és Minőségellenőrző Kft.	2013.03.06.
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Kiegészítések:
(Additional remarks:)

* A tanúsítvány a munkáltató aláírásával érvényes
(This certificate is valid with the signature of the employer.)

GAMMA-CONTROLL www.gamma-controll.hu 6750 Algyő, Külterület 01884/14. hrsz. Tel./Fax.: +36 62/517-400 / 61344	**RADIOGRÁFIAI VIZSGÁLATI JEGYZŐKÖNYV** RADIOGRAPHIC EXAMINATION REPORT	Jegyzőkönyv szám: Report No.: **2431/13** Kiállítás dátuma: Date of report: **2013.10.30**

Vizsgálat tárgya: Object:	Coupling	Megrendelő: Client:	JE-ZO Kft. Szeged
Munkaszám: Job No.:	—	Rendelési szám: Order No:	—
Rajzszám: Drawing No.:	MT-3121-3000	Anyagminőség: Material:	AISI 4130
Vizsgálati szabvány: Testing standard:	QCP-13-1	Vizsgálat terjedelme: Extent of testing:	100%
Átvételi követelmény: Acceptance criteria:	ASTM E94	Hőkezelés: Heat treatment condition:	After PWHT
Kód: Code:	MSZ EN ISO 6520-1	Hegesztő jele: Welder stamp:	BC15
Berendezés típusa: Type of equipment:	GAMMAMAT	Képminőségjelző típusa: Type of IQI:	ASTM set B type
Sugárforrás: Source:	Ir192	Képminőség jelző helye: Placement of IQI:	F
Sugárforrás mérete: Source size:	3x1,5mm	Előírt képminőség: Required IQI:	2% (2-2T)
Aktivitás: Activity:	0,4 TBq	Film típus: Film Type:	FOMA R5
Filmkidolgozás módja: Film processing:	Kézi: Manual: / Automata: Automatic: X	Fóliafajta és vastagság: Screen type and thick:	Pb 0,027

Megnevezés Designation	Méret Size ⌀	Felvételek száma: Number of radiographs db	Átsugárzott anyagvastagság: Penetrated thickness mm	Sugárforrás film távolság: Source-to-film distance mm	Film és a tárgy sugárforrás felőli oldalától: Distance from source side of object to film mm	Feketedés: Density	Megvilágítási idő: Expos. Time min	Minősítés: A=megfelelő, NA=nem megfelelő Result: A=accepted, NA=not accepted	Vizsgálat időpontja: Date of test	Hibák/Defects Gáz Porosity A 200	Salak Slag B 300	Kötés Lack of fusion C 401	Gyök Lack of penetration D 402	Repedés Crack E 100	Felület Surface F 500
✓ 8083	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
✓ 8084	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
✓ 8085	115/77	4	19	96	19	2.4	0.5	A	10.30. 10h						
✓ 8086	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
✓ 8087	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
✓ 8088	115/77	4	19	96	19	2.4	0,5	A	10.30. 10h						

A filmszámok és varratszámok azonosak, beazonosításuk a megrendelőt terheli.
The numbers of the films and welds are identical, their identification is the task of the costumer.

Vizsgálatot végezte: Performed by: Ménesi I. - Szabó T.

Vizsgálat helye: Place of test: 6750 Algyő, Gamma-Controll Kft. Telephely	Értékelte: Evaluated by: Ménesi István RT20101120107	Jóváhagyta: Approved by: GAMMA - CONTROLL KFT 6750 Algyő, Külterület 01884/14. hrsz Adószám: 11094614-2-06 www.gammacontroll.hu Tel.: 06 30 218 2640 Felelős Vezető

GAMMA-CONTROLL

www.gamma-controll.hu
6750 Algyő, Külterület 01856/14. hrsz.
Tel./Fax.: +36 62/517-400 / 61344

RADIOGRÁFIAI VIZSGÁLATI JEGYZŐKÖNYV

RADIOGRAPHIC EXAMINATION REPORT

Jegyzőkönyv szám:
Report No.: **2430/13**

Kiállítás dátuma:
Date of report: **2013.10.30**

Vizsgálat tárgya: Object:	Coupling	Megrendelő: Client:	JE-ZO Kft. Szeged
Munkaszám: Job No.:	---	Rendelési szám: Order No:	---
Rajzszám: Drawing No.:	MT-3121-3000	Anyagminőség: Material:	AISI 4130
Vizsgálati szabvány: Testing standard:	QCP-13-1	Vizsgálat terjedelme: Extent of testing:	100%
Átvételi követelmény: Acceptance criteria:	ASTM E94	Hőkezelés: Heat treatment condition:	After PWHT
Kód: Code:	MSZ EN ISO 6520-1	Hegesztő jele: Welder stamp:	BC15
Berendezés típusa: Type of equipment:	GAMMAMAT	Képminőségjelző típusa: Type of IQI:	ASTM set B type
Sugárforrás: Source:	Ir192	Képminőség jelző helye: Placement of IQI:	F
Sugárforrás mérete: Source size:	3x1,5mm	Előírt képminőség: Required IQI:	2% (2-2T)
Aktivitás: Activity:	0,4 TBq	Film típus: Film Type:	FOMA R5
Filmkidolgozás módja: Film processing:	Kézi: Manual: Automata: Automatic: X	Fóliafajta és vastagság: Screen type and thick:	Pb 0,027

Megnevezés Designation	Méret Size ø	Felvételek száma Number of radiographs db	Átsugárzott anyagvastagság Penetrated thickness mm	Sugárforrás film távolság Source-to-film distance mm	Film táv. a tárgy sugárforrás felőli oldalától Distance from source side of object to film mm	Feketedés Density	Megvilágítási idő Expos. Time min	Minősítés: A=megfelelő NA=nem megfelelő Result A=accepted NA=not accepted	Vizsgálat időpontja; Date of test	Hibák/Defects Gáz Porosity A 200	Salak Slag B 300	Kötés Lack of fusion C 401	Gyök Lack of penetration D 402	Repedés Crack E 100	Felület Surface F 500
✓8089	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
✓8090	115/77	4	19	96	19	2,4	0,5	A	10.30. 10h						
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

A filmszámok és varratszámok azonosak, beazonosításuk a megrendelőt terheli.
The numbers of the films and welds are identical, their identification is the task of the costumer.

Vizsgálatot végezte:
Performed by: Ménesi I. - Szabó T.

Vizsgálat helye: Place of test:	Értékelte: Evaluated by:	Jóváhagyta: Approved by:
6750 Algyő, Gamma-Controll Kft. Telephely	Ménesi István RT20101120107	GAMMA - CONTROLL KFT 6750 Algyő, Külterület 01856/14. hrsz. Adószám: [illegible] Varga Miklós www.gamma-controll.hu Tel.: [illegible]

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **RT20101120107**

A tanúsított neve: (The name and forename of the certificated individual): ***Ménesi István***

Születési hely/idő: (Place and date of birth): ***Szentes, 1988. 09. 06.***

A tanúsított személy aláírása (The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Radiográfiai anyagvizsgálat (Radiographic testing)***

Ipari terület: (Industrial sector): **Készülékek, berendezések, létesítmények vizsgálata EM (Pre and in-service testing of equipment, plant and structure)**

Termék terület(ek): (Product sector(s)): ***(c), (w)***

A minősítés fokozata: (The level of certification): ***RT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2012. 03. 28.***

A tanúsítás érvényes: (The date upon which certification expires): ***2017. 03. 27.***

Tanúsító Testület nevében (On behalf of certifying body)

Vizsgáztató (Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Dátum (Date): _____

Tanúsító Testület nevében (On behalf of certifying body)

A tanúsítás érvényessége -ig megújítva (MSZ EN 473 9.):
(Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certification body)

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint „a Nemzeti Akkreditáló Testület által a **NAT-5-0013/2010** számon akkreditált személytanúsító szervezet" a nevezett személyt tanúsítja az MSZ EN 473 szerint eredményes vizsgája alapján a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an "accredited certification body for person an by National Accreditation Board (under No. **NAT-5-013/2010**", on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett kötések-termékek (welded products); t - csövek (tubes); wp - alakított termékek (wrought products); p - műanyag termékek (plastics products); k - kompozitok (composites products).

RT20101120107

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon. (MSZ EN 473 3.21)
(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21))

GAMMA-CONTROLL Kft.
6726 Szeged, Tuzok u. 3.
Adószám: 11094614-2-06
OTP Bank: 11735005-20406154
www.gamma-controll.hu
Tel :06-30-218-2640

Munkáltató aláírása: (Signature of the employer:) _____ **Dátum:** (Date:) 2013. 04. 19.

Folyamatos munkavégzés igazolása (MSZ EN 473 9.)
(Evidence of continued work activity (MSZ EN 473 9.))

Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph (Stamp)	Dátum (Date)
1.		"GAMMA-CONTROLL Anyagvizsgáló és Minőségellenőrző Kft."	2013. 04. 19.
2.		"GAMMA-CONTROLL Anyagvizsgáló és Minőségellenőrző Kft."	2013. 06. 09.
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Kiegészítések:
(Additional remarks:)

* A tanúsítvány a munkáltató aláírásával érvényes
(This certificate is valid with the signature of the employer.)

ContiTech Rubber Industrial Kft. Szeged/Hungary	**Examination record Vizsgálati jegyzőkönyv** **Liquid penetrant examination Festékdiffúzlós vizsgálat** ☒ **Magnetic particle examination Mágneses repedésvizsgálat**	Record No. Jegyzőkönyv száma : 1222/13

Manufacturer Gyártó	JE-ZO Kft.	Serial No. Gyári szám	8083-8090
Customer Megrendelő	ContiTech Rubber Industrial Kft.	Drawing No. Rajzszám	MT 3121-3000
Object Tárgy	coupling(s)	Material Anyagminőség	AISI 4130
Quantity Mennyiség	8 pc(s)	Extent of examination Vizsgálat terjedelme	100 % outside
Requirements Követelmények	ASTM E 709	Heat treatment Hőkezelés	yes
Written Procedure No. Vizsgálati eljárás száma	QCP-11-1	Welder: Hegesztő:	Szabó T.

Liquid penetrant examination /Folyadékbehatolásos vizsgálat

Penetrant Behatoló anyag	Remover Tisztító	Developer Előhívó
Dwell time Behatolási idő	Drying Szárítás	Developing time Előhívási idő
Surface temperature A felület hőmérséklete	Surface condition Felület állapota	Lighting intensity Megvilágítás

Magnetic particle examination/Mágnesezhető poros vizsgálat

Equipment type Készülék típusa	TSW 1000	Testing material Vizsgáló anyag	MR 76F	Magnetizing current Mágnesező áram	1000 A
Black light type UV-A lámpa típusa	Superlight C 10A-HE	Field strength checking Térerőmérő	Berthold disc	Field strength Térerő	4,2 kA/m
Surface temperature A felület hőmérséklete	23 °C	Surface condition Felület állapota	machined	Lighting intensity Megvilágítás	1000 µW/cm²

Test results
Eredmények :

satisfactory
megfelelő.....8..... pc(s)/db

not accepted
nem megfelelő.....-..... pc(s)/db

Performed by NDE Level II. Vizsgálatot végezte	Revised by Q.C. manager Ellenőrizte – MEO vezető
Signature Oravecz Gábor	Signature Markó László
Aláírás	Aláírás
Place/Date	Place/Date
Kelt Szeged, 04.11.2013.	Kelt Szeged, 04.11.2013.

ContiTech Rubber Industrial Kft. QC 3

ContiTech Rubber Industrial Kft. QC 1

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

RONCSOLÁSMENTES ANYAGVIZSGÁLÓ TANÚSÍTVÁNY
(Certificate of NDT personnel)

Azonosító szám: (Identification No.): **MT20103010506Ú**

A tanúsított neve: (The name and forename of the certificated individual): ***Oravecz Gábor***

Születési hely/idő: (Place and date of birth): ***Szeged, 1958. 07. 07.***

A tanúsított személy aláírása
(The signature of the certificated individual)

Vizsgálati eljárás(ok): (The NDT method(s)): ***Mágnesezhető poros anyagvizsgáló (Magnetic particle testing)***

Ipari terület: (Industrial sector): **Fémfeldolgozás MM (Metal manufacturing)**

Termék terület(ek): * Product sector(s): ***(c), (f), (w), (wp)***

A minősítés szintje: (The level of certification): ***MT2***

A tanúsítás és kiadásának időpontja: (The date of certification and it's issue): ***Budapest, 2012. 02. 21.***

A tanúsítás érvényes: (The date upon which certification expires): ***2017. 02. 20.***

Tanúsító Testület nevében
(On behalf of certifying body)

Vizsgáztató
(Examiner)

Az ipari és/vagy termék terület érvényesség kiterjesztve: (The industrial and/or product sector has been expanded to):

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certifying body)

A tanúsítás érvényessége _____ **-ig megújítva (MSZ EN 473 9.):**
(Renewed the validity of the certification until (MSZ EN 473 9.):)

Dátum (Date): _____

Tanúsító Testület nevében
(On behalf of certification body)

A Magyar Hegesztéstechnikai és Anyagvizsgálati Egyesülés, mint „a Nemzeti Akkreditáló Testület által a **NAT-5-0013/2010** számon akkreditált személytanúsító szervezet" a nevezett személyt tanúsítja az MSZ EN 473 szerint eredményes vizsgája alapján a fentiek szerint:
(The Hungarian Association of Welding Technology and Material Testing as an "accredited certification body for person an by National Accreditation Board (under No. **NAT-5-013/2010**", on the basis of his/her successful examination under the standard MSZ EN 473, hereby certifies the named individual according to the above:)

* c - öntvények (castings); f - kovácsolt termékek (forgings); w - hegesztett kötések-termékek (welded products); t - csövek (tubes); wp - alakított termékek (wrought products); p - műanyag termékek (plastics products); k - kompozitok (composites products).

MT20103010506Ú

MAGYAR HEGESZTÉSTECHNIKAI ÉS ANYAGVIZSGÁLATI EGYESÜLÉS
(HUNGARIAN ASSOCIATION OF WELDING TECHNOLOGY AND MATERIAL TESTING)
(Certification Body)

* **Meghatalmazzuk a tanúsítvány tulajdonosát, hogy vizsgálatokat végezzen és azok eredményéért felelősséget vállaljon.** (MSZ EN 473 3.21)
(The holder of this certificate has been authorised to perform tests and take responsibility for the test results. (MSZ EN 473 3.21))

Munkáltató aláírása: (Signature of the employer:) _____ **Dátum:** (Date:) 2012. 02. 21.

Folyamatos munkavégzés igazolása (MSZ EN 473 9.) (Evidence of continued work activity (MSZ EN 473 9.))			
Sorsz.:	Munkáltató aláírása (Signature of the employer)	Ph.	Dátum (Date)
1.		ContiTech Rubber Industrial Kft. Quality Control Dept. (1)	2013. 01. 24.
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

Kiegészítések:
(Additional remarks:)

* A tanúsítvány a munkáltató aláírásával érvényes
(This certificate is valid with the signature of the employer.)

Bekaert Hlohovec a.s.
Mierová 2317
92028 Hlohovec / Slovakia
Tel:: 00421337363111
Fax:: 00421337422742

505760

STEELCORD
MANUFACTURER : BKHL

Page : 1 / 1

Certificate of Analysis
Delivery No. : 4046181212

Contitech Rubber Industrial Kft.
CONTITECH RUBBER IND SZEGED
Budapesti út 10
H-6728 SZEGED

Sales Order	3046059220/10
Purchase Order	32260330
Inspection lot	090000200685/000001
Batch	3500245379
Date produced	01.07.2013
Date COA	09.08.2013
Spools	32 delivered from a batch of 32 produced
Units	18 delivered from a batch of 16 produced
Delivery net Qty.	10517 KG
Material Description	Zinc coated steelcord 1X24DW/3.6 NT 20/36 ZZ B650 5000 M
Lay direction	ZZ
Lay length	20/36

Spec customer	Contitech Rubber Industrial Kft.
Your code	14-18-07/1
Your spec	REV.3 / 15.01.2002
Our Spec	H207297 / 26.10.2012

Tests			Specs		Results	
Test	Procedure	Unit	Aim	Min. Max.	Avg. N	Min ind Max ind
Cord diameter	RA12-100	mm	3,6000	3,4200 3,7800	3,6845 6	3,6640 3,6930
Linear density	RA30-110	g/m	65,000	61,700 68,300	65,632 6	65,300 65,870
Cord breaking strength	RA30-203	N		17900,0	19337,0 6	19087,0 19584,0
Cord elongation at break	RA30-203	%		2,50	2,98 6	2,80 3,15
Zinc D1	RA40-741	g/m2		32,000	40,057 6	37,870 44,630
Zinc D2	RA40-741	g/m2		44,000	48,788 6	45,350 55,100
Residual torsions	RA30-150	Nt	0,000	-3,000 3,000	-0,250 6	-0,500 0,000

Comments :
D1: 0,54
D2: 0,73

Nominal Chemical composition of High Grade Oxysteel:
%Carbon : 0.70-0.90
%Manganese: 0.40-0.60
%Silicon: <0.230
%S: <0.011
%P: <0.012

Microstructure/Texture: Metallurgically the texture is known as a higly drawn, fine perlitic structure.

Electronically Signed by Quality Manager (Nagy Marcel)

According DIN EN 10204 3.1

Terninox S.p.A. con Unico Socio
Una società del gruppo ThyssenKrupp Acciai Speciali Terni
P.IVA 00682070558

Azienda con sistema di gestione certificato da IGQ secondo ISO 9001

CERTIFICATO DI COLLAUDO Conforme a EN 10204/ 3.1 — n° : 63892/2012

25 x 0,6 mm

Specifica/Specification:	**Destinatario/Receiver:**	**Cliente/Customer:** ACCIAI VENDER S.P.A.
EN 10088-2	ACCIAI VENDER S.P.A.	VIA A.NOBEL, 4/A Q.RE IND.LE S.P.I.P
	VIA A. NOBEL, 3/A	43100 PARMA
	43100 PARMA	**Acciaio/Steel:** 304PS

OUTSIDE STRIPWOUND TUBE

DDT/DEL. NOTE : 16753 **DEL/OF:** 24/05/2012 **Ordine/order Terninox :** P04249 **Ord. Cliente/Customer :**

Matricola Serial Number	Pos Item	Tipo Prodotto Product Type	Fin	Descrizione Description	Dimensioni(mm) Dimensions(mm)	Pezzi Pieces	Weight (Kg)	Rif. Cli. Cust. Ref.	Colata Heat	NIM
C47997 T33882	22	COIL	2B		0.60 x 460.0	1	6040		0431359	310727
C54489 T33887	27	NASTRI STRETTI	BA		0.79 x 264.7	1	1290		0431741	324612

IL MATERIALE SOPRA ELENCATO E' STATO DIMENSIONALMENTE E/O SUPERFICIALMENTE TRASFORMATO DA TERNINOX SENZA ALTERARNE LE CARATTERISTICHE MECCANICHE E CHIMICHE
THE MATERIAL DESCRIBED ABOVE HAS BEEN DIMENSIONALLY AND/OR SUPERFICIALLY TRASFORMED BY TERNINOX WITHOUT CHANGING THE MECHANICAL AND CHEMICAL FEATURES

Analisi di colata/Chemical Composition

Colata/Heat	C %	Si %	Mn %	P %	S %	Cr %	Ni %	Mo %	N %	Ti %	Cu %	Nb %	B %	Al %	Co %
0431359	0.045	0.300	1.290	0.027	0.001	18.000	9.040	0.260	0.024		0.310				
0431741	0.048	0.310	1.420	0.029	0.001	18.090	9.050	0.320	0.019		0.370				

Risultati delle prove/Test Result (1N/mm²=1 M Pa)

NIM	Prelievo (1)	Senso (2)	Caric. unit. snervamento Yield strenght		Caric. unit. Rottura Tensile strength	Allungamento a rottura Ultimate elongation (%)			Durezza Hardness	Piega a Bend To 180°	Trat.termico Ricot. di solub./ heat treatment of annealing for solubility	Resistenza alla corrosione intergranulare secondo / Resistance to corrosion intergranulare	Grano Grain
			RpO2% N/mm²	Rp1% N/mm²	Rm N/mm²	Lo =2"	Lo =80	Lo =A5	HRB				
310727	T	T	245	271	607		60.7		70.5		1050	EN ISO 3651-2	
	C	T	230	261	604		62.8		66.0				
324612	T	T	235	262	588		62.4		70.5		1050	EN ISO 3651-2	
	C	T	237	267	605		62.1		72.0				

I dati chimici e fisici sopra riportati sono tratti dal certificato di qualita' del nostro fornitore qualificato il cui originale e' in ns. possesso e disponibile su richiesta.
Chemical and physical data reported above are extracted from quality certificate emitted from our qualified supplier: the original document is in our possess and it is available upon your request.

Certifichiamo che i prodotti sopra elencati sono conformi alle prescrizioni dell'ordine/We certify that products listed above are compliant to order prescriptions

(1) Sampling
T = Testa - Top
C = Coda - Bottom

(2) Senso
T = Trasversale - Transverse
L = Longitudinale - Longitudinal

3. ITAL INOX HUNGÁRIA KFT.
1184 Budapest, Lakatos út 42/A.
297-1650, 291-6239 Fax: 290-5067
Adószám: 12141537-2-43
BAG Bk. 10000080-00000005-0?320181

COMPLIES WITH ED 2000/53/EC

Certificato emesso automaticamente

Data/Date 24/05/2012

R. GOVONI

500/124
506320

CONTITECH RUBBER Industrial Kft.
No:QC-DB- 651 /2013
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MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements
BUDAPEST XII., NÉMETVÖLGYI ÚT 37-39.
1535 Budapest, Pf. 919
Telefon: 458-5800
Telefax: 458-5927

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
NYO - 0008/2013
Hivatkozási szám / *Reference No.*:
32259470
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Kiadva / *Issued*
Budapest, 2013. 01. 28. / *28 01 2013*

KALIBRÁLÁSI BIZONYÍTVÁNY
CALIBRATION CERTIFICATE

A kalibrálás tárgya:	**villamos kimenőjelű nyomásmérő**
Object of calibration:	***electrical-output manometer***
Gyártó / *Manufacturer*:	AFRISO-EURO-INDEX GmbH
Típus / *Type*:	DMU03 HD
Azonosító szám / *Serial No.*:	1518086
Műszaki adatok / *Technical data*:	(0...2500) bar méréstartomány / *measuring range (0...2500) bar*
	(4...20) mA kimenőjel tartomány / *output signal range (4...20) mA*
Kalibrálásra bemutatta:	ContiTech Rubber Industrial Kft.
Customer:	6728 Szeged, Budapesti út 10.
A kalibrálás helye és ideje:	**Magyar Kereskedelmi Engedélyezési Hivatal**
Place and date of calibration:	***Hungarian Trade Licensing Office***
	Metrológiai Hatóság, Mechanikai Mérések Osztály
	Metrology Authority, Section of Mechanical Measurements
	Budapest, 2013.01.24.
A kalibrálást végezte:	.....
Calibrated by:	**Szaulich Dénes**
	metrológus / *metrologist*

A kalibrálásnál alkalmazott etalonok:
Standards used for the calibration:

Megnevezés: *Designation:*	Gyártó: *Manufacturer:*	Típus: *Type:*	Gyártási szám: *Serial No.:*	Bizonyítvány szám: *Certificate No.:*
túlnyomás etalon / *pressure standard*	Budenberg	283	20603	NYO-0001/2013
digitális multiméter / *digital multimeter*	Keithley	2000	0597910	ELD-0014/2012
normál ellenállás / *resistance standard*	ZIP	P 331	117530	ELD-0021/2012
hőmérő / *temperature measuring instr.*	GANZ MM	DTH1	33656	Hőm-0296/2012

A mérési eredmények a nemzeti (nemzetközi) etalonra visszavezetettek.
The measuring results are traceable to national standards.

A kalibrálás módja:
Calibration method:
A kalibrálást a KE NYO-3-2002 számú kalibrálás eljárás alapján végeztük.
The calibration was done according to the calibration procedure No.: KE NYO-3-2002.

CIPM MRA

This certificate is consistent with Calibration and Measurement Capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (for details see http://www.bipm.org).

MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
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A kalibrálás körülményei:
Calibration conditions:

környezeti hőmérséklet / *Ambient temperature*	21,1 °C
a kalibrált eszköz helyzete / *Position of the calibrated manometer*	függőleges / *vertical*
a kalibrált eszköz tápfeszültsége / *Supply voltage of the calibrated manometer*	24V DC
nyomóközeg / *Pressure transfer medium*	olaj / *oil*

Mérési eredmények a (0...2500) bar nyomástartományban:
Results of the measurements in the pressure range of (0...2500) bar:

Nyomás, névleges érték *Pressure, nominal value* bar	Áram-kimenőjel, névleges érték *Current-Output, nominal value* mA	Áram-kimenőjel, mért eltérés a helyes értéktől *Current-Output, measured deviation from the reference value* mA	Nyomás, mért eltérés a helyes értéktől *Pressure, measured deviation from the reference value* bar	Eredő mérési bizonytalanság *Expanded uncertainty of the measurement* bar
0	4,0	-0,0042	-0,7	2,6
250	5,6	-0,0002	0,0	
500	7,2	0,0029	0,5	
750	8,8	0,0050	0,8	
1000	10,4	0,0063	1,0	
1250	12,0	0,0053	0,8	
1500	13,6	0,0033	0,5	
1750	15,2	-0,0003	-0,1	
2000	16,8	-0,0052	-0,8	
2250	18,4	-0,0117	-1,8	
2500	20,0	-0,0192	-3,0	

Mérési bizonytalanság: A mérési eredmény(ek) mellett közölve.
Uncertainty of measurement: *See next to the results of the measurements.*

A közölt kiterjesztett mérési bizonytalanság a standard bizonytalanságnak *k kiterjesztési tényezővel* szorzott értéke (k = 2), amely normális (Gauss) eloszlás feltételezésével közelítőleg 95%-os fedési valószínűségnek felel meg.
The reported expanded uncertainty of measurement is stated as the standard uncertainty of measurement multiplied by the coverage factor k=2, which for a normal distribution corresponds to coverage probability of approximately 95 %.

A mérési bizonytalanság tartalmazza az etalonból, a kalibrálás módszeréből, a környezeti feltételekből, a kalibrált mérőeszközből stb. eredő részbizonytalanságokat.
It contains the uncertainties of the standards, calibration method, enviromental conditions, calibrated device etc.

A standard bizonytalanság meghatározása az EA–4/02 (Expression of the Uncertainty of Measurement in Calibration) kiadványnak megfelelően történt.
The standard uncertainty of measurement has been determined in accordance with the EA Publication EA 4/02 (Expression of the Uncertainty of Measurement in Calibration).

MKEH
Metrológiai Hatóság/*Metrology Authority*
Mechanikai Mérések Osztály
Section of Mechanical Measurements

Ügyiratszám / *File No.*:
MKEH-MH/00287-003/2013/NY
Bizonyítványszám / *Certificate No.*:
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Bélyegzés:
Calibration mark:
A kalibrált mérőeszközön **K067662** azonosító számú kalibrálási bélyeget helyeztünk el.
*We have placed a calibration stamp No.: **K067662** on the calibrated instrument.*

Megjegyzések:
Additional remarks:
Jelen bizonyítvány összhangban van a Nemzetközi Súly és Mértékügyi Bizottság (CIPM) Kölcsönös Elismerési Megegyezése (MRA) C függeléke által tartalmazott kalibrálási és mérési képességekkel (CMCs). Az MRA minden aláíró intézete elismeri egymás kalibrálási és mérési bizonyítványait a C függelék szerinti mennyiségfajtákra, azok értéktartományaival és mérési bizonytalanságaival (közelebbit lásd: http://www.bipm.org)
This certificate is consistent with Calibration and Measurement Capabilities (CMCs) that are included in Appendix C of the Mutual Recognition Arrangement (MRA) drawn up by the International Committee for Weights and Measures (CIPM). Under the MRA, all participating institutes recognize the validity of each other's calibration and measurement certificates for the quantities, ranges and measurement uncertainties specified in Appendix C (for details see http://www.bipm.org)

A kalibrálási bizonyítványban megadott értékek a mérőeszköznek a kalibrálás idejére és körülményeire jellemző adatai.
The measurement results show the metrological properties of the device during the time of the calibration under the environmental conditions listed above.

Az újrakalibrálás időpontját a felhasználó dönti el a mérőeszköz használatának és állapotának függvényében.
The date of the next calibration is decided by the user. It depends on the usage and the condition of the device.

A bizonyítvány kiadható / ***Approved by*:**

Magyar Kereskedelmi Engedélyezési Hivatal Metrológiai Hatóság 324.

Kálóczi László
osztályvezető / *Head of Section*

AMEREDEV

Requested Exceptions

- Variance is requested to connect the BOP choke outlet to the choke manifold using a co-flex line (instead of using a 4" OD steel line) with a 10,000 psi working pressure that has been tested to 15,000 psi and is built to API Spec 16C. Once the flex line is installed it will be tied down with safety clamps.

- Variance is requested to allow Option of rig not capable of reaching TD presetting Surface, Drilling Plan will be same using Fresh Water fluid system.

- Variance is requested to allow Temporary Postponement of Operations on well to skid to adjacent well if multiple wells on drilling pad are drilled.

- Variance is requested to allow use of Multi-Bowl Well Head System.

- Variance is requested to allow adjustment of Casing Design Safety Factor on conditions that Ameredev keeps minimum of 1/3 casing capacity filled with OMW drilling fluids.

- Variance is requested to allow 5M Annular Preventer on 10M BOPE System to drill Production Interval. (Supporting Documentation Attached)

APD ID: 10400030726 **Submission Date:** 06/13/2018

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

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

Show Final Text

Section 1 - Existing Roads

Will existing roads be used? YES

Existing Road Map:

CAMELLIA_FED_COM_26_36_21_083H___SITE_ACCESS_MAP_20190405133737.pdf

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

ROW ID(s)

ID:

Do the existing roads need to be improved? NO

Existing Road Improvement Description:

Existing Road Improvement Attachment:

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

CAMELLIA_FED_COM_26_36_21_083H___SITE_ACCESS_MAP_20190405133841.pdf
CAM_AZE_5SX_ROAD_20190405133855.pdf

New road type: RESOURCE

Length: 455 Feet **Width (ft.):** 30

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

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 20

New road access erosion control: Crowned and Ditched

New road access plan or profile prepared? NO

New road access plan attachment:

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information: NM One Call (811) will be notified before construction starts.

Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and Ditched

Road Drainage Control Structures (DCS) description: Crowned and Ditched

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

CAMELLIA_FED_COM_26_36_21_083H___SITE_ACCESS_MAP_20190405133841.pdf
CAM_AZE_5SX_ROAD_20190405133855.pdf

New road type: RESOURCE

Length: 455 Feet **Width (ft.):** 30

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

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 20

New road access erosion control: Crowned and Ditched

New road access plan or profile prepared? NO

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information: NM One Call (811) will be notified before construction starts.

Access miscellaneous information:

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

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New road drainage crossing: OTHER

Drainage Control comments: Crowned and Ditched

Road Drainage Control Structures (DCS) description: Crowned and Ditched

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 2 - New or Reconstructed Access Roads

Will new roads be needed? YES

New Road Map:

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CAM_AZE_5SX_ROAD_20190405133855.pdf

New road type: RESOURCE

Length: 455 Feet **Width (ft.):** 30

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

Army Corp of Engineers (ACOE) permit required? NO

ACOE Permit Number(s):

New road travel width: 20

New road access erosion control: Crowned and Ditched

New road access plan or profile prepared? NO

New road access plan attachment:

Access road engineering design? NO

Access road engineering design attachment:

Access surfacing type: OTHER

Access topsoil source: ONSITE

Access surfacing type description: Caliche

Access onsite topsoil source depth: 6

Offsite topsoil source description:

Onsite topsoil removal process: Grader

Access other construction information: NM One Call (811) will be notified before construction starts.

Access miscellaneous information:

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

Drainage Control

New road drainage crossing: OTHER

Drainage Control comments: Crowned and Ditched

Road Drainage Control Structures (DCS) description: Crowned and Ditched

Road Drainage Control Structures (DCS) attachment:

Access Additional Attachments

Additional Attachment(s):

Section 3 - Location of Existing Wells

Existing Wells Map? YES

Attach Well map:

CAMELLIA_FED_COM_26_36_21_083H___1_MILE_RADIUS_WELLS_20190405134007.pdf

Existing Wells description:

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

Submit or defer a Proposed Production Facilities plan? SUBMIT

Production Facilities description: Production from the proposed well will be transported to an existing production facility named Camellia CTB, northwest of the well pad, via a buried 4" poly flowline (700 psi maximum) that runs approximately 2,614'.

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Production Facilities map:

BO_CAMELLIA_FED_COM_BATTERY_SITE_REV1_20190405134127.pdf

CAM_AZE_5SX_FLOWLINE_20190405134129.pdf

BO_CAM_AZE_5XS_PAD_SITE_REV1_20190405134205.PDF

Section 5 - Location and Types of Water Supply

Water Source Table

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

Water source type: GW WELL

Describe type:

Source longitude:

Source latitude:

Source datum:

Water source permit type: PRIVATE CONTRACT

Source land ownership: PRIVATE

[redacted]

Source transportation land ownership: FEDERAL

Water source volume (barrels): 20000

Source volume (acre-feet): 2.577862

Source volume (gal): 840000

Water source and transportation map:

CAMELLIA_FED_COM_26_36_21_083H___WATER_MAP_20190405134608.pdf

CAMELLIA_FED_COM_26_36_21_083H___WATER_WELLS_LIST_20190405134609.pdf

[redacted]

New water well? NO

New Water Well Info

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

Well target aquifer:

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

Aquifer comments:

Aquifer documentation:

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

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

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

Drilling method: **Drill material:**

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Grout material:

Grout depth:

Casing length (ft.):

Casing top depth (ft.):

Well Production type:

Completion Method:

Water well additional information:

State appropriation permit:

Additional information attachment:

Section 6 - Construction Materials

[redacted]

Construction Materials source location attachment:

CAMELLIA_FED_COM_26_36_21_083H___CALICHE_MAP_20190405134800.pdf

Section 7 - Methods for Handling Waste

Waste type: DRILLING

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

Amount of waste: 2000 barrels

Waste disposal frequency : Daily

[redacted]

Safe containmant attachment:

[redacted] **Disposal location ownership:** COMMERCIAL

Disposal type description:

[redacted]

Reserve Pit

[redacted]

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Cuttings Area

Cuttings Area being used? NO

Are you storing cuttings on location? YES

[redacted]

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

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

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

WCuttings area liner

Cuttings area liner specifications and installation description

Section 8 - Ancillary Facilities

Are you requesting any Ancillary Facilities?: NO

Ancillary Facilities attachment:

Comments:

Section 9 - Well Site Layout

Well Site Layout Diagram:

CAMELLIA_FED_COM_26_36_21_083H___WELL_SITE_DIAGRAM_20190405135114.pdf

Comments:

Section 10 - Plans for Surface Reclamation

[redacted]

Recontouring attachment:

CAMELLIA_FED_COM_26_36_21_083H___WELL_SITE_DIAGRAM_20190405135134.pdf

Drainage/Erosion control construction: Crowned and ditched

Drainage/Erosion control reclamation: Harrowed on the contour

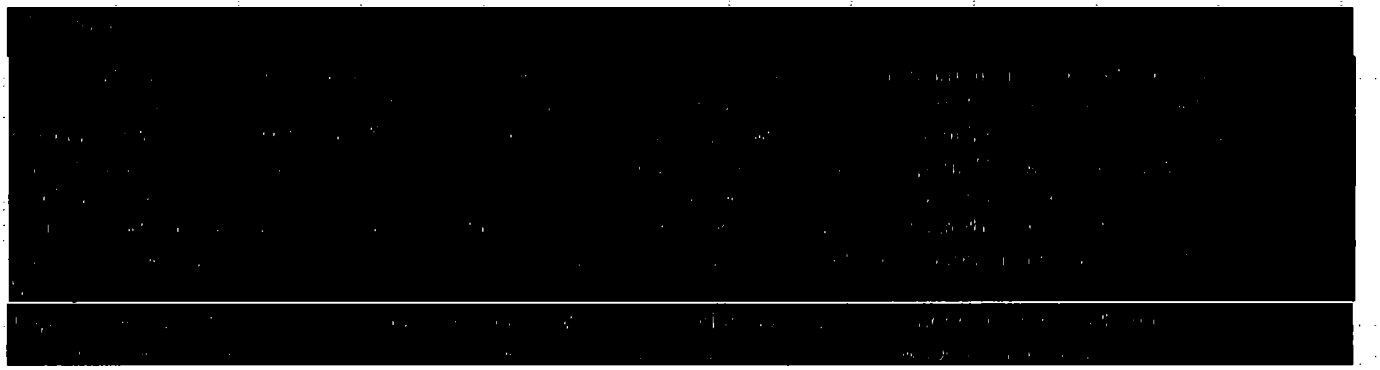
Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Well pad proposed disturbance (acres): 4.53
Road proposed disturbance (acres): 0.313
Powerline proposed disturbance (acres): 0
Pipeline proposed disturbance (acres): 1.8
Other proposed disturbance (acres): 0
Total proposed disturbance: 6.643

Well pad interim reclamation (acres): 0.79
Road interim reclamation (acres): 0
Powerline interim reclamation (acres): 0
Pipeline interim reclamation (acres): 0
Other interim reclamation (acres): 0
Total interim reclamation: 0.79

Well pad long term disturbance (acres): 3.74
Road long term disturbance (acres): 0.313
Powerline long term disturbance (acres): 0
Pipeline long term disturbance (acres): 1.8
Other long term disturbance (acres): 0
Total long term disturbance: 5.853



Soil treatment: None

Existing Vegetation at the well pad:

Existing Vegetation at the well pad attachment:

Existing Vegetation Community at the road:

Existing Vegetation Community at the road attachment:

Existing Vegetation Community at the pipeline:

Existing Vegetation Community at the pipeline attachment:

Existing Vegetation Community at other disturbances:

Existing Vegetation Community at other disturbances attachment:

Non native seed used? NO

Non native seed description:

Seedling transplant description:

Will seedlings be transplanted for this project? NO

Seedling transplant description attachment:

Will seed be harvested for use in site reclamation? NO

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Seed harvest description:

Seed harvest description attachment:

Seed Management

Seed Table

Seed type: **Seed source:**

Seed name:

Source name: **Source address:**

Source phone:

Seed cultivar:

Seed use location:

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

Total pounds/Acre:

Seed Summary	
Seed Type	Pounds/Acre

Seed reclamation attachment:

Operator Contact/Responsible Official Contact Info

First Name: Zachary **Last Name:** Boyd

Phone: (580)940-5054 **Email:** zboyd@ameredev.com

Seedbed prep:

Seed BMP:

Seed method:

Existing invasive species? NO

Existing invasive species treatment description:

Existing invasive species treatment attachment:

Weed treatment plan description: To BLM standards

Weed treatment plan attachment:

Monitoring plan description: To BLM standards

Monitoring plan attachment:

Success standards: To BLM satisfaction

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Pit closure attachment:

Section 11 - Surface Ownership

Disturbance type: WELL PAD

[redacted]

USFS Region:

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

Disturbance type: NEW ACCESS ROAD

[redacted]

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

[redacted]

USFS Region:

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

Disturbance type: PIPELINE

[redacted]

USFS Region:

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

Section 12 - Other Information

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

ROW Type(s):

ROW Applications

SUPO Additional Information:

Operator Name: AMEREDEV OPERATING LLC

Well Name: CAMELLIA FED COM 26 36 21 **Well Number:** 083H

Use a previously conducted onsite? YES

[redacted]

Other SUPO Attachment

CAMELLIA_FED_COM_26_36_21_083H___SUPO_REV_20190405135459.pdf

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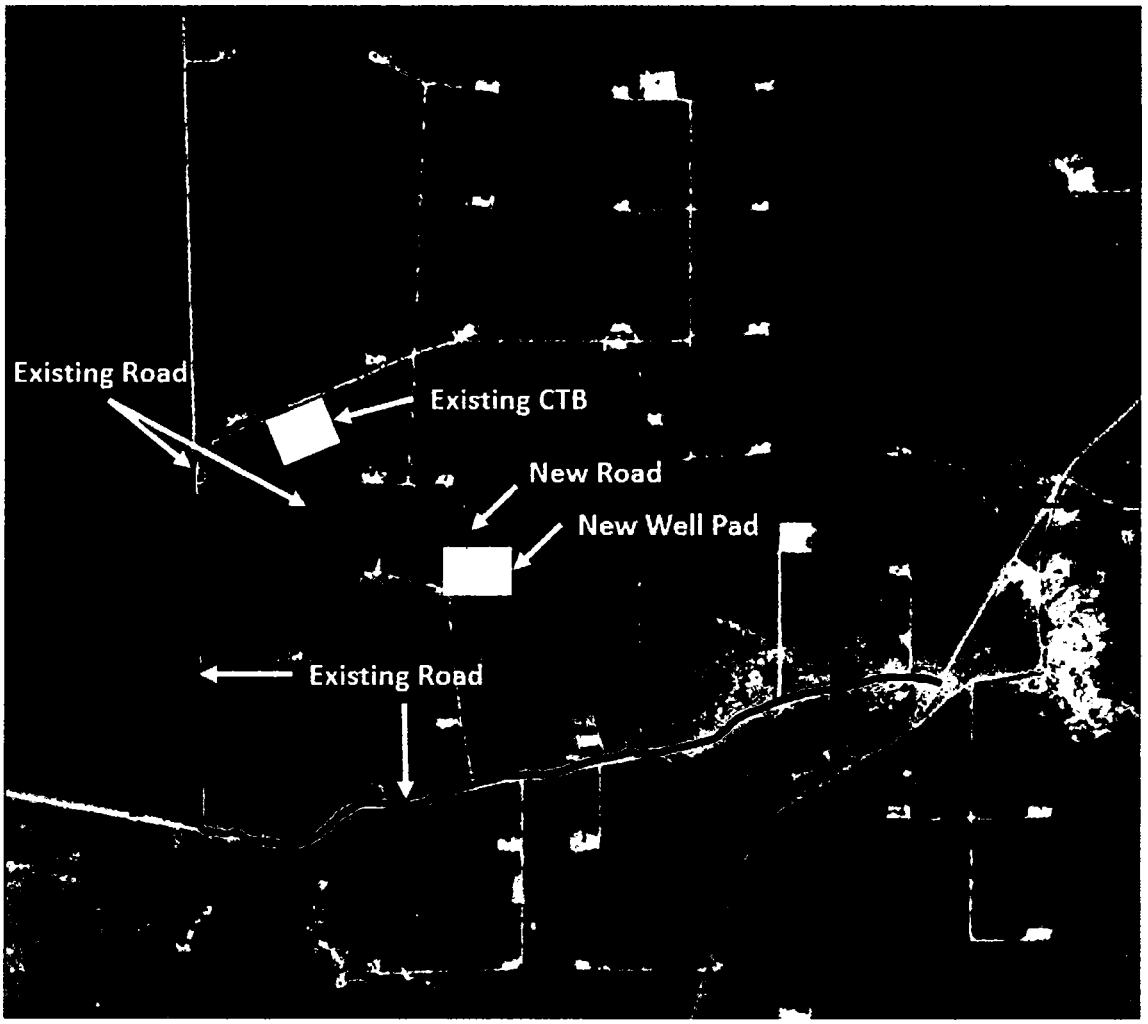
Camellia Fed Com 26 36 21 083H
Section 21, Township 26S, Range 36E
Lea County, New Mexico



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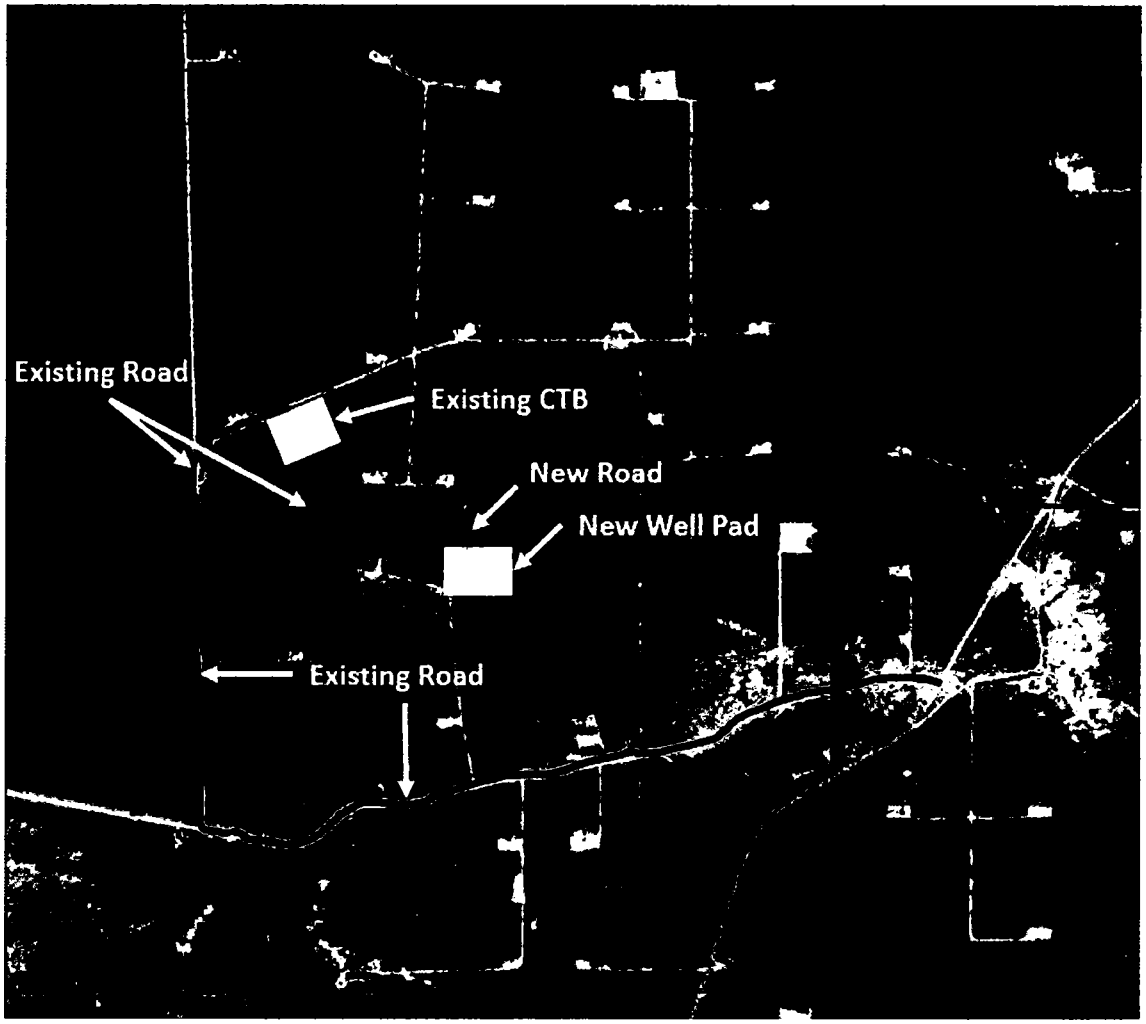
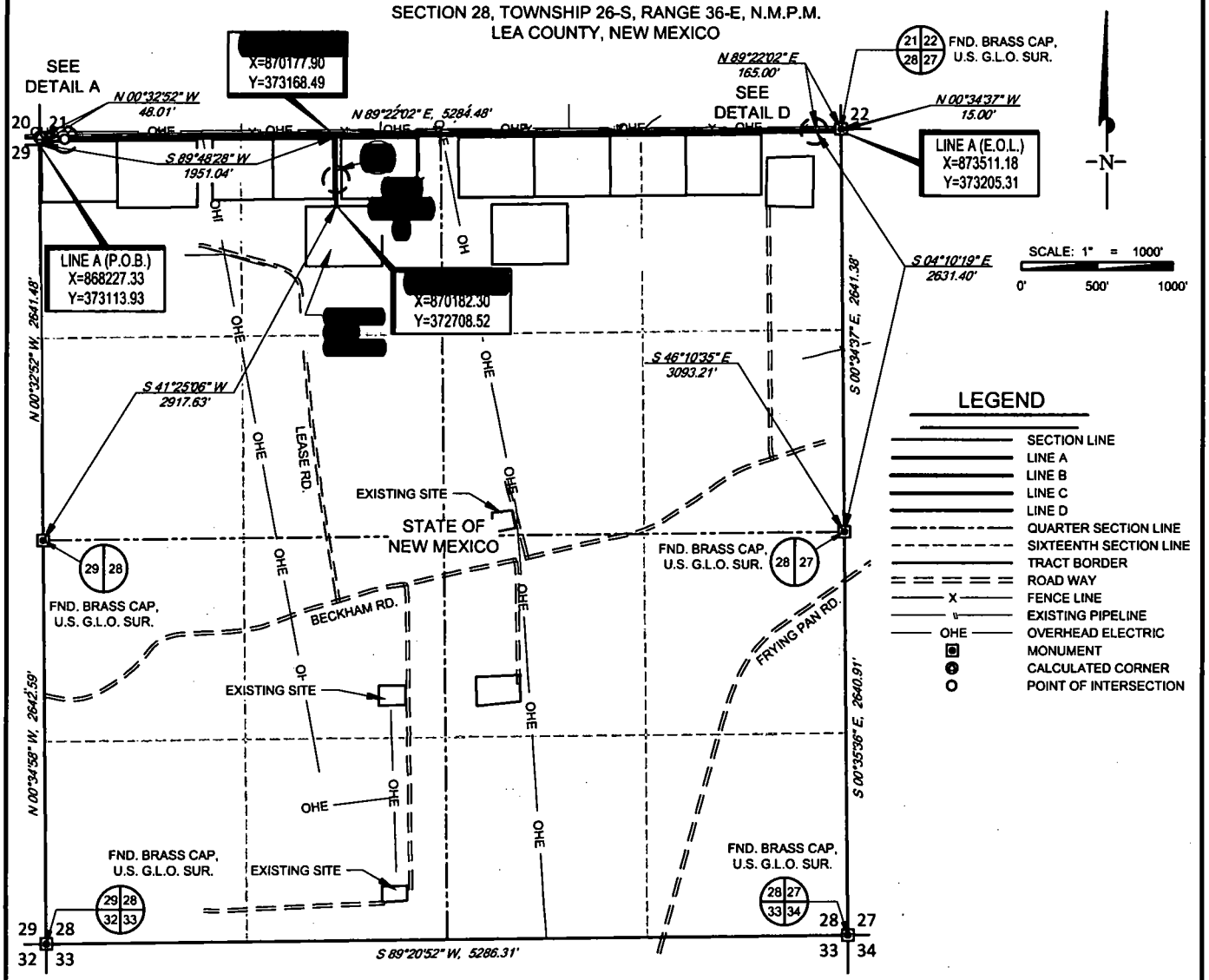
Section 21, Township 26S, Range 36E
Lea County, New Mexico



SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



LEGEND

- SECTION LINE
- LINE A
- LINE B
- LINE C
- LINE D
- QUARTER SECTION LINE
- SIXTEENTH SECTION LINE
- TRACT BORDER
- ROAD WAY
- FENCE LINE
- EXISTING PIPELINE
- OVERHEAD ELECTRIC
- MONUMENT
- CALCULATED CORNER
- POINT OF INTERSECTION

CAMELLIA FED COM ROAD EASEMENT

Being a proposed road easement being 30 feet in width, 15 feet left and right of the above platted centerline total line footage containing 5802.80 feet or 351.68 rods, containing 4.00 acres more or less and being allocated by quarter quarters as follows:

NW/4 NW/4 - 1324.44 feet or 80.27 rods, containing 0.91 acres
NE/4 NW/4 - 1776.12 feet or 107.63 rods, containing 1.23 acres
NW/4 NE/4 - 1366.12 feet or 82.80 rods, containing 0.94 acres
NE/4 NE/4 - 1336.12 feet or 80.98 rods, containing 0.92 acres

MICHAEL B. BROWN NEW MEXICO 18329 PROFESSIONAL SURVEYOR

Michael B. Brown, P.S. No. 18329
APRIL 20, 2018

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AMEREDEV OPERATING, LLC

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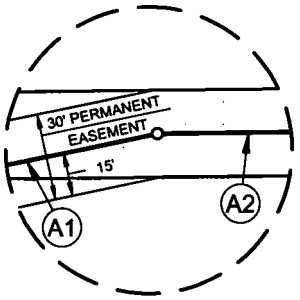
CAMELLIA FED COM ROAD	REVISION: AMD	04/20/2018
DATE: 03/22/2018		
FILE: EP_CAMELLIA_FED_COM_ROADS_SEC_28_REV1		
DRAWN BY: IMU		
SHEET: 1 OF 2		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND, UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY AMEREDEV OPERATING LLC. ONLY UTILITIES/EASEMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN/ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY.
4. P.O.B./B.O.L. = POINT OF BEGINNING/BEGINNING OF LINE
5. P.O.E./E.O.L. = POINT OF EXIT/END OF LINE

S:\SURVEY\AMEREDEV_OPERATING_LLC\CAMELLIA_FED_COM\FINAL_PRODUCTS\EP_CAMELLIA_FED_COM_ROADS_SEC_28_REV1.DWG 4/1/2019 4:04:31 PM ccaston

SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



DETAIL VIEW A
SCALE: 1" = 60'

LINE TABLE A

LINE	BEARING	DISTANCE
A1	N 78°03'36" E	168.37'
A2	N 89°22'02" E	5119.43'

LINE TABLE C

LINE	BEARING	DISTANCE
C1	S 00°34'37" E	45.00'

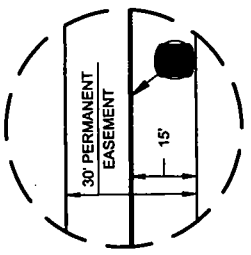
LINE TABLE D

LINE	BEARING	DISTANCE
D1	N 00°34'54" W	15.00'

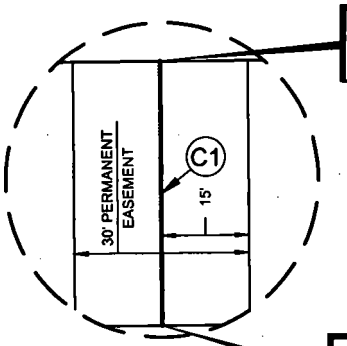
LEGEND

- SECTION LINE
- LINE A
- LINE B
- LINE C
- LINE D
- QUARTER SECTION LINE
- SIXTEENTH SECTION LINE
- TRACT BORDER
- ROAD WAY
- X — FENCE LINE
- EXISTING PIPELINE
- OHE — OVERHEAD ELECTRIC
- MONUMENT
- CALCULATED CORNER
- POINT OF INTERSECTION

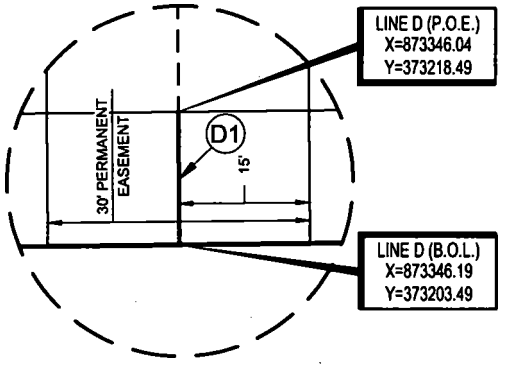
-N-



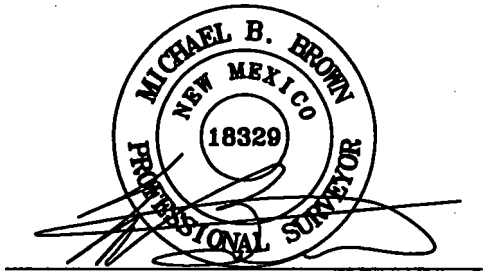
SCALE: 1" = 40'



DETAIL VIEW C
SCALE: 1" = 30'



DETAIL VIEW D
SCALE: 1" = 20'



Michael B. Brown, P.S. No. 18329
APRIL 20, 2018

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Camellia Fed Com 26 36 21 083H
Section 28, Township 26S, Range 36E
Lea County, New Mexico

Exhibit 2 – One Mile Radius Existing Wells depicts all known wells within a one mile radius of the Camellia Fed Com 26 36 21 083H. See *Exhibit 2a – One Mile Radius Wells List* for a list of wells depicted.

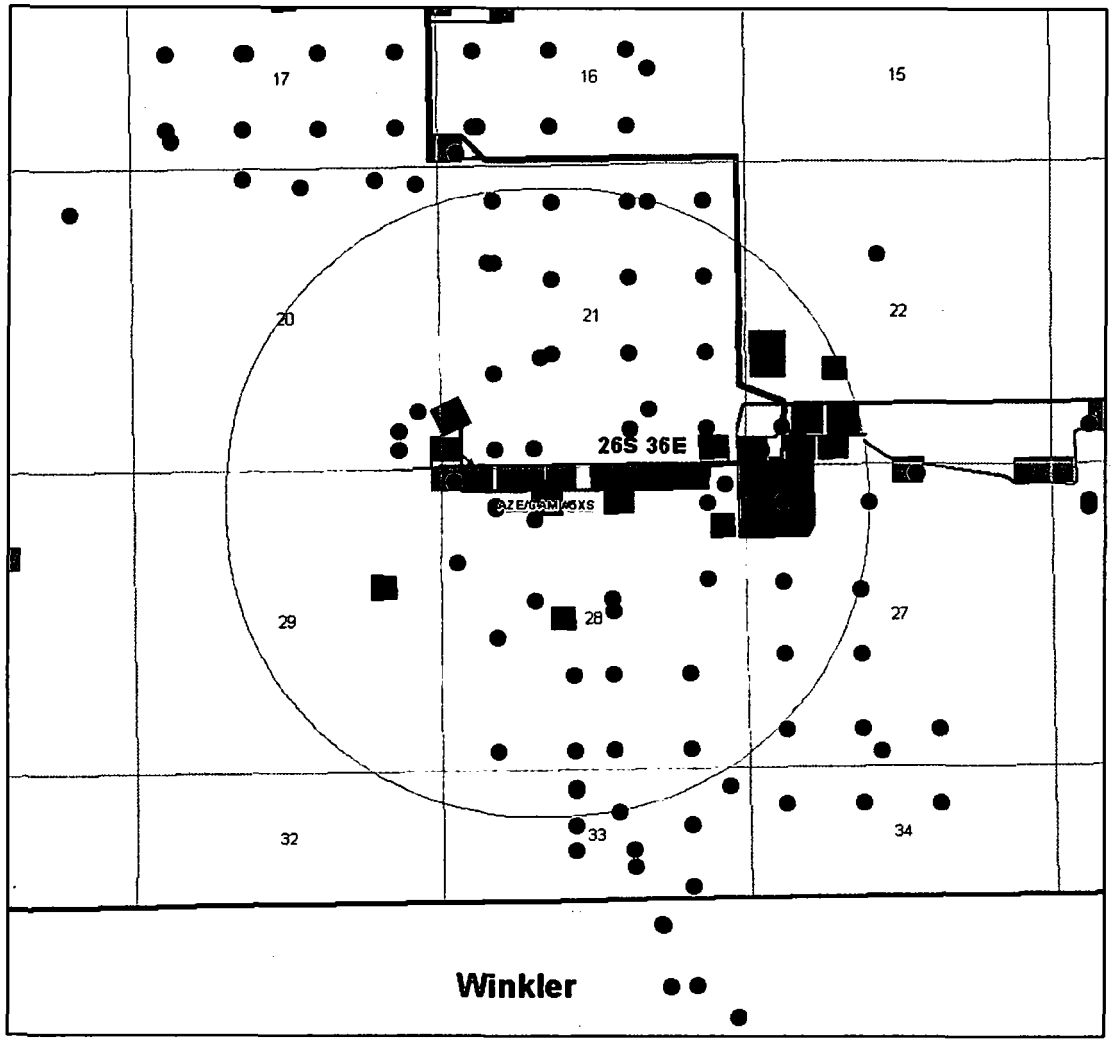


Exhibit 2 – One Mile Radius Existing Wells

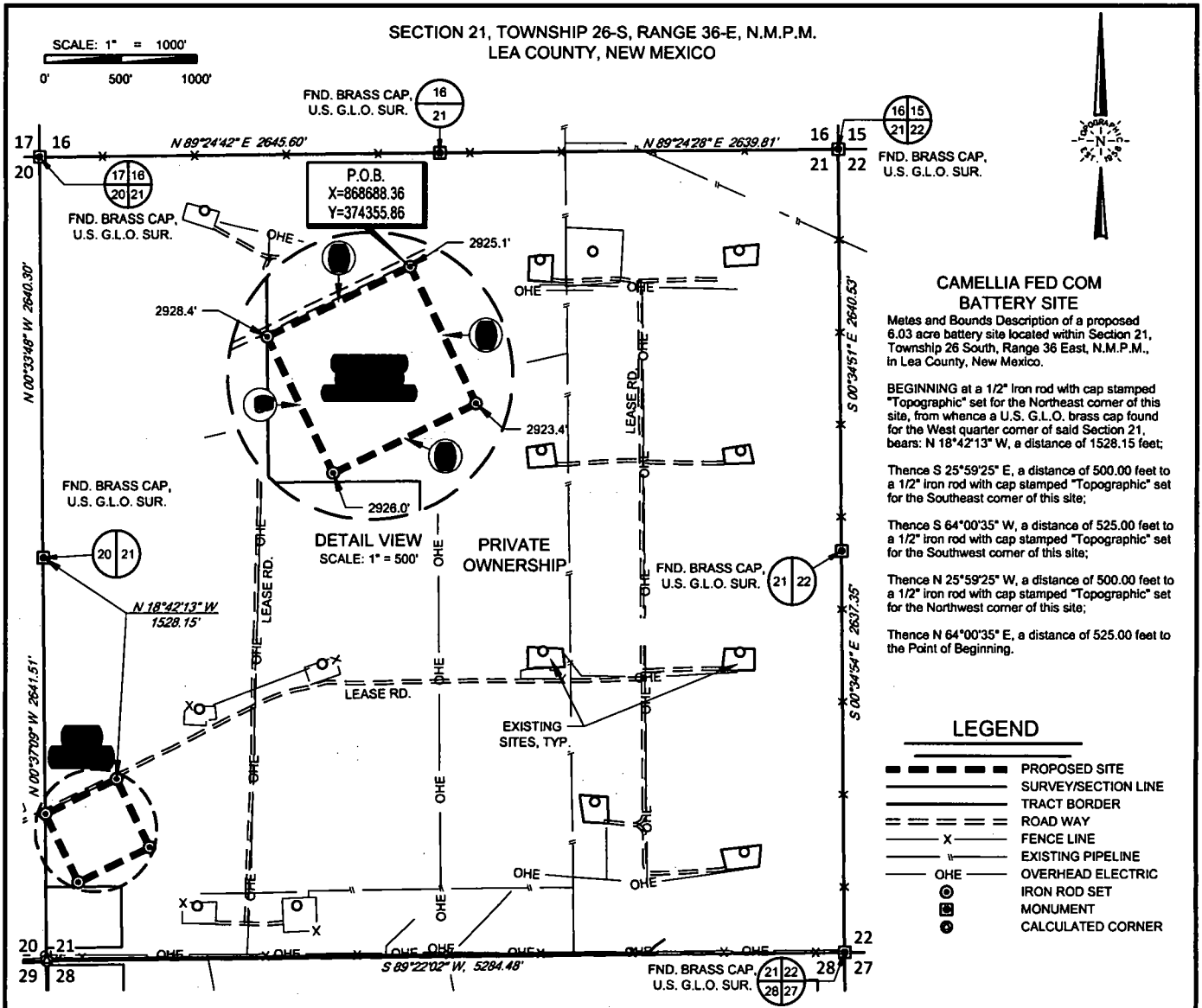
AMEREDEV

API	WELL NAME	STATUS	TD
30025257020000	LEA /7406/ 2	PLUGOIL	3340
30025257780000	QUANAH PARKER 1	PLUGOIL	3310
30025257840000	LEA 7406 JV-S 3	DRY	887
30025258290000	LEA 7406 JV-S 4	PLUGOIL	3268
30025259230000	HORSE BACK 4	JNK	748
30025259530000	NEW MEXICO `CV` STAT 1	PLUGOIL	3239
30025259540000	HORSE BACK 4Y	JNK	749
30025260230000	QUANAH PARKER 3	ABDNLOC	0
30025260480000	NEW MEXICO `CV` STAT 2	PLUGOIL	3400
30025098560000	SAND HILLS UNIT 6	JNK	1257
30025098570000	SAND HILLS UNIT A 1	DHSO	3349
30025098580000	FEDERAL 1	DHSO	3940
30025258410000	PARKER QUANAH 2	JNK	284
30025258900000	LEA 7406 JV-S 5	OIL	3266
30025259090000	LEA 7406 JV-S 6	PLUGOIL	3250
30025259110000	PARKER QUANAH 2-Y	PLUGOIL	3258
30025259200000	LEA 7406 JV-S 7	PLUGOIL	3270
30025259300000	LEA 7406 JV-S 8	PLUGOIL	3270
30025259570000	LEA WD-1	DHSO	3420
30025260560000	LEA 7406-JV-S 9	DRY	3268
30025260680000	LEA 7406-JV-S 9-Y	PLUGOIL	3270
30025261310000	WILSON /21/-FEDERAL 1	OIL	3340
30025261320000	WILSON /21/ FED 2	OIL	3500
30025261330000	WILSON `21`-FEDERAL 3	OIL	3797
30025261340000	WILSON 21-FEDERAL 4	OIL	3575
30025261350000	WILSON 21-FEDERAL 5	OIL	3800
30025261360000	WILSON `21` FEDERAL 6	JNK	1682
30025261370000	WILSON /21-FED/ 7	OIL	3700
30025261380000	WILSON /21/ FED 8	OIL	3700
30025267180000	WILSON /21/ FED 6-Y	OIL	3750
30025268770000	BUFFALO HUMP 1	PLUGOIL	3585
30025269870000	BUFFALO HUMP 2	PLUGOIL	3545
30025270000000	LEA /21/ 7406 JV-S 1	OIL	3668
30025270280000	LEA /21/7406 JV-S 2	OIL	3658
30025270290000	LEA /21/7406 JV-S 3	OIL	3598

30025270300000	LEA /21/7406 JV-S 4	JNK	1060
30025270410000	LEA `21` 7406 JV-S 6	OIL	3495
30025270420000	LEA `21` 7406 JV-S 7	OIL	3525
30025270430000	LEA /21/7406 JV-S 8	OIL	3570
30025271290000	BUFFALO HUMP 8	PLUGOIL	3606
30025271630000	AMERICAN EAGLE 1	PLUGOIL	3550
30025272070000	LEA /21/ 7406 JV-S 4-Y	OIL	3550
30025388850000	EAGLE FEATHER FEDERA 2	GAS	13179
30025401700000	GOOD CHIEF STATE 1	OIL	3873
30025269880000	QUANAH PARKER 3	ABDNLOC	
30025269890000	QUANAH PARKER 4	ABDNLOC	
30025442020000	AMEN CORNER 26 36 27 111H	PERMIT	
30025441050100	AZALEA 26-36-28 STAT 121H	JNK	3561
30025444390000	MAGNOLIA 26-36-22 ST 111H	PERMIT	
30025444720000	MAGNOLIA 26-36-22 ST 101H	PERMIT	
30025441050000	AZALEA 26-36-28 STAT 121H	AT-TD	13600

Exhibit 2a – One Mile Radius Existing Wells List

SECTION 21, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



CAMELLIA FED COM BATTERY SITE

Metes and Bounds Description of a proposed 6.03 acre battery site located within Section 21, Township 26 South, Range 36 East, N.M.P.M., in Lea County, New Mexico.

BEGINNING at a 1/2" iron rod with cap stamped "Topographic" set for the Northeast corner of this site, from whence a U.S. G.L.O. brass cap found for the West quarter corner of said Section 21, bears: N 18°42'13" W, a distance of 1528.15 feet;

Thence S 25°59'25" E, a distance of 500.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Southeast corner of this site;

Thence S 64°00'35" W, a distance of 525.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Southwest corner of this site;

Thence N 25°59'25" W, a distance of 500.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Northwest corner of this site;

Thence N 64°00'35" E, a distance of 525.00 feet to the Point of Beginning.

LEGEND

- PROPOSED SITE
- SURVEY/SECTION LINE
- TRACT BORDER
- ROAD WAY
- FENCE LINE
- EXISTING PIPELINE
- OHE — OVERHEAD ELECTRIC
- IRON ROD SET
- MONUMENT
- CALCULATED CORNER

SITE TABLE

LINE	BEARING	DISTANCE
[redacted]		

STAN W. LLOYD
NEW MEXICO
19642
PROFESSIONAL SURVEYOR

Stan W. Lloyd, P.S. No. 19642
MAY 30, 2018

AMEREDEV
AMEREDEV OPERATING, LLC

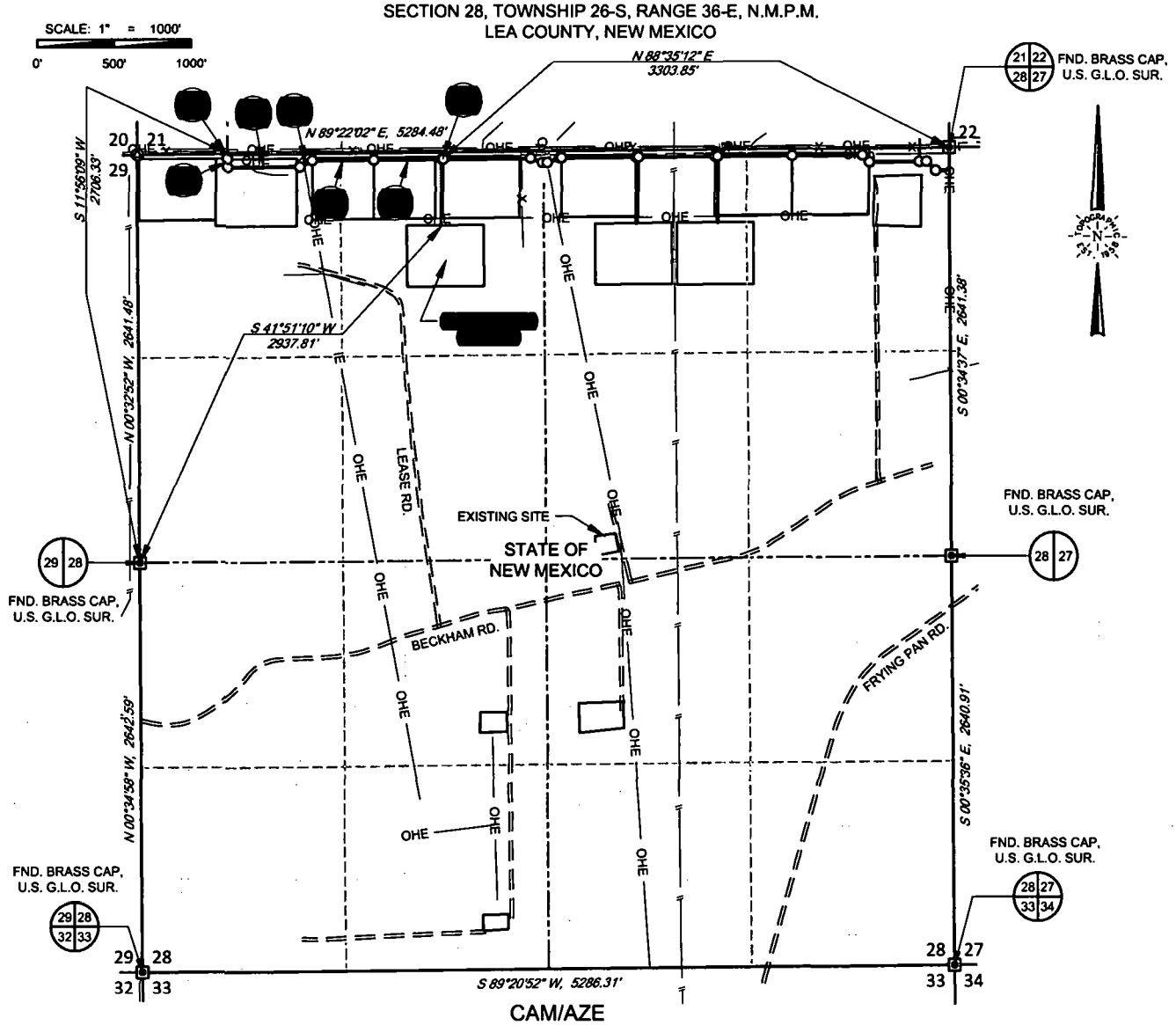
TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

CAMELLIA FED COM BATTERY SITE	REVISION:	
	ACC	05/30/18
DATE: 12/19/17		
FILE: BO_CAMELLIA_FED_COM_BATTERY_SITE_REV1		
DRAWN BY: ACC		
SHEET: 1 OF 1		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
3. CERTIFICATION IS MADE ONLY TO THE LOCATION OF THIS EASEMENT, IN RELATION TO THE EVIDENCE FOUND DURING A FIELD SURVEY, MADE ON THE GROUND, UNDER MY SUPERVISION, AND USING DOCUMENTATION PROVIDED BY AMEREDEV OPERATING LLC. ONLY UTILITIES/EASEMENTS THAT WERE VISIBLE ON THE DATE OF THIS SURVEY, WITHIN/ADJOINING THIS EASEMENT, HAVE BEEN LOCATED AS SHOWN HEREON OF WHICH I HAVE KNOWLEDGE. THIS CERTIFICATION IS LIMITED TO THOSE PERSONS OR ENTITIES SHOWN ON THE FACE OF THIS PLAT AND IS NON-TRANSFERABLE, AND MADE FOR THIS TRANSACTION ONLY.
4. P.O.B. = POINT OF BEGINNING

S:\SURVEY\AMEREDEV_OPERATING_LLC\CAMELLIA_FED_COM\FINAL_PRODUCTS\BO_CAMELLIA_FED_COM_BATTERY_SITE_REV1.DWG 5/30/2018 9:51:16 AM ccaston

SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO

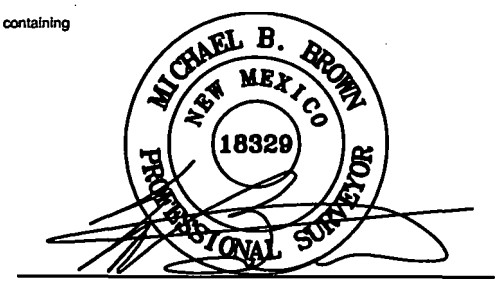


CAM/AZE
FLOWLINE EASEMENT

Being a flowline easement being 30 feet in width, 15 feet left and right of the above platted centerline total line footage containing 6228.72 feet or 377.50 rods, containing 4.29 acres more or less and being allocated by quarter quarters as follows:

NW/4 NW/4 - 831.34 feet or 50.38 rods, containing 0.57 acres
NE/4 NW/4 - 1756.42 feet or 106.45 rods, containing 1.21 acres
NW/4 NE/4 - 2186.45 feet or 132.52 rods, containing 1.51 acres
NE/4 NE/4 - 1454.51 feet or 88.15 rods, containing 1.00 acres

SEE SHEET 2 OF 2 FOR
LINE TABLES, DETAILS & LEGEND



Michael Blake Brown, P.S. No. 18329
FEBRUARY 9, 2019

AMEREDEV
AMEREDEV OPERATING, LLC

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
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2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

CAM/AZE FLOWLINE EASEMENT	REVISION: INT	DATE
DATE: 02/09/19		
FILE: EP_CAM_AZE_FL_SEC_28		
DRAWN BY: GJU		
SHEET: 1 OF 2		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
2. ALL BEARINGS, DISTANCES, AND COORDINATE VALUES CONTAINED HEREIN ARE GRID BASED UPON THE NEW MEXICO COORDINATE SYSTEM OF 1983, EAST ZONE, U.S. SURVEY FEET.
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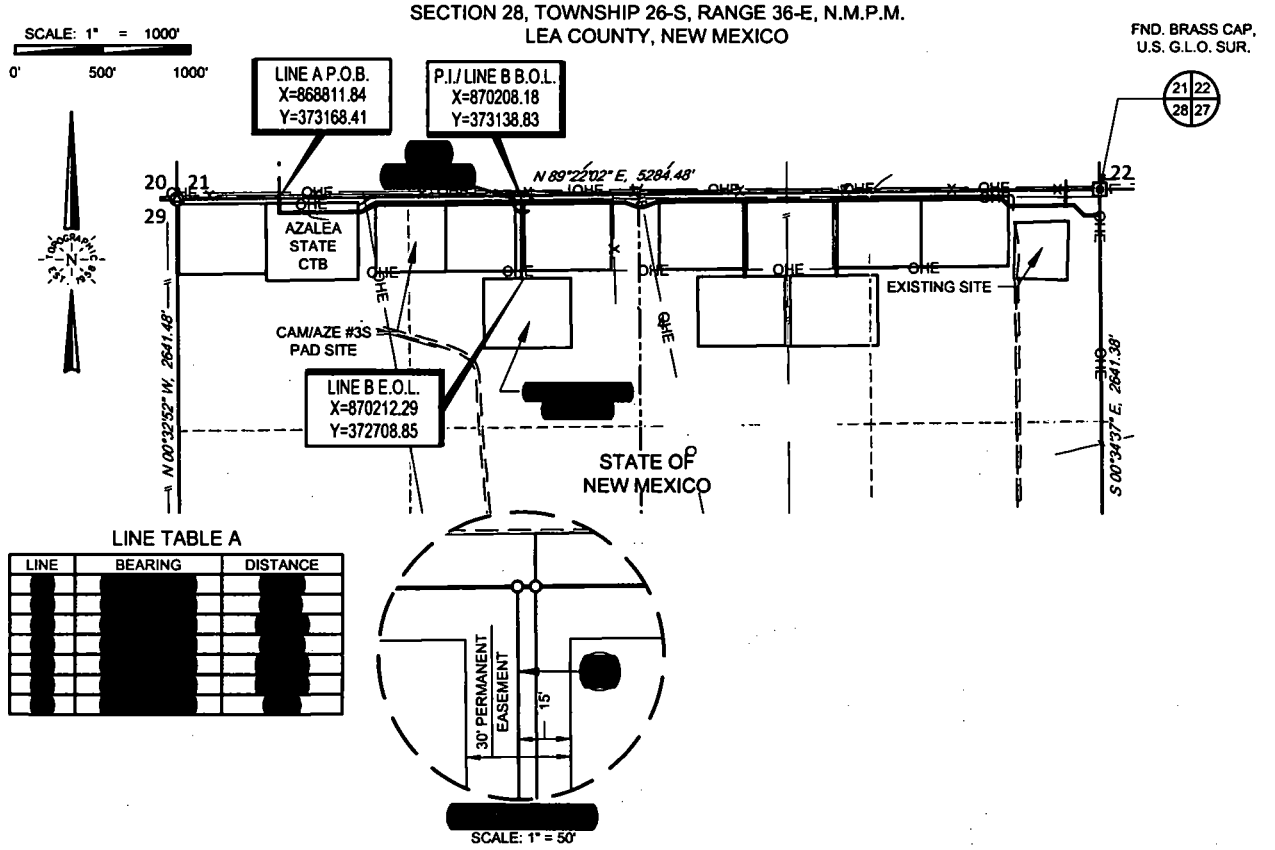
4. B.O.L./P.O.B. = BEGINNING OF LINE/POINT OF BEGINNING
5. E.O.L./P.O.E. = END OF LINE/POINT OF EXIT
6. P.I. = POINT OF INTERSECTION

SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO



LINE TABLE A

LINE	BEARING	DISTANCE
[redacted]		

LINE TABLE B

LINE	BEARING	DISTANCE
[redacted]		

LEGEND

- SECTION LINE
- SURVEYED BASELINE A
- SURVEYED BASELINE B
- SURVEYED BASELINE C
- SURVEYED BASELINE D
- SURVEYED BASELINE E
- CONTINUED BASELINE
- EDGE OF EASEMENT
- QUARTER SECTION LINE
- SIXTEENTH SECTION LINE
- TRACT BORDER
- ROAD WAY
- FENCE LINE
- EXISTING PIPELINE
- OVERHEAD ELECTRIC
- MONUMENT
- CALCULATED CORNER
- POINT OF INTERSECTION

SEE SHEET 1 OF 2 FOR
TIES & LINE DESCRIPTION

Michael Blake Brown, P.S. No. 18329
FEBRUARY 9, 2019

AMEREDEV
AMEREDEV OPERATING, LLC

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

CAM/AZE FLOWLINE EASEMENT	REVISION: INT	DATE
DATE: 02/09/19		
FILE: EP_CAM_AZE_FL_SEC_28		
DRAWN BY: GJU		
SHEET: 2 OF 2		

NOTES:
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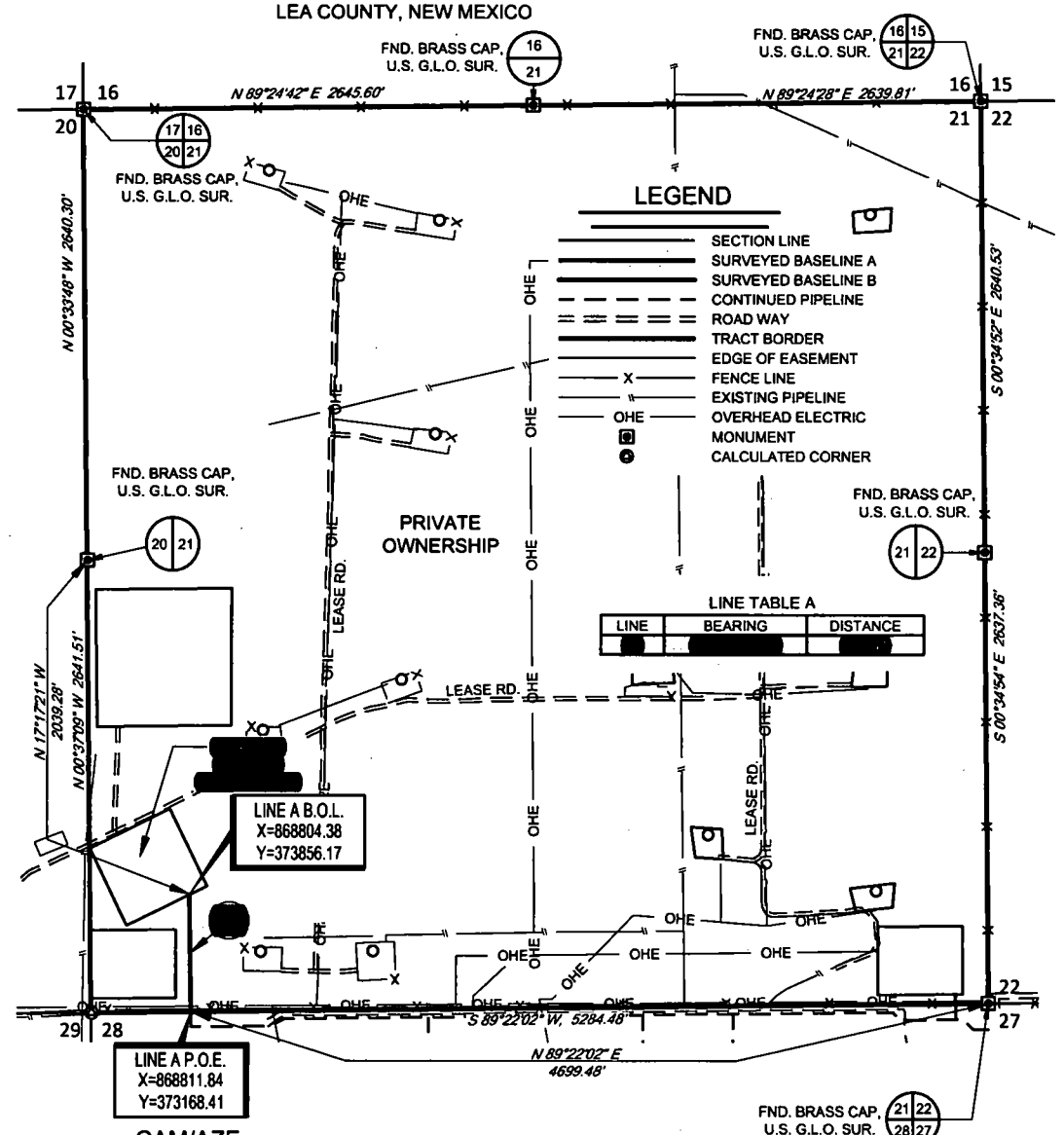
S:\SURVEY\AMEREDEV_OPERATING_LLC\AZALEA_STATE_COM\FINAL_PRODUCTS\EP_CAM_AZE_FL_SEC_28.DWG 2/11/2019 3:49:40 PM ccaston

SECTION 21, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SCALE: 1" = 1000'
0' 500' 1000'

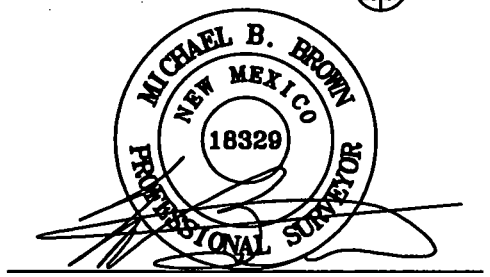


LINE TABLE A

LINE	BEARING	DISTANCE

CAM/AZE
FLOWLINE EASEMENT

Being a proposed flowline easement being 30 feet in width, 15 feet left and right of the above platted centerline total line footage containing 745.04 feet or 45.15 rods, containing 0.51 acres more or less.



Michael Blake Brown, P.S. No. 18329
FEBRUARY 9, 2019

AMEREDEV
AMEREDEV OPERATING, LLC

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7554
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

CAM/AZE FLOWLINE EASEMENT	REVISION: INT	DATE
DATE: 02/09/19		
FILE: EP_CAM_AZE_FL_SEC_21		
DRAWN BY: GJU		
SHEET: 1 OF 1		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
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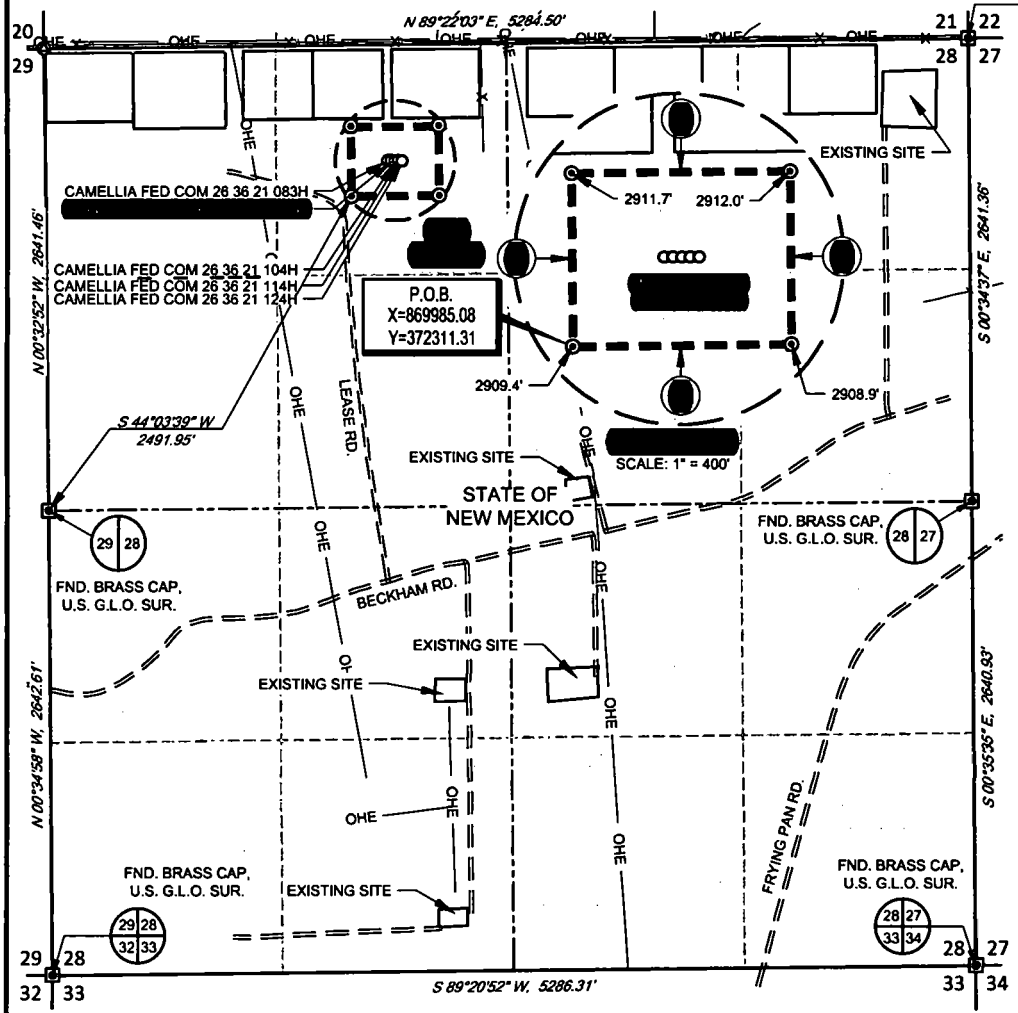
SECTION 28, TOWNSHIP 26-S, RANGE 36-E, N.M.P.M.
LEA COUNTY, NEW MEXICO

SCALE: 1" = 1000'
0' 500' 1000'



CAM/AZE #5XS PAD SITE

Metes and Bounds Description of a proposed 4.53 acre pad site located within the Northeast Quarter of the Northwest Quarter of Section 28, Township 26 South, Range 36 East, N.M.P.M., in Lea County, New Mexico.

BEGINNING at a 1/2" iron rod with cap stamped "Topographic" set for the Southwest corner of this site, from whence a brass cap found for the West quarter corner of said Section 28, bears: S 44°03'39" W, a distance of 2,491.95 feet;

Thence N 00°32'52" W, a distance of 395.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Northwest corner of this site;

Thence N 89°22'02" E, a distance of 500.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Northeast corner of this site;

Thence S 00°32'52" E, a distance of 395.00 feet to a 1/2" iron rod with cap stamped "Topographic" set for the Southeast corner of this site;

Thence S 89°22'02" W, a distance of 500.00 feet to the Point of Beginning.

LEGEND

- PROPOSED SITE
- SURVEY/SECTION LINE
- QUARTER SECTION LINE
- SIXTEENTH SECTION LINE
- TRACT BORDER
- ROAD WAY
- FENCE LINE
- EXISTING PIPELINE
- OVERHEAD ELECTRIC
- IRON ROD SET
- MONUMENT
- CALCULATED CORNER

SITE TABLE

LINE	BEARING	DISTANCE
[redacted]		

NE/4 NW/4 - Containing 4.53 acres, 197,500 sq. ft.

STAN W. LLOYD
NEW MEXICO
19642
PROFESSIONAL SURVEYOR

Stan W. Lloyd, P.S. No. 19642
APRIL 26, 2018

AMEREDEV
AMEREDEV OPERATING, LLC

TOPOGRAPHIC
LOYALTY INNOVATION LEGACY
1400 EVERMAN PARKWAY, Ste. 146 • FT. WORTH, TEXAS 76140
TELEPHONE: (817) 744-7512 • FAX (817) 744-7548
2903 NORTH BIG SPRING • MIDLAND, TEXAS 79705
TELEPHONE: (432) 682-1653 OR (800) 767-1653 • FAX (432) 682-1743
WWW.TOPOGRAPHIC.COM

CAM/AZE #5XS PAD SITE	REVISION:	
	EAH	04/26/18
DATE: 03/21/2018		
FILE: BO_CAM_AZE_5XS_PAD_SITE_REV1		
DRAWN BY: IMU		
SHEET: 1 OF 1		

NOTES:
1. ORIGINAL DOCUMENT SIZE: 8.5" X 11"
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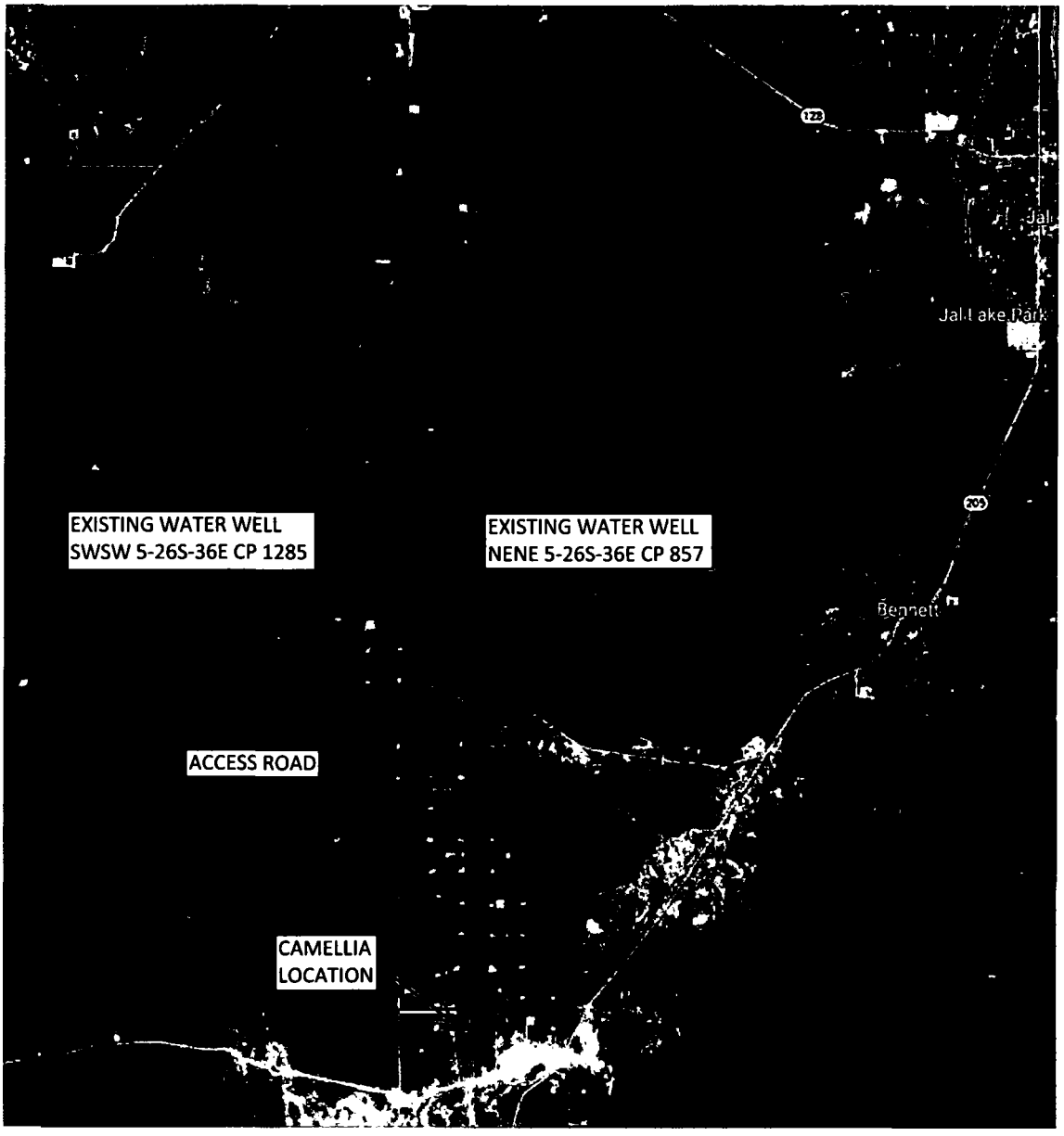
4. P.O.B. = POINT OF BEGINNING

S:\SURVEY\AMEREDEV_OPERATING_LLC\CAMELLIA_FED_COM\FINAL_PRODUCTS\BO_CAM_AZE_5XS_PAD_SITE_REV1.DWG 4/27/2018 2:27:55 PM ccaston

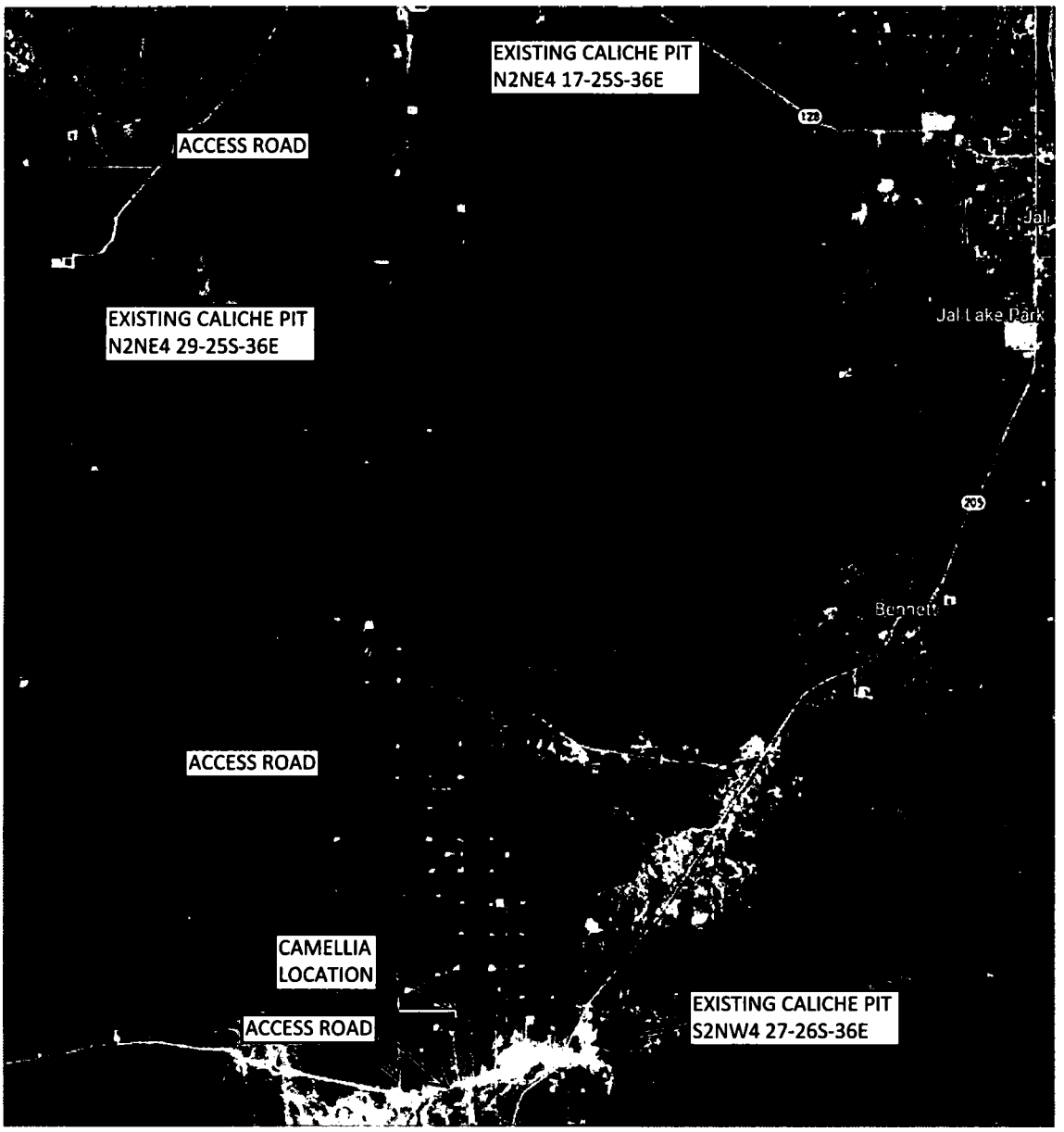

123
Jal
Jal Lake Park
EXISTING WATER WELL
SWSW 5-26S-36E CP 1285
EXISTING WATER WELL
NENE 5-26S-36E CP 857
Bennett
ACCESS ROAD
CAMELLIA
LOCATION

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 21, Township 26S, Range 36E
Lea County, New Mexico

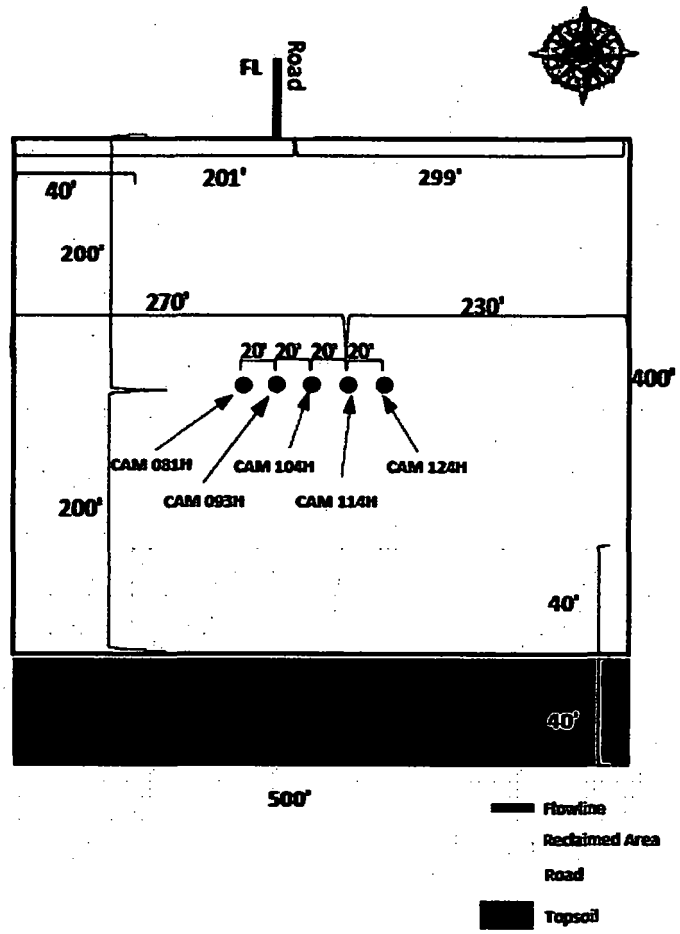
AMEREDEV

Permit #	Well Name	Location (Lat/Lon)
CP 1049 POD 2	Bennett	32°04'14.32" N, 103°12'32.30" W
CP 1378	S. Eppenour	32°05'40.62" N, 103°13' 35.26" W
CP 1285	Sec. 5	32°03'56.50" N, 103°17'37.04" W
CP 857	Capped	32°04'39.70" N, 103°16'51.13" W
C 2287	#1	32°03'59.0" N, 103°33'16.8" W
C 2286	#2	32°03'59.2" N, 103°33'15.2" W
C 2290	#3	32°04'1.0" N, 103°33' 12.6" W
C 2285	#4	32°04'3.7" N, 103°33'9.7" W
C 2288	#5	32°04'0.5" N, 103°33'8.4" W
C 2294	Garden	32°03'3.2" N, 103°32'38.1" W
C 2293	House	32°03'2.3" N, 103°32'36.8" W
J-11-S-3	Farm Well #2	32°03'08.4" N, 103°16'35.2" W
J-11-S-2	Farm Well #3	32°03'11.5" N, 103°17'02.0" W
J-11-S	Farm Well #4	32°03'24.6" N, 103°17'02.1" W
CP 1170 POD 1	CB 1	32°03'57.2" N, 103°18'45.3" W
CP 1170 POD 5		32°07'17.1" N, 103°17'48.0" W
CP 1263 POD 5	CB 2	32°03'56.27" N, 103°18'27.4" W
CP 1263 POD 3	CB 3	32°03'54.90" N, 103°18'16.74" W
CP 1351 POD 1	CB 4	32°03'57.16" N, 103°17'45.13" W
CP 1351 POD 2	CB 5	32°03'30.70" N, 103°17'45.70" W
J 26	Ryan	32°01'20.41" N, 103°15'49.46" W
J 3		32°02'41.5" N, 103°18'55.8" W

Exhibit 4 – Water Wells


EXISTING CALICHE PIT
N2NE4 17-25S-36E
ACCESS ROAD
EXISTING CALICHE PIT
N2NE4 29-25S-36E
Jal Lake Park
Bennett
ACCESS ROAD
CAMELLIA
LOCATION
ACCESS ROAD
EXISTING CALICHE PIT
S2NW4 27-26S-36E

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 28, Township 26S, Range 36E
Lea County, New Mexico



Camellia Fed Com 26 36 21 083H SHL: SEC 28-26S-36E, 670' FNL 1960' FWL

Camellia Fed Com 26 36 21 093H SHL: SEC 28-26S-36E, 670' FNL 1980' FWL

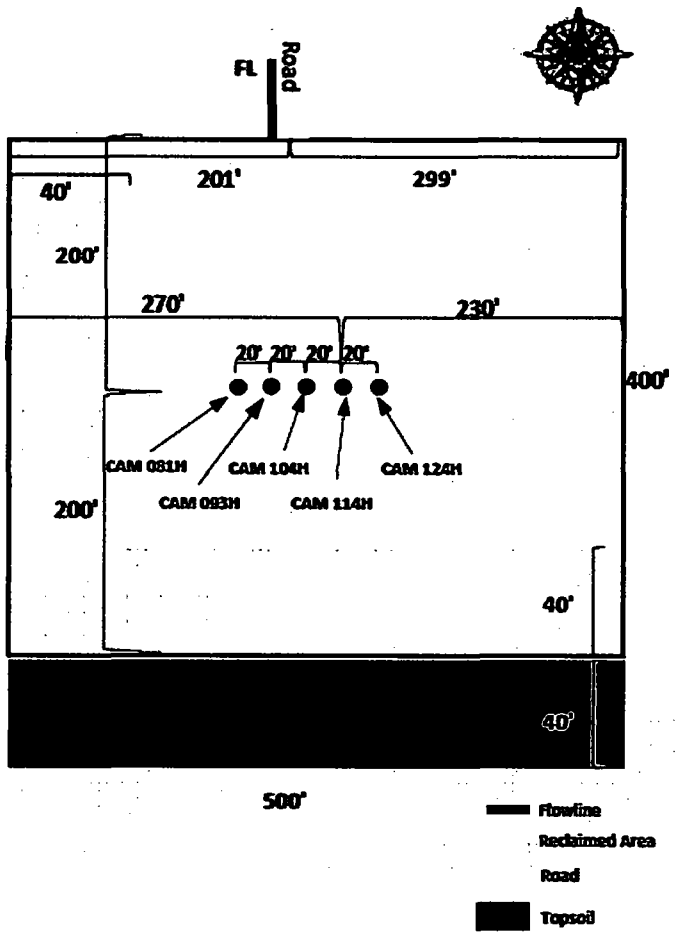
Camellia Fed Com 26 36 21 104H SHL: SEC 28-26S-36E, 670' FNL 2000' FWL

Camellia Fed Com 26 36 21 114H SHL: SEC 28-26S-36E, 670' FNL 2020' FWL

Camellia Fed Com 26 36 21 124H SHL: SEC 28-26S-36E, 670' FNL 2040' FWL

Exhibit 3 – Well Site Diagram

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 28, Township 26S, Range 36E
Lea County, New Mexico



Camellia Fed Com 26 36 21 083H SHL: SEC 28-26S-36E, 670' FNL 1960' FWL

Camellia Fed Com 26 36 21 093H SHL: SEC 28-26S-36E, 670' FNL 1980' FWL

Camellia Fed Com 26 36 21 104H SHL: SEC 28-26S-36E, 670' FNL 2000' FWL

Camellia Fed Com 26 36 21 114H SHL: SEC 28-26S-36E, 670' FNL 2020' FWL

Camellia Fed Com 26 36 21 124H SHL: SEC 28-26S-36E, 670' FNL 2040' FWL

Exhibit 3 – Well Site Diagram

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 21, Township 26S, Range 36E
Lea County, New Mexico

Surface Use Plan of Operations

Introduction

The following Surface Use Plan of Operations will be implemented by Ameredev Operating, LLC (Ameredev), after APD approval. No disturbance will be created other than those described in this surface use plan. If any additional surface disturbance becomes necessary after APD approval, the appropriate BLM approved sundry notice or right-of-way application will be acquired prior to such disturbance. This Surface Use Plan includes Ameredev's well pad, battery site, electrical, water and flow lines, and access roads.

Before any surface disturbance is created, stakes or flagging will be installed to mark boundaries of permitted areas of disturbance, including soil storage areas. As necessary, slope, grade, and other construction control stakes will be placed to ensure construction is in accordance with the surface use plan. All boundary markers will be maintained in place until final construction cleanup is completed. If disturbance boundary markers are displaced, they will be replaced before construction proceeds. Adjacent operators will be contacted before construction starts to mark adjacent pipelines.

Directions to proposed pad:

At the intersection of NM-205 and NM-128, head south on NM-205 approximately 8 miles. Turn west (right) on lease road and proceed approximately 1.2 miles. Turn south (left) on lease road and proceed approximately 460', to the northwest of the well pad. See *Exhibit 1 – Well Pad Access* for a map of the route.

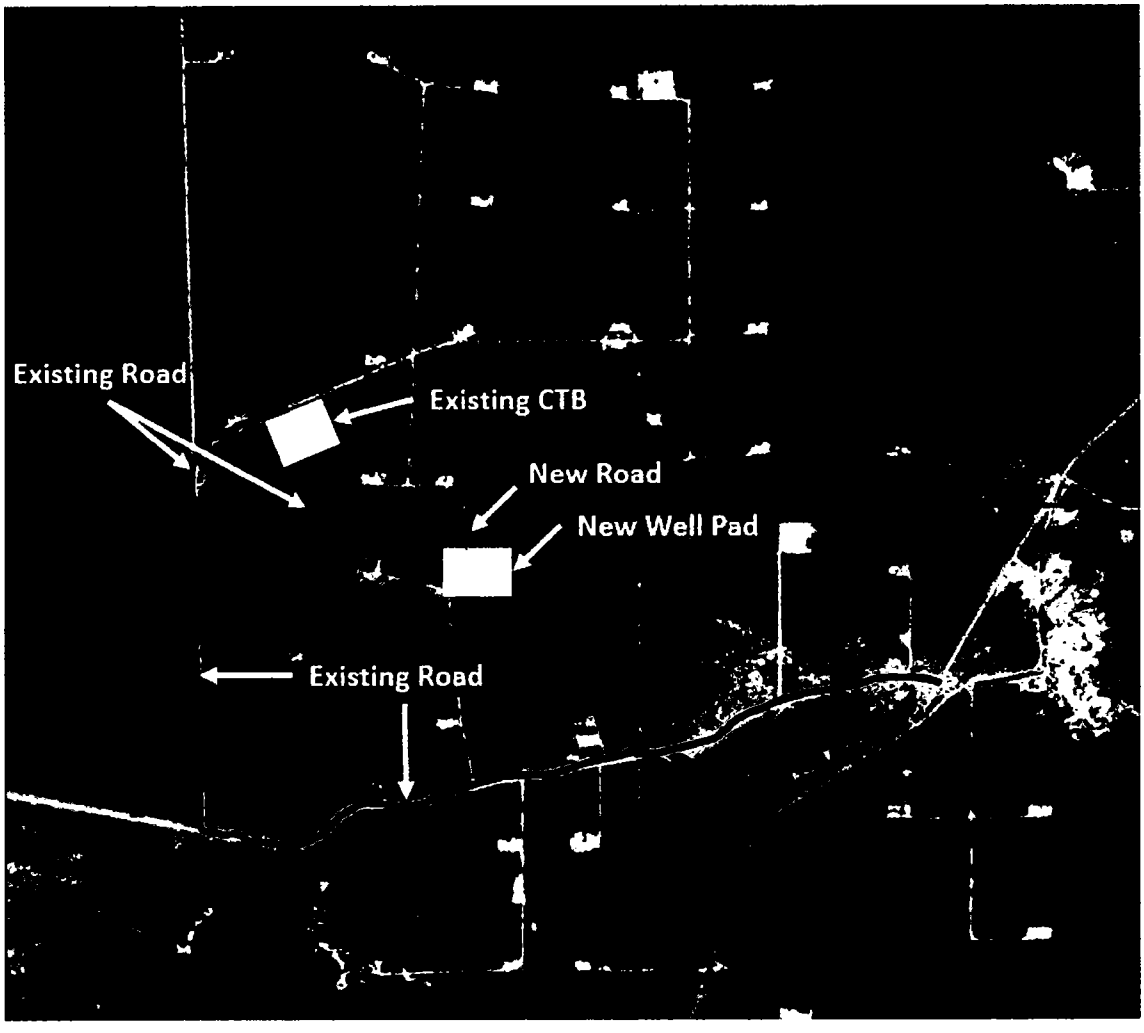


Exhibit 1 – Well Pad Access

Section 1 – Existing Roads

A. The existing access road route to the proposed project is depicted on *Exhibit 1 – Well Pad Access*. Improvements to the driving surface will be done where necessary. No new surface disturbance will be done, unless otherwise noted in the New or Reconstructed Access Roads section of this surface use plan.

B. Any required right-of-way will be acquired before construction begins.

C. The operator will improve or maintain existing roads in a condition the same as or better than before operations begin. The operator will repair pot holes, clear ditches, repair the crown, etc. All existing structures on the entire access route such as cattle guards, other range improvement

projects, culverts, etc. will be properly repaired or replaced if they are damaged or have deteriorated beyond practical use.

D. Operator will prevent and abate fugitive dust as needed, whether created by vehicular traffic, equipment operations, or wind events. BLM written approval will be acquired before application of surfactants, binding agents, or other dust suppression chemicals on roadways.

Section 2 – New or Reconstructed Access Roads

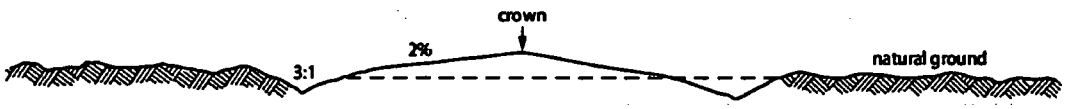
A. A section of new access road will be needed for this proposed project. See *Exhibit 1 – Well Pad Access*, for locations.

B. The length of new access road needed to be constructed for this proposed project is approximately 455 feet.

C. New access road will be constructed with 6 inches of compacted caliche.

D. The maximum driving width of the access road will be 20 feet. The maximum width of surface disturbance when constructing the access road will not exceed 30 feet. All areas outside of the driving surface will be revegetated.

E. When the road travels on fairly level ground, the road will be crowned and ditched with a maximum 2% slope from the tip of the road crown to the edge of the driving surface. Ditches will be constructed on each side of the road. The ditches will be 3 feet wide with 3:1 slopes. See road cross section diagram below:



F. No turnouts will be constructed on the new portions of access road.

G. No cattle guards will be installed on the new portions of access road.

H. Right-of-way will be acquired before construction begins.

I. No culverts or low water crossings will be constructed for the new portions of access road.

J. Since the access road is on level ground, no lead-off ditches will be constructed for the new portions of access road.

K. Any sharp turns in the in the new road will be rounded to facilitate turning by trucks.

L. Newly constructed or reconstructed roads, on surface under the jurisdiction of the Bureau of Land Management, will be constructed as outlined in the BLM "Gold Book" and to meet the standards of the anticipated traffic flow and all anticipated weather requirements as needed. Construction will include ditching, draining, crowning and capping or sloping and dipping the roadbed as necessary to provide a well-constructed and safe road.

M. All topsoil and fragmented rock removed in excavation will be used as directed in approved plan.

Section 3 – Location of Existing Wells

Exhibit 2 – One Mile Radius Existing Wells depicts all known wells within a one mile radius of the Camellia Fed Com 26 36 21 083H. See *Exhibit 2a – One Mile Radius Wells List* for a list of wells depicted.

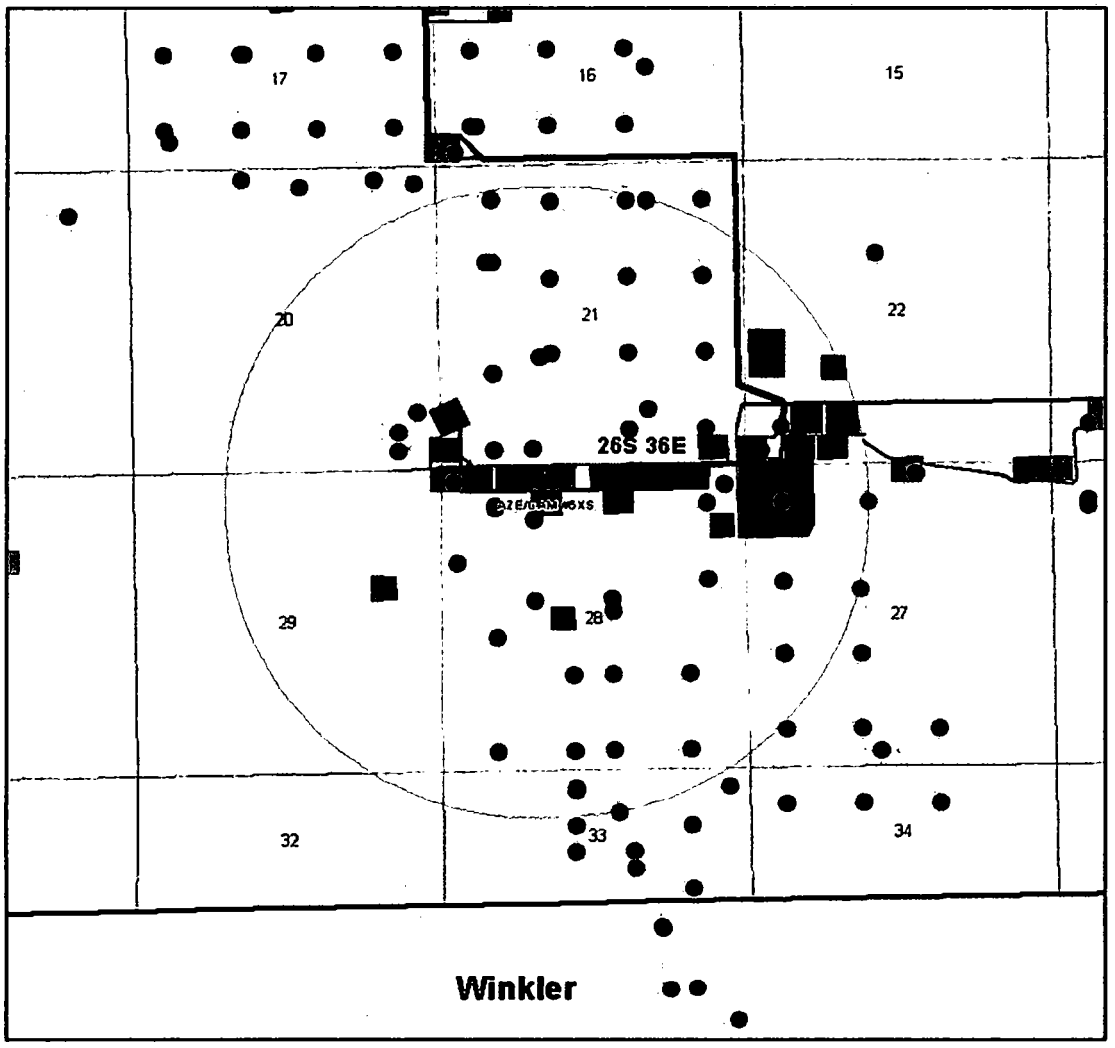


Exhibit 2 – One Mile Radius Existing Wells

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 21, Township 26S, Range 36E
Lea County, New Mexico

API	WELL NAME	STATUS	TD
30025257020000	LEA /7406/ 2	PLUGOIL	3340
30025257780000	QUANAH PARKER 1	PLUGOIL	3310
30025257840000	LEA 7406 JV-S 3	DRY	887
30025258290000	LEA 7406 JV-S 4	PLUGOIL	3268
30025259230000	HORSE BACK 4	JNK	748
30025259530000	NEW MEXICO `CV` STAT 1	PLUGOIL	3239
30025259540000	HORSE BACK 4Y	JNK	749
30025260230000	QUANAH PARKER 3	ABDNLOC	0
30025260480000	NEW MEXICO `CV` STAT 2	PLUGOIL	3400
30025098560000	SAND HILLS UNIT 6	JNK	1257
30025098570000	SAND HILLS UNIT A 1	DHSO	3349
30025098580000	FEDERAL 1	DHSO	3940
30025258410000	PARKER QUANAH 2	JNK	284
30025258900000	LEA 7406 JV-S 5	OIL	3266
30025259090000	LEA 7406 JV-S 6	PLUGOIL	3250
30025259110000	PARKER QUANAH 2-Y	PLUGOIL	3258
30025259200000	LEA 7406 JV-S 7	PLUGOIL	3270
30025259300000	LEA 7406 JV-S 8	PLUGOIL	3270
30025259570000	LEA WD-1	DHSO	3420
30025260560000	LEA 7406-JV-S 9	DRY	3268
30025260680000	LEA 7406-JV-S 9-Y	PLUGOIL	3270
30025261310000	WILSON /21/-FEDERAL 1	OIL	3340
30025261320000	WILSON /21/ FED 2	OIL	3500
30025261330000	WILSON `21`-FEDERAL 3	OIL	3797
30025261340000	WILSON 21-FEDERAL 4	OIL	3575
30025261350000	WILSON 21-FEDERAL 5	OIL	3800
30025261360000	WILSON `21` FEDERAL 6	JNK	1682
30025261370000	WILSON /21-FED/ 7	OIL	3700
30025261380000	WILSON /21/ FED 8	OIL	3700
30025267180000	WILSON /21/ FED 6-Y	OIL	3750
30025268770000	BUFFALO HUMP 1	PLUGOIL	3585
30025269870000	BUFFALO HUMP 2	PLUGOIL	3545
30025270000000	LEA /21/ 7406 JV-S 1	OIL	3668
30025270280000	LEA /21/7406 JV-S 2	OIL	3658
30025270290000	LEA /21/7406 JV-S 3	OIL	3598
30025270300000	LEA /21/7406 JV-S 4	JNK	1060
30025270410000	LEA `21` 7406 JV-S 6	OIL	3495
30025270420000	LEA `21` 7406 JV-S 7	OIL	3525
30025270430000	LEA /21/7406 JV-S 8	OIL	3570
30025271290000	BUFFALO HUMP 8	PLUGOIL	3606

30025271630000	AMERICAN EAGLE 1	PLUGOIL	3550
30025272070000	LEA /21/ 7406 JV-S 4-Y	OIL	3550
30025388850000	EAGLE FEATHER FEDERA 2	GAS	13179
30025401700000	GOOD CHIEF STATE 1	OIL	3873
30025269880000	QUANAH PARKER 3	ABDNLOC	
30025269890000	QUANAH PARKER 4	ABDNLOC	
30025442020000	AMEN CORNER 26 36 27 111H	PERMIT	
30025441050100	AZALEA 26-36-28 STAT 121H	JNK	3561
30025444390000	MAGNOLIA 26-36-22 ST 111H	PERMIT	
30025444720000	MAGNOLIA 26-36-22 ST 101H	PERMIT	
30025441050000	AZALEA 26-36-28 STAT 121H	AT-TD	13600

Exhibit 2a – One Mile Radius Existing Wells List

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

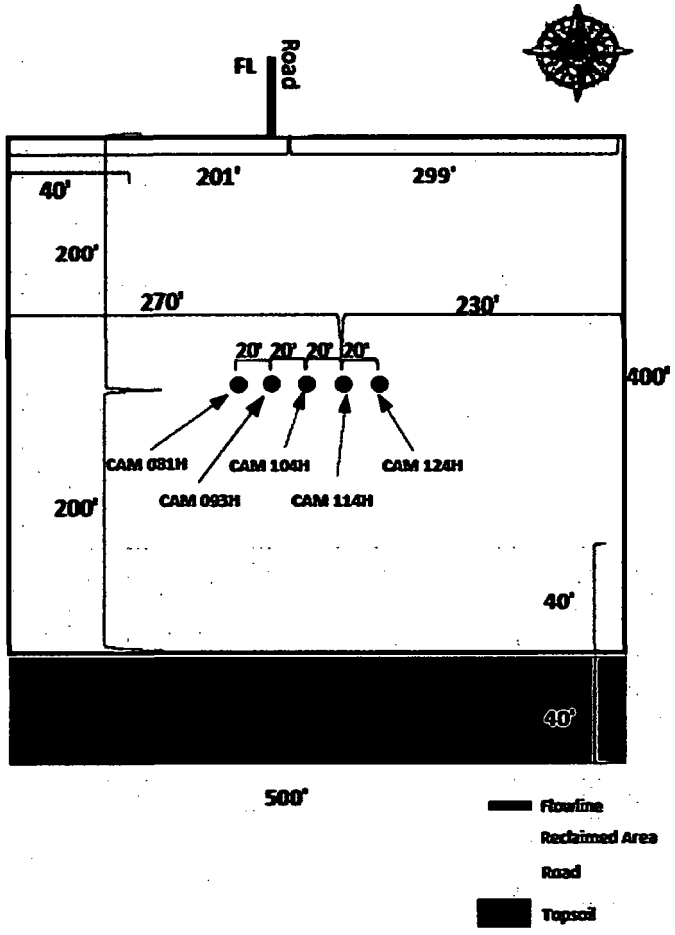
A. The multiple well pad will be located on section 28, and will measure 395'x500'. Should any type of production facilities be located on the well pad, they will be strategically placed to allow for maximum interim reclamation, re-contouring, and revegetation of the well location.

B. Production from the proposed well will be transported to an existing production facility named Camellia CTB, northwest of the well pad, via a buried 4" poly flowline (700 psi maximum) that runs approximately 2,614'.

C. All permanent (lasting more than six months) above ground structures including but not limited to pump jacks, storage tanks, barrels, pipeline risers, meter housing, etc., that are not subject to safety requirements will be painted a non-reflective paint color, Shale Green, from the BLM Standard Environmental Colors chart, unless another color is required in the APD Conditions of Approval.

D. If any plans change regarding the production facility or other infrastructure (pipeline, electrical lines, etc.), Ameredev will submit a sundry notice or right-of-way (if applicable) prior to installation or construction.

Ameredev Operating, LLC
Camellia Fed Com 26 36 21 083H
Section 21, Township 26S, Range 36E
Lea County, New Mexico



Camellia Fed Com 26 36 21 083H SHL: SEC 28-26S-36E, 670' FNL 1960' FWL

Camellia Fed Com 26 36 21 093H SHL: SEC 28-26S-36E, 670' FNL 1980' FWL

Camellia Fed Com 26 36 21 104H SHL: SEC 28-26S-36E, 670' FNL 2000' FWL

Camellia Fed Com 26 36 21 114H SHL: SEC 28-26S-36E, 670' FNL 2020' FWL

Camellia Fed Com 26 36 21 124H SHL: SEC 28-26S-36E, 670' FNL 2040' FWL

Exhibit 3 – Well Site Diagram

Section 5 - Location and Types of Water Supply

A. This location will be drilled using a combination of water and mud systems (outlined in the Drilling Program). The water will be obtained from preexisting water wells, by running a pump directly to the drilling rig. See *Exhibit 4 - Water Wells*, for a list of available water wells. In cases where a polyline is used to transport water for drilling or completion purposes, the existing and proposed roads into location will be utilized.

Permit #	Well Name	Location (Lat/Lon)
CP 1049 POD 2	Bennett	32°04'14.32" N, 103°12'32.30" W
CP 1378	S. Eppenour	32°05'40.62" N, 103°13' 35.26" W
CP 1285	Sec. 5	32°03'56.50" N, 103°17'37.04" W
CP 857	Capped	32°04'39.70" N, 103°16'51.13" W
C 2287	#1	32°03'59.0" N, 103°33'16.8" W
C 2286	#2	32°03'59.2" N, 103°33'15.2" W
C 2290	#3	32°04'1.0" N, 103°33' 12.6" W
C 2285	#4	32°04'3.7" N, 103°33'9.7" W
C 2288	#5	32°04'0.5" N, 103°33'8.4" W
C 2294	Garden	32°03'3.2" N, 103°32'38.1" W
C 2293	House	32°03'2.3" N, 103°32'36.8" W
J-11-S-3	Farm Well #2	32°03'08.4" N, 103°16'35.2" W
J-11-S-2	Farm Well #3	32°03'11.5" N, 103°17'02.0" W
J-11-S	Farm Well #4	32°03'24.6" N, 103°17'02.1" W
CP 1170 POD 1	CB 1	32°03'57.2" N, 103°18'45.3" W
CP 1170 POD 5		32°07'17.1" N, 103°17'48.0" W
CP 1263 POD 5	CB 2	32°03'56.27" N, 103°18'27.4" W
CP 1263 POD 3	CB 3	32°03'54.90" N, 103°18'16.74" W
CP 1351 POD 1	CB 4	32°03'57.16" N, 103°17'45.13" W
CP 1351 POD 2	CB 5	32°03'30.70" N, 103°17'45.70" W
J 26	Ryan	32°01'20.41" N, 103°15'49.46" W
J 3		32°02'41.5" N, 103°18'55.8" W

Exhibit 4 – Water Wells

Section 6 – Construction/Construction Materials

A. Caliche will be obtained from the caliche pit located at Lat: 32° 8'0.90"N, Long: 103°16'45.05" or the caliche pit at Lat: 32° 6'28.34"N, Long: 103°16'58.48"W or the caliche pit at Lat: 32° 1'1.28"N, Long: 103°15'15.83"W.

B. Caliche utilized for the drilling pad will be obtained either from the locations listed above, an existing approved mineral pit, or by benching into a hill, which will allow the pad to be level with existing caliche from the cut, or extracted by "flipping" the well location. A mineral material permit will be obtained from the BLM prior to excavating any caliche on Federal Lands. Amount will vary for each pad. The procedure for "flipping" a well location is as follows:

1. An adequate amount of topsoil/root zone (usually top 6 inches of soil) will be stripped from the proposed well location and stockpiled along the side of the well location as depicted on the *Exhibit 3 - Well Site Diagram*.
2. An area will be used within the proposed well site dimensions to excavate caliche.
3. Subsoil will be removed and stockpiled within the surveyed well pad dimensions.
4. Once caliche/surfacing mineral is found, the mineral material will be excavated and stock piled within the approved drilling pad dimensions.
5. Subsoil will then be pushed back in the excavated hole and caliche will be spread accordingly across the entire well pad and road (if available).
6. Neither caliche, nor subsoil will be stockpiled outside of the well pad dimensions. Topsoil will be stockpiled along the south edge of the pad as depicted in *Exhibit 3 – Well Site Diagram.*
7. In the event that no caliche is found onsite, caliche will be hauled in from a BLM approved caliche pit or other established mineral pit. A BLM mineral material permit will be acquired prior to obtaining any mineral material from BLM pits or federal land.

Section 7 - Methods of Handling Waste

A. Drill cuttings, mud, salts and other chemicals will be properly disposed of into steel tanks on site and hauled to a State approved commercial disposal facility.

B. Garbage and trash produced during drilling and completion operations will be collected in a portable metal trash container and disposed of properly at a state approved disposal facility. All trash on and around the well site will be collected for disposal.

C. Human waste and grey water will be properly contained and disposed of properly at a state approved disposal facility.

D. After drilling and completion operations, trash, chemicals, salts, frac sand and other waste material will be removed and disposed of properly at a state approved disposal facility.

Section 8 - Ancillary Facilities

A. No ancillary facilities will be needed for the proposed project.

Section 9 - Well Site Layout

A. See *Exhibit 3 - Well Site Diagram.* The following information is presented:
1. Reasonable scale
2. Well pad dimensions/orientation
3. Proposed access road
4. Topsoil stockpile

B. The proposed drilling pad was staked and surveyed by a professional surveyor. The attached survey plat of the well site depicts the drilling pad layout as staked.

C. Topsoil salvaging
1. Grass, forbs, and small woody vegetation such as mesquite will be excavated as the topsoil is removed. Large woody vegetation will be stripped and stored separately and re-spread evenly on the site following topsoil re-spreading. Topsoil depth is defined as the top layer of soil that contains 80% of the roots. In areas to be heavily disturbed, the top 6 inches of soil material will be stripped and stockpiled on the perimeter of the well location and along the perimeter of the access road to control run-on and run-off, to keep topsoil viable, and to make redistribution of topsoil more efficient during interim reclamation. Stockpiled topsoil should include vegetative material. Topsoil will be clearly segregated and stored separately from subsoils. Contaminated soil will not be stockpiled, but properly treated and handled prior to topsoil salvaging.

Section 10 - Plans for Final Surface Reclamation

Reclamation Objectives

A. The objective of interim reclamation is to restore vegetative cover and a portion of the landform sufficient to maintain healthy, biologically active topsoil, to control erosion, and to minimize habitat and forage loss, visual impact, and weed infestation during the life of the well or facilities.

B. The long-term objective of final reclamation is to return the land to a condition similar to what existed prior to disturbance. This includes restoration of the landform and natural vegetative community, hydrologic systems, visual resources, and wildlife habitats. To ensure that the long-term objective will be reached through human and natural processes, actions will be taken to ensure standards are met for site stability, visual quality, hydrological functioning, and vegetative productivity.

C. The BLM will be notified at least 3 days prior to the commencement of any reclamation procedures.

D. If circumstances allow, interim reclamation and/or final reclamation actions will be completed no later than 6 months from when the final well on location has been completed or plugged. Ameredev will gain written permission from the BLM if more time is needed.
E. Interim reclamation will be performed on the well site after the well is drilled and completed. *Exhibit 3 – Well Site Diagram* depicts the location and dimension of the planned interim reclamation for the well site.

Interim Reclamation Procedures (if performed)

A. Within 30 days of well completion, the well location and surrounding areas will be cleared of, and maintained free of, all materials, trash, and equipment not required for production.
B. In areas planned for interim reclamation, all the surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
C. The areas planned for interim reclamation will then be contoured to the original contour if feasible, or if not feasible, to an interim contour that blends with the surrounding topography as much as possible. Where applicable, the fill material of the well pad will be backfilled into the cut to bring the area back to the original contour. The interim cut and fill slopes prior to re-seeding will not be steeper than a 3:1 Ratio, unless the adjacent native topography is steeper. Note: Constructed slopes may be much steeper during drilling, but will be re-contoured to the above ratios during interim reclamation.
D. Topsoil will be evenly re-spread and aggressively revegetated over the entire disturbed area not needed for all-weather operations, including cuts and fills. To seed the area, the proper BLM mixture, free of noxious weeds, will be used. Final seedbed preparation will consist of contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting, in order to break the soil crust and create seed germination micro-sites.
E. Proper erosion control methods will be used on the area to control erosion, runoff, and siltation of the surrounding area.
F. The interim reclamation will be monitored periodically to ensure that vegetation has reestablished and that erosion is controlled.

Final Reclamation Procedures (well pad, buried pipelines, etc.)

A. Prior to final reclamation procedures, the well pad, road, and surrounding area will be cleared of material, trash, and equipment.
B. All surfacing material will be removed and returned to the original mineral pit or recycled to repair or build roads and well pads.
C. All disturbed areas, including roads, pipelines, pads, production facilities, and interim reclaimed areas will be re-contoured to the contour existing prior to initial construction or a contour that blends indistinguishably with the surrounding landscape. Topsoil that was spread over the interim reclamation areas will be stockpiled prior to re-contouring. The topsoil will be redistributed evenly over the entire disturbed site to ensure successful revegetation. All topsoil remaining at the battery will be reseeded in place for the life of the battery.
D. After all the disturbed areas have been properly prepared, the areas will be seeded with the proper BLM seed mixture, free of noxious weeds. Final seedbed preparation will consist of

contour cultivating to a depth of 4 to 6 inches within 24 hours prior to seeding, dozer tracking, or other imprinting, in order to break the soil crust and create seed germination micro-sites.

E. Proper erosion control methods will be used on the area to control erosion, runoff, and siltation of the surrounding area.

F. All unused equipment and structures including pipelines, electric line poles, tanks, etc. that serviced the well will be removed.

G. All reclaimed areas will be monitored periodically to ensure that revegetation occurs, that the area is not re-disturbed, and that erosion is controlled.

Section 11 - Surface Ownership

A. New Mexico State Land Office has surface ownership for proposed project area.

Section 12 - Other Information

A. There are no dwellings within 1 mile of this location.

B. An on-site meeting for Ameredev's Camellia Fed Com 26 36 21 083H well was held on March 29, 2018. Attendees included Jeff Robertson (BLM), Shane McNeely (Ameredev), and Ged Adams (Topographic).

C. The well pad described in this document – Camellia (CAM #5SX) - will contain 5 wells that produce into an existing central tank battery (CTB) located northwest of the well pad. The wells share a common pad access road, and the five flowlines from the individual wells will share a common corridor that will terminate into the CTB. The wells that share the pad are:

- Camellia Fed Com 26 36 21 083H, APD ID# 10400030726
- Camellia Fed Com 26 36 21 093H, APD ID# 10400030569
- Camellia Fed Com 26 36 21 104H, APD ID# 10400030326
- Camellia Fed Com 26 36 21 114H, APD ID# 10400030038
- Camellia Fed Com 26 36 21 124H, APD ID# 10400030103

Ameredev field representative:

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Cell: (432) 385-6996

Email: zboyd@ameredev.com

Ameredev office contact:

Christie Hanna, Regulatory Coordinator

Direct: (737) 300-4723

Email: channa@ameredev.com

Ameredev Operating, LLC Address: 5707 Southwest Parkway Building 1, Suite 275 Austin, Texas 78735

Section 1 - General

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

Section 2 - Lined Pits

Would you like to utilize Lined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

PWD surface owner:

PWD disturbance (acres):

Lined pit PWD on or off channel:

Lined pit PWD discharge volume (bbl/day):

Lined pit specifications:

Pit liner description:

Pit liner manufacturers information:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Lined pit precipitated solids disposal schedule:

Lined pit precipitated solids disposal schedule attachment:

Lined pit reclamation description:

Lined pit reclamation attachment:

Leak detection system description:

Leak detection system attachment:

Lined pit Monitor description:

Lined pit Monitor attachment:

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

Is the reclamation bond a rider under the BLM bond?

Lined pit bond number:

Lined pit bond amount:

Additional bond information attachment:

Section 3 - Unlined Pits

Would you like to utilize Unlined Pit PWD options? NO

Produced Water Disposal (PWD) Location:

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

Unlined pit PWD on or off channel:

Unlined pit PWD discharge volume (bbl/day):

Unlined pit specifications:

Precipitated solids disposal:

Decribe precipitated solids disposal:

Precipitated solids disposal permit:

Unlined pit precipitated solids disposal schedule:

Unlined pit precipitated solids disposal schedule attachment:

Unlined pit reclamation description:

Unlined pit reclamation attachment:

Unlined pit Monitor description:

Unlined pit Monitor attachment:

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

Beneficial use user confirmation:

Estimated depth of the shallowest aquifer (feet):

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

TDS lab results:

Geologic and hydrologic evidence:

State authorization:

Unlined Produced Water Pit Estimated percolation:

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

Is the reclamation bond a rider under the BLM bond?

Unlined pit bond number:

Unlined pit bond amount:

Additional bond information attachment:

Section 4 - Injection

Would you like to utilize Injection PWD options? NO

Produced Water Disposal (PWD) Location:

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

Injection PWD discharge volume (bbl/day):

Injection well mineral owner:

Injection well type:

Injection well number: **Injection well name:**

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

Injection well new surface disturbance (acres):

Minerals protection information:

Mineral protection attachment:

Underground Injection Control (UIC) Permit?

UIC Permit attachment:

Section 5 - Surface Discharge

Would you like to utilize Surface Discharge PWD options? NO

Produced Water Disposal (PWD) Location:

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

Surface discharge PWD discharge volume (bbl/day):

Surface Discharge NPDES Permit?

Surface Discharge NPDES Permit attachment:

Surface Discharge site facilities information:

Surface discharge site facilities map:

Section 6 - Other

Would you like to utilize Other PWD options? NO

Produced Water Disposal (PWD) Location:

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

Other PWD discharge volume (bbl/day):

Other PWD type description:

Other PWD type attachment:

Have other regulatory requirements been met?

Other regulatory requirements attachment:

AFMSS

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

Bond Info Data Report

05/16/2019

Bond Information

Federal/Indian APD: FED

BLM Bond number: NMB001478

BIA Bond number:

Do you have a reclamation bond? NO

Is the reclamation bond a rider under the BLM bond?

Is the reclamation bond BLM or Forest Service?

BLM reclamation bond number:

Forest Service reclamation bond number:

Forest Service reclamation bond attachment:

Reclamation bond number:

Reclamation bond amount:

Reclamation bond rider amount:

Additional reclamation bond information attachment: