

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
BUREAU OF LAND MANAGEMENT**SUNDRY NOTICES AND REPORTS ON WELLS**  
*Do not use this form for proposals to drill or to re-enter an abandoned well. Use form 3160-3 (APD) for such proposals.*FORM APPROVED  
OMB NO. 1004-0135  
Expires: July 31, 20105. Lease Serial No.  
NMLC063798

6. If Indian, Allottee or Tribe Name

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

**SUBMIT IN TRIPLICATE - Other instructions on reverse side.**

1. Type of Well

☐ Oil Well ☐ Gas Well ☒ Other: INJECTION

2. Name of Operator

AGAVE ENERGY COMPANY

Contact: MICHAEL W SELKE

E-Mail: mselke@geolex.com

3a. Address

105 S FOURTH ST  
ARTESIA, NM 88210

3b. Phone No. (include area code)

Ph: 505-842-8000  
Fx: 505-842-7380

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)

Sec 13 T24S R33E NESE 1600FSL 150FEL

8. Well Name and No.  
RED HILLS AGI 19. API Well No.  
30-025-40448-00-X110. Field and Pool, or Exploratory  
AGI

11. County or Parish, and State

LEA COUNTY, NM

## 12. CHECK APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT, OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation (clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. If the proposal is to deepen directionally or recompleat horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports shall be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompleat in a new interval, a Form 3160-4 shall be filed once testing has been completed. Final Abandonment Notices shall be filed only after all requirements, including reclamation, have been completed, and the operator has determined that the site is ready for final inspection.)

See attachments for analysis and resolution of intermediate casing cement bond anomaly and BLM approval to proceed with drilling activities.



14. I hereby certify that the foregoing is true and correct.

**Electronic Submission #227326 verified by the BLM Well Information System  
For AGAVE ENERGY COMPANY, sent to the Hobbs  
Committed to AFMSS for processing by KURT SIMMONS on 12/04/2013 (14KMS2773SE)**

Name (Printed/Typed) MICHAEL W SELKE

Title GEOLOGIST, CONSULTANT TO AGAVE

Signature (Electronic Submission)

Date 11/19/2013

## THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved By

ACCEPTED

EDWARD FERNANDEZ  
Title PETROLEUM ENGINEER

Date 12/04/2013

Conditions of approval, if any, are attached. Approval of this notice 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.

Office Hobbs

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.

\*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\* BLM REVISED \*\*

DEC 10 2013

**Agave Energy Company Red Hills AGI #1 Intermediate Casing Cement Bond Analysis**

The 360° CBL which was run on the 9 5/8" intermediate casing indicated poor bonding over an interval primarily within the section from 1400' to approximately 300'. This was clearly unexpected since we and BLM (Pat McKelvey) witnessed approximately 60 barrels of cement returns to the surface during the cement job. In general, the CBL shows excellent bonding observed from the intermediate casing set point of 5346' to the casing shoe on the surface casing with the exception of isolated anomalies detected in the upper Salado and lower Rustler Formations from 1750' to 1400'.

Geolex provided the following plan to the BLM on November 8<sup>th</sup>.

1. Set retrievable plug approximately 2 joints above casing shoe in 9 5/8" intermediate casing at 5280'.
2. Pressure up intermediate casing to 1000 psi
3. Rerun 360° CBL from plug depth to surface under 1000 psi pressure to determine if micro annulus is present
4. Contact Engineer on call (Jennifer) and provide both CBLs to BLM (Fernandez, Ingram, Mason) via email as soon as new one is run and insure full header is visible on log for BLM review—Geolex will contact Jennifer as she is the on call engineer for this weekend (anticipated Saturday)
5. Rig up to perform annular pressure test on the annulus between surface (13 3/8") casing and intermediate (9 5/8") casing by pumping water into annulus
6. Advise BLM on call inspector that we intend to do an annular pressure test if they wish to witness
7. Pressure up annulus to 500 psi and chart for 30 minutes while noting approximate water volume required to pressure up (hold 500psi on 9 5/8" while annulus is pressured up for safety and intermediate casing protection).
8. Provide copy of signed and dated chart to BLM (Fernandez, Ingram, Mason) via email for review and evaluation Call Jennifer (575-706-2779) to assure receipt, then Jennifer to review and consult as needed with Wesley and anticipate a 2-3 hr. review time to get go/no go on running production string.

In order to comply with the above plan, Geolex set the plug at 5282' during the morning of November 9<sup>th</sup> and entered the borehole with the CBL logging equipment. The logging equipment was run in hole to plug depth and the intermediate casing was pressured up to 1000 psi. The CBL run was then started and charted at the surface. As the wireline exited the BOP, the removal of the wireline volume from the well bore caused the pressure to drop. In order to maintain a pressure above 1000 psi, the pressure was increased to 1100 psi and allowed to drop to about 1000 psi prior to adding water and pressuring back up to 1100 psi. This can be seen on the chart as noted by a wavy line between 1000 psi and 1100 psi. The CBL logging run was continued to the surface with 1000 to 1100 psi on the intermediate casing.

This CBL was compared to the CBL run that was run first with zero psi on the intermediate casing. The result of this comparison clearly demonstrates that many of the anomalies that seemed to indicate a poor cement bond have been eliminated. This clearly indicates that the observed bonding anomaly is really due to micro annulus except in a few selected areas in the

evaporite and salt sections of the lower Rustler and Salado Formations. The following table shows where the cement anomalies are located and where the washouts exist.

<u>CBL Anomaly Depth</u>	<u>Increased Hole Diameter Depth</u>
1400' - 1420'	1400' - 1570'
1444' - 1464'	1400' - 1570'
1542' - 1548'	1400' - 1570'
1561' - 1564'	1400' - 1570'
1623 - 1642'	1622' - 1632'
1664' - 1750'	1690' - 2015'
2040' - 2056'	2032' - 2034'
2179' - 2218'	2182' - 2660'

It is evident that the areas where the bonding was less than desirable are located within sections of the borehole in the lower Rustler and Salado Formations that contain minor washouts or where the hole is somewhat expanded.

These minor washouts have created microannulus which is generally very small since it is significantly eliminated by the small expansion of the 9 5/8" J55 casing under 1000 psi of pressure as shown by comparing the zero and 1000 psi CBL logs. This does not mean cement does not exist at these locations. The cement is there, but an excellent cement bond is not. Also, there are two voids extending approximately 20' each at a depth of approximately 1400' to 1420' and 1445' to 1465'. These voids are compared to the caliper log which shows two minor washouts at the same depths that caused the voids to form. These washouts are located below the freshwater formations that are isolated by the surface casing that exists from the surface to a depth of 1372'. These washout areas are separated by about 3000 feet of formation and casing with a good cement bond and are not threatened in any way by the operation of AGI #1. These portions of the intermediate casing that have less than optimal bonding are either within the surface casing (approximately 85%) or in the lower Rustler and Salado which have over 2500 feet of separation from underlying formations where excellent cement bond exists. Furthermore the area above the surface casing depth is protected by surface casing and excellently bonded cement on the surface casing string. The potential pay zones in the area of AGI #1 that exist in the Bell Canyon Formation at depths of approximately 5280' are well isolated and will be further protected by an additional casing string comprised of 7" diameter casing and corrosion resistant cement.

Most of the CBL anomalies exist at depths that are protected by more than one casing string and associated cement and are adequately cemented to protect all fresh water bearing zones and potentially productive reservoirs. Geolex is currently conducting the annular pressure test and will transmit those results later today as they become available. The BLM Hobbs field office was notified of the test at 4:01 am by the company man.

On behalf the operator, Agave Energy Co., Geolex requests acceptance of these bond logs and approval to continue with the operation of running the 7" production string.

From: Jennifer Mason <jmason1626@gmail.com>  
 Sent: Saturday, November 09, 2013 10:24 PM  
 To: Mike Selke  
 Cc: Ingram, Wesley W  
 Subject: Re: Red Hills AGI #1 Cement Bond Log

Based on the information you provided to the BLM, we believe you do have cement on the intermediate casing but we can not agree that it is "confident". We can allow you to continue with drilling activities if upon completion of this well an annulus monitoring system (by the BLM) is installed and monitors the pressure of the annulus for the life of the well. This would adequately protect all resources involved.

On Sat, Nov 9, 2013 at 9:55 PM, Mike Selke <msselke@geolex.com> wrote:  
 All

We have attempted five pressure tests on the annular space between the 9 5/8-inch and 3 3/8-inch casing. The test followed the plan developed by Geolex and BLM and cited in the report of the CBL, which was transmitted earlier. The test was conducted by connecting the annular space to a pump truck and increasing the pressure in the annulus to 500 psi then monitoring pressure for 30 minutes.

In each test the pressure was increased to 500 psi or greater in just a few seconds after the addition of three to four gallons of water (see radial charts). In each test the pressure rate of 20 psi per minute (approximate) so not all tests were run the full 30 minute connections were checked for leaks. Several leaks were identified in the recorder hose and were replaced. All other connections were checked with water and soap and none were found to be leaking. The injection hose was disconnected and plugged. The entire injection system was tested and held pressure between 580 and 600 psi for approximately 40 minutes (see chart). The fifth and final test was run with 1200 psi in the 9 5/8-inch casing. The test fell off as with the other tests at the beginning of the test, starting at 720 psi and ending at approximately 200 psi. All tests had a nearly instantaneous pressure increase to 500 psi from an estimated injection volume of water of three to five gallons of water. Pressure tests fell off at similar rates.

The near instantaneous jumps in pressure from zero to 500-700 psi with a very low volume of water (three to five gallons), along with the results of the CBL completed earlier indicate that the annulus is filled with competent cement. We believe that the micro annulus identified in the cement bond log of the 9 5/8-inch casing may be contributing to the well declines. There will be three layers of protection in the surface casing interval. A 3-inch long string is installed and cemented to the surface.

Regards

Michael W. Selke, RG  
 Geolex, Incorporated  
 500 Marquette Avenue NW, Suite 1350  
 (505) 842-8000 Ext. 106  
 (505) 842-7380 fax  
 (505) 321-2448 cell  
 msselke@geolex.com

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