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DEC 17 2012 Form 2

DEPARTMENT of ENVIRONMENT and NATURAL RESOURCES  
 Minerals & Mining Program – Oil & Gas Section  
 2050 West Main, Suite #1, Rapid City, SD 57702-2493  
 Telephone: 605-394-2229. FAX: 605-394-5317

DEPT OF ENVIRONMENT & NATURAL RESOURCES - RAPID CITY



APPLICATION FOR PERMIT TO DRILL

Type of work:

- Drill New Well  Reenter Well  Drill Directional Well  
 Other \_\_\_\_\_

Type of well:

- Oil Well  Gas Well  Injection  
 Other \_\_\_\_\_

Name and Address of Operator:

Vaalco Energy (USA), Inc.  
 4600 Post Oak Place, Suite 300 Houston, TX 77027

Telephone  
 (713) 623-0801

Name and Address of Surface Owner:

Name and Address of Drilling Contractor and Rig Number:

Stoneham Drilling Corporation  
 14067 Jackson St. Williston, ND 58801

Stoneham Rig #11

Surface Location of well: Qtr-Qtr, Sec, Twp, Rge, County, feet from nearest lines of section, and latitude and longitude (if available):  
 SE NE, Sec. 7, T18N-R6E, Harding County, 1960' FNL and 820' FWL Lat. 45.54000 Long. 103.425675

If Directional, top of pay and bottom hole location from nearest lines of section:

Acres in Spacing (Drilling) Unit:

40

Description of Spacing Unit

Sec. 7 SE NE

| Well Name and Number |                | Elevation       | Field and Pool, or Wildcat |   | Proposed Depth and Formation |
|----------------------|----------------|-----------------|----------------------------|---|------------------------------|
| Ludlow 07-01         |                | 2861' GL        | Dean, Wildcat              |   | 8,500' Red River             |
| Size of Hole         | Size of Casing | Weight per Foot | Depth                      | Cementing Program (amount, type, additives) | Depth                        |
| 1) 26"               | 16"            | 42.05 #         | 100'                       |   | 100'                         |
| 2) 12-1/4"           | 8-5/8"         | 24 #            | 1,500'                     | 538 sks Class G. See Attached               | 1500'                        |
| 3) 7-7/8"            | 5-1/2"         | 20 #            | 8,500'                     | 785 sks, Pozz G/Class G. See Attached.      | 3500'                        |
| 4)                   |                |                 |                            |   |                              |

Describe Proposed Operations (Clearly State all Pertinent Details, and Give Pertinent Dates, Including Estimated Date of Starting any Proposed Work). Use additional page(s) if appropriate.

Vaalco proposes to drill the subject well to a TD of 8500' to test the Red River B and Red River D formations. See drilling procedure attached. Vaalco agrees to use a 12 mil liner. If productive, casing will be run and the well will be completed. Vaalco proposes to spud this well immediately upon approval of the Application for Permit to Drill, and approval of the Harding County Auditors office.

I hereby certify that the foregoing as to any work or operation performed is a true and correct report of such work or operation.

*Lisa Smith*  
 Signature

Lisa Smith Agent for Vaalco Energy (USA), Inc.  
 Name (Print) Title

December 12, 2012  
 Date

FOR OFFICE USE ONLY

Approved By: *Robt Townsend* *Administrator Minerals & Mining Program*

Permit No. 2022 API No. 40 063 20739 Date Issued: 12/21/2012  
 Conditions, if any, on attached page.



**DEPARTMENT of ENVIRONMENT  
and NATURAL RESOURCES**

PMB 2020  
JOE FOSS BUILDING  
523 EAST CAPITOL  
PIERRE, SOUTH DAKOTA 57501-3182  
[www.state.sd.us/denr](http://www.state.sd.us/denr)

**PERMIT CONDITIONS**

Vaalco: Ludlow 07-01  
18N-6E-7 SENE, Harding County

Permit: #2022  
API: 40 063 20739

Approval has been granted to drill this location as detailed on the attached Application for Permit to Drill (Form #2) with the following additional conditions:

1. This permit is conditioned on compliance with all applicable requirements of South Dakota Codified Laws 45-9 and Administrative Rules of South Dakota 74-12.
2. A 12-mil woven, reinforced high-density polyethylene liner must be used on all pits.
3. Surface runoff must be diverted around the drill site.
4. The surface hole must be drilled with fresh water.
5. Cement must be circulated to the ground surface on the surface casing.
6. If production casing (long string) is set:
  - A. The cement program approved as submitted with the application shall be followed.
  - B. A cement bond log must be run and filed with the department within 60 days after completion of the well as required by Administrative Rules of South Dakota 74:12:02:12.
7. If the well is productive, only one Red River zone may be produced, unless Vaalco Energy petitions the Board of Minerals and Environment to approve multiple completions or commingling in the wellbore.
8. If abandoned: A plugging plan must be submitted at least 7 days prior to plugging for the department's review and approval; otherwise, the following plan must be followed:
  - A. If production casing will remain in the wellbore, a mechanical integrity test must be conducted to verify the integrity of the casing.
  - B. With long string, sufficient cement must be circulated to install:
    1. A 100-foot plug immediately above the perforations.
    2. A 100-foot cement plug, half in and half out of the top of the casing stub after the retrievable part of the production casing has been removed.
    3. A 100-foot cement plug, half in and half out of the top of any fresh water aquifer between the top of the casing stub and the base of the surface casing. Freshwater resources at this site include: Madison, Minnelusa, Minnekahta, Canyon Springs, and Inyan Kara.
    4. A 100-foot plug, half in and half out of the base of the surface casing.
    5. A 25-foot cement plug at the top of the surface casing.
  - C. Without long string, sufficient cement must be circulated to set:
    1. 100-foot cement plugs, half in and half out of the top of the following formations:  
Red River, Interlake, Madison, Minnelusa, Minnekahta, Canyon Springs, and Inyan Kara.
    2. A 100-foot cement plug, half in and half out of the base of the surface casing.
    3. A 25-foot cement plug at the top of the surface casing.
    4. Heavy, mud-laden fluid must be used between all plugs.
  - D. The casing string must be cut off at least three feet below the final ground surface contour. A plate with the name of the operator, well name and number, and legal location by quarter-quarter section, township and range must be welded to the casing stub. The location of the abandoned well must be surveyed with high resolution global positioning system equipment or other appropriate survey methods sufficient to accurately locate the well. Survey coordinates must be included in the final abandonment report.

9. Surface reclamation of the site must be completed within one year of plugging and abandoning the well.
10. A washed set of sample cuttings (or cores, if cut) must be shipped, free of charge, to:

Derric Iles  
Geological Survey Program  
Akeley-Lawrence Science Center  
University of South Dakota  
414 E. Clark Street  
Vermillion, SD 57069-2390

11. Please notify this office prior to plugging so a witness can be on location. If plugging will occur after regular business hours, call Jeff Klenner at 605-929-1414.
12. Activities requiring approval from the department may not be initiated until proper approval has been obtained.