UIC Class II Permit Application

Continental Resources is requesting to convert the following well to a High Pressure Air Injection Well to support the secondary oil recovery project within the Buffalo Red River Unit.

Well Name: BRRU 12-19H
Well Location: SWNW Sec 19-21N-4E, Harding County, Buffalo, SD.

The application for a permit to inject shall contain the following complete information:

(1) A one-half mile fixed radius area of review plat which shows the location of the injection well or wells, existing or proposed; the location of all oil and gas wells; the location of all water wells active and abandoned; the location of all other wells, including plugged and abandoned wells; abandoned locations; dry holes; current drilling locations; the names of operators; the surface and mineral owners; and each offset operator;

See attached map.

Operator: Continental Resources is the only operator in the Buffalo Red River Unit.

Working Owners:

Continental Resources Inc. (Operator)
Inland Oil & Gas Corporation
Linn Operating INC.

Mineral Owners

See Attached. The Buffalo Red River Unit has been unitized resulting in a large number of mineral owners.

Surface Owner

Name: Shirley Clarkson

Address: 12233 Rasmus Road, Buffalo, SD, 57720

(2) The formation or formations from which oil, gas, and water wells are producing or have produced;

Oil: Red River "B" Formation

Gas: Red River "B" Formation

Water: Red River "B" Formation, Fox Hills, Hell Creek, Inyan Kara, Madison, & Minnelusa.

(3) The name, description (stratigraphic and structural), and depth of the receiving formation or formations and the overlying confining zone or formation;

Receiving formation(s): Red River "B" at 9,165' MD & 8,645' TVD

The Red River "B" zone porosity in the vicinity of the BRRU #12-19H well is 15'-17' thick. It is composed of brown to tan dolomite, often with a chert layer between the upper and lower porosity zones. The upper "B" porosity is about 3' thick in this area and is usually laminated recrystalized algal mat, having better permeability and better oil saturation than the lower "**B**" porosity. The lower "B" porosity is more of a bioturbated mudstone, that is as porous or more porous than the upper "B" but with lower permeability and lower oil saturation.

Confining zone/formation(s): The BRRU #12-19H well lateral enters the Red River "B" zone porosity at 9,165' MD and 8,645' TVD and the lateral ends in the "B" zone porosity at 13,689'MD and 8,680' TVD.

The State #32-16 well in section 16-T21N-R4E shows 73' of shale above the Red River top from 8,435' to 8,508', which contains air injection from going higher than the Red River formation. It also shows 39' of tight limestone below the base of the Red River "B" porosity from 8,563' to 8,602' which contains air injection from going lower than the Red River "B" zone porosity zone. See attached type log for the State #32-16 well.

The State #32-16 is the closest well as most BRRU wells were intentionally not drilled into the Red River "C" zone due to the high volume of water within the zone.

(4) The well type, construction, spud date, total depth, formation tops, record of completion or recompletion, and plugging for all oil, gas, and injection wells within the area of review, **and any additional pertinent information which the secretary determines is necessary to make an informed judgment on the issuance of a permit,** including drill stem tests and well logs for all oil and gas wells identified in the area of review;

1) **BRRU 12-18 - Producing**
2) **BRRU 44-18 - Producing**
3) **Federal Graves 34-24 - Producing**
4) **BRRU 34–19 – TA'd Plan to plug.**
5) **BRRU 14-19 - HPAI**
6) **BRRU 32-18 – HPAI**
7) **BRRU 34-18 – P&A'd**
8) **BRRU 14-18 – P&A'd**
9) **BRRU 32-19 – P&A'd**

See attached documents.

(5) Information on abandoned and active water wells, as follows:

(a) Abandoned water wells: None

(i) The legal location;

(ii) Well name; and

(iii) Method of abandonment, if available;

(b) Active water wells: None

(i) The legal location;

(ii) Well name;

(iii) An analysis of water quality, including information on total dissolved solids content, chlorides, sodium, sulfates, nitrates, and hydrocarbons;
Total Dissolved Solids:_____
Chlorides:_____
Sodium:_____
Sulfates:_____
Nitrates:_____
Hydrocarbons:_____

(iv) The construction program, including casing size and type, if available;
Construction details:

Hole/drill bit sizes
Surface: NA Production: NA

Casing sizes and weights
Surface: NA Production: NA

Tubing size and weight: NA

Cement details:
Surface
Type(s):
Additives (list to each individual type): _____
_____

Production
Type(s): NA

Additives (list to each individual type): _____

_____

_____

_____

Tubing
Type(s): NA
Additives (list to each individual type): _____

_____

_____

(v) Depth of well, if available;

(vi) A geologic/driller's log, if available;
(vii) The water level and pump type, if available;

(6) A description of the injection well's casing and the proposed casing program, and the proposed method for testing the casing for mechanical integrity before use as an injection well.

See attached.

1) Proposed wellbore with csg details

The current production equipment will be removed and an incoloy packer and tbg with API modified collars tested to 5000 PSI installed.

The casing in BRRU #12-19H will be MIT tested as required by the State of South Dakota, which is a 15 minute test at 1000 psi with an allowable 10% fall off.

(7) The geologic name and the depth to and interval of all freshwater resources which may be affected by injection;

Name: Fox Hills Depth: 800'

The BRRU #12-19H cement bond log shows water bearing sands at the following depths:

Name: Dakota Sand Interval: 4,548' – 4,754'

Name: Minnelusa Sand Interval: 6,242 – 6,370'

(8) The names and addresses of the operators of the project;

Name: Continental Resources
Address: PO Box 268870, Oklahoma City, OK, 73126

(9) Schematic drawings of the surface and subsurface construction details of the well with detailed drawings of the gauge connections;

See Attached

(10) The source and nature of the substance or substances to be injected, its viscosity, its compatibility with the receiving formation, including stability indices, and the estimated average and maximum daily amounts to be injected. If the nature of the injected fluid is produced water, a water quality analysis must be submitted and must include information on total dissolved solids content, chlorides, sodium, sulfates, nitrates, and hydrocarbons;

Air is to be injected.

Viscosity: N/A
Compatibility: N/A
Stability indices: N/A
Laboratory Recommendations: N/A
Average Daily Injection Volume: 1,000 – 1,500 MFC
Maximum Daily Injection Rate: 5000 MCF
Produced-water quality
Total Dissolved Solids: N/A
Chlorides: N/A
Sodium: N/A
Sulfates: N/A
Nitrates: N/A
Hydrocarbons: N/A

(11) The average and maximum estimated injection pressure;

Average: 4,250 psi
Maximum: 4,500 psi

(12) A narrative description of any proposed production stimulation program, including a feasibility study, process description, and an explanation of how the data were determined, such as working calculations;
Production stimulation Program

Feasibility Study:

The feasibility of oil recovery using air-injection has been demonstrated by the increase in production from the three Red River Units.

Process description:

Compressed air will be injected into the Red River porosity zone, which will ignite upon contact with the hydrocarbons within the reservoir. This combustion will cause a front of nitrogen and CO2 that will sweep the oil towards a producing well.

How data was Determined:

Increase in production since the air injection project started in 1979.

(13) An analysis of any corrective action on all wells identified on the plat required by subdivision (1) of this section and the basis for the conclusion;

Corrective Action:

Continental Resources is not aware of any corrective actions needed on any of the wells in the AOR.

Basis for the Conclusion:

All wells within the area of review are properly constructed so no corrective action is need.

(14) The injection zone characteristics, including porosity, compressibility, and intrinsic permeability. This information has been collected over the numerous years of drilling and completion of wells within the unit using well logs and core samples.

Porosity: 17%
Compressibility: 0.7 x 10 -6 psi -1
Intrinsic Permeability: 10 md

(15) The expected project life

Years: 20 – 25

(16) The surface owner's name, address, and telephone number.

Name: Shirley Clarkson

Address: 12233 Rasmus Road, Buffalo, SD, 57720

Telephone number: (605) 375 - 3261

As indicated in Section 4, the Secretary reserves the right to request additional pertinent information needed to make a recommendation on the approvability of the application. The secretary shall deny any permit application which is incomplete.

In addition, the applicant will need to submit a notorized Certification of Applicant (Form 13), that can be obtained at http://denr.sd.gov/documents/form13.pdf. or by contacting the South Dakota Department of Environment and Natural Resources

All permits to inject are issued pursuant to the provisions of chapter 74:10:11.01.

Name of person legally responsible for Class II operation (owner/operator),

Continental Resources INC
Address: PO Box 268870, Oklahoma City, OK, 73126
Telephone: (405) 234-9000

Local representative or contact person if different from above:

Name: Gordon Carlson
Address: 11583 S. Cave Hills Road, Buffalo, SD, 57720
Telephone: (605) 375-3731

I certify under penalty of law that I have personally examined and am familiar with the information submitted in this document and all attachments and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information including the possibility of fine or imprisonment.

Signature _____ Date 4/11/2013

PETER MACINTYRE PRODUCTION ENGINEER
Printed Name of Person Signing Title

Subscribed and sworn before me this 11 day of April, 2013.

_____
Notary Public

My commission expires: 1/25/15

KIMBERLY J. WHITE NOTARY # 03000917 EXP. 01-25-2015 PUBLIC STATE OF OKLAHOMA