



**DEPARTMENT of ENVIRONMENT
and NATURAL RESOURCES**

JOE FOSS BUILDING
523 EAST CAPITOL
PIERRE, SOUTH DAKOTA 57501-3182

denr.sd.gov

July 24, 2018

Peter MacIntyre
Continental Resources, Inc.
20 N. Broadway
Oklahoma City, OK 73102

Re: Oil and Gas Case No. 15-2018 - approval of a Major Modification of Permit to Inject,
Kirkwood 12-31 Federal WBRRU Injection Well, SW/4 NW/4 Section 31, Township 21
North, Range 4 East, Harding County

Dear Mr. MacIntyre:

Thank you for your application filed June 13, 2018, requesting modification of Continental Resources' permit to inject for its existing Kirkwood 12-31 Federal WBRRU well. Your application requested modification of injection fluid from air to water for the Kirkwood 12-31 Federal WBRRU injection well.

The department published a Notice of Recommendation for Case No. 15-2018, recommending approval of the application. The final date for intervention was July 18, 2018, and no parties petitioned the Board of Minerals and Environment for a hearing on the application by the deadline.

Therefore, in accordance with the Administrative Rules of South Dakota (ARSD) 74:12:07 and 74:12:09, approval of the application is hereby granted. The permit is conditioned on compliance with all applicable requirements of South Dakota Codified Laws 45-9 and ARSD 74:12. Please refer to the enclosed Notice of Recommendation for specific terms and conditions.

Thank you for your interest in protecting the water resources of the state.

Sincerely,

A handwritten signature in blue ink, appearing to read "S. Pirner".

Steven M. Pirner
Secretary

Enclosure

STATE OF SOUTH DAKOTA
SECRETARY OF THE
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES

IN THE MATTER OF THE APPLICATION OF CONTINENTAL RESOURCES, INC., OKLAHOMA CITY, OK, TO MODIFY ITS PERMIT TO INJECT FOR THE KIRKWOOD 12-31 FEDERAL WBRRU WELL LOCATED IN THE SW¼ NW¼ SECTION 31, TOWNSHIP 21 NORTH, RANGE 4 EAST, IN THE WEST BUFFALO RED RIVER UNIT (WBRRU) OF THE BUFFALO FIELD, HARDING COUNTY, ABOUT THIRTEEN MILES NORTHWEST OF BUFFALO, SD, TO SUPPORT WATER FLOOD IN THE "B" ZONE OF THE RED RIVER FORMATION IN THE WEST BUFFALO RED RIVER UNIT FOR ENHANCED RECOVERY OF OIL AND GAS.	NOTICE OF RECOMMENDATION FOR MAJOR MODIFICATION OF PERMIT TO INJECT OIL AND GAS CASE NO. 15-2018
---	--

Notice is hereby given to the public and to all interested persons that pursuant to South Dakota Codified Laws (SDCL) Chapter 1-26 and Chapter 45-9 and further pursuant to the Administrative Rules of South Dakota (ARSD) 74:12:07 and 74:12:09, the following matter has come to the attention of the Secretary of the Department of Environment and Natural Resources, hereinafter "Secretary."

Continental Resources, Inc., hereinafter "Continental," has requested a major modification of its permit to inject for the existing Kirkwood 12-31 Federal WBRRU well. The permit to inject for the Kirkwood 12-31 Federal WBRRU well was previously authorized under South Dakota Oil and Gas Order No. 3-1987. The request entails modifying injection fluid for the Kirkwood 12-31 Federal WBRRU from air to water.

The Kirkwood 12-31 Federal WBRRU well was completed with 1,998 feet of 8 5/8-inch steel surface casing, cemented to protect underground sources of drinking water, and 8,500 feet of 5 1/2-inch steel production casing, cemented to protect underground sources of drinking water. The injection zone remains the "B" zone of the Red River Formation. Injection water will be water from the Red River Formation from West Buffalo Red River Unit wells, Table Mountain Field wells, and a future water supply well within the WBRRU. No domestic water wells are located within the one-half mile area of review. All wells within the one-half mile area of review and maximum calculated radius of influence are constructed such that the injection into the Kirkwood 12-31 Federal WBRRU well will not affect any underground sources of drinking water.

The requested maximum injection pressure for water injection is 1,700 pounds per square inch and the total requested injection volume is 27,375,000 cumulative barrels of water.

The Secretary recommends approval of the application with the following conditions:

- 1) Injection operations authorized under the permit to inject must be conducted in accordance with SDCL Chapter 45-9, ARSD 74:12, and any applicable orders or rules promulgated by the South Dakota Board of Minerals and Environment;
- 2) The total number of barrels injected during the life of this permit may not exceed 27,375,000 barrels of water;
- 3) The maximum injection rate must not exceed 3,000 barrels of water per day;

- 4) The term of water injection may not exceed 25 years;
- 5) The maximum pressure for water injection must not exceed 1,700 pounds per square inch surface injection pressure during injection operations;
- 6) A mechanical integrity test must be successfully conducted prior to the commencement of water injection activity. The well must pass the mechanical integrity test at 1,000 pounds per square inch surface pressure. The operator is required to notify the Secretary a minimum of 72 hours prior to running a mechanical integrity test;
- 7) Once mechanical integrity is confirmed, the well must be retested at least once every five years to ensure mechanical integrity is maintained;
- 8) If an unsuccessful pressure test occurs, the operator must cease operations immediately if injection threatens any underground source of drinking water. If the failure does not threaten an underground source of drinking water, the operator must cease operations within 48 hours after receipt of the Secretary's notice, and take corrective action on the well as soon as feasible. Corrective action options include repairing the well so that a successful test result can be obtained, plugging and abandoning the well, or any other action approved by the Secretary.

Authority for the Secretary to approve this application is contained in ARSD 74:12:07 and 74:12:09. Unless a person files a petition requesting a hearing on the above application pursuant to the provisions of ARSD 74:09:01 on or before July 18, 2018, the Secretary's recommendation will be considered final and the Secretary will approve the application in accordance with that recommendation.

The application and notice of recommendation are also posted on the Department of Environment and Natural Resource's website at: <http://denr.sd.gov/des/og/pubhearing.aspx> and <http://denr.sd.gov/public>. Additional information about this application is available from Mike Lees, Administrator, Minerals and Mining Program, Department of Environment and Natural Resources, 523 East Capitol Avenue, Pierre, SD 57501, telephone (605) 773-4201, email michael.lees@state.sd.us.

June 22, 2018



Steven M. Pirner
Secretary

Published once at the total approximate cost of _____.