

ORDER / CASE NO: CASE NO. 18-1985

**ORDER / NOTICE OF
RECOMMENDATION TYPE: UIC**

COUNTY: HARDING

**LOCATION(S): T. 20N., R. 4E.,
SE1/4 NE1/4 SEC. 11
(SBRRU 42-11 WELL)**

**OPERATOR: KOCH EXPLORATION
COMPANY**

DATE ORDER ISSUED: 09/24/1985

DATE ORDER CLOSED:

AMENDS:

AMENDED BY:

APPROVAL STATUS: APPROVED

FIELD NAME: BUFFALO FIELD

**UNIT NAME: SOUTH BUFFALO RED RIVER
UNIT**

BEFORE THE
BOARD OF MINERALS AND ENVIRONMENT

IN THE MATTER OF THE APPLICATION)	CASE NO. 18-85
OF KOCH EXPLORATION COMPANY FOR THE)	
APPROVAL OF UNDERGROUND INJECTION)	
OF AIR AND OTHER SUBSTANCES IN SOUTH)	<u>FINDINGS OF FACT,</u>
BUFFALO RED RIVER UNIT 42-11 WELL,)	<u>CONCLUSIONS OF LAW</u>
SECTION 11, TOWNSHIP 20 NORTH, RANGE)	<u>AND ORDER</u>
4 EAST, BHM, IN THE BUFFALO FIELD,)	
HARDING COUNTY, SOUTH DAKOTA.)	(UIC PERMIT NO. 18-45)

An application having been made by Koch Exploration Company, hereinafter "Koch," for the approval of injection of air and other substances into the South Buffalo Red River Unit 42-11 Well in the Southeast Quarter of the Northeast Quarter (SE $\frac{1}{4}$ NE $\frac{1}{4}$) of Section 11, Township 20 North, Range 4 East, BHM, in the Buffalo Field, Harding County, South Dakota; and

A hearing having been held on Thursday, September 19, 1985, before the South Dakota Board of Minerals and Environment, hereinafter "Board"; and

Koch Exploration Company appearing by and through Robert D. Buettner, General Counsel, and Scott Sumner, its attorney, and having presented testimony of Mr. Ron Miller, Engineer with Koch, together with other exhibits and evidence in support of said applications; now, therefore,

In consideration of the application and the evidence presented at the hearing, the Board hereby issues the following:

FINDINGS OF FACT:

I.

Koch's application was made to the Department on the 15th day of July, 1985.

II.

That Notice of Hearing on the application was published in the Daily Capitol Journal of Pierre, Hughes County, South Dakota, the Lead Daily Call of Lead, Lawrence County, South Dakota, and the Nation's Center News of Buffalo, Harding County, South Dakota, on or before the 30th day of August, 1985.

III.

That Notice of Hearing was served by United States Mail, certified return receipt requested, upon all of the owners of surface and minerals within the area of review defined by regulation for the South Buffalo Red River Unit 42-11 Well on the 16th day of August, 1985, and that return receipts received in response to that mailing have been filed with the Board, together with an Affidavit of Service thereof, in compliance with the statute.

IV.

That the area of review has been determined by a plat showing the location of the injection well, the location of all oil and gas wells, and the location of water wells, including abandoned and drilling wells and dry holes, the names of operators and owners within one-half mile of the injection well and that there are no offset operators.

V.

That wells are producing or have produced from the Red River Formation ("B" Zone).

VI.

That the formation to be affected by injection is the Red River "B" Zone which zone is an Ordovician tight limestone with interlayered porous dolomite and that the top of the Red River "B" Zone for the described well is at 8,605 feet (minus 5,470 feet).

VII.

The proposed casing program for the South Buffalo Red River Unit 42-11 Well is surface casing of 8 5/8 inches, 24# K-55 cemented through fresh water zones; production casing: on bottom: 4 1/2 inch N-80 11.6#; across salt section: 4 1/2 inch P-110 13.5#; on top 4 1/2 inch 11.6# K-55.

VIII.

That prior to cementing tubing string, casing will be pressured to 1,000 PSI; pressure then monitored for 15 minutes.

IX.

That fresh water resources are at a depth of 400 feet subsurface and geologically named Fox Hills Sand.

X.

That the operator of this project is Koch Exploration Company of P.O. Box 2256, Wichita, Kansas, 67201, and pursuant to ARSD 74:10:09:03, operators in the pool were served notice of Koch's intent to apply for injection approval.

XI.

A schematic drawing of surface and subsurface construction details of the injection well is a part of the record herein and shows construction details satisfactory for

the proposed injection operations.

XII.

The primary substance to be injected is air, together, periodically, with other substances including nitrogen, produced gas, water and natural gas. The produced gas and produced water would be from the Red River Formation.

XIII.

The average injection pressure is 4,480 PSI WHP with maximum rates being 4,600 PSI WHP.

XIV.

The purpose of the high rate air injection is to support in situ combustion, the method of secondary recovery, adopted by the Board of Minerals and Environment by previous orders for unit operations in the Buffalo Red River Unit.

XV.

No corrective action has been taken nor is corrective action necessary on wells identified within the area of review.

XVI.

The underground injection will not endanger drinking water.

XVII.

The method proposed for casing integrity tests are as follows: first perforations will be plugged, the production casing will be tested at 1,000 PSI surface, 4,700 PSI BHP; the tubing will be tested at 5,000 to 7,000 PSI with nitrogen; the tubing will be cemented inside the production casing and tested again; the operator will monitor annulus pressure.

XVIII.

That no persons appeared at the hearing in opposition to the application.

UPON THE FOREGOING FINDINGS OF FACT, THE BOARD
HEREBY MAKES THE FOLLOWING:

CONCLUSIONS OF LAW:

I.

That the Board has jurisdiction over the subject matter and the persons involved in this application.

II.

That Notice of Hearing on this application was published as required by law and as required by the Memorandum of Agreement executed with the Environmental Protection Agency granting the State authority to enforce the UIC Program and that Notice of Hearing was served by certified mail, return receipt requested, upon interest owners within the area of review for the proposed injection well in accordance with SDCL § 45-9-58.

III.

That Koch's application for the above-described air injection well is complete.

IV.

That the proposed air injection operations will not endanger drinking water sources.

V.

That the proposed injection will be constructed with adequate casing, tubing and packer and adequate cementing to prevent significant leaks or movement into fresh water

sources.

VI.

That the maximum injection pressure of 4,600 PSI assures that the pressures in the injection zone during injection will not initiate new fractures nor propagate existing fracutures in the confining zone and further, will preclude the injection from causing the movement of fluids into a fresh water resource.

VII.

That upon the foregoing Findings of Fact and Conclusions of Law, Koch Exploration Company's application for an order permitting the injection of air and other substances into the Red River Formation for the purpose of supporting its method of secondary recovery operations conducted in the area known as the Buffalo Red River Unit ought be granted.

O R D E R

WHEREFORE, Upon the foregoing Findings of Fact and Conclusions of Law, the Board of Minerals and Environment for the State of South Dakota hereby grants Koch Exploration Company's application for permission to inject air, nitrogen, produced gas, produced water and natural gas into the Red River Formation utilizing the South Buffalo Red River Unit 42-11 Well in Section 11, Township 20 North, Range 4 East, Black Hills Meridian, in the Buffalo Field, Harding County, South Dakota, all in support of the method of secondary recovery operations conducted in South Buffalo Red River Unit, with maximum injection pressure of 4,600 PSI. Koch Exploration Company of P.O. Box 2256, Wichita, Kansas, 67201, is designated the operator of

this project. Koch shall comply with all applicable requirements of ARSD 74:10:09 in connection with commencement, operation and discontinuance of injection operations of this injection well.

DATED this 24th day of Sept., 1985.

SOUTH DAKOTA BOARD OF MINERALS
AND ENVIRONMENT

By 
Richard C. Sweetman
Its Chairman

Board of Trustees
9-19-85

Motion carried.

The next five items were bond and/or liability releases for exploration permits. See Matrix sheet.

Motion by Mr. Farnsworth, seconded by Mr. Blumhardt to release bonds and/or liabilities for permits EX-4, EXNI-178, EX-108, EXNI-172 and EXNI-174.

Motion carried.

Koch Exploration Company contested hearings #14-85, 15-85, 16-85^{1/}, 17-85^{2/}, 18-85, and 19-85.

Scott Sumner, Rapid City, attorney for Koch Exploration Company requested that Koch be allowed to withdraw an application and that Koch further be allowed to continue two other applications until the October Board meeting. Mr. Sumner indicated that the application was therefore for three of the original six requests.

Garland Erbele, Natural Resource Engineer, Department of Water and Natural Resources, was sworn in by Mr. McCahren and stated the notices for the six applications from Koch were published in the Nation Center News, Daily Capital Journal, and the Lead Daily Call. He further stated no comments were received by the Department concerning the notices. Mr. Erbele stated affidavits of publication had been received from the Daily Capital Journal and the Nation Center News. The affidavit of publication had not yet been received by the Lead Daily Call. Mr. Sumner requested that the Board make the affidavits of publication part of the file and that they be accepted into the file for future use.

Mr. Sumner presented to the Board three exhibits. Exhibit 1 was an affidavit by Mr. Randolph Whippel, district landman for special projects for Koch Exploration Company. This exhibit was presented because Mr. Whippel is familiar with the Buffalo Field area in Harding County and also has performed a search of Koch's records to identify owners of surface and minerals within the areas affected.

Chairman Sweetman asked if there was anyone present at the hearing who was in opposition to Exhibit 1 and also if the Board members would accept it into the file as Exhibit 1. There was no opposition and the exhibit was entered into the record.

Exhibit 2 was an affidavit of service by Mr. Sumner establishing that Mr. Sumner did, in fact, serve a copy of the notice of public hearing to each of the people on the list of names provided by Mr. Whippel by certified mail, return receipt requested as required by the statute. Mr. Sumner offered this into the record with no opposition.

Exhibit 3 was a packet of the return receipts returned pursuant to the certified mailing made pursuant to Exhibit 2. Exhibit 3 was entered into the file with no opposition.

Mr. Ron Miller, Box 2256, Wichita, Kansas, Project Manager for Koch was sworn in by Mr. McCahren.

1/ Application withdrawn
2/ ~~Application~~ Case continued

Mr. Sumner asked Mr. Miller questions concerning his position as Petroleum engineer. Mr. Sumner stated that Koch wished to withdraw its application for the South Buffalo Red River Unit concerning well #2-35 or Hearing #16-85.

Mr. Sumner stated Koch (South Buffalo Red River Unit) wishes for a continuance until next Board meeting on hearing #'s 17-85 and 19-85 on wells 33-12 and 32-34.

Mr. Sumner stated the reason for the continuance was the information Koch has on these wells does not put Koch in a position to determine if Koch should continue to produce from the wells or convert the wells to air injection wells.

Mr. Sumner stated Koch would proceed with hearings 14-85, 15-85 and 18-85.

Mr. Sumner proceeded by asking Mr. Miller if he was able to identify the application prepared on the wells for Buffalo Red River Unit #'s 32-18, 32-19 and (South Buffalo Red River Unit) 42-11.

Mr. Miller indicated that he had reviewed the applications and they were prepared under his supervision.

Mr. Sumner asked the Board to accept the three applications for wells #32-18, 32-19 and 42-11 along with the attached exhibits into the record. They were accepted with no opposition.

Mr. Miller explained the tests on the 3 injection wells. He stated Koch intends to use the same integrity tests and casing that has previously been used in the Buffalo Red River and South Buffalo Red River Unit. He explained Koch plugs existing perforations covering the Red River formation, tests the production casing to 1,000 psi, tests each tubing connection as Koch runs tubing into the hole from 5,000 to 7,000 psi with nitrogen gas. Koch cements the tubing with premium connections on the tubing itself in place all the way to the surface so there is no water in the annulus between the tubing and the production casing. Koch tests the tubing for leaks prior to drilling the tubing out by pressure test. Next Koch begins injection of air and monitoring the annulus pressure as required by the casing integrity test. Mr. Miller explained that special testing of the wells are also done by monitoring injection rates and pressure tests for deviations 3 times a day. Koch also runs fall out tests 2 times a day.

Questions were asked by Board members

Mr. Miller stated all wells in the Red River Unit are isolated with cement and no corrective action is needed for any of the wells in the area of review.

Mr. Miller explained the request was for the Board's order to allow the injection of air, the produced gas, natural gas, nitrogen, and water. He explained Koch does not intend to inject continuously. He indicated the original order allowed air and other substances and Koch, he explained has injected water and nitrogen periodically.

Questions were asked by Board members and discussion followed.

#14-85, #15-85, #18-85 Approved 9-19-85 Jm
#17-85, #19-85 Continued
#16-85 Withdrawn³

Mr. Sumner asked Mr. Miller if he was familiar with the various water formations in the vicinity of the areas covered by the injection applications. Mr. Sumner also asked if Mr. Miller if he believed there would be a problem with the injections affecting the drinking water. Mr. Miller explained it did not present a drinking water problem because the cement protects the Red River Zone from any other zone and it is basically isolated. Mr. Miller stated the surface casing protects all of the Fox Hills formation where the fresh water zone is located.

Mr. Sumner stated Koch would like to have the Board approve the applications for underground injection of air and other substances as identified by Mr. Miller for Buffalo Red River Unit well 32-18 which is hearing no. 14-85, the Buffalo Red River Unit well 32-19 which is hearing no. 15-85 and the South Buffalo Red River Unit well 42-11 which is hearing no. 18-85.

Chairman Sweetman asked if there was anyone wishing to speak in favor of the request for case nos. 14-83, 15-85 and 18-85.

Mr. Erbele stated 2 letters of support had been received by the Department. Mr. Erbele indicated the letters are from Phillips Oil Co. and Workala Industries. Mr. Erbele read the letters to the Board members.

Mr. Sweetman stated the letters would be part of the record and asked if there was anyone else to testify for or against the application.

There was none.

Motion by Mr. McCahen, seconded by Mr. Blumhardt to grant application 14-85.

Motion carried.

Case 15-85

Motion by Mr. McCahren, seconded by Blumhardt to grant application 15-85.

Motion carried.

Case 18-85

Motion by Mr. McCahren, seconded by Mr. Blumhardt to grant application 18-85.

Motion carried.

Ms. Gledd stated for the record that Mr. Jim Nelson had received a telephone call from Mr. Russell Carver who was unable to attend the hearings and that Mr. Carver wished to be a party in the two continued hearings which are to be held at the October meeting.

Discussion followed.

Mr. Farnsworth moved that #17-85 and 19-85 be continued until the next meeting of the Board.

Motion carried.

Koch Case Hearing Permit #12-85.

Ms. Giedd stated for the record that Mr. Carver, representing the Harding County Minerals and Landowners Association, had telephoned Mr. Nelson asking that Mr. Carver be allowed to Intervene In #12-85 and also that the hearing concerning #12-85 be continued until the next Board meeting.

Discussion followed.

Because no written request by either Mr. Carver or the Harding County Minerals and Landowners Association had been received and further because no one was present at the hearing representing said practices Chairman Sweetman stated that the hearing would be held as scheduled today. He stated it would be mentioned a verbal request to Intervene was made but not acted upon.

Chairman Sweetman stated hearing 12-85 would proceed.

Mr. Sumner asked the Board to Include and Incorporate as part of Koch's modification application the entire record and the Board's file relative to the original application so that the Information on the original application relative to the various points would be Incorporated as one. Mr. Sumner Indicated the application Includes the 12 Items required by the regulations.

Chairman Sweetman asked if anyone was In opposition to Incorporating the the original application materials into this record. There was no opposition so it became part of the record.

Mr. Sumner referred to a letter (filed BME) from Mr. Randy Whippel, Koch Exploration Co., dated July 2, 1985, with attachments showing the wells In the area and other geologic Information surrounding the area. Mr. Sumner stated that the letter sets forth the nature for the request concerning the application for 12-85 and asked that the letter be Incorporated Into the record.

Mr. Erbele stated public notices had been published In the Lead Daily Call, Nation Center News and the Daily Capitol Journal and that the Department had received no comments In favor or against Koch's application. Mr. Erbele stated affidavits of publication had been received from the Nation Center News and the Pierre Capital Journal and that a copy of the application had been sent to Mr. Russell Carver and the Harding Co. Minerals and Landowners Association.

Mr. Sumner moved that the application be Included as part of the record for 'evidentury purposes.

Chairman Sweetman Indicated that the application would be part of the record with no objections.

Mr. Sumner called Mr. Miller to testify.

Mr. Miller stated Koch is presently Injecting water Into the Red River formation and they are finding It is not adequate to dispose of all the water Koch produces from the Buffalo Red River Unit. Mr. Miller Indicated Koch expects Increases In both oil and water as more air Is Injected. At present, Koch has a surface pit which has been used since 1954 by Koch and other operators. This pit, Mr. Miller explained Is full. At present, Koch Is putting most of the water down the Injection wells and occasionally some goes Into the pit.

Mr. Miller explained Koch needs another zone to inject produced water into. Mr. Miller stated Koch plans to perforate the Minnelusa formation, a sandstone located about 6,000 feet below the surface. Mr. Miller further explained the zone and also analyses of the water sample shows the TDS to be 8,860 ppm which qualifies the zone for an exempted aquifer since it is between 3,000 and 10,000 ppm. The Minnelusa which is transected by in the Buffalo Red River Unit 33-9 disposal well is isolated by cement and the casing has been tested for integrity. Koch proposes to perforate the Minnelusa from a 6,085 feet to 6,247 feet and to run a bottom hole pressure test to determine the original formation pressure of the Minnelusa. Koch plans to have dual injection into the Red River and the Minnelusa leaving the Red River formation zone open. The Red River produced water zone has a TDS of 15,900 mg/l and a max pressure of 1,500 psi. The average pressure, they estimate would be 100 psi over five days. Koch plans to inject at the lowest possible pressure because of costs. Further, by injecting under 1,500 psi, the danger of fracturing the formation is reduced. The tubing to be run into the well is tested at 5,000 psi, a packer seals off the casing from any pressure and Koch monitors the annulus continually.

Mr. Miller indicated Koch does not expect any impact on the wells in the Minnelusa formation because it is a very large reservoir and the fact they are injecting 1,000 to 1,200 barrels a day will not affect the formation.

Discussion followed.

Mr. Sumner stated that first the Board would have to exempt the aquifer, which according to the regulations could be done because the aquifer is below 10,000 ppm and is not expected to be utilized for a public water supply.

Mr. Sumner then moved the Board to exempt the aquifer and to further modify the Board's earlier order so as to allow Koch to reinject the produced waters into the Red River formation.

Chairman Sweetman asked if there was anyone in favor of Koch's application or against it.

Garland Erbele, stated EPA should approve under the UIC Memorandum of Agreement the exempted aquifer. He stated the application had been submitted to EPA but nothing had been received back on the status of the application. Mr. Erbele indicated that DWR would request that a cement bond log be run on the well.

Mr. Whippel was asked by Mr. Sumner to testify.

Mr. Whippel was sworn in by Mr. McCahren.

Mr. Whipple, District Landman for Koch Exploration Company, was asked by Mr. Sumner if Mr. Russel Carver owned interests in the vicinity of the Buffalo Red River Unit in which the water injector is located. Mr. Whipple indicated to his knowledge that Mr. Carver did not own any interest in this area. Mr. Whipple stated the injector was approximately 2 1/2 miles from Mr. Carver's land. Mr. Sumner asked the Board to have Mr. Fred Steece state, to the Board for the records, his observations of the conditions in the field and the necessity for the use of the well.

Mr. Steece, Oil and Gas Supervisor, Rapid City, was sworn in by Mr. McCahren and proceeded to explain the necessity of the well.

He explained his observance of the well 33-9 location was that it was full and felt something should be done with the water.

This ended Mr. Steeces testimony. Mr. Sumner stated the request for the bond log by the Staff and EPA was no problem for Koch and that Koch would comply with the request.

Motion by Mr. Taylor, seconded by Farnsworth to exempt the Minnelusa formation for the purpose of injecting wastewater.

Chairman Sweetman asked if there was a radius to be exempted and Mr. Erbele stated the Department recommended a 1 mile radius of the Minnelusa around the injection well be contained within the exempted status.

Mr. Taylor and Mr. Farnsworth indicated they would incorporate that in their motion and second.

Chairman Sweetman recommended the Board proceed.

Motion carried.

Motion by Mr. Taylor, seconded by Mr. McCahren to approve the application of Koch Exploration Co. with the additional requirement of running a cement bond log on the well.

Motion carried.

Discussion followed.

Hazardous Waste Rules Amendments

Kevin Tveidt, employed with the Hazardous Waste program, DWR, began by reading a letter from EPA as to the reasons for the amended rules. Mr. Tveidt indicated there were no new rules, they have all been in place nationally and the State is merely catching up with the rule making process. Mr. Tveidt stated the notice of the amendments was published in 5 newspapers by July 23, 1985, and was also sent to approximately 100 people on the State's mailing lists on July 21, 1985. Twenty-one people had asked for and received copies of the rules and the State had received no written comments.

Chairman Sweetman asked if there were any comments on the proposed rules. No comments.

Moved by Mr. McCahren, seconded by Mr. Farnsworth to adopt the amended Hazardous Waste Rules 74-2A.

Motion carried.

Mr. Tveidt showed to the Board members, with the use of an overhead projector, the amended rules adopted by the Board today. Mr. Tveidt explained the changes and effects it would have on the environment.

STATE OF SOUTH DAKOTA

DEPARTMENT OF WATER AND NATURAL RESOURCES

NOTICE OF PUBLIC HEARING

Notice is hereby given to the public and to all interested parties, that the Board of Minerals and Environment, pursuant to provisions contained in SDCL 1-26-16 thru 1-26-37; 45-8-1 thru 45-8-16; and 45-9-11, 45-9-13, 45-9-17, 45-9-37 thru 45-9-52; will at _____:_____ P.M. (or as soon thereafter as applicant can be heard) on _____, the _____ day of August, 1985, in _____,

South Dakota; hold a public hearing for the purpose of hearing evidence upon the following case(s):

Case No. <u>14</u> -85	Case No. <u>17</u> -85
Case No. <u>15</u> -85	Case No. <u>18</u> -85
Case No. <u>16</u> -85	Case No. <u>19</u> -85

Application is made by Koch Exploration Company of P. O. Box 2256, Wichita, Kansas for orders permitting the authorized injection of air into the Red River Formation for the purpose of supporting its method of secondary recovery operations conducted in areas known as the Buffalo Red River Unit (BRRU) and the South Buffalo Red River Unit (SBRRU) Harding County, South Dakota.

Applicant requests that orders authorize the injection of air by using the following named wells:

14-85	BRRU 32-18, T21N, R4E, Section 18:	SW/4 NE/4
15-85	BRRU 32-19, T21N, R4E, Section 19:	SW/4 NE/4
16-85	SBRRU 12-35, T21N, R4E, Section 35:	SW/4 NW/4
17-85	SBRRU 33-12, T20N, R4E, Section 12:	NW/4 SE/4
18-85	SBRRU 42-11, T20N, R4E, Section 11:	SE/4 NE/4
19-85	SBRRU 32-34, T21N, R4E, Section 34:	SW/4 NE/4

Applicant asserts that approval for injection is essential to sustain current secondary recovery operations which will promote greater ultimate recovery of oil and gas, prevent waste and protect correlative rights.

Any interested person may present statements or arguments orally or in writing relevant to the action proposed at the time and place of this hearing as referenced previously. The hearing is an adversary proceeding and any person has the right to be present or to be represented by a lawyer. These and other due process rights will be forfeited if not exercised at the hearing.

A copy of the application is on file in the Department of Water and Natural Resources, Joe Foss Building, Pierre, South Dakota 57501 and the Department's

Western Field Office-Oil and Gas, 36 East Chicago Street, Rapid City, South Dakota 57701.

The Board of Minerals and Environment may upon its own motion or at the instance of any interested person, pursuant to the hearing, enter such order or orders adopting the proposals substantially as above set forth without further notice, in keeping with the evidence submitted. Decisions based on the hearing may be appealed to the Circuit Court and to the State Supreme Court as provided by law.

Any handicapped person wishing to attend this hearing may contact the Department of Water and Natural Resources or call 605-394-2229.

FOR THE BOARD OF MINERALS AND ENVIRONMENT

Fred V. Steece, Supervisor
Western Field Office-Oil and Gas
Department of Water and Natural Resources
July ____, 1985



July 15, 1985

KOCH EXPLORATION COMPANY

The State of South Dakota
Dept. of Water & Natural Resources
Joe Foss Building
Pierre, South Dakota 57501

RE: **Underground Injection Application
Buffalo Red River and South Buffalo
Red River Unit Areas
Harding County, South Dakota**

Attn: Garland Erbele
Program Director
Underground Injection Control

Gentlemen:

Koch Exploration Company, a subsidiary of Koch Industries, Inc. (Koch), Operator and working interest owner of the Buffalo Red River Unit (BRRU) and the South Buffalo Red River Unit (SBRRU) areas hereby applies for the right to inject air into the Red River formation underlying the above unitized areas for the purpose of pressure maintenance sufficient to support its method of secondary recovery, known as insitu combustion, previously adopted and approved by the Board of Minerals and Environment (the Board) under Oil and Gas Orders 5-78 and 1-83.

This application is submitted to comply with ARSD 74:10:09:02 for the express purpose of obtaining the authorization by the Board to allow the permitting of air injection into the Red River Formation by utilizing the following described wells:

- BRRU 32-18 Well (See attachment I)
- BRRU 32-19 Well (See attachment II)
- SBRRU 12-35 Well (See attachment III)
- SBRRU 33-12 Well (See attachment IV)
- SBRRU 42-11 Well (See attachment V)
- SBRRU 32-34 Well (See attachment VI)

All attachments are made a part hereof.

In addition, Koch submits as attachment VII an affidavit and certification of mailing indicating that personal notice of this application was served to each operator in the pool. Koch requests that this application be heard at the next scheduled meeting of the Board to be held August 15, 1985.

Respectfully,

Randolph Whipple
Randolph Whipple
District Landman
Special Projects

RBW/cew:44
Attachments

cc: Office of the State Geologist - Fred Steece
Department of Water & Natural Resources - Warren R. Neufeld
Banks and Johnson Attorneys at Law - Scott Sumner

#18-85

ATTACHMENT V

Made a part of that underground injection application dated July 15, 1985, for utilizing the SBRRU 42-11 well

Item (1). The area of review is illustrated on plat attached hereto as attachment V-A.

Item (2). The formation from which wells are producing or have produced is the Red River Formation ("B" zone).

Item (3). The Red River "B" zone will be the primary formation affected by authorized injection. The Red River "B" zone is an Ordovician tight limestone with interlayered porous dolomite. The top of the Red River "B" zone for the described well is:

8409'+

Item (4). The well history for the SBRRU well 42-11 is summarized as follows:

Current Status: Application filed for permit to drill 6/28/85
 Date Drilled : Not yet spudded.
 TD : 8390' (Est.)
 PBSD : Will submit at later date
 Completion : Will submit at later date
 Perforated : Will submit at later date
 Logs : Will submit at later date
 DST : Will submit at later date

Item (5). Casing Program for the SBRRU 42-11 well

Surface Casing:
 Production Casing: on bottom: (Surface & Production Casing program will be 8-5/8" 24# K-55 & 4-1/2" 11.6# K-55 and 13.5# N-80 and P-110. Will submit depths and other information upon completion of well.)
 across salt section:
 on top:
 casing set at:
 cemented:

Casing Integrity Test: Prior to cementing tubing string, casing will be pressured to 1000 PSI. Pressure then monitored for 15 minutes.

- Item (6). Freshwater resources are at a depth of 400' subsurface and geologically named Fox Hills Sand.
- Item (7). The operator of this project is Koch Exploration Company of P. O. Box 2256, Wichita, Kansas 67201 and pursuant to 74:10:09:03; operators in the pool have been served notice of Koch's intent to apply for injection approval.
- Item (8). The schematic drawing of surface and subsurface construction details of the injection well is attached hereto as attachment V-B.
- Item (9). The nature of the substance to be injected is air whose source is compression facilities situated on the unit areas.
- Item (10). The average injection pressure is 4480 psi WHP with maximum rates being 4600 psi WHP.
- Item (11). The purpose of high rate air injection is to support insitu combustion, the method of secondary recovery, adopted by the Board of Minerals and Environment by previous orders.
- Item (12). There have been no corrective action on wells identified on plat required by 74:10:09:02 (1).
- Item (13). Attachment VII, made a part hereof, certifies that applicant has submitted a true and correct copy of the application for injection to each operator in the pool pursuant to 74:10:09:03.

34

35

ATTACHMENT V-A
INJECTION APPLICATION
DATED JULY 15, 1985
AREA OF REVIEW
NO. 42-11 SBRRU

T
21
N

No. 34 Haivala
14-76

No. 34-34 SBRRU
6-21-84

No. 14-35 SBRRU
1-25-85

No. 32-3 State
3-9-77

No. 12-2 Haivala-Fed.
4-20-77

No. 32-2E Haivala
10-5-77

No. 12-1 SBRRU

No. 32-1 SBRRU

3

2

1

No. 34-2A Haivala
3-30-60

No. 34-1 SBRRU
5-12-84

No. 34-3 Tilus
8-21-76

No. 14-2A Tilus
10-12-75

No. 14-1 Haivala-Seppala
7-9-77

No. 14-1
11-1

No. 1 U.S.A.
2-21-71

No. 32-10A Tilus
1-1-66

No. 12-11A Tilus (No. 1)
7-14-59

No. 32-11A Seppala
2-10-60

No. 12-12 Seppala
7-1-77

No. 33-12 SBRRU

10

11

12

No. 42-11 SBRRU

No. 32-12 Seppala
8-31-77

No. 12-9-8-6

No. 14-11A Tilus
12-5-65

No. 34-11 Tilus-Seppala
11-1-76

No. 14-12 Seppala
4-17-77

No. 34-12 Seppala
10-18-77

No. 14-7 Seppala
10-22-77

T
20
N

No. 31-15 SBRRU
7-22-83

No. 32-14 E Seppala
6-19-77

No. 12-13 Seppala
6-20-77

No. 32-13 Seppala
11-16-77

No. 12-18 Seppala
6-30-78

15

14

13

No. 12-14 SBRRU
7-25-84

No. 32-14 E Seppala
6-19-77

No. 12-13 Seppala
6-20-77

No. 32-13 Seppala
11-16-77

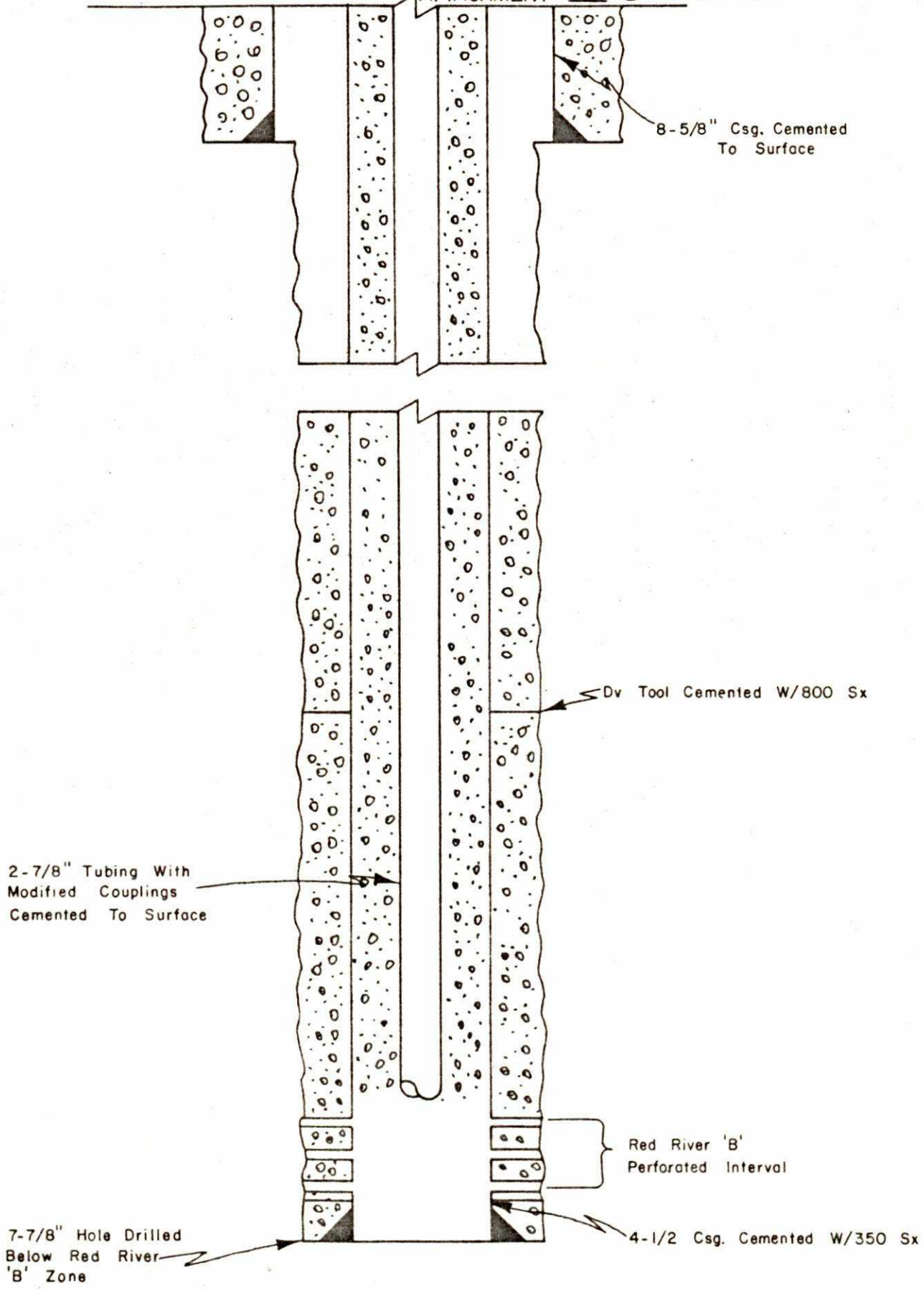
No. 12-18 Seppala
6-30-78

Koch Exploration is Operator
on all lands within 1/2 mile radius.

Owners within area of review:
M. Butler
T. Seppala, Exec. for Reuben Seppala
A. M. Tilus

R4E

Schematic Drawing Of Subsurface Construction
Detail Of Air Injection Well SBRRU 42 - 11
Made A Part Of Injection Application Dated July 15, 1985
ATTACHMENT V - B Ground Level



The preceding operators were obtained from the Office of the State Geologist, State of South Dakota, Rapid City, South Dakota.

In witness whereof, this affidavit is executed this 16th day of July, 1985.

KOCH EXPLORATION COMPANY

By: *Randolph Whipple*
Randolph Whipple, District Landman
Special Projects

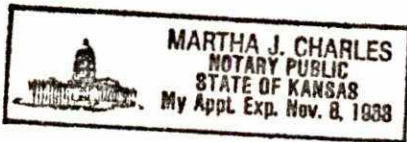
STATE OF KANSAS)
) SS:
COUNTY OF SEDGWICK)

Before me, the undersigned, a Notary Public, in and for said County and State, on this 16th day of July, 1985, personally appeared Randolph Whipple, to me known to be the identical person described in and who executed the within and foregoing instrument of writing and acknowledged to me that he duly executed the same as his free and voluntary act and deed for the uses and purposes therein set forth.

In witness whereof, I have hereunto set my hand and affixed my notarial seal the day and year last above written.

Seal:

Martha J. Charles
Notary Public



**CERTIFIED MAIL
RECEIPTS NOT
AVAILABLE**