

STATE OF SOUTH DAKOTA
DEPARTMENT OF ENVIRONMENT AND NATURAL RESOURCES
BOARD OF MINERALS AND ENVIRONMENT

<p>IN THE MATTER OF THE PETITION OF LUFF EXPLORATION COMPANY, DENVER, CO, FOR AN ORDER APPROVING THE OPERATION OF A PORTION OF THE COREY BUTTE FIELD AND PETE’S CREEK FIELD CONSISTING OF ALL OF SECTION 34 AND THE W/2 OF SECTION 35, TOWNSHIP 23 NORTH, RANGE 6 EAST, AND ALL OF SECTION 3, TOWNSHIP 22 NORTH, RANGE 6 EAST, HARDING COUNTY, SD AS THE CROOKED CREEK RED RIVER UNIT; PROVIDING FOR THE RECOVERY OF RISK COMPENSATION FROM OWNERS WHO ELECT TO HAVE THEIR SHARE OF UNIT EXPENSES CARRIED; APPROVING THE UNIT AGREEMENT AND UNIT OPERATING AGREEMENT FOR THE UNIT; DESIGNATING LUFF EXPLORATION COMPANY AS UNIT OPERATOR; AND FOR OTHER RELIEF AS THE BOARD DEEMS APPROPRIATE.</p>	<p style="text-align:center">OIL AND GAS CASE NO. 6-2018</p> <p style="text-align:center">ORDER</p>
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SECRETARY’S ORDER UNDER SDCL 45-9-74

A Petition (“Petition”) of Luff Exploration Company (“Luff”) was submitted to the South Dakota Board of Minerals and Environment (“Board”) on March 26, 2018. The Board prepared and published a Notice of Opportunity for Hearing (“Notice”) and Luff caused a copy of the Petition and the Notice to be served by mail or personally on each party affected by the petition. No petitions to intervene were filed in accordance with the Notice. Therefore, pursuant to South Dakota Codified Laws (SDCL) 45-9-74, and based upon Luff’s Petition and the supporting documents filed by Luff, the Secretary makes and enters the following order:

Luff represents the owners of interests in the oil and gas leasehold estate underlying all or portions of all of Section 34 and the West Half of Section 35, Township 23 North, Range 6 East

of the Black Hills Meridian; and all of Section 3, Township 22 North, Range 6 East of the Black Hills Meridian. All of said lands are located in Harding County, SD.

By Petition dated March 23, 2018, Luff petitioned the Board for an order approving the operation of a portion of the Corey Butte and Pete's Creek fields, consisting of the lands described in paragraph 1 (the "Unit Area"), as the "Crooked Creek Red River Unit;" approving the Unit Agreement and Unit Operating Agreement for the unit, and designating Luff as operator.

Three producing wells, each originally drilled by Continental Resources, Inc. and now operated by Luff, have been drilled in the Unit Area. The Travers 1-34H well was drilled in 2007, and currently produces from a spacing unit consisting of all of said Section 34. The Carla 1-35H was drilled in 2008 and was abandoned shortly after; however, in 2014 Luff reentered the wellbore and isolated the original lateral, drilled a new lateral, and reestablished production. The Carla 1-35H was originally spaced on a 640-acre basis, with a spacing unit consisting of all of said Section 35, but currently produces from a spacing unit consisting of the West Half of said Section 35. The Fowler 1-3H well was originally drilled in 2007, and Luff drilled two additional laterals in 2015. The Fowler 1-3H currently produces from a spacing unit consisting of all of said Section 3.

The existing spacing unit for the Fowler 1-3H well is located in the Pete's Creek Field, and the remaining spacing units are located in the Corey Butte Field. All of the existing spacing units have five hundred foot setback requirements from the boundaries of the spacing unit, and Luff has no objection to the same requirement applying to the Unit Area.

As described in the proposed Unit Agreement, the formation Luff is seeking to unitize within the Unit Area (the "Unitized Formation") is defined as the stratigraphic interval from the top of the Gunton member of the Stony Mountain Formation, found at a depth of 8,763 feet below the Kelly Bushing as identified by the Schlumberger Platform Express Compensated Neutron-3 Detector Litho Density porosity log run in the vertical portion of the Miller Ranch F-4H well located in the SE¼ NW¼ of Section 4, Township 22 North, Range 6 East, Harding

County, SD, and to include all principal zones down to the Red River “C” zone marker, found at a depth of 8,987 feet below the Kelly Bushing as identified by the same log. There are no Red River open hole well logs within the Unit Area, so Luff has used a log from a nearby well outside the Unit Area to describe the stratigraphic interval.

Luff seeks to unitize the Unit Area in order to conduct a secondary recovery project consisting of a waterflood. Luff anticipates drilling one additional horizontal well parallel to the Travers 1-34H well, in the area between the Travers 1-34H well and the other existing wells in the Unit Area, producing from the new horizontal well for approximately one year, and then converting the well to water injection service. The three existing wells within the Unit Area will continue to produce oil and gas. Luff estimates the total cost of the project to be approximately \$2,913,400. Luff intends to obtain approval from the Secretary under Chapter 74:12:07 of the Administrative Rules of South Dakota (“ARSD”) prior to commencing injection in the Unit Area.

Luff proposes to divide the Unit into three separate tracts. Within those tracts Luff proposes to allocate expenses and production based on a two-phase formula, with Phase I being based 50% on Current Oil Production Rate, defined as a six-month average ending March 31, 2018, and 50% on Remaining Oil Reserves – Primary Recovery (effective April 1, 2018), and Phase II being based 70% on Estimated Ultimate Recovery – Primary, and 30% Movable (Mobile) Oil in Place Originally. Conversion to Phase II would occur when 133,800 additional barrels of oil are recovered from the Unitized Formation, from and after April 1, 2018.

Luff conducted subsurface mapping and reservoir modeling studies relying on data from other waterflood projects previously conducted by Luff. Based on that data, Luff estimates that the waterflood proposed for the Unit Area will recover approximately 228,000 barrels of oil that otherwise would likely not be recovered. The present value of this oil is greater than the estimated cost of implementing the waterflood.

All wells located within the Unit Area or within one half mile of the boundaries of the Unit Area are operated by Luff, so Luff is the only operator affected by this project.

The Unit Agreement and Unit Operating Agreement are fair, reasonable, just and equitable, address the matters set forth in SDCL 45-9-39, and contain all the terms, provisions, conditions and requirements reasonably necessary and proper to protect and safeguard the respective rights and obligations of the several persons affected and will effectuate and accomplish the purposes of SDCL Chapter 45-9. The Unit Agreement and Unit Operating Agreement provide for the efficient unitized management and control of the further development and operation of the Unit for the recovery of oil and gas from the unitized formation defined in said Agreements.

The Unit Operating Agreement provides for the application of risk compensation in the event any working interest owner elects not to participate in a future unit operation. Currently, there are no nonconsenting interests in the existing wells within the Unit Area.

The area included within the Unit is less than the entire pool or common source of supply, but the area is of such size and shape as is reasonably required for the unit operations and the conduct of such operations will have no adverse effect upon other portions of the pool. The unitized management, operation and further development of the Red River "B" formation in the Unit are reasonably necessary to increase substantially the ultimate recovery of oil and gas.

Unitization of the proposed Unit Area and the unitized management, operation and further development thereof as a Unit, all as set forth in the application and the Unit Agreement and Unit Operating Agreement and other exhibits presented by Luff will prevent waste, will equitably distribute the oil and gas among the various owners of the enlarged Unit Area, will result in the recovery of substantially more oil and gas than otherwise will be recovered, and will protect the correlative rights of the several owners.

The plan for unit operations consisting of the Unit Agreement and the Unit Operating Agreement has been approved in writing by those persons who will, under this order, be required to pay at least sixty percent of the cost of the unit operation and by the owners of at least sixty

percent of the production or proceeds thereof that will be credited to interests which are free of cost. Original or copies of ratifications evidencing the same have been submitted to the Board by Luff.

The Board has authority to hear and decide this matter pursuant to SDCL Chapter 45-9 and ARSD Chapter 74:12:06, and the Secretary has authority to issue this order pursuant to SDCL 45-9-74.

All notices of the Petition and Notice of Opportunity for Hearing were properly and timely given. The Petition is complete in all respects and contains all required and requested information, and Luff is an “interested person” within the meaning of SDCL 45-9-37.

The Board has jurisdiction pursuant to SDCL 45-9-37 et seq. to issue orders approving the operation of a pool, or part therefor, as a unit.

The operation of the Unit in accordance with the Unit Agreement and the Unit Operating Agreement is reasonably necessary in order to increase substantially the ultimate recovery of oil or gas and the value of the estimated additional recovery of oil or gas exceeds the estimated additional cost incident to conduct such operations.

The Unit Agreement and the Unit Operating Agreement contain terms and conditions that are just and reasonable, and prescribe a plan for unit operations including those matters set forth in SDCL 45-9-39.

The Unit Agreement and the Unit Operating Agreement have been ratified or approved in writing by those persons who will be required to pay at least sixty percent of the cost of the unit operations under the plan of unit operations and by the owners of at least sixty percent of the production or proceeds thereof that will be credited to interests which are free of cost, such as royalties and production payments.

The allocation formula set forth in the Unit Agreement is just and reasonable.

The unit area included in the Unit Agreement is of such size and shape as may be reasonably required for the conduct of the contemplated unit operations and the conduct thereof will have no adverse effect upon any other portions of the pool.

IT IS THEREFORE ORDERED

A. That the Petition of Luff to approve the operation of the lands described above as a Unit is granted and approved, and that the Unit is designated the “Crooked Creek Red River Unit.”

B. The Unit Agreement and Unit Operating Agreement submitted by Luff are hereby approved and adopted as the plan for unit operations of the Unit.

C. The Unit is hereby created, authorized, and approved effective June 1, 2018.

D. Luff Exploration Company is designated as the initial operator of the Unit.

E. Prior spacing orders of the Board for the Corey Butte and Pete’s Creek fields, including without limitation Order Nos. 3-1975a, 17-1997, 18-1997, and 64-2013, are hereby amended to expand the boundary of the Corey Butte Field to include all of Section 3, Township 22 North, Range 6 East. Said orders are further amended to authorize operation of the Unit in accordance with this order, the Unit Agreement, and the Unit Operating Agreement.

F. Luff is hereby authorized as Unit Operator to drill horizontal or vertical wells at any location within the Unit subject only to a setback requirement that any vertical well or the horizontal component of any horizontal well open to the unitized formation be no closer than five hundred feet to the boundary line of the Unit.

G. Before the commencement of any water injection into the Unitized Formation, Luff as Unit Operator shall make application for underground injection in accordance with the statutes and regulations of the State of South Dakota, including but not limited to ARSD Chapter 74:12:07, and obtain all necessary approvals.

H. The Unit Agreement and the Unit Operating Agreement as approved hereby shall govern operations for the Unit in all respects. If, pursuant to the terms of the Unit Operating Agreement, a working interest owner elects not to participate in a future Unit operation, Luff must obtain approval from the Board and comply with the “good faith attempt” and notice requirements of ARSD 74:12:10:04 before applying any risk compensation.

Dated and signed this 23rd day of May 2018.

A handwritten signature in blue ink, appearing to read 'S. Pirner', with a stylized flourish at the end.

Steven M. Pirner
Secretary
Department of Environment and Natural Resources