APRIL 13, 1989
NARRATIVE FOR
FALL RIVER COUNTY, SOUTH DAKOTA
OIL AND GAS DEVELOPMENT POTENTIAL MAP

INTRODUCTION:

Fall River county is located in the extreme southwestern corner of the state. This county covers Tps. 7 through 12 S, Rgs. 1 through 9 E.. This county is the South Dakota Resource Area's southwestern limit.

The topography in Fall River, county is separated into two physiographic regions by the Cheyenne River (Kenne,1973). The river flows in a northeast direction with dendritic tributaries. It has rolling plains type topography to its southeast and a cuesta topography on the northwest.

The geologic package within the county is comprised of Pre-Cambrian age pink biotite granite at depth, to Quaternary alluvium gravel, eolian sands and soils on the surface. The basement Pre-Cambrian granite varies in structural elevation from 2500 feet above sea level in the north-central part of the county to -1325 feet below sea level in the southwestern portion of the county (Steece, 1961). The granite never outcrops in the county. The majority of the county has Cretaceous age Pierre Shale at the surface, with the north-central part of the county yielding outcrops of the Lower Cretaceous and upper Jurassic age rocks. Currently, the only producing formation is the Permian-Pennsylvanian Minnelusa Formation.

Structurally, the county is influenced by the Black Hills Uplift to the north. Keene (1973) has mapped three major anticlines across the county; the Cottonwood Anticline in the west, the Chilson Anticline in the south- central portion of the county, and the Cascade Anticline in the eastern portion of the county.

Since oil and gas drilling began in this county, all but three of the townships have had some drilling activity. In the past 15 years 25 of the 54 townships have had one or more wells drilled. Of the 25 townships, 5 have producing fields or wells capable of production.

There are no Indian lands within this county.

OCCURRENCE POTENTIAL:

The entire county is moderate occurrence potential based on the sedimentary thickness of 2,000 - 5,000 feet,(Mallory, 1973) except for the townships that have established production. Those townships will also have a high occurrence potential because of that production.

DEVELOPMENT POTENTIAL:

Eight of the 54 townships are classified as high development potential. Within those eight townships, are seven producing oil and gas fields. There have been 134 wells drilled across the county in the past 15 years. Most of the drilling has been in the western part of the county, Rgs. 1 through 4 east. All of the current production is from structural and or stratigraphic traps in the Minnelusa Formation. The remaining 46 townships are rated as moderate development potential. This is based on the past drilling activity in each township and/or the presence of the Minnelusa Formation at depth. It is expected that the drilling activity will remain the same over the next 15 years. This activity will most likely be in the townships that already have Minnelusa production or shows in the formation.

REFERENCE CITED

Keene, J. R., 1973, Ground water resources of the western half of the Fall River County, South Dakota: Department of Natural Resources Development Geological Survey, Report of Investigations No. 109 82 p.

Mallory, W. W., (ed.) 1972, Geologic atlas of the Rocky Mountain Region: Rocky Mountain Association of Geologist, p.56.

Steece, F. V., 1961, Pre-Cambrian surface of South Dakota: South Dakota Geological Survey, Mineral Resource Investigation Map, No. 2, scale: 1 inch = 30 miles.