

APRIL 12, 1989
NARRATIVE FOR
CUSTER COUNTY, SOUTH DAKOTA
OIL AND GAS DEVELOPMENT POTENTIAL MAP

INTRODUCTION:

Custer County is located in the southwest corner of the state and just north of Fall River county. Its western limit is the state line between Wyoming and South Dakota. This county is comprised of Tps. 2-6 S., Rgs. 1-12 E.. The Pine Ridge Indian Reservation forms a portion of the eastern county line.

The cuesta type topography in the south changes gradually in a northward direction, to steeper dissected rolling hills, to almost bad lands type of geomorphology. This change is due to the Black Hills to the north.

Custer County, is on the southern end of the Tertiary age Black-Hills Uplift. This topographic high has a north to northwest axial trend and covers portions of several counties to the north. This uplift has influenced the total geologic structure of the county. It has caused Pre-Cambrian granite and meta-sediments to be exposed in the north-central portion of the county, with the Paleozoic age and younger rocks being exposed and eroded along the flanks.

In the past 15 years drilling has been limited to 7 townships for a total of 16 wells. Out of the seven, T. 6 S., R. 2 E., has the only producing field for the county. This field is a four well field, producing from the Permian- Pennsylvanian Minnelusa Formation. Because of the geologic influence of the Black Hills Uplift it is expected that the drilling activity will remain the same, and be focused on the isolated townships which have yielded shows of oil or gas from the Minnelusa Formation.

Custer County contains no Indian lands, although the Custer County map notes the Pine Ridge Indian Reservation along its eastern county line.

OCCURRENCE POTENTIAL:

Custer County has lands of high, moderate, low and very low to unknown occurrence potentials. Several of the extreme southwest townships are classified as high occurrence potential. This is because of the established production in those townships, even though the sedimentary package is less than 5,000 feet in thickness (Mallory, 1972). The eastern portion of the county contains a thick Paleozoic and Cretaceous age sedimentary package (2,000 to 5,000 feet) which has the potential to yield both source rocks and reservoir conditions, but lacks any established production. This area is given a moderate occurrence potential. The central portion of the county is of low occurrence potential based on a thin sedimentary cover (less than 2,000 feet), and no established production. The very low to unknown occurrence potential area is in the central part of the county where the Pre-Cambrian rocks are exposed at the surface demonstrating a lack of a

sedimentary package. The type log for the county is the 1 Kaiser Ranch, sec. 3, T. 4 S., R. 10 E.. This well spudded in the Niobrara and reached maximum depth in the Minnelusa.

DEVELOPMENT POTENTIAL:

Custer County contains all four types of development potential. There are three townships rated as high development potential based on producing wells or shows of oil and gas from current drilling activity. The moderate development potential areas are all townships adjacent to the high development areas, and/or townships that have demonstrated drilling interest in the past 15 years and contain a moderate potential occurrence sedimentary package. The low development potential areas are townships that are adjacent to the outcrop of the Minnelusa, and/or near the Pre-Cambrian outcrop and therefore contain a thin sedimentary package. The very low to unknown areas are all townships in which the Pre-Cambrian outcrop is known to be exposed or very near the surface.

Indian lands are indicated on the Custer map along its eastern county line. These lands are not part of the county and were not classified.

Because of the influence of the Black Hills Uplift across most of the county, drilling activity will most likely occur in the townships that have been drilled in the past 15 years. The number of wells will be approximately 3 per township.

REFERENCE CITED

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