Chouteau Co.
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ECONOMIC MINERAL RESOURCES

Chouteau County

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The mineral resources of Chouteau County, with the exception of underground water, are not of economic importance at this time(1963). The county does contain some of the igneous intrusive rocks of the southwestern part of the Bearpaw Mountains, and the unusually well differentiated intrusives of the Highwood Mountains (particularly Square Butte) stimulated a series of debates pertinent to different hypotheses of magmatic differentiation between geologists of a half century ago. Further, most of the intrusive igneous rocks of the Bearpaw's and Highwood's were placed in the classic "alkalic" suite by the famous old-time geologist, Esper P. Larsen. Square Butte has acquired considerable notoriety among geologists, and the igneous rock "shonkinite" was named for its occurrence in Shonkin Sag.

Metalliferous mineral deposits seem to be lacking in importance, though there are unverified reports of beryl in the vicinity of the Rocky Boy stock east of Big Sandy.

Fairly extensive oil and gas exploration has been conducted in Chouteau County, but the only discovery to date(1963) has been the Sherard or Birch Creek Anticline (sec. 17, T. 25 N., R. 17 E.). A well drilled here in 1922 is reported to have initially yielded 3 to 20 million cubic feet of gas per day from depths of 1,050 and 1,750 feet. Records indicate the main gas producing horizon was the Eagle Sandstone. Other wells were drilled some 15 years later, and, though gas was encountered, the lack of a pipeline resulted in a shut-in and abandonment of the field. Prospects for future oil and gas exploration activities seem good, especially along the Sweetgrass arch and its eastern flank in western Chouteau County.

Coal

Chouteau County includes a portion of the Bearpaw Mountains coal field. The coal is mostly subbituminous in rank and occurs mostly in the Eagle Sandstone and Judith River Formation of upper Cretaceous age. The only fair-sized former coal mine, however, was in a fault block of Fort Union strata

east of Big Sandy. In general, the economics of coal production are unfavorable, especially in the case of the Eagle and Judith River Formation coal. These are too thin and lenticular to allow commercial operations, and such coals can be utilized only by future advanced technology of underground gasification.

Sodium Sulfate

A group of intermittent lakes with high concentrations of sodium sulfate are present in Chouteau County. These lakes occur in the famous Shonkin Sag, a topographically low area which carried the waters of the Missouri River in prehistoric glacial times. The lakes have no outlet and practically dry up during the summer season. They are named White Lake, Lost Lake, Big Lake, and Kingsburt or "Alkali" Lake. Location is a matter of common knowledge.

The concentration of sodium sulfate is due to many seasons of evaporative concentration of runoff water and inseepage of ground water. When the water is saturated, the grey to white crystals of sodium sulfate hydrate form in and on the muddy sides and bottom of the lakes.

The various hydrates of sodium sulfate salts are most widely used in the wood pulp and paper industry, but have a wide application to uses by a score of basic industries. Evaluation of the Chouteau County sodium sulfate deposits has not yet been completed due to the extreme difficulty and danger of working with the thick lake muds.

Ground Water

Most of the area of Chouteau County is covered by glacial drift, which is underlain by strata of the Colorado Shale in the western and most of the southern portion, and, for the most part, by the Eagle Sandstone in the eastern and northeastern portions of the county.

Ground water is not readily available from the Colorado, and, if shallow sources are not available, it becomes necessary to drill to the Kootenai Formation at depths to over 2,000 feet. Deep wells, some of which are flowing wells, are not uncommon in Chouteau County.

The Eagle Sandstone consitutes a much shallower aquifer in northeastern and eastern Chouteau County. There have been problems involving water quality and yield from Eagle wells, for the Eagle seems to have a variable permeability or coefficient of transmissibility. This is particularly true in the general area north of Virgelle and Loma, where residents have been advised to drill into the Eagle where they encountered water rather highly mineralized because of restricted circulation.

Chouteau County has many water wells both shallow and deep. There are numerous filings under the provisions of the 1961 and 1957 statutes.