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DIVISION OF MINES AND MINERALS

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Alaska Oil Shale

I regret that this promised brief report is getting to you later than I expected. The press of "cleaning up the store" before going on annual leave put me behind schedule.

This is indeed a brief report and can be expanded when additional literature which has just been published becomes available to us.

TRM:may

Enclosure

cc: James A. Williams, Director
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BRIEF REVIEW
LITERATURE ON ALASKA OIL SHALE

General

Reports of oil shales in Alaska in geological literature are confined to the northern third of the state. There are widespread authenticated occurrences of oil shales on the south and north slopes of the Brooks Range; several of which are within Naval Petroleum Reserve No. 4 and, therefore, not subject to mineral entry. Oil shale lands lying on open Federal Public Domain cannot be leased except by special approval of the Department of the Interior in the same manner as the oil shales on the Federal Public Domain in the Green River Formation in the Rocky Mountain states. No oil shale deposits are known to have been worked commercially in Alaska; although, the natives of the northern coastal areas are reported to have used oil shales for fuel, presumably transporting the shale by dog team over considerable distances. This may partly account for the widespread reports of oil shale float along transportation routes in Arctic areas and may have lead to some false conclusions about the areal extent of some deposits.

Information on Alaska oil shales mentioned in the following publications is summarized as follows:

USGS Bulletin 797, page 122

A report is mentioned of an occurrence on the Christian River about 75 miles north of Ft. Yukon. The sample yielded 122 gallons of crude shale oil per ton with a pour point of 11 degrees. This deposit had not been visited by members of the U. S. Geological Survey at the time this bulletin was written and its age and areal extent are undetermined to my knowledge.

Also mentioned in this bulletin is an occurrence on the Yukon River just above Nation River. A sample of the latter shale yielded 28 gallons of oil per ton.

USGS Bulletin 815, pages 283-287

This bulletin mentions an oil shale float speciman found on the Etivluk River abour five miles south of its confluence with the Colville River. No analyses are given of these shales of which mention is made on page 283 of this bulletin.

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Several historical references are made to oil shale float in this area. The area is structurally complex and no attempt is made to relate the float to specific stratigraphic position, although, rocks of Lower Cretaceous and older are implicated.

Oil shale was found in place in rocks of probable Lower Cretaceous age on the Kivalina River approximately 30 miles northeast of the village of Kivalina. This village lies southeast of Cape Thompson about 35 miles. No assays of oil content were mentioned.

Incidental mention is made of oil shale float near the mouth of the Meade River and at Point Hope.

It is of historical interest to note that in this bulletin that the oil shales described are considered to be "strongly indicated" as the source for oil found in the Paleozoic rocks. Present day concepts of source rocks, transportation, and accumulation of crude petroleum do not favor oil shales as the source rock of crude petroleum.

Geological Survey Professional Paper 475-D, Article 148

This paper relates some results of geological investigation made during 1963 within the Naval Petroleum Reserve #4 in which an oil shale of unusually high oil content in the Tiglukpuk Formation was investigated. The shale assayed between 46 and 146 gallons per ton of rock. This compares with an average spread of 15 to 25 gallons per ton from oil shales in the Green River Formation in the Rocky Mountain area although assays of 75 gallons per ton are occasionally recorded. Geological mapping of the Naval Petroleum Reserve #4 from 1948 to 1953 indicated that oil shales occurred in the Tiglukpuk (Jurassic) and in other rock units that appear to correlate with the Tiglukpuk. Oil shale outcrops sporatically from the Ipewic River on the west to the Anaktuvuk on the east, a distance of more than 300 miles along the north edge of the Brooks Range. These exposures of oil shale strata are sparse and discontinuous and show strong deformation. Reserves were apparently very difficult to determine. No beds of appreciable thickness were reported. The exposures along the Kiligwa River appear to offer the most promise although additional studies will certainly be required to assess its potential. Highly organic shales are reported in the Shublik Formation (Triassic) and in the Lisburne Group (Mississippian). The Shublik shales yielded 25 gallons per ton which would make it very interesting as an oil shale by Rocky Mountain standards. The Lisburne shales yielded only 6.7 gallons per ton. Readers will find the chart on page D-132 of this paper informative as to analyses and descriptions of localities sampled.

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Colorado School of Mines Quarterly 1967, Volume 62, No. 3, pages 39-43

We have not yet received this recent publication on oil shale. Our only reference to it is the Abstract of North American Geology January, 1963, published by the USGS which describes oil shales in the Mississippian through Jurassic beds in the southern foothills belt of the North Arctic Slope. Assays are the highest reported anywhere in the referenced literature. They yielded from 15 to 160 gallons of oil per ton. The article is written by Irvin L. Tailleur, the author of the article in Professional Paper 475-D.

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