DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

PREPARED IN COOPERATION WITH THE STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES, DIVISION OF GEOLOGICAL
AND GEOPHYSICAL SURVEYS AND DIVISION OF OIL AND GAS

MISCELLANEOUS FIELD STUDIES
MAP MF- 928B

TAILLEUR, ENGWICHT

STRUCTURES, TERTIARY MARKERS, GEOTHERMAL

EXPLANATION

STRUCTURE CONTOURS
(after Howitt, 1971)

2200	Marker 19, lowest
1300	Marker 10, middle
500	Marker 1, top
X 1000 (stage) (Mio)	Outcrop thickness and apparent age of partial section
1.6	Geothermal gradient, from Geothermal Survey, North America

Notes

This map shows structure contours on several markers in the Tertiary rocks in the Prudhoe Bay area and the regional geothermal gradients.

In a report on permafrost, Howitt (1971) summarized the available information on the youngest sediments found in wells along the coastal zone around Prudhoe Bay. His structural maps, based on three marker horizons in the electric logs, are reproduced on this map. The structure indicates northeastward deposition into a nearshore environment.

According to Howitt, pollen suites recovered from cores in these rocks indicate that spruce-pine-hemlock forests were in existence during deposition of the lower part of this section with the addition of some hardwoods during the middle part of deposition. During the last part of deposition, there was only sphagnum moss and non-tree vegetation, implying a cooler climate.

Contours of the geothermal gradient (Am. Assoc. Petroleum Geologists, undated) apparently correlate with other geologic trends. The lower gradients coincide with the deepest part of the Colville basin, and the higher gradients with the thinner section of sediments deposited over the Barrow arch. The inflection of the isograds in the vicinity of Prudhoe Bay may be due to an insulating effect from the hydrocarbon accumulation and(or) a slightly greater proportion of poorly conductive rocks. Heat flow in the area of Prudhoe Bay is essentially the same as other regions in the Arctic (Gold and Lachenbruch, 1973).

CONTOUR INTERVALS: 100 OR 200 FEET SUB-SEA LEVEL. 0.20° F./100 FEET

Scale 1:500,000

1 inch equals approximately 8 miles

10 0 10 20 30 40 MILES

10 0 10 20 30 40 50 KILOMETRES

Base from Harrison Bay, Beechey Point, Flaxman Island, 1955, Umiat, Sagavanirktok and Mount Michelson, 1956, 1:250,000 U.S. Geological Survey

GENERALIZED STRUCTURE MAP OF TOP, MIDDLE, AND BASAL TERTIARY MARKERS WITH GEOTHERMAL GRADIENTS EASTERN NORTH SLOPE PETROLEUM PROVINCE, ALASKA

COMPILED BY I. L. TAILLEUR AND S. E. ENGWICHT, 1978

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