STATE OF ALASKA
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF GEOLOGICAL AND GEOPHYSICAL SURVEYS

This report is preliminary and has not been edited or reviewed for conformity with Alaska Geological and Geophysical Surveys standards.

Resource Evaluation Section

March 1973

Alaska Open File Report 28

GEOLOGIC AND MINERAL EVALUATION OF THE CHARLEY RIVER DRAINAGE, ALASKA

By
W.M. Lyle

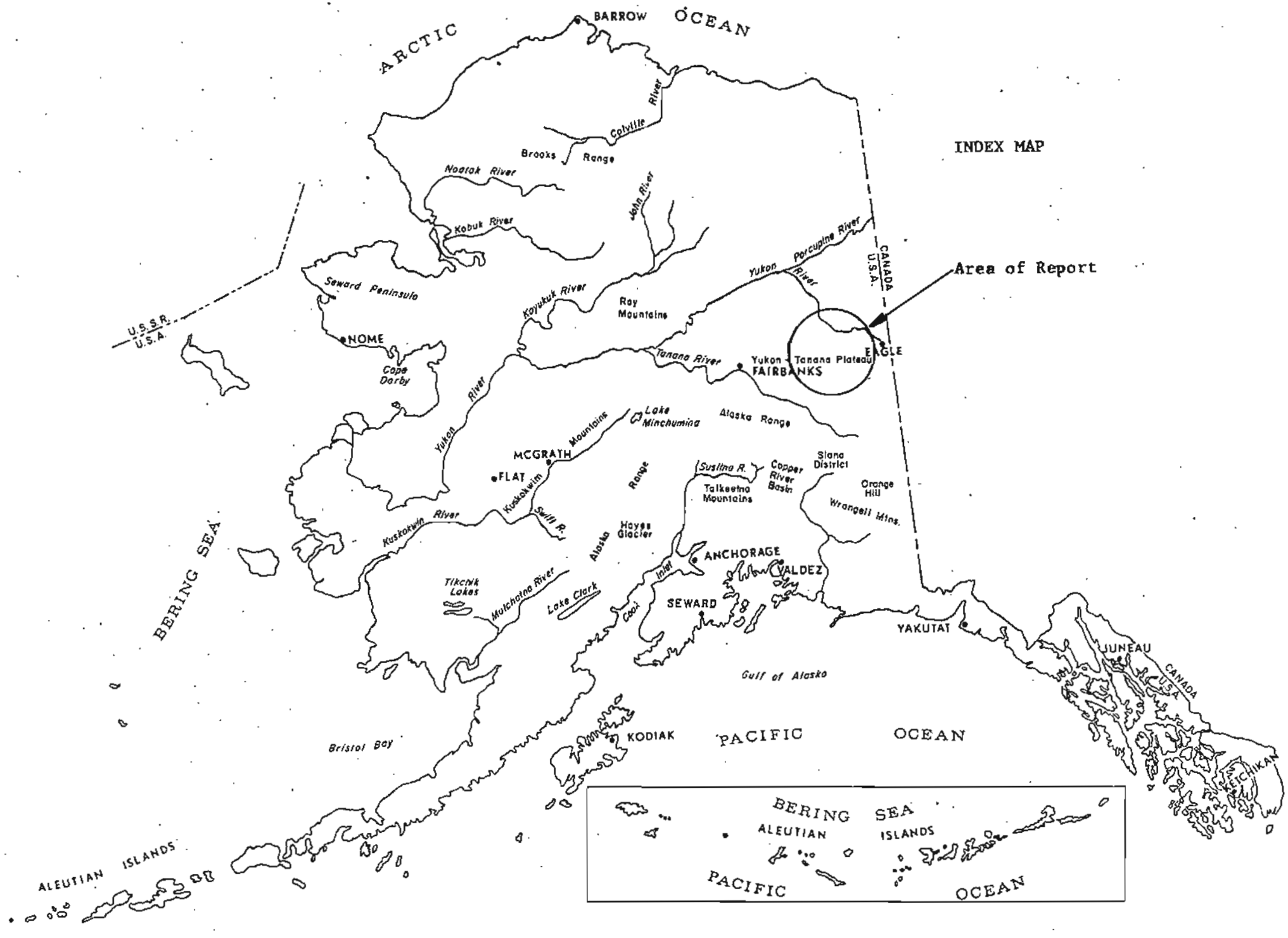
INDEX MAP
Area of Report
ARCTIC OCEAN
BARROW
Colville River
Brooks Range
Noatak River
John River
Kobuk River
Seward Peninsula
Koyukuk River
Ray Mountains
Yukon River
Porcupine River
CANADA U.S.A.
U.S.S.R.
U.S.A.
NOME
Cape Darby
Tanana River
Yukon-Tanana Plateau
FAIRBANKS
EAGLE
Yukon River
Lake Minchumina
Alaska Range
MCGRATH
Mountains
FLAT
Kuskokwim
Range
Susitna R.
Copper River Basin
Talkeetna Mountains
Slana District
Orange Hill
Wrangell Mtns.
Kuskokwim River
Swift R.
Alaska
Hayes Glacier
BERING SEA
ANCHORAGE
VALDEZ
Inlet
Tikchik Lakes
Mulchatna River
Lake Clark
SEWARD
Cook
YAKUTAT
JUNEAU
CANADA
USA
Gulf of Alaska
KODIAK
PACIFIC OCEAN
Bristol Bay
KETCHIKAN
ALEUTIAN ISLANDS
BERING SEA
ALEUTIAN ISLANDS
PACIFIC OCEAN

TABLE OF CONTENTS

PLATES

INTRODUCTION

This report has been prepared to assist the Wild and Scenic River Task Force of the U. S. Bureau of Outdoor Recreation in considering the possible mineralized areas within the Charley River drainage basin and their potential.

The Charley River and its tributaries are located in Charley River, Eagle and Big Delta quadrangles in east-central Alaska. The river drains the Yukon-Tanana Upland and flows northeast into the Yukon River in the Kandik Basin.

CONCLUSIONS AND RECOMMENDATIONS

The Charley River drainage is located within a broad mineralized belt. Placer claims have been mined for gold on other northeast flowing streams in the area and noncommercial quantities of gold have been noted on its tributaries. The mineralization of the Charley River Basin is not well enough known to evaluate the area for future economic mineral potential. It is therefore recommended that a geochemical evaluation be completed in this drainage area before it is classified.

REGIONAL GEOLOGY

The Charley River is located on the southwest flank of the Kandik Basin. It drains the mountains of the Yukon-Tanana highlands. The major structural trend is northwest-southeast along the Tintina Fault zone. Secondary northeast-southwest trends are noted by the alignment of the Glenn Creek fault, Mardow Creek fault and long axis of the Kathul syncline, and Step Mountain anticline.

GENERAL GEOLOGY

The Charley River headwaters are in the Eagle and Big Delta quadrangles in east-central Alaska. The river's tributaries drain the complexly dissected Yukon-Tanana upland. Through much of the headwaters, the river drains granite mountains of Jurassic and Cretaceous age.

South of the Tintina Fault trend in Charley River quadrangle, the river drains a complex group of metamorphic rocks including quartz-plagioclase-mica? schist; fine-grained grayish-black and grayish-green phyllite; and fine- to coarse-grained massive greenstone. Twin Mountain, a few miles west of the river, is a medium to coarse-grained quartz monzonite.

North of the Tintina fault zone, the river meanders through a valley filled with Quaternary sediments. Near the mouth of the river, rocks ranging in age from Middle Triassic to Tertiary crop out on both sides of the valley.

The Glenn Shale is mainly grayish-black carbonaceous shale. The lower few hundred feet locally contain oil shale and is a good source rock for hydrocarbons. The unit is fossiliferous with fossils ranging in age from Late Triassic to Lower Cretaceous.

The Lower Cretaceous Keenan Quartzite is medium-gray massive quartzite and sandstone with a few interbeds of dark-gray siltstone and argillite. The unit forms resistant ridges and ranges from 100 to 1000 feet in thickness.

Lower Cretaceous Biederman Argillite is a rhythmically interbedded, dark-gray argillite and medium-gray siltstone and sandstone. It is at least 5000 feet thick.

Upper Cretaceous to Pliocene sandstone, mudstone, and conglomerates unconformably overly the middle Triassic to Lower Cretaceous rocks.

MINERAL POTENTIAL

The presence of greenstones, granite, metamorphic rocks and local limestones with quartz veins indicates that the area south of the Tintina fault should have potential mineralized zones.

CHARLEY RIVER TRIBUTARIES

Drayham Creek, about twenty miles upstream from the mouth of Charley River, reportedly had some gold. Flat Creek, ten miles up from the mouth had gold prospects reported in 1914.

Irish Gulch also had noncommercial quantities of placer gold found in it.

COAL CREEK

Coal Creek, twelve miles west and subparallel to the Charley River, drains the same range of mountains. Gold placers were discovered on this stream in 1910 and were worked as late as 1968.

WOODCHOPPER

This stream is twenty miles west of the mouth of the Charley River and subparallel to it. It is 12 miles long with an alluvial valley 1/2 mile wide. Two hundred and thirty acres were patented in 1955 for placer gold mining.

FOURTH OF JULY CREEK

Fourth of July Creek, 25 miles east-southeast, was the largest mining enterprise in the Charley River Area. This gold placer deposit was discovered in 1911 and assayed at $18.89 per ton. Silver, platinum, and mercury were

also present in the placer. Active claims are being worked in this creek today.

BIBLIOGRAPHY

Brabb, Earl E. and Churkin, Jr., Michale, 1969, Geological Map of the Charley River Quadrangle.

Cobb, Edward H., 1972, Metallic Mineral Resources Map of the Eagle Quadrangle, Alaska.

_____, 1972, Metallic Mineral Resources Map of the Charley River Quadrangle, Alaska.

Mertie, Jr., J. B., 1930, Geology of the Eagle-Circle District Alaska, G.S.A. Bull. 816.