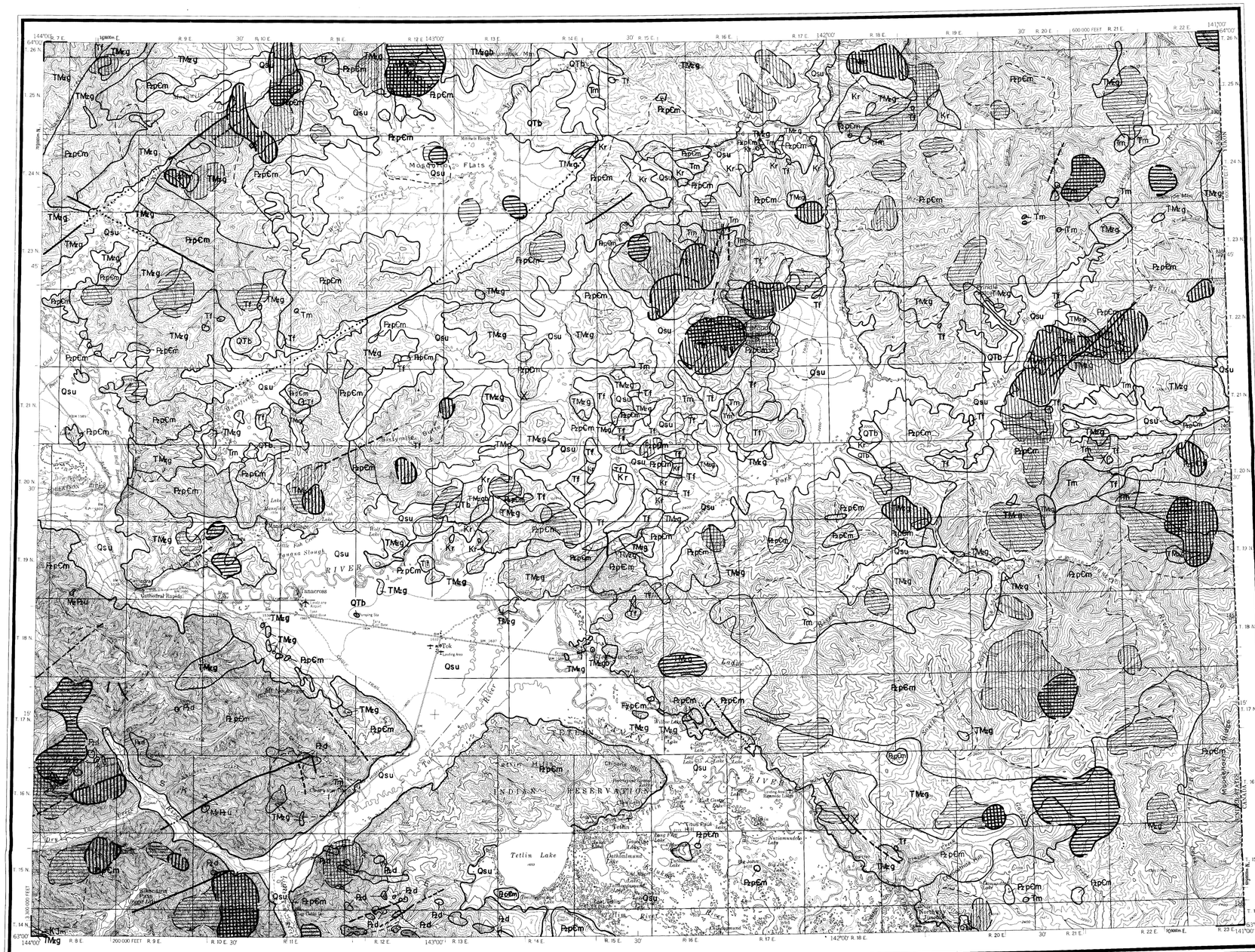
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

FOLIO OF THE TANACROSS QUADRANGLE, ALASKA

MAP MF-767N

CURTIN AND OTHERS--GEOCHEMICAL MAP, LEAD AND ZINC



EXPLANATION

GEOLOGY GENERALIZED FROM FOSTER (1970)

CORRELATION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

Qsu — QUATERNARY

SEDIMENTARY ROCKS

IGNEOUS AND METAMORPHIC ROCKS

QTb — QUATERNARY AND TERTIARY

Tm, Tf — TERTIARY(?)

Tmg, Tmgb — TERTIARY OR MESOZOIC

Kr — CRETACEOUS(?)

KJm — CRETACEOUS OR JURASSIC

TMzu — MESOZOIC OR PALEOZOIC

Pd — PALEOZOIC(?)

PzpCm — PALEOZOIC AND (OR) PRECAMBRIAN

DESCRIPTION OF MAP UNITS

UNCONSOLIDATED DEPOSITS

Qsu — UNCONSOLIDATED SEDIMENTARY DEPOSITS

SEDIMENTARY ROCKS

Kr — DETRITAL ROCKS (CRETACEOUS?)

KJm — MENTASTA ARGILLITE OF RICHTER (1967) (JURASSIC OR CRETACEOUS)

IGNEOUS AND METAMORPHIC ROCKS

QTb — BASALT

Tm — MAFIC VOLCANIC ROCKS

Tf — FELSIC TUFF, WELDED TUFF, LAVA, AND HYPABYSSAL INTRUSIVE ROCKS

Tmg — GRANITIC ROCKS, UNDIVIDED

Tmgb — GABBRO

TMzu — ULTRAMAFIC ROCKS

Pd — DIORITE

PzpCm — METAMORPHIC ROCKS, UNDIVIDED

GEOLOGIC SYMBOLS

CONTACT, APPROXIMATELY LOCATED

FAULT, DASHED WHERE APPROXIMATELY LOCATED, DOTTED WHERE CONCEALED. U. UPTHROWN SIDE D. DOWNTHROWN SIDE

FAULT OR LINEAMENT FROM AERIAL PHOTOGRAPHS

X — BASE METAL PROSPECTS NORTH OF THE TANANA RIVER

GEOCHEMICAL SYMBOLS

WEAK METAL ANOMALY

WEAKLY ANOMALOUS VALUES IN ONE SAMPLE MEDIUM. NO DISTINCTION IS MADE BETWEEN ANOMALOUS AMOUNTS OF CU, MO OR BOTH CU AND MO.

PB ZN PB-ZN

MODERATE METAL ANOMALY

WEAKLY ANOMALOUS VALUES IN TWO SAMPLE MEDIA OR STRONGLY ANOMALOUS VALUES IN ONE SAMPLE MEDIUM.

PB ZN PB-ZN

STRONG METAL ANOMALY

A COMBINATION OF VALUES RANGING FROM WEAKLY ANOMALOUS AND STRONGLY ANOMALOUS VALUES IN TWO SAMPLE MEDIA TO STRONGLY ANOMALOUS VALUES IN ALL FOUR SAMPLE MEDIA.

DISCUSSION

This geochemical map shows drainage basins in which either anomalous lead, zinc, or both lead and zinc values were detected in at least one of four sample media: (A) the oxide residue (oxalic-acid-leachable fraction) of stream sediment, (B) the minus-80-mesh stream sediment, (C) the ash of streambank sod (mixed organic and inorganic material) collected beneath the water level, and (D) the ash of aquatic bryophytes (mosses). The anomaly patterns were derived from the point-plot maps of lead and zinc distribution in the individual sample media (Curtin, Day, O'Leary, Marsh, and Tripp, 1976a, b). Background data were disregarded for each of the two metals. Weakly anomalous data for all media (small black symbols) were assigned the number 2; strongly anomalous data for all media (large black symbols) were assigned the number 3. These new data were then summed or "stacked" for each metal so that all sites showing anomalous values in one or more of the sample media had a numerical rating that ranged from 2 (weakly anomalous value in one sample medium) to a possible 12 (strongly anomalous values in all four sample media). The summed data were ranked into the three groups shown in the explanation. The drainage basins showing anomalous values were outlined according to these groups. As a final step the composite lead anomaly map was then superimposed on that of zinc to give this composite lead-zinc map.

A number of drainage basins in which the amounts of lead, zinc, or both lead and zinc are anomalously high are shown on the map. An area containing two porphyry copper prospects is delineated by the strong lead anomaly in the east-central part of the quadrangle (T. 21-22 N., R. 20-21 E.). To the south in T. 20 N., R. 21 E. a moderate zinc anomaly is associated with another outcropping mineralized zone that has been prospected. A strong lead-zinc anomaly to the north in T. 24 N., R. 21 E. reflects the presence of an additional prospect.

In the area of Mount Fairplay, in the north-central part of the quadrangle, strong and moderate lead-zinc anomalies reflect the presence of both known and potential mineralized zones in the Mesozoic-Tertiary granitic rocks and the Tertiary felsic rocks.

In the northwest part of the quadrangle a strong lead anomaly reflects the presence of an altered and mineralized Tertiary felsic intrusive body. Anomalous amounts of copper, lead, molybdenum, tin, and silver were measured in rocks collected within and around the intrusive body.

Other lead and zinc anomalies in that area of the quadrangle north of the Tanana River are similar to those that are associated with the known mineralized zones. The anomalous areas that show the most promise for additional exploration are those that are associated with sharp magnetic highs (Griscom, 1976) and the Mesozoic-Tertiary granitic rocks and Tertiary hypabyssal rocks. A number of areas in the central and eastern parts of the quadrangle show this association and, therefore, warrant additional study. The anomalies around and within Mosquito Flats and those in the west-central part of the quadrangle also warrant further investigation.

Two base metal prospects in that part of the quadrangle north of the Tanana River are not defined by the anomalous patterns on the lead-zinc map. These prospects are located in T. 21 N., R. 14 E.and T. 18 N., R. 15 E. The absence of anomalous lead and zinc values around the prospects indicates either that the lead-zinc content of the altered and mineralized rock is low or that the amount of mineralized rock is too small to produce lead- and zinc-bearing dispersion trains that could be detected at the sampling density used in this study.

The anomalies in the Alaska Range in the southwest corner of the quadrangle are most likely associated with small mineralized veins and shear zones which are known to occur in this area.

REFERENCES CITED

Curtin, G. C., Day, G. W., O'Leary, R. M., Marsh, S. P., and Tripp, R. B., 1976a, Geochemical maps showing the distribution and abundance of lead in the Tanacross quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-767H, 1 sheet, scale 1:500,000.

———1976b, Geochemical maps showing the distribution and abundance of zinc in the Tanacross quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-767I, 1 sheet, scale 1:500,000.

Foster, H. L., 1970, Reconnaissance geologic map of the Tanacross quadrangle, Alaska: U.S. Geol. Survey Misc. Geol. Inv. Map I-593, scale 1:250,000.

Griscom, Andrew, 1976, Aeromagnetic map and interpretation of the Tanacross quadrangle, Alaska: U.S. Geol. Survey Misc. Field Studies Map MF-767A, 2 sheets, scale 1:250,000.

BACKGROUND INFORMATION RELATING TO THIS MAP IS PUBLISHED AS U.S. GEOLOGICAL SURVEY CIRCULAR 734, AVAILABLE FREE OF CHARGE FROM THE U.S. GEOLOGICAL SURVEY, RESTON, VA. 22092

For sale by U. S. Geological Survey, price $.50

BASE FROM U. S. GEOLOGICAL SURVEY, 1:250,000, TANACROSS QUADRANGLE, 1964

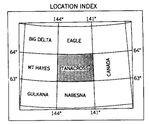
SCALE 1:250 000

5 0 5 10 15 20 25 MILES

5 0 5 10 15 20 25 KILOMETERS

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

LOCATION INDEX



COMPOSITE GEOCHEMICAL MAP OF ANOMALOUS LEAD AND ZINC DISTRIBUTION IN THE TANACROSS QUADRANGLE, ALASKA

BY

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1976