# A GEOCHEMICAL INVESTIGATION OF THE WOOD RIVER-TIKCHIK LAKES AREA SOUTHWESTERN ALASKA

By

Gilbert R. Eakins

## INTRODUCTION

The Alaska Division of Mines and Geology undertook geochemical sampling of stream sediments in the Wood River-Tikchik Lakes area near Dillingham, Alaska, in 1967 (Eakins, 1968). Additional sampling was done in 1968 near Marsh Mountain and Lake Aleknagik (fig 1) to check apparent anomalies. This report concerns the follow-up work.

## EARLY ANOMALIES AND NEED FOR RESTUDY

The 372 samples collected in 1967 were analyzed for copper, lead, zinc, molybdenum, and mercury. Analyses for copper, lead, zinc, and molybdenum revealed a single anomaly on a small stream which enters Little Togiak Lake from the south. Analyses for mercury, however, showed anomalies of more than 250 parts per billion at several localities. The main mercury anomalies were in streams entering the southeastern part of Lake Aleknagik and in streams on Marsh Mountain near the Red Top Mine.

Additional geochemical sampling was undertaken for two main reasons. First, mercury is geochemically very mobile, and the apparent anomalous concentrations of this metal did not necessarily indicate mineralization in the immediate vicinities. Second, the mercury vapor detector used in the sample analyses is subject to interference from carbonaceous material which was present in some of the samples analyzed.

## ADDITIONAL DATA

In 1968, 26 samples were collected from streams entering the southeastern end of Lake Aleknagik (fig 2) and seven samples were collected from Marsh Mountain (fig 3). All were from an anomalous mercury area outlined by sampling in 1967. Twenty-six of these samples were analyzed for mercury. The normal or "background" values were determined from frequency distribution graphs constructed from the 372 earlier analyses. The results are as follows:

| Element | Mode | | Anomalous Value |
|---|---|---|---|
| Copper | 50-60 | ppm | 100 and over ppm |
| Lead | 20-30 | ppm | 50 and over ppm |
| Zinc | 120-130 | ppm | 200 and over ppm |
| Molybdenum | 1-2 | ppm | 5 and over ppm |
| Mercury | 50-100 | ppb | 250 and over ppb |

The check sampling did not yield anomalous values for copper, lead, zinc, or molybdenum, but showed definite concentrations of mercury. The mercury assays from the 1967 and 1968 sampling are shown on Figure 2.

## CONCLUSIONS

Twenty-one of the 26 samples analyzed for mercury yielded anomalous assays (over 250 ppb). The number of samples is insufficient to appreciably change the previous sampling results, but the above-normal values do confirm the anomalies found on Marsh Mountain and around the lower end of Lake Aleknagik.

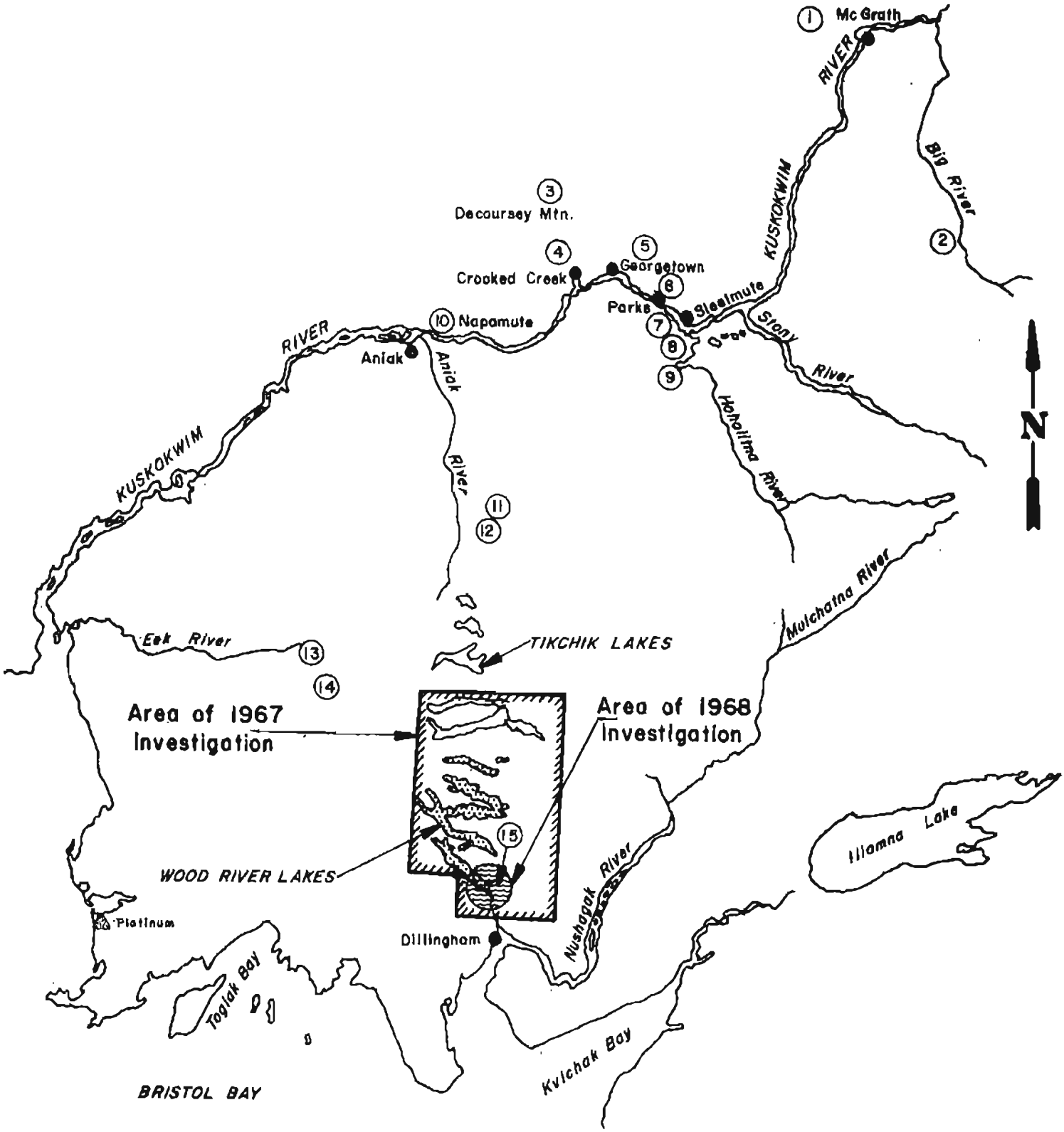
## REFERENCE CITED

Eakins, G. E., 1968, A Geochemical Investigation of the Wood River-Tikchik Lakes Area, Southwestern Alaska; Alaska Division of Mines and Geology Geochemical Report No. 17, 31p.

GEOCHEMICAL SAMPLING AT MARSH MOUNTAIN
AND LAKE ALEKNAGIK, 1968

| Sample Loc. No. | Sample Field No. | Type of Sample | Copper ppm | Zinc ppm | Lead ppm | Mercury ppb |
|---|---|---|---|---|---|---|
| 1 | 8E-53 | Soil | 50 | 60 | 30 | 1000 |
| 2 | 8E-52 | Stream | 40 | 70 | 25 | 300 |
| 3 | 8E-56 | Soil | 65 | 60 | L* | 300 |
| 4 | 8E-66 | Soil | 50 | 70 | 25 | 1130 |
| 5 | 8E-57 | Stream | 25 | 70 | L* | 700 |
| 6 | 8E-58 | Stream | 40 | 80 | L | IS** |
| 7 | 8E-60 | Stream | 25 | 30 | L | 550 |
| 8 | 8E-67 | Stream | 35 | 60 | L | 400 |
| 9 | 8E-68 | Stream | 20 | 50 | L | IS |
| 10 | 8E-70 | Stream | 10 | 50 | L | IS |
| 11 | 8E-33 | Stream | 20 | 60 | 25 | 160 |
| 12 | 8E-34 | Stream | 40 | 50 | L | 300 |
| 13 | 8E-51 | Stream | 15 | 40 | 25 | 160 |
| 14 | 8E-50 | Stream | 10 | L | L | 900 |
| 15 | 8E-46 | Stream | 25 | 50 | L | 200 |
| 16 | 8E-77 | Stream | 25 | 50 | L | IS |
| 17 | 8E-76 | Stream | 35 | 30 | L | 550 |
| 18 | 8E-78 | Stream | 10 | 30 | L | IS |
| 19 | 8E-75 | Stream | 10 | L | L | IS |
| 20 | 8E-79 | Stream | 35 | 60 | L | 1000 |
| 21A | 8E-73A | Stream | 40 | 80 | 25 | 450 |
| 21B | 8E-73B | Stream | 40 | 80 | L | 600 |
| 22 | 8E-81 | Stream | 10 | 30 | L | IS |
| 23 | 8E-83 | Stream | 25 | 75 | 25 | 450 |
| 24 | 8E-82 | Stream | 25 | 70 | L | 260 |
| 25 | 8E-85 | Stream | 40 | 80 | L | 750 |
| 26 | 8E-94 | Stream | 50 | 100 | 30 | 650 |
| 27 | 8E-92 | Stream | 10 | 60 | L | 160 |
| 28 | 8E-93 | Soil | 40 | 80 | L | 300 |
| 29 | 8E-91 | Stream | 20 | 70 | L | 700 |
| 30 | 8E-90 | Stream | 10 | 55 | L | 160 |
| 31 | 8E-87 | Stream | 20 | 60 | L | 450 |
| 32 | 8E-89 | Stream | 10 | 50 | L | 450 |

* Detected but below 25 ppm
** Insufficient sample for determination

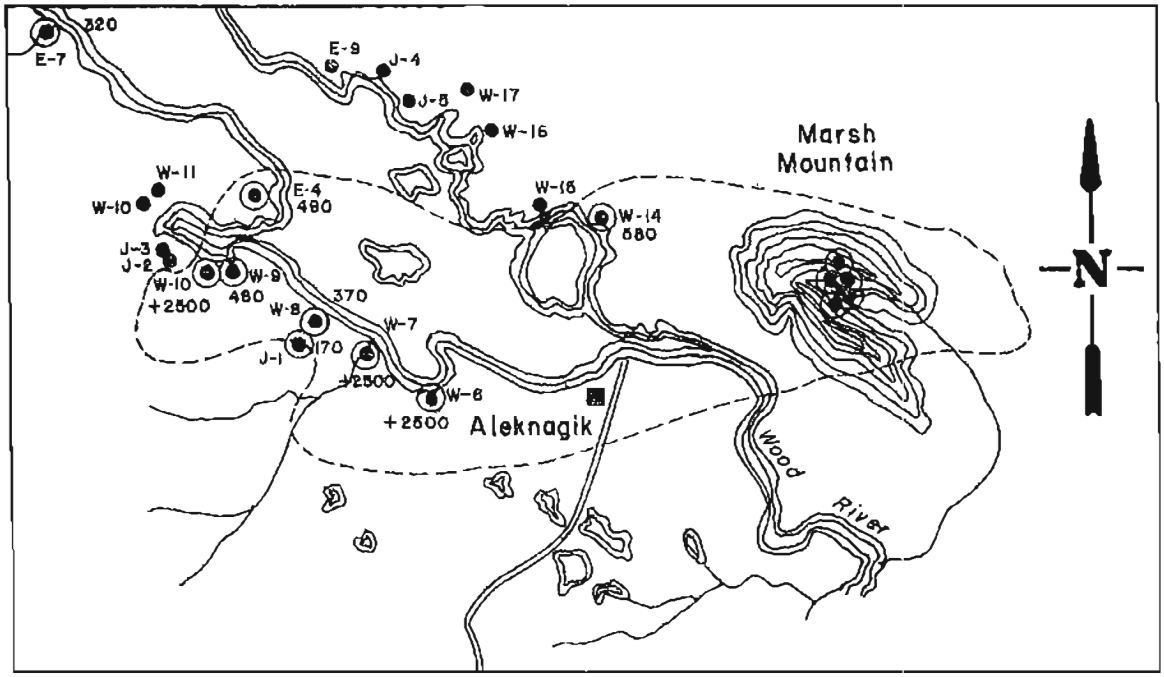



# LOCATION MAP SHOWING MERCURY MINES AND PROSPECTS

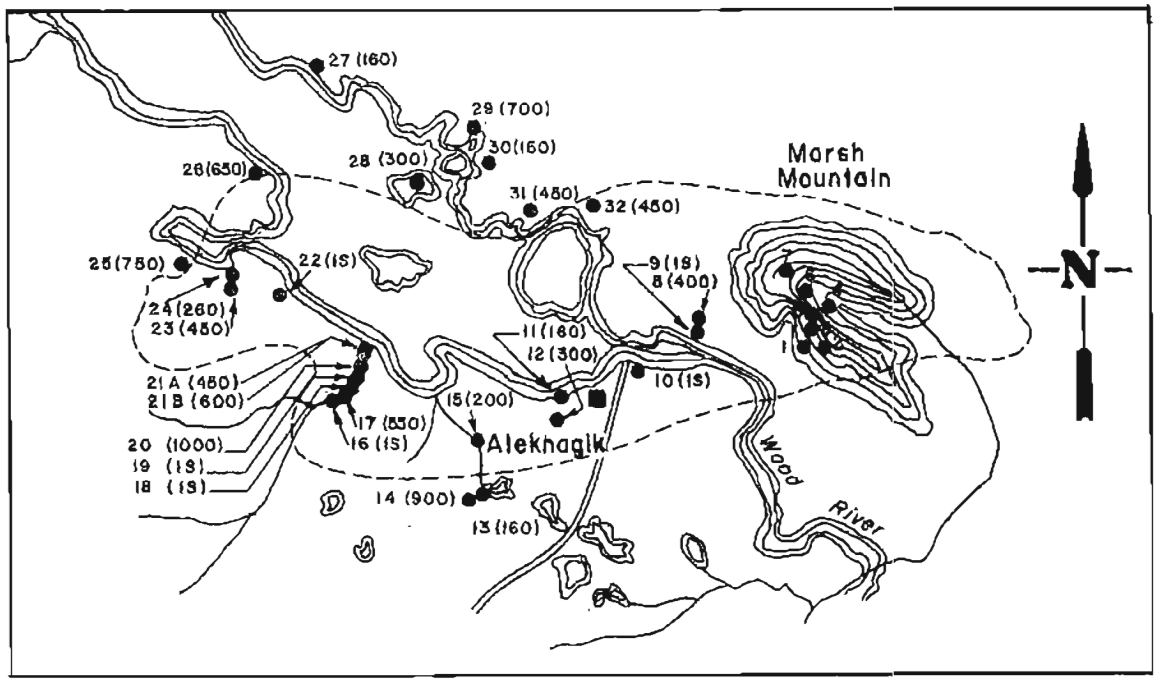
Ref: U.S. Bureau of Mines Information Circular 8131, 1962 "FIGURE 1"

1. Mount Joaquin
2. White Mountain
3. De Courcy Mountain
4. Rhyolite
5. Willis and Fuller
6. Parks (Alice and Bessie)
7. Red Devil
8. Barometer
9. Fairview
10. Kolmakof
11. Lucky Day
12. Broken Shovel
13. Rainy Creek
14. Kagati Lake
15. Marsh Mountain (Red Top)

Figure 1




# 1967 GEOCHEMICAL SAMPLE LOCATIONS LAKE ALEKNAGIK




# 1968 GEOCHEMICAL SAMPLE LOCATIONS LAKE ALEKNAGIK

LEGEND

| | | |
|---|---|---|
| ◉ W-8 | 1967 | Sample location and number |
| 500 | 1967 | Parts per billion mercury |
| • 20 | 1968 | Sample location and number |
| (500) | 1968 | Parts per billion mercury |
| ---- | | Area of mercury anomaly sampling in 1967 |

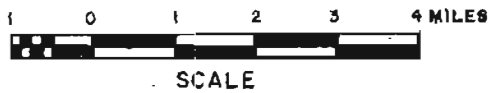
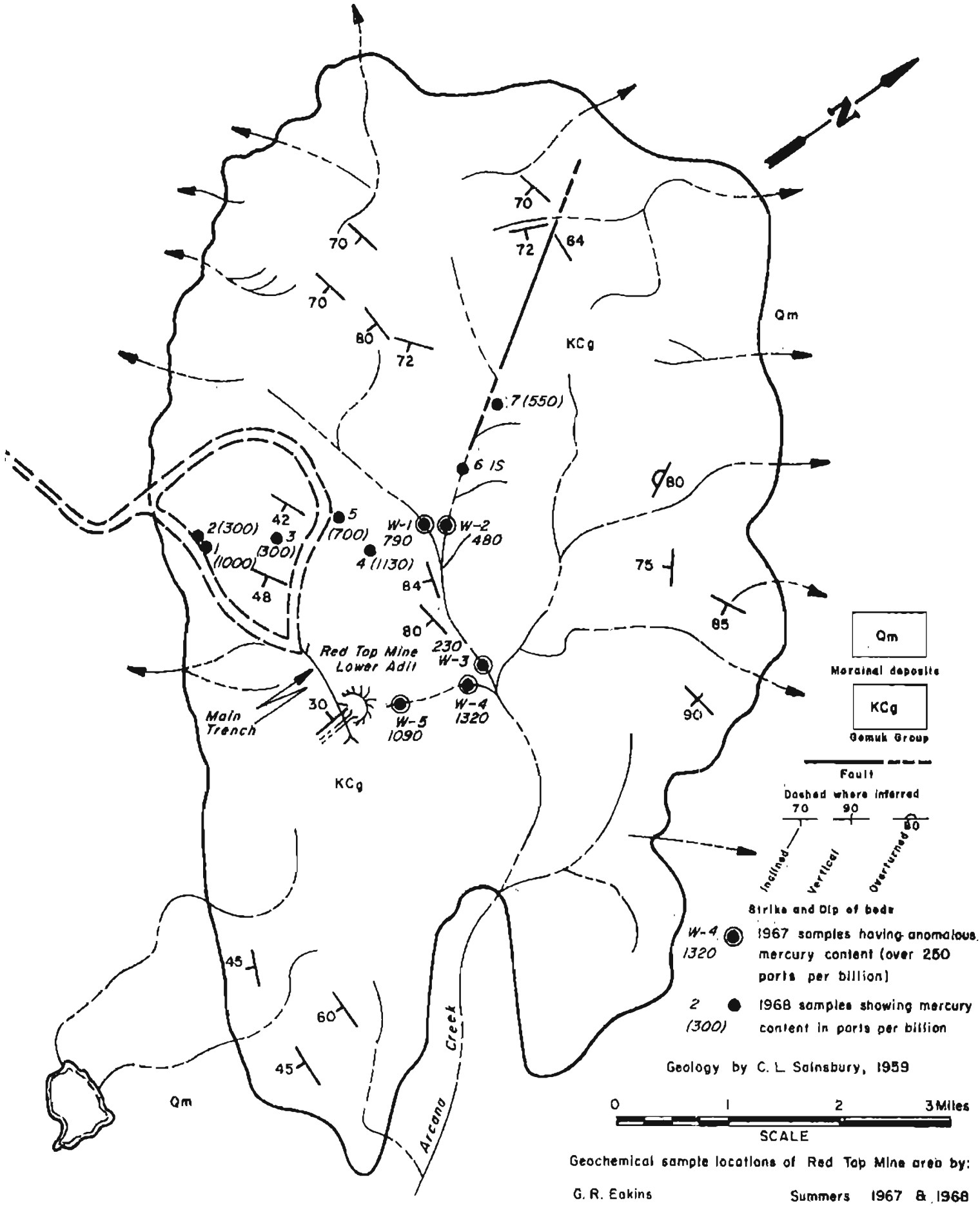



Figure 2




# MARSH MOUNTAIN AREA

Figure 3

# C O N T E N T S



# I L L U S T R A T I O N S

STATE OF ALASKA

Keith H. Miller - Governor

DEPARTMENT OF NATURAL RESOURCES

Thomas E. Kelly - Commissioner

DIVISION OF MINES AND GEOLOGY

James A. Williams - Director


SUPPLEMENT TO GEOCHEMICAL REPORT NO. 17

# A GEOCHEMICAL INVESTIGATION OF THE WOOD RIVER-TIKCHIK LAKES AREA SOUTHWESTERN ALASKA

By

Gilbert R. Eakins

College, Alaska

March, 1969