

**GEOCHEMICAL DISTRIBUTION OF ELEMENTS IN STREAM SEDIMENTS AND HEAVY-MINERAL CONCENTRATE SAMPLES
IN THE SOUTHERN HALF OF THE NATIONAL PETROLEUM RESERVE, ALASKA**

By
P. K. Theobald, H. N. Barton, T. M. Billings, J. G. Frisken, P. L. Turner, and George Van Trump Jr.
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DISCUSSION
During the summer of 1977, the U.S. Geological Survey conducted a regional geochemical reconnaissance of the Mihaheuk Mountain and Howard Pass quadrangles located in the western Brooks Range of Alaska as part of a combined program with the U.S. Bureau of Mines to assess the regional mineral potential. Within a 20,000 km² area, 574 sample sites were selected providing a sample density averaging one sample per 35 km². Free-flowing streams of similar size were selected as sites for the collection of three types of samples: stream bank soil or mud, stream sediment, and heavy-mineral concentrate. The stream bank soil has not been analyzed.

Heavy-mineral concentrate samples were produced by panning approximately 3 kg of screened stream sediment. The dried samples were passed through bromoform and the collected heavy minerals were separated into 3 magnetic fractions on the Franz isodynamic magnetic separator. The nonmagnetic at 0.6 amp fraction was also analyzed by emission spectroscopy.

Computer derived element-distribution maps were produced for the elements considered most useful in interpreting the mineral potential: barium and zinc in stream sediments; and arsenic, chromium, lead, and silver in the non-magnetic at 0.6 amp fraction of the heavy-mineral concentrate. Element concentrations are contoured at parts per million concentration values intermediate between those determined by the six step spectrographic method (1, 1.5, 2, 3, 5, 7, 10, and 20 parts per million).

Screened stream sediment samples of approximately 1 kg were dried and passed through a 30 mesh sieve and pulverized. Analyses by semi-quantitative optical emission spectroscopy were made for 30 elements (Frisken and Marranzino, 1969).

The contour labeled L separates nondetectable values from those detectable but below the lowest standard.

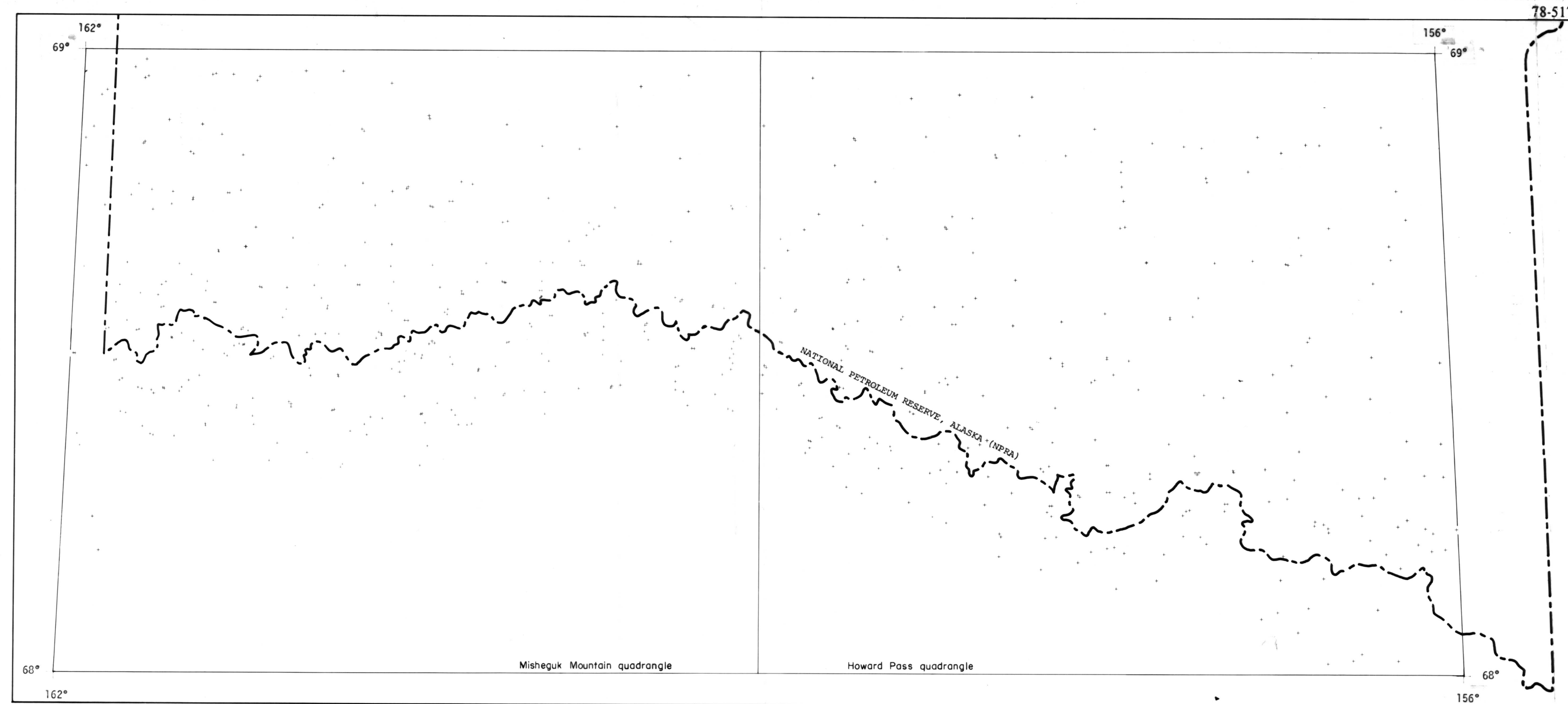
Use of a specific brand name does not necessarily constitute endorsement by the U.S. Geological Survey.

REFERENCE
Frisken, D. J., and Marranzino, A. P., 1969, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials; U.S. Geological Survey Circular 591, 6 p.

Base from U.S. Geological Survey, Mihaheuk Mountain and Howard Pass, 1:250,000.

BOUNDARY OF NATIONAL PETROLEUM RESERVE, ALASKA (NPR)

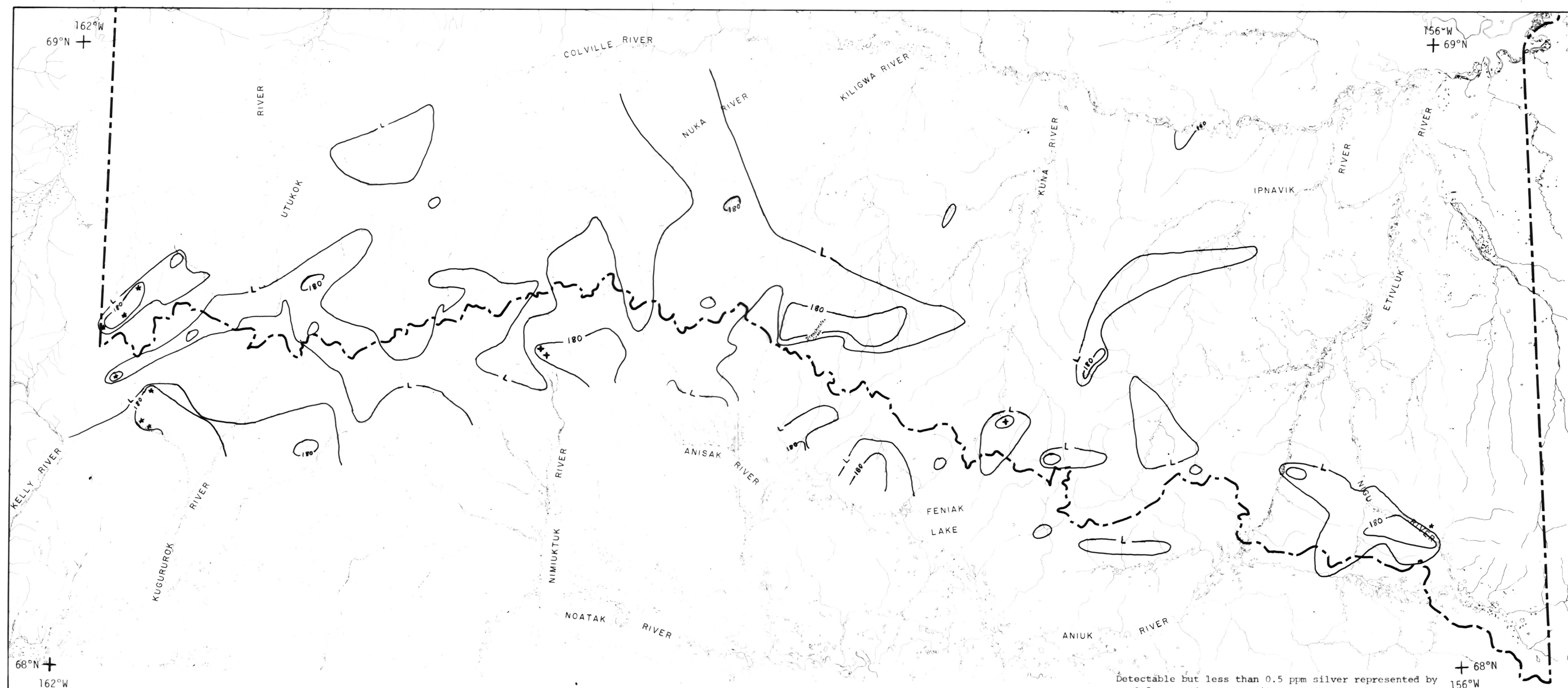
GEOCHEMICAL CONTOUR—Showing concentration in parts per million (ppm). Hatched toward side of lesser concentration.



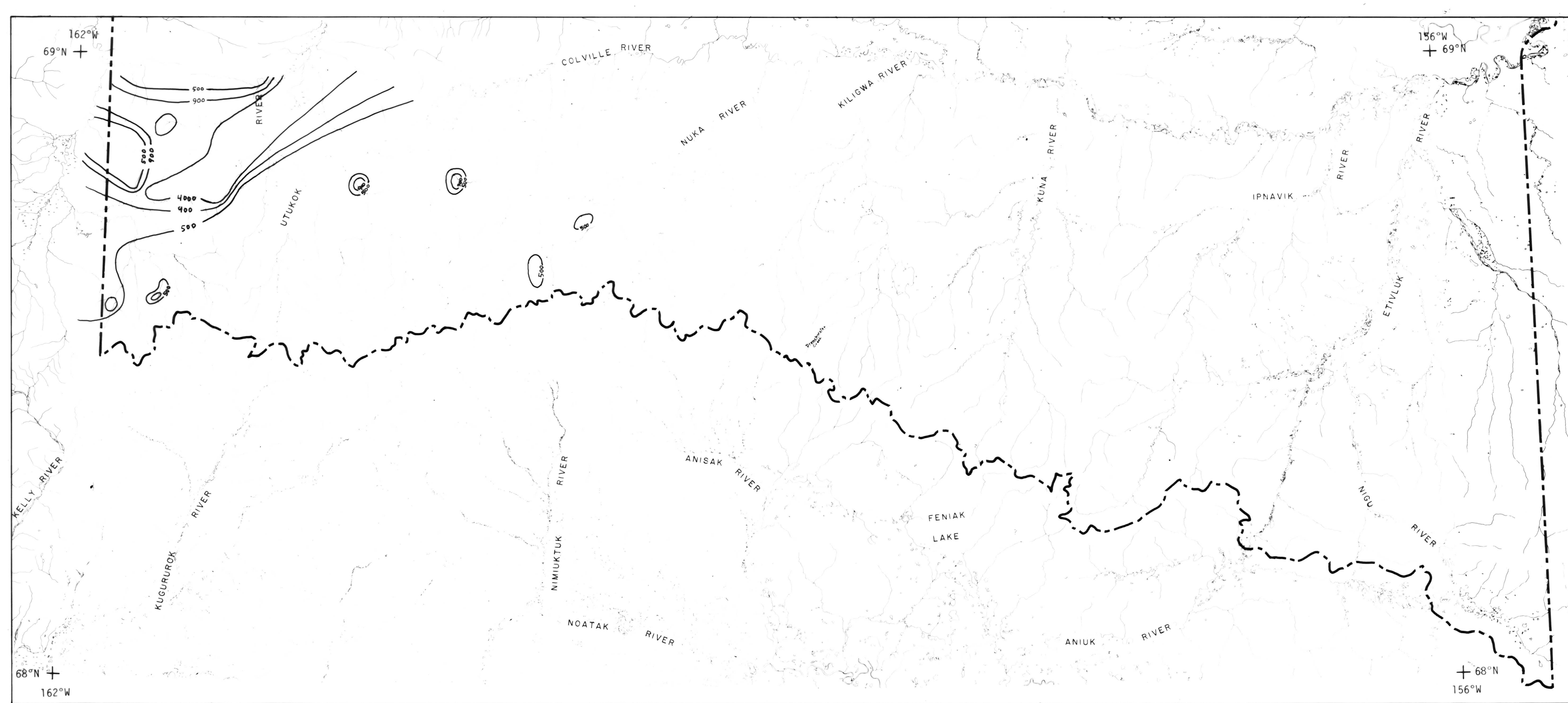
MAP SHOWING REGIONAL GEOCHEMICAL SAMPLE SITES/CROSS IN THE SOUTHERN HALF OF THE NATIONAL PETROLEUM RESERVE, ALASKA



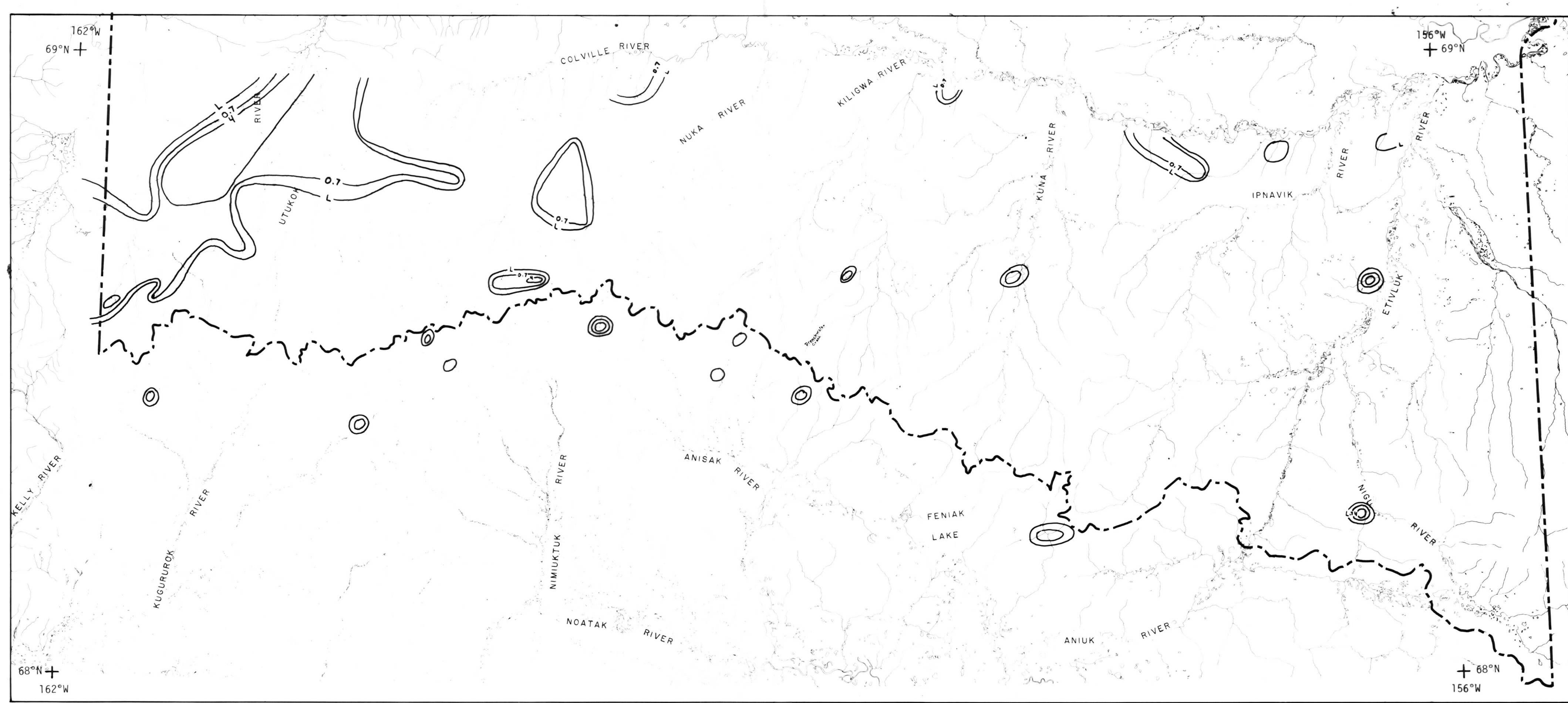
DISTRIBUTION OF BARIUM IN STREAM SEDIMENT SAMPLES



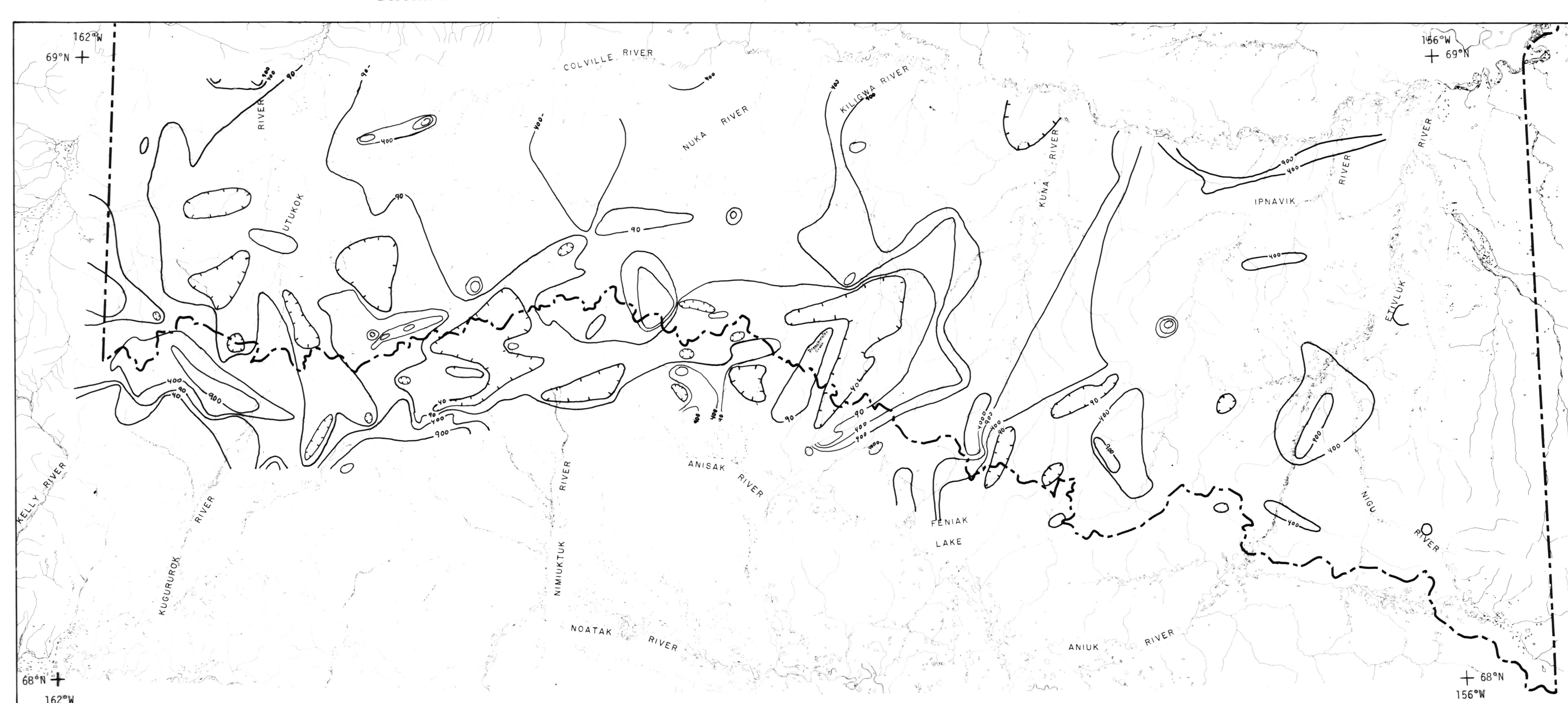
DISTRIBUTION OF ZINC AND SILVER IN STREAM SEDIMENT SAMPLES



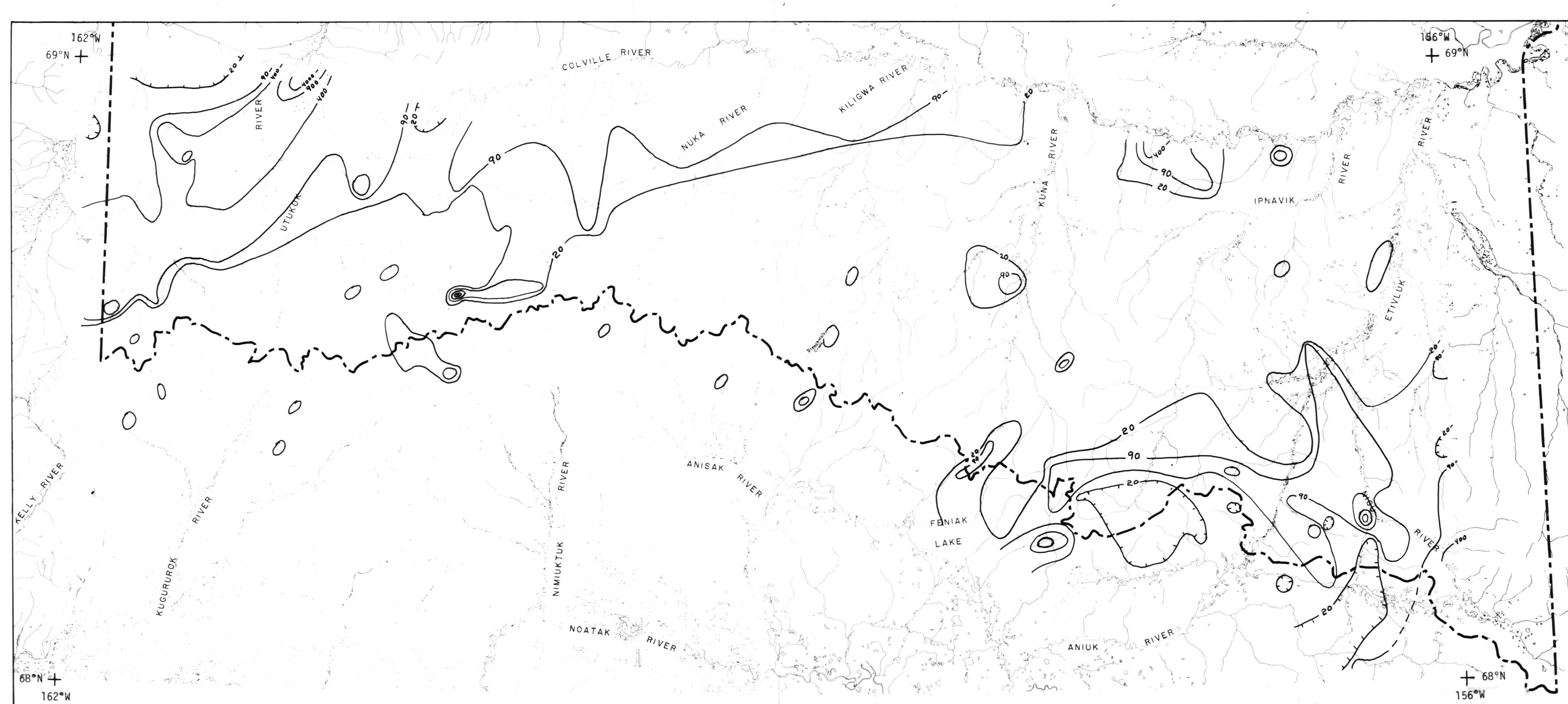
DISTRIBUTION OF ARSENIC IN THE NONMAGNETIC FRACTION OF HEAVY-MINERAL CONCENTRATE SAMPLES



DISTRIBUTION OF SILVER IN THE NONMAGNETIC FRACTION OF HEAVY-MINERAL CONCENTRATE SAMPLES



DISTRIBUTION OF CHROMIUM IN THE NONMAGNETIC FRACTION OF HEAVY-MINERAL CONCENTRATE SAMPLES



DISTRIBUTION OF LEAD IN THE NONMAGNETIC FRACTION OF HEAVY-MINERAL CONCENTRATE SAMPLES