DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

OPEN-FILE REPORT
78-517

SCALE 1:500 000

10 0 10 20 30 40 50 MILES

10 0 10 20 30 40 50 KILOMETERS

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, R. 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 Misheguk 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 regions' mineral potential. Within a 20,300 km^2 area, 574 sample sites were selected providing a sample density averaging one sample per 35 km^2. Free-flowing streams of similar size were selected as sites for the collection of three types of samples; stream bank sod or muck, stream sediment, and heavy-mineral concentrate. The stream bank sod has not been analyzed.

Screened stream sediment samples of approximately 1 kg were dried and passed through a 30 mesh sieve and pulverized. Analyses by semiquantitative optical emission spectroscopy were made for 30 elements (Grimes and Marranzino, 1968).

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 Frantz isodynamic magnetic separator[1]. 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 so forth).

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

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

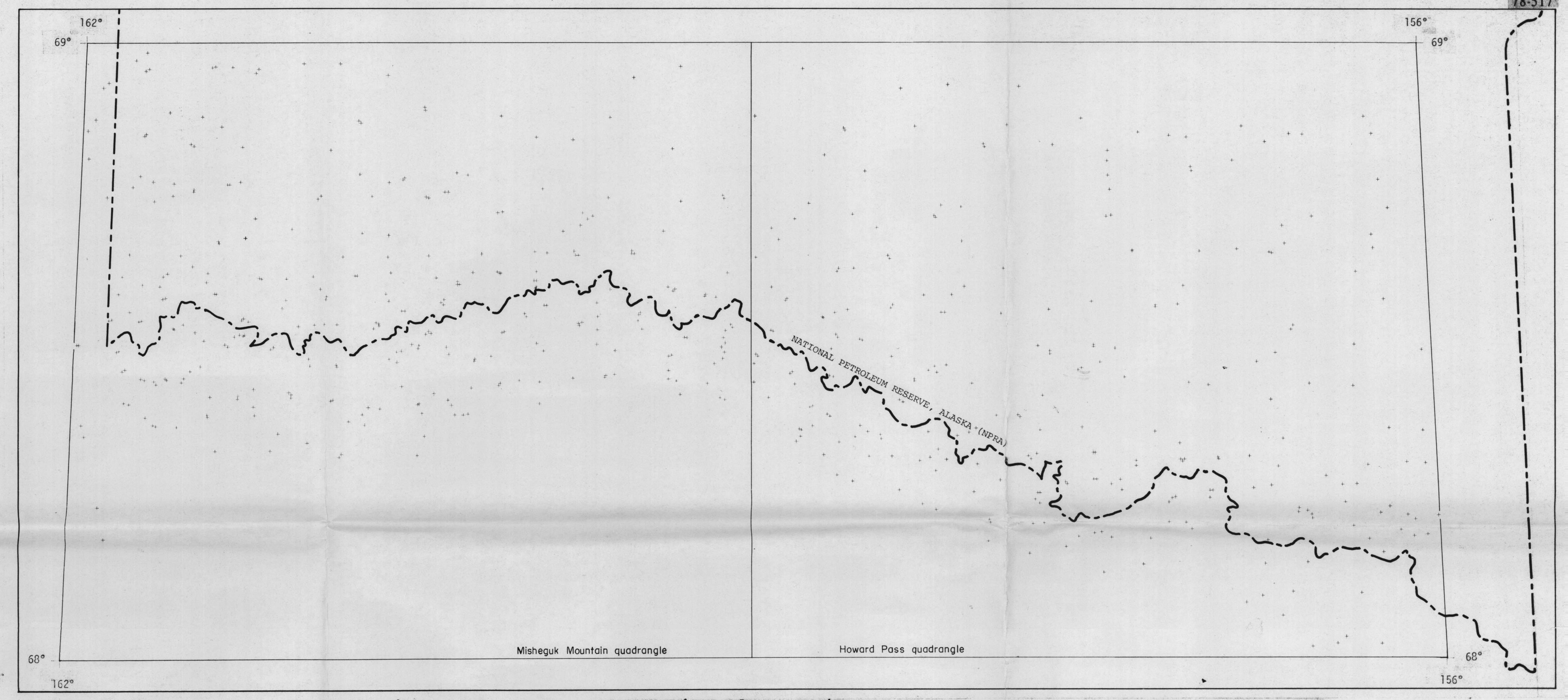
BOUNDARY OF NATIONAL PETROLEUM RESERVE, ALASKA (NPRA)

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

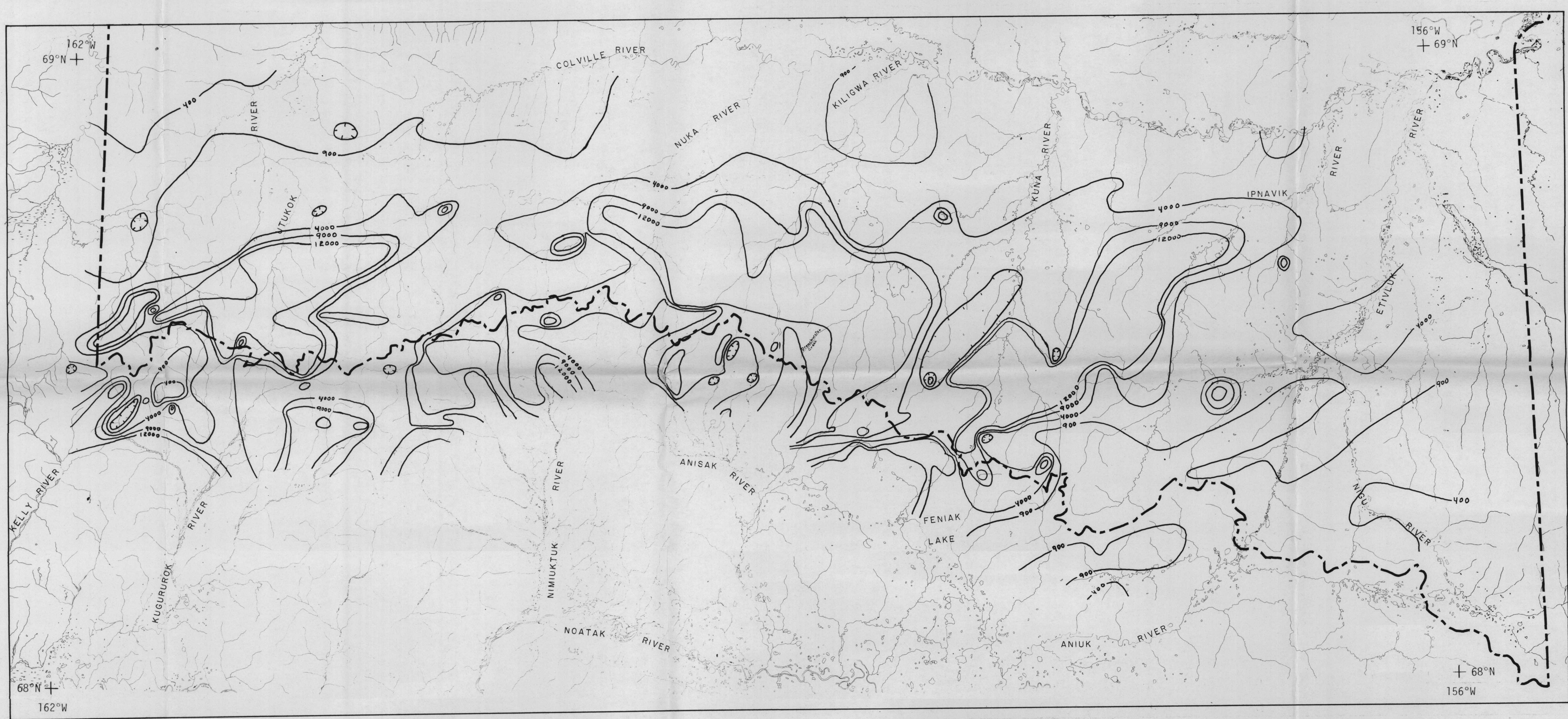
REFERENCE

Grimes, D. J. and Marranzino, A. P., 1968, 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.

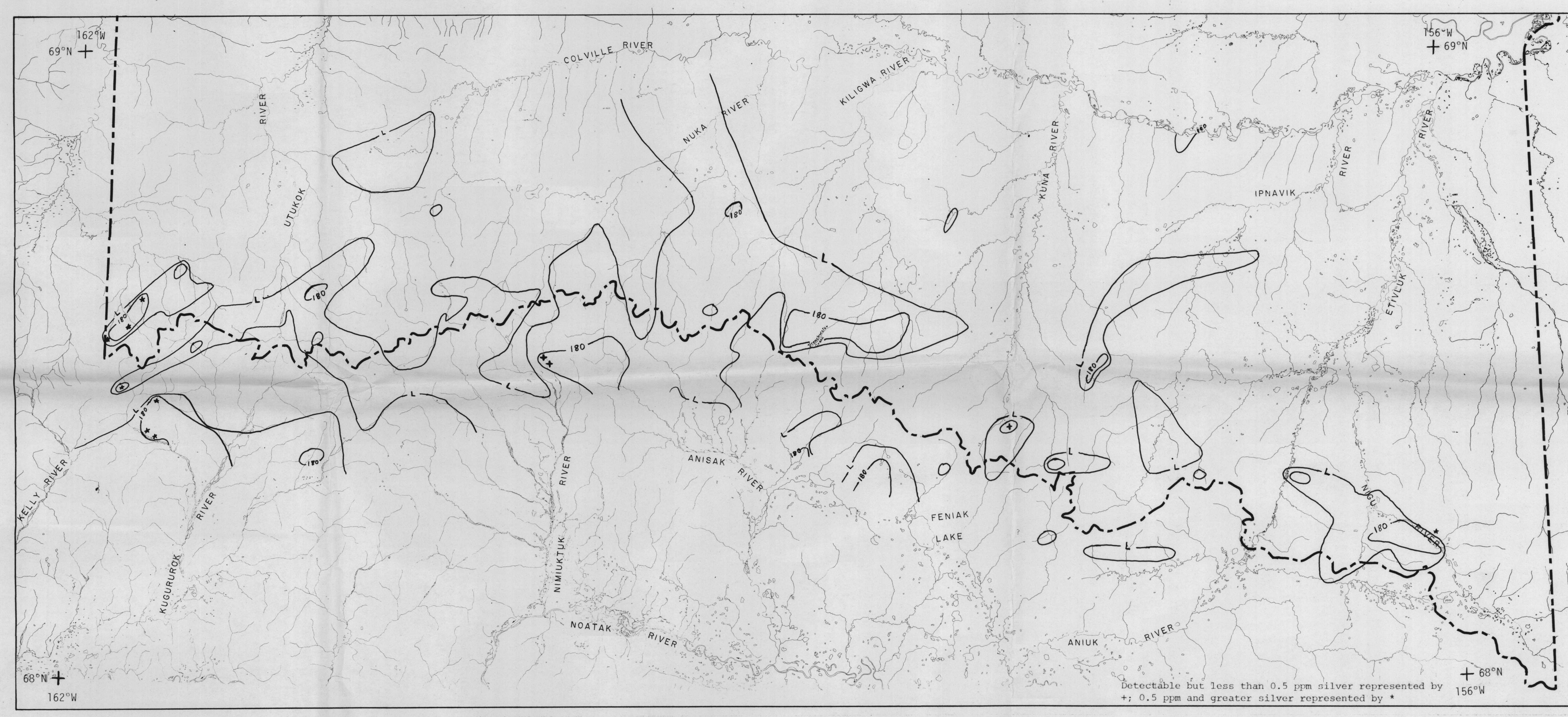
Base from U.S. Geological Survey, Misheguk Mountain and Howard Pass, 1956, 1:250,000.



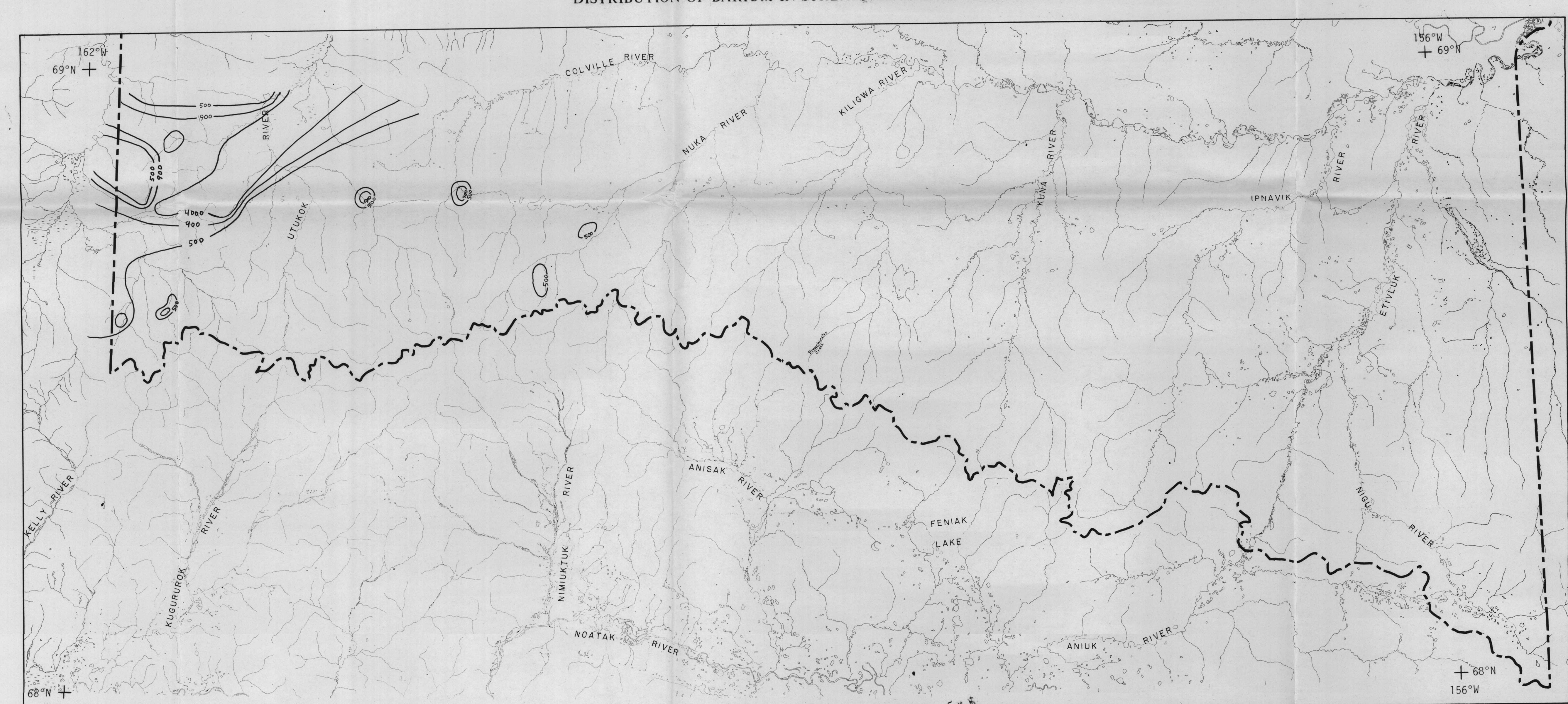
MAP SHOWING REGIONAL GEOCHEMICAL SAMPLE SITES (CROSS) IN THE SOUTHERN HALF OF THE NATIONAL PETROLEUM RESERVE, ALASKA



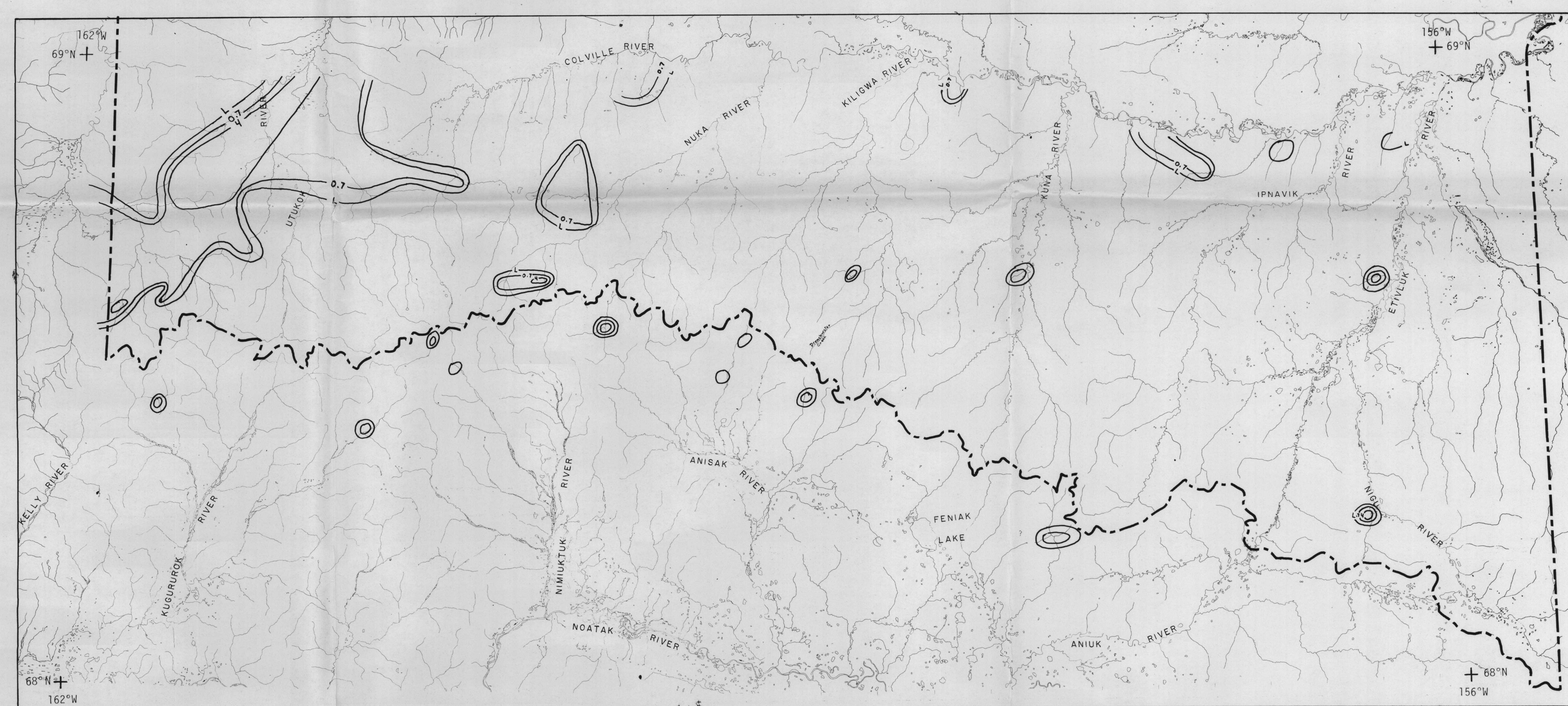
DISTRIBUTION OF BARIUM IN STREAM-SEDIMENT SAMPLES



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