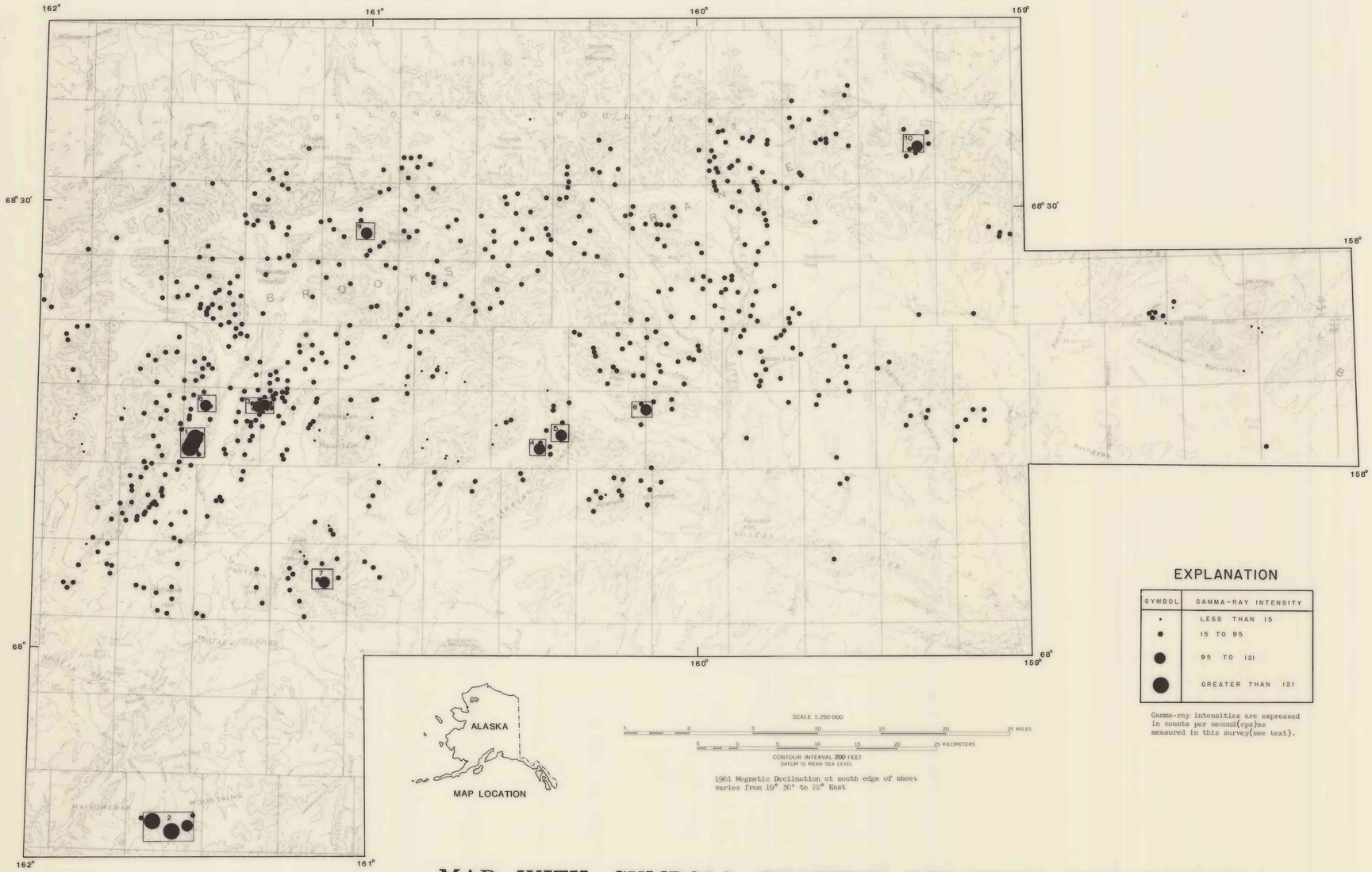
DEPARTMENT OF THE INTERIOR
UNITED STATES GEOLOGICAL SURVEY

U.S. GEOLOGICAL SURVEY
OPEN FILE REPORT
79-1086
SHEET 2 OF 2



SCALE 1:250 000

CONTOUR INTERVAL 200 FEET
DATUM IS MEAN SEA LEVEL

1961 Magnetic Declination at south edge of sheet varies from 19° 30' to 22° East

EXPLANATION

SYMBOL	GAMMA-RAY INTENSITY
•	LESS THAN 15
●	15 TO 95
●	95 TO 121
●	GREATER THAN 121

Gamma-ray intensities are expressed in counts per second(cps)as measured in this survey(see text).

MAP WITH SYMBOLS SHOWING RELATIVE MAGNITUDES OF GAMMA-RAY INTENSITIES AT GROUND STATIONS

This report is preliminary and has not been edited or reviewed for conformity with Geological Survey standards and nomenclature.

Base from U.S.G.S. 1:250,000 TOPO SERIES Misheguk Mountain, 1956; Baird Mountains, 1956; Howard Pass, 1956; ALASKA

Significant Localities

There are two localities which are anomalous. At three stations in the area labeled (1) on the Kugururok River (sheet 2), the radiation is greater than 6 times the mean. The high radiation values occur over highly chloritized latite porphyry and associated tuffaceous sediments which outcrop as isolated rubble piles in tundra. These volcanics may be related to similar rocks at Drenchwater Creek in the Howard Pass quadrangle (Nokleberg and Winkler, 1978). The high potassium content of these rocks is probably responsible for the observed radioactivity.

The second anomalous locality, labeled (2), is in the Maiyumerak Mountains. This area was investigated to determine the cause of local, prominent iron-staining, but has not been mapped in detail (Brosgé, et al., 1967). Gamma-ray intensities of up to 5 times the mean were observed throughout area 2. Intensities up to 14 times the mean occur locally over a black, phyllitic, carbonaceous shale, possibly of the Hunt Fork or Noatak Formations. Immediately above the shale are outcrops of pinkish, brown weathering, schistose siltstone. These outcrops show higher average intensities than the shales and locally reach 24 times the mean. Black shales are often more radioactive than other sedimentary rocks, but the peak intensities in area 2 were greater than ten times those of any other black shale in this survey.

Geochemical analyses were performed on eight samples--four rock and four stream sediment samples--from area 2 (see table below). The stream sediment samples did not show thorium in detectable concentrations and were not analyzed for uranium. All four rock samples showed low uranium concentrations and all but one showed low thorium concentrations. The exception, 78 Tr 208, shows a thorium concentration of 133 ppm, about ten times the average for this type of rock (siltstone) (Levinson, 1974). This sample was obtained from the area of highest observed radioactivity, but did not itself prove very radioactive, suggesting that it may not be a representative sample of the radioactive zone.

Eight other localities (numbers 3 to 10 on sheet 2) have intensities at the top of the background range, more than twice the mean. Locality 3 is associated with the Ginny Creek sulfide deposit (Nokleberg and Winkler, 1978). The deposit is in the form of disseminated sulfide minerals in a sandstone matrix. The high gamma-ray intensities are associated with unmineralized, black Kayak Shales, and not with the underlying sulfide-rich Noatak Sandstone. The high radioactivity and the sulfide deposit seem not directly related.

At localities 4 and 6, a high intensity occurs over buff, calcareous sandstone and siltstone which underlies, and is probably associated with, coarse, microcline-rich sands of the Nuka Formation. The buff-colored unit contains little or no alkali feldspar, but potassium in clays may be the source of the high radioactivity. At locality 5 the high intensity is associated with a shale of uncertain stratigraphic identity. The high values at locality 7 are on a fault-bounded block of buff to gray-brown shales, also of uncertain stratigraphic identity. Although exposure at locality 8 is poor, the high intensity may be associated with either Kayak Shales or with the volcanics of locality 1. A high intensity at locality 9 occurs on a buff, sheared, calcareous, fossiliferous mudstone underlain by Baird Group carbonate. The high at locality 10 is on dark Kayak Shale.

Conclusion

This compilation is not intended to be a complete gamma-ray survey of the field area and samples cover only a small proportion of the total area. Nevertheless, the compilation establishes background radiation levels for this type of survey for various rock types throughout the area, and discriminates two localities anomalous enough to merit further investigation.

References

Brosgé, W. P., Reiser, H. N., and Tailleur, I. L., 1967, Copper Analyses of Selected Samples, Southwestern Brooks Range, Alaska: U.S. Geological Survey Open File Rept. 274, 1 sheet.

Crawford, J. E., and Paone, J., 1956, Facts Concerning Uranium Exploration and Production: U.S. Government Printing Office, p. 130.

Levinson, Alfred A., 1974, Introduction to Geochemical Exploration: Calgary, Applied Publishing, 612 p.

McDermott, M., 1977, Field Surveys Using a Portable Gamma-Ray Scintillometer: GeoMetrics Inc., Technical Report No. 12, p. 11.

Nokleberg, W. J., and Winkler, G. R., 1978, Geologic setting of the lead and zinc deposits, Drenchwater Creek area, Howard Pass quadrangle, western Brooks Range, Alaska: U.S. Geol. Survey, open-file rept. 78-70C, 16 p.

GEOCHEMICAL VALUES FROM AREA 2 (SHEET 2)

SAMPLE	LOCATION LAT.	LOCATION LONG.	SAMPLE TYPE	SEMI-QUANT. SPECTROGRAPHIC ANALYSES	Th	U
78 Tr 205	67 47 42	161 55 18	Str. Sed.	N	-	-
78 Tr 205 A	"	"	Rock	N	28	2
78 Tr 205 B, C	"	"	Rock	N	20	0.5
78 Tr 205 D, E	"	"	Rock	N	14	2
78 Tr 206 E	67 47 39	161 51 12	Str. Sed.	N	-	-
78 Tr 206 N	"	"	Str. Sed.	N	-	-
78 Tr 207	67 47 41	161 33 18	Str. Sed.	N	-	-
78 Tr 208	67 47 40	161 57 00	Rock	L	133	4

All analyses are shown in parts per million (ppm)
N= Not detected at limit of Detection
L=Detected but below limit of determination

All analyses conducted by U.S.G.S. Branch of Exploration Research
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