Reconnaissance for radioactive deposits in Alaska, 1953

By J. J. Matzko and R. G. Bates

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Trace Elements Investigations Report 442

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Geology and Mineralogy

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UNITED STATES DEPARTMENT OF THE INTERIOR

GEOLOGICAL SURVEY

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*This report concerns work done on behalf of the Division of Raw Materials of the U. S. Atomic Energy Commission.

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By John J. Matzko and Robert G. Bates

ABSTRACT

During the summer of 1953 the areas investigated for radioactive deposits in Alaska were on Nikolai Creek near Tyonek and on Likes Creek near Seward in south-central Alaska where carnotite-type minerals had been reported; in the headwaters of the Peace River in the eastern part of the Seward Peninsula and at Gold Bench on the South Fork of the Koyukuk River in east-central Alaska, where uranothorianite occurs in placers associated with base metal sulfides and hematite; in the vicinity of Port Malmesbury in southeastern Alaska to check a reported occurrence of pitchblende; and, in the Miller House-Circle Hot Springs area of east-central Alaska where geochemical studies were made. No significant lode deposits of radioactive materials were found. However, the placer uranothorianite in the headwaters of the Peace River yet remains as an important lead to bedrock radioactive source materials in Alaska. Tundra cover prevents satisfactory radiometric reconnaissance of the area, and methods of geochemical prospecting such as soil and vegetation sampling may ultimately prove more fruitful in the search for the uranothorianite-sulfide lode source than geophysical methods.

INTRODUCTION

The chief objective of reconnaissance for radioactive deposits in Alaska, conducted by the Geological Survey on behalf of the Division of

Raw Materials of the U. S. Atomic Energy Commission, is the discovery of high-grade uranium ores. During the field season of 1953 attempts were made to locate reported occurrences of carnotite-type minerals on Nikolai Creek near Tyonek and on Likes Creek near Seward in south-central Alaska (Wedow and others, 1952, p. 20-23, 37-38) and to search for the bedrock sources of uranothorianite associated with base metal sulfides and hematite in placers at the headwaters of the Peace River in the eastern Seward Peninsula (Gault and others, 1953, p. 28-31) and on the South Fork of the Koyukuk River in east-central Alaska (Nelson and others, 1954, p. 48). In addition, a brief search was made for pitchblende reported by a prospector in the vicinity of Port Malmesbury, southeastern Alaska. Further search for the bedrock source of uranium in the Miller-House-Circle Hot Springs area of east-central Alaska (Nelson and others, 1954, p. 29-38) was made by using the geochemical prospecting techniques of soil and water sampling. (See fig. 1.)

The instruments used to detect radioactivity during the 1953 field season consisted of standard commercial portable Geiger counters modified to accept a variety of probes. (See Wedow, 1951.) Portable scintillation counters were also used. Some of the latter were modified to take recording devices which would permit the observer to obtain a permanent continuous record of variations in radioactivity; this modification was used mostly in airborne and carborne traverses.

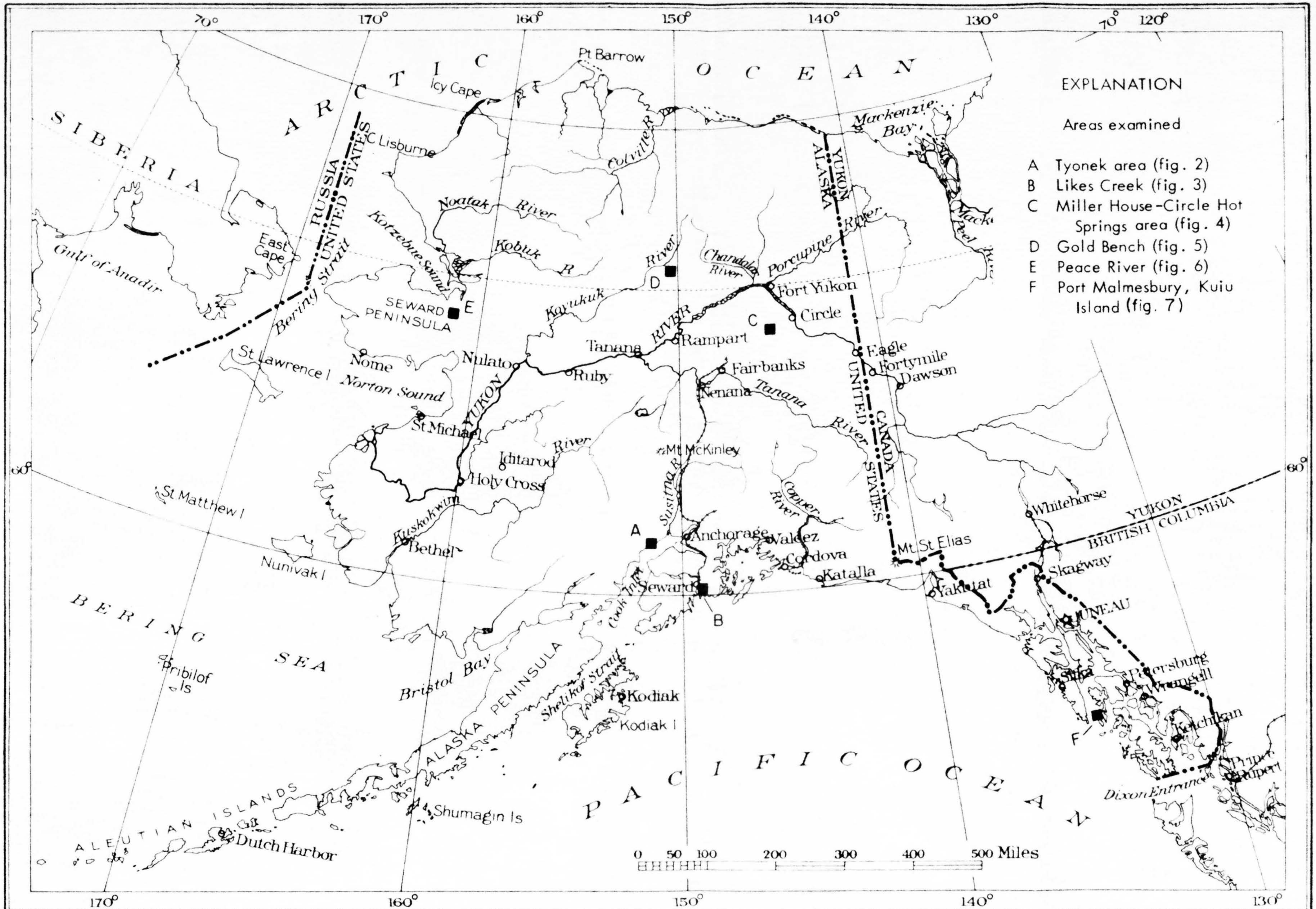


FIGURE 1.--INDEX MAP OF ALASKA SHOWING AREAS EXAMINED, 1953

AREAS INVESTIGATED

Tyonek area

Samples of limestone containing metatyuyamunite, submitted in the summer of 1951 to the Geological Survey by H. N. Fowler, a prospector from Anchorage, contain as much as 0.92 percent uranium. As originally reported in 1951 (Tolbert and Nelson, 1951, p. 6 and table 1) the Fowler prospect was thought to be in the Yentna River drainage and north of the mouth of the Skwentna River. Additional information obtained by Fowler in the spring of 1952 placed the location of the samples on the Deshka River, about 25 miles south-southwest of Talkeetna. The Deshka site was examined by Nelson (Wedow and others, 1952, p. 20) in 1952 but no uraniferous deposits were found.

Further inquiries by Fowler and his associates indicated that the samples were found in the fall of 1949 by Max Chickalusian of Tyonek. The location was given as the north side of the valley of a left-limit tributary of Nikolai Creek, 16 miles northwest of Tyonek. (See fig. 2.)

An attempt by Wedow, Fowler and Chickalusian to visit this site in October 1952 was unsuccessful due to adverse weather conditions which also made it unsafe to approach sufficiently close to the site to conduct airborne radioactivity traverses from a light plane.

In June 1953, Wedow and Bates accompanied by Fowler, made another attempt to locate the source of the samples but were again unsuccessful, chiefly because the nearest point of access by light plane to the prospect was a small lake more than 6 miles to the southeast and the

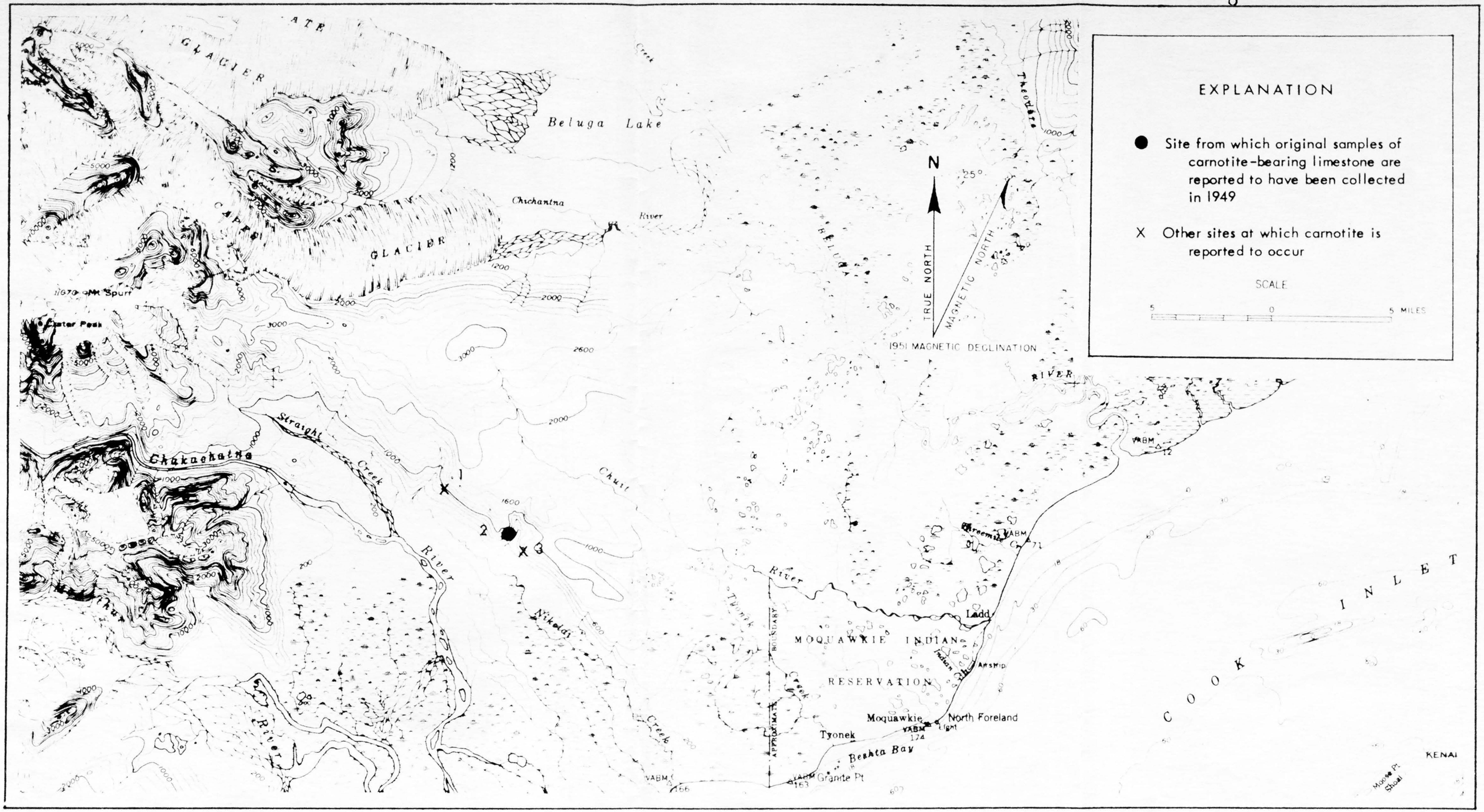


FIGURE 2.--MAP OF PART OF THE TYONEK QUADRANGLE, SOUTH-CENTRAL ALASKA

Showing location of Fowler carnotite prospect intervening terrain consisted of rough glacial moraine covered by a dense growth of alder and numerous beaver ponds (fig. 2).

No uraniferous limestone or other radioactive material was found in the several hours spent on the ground in the prospect area. Airborne radioactivity traverses over the area did not locate any anomalies; and Chickalusian, who accompanied Wedow in the airborne work, was unable to recognize the precise spot from which he had obtained the samples. In view of these factors and the difficulty of access to the prospect area, it was decided therefore to curtail investigations until such time as a precise location was given, or helicopter support for a ground party would be available. The project will be reopened should Fowler obtain additional samples from the area or if helicopter support can be assured for a period of three to four weeks, probably in cooperation with the Topographic Division of the Geological Survey.

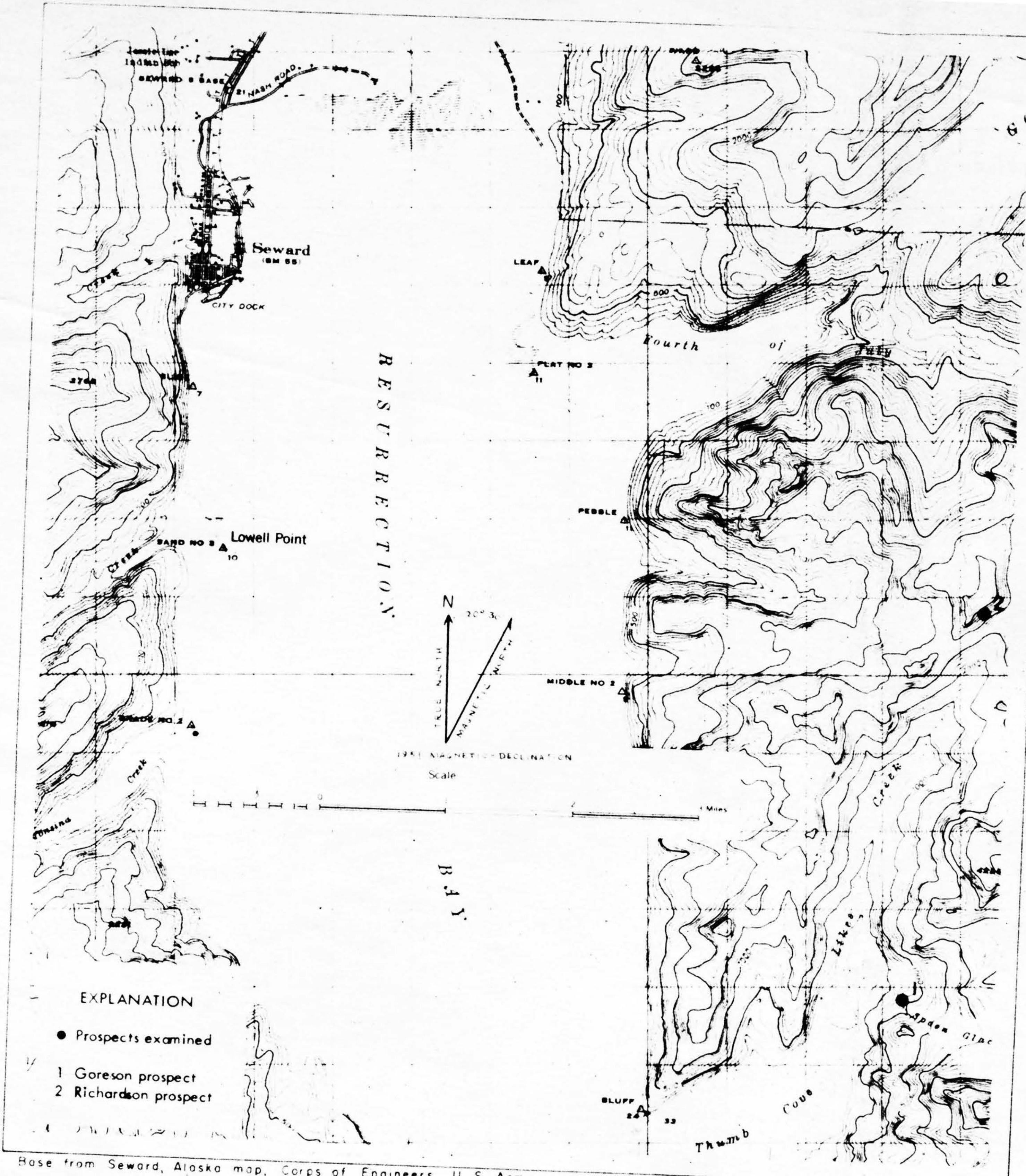
Chickalusian's description of the outcrop (locality 2, fig. 2) from which the samples were taken indicated that it is approximately 50 feet long and 10 feet thick. He described the "yellow rock" to be in long lenses as much as 3 inches thick between thin beds of limestone. Laboratory studies on the available samples have shown that the carnotite is also disseminated in the limestone. (See Wedow and others, 1952.)

No limestone was reported near Nikolai Creek by Geological Survey reconnaissance parties that passed through the area in 1927 and 1928 (Capps, 1935). According to Capps (1935) the bluff along the northeast side of Nikolai Creek is composed of Eocene clay, sand and gravel, and, locally, tuff and lignite. These are overlain, in part, by Quaternary glacial deposits. To the west on the eastern flank of Mount Spurr gneissic granite of Mesozoic age is partially overlain by Tertiary lavas and tuff. The only reported limestone in the general Mount Spurr region is to the west of Mount Spurr in the drainage of the Igitna and Chilligan Rivers. It is described as a gray, crystalline, thin bedded limestone associated with metamorphosed shale and sandstone. These rocks, together with basaltic lava flows, are of Upper Jurassic or Cretaceous age, and are entirely or nearly surrounded by granitic rocks of late Mesozoic age. (See Capps, 1935.)

Likes Creek area

In September 1952, two samples of metatyuyamunite-bearing sandstone were given to members of the Geological Survey by Martin Goreson through Russell R. Norton, both of Seward, Alaska. Analysis of one of the samples indicates 1.5 percent equivalent uranium and 1.7 percent chemical uranium. These samples were reportedly found in 1949 as float at the foot of Spoon Glacier (locality 1, fig. 3). Spoon Glacier is located on the east side of the valley of Likes Creek on the west side of Resurrection Peninsula just north of Thumb Cove. In the late fall of 1952, two attempts were made to locate the bedrock source of the metatyuyamunite or to duplicate the previous samples. The bedrock source of the radioactive minerals was not found and the samples were not duplicated in the field, even though the Survey party was accompanied by Goreson and Norton on one trip. (See Wedow, and others, 1952, p. 37-38.)

During July 1953, Survey personnel spent four days in the area to



Base from Seward, Alaska map, Corps of Engineers, U.S. Army

FIGURE 3.--MAP OF THE LIKES CREEK AREA, RESURRECTION PENINSULA, ALASKA

locate the source of the metatyuyamunite. This investigation was unsuccessful and no anomalous radiation was detected by ground surveys.

While in the area, Geological Survey personnel were accompanied by Fred W. Richardson, a prospector from Anchorage, who had a "carnotite" prospect on the mountain to the west of the divide between Likes Creek and Fourth of July Creek (locality 2, fig. 3). Mr. Richardson led the Geological Survey party to his prospect and upon examination the "carnotite" was found to be weathered yellow-green graywacke.

According to Grant and Higgins (1909, p. 98-107) the bedrock on the west side of Likes Creek is composed of graywacke with some slate. The bedrock on the east side of Likes Creek is composed of lava flows altered to greenstone and contains several old copper prospects.

Miller House-Circle Hot Springs area

Placer concentrates from Portage Creek, a north-flowing stream draining into Medicine Lake, in the vicinity of Circle Hot Springs (fig. 4) were reported to contain as much as 0.0X percent equivalent uranium (Wedow, White, and others, 1954, p. 4-6). Attempts to duplicate these samples in 1952 were not successful (Nelson and others, 1954, p. 24-40). However, a water sample taken in 1952 from Portage Creek, below Heine Carsten's placer workings, contained 40.2 parts per billion uranium (Nelson and others, 1954, p. 34). This is significantly high concentration as the average content of fresh waters is 0.1 part per billion uranium, (Irving May, oral communication).

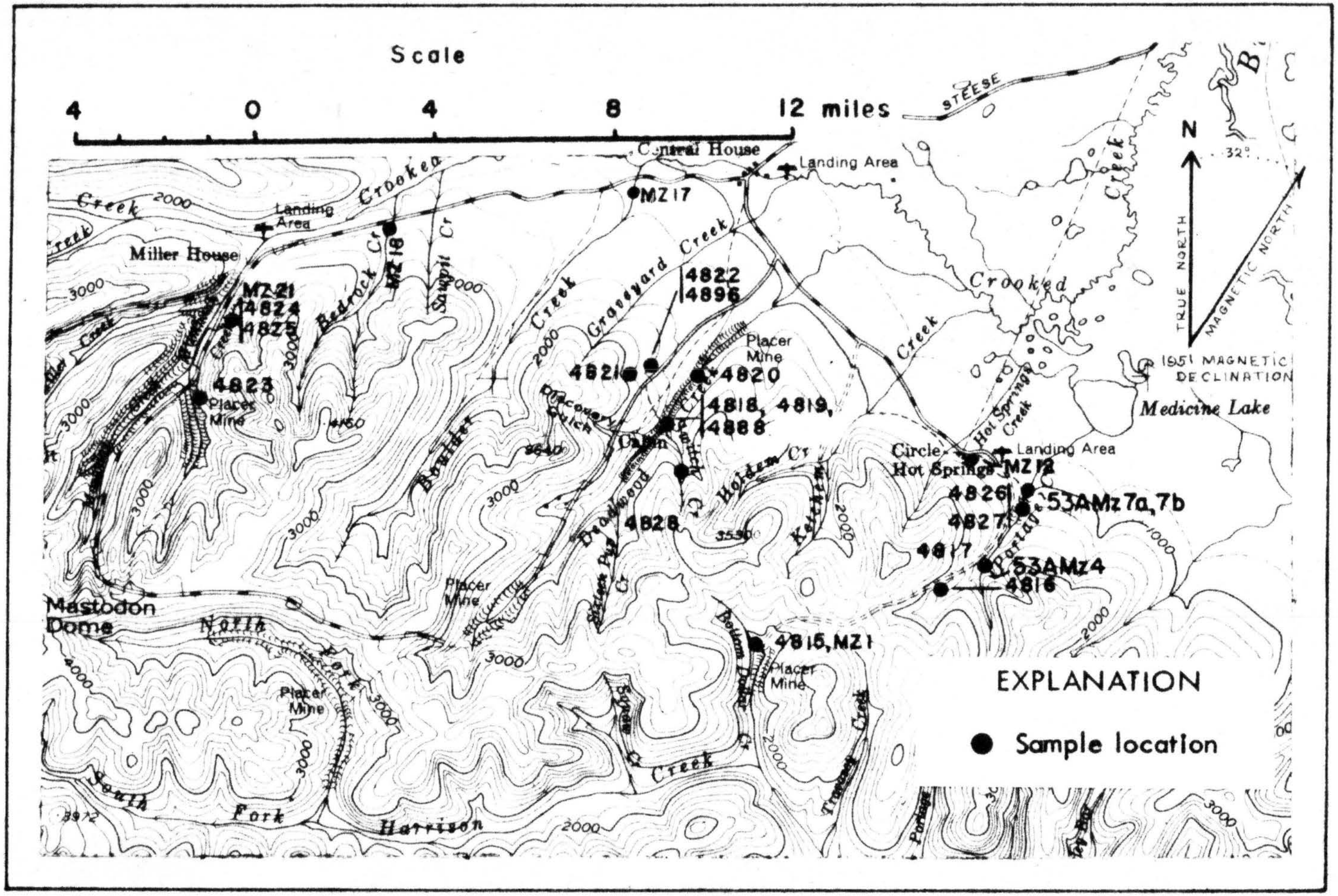


FIGURE 4.--MAP OF THE MILLER HOUSE-CIRCLE HOT SPRINGS AREA, CIRCLE QUADRANGLE, ALASKA

Bedrock, placer and water samples were collected by the Geological Survey reconnaissance party in this area in 1953. Only three samples were collected that contained more than 0.005 percent equivalent uranium: sluice concentrates from Deadwood Creek and Portage Creek contained 0.008 and 0.006 percent equivalent uranium respectively; and a sample of crushed granite from the divide between Portage Creek and Half Dollar Creek contained 0.007 percent equivalent uranium (table 1). A traverse made with a portable Geiger counter on the cleaned bedrock of Heine Carsten's placer ground did not indicate any radioactivity anomalies. A small piece of granite rock with purple fluorite was found loose in the bedrock.

Of the ten water samples collected for uranium analysis in the area in 1953, only two contained high concentrations of uranium (table 1). All of the 1953 samples taken for uranium analysis were collected in 500 milliliter polyethylene bottles, but three samples analyzed for total heavy metal content were collected in 1 gallon pyrex bottles (table 1). An attempt was made to duplicate the high uranium water sample which was collected in a pyrex bottle in 1952. Also, to determine if any appreciable loss in uranium occurred in samples not acidified, a duplicate sample was collected at one locality on Portage Creek.

R. G. Milkey (1953, p. 12) has indicated that no uranium solution with a pH of less than 4.2 (acidic) decreased significantly in concentration. He also states that for solutions of the same concentration greater losses of uranium occur in polyethylene bottles than in pyrex bottles. This occurs because, in addition to losses through ion exchange and hydrolysis, uranium is also lost by Van der Waal's adsorption which varies directly with the degree of roughness of the surface to which the uranium solutions are exposed. Polyethylene bottles have a rougher, and hence a larger attracting surface and, therefore, will tend to adsorb more uranium than the smoother surfaced pyrex containers. Thus, non-acidified samples that are allowed to stand in polyethylene bottles may give misleadingly low results. Milkey's findings are apparently borne out by the analysis of the duplicate samples collected in polyethylene bottles on Portage Creek in 1953. The analyses show that the sample (53AMz 7A) acidified with about 2 ml of concentrated hydrochloric acid contained 15 parts per billion uranium whereas the non-acidified sample (53AMz 7B) contained 14 parts per billion uranium. This is a significant difference when it is noted that present fluorimetric analyses for uranium are sensitive to 0.1 part per billion.

The difference in uranium content between the water samples containing 40.2 parts per billion uranium (1952) and 15 parts per billion uranium (1953) is probably due principally to the effects of the sluicing operation on Portage Creek, at the time of collection of the 1952 samples. West (Nelson, and others, 1954, p. 34) has suggested that a possible explanation for the high uranium sample at Carsten's placer gold property is due in part to the sluicing operation which caused an increase of solids in suspension in the creek, and the probable more rapid solution of uraniferous material in the area.

A water sample taken at Martin's workings on Portage Creek, a mile and a half upstream from Carsten's workings contained only 1.7 parts per billion uranium. The uranium content of the water at Carsten's camp is about eight times greater than at Martin's camp, which suggests that a source of uranium must lie along the drainage between the two camps. Further water sampling at regular intervals between the two camps might aid materially in locating the source of the uranium.

Gold Bench area

A concentrate obtained in 1952 from gold-placer mining operations at Gold Bench (fig. 5) on the South Fork of the Koyukuk River contained 0.18 percent equivalent uranium. (See Wedow and others, 1953, p. 3.) Laboratory studies showed that the chief radioactive mineral is uranothorianite. As hematite and traces of gold, bismuth, copper, lead, tin, and tungsten minerals are associated with uranothorianite in the gravels at Gold Bench, it is believed that the radioactive minerals may have been derived from a lode source in the drainage area above Gold Bench. The source of the gold mined from the gravels at Gold Bench is unknown, although Maddren (1913, p. 106) suggests that the source area of the gold is in the mountains on the south side of the South Fork of the Koyukuk River.

The field party in the area during 1953 attempted to locate the lode source of the uranothorianite. Because of the wide-spread cover of tundra, gravel, and moss over most of the area, the method of testing placer concentrates for radioactivity, similar to that developed by West and Matzko (Gault and others, 1953, p. 21-27) on the eastern Seward Peninsula, was adopted to search for the source of the uranothorianite. Special attention was paid to those streams draining into the South Fork of the Koyukuk River from the south. Gravels from all streams draining into the South Fork for

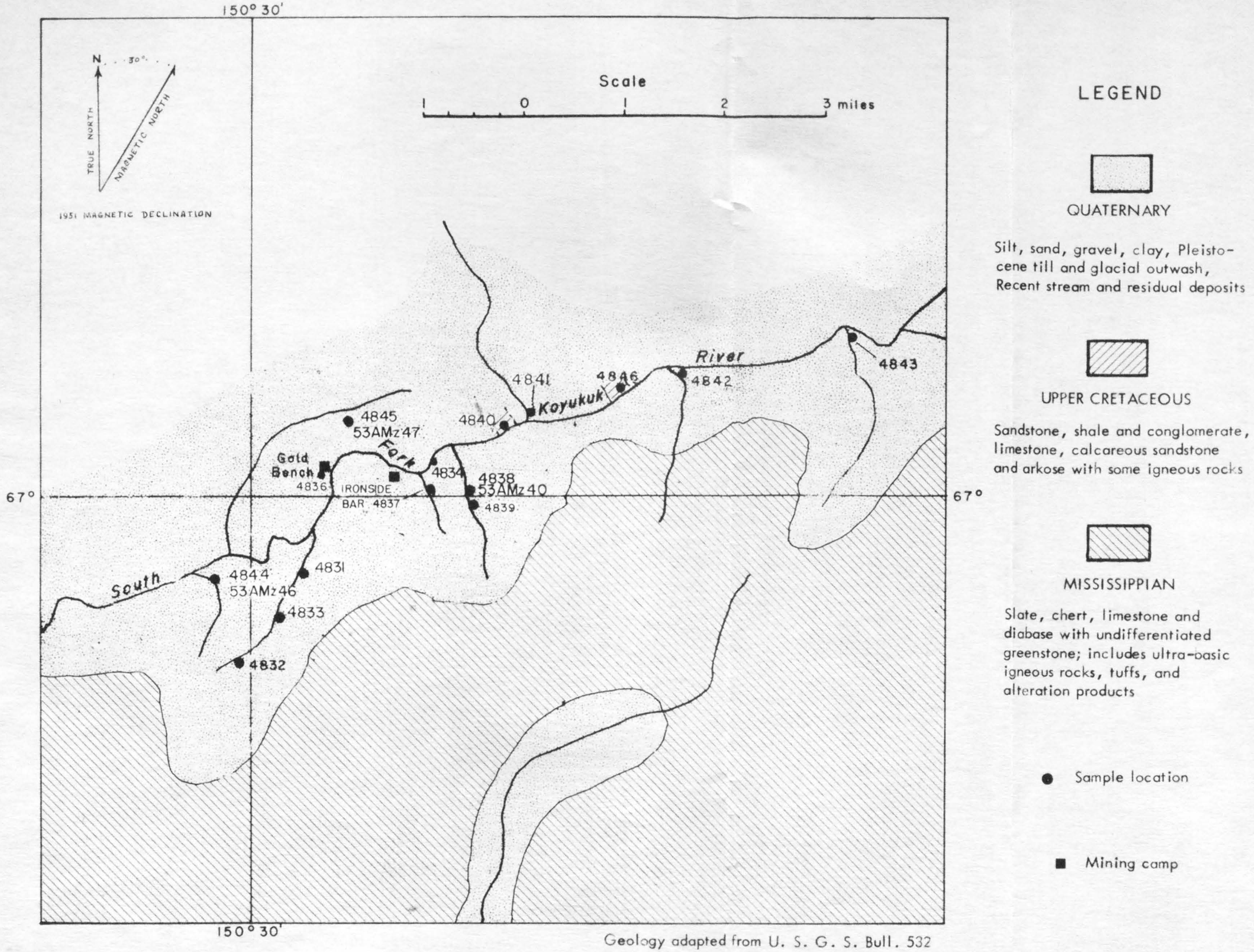


FIGURE 5.--GEOLOGIC SKETCH MAP OF THE GOLD BENCH AREA, EAST-CENTRAL ALASKA.

a distance of 7 miles upstream and 2 miles downstream were sampled. Neither the lode source of the uranothorianite was located nor was any significant radioactivity noted.

Chemical determinations of three water samples from tributary streams in the Gold Bench area (table 1) indicate a high of 0.2 parts per billion uranium for one of the samples; and, the other two samples contain 0.1 parts per billion uranium. The uranium content is probably lower than normal for the streams sampled because heavy surface runoff caused by practically continuous rain during the reconnaissance would tend to dilute the uranium content of the waters.

Table 1.--Equivalent and chemical uranium analyses of samples collected in 1953.

Sample No.	Uranium (percent) equivalent	Uranium (percent) chemical	Description and location
			Port Malmesbury
X-1	0.001		Silicified graywacke with limonite and sulfides
X-2	.001		Diorite intrusive
X-3	.001		Replacement vein material of quartz and pyrite containing gold, silver, lead and zinc
X-4	.001		Silicified graywacke interbedded with marbleized limestone
X-5	.001		Mafic dike
X-6	.001		"Pods" containing pyrrhotite, specular hematite and chalcopyrite
X-7	.001		Diorite intrusive

Table 1.--Equivalent and chemical uranium analyses of samples collected in 1953--Continued.

Sample No.	Uranium (percent) equivalent	Uranium (percent) chemical	Description and location
			Miller House-Circle Hot Springs
4815	0.002		Bottom Dollar Creek, 5-pan concentrate.
4816	.001		Mafic dike on Portage Creek.
4817	.002		Portage Creek, upstream from Heine Carsten's placer mine, weathered granite bedrock.
4818	.004		Deadwood Creek near Switch Creek, granite bedrock.
4819	.002		Mouth of Switch Creek, 4-pan concentrate.
4820	.008		Deadwood Creek, sluice box concentrate.
4821	.002		Last left limit tributary to Deadwood Creek, porphyritic granite.
4822	.002		Near schist-granite contact on last left limit tributary to Deadwood Creek, 4-pan concentrate.
4823	.001		Independence Creek, sluice box concentrate.
4824	.004		Miller House Granite Creek, granite float.
4825	.002		Miller House Granite Creek, 4-pan concentrate.
4826	.006		Portage Creek (H. Carsten), sluice box concentrate.
4827	.005		Portage Creek, bedrock sample contains purple fluorite.
4828	.003		Switch Creek, sluice box concentrate.
4888	.004		Switch Creek, near mouth, granite bedrock.
4896	.001		Last left limit tributary to Deadwood Creek, rock samples from near mouth of tributary.
53AMz 1		0.3×10^{-7}	Bottom Dollar Creek.
53AMz 4		1.7×10^{-7}	Portage Creek, on Hank Martin's placer property.
53AMz 7A		15×10^{-7}	Portage Creek, on Heine Carsten's placer property, acidified.
53AMz 7B		14×10^{-7}	Portage Creek, on Heine Carsten's placer property, not acidified.
53AMz 12		0.2×10^{-7}	Circle Hot Springs from hot springs side of hill.
53AMz 17		$.3 \times 10^{-7}$	Boulder Creek.
53AMz 18		$.5 \times 10^{-7}$	Bedrock Creek.
53AMz 20		$.4 \times 10^{-7}$	Albert Creek, about 3 miles northeast of Central House on Steese hwy, off fig. 4
53AMz 21		1.3×10^{-7}	Miller House Granite Creek.
53AMz 22		0.4×10^{-7}	Faith Creek, about 56 miles southeast of Central House on Steese hwy, off fig. 4.

Table 1.--Equivalent and chemical uranium analyses of samples collected in 1953--Continued.

Sample No.	Uranium (percent) equivalent	Uranium (percent) chemical	Description and location
			Gold Bench
4831	0.001		From southeast tributary stream to South Fork, Koyukuk River and across from Gold Bench, 5-pan concentrate.
4832	.001		Taken about 1 mile upstream from sample 4831, 5-pan concentrate.
4833	.001		Taken about ½ mile upstream from sample 4831, 5-pan concentrate.
4834	.002		From gravel bar, South Fork Koyukuk River, 6-pan concentrate.
4836	.001		From unworked bench gravels at Gold Bench, 6-pan concentrate.
4837	.001		From first southeast tributary to South Fork Koyukuk River, above Gold Bench, 6-pan concentrate.
4838	.001		From second southeast tributary to South Fork Koyukuk River, above Gold Bench, 5-pan concentrate.
4839	.001		From high slope drainage upstream and above sample location 4838, 2-pan concentrate.
4840	.001		Northwest bank of South Fork Koyukuk River, about 2 miles upstream from Gold Bench, crushed bed rock sample of black slate interbedded with sandstone.
4841	.001		Taken from first northerly tributary to South Fork Koyukuk River, upstream from Gold Bench, 5-pan concentrate.
4842	.001		Taken from third southeast tributary to South Fork Koyukuk River, upstream from Gold Bench, 4-pan concentrate.
4843	.001		From Grayling Creek, 4-pan concentrate.
4844	.001		Taken from first southeast tributary to South Fork Koyukuk River, downstream from Gold Bench, 2-pan concentrate.
4845	.001		From high bench just west of Gold Bench, 5-pan concentrate.
4846	.002		About 3 miles upstream from Gold Bench and on South Fork Koyukuk River, fossiliferous black shale.
53AMz 40		0.2×10^{-7}	Same locality as sample No. 4838, acidified.
53AMz 46		$.1 \times 10^{-7}$	Same locality as sample No. 4844, acidified.
53AMz 47		$.2 \times 10^{-7}$	Same locality as sample No. 4845, acidified.

Table 1.--Equivalent and chemical uranium analyses of samples collected in 1953--Continued.

Sample No.	Uranium (percent) equivalent	Uranium (percent) chemical	Description and location
			Peace River
4891	0.003		Bottom of trench No. 1, weathered bedrock.
4892	.003		Trench No. 1, weathered bedrock.
4893	.003		Bottom of test pit in trench No. 3, bedrock.
4894	.003		From 5 foot deep pit in trench No. 6, bedrock.
4895	.001		Prospect pit on divide north of trenches 5 and 6.

Peace River area

Reconnaissance for radioactive deposits in the Buckland-Kiwalik divide area of the Candle quadrangle, Seward Peninsula, in 1947, by West and Matzko (Gault and others, 1953, p. 21-27), disclosed significant amounts of uranothorianite in concentrates from placers in the headwaters of the Peace River (fig. 6). The equivalent-uranium content of these concentrates ranges from about 0.2 to 0.8 percent or roughly 10 times that of other uranothorianite-bearing concentrates from the eastern Seward Peninsula. In addition to uranothorianite, gummite, thorite, copper sulfides, iron oxides, molybdenite, gold, silver, bismuth, and other heavy minerals were identified in the samples. The gummite is probably an alteration product of the uranothorianite. The placers from which these concentrates were obtained lie near a granite-andesite contact in a restricted (one-half square mile) drainage basin. The friable gummite further bears out the belief that the heavy minerals in these placers could not have traveled far from their bedrock source.

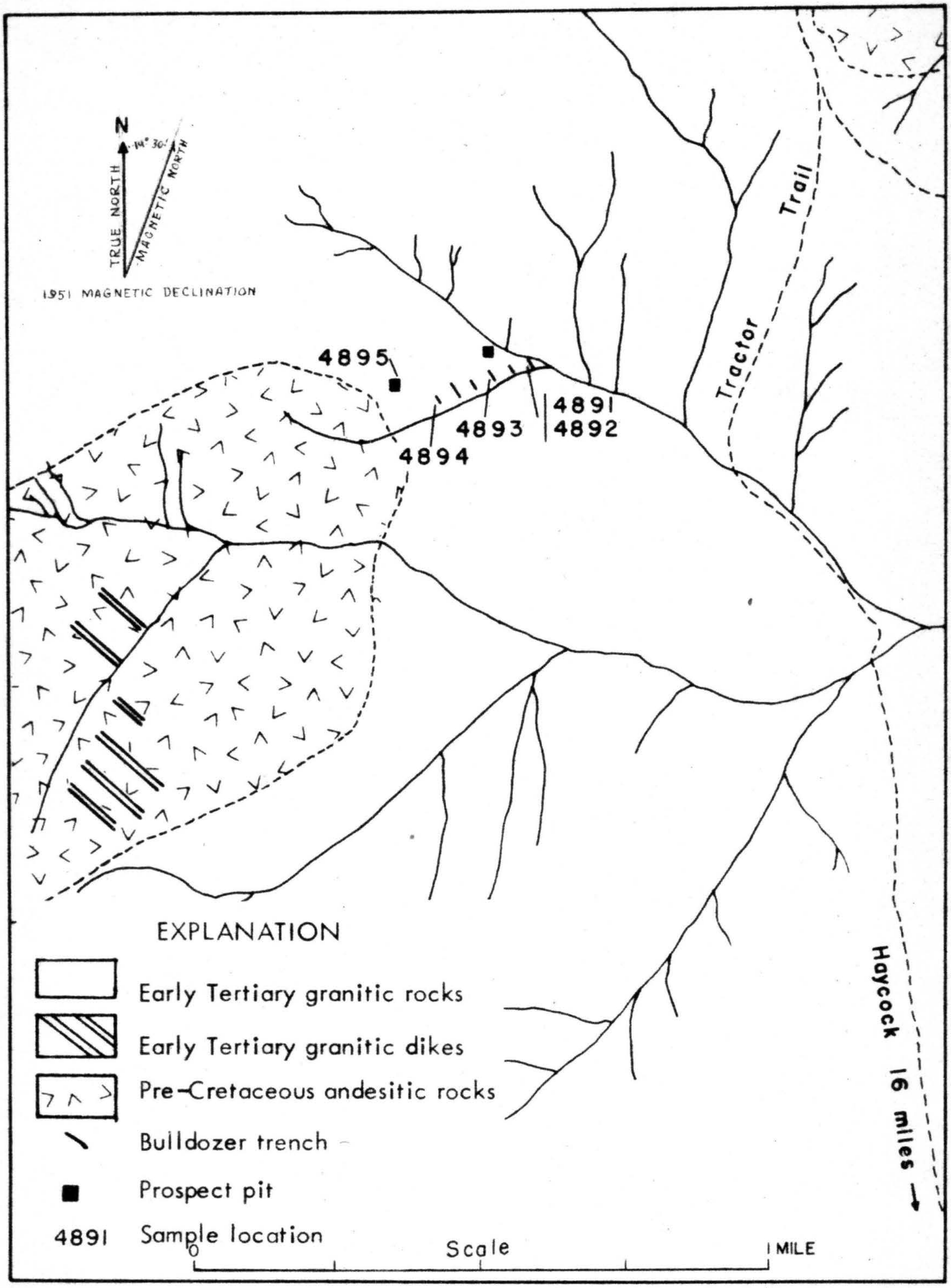


FIGURE 6.-- SKETCH MAP OF HEADWATERS OF THE PEACE RIVER, CANDLE QUADRANGLE, SEWARD PENINSULA, ALASKA

A brief reconnaissance of the area in 1951 by West (Gault and others, 1953, p. 28-31) indicated galena, sphalerite, pyrrhotite, covellite, and fluorite in addition to those minerals previously identified. The intimate association of pyrite, sphalerite, chalcopyrite, and galena in discrete grains in the placers, but not in the granite country rock, may indicate a possible lode source for the sulfides. The occurrence of gummite with tetradymite, galena, and pyrite suggests that the radioactive minerals occur with the sulfides in a lode deposit.

During the 1947 reconnaissance a placer-sampling technique was employed. In 1951, hand trenching by the field party to locate the lode source of the minerals was not satisfactory due to frozen ground and excessive flow of ground water. Bedrock was reached in only 4 of 16 pits put down. Additional work on the project was recessed pending the availability of a bulldozer or the development of new sampling techniques.

In July 1953, the Geological Survey was informed that two men from Nome, Elmer Straub and William Munz, were prospecting with a bulldozer for uranium in the area. A small field party was immediately sent to the area to determine the possibilities for putting a larger party into the area to work with the prospectors and to take advantage of the heavy equipment present. Upon arrival it was found that the bulldozer had broken down and the prospectors had abandoned their efforts. In all, six trenches were put in before the equipment became unoperative. Bedrock was reached in only one of these trenches. Contrary to the recommendations of West (Gault and others, 1953, p. 28-31), none of the trenches were cut transverse to the stream at the point where the most radioactive samples were found in 1947 and 1951. All the trenches are on the north bank of the stream normal to the direction of flow on 200-foot centers and about 0.2 mile downstream from the location of the most radioactive samples. Bedrock was reached in only one or possibly two trenches and it is believed that the results of the prospectors were inconclusive.

As no heavy equipment would be available to continue the trenching, it was decided not to bring a field party into the area but to attempt to reach bedrock by deepening parts of the trenches. Pits were dug, or deepened so that bedrock was reached in three of the six trenches. The maximum equivalent uranium content of the bedrock samples was 0.003 percent.

Samples were also taken of a mineralized zone in the bottom of a placer cut on Bear Creek at Porter's Camp. Analyses indicate as much as 0.02 percent equivalent uranium. No uranium minerals were identified but alpha plate studies show that the major source of the radioactivity is an opaque, non-crystalline material.

Port Malmesbury area

In 1948 and 1949, the Alaskan Territorial Department of Mines scanned all of its file samples for radioactivity. One sample which showed considerable radioactivity was sent in 1949 to the Atomic Energy Commission in New York for analysis. The Commission's New York laboratory reported that the sample (406-K) contained 0.05 percent uranium oxide equivalent and described it as "altered iron-stained siliceous rock with veinlets of calcite, pyrite, and a dark red mineral, possibly hematite". At the time the source of the sample was unknown. (See Wedow, White, and Moxham, 1951, p. 63-64.)

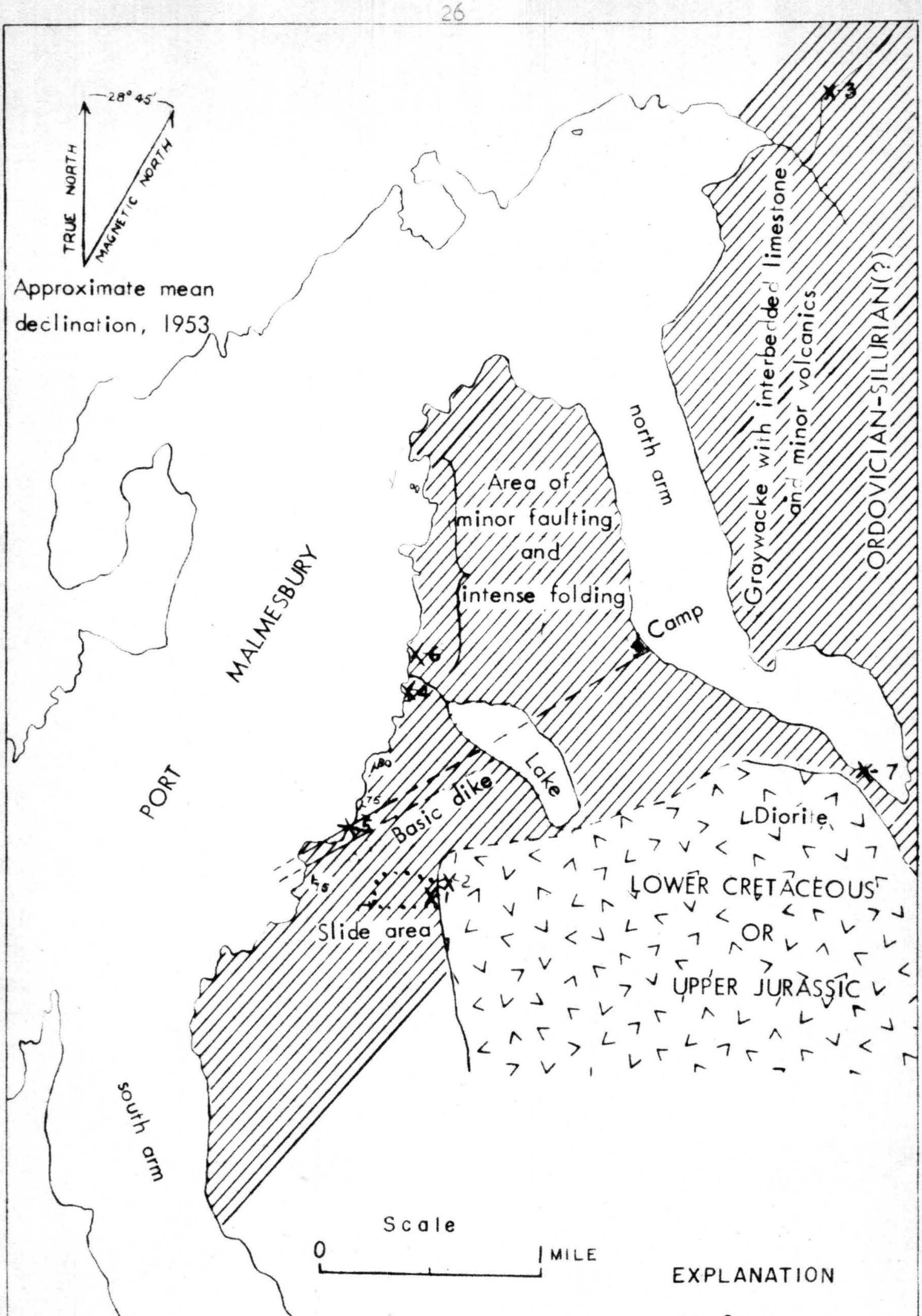
In September 1953 Mr. Donald MacDonald, formerly of Petersburg, Alaska called at the Geological Survey in Washington, D. C. Mr. MacDonald identified a specimen of the radioactive iron-stained rock as part of a sample that his father, Gordon MacDonald, had sent in the early 1930's to the Territorial Department of Mines in Ketchikan believing that it contained cinnabar. Donald MacDonald stated that the sample came from the tidal zone along the shore between the north and the south arms of Port Malmesbury, Kuiu Island, southeastern Alaska (fig. 7). Gordon MacDonald and his partner, John Luderman, also reported two sulfide-bearing quartz veins that cut across a creek draining into the head of Port Malmesbury from the northeast.

Donald MacDonald visited the area in 1939 and collected additional samples from the veins. He states that the veins which occur in a dark graywacke (?) are 8 inches wide and 6 feet apart. An assay of one of the veins by the Territorial Assay Office at Ketchikan gave a value of $5 per ton for gold, and $35 per ton for silver. The metallic minerals in the vein are galena, pyrite, and a heavy black mineral which occurs as blebs in the vein quartz. MacDonald believes the black mineral to be pitchblende for the following reasons:

(1) Samples of the veins showed strong radioactivity when tested with a gold leaf electroscope;

(2) a borax bead test for uranium was positive; and

(3) the possibility that the fogging of the film in his camera was due to the fact that the camera had been laid on the vein and carried for some hours in a pack with the samples.



Geology adapted from U.S.G.S. Bull. 800

FIGURE 7.--GEOLOGIC SKETCH MAP OF PORT MALMESBURY AREA, KUIU ISLAND

Robert Velikanje, geologist from the Geological Survey's Juneau office, made two short trips into the area with MacDonald in the fall of 1953. On the first trip the party was in the area only 3 hours and used their time to familiarize themselves with the area to aid them in planning the requirements for a several days reconnaissance of the area at a later date. Two weeks later the same party again visited the area and remained there one week. Bad weather and the lack of a small boat, however, prevented the party from searching for the quartz veins reported at the head of the bay. The outcrops that MacDonald stated were the source of the red radioactive float rock on the beach had been covered by slides and could not be examined. No samples collected in the area in 1953 contained more than 0.001 percent equivalent uranium.

In the spring of 1954, Donald MacDonald returned to Port Malmesbury and collected additional samples. These samples, tested by C. L. Sainsbury, geologist in the Juneau, Alaska, office of the Geological Survey, were not radioactive. Later in the summer, additional samples collected by MacDonald also did not contain any radioactivity. MacDonald then stated that for financial reasons he was abandoning the search.

In the late fall of 1954, R. S. Velikanje and Robert Thorne, engineer, U. S. Bureau of Mines, Juneau, Alaska, spent several days in the area to evaluate the sulfide veins. They carried Geiger counters but did not locate any radioactivity anomalies.

SUMMARY AND CONCLUSIONS

In 1953 the Geological Survey conducted reconnaissance for high-grade uranium ores in six widely scattered areas in Alaska. The areas were selected primarily on the basis of the reported locations of high-grade ore samples submitted by prospectors and the occurrence of uranothorianite with associated sulfides in creek placers. No high-grade bodies of ore were found during the brief reconnaissances conducted in each area. It is unlikely, however, that the samples submitted by the prospectors were "imported" to Alaska, and the prospectors have been urged to continue their searches for new samples of interest and to submit more information on the precise location of the samples they had submitted. The lode sources of the uranothorianite could not be located, but further reconnaissance, particularly in the headwaters of the Peace River on the Seward Peninsula, using geochemical techniques will be needed before these radioactive placer occurrences can be eliminated from further consideration.

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