

RADIOMETRIC RECONNAISSANCE OF
SOME ALKALINE GRANITIC ROCKS, ATLIN AREA,
BRITISH COLUMBIA

(part of Project C449 - Bee Cee)

parts of NTS 104 M, N, & O

by

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SUMMARY AND CONCLUSION:

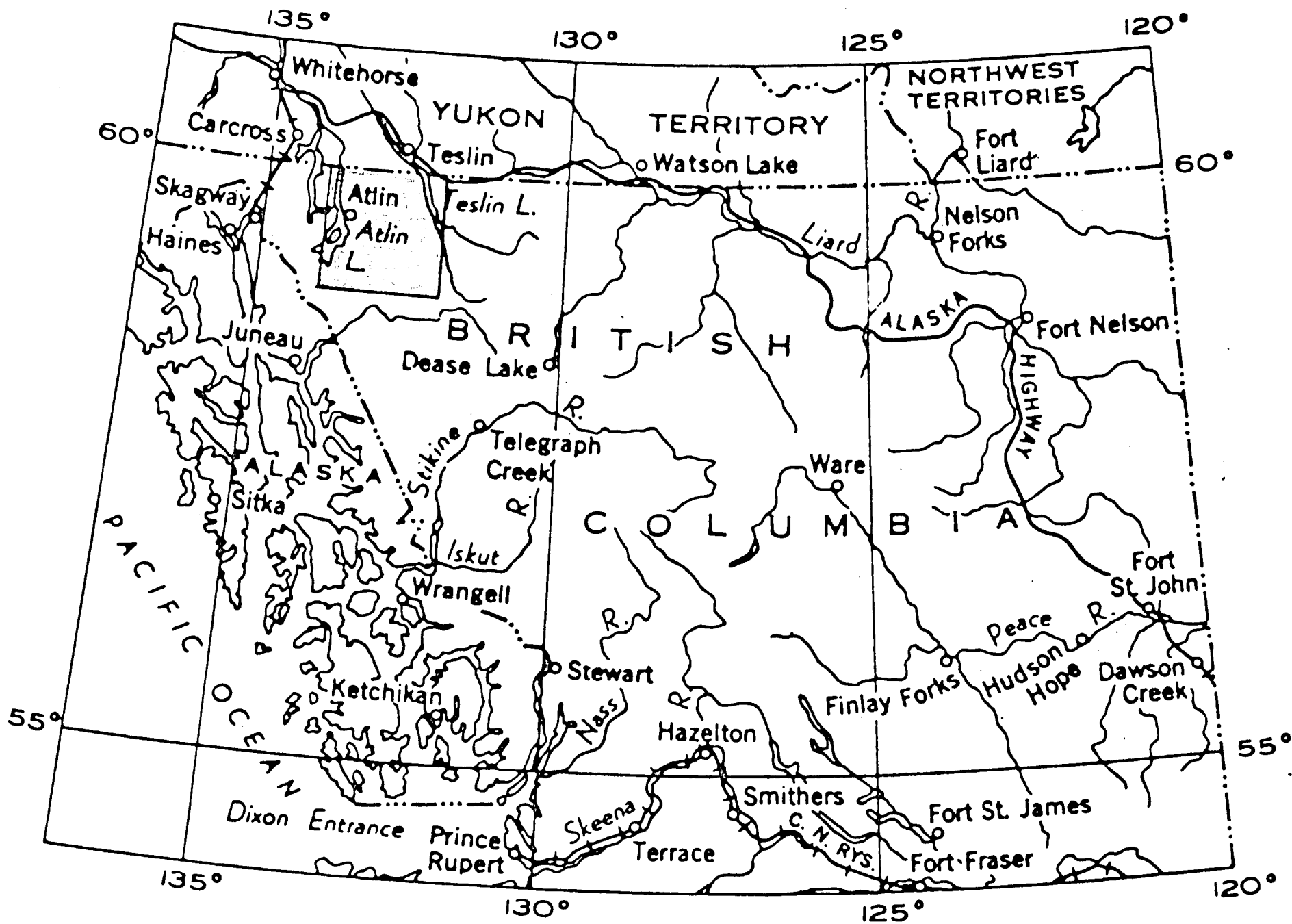
Aeroradiometric reconnaissance was conducted over several alkaline granitoid stocks and small batholiths in the Atlin area. The working hypothesis for this search is based on the known association of the elements U, Th, Cl, and F with peralkaline nepheline syenites. Examples are documented at Ilímaussaq, Greenland; Poços de Caldas, Brazil; Pilanesberg, South Africa; and Bokan Mountain, Alaska.

Unfortunately, the granitoid rocks of the Atlin area do not appear to fit in the category of uranium hostrocks. All anomalous areas can readily be explained as simple mass effect caused by high walled cirques of granitoid rocks. No radioactive fluorite bearing veins or contact zones were found. No further work is recommended.

A silt sample collected from the south fork of Wann River yielded 18 ppm uranium which is nearly eight times background for the general area. This sample could be a highly diluted fraction of a large drainage which is not within the area of aerial radiometric reconnaissance.

INTRODUCTION:

The purpose of this project was to assess several alkaline granitic intrusives in the Atlin area as possible hostrocks of economic deposits of uranium. Alkaline granites, and in particular nepheline syenite and their related hybrid varieties, are known to contain anomalous amounts of fluorine in other locations. The halides, fluorine specifically, may form complexes with uranium and possibly rare earths, thus providing a way to concentrate these elements during late stages of intrusion. This idea served as the basic exploration concept.



INDEX MAP

Figure 1. - Index Map, Atlin area, B. C.

The Atlin area situated about 125 miles southeast of Whitehorse, Yukon in the northwestern corner of British Columbia is one area that contains igneous rocks that may meet the exploration guidelines. Aeroradiometric surveys were flown over selected intrusions with a Bell 206B Jet Ranger in which was mounted a semi-portable gamma ray spectrometer (Scintrex Gam-1) and Hewlett Packard Chartrecorder tied to a 113 cu. in. sodium iodide crystal (Scintrex GSA-61).

All land surfaces below about 5500 feet are gently rounded whereas above the topography is classical alpine; continental glaciation has sculptured the lower hillsides and valleys but alpine glaciers carved the sharp, ragged high mountain terrain. Large glacially carved lakes with a northerly trend, namely Taku, Atlin and Teslin Lakes, are principal sources of the Yukon River system.

REGIONAL GEOLOGY:.

The project area spans two tectonic belts, the Coast Crystalline Belt in the southwest and the Intermontane Belt which covers most of the project area. The Coast Crystalline Belt is characterized by several sequences of metavolcanics, metasediments, gneisses and granitoid rocks mostly dating from Late Jurassic and Early Tertiary. We, of course, are concerned about the granitoid rocks as possible uranium bearing hostrocks. Here the plutonic rocks comprise fifty or more percent of the outcrop, of which quartz diorite and granodiorite are the most abundant. Here the Intermontane Belt is composed of Late Paleozoic, Triassic and Jurassic eugeosynclinal metavolcanics and related metasediments which are intruded by granitoid rocks. There is little difference between the two tectonic provinces in this area except the Intermontane has a somewhat smaller aerial extent of granitic outcrop.

Several lode-type base metal showings occur in the general area, the principal one being the Adanac molybdenum deposit which contains 100,000,000 T. of 0.11 MoS_2 : only a test mill has operated on the Adanac (personal communication, J.W. Simpson). The Atlin Mining District is best remembered for the \$20 million worth of placer gold produced between 1898 and present day. A radioactive, jasperoid skarn with high thorium content is reported from the isthmus between Graham Inlet and Atlin Lake. It was not visited.

EXPLORATION PROGRAM:

Helicopter aeroradiometric reconnaissance was conducted over several alkaline granitoid plutons of stock and small batholith proportions. These areas, Fig. 2, are: (1) The Cathedral, (2) Mount Mussen and Mount Caplice, (3) the Florence Range, (4) Teslin Lake intrusives, (5) Dawson Peaks, (6) Mount Snowdon - Weir Mountain, (7) Ruby Creek, and, (8) Atlin Mountain. The results of uranium search in each of these areas are described briefly.

The Cathedral (including Mount Mussen and Mount Caplice)

The Cathedral, a prominent spired alpine mountain, is located 22 miles southwest of the town of Atlin and is easily seen from there. The core of this small range is composed of hornblende quartz monzonite, which intrudes metavolcanics of probable Late Paleozoic age. The hornblende quartz monzonite is light pinkish grey to light grey and weathers the same; fine to medium crystalline, subporphyritic with minor angular inclusions of mafic volcanic rocks.

RESULTS (THE CATHEDRAL)

<u>Rock Type</u>	<u>Background cps</u>
hbl. quartz monzonite	1000 - 1200
metavolcanics	200 - 400
<u>contours flown:</u>	3000, 4000, 5000 ft.
<u>anomalies:</u>	none, only mass effect phenomena in high-walled cirques.

A 4000 foot contour was flown around Mount Mussen and Mount Caplice which are located directly south of The Cathedral across Willison Bay. No significant radiometric readings were recorded there. Granitic rocks average 550 cps, metasediments a lowly 200 cps which is very, very dead on the big 113 cu. in NaI crystal. Some dikes read up to 900 cps on the east slopes of Mount Caplice.

All of Mount Mussen and Mount Caplice plus the eastern half of The Cathedral are within the boundaries of the newly proposed Atlin Provincial Park, Fig. 3. Claim staking is permitted, but the claims are not immediately recorded by the Mining Recorder. Instead, the claim goes into a state of limbo until a decision of the land status is handed down by the Parks Branch as to whether or not the claims will be accepted (see Appendix).

Florence Range

The Florence Range is located about 30 miles southwest of Atlin and due west of The Cathedral.

Mass effect from the enveloping granitic rocks in precipitous cirques and canyons adequately explain the cause of the radiometric anomalies found in the Florence Range. Granitic rocks vary in composition from quartz monzonite to granodiorite, and are similar to The Cathedral pluton. Background for granites is 1200 - 1500 cps; for metavolcanics and

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SECTION

Figure 3. - PROPOSED ATLIN PROVINCIAL PARK BOUNDARIES



hornblendite 450 cps. Thirteen stream sediment samples collected around the periphery of the Florence Range have a mean of 4 ppm and range from 0.2 to 18 ppm uranium. The sample that has 18 ppm uranium was collected from the mouth of the south fork of Wann River, interestingly enough, from a drainage that was not flown. This should be kept in mind as the geochem value is eight times background though still low. Also as the sample was collected at the mouth of the stream maximum dilution could have occurred.

Teslin Lake Intrusives

Alkali granitic rocks occur east of Teslin Lake, Fig. 2, as low relief mounds and hillocks surrounded by swamps and small lakes, very typical of the lowlands adjacent to Teslin Lake. Porphyritic nepheline monzonite, syenite porphyry and monzonite were collected. Other varieties probably exist but due to the heavy spruce and pine forest very few helicopter landing sites were available.

No radiometric anomalies were found flying low speed, low altitude traverses with the French scintillometer (the GAM-1 was not operative). Ground traverses yield backgrounds of 50 - 120 cps whereas airborne is 25 - 80 cps.

A single aerial traverse over the quartz diorite at Dawson Peaks was flown on a return leg after refueling in Teslin. Backgrounds vary from 50 - 80 cps with maximum ground readings only 120 cps.

Mount Snowdon - Weir Mountain

After completing prospecting at Teslin Lake, a reconnaissance traverse was flown along the flanks of Mount Snowdon and Weir Mountain. The purpose of this work was to determine if D. G. Layton and Associates had, indeed, found interesting radioactivity. This was not proven. Backgrounds

for the alaskite, Unit 13a, of Snowdon and Weir are higher than other igneous rocks checked at Teslin. Backgrounds vary from 100 - 250 cps. A few zig-zag passes over Layton's CX-1 claim nearly adjacent to Trout Lake showed backgrounds of 50 - 75 cps over reworked fluvial terrace sediments and/or glacial till (?). The French scintillometer was used here.

Ruby Creek

Quartz monzonites forming the outcrops at the headwaters of Ruby Creek give radiometric backgrounds of 150 - 200 cps on the French scintillometer. A ground traverse down Ruby Creek which was almost entirely over Tertiary basalts gave backgrounds of 50 - 70 cps.

Atlin Mountain

The core of Atlin Mountain is composed of Tertiary quartz monzonite which intrudes Mesozoic metasediments and metavolcanics. No anomalies were found flying with the GAM-1.

<u>Rock Type</u>	<u>Counts per second</u>
Quartz Monzonite	900 - 1200
Cache Creek Group	200 - 600
Laberge Group	400 - 500
Unit A	600 - 1200

As in all the other areas that were flown, the radiometric backgrounds of volcanics versus granitoid rocks is strikingly different; granitoids are two to six times background of volcanics and metasediments.

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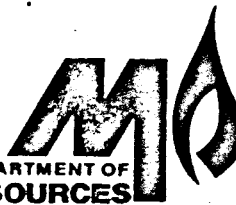
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THE DEPARTMENT OF
MINES AND PETROLEUM RESOURCES



WHEN REPLYING PLEASE REFER TO

FILE NO.

RECEIVED

AUG 17 1976

Circular Letter No. 58 M

Date - August 12th, 1976

Subject - Recording of Claims Located
in a Recreational Area

GOVERNMENT AGENT
VICTORIA, B. C.
TO: ALL MINING RECORDERS

The Department recently plotted on our Mineral Titles Reference Maps the recreational areas established by the Provincial Parks Branch.

Our present procedure in dealing with mineral claims which are staked in recreational areas is that upon receipt of the record by the Mining Recorder it is not recorded but forwarded to Victoria and in turn the Parks Branch is advised that the mineral claims have been staked in a particular recreational area and the Parks Branch then provides us with their comments and the Mining Recorder is subsequently advised.

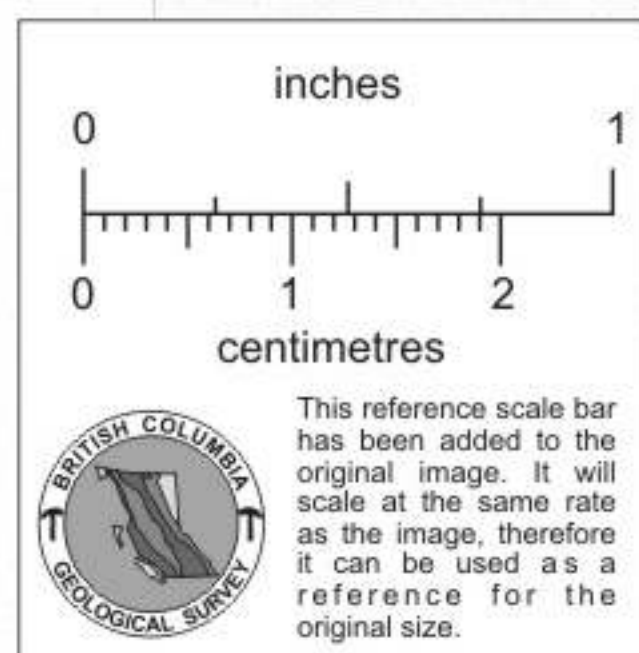
In order to prevent, where possible, situations arising where an individual stakes mineral claims in a recreational area and they are subsequently refused for recording by the Parks Branch, it would be appreciated if when dealing with the public and an interest is expressed regarding the staking of mineral claims in a recreational area that the potential staker be advised of our procedure in order that time, effort and money is not expended needlessly.

It is our understanding that the Parks Branch is preparing regulations regarding the staking of claims in recreational areas and copies of these will be forwarded to you when they are received.

A handwritten signature in cursive script, appearing to read 'E. J. Bowles'.

E. J. Bowles
Chief Gold Commissioner

RR:bmh



SAMPLE LOCATION
for FLORENCE RANGE