STREAM AND SOIL GEOCHEMICAL SURVEYS IN LABRADOR

by

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Field work in the summer of 1980 was done on four base metal anomalies and one uranium anomaly (see figure). These areas were selected on the basis of results from the previous year's detailed lake sediment/water sampling project of 14 regionally anomalous areas (Labrador Open File 224, 1980), which were themselves initially identified from the results of a regional lake sediment geochemical survey (Labrador Open Files 133, 396 and 13N (1978)).

The purposes of this year's project were twofold, firstly, to determine whether the anomalies could be related to bedrock mineralization in an effort to promote the exploration and development of the Province's mineral resources and, secondly, to evaluate the effectiveness of various geochemical exploration methods in the Labrador environment.

BASE METAL ANOMALIES

Stream sediments and water from Anomalies 1, 3 and 4 in N.T.S. areas 23J/10, 15 and 16 were collected at 250 m intervals from drainage systems having anomalously high base metal contents in lake sediment and water samples. All three areas are in the Labrador Trough and are underlain by shales and slates of the Menihek and Attikamagen Formations, some of which have been intruded by sills and dikes of Wakuach gabbro.

Zinc was of principal interest but high concentrations of silver and lead were commonly found in association. Stream waters were analyzed in the field for their heavy metal content using a colorimetric technique, and these data were used to further define particularly anomalous areas for detailed soil and till sampling.

Work at Anomaly 8 (N.T.S. sheet 13N/11) included grid cutting and soil sampling a 1.4 km^2 area adjacent to and surrounding two ponds with very high zinc and lead contents in their sediments and very high zinc contents in their waters. A V.L.F. survey was also made over the grid. The area is underlain by Helikian felsic volcanic rocks.

Results of the work on the base metal anomalies will be released as an open file report during the winter or spring of 1981.

URANIUM ANOMALY

Two areas totalling about 30 km^2 were selected from Anomaly 12 (N.T.S. sheets 13M/9 and 16) for detailed stream sediment and water sampling because of their high uranium contents in lake sediments and waters. These two areas were both found to be centered around exposures of Aphebian foliated leucogranite which are separated by Helikian intrusions of massive granitic to anorthositic rocks.

Mineralization. In addition to stream sampling, some scintillometer prospecting and mapping was done during which several occurrences of uranium mineralization were located. All occurrences found were in the foliated leucogranite and most consist of small veins a few to several metres in length. Some mineralization is restricted to "hot spots" and shear zones within the granite. The uranium mineralization, particularly in the southern area, is found most commonly as narrow, sharply defined veins commonly parallel or subparallel to the foliation; in some instances, the veins distinctly crosscut the fabric. Vein lengths vary from less than a metre to greater than 20 m. In some cases, isolated "hot spots" rather

GEOLOGY

GRENVILLE PROVINCE

HADRYNIAN	Supracrustal arkosic sedimentary rocks of the Double Mer Formation
HELIKIAN AND APHEBIAN	Metamorphosed equivalents of the Seal and Bruce River Groups
HELIKIAN AND EARLIER	Metamorphic rocks, mainly quartzofeldspathic gneisses

CHURCHILL PROVINCE

HELIKIAN	Supracrustal sedimentary and volcanic rocks of the Seal Group
APHEBIAN	Sedimentary and volcanic rocks of the Labrador Trough
APHEBIAN AND EARLIER	Metamorphic rocks, mainly quartzofeldspathic gneisses and granites

NAIN PROVINCE

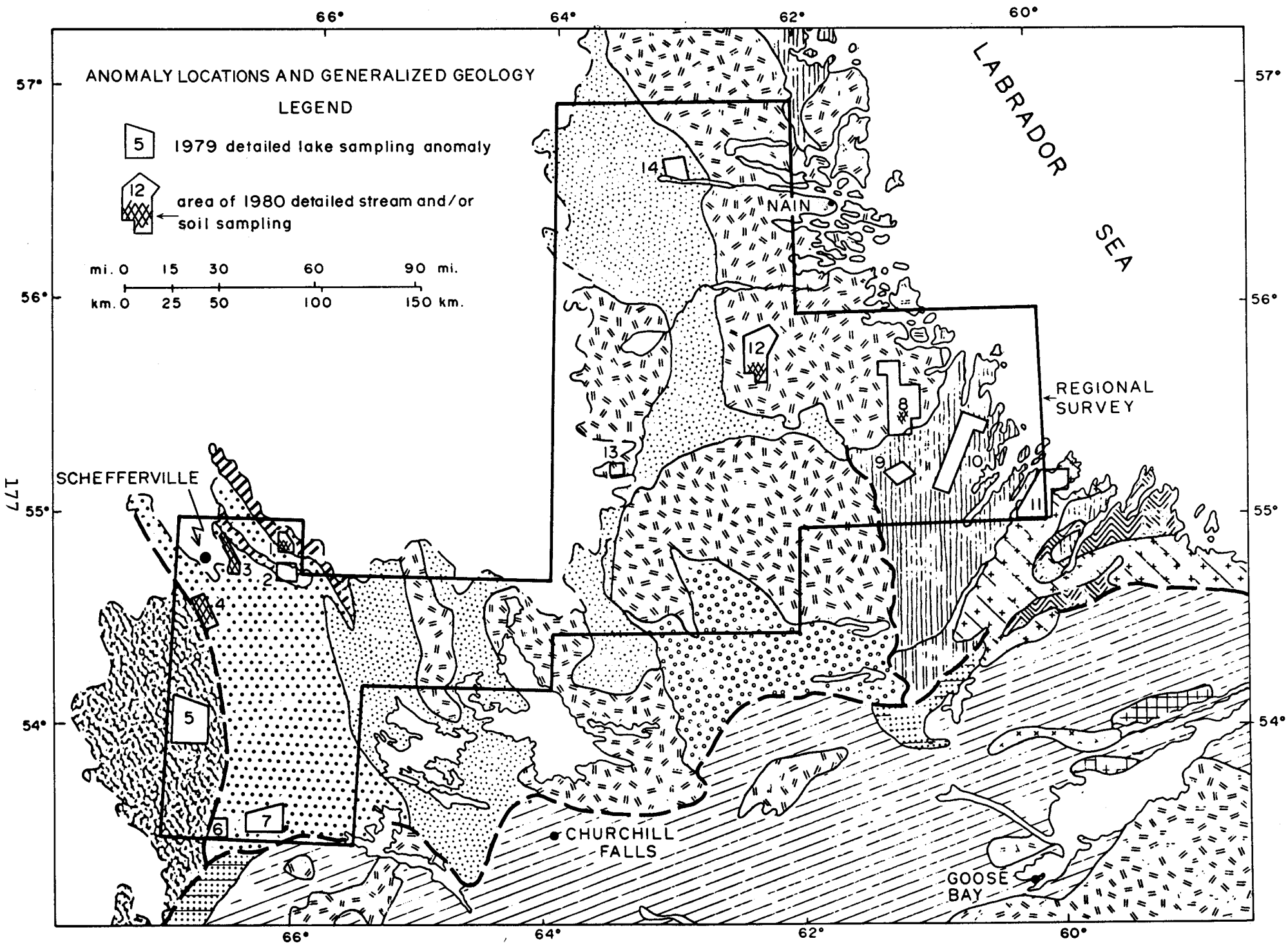
HELIKIAN AND APHEBIAN	Supracrustal sedimentary and volcanic rocks of the Moran Lake and Bruce River Groups
APHEBIAN	Metamorphosed sedimentary and volcanic rocks of the Aillik Group
ARCHEAN	Basement gneisses

SUPERIOR PROVINCE

ARCHEAN	Granulitic gneisses and felsic to mafic intrusives

INTRUSIVE ROCKS

HELIKIAN	Anorthosites, gabbros and associated acidic intrusives and extrusives
HELIKIAN AND EARLIER	Massive to poorly foliated acidic intrusives
APHEBIAN	Acidic intrusives and associated metamorphic rocks
	Gabbroic sills


ANOMALY LOCATIONS AND GENERALIZED GEOLOGY
LEGEND
5 1979 detailed lake sampling anomaly
12 area of 1980 detailed stream and/or soil sampling
mi. 0 15 30 60 90 mi.
km. 0 25 50 100 150 km.
66°
64°
62°
60°
57°
56°
55°
54°
LABRADOR SEA
NAIN
REGIONAL SURVEY
SCHEFFERVILLE
CHURCHILL FALLS
GOOSE BAY
1
2
3
4
5
6
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8
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10
12
13
14
177

than veins are present. Although little time was spent on the northern area, the little mineralization found there seemed related to shear zones in the granite with wider widths of lower radioactivity than is typical in the southern vein-type occurrences.

Fist-sized grab samples of rock collected along a sampling "traverse" running perpendicular to one of the most radioactive veins gave the assays and analyses shown in Table I below.

This particular vein is on a cliff face and its lateral extent could not be determined, but its radioactivity decreases sharply within a few metres in a vertical direction. Several other less radioactive veins were found nearby. Another area about 1 km to the northeast is host to several veins with most scintillometer readings being about 25% as high as this vein. One vein in this second area, however, gave scintillometer readings equal to or slightly higher than the analyzed vein. Its lateral extent is bounded by overburden but exceeds 2 metres.

Autoradiographs and X-ray diffraction analyses of vein and wall rock material corresponding to sample 40027 indicate the dominant uranium bearing mineral to be uraninite (pitchblende) with lesser amounts of kasolite, a secondary U-Pb silicate derived from the weathering of pitchblende (J.A. Kerswill, Geological Survey of Canada).

Generally, no visible alteration is associated with the veining, although quartz veins are present in a few instances and slight gossan streaks occur in others. Spectrometer analyses indicate extremely low thorium concentrations relative to uranium.

Stream Sampling. Stream samples were collected at 250 m intervals. The minus 80 mesh fraction of the dried sediments was analyzed for U, Pb, Zn, Co, Ni, Ag, Mn, Fe, Mo, F and loss-on-ignition (LOI) as a measure of the organic content. Waters were analyzed for pH, U and F. Sediments were analyzed for U by a delayed counting neutron activation technique and waters were analyzed fluorimetrically.

In both sampling media, U gives the best indication of U mineralization in the rocks upstream of sample sites. The concentration of U in sediments, however, was found to be strongly correlated with the LOI. Therefore, this variation should be removed as much as possible by some statistical technique such as linear regression before the U in sediment data is used as a guide to mineralization.

The survey results including a text, data and maps from this anomaly were released as Labrador Open File 13M/12 in October, 1980.

TABLE I

Sample	Assay/Analysis	Comments
40027	1.81% U_3O_8	Sample of vein and wall rock material
40028	0.13% U_3O_8	Sample of wall rock 6-12 cm from vein center
40029	11.9 ppm U	Sample of wall rock 30 cm from vein center
40030	6.2 ppm U	Sample of wall rock 1.2 m from vein center