803189

Government of Canada / Gouvernement du Canada

MEMORANDUM **NOTE DE SERVICE**

TO / À: Dr. J.M. Duke
Director, Mineral Resources Division

FROM / DE: R.V. Kirkham

SECURITY - CLASSIFICATION - DE SÉCURITÉ:

OUR FILE — N / RÉFÉRENCE:

YOUR FILE — V / RÉFÉRENCE:

DATE: October 20, 1989

SUBJECT / OBJET: **Work in British Columbia**

Since some people continually seem to be concerned and surprised about my activities in British Columbia, I will try to make this outline of my activities as complete as possible. I have active projects at Sulphurets, Kitsault Lake, Hudson Bay Mountain and on alkaline porphyry (+some skarns) Cu-Au deposits. I hope to continue work in B.C., especially in northwestern British Columbia and Smithers area.

1) **Sulphurets:**

This is a major joint project with Bruce Ballantyne and Don Harris. Jim Mortensen and others in the Geochronology Section have provided us with two radiometric dates (one only preliminary). Our main contacts in the B.C. Geological Survey Branch have been Dani Alldrick and Jim Britton.

The project was started in 1986 and the emphasis has been on geology, lithogeochemistry and systematic mineralogy. R.V. Kirkham completed another successful field season in the area last summer and from the Eskay Creek camp extended our coverage to the north into the Treaty Glacier area (Tantalus Property) (see attached location map – coverage to the north only partly completed). Samples collected last summer still have to be analyzed and prepared for mineralogical studies.

Exploration activity is expanding in the area every year and one mine feasibility study should be completed this winter. We hope to keep abreast of developments in the area and to resolve some major remaining problems over the next 2 or 3 years, until our final reports are completed. This is an exciting area in which to do research and we hope to build on our extensive general foundation by doing more detailed problem solving type studies.

Bruce Ballantyne gave a talk in Brazil this month including data from this project and we plan to present a talk and 3 poster displays at the GSC Minerals Colloquium and hope to do the same at the Cordilleran Roundup. I have been working on a paper for Current Research but it has not been going well. We would like to have an Open File Report, consisting of a preliminary geologic map, specimen location map, preliminary mineral distribution map, and preliminary Cu, Mo, Au,

...2

Ag, As and Sb distribution maps at 1:20 000 scale, released before next summer.This Open File would be directed towards people doing exploration in the area and would give us an opportunity to release information on several Au and Ag and a significant Mo discovery that we have made. This Open File was planned for completion this winter but we were unable to obtain a COP student for the September-December term to work on it. A major concern is to get the Open File completed, so that we cannot be accused of sitting on data or not finishing reports. Production of the report depends on obtaining the services of a qualified COP student or a support geologist with map-making and computer data processing expertise. Given adequate support, the opportunity exists for the GSC and Mineral Resource Division to make a very timely release on an area of major exploration interest. I am also concerned that we have adequate budgets for further field work and analyses. For efficient production of reports we will also need increased office support for this project.

The GSC project, as currently designed, should yield very valuable results (primarily for exploration companies working here and elsewhere and for general modeling of a deformed, precious metal-rich porphyry Cu-Mo system). Nevertheless, from the outset I have felt that it lacks structural geology expertise. As work has progressed this need has become even more apparent. The structural problems fall into two categories: 1) origin of syntectonic bonanza-grade precious metal vein systems, and 2) resolution of major, complex regional structures which include crustal-scale thrusts (some folded) and shear zones and at least one major recumbent fold just to the west of the study area (as yet unmapped) and many smaller scale recumbent, disharmonic and chevron folds. Other workers in the area have not recognized the importance of these structures and have subsequently misinterpreted basic structural and stratigraphic relationships. Some of the structures discussed above are only exposed in very steep cliff faces, so they might be largely inaccessible for detailed study. However, this does negate their importance for resolution of fundamental structural and stratigraphic relationships in the area.

While working with the Orequest Consulting Group in the Treaty Glacier area (sharing helicopter logistics), R.V. Kirkham stayed in Calpine Resources Limited Eskay Creek camp (see attached location map). The Eskay Creek deposit is a very significant precious and base metal discovery which the company considers to be a "volcanogenic epithermal massive sulphide deposit" (Northern Miner, September 4, 1989). Both economic and geological analogies have been drawn with Hemlo. Information on this property at this time is considered to be confidential and very sensitive. Provided that we do not release any information without permission, the companies involved have invited the GSC to work on the deposit. Currently we have no plans for any major work on this deposit but Don Harris will do some reconnaissance mineralogy and Bruce Ballantyne some reconnaissance lithogeochemical analyses on some pieces of drill core that I collected last summer. Bob Barnett of the University of Western Ontario has identified a very exotic mineral suite in this deposit with some distinct similarities to Hemlo. We will also examine some rhyolite samples to see if they contain zircons suitable for dating (planned dating of a rhyolite unit has been discussed with Dani Alldrick). The Eskay Creek deposit is probably the same general age as the large alteration zones in the Sulphurets area.

...3

Brief visits by R.V. Kirkham were also made to the Snip, Skyline, Big Missouri and Silver Butte properties. For several years R.V. Kirkham has unsuccessfully attempted to visit Noranda's Todd Creek Au-Cu property. Nevertheless, we have been doing some mineralogical and geochemical work on samples sent by the company.

To improve metallogenetic analyses, on the longer term, R.V. Kirkham hopes to obtain accurate radiometric and/or fossil dates on as many major metalliferous deposits in the northern Coast Mountains as possible. We have a request for a rhyolite sample from Cominco from the Tulsequah VMS deposits but so far we have not received one. I have discussed with several geologists the dating of the Granduc and Anyox deposits (see location map) but as yet we have not figured out how to date them.

2) **Kitsault Lake:**

This is a modest-scale joint project with Ian Jonasson. It was initiated at the invitation of Jerry Blackwell (formerly with Cominco) and Cominco. Cominco has dropped their option on the property but we have a continuing relationship with the new operators. The property has been reactivated and is currently being drilled.

The property contains very unusual volcanic exhalative celestite and sphalerite. We are doing some chemical and mineralogical work and, if we can find suitable material, we hope to obtain an accurate U/Pb zircon date for the deposit. The project contains a component of development analytical chemistry (Cominco could not obtain reliable Sr analyses).

It should be emphasized that Cominco (and to date the present operators) have not released any information on this property and until they do or we have permission to publish our results, the Survey should not be to open with information on this property (a brief account of current exploration activity on the property was just released in the Northern Miner, October 16, 1989). Dani Alldrick has seen the property and I checked with him in 1986 to be sure that he had no objection to us working on this property. He welcomed any work that we cared to do in the Alice Arm area.

In connection with this work, several other properties in the area have been examined (e.g. Dolly Varden Red Point showing, Torbrit, Homestake and Willoughby Glacier). We have analyzed some rocks collected by Barry Delvin from the Red Point claims (part of a very large pyritic alteration zone with Cu and Au showings. Homestake is part of the same alteration zone. Both have similarities to Sulphurets and possibly Todd Creek(?)). The results have been given to the company. Delvin completed a M.Sc. thesis at University of British Columbia on the Dolly Varden-Torbrit area, which he concluded contains low-sulphide, Ag-rich, volcanic exhalative barite deposits (in agreement with private consulting reports by Bill Pearson). Because of the relevance of this conclusion to our work at Kitsault Lake we have been doing a little comparative work on one accessible underground old stope at Torbrit. I measured, photographed and sampled on a centimetre scale about 3 to 4 metres of argentiferous layered barite, chert and hematite. At this point I have not decided if

...4

this is part of a huge crustified vein system (greater than 15 m wide) or part of a syngenetic bedded deposit. Crustified veins are known on the property.

Bond Gold International has released some encouraging results from the Willoughby Glacier area and have announced a "major" Au discovery on the Red Mountain property about 6 km west of the Willoughby Glacier showings (Northern Miner, October 9, 1989). This discovery will add greatly to interest in area and to the relevance of our work both at Sulphurets and Kitsault Lake.

3) Hudson Bay Mountain:

Three days were spent in the area with Don MacIntyre of the B.C. Geological Survey Branch. Four samples for U/Pb zircon dating were collected (Jim Mortensen will do the work). The B.C. Geological Survey Branch hopes to prepare a compilation map for the area over the next couple of years. An attempt will be made to establish more firmly the age relationships of important volcanic and intrusive units in the area. The B.C. Geological Survey Branch has just compiled R.V. Kirkham 1960s geological mapping for the area on 1:20 000 scale orthophotograph maps. They would like to Open File these maps this winter. Don MacIntyre will be in Ottawa during the third week of November to work with R.V. Kirkham on the Hudson Bay Mountain maps. The production of the maps should be viewed as B.C. Geological Survey Branch work but the radiometric dating should probably be viewed as GSC work. Depending on the results of this work, possibly a couple of more dates should be obtained for major volcanic units in type sections of the Hazelton and Skeena groups on Ashman Ridge. The Hudson Bay Mountain area contains many mineral deposits, including the large Glacier Gulch porphyry Mo (W) deposit.

4) Alkaline porphyry Cu-Au deposits:

As was discussed about two years ago, and in collaboration with Larry Hulbert, a suite of R.V. Kirkham's samples has been largely prepared for base-metal, Au and PGE analyses. Most samples were sawed last summer but they remain to be described and crushed and ground. Analyses will have to wait until funds are available.

Larry Hulbert (primary interest PGEs), Vic Preto of the B.C. Geological Survey Branch (knowledgeable expert on local geology) and R.V. Kirkham (primary interest undirectional solidification textures (USTs)) plan to spend a couple of days in the Copper Mountain area of southern British Columbia. To date, however, the logistic of a joint field trip have not been possible to arrange. Nevertheless, we still intend to do this work, possibly combined with a visit to the Iron Mask batholith, when feasible.

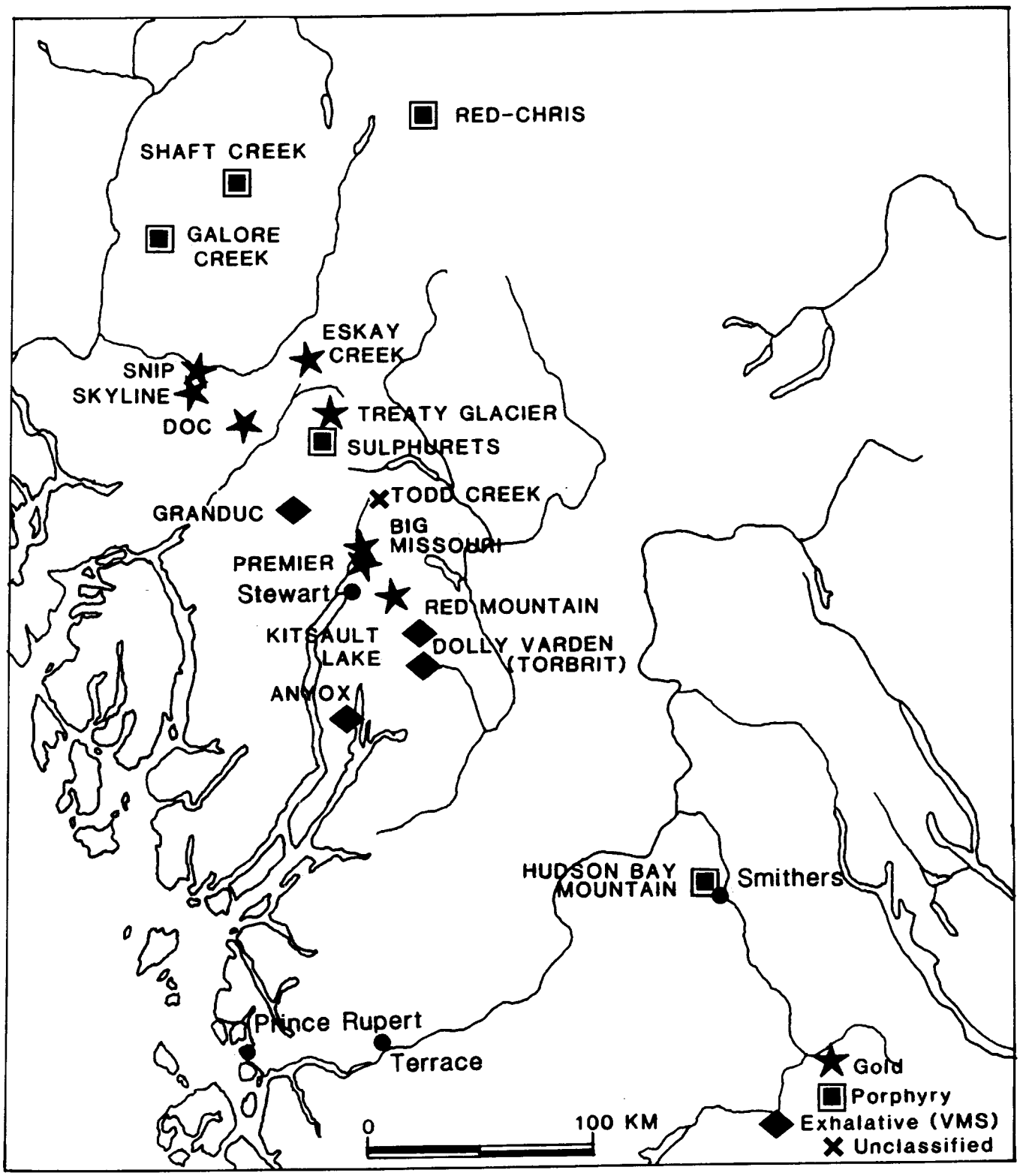
...5

Don Harris and Bruce Ballantyne have been doing a small amount of work on samples, sent by the company, on the Mount Milligan alkaline porphyry Cu-Au discovery. Sulphurets work can also be viewed as part of an alkaline porphyry Cu-Au study.

R.V. Kirkham

R.V. Kirkham

cc: S.B. Ballantyne
D.C. Harris
L. Hulbert
I.R. Jonasson
J.K. Mortensen
R.F.J. Scoates
W.D. Sinclair


RED-CHRIS
SHAFT CREEK
GALORE CREEK
ESKAY CREEK
SNIP
SKYLINE
DOC
TREATY GLACIER
SULPHURETS
TODD CREEK
GRANDUC
BIG MISSOURI
PREMIER
Stewart
RED MOUNTAIN
KITSAULT LAKE
DOLLY VARDEN (TORBRIT)
ANYOX
HUDSON BAY MOUNTAIN
Smithers
Prince Rupert
Terrace
0
100 KM
Gold
Porphyry
Exhalative (VMS)
Unclassified