B.C. Regional Geochemical Survey: 1999 Field Programs

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INTRODUCTION

The Exploration Services and Information Section of the British Columbia Geological Survey Branch is responsible for administering the Regional Geochemical Survey (RGS) program and providing complimentary research and orientation studies designed to promote the effective use of exploration geochemistry by industry. Results are used by industry to pinpoint exploration opportunities and by government for resource management, land-use planning and environmental assessments. The section's contribution of applied geochemical information to the exploration community during the 1999 field season is summarized in this paper.

REGIONAL GEOCHEMICAL SURVEY PROGRAM (RGS)

RGS Archive Program

Since 1975, over 45,000 drainage sediment and water samples have been collected and analyzed by the RGS Program. Starting in 1991, the RGS Archive program has routinely upgraded the RGS database with previously unavailable analytical information. Sediment samples saved from surveys conducted from 1976 to 1985 have been re-analysed by instrumental neutron activation analysis (INAA) for gold and twenty-five other metals not included as part of the original data releases. To date, the RGS Archive Program has compiled and published this new data for over 18,735 samples covering 15-1:250 000 NTS map sheets. The most recent data release included results from 1235 sediment samples collected during a 1979 Quesnel Lake (NTS 93A) RGS Program. New analytical data plus original field and analytical results were published in June, 1999 (Jackaman, 1999). RGS archive gold data for Atlin (NTS 104N), Jennings River (NTS 104O) and McDame (NTS 104P) 1:250 000 survey areas are scheduled for release in the summer of 2000 (Jackaman, in preparation).

Drainage Sediment and Water Surveys

Four reconnaissance-scale drainage sediment and water surveys were conducted in the Central Coast and Queen Charlotte Islands during 1999 (Figure 1). Lake sediment and water samples were collected from 133 sites covering an area of over 700 square kilometres near Cape Caution (92L/14, 92M/3,4). In the Khutze River area (103H/1,2,7), sediment and water samples were collected from 111 sites covering an area of around 800 square kilometres. Moss sediment and water samples were collected from 94 sites covering an area of approximately 800 square kilometres south of Bella Coola (93D/1,2,7,8). On the Queen Charlotte Islands, moss sediment and water samples were collected from 184 sites covering an area of over 1700 square kilometres (103F/1, 103G/4, 103F/7,8,9,10).

These surveys are designed to provide baseline regional geochemical data that can be used in the evaluation of the mineral potential of the target areas. Funded under the government's Corporate Resource Inventory Initiative (CRII), these surveys are part of the Ministry of Energy and Mines' contribution to the Central Coast and Queen Charlotte Island Land Resource Planning process (Pinsent, this volume). The projects are also an extension of the RGS program, and the data would be incorporated into any future surveys conducted in these regions. Results are expected to be published early in 2000.

GEOCHEMICAL RESEARCH AND ORIENTATION STUDIES

Ancient Pacific Margin NATMAP Project

Exploration successes for volcanogenic massive sulphide (VMS) deposits in Yukon-Tanana Terrane *(e.g.* Kudz Ze Kayah, Wolverine) and Slide Mountain Terrane (*e.g.* Ice) rocks of the southern Yukon have focused attention on the possible VMS potential of correlative rocks of the Big Salmon Complex in northern British Columbia. As no detailed geochemical studies had been previously conducted in this area to characterize the element signatures and geochemical dispersal of either VMS deposits or their felsic volcanic host rocks, preliminary field studies were initiated here during the summer of 1999 as part of the Ancient Pacific Margin NATMAP Project (Cook and Pass, this volume). A series of additional papers describing results of NATMAP bedrock and surficial geology mapping programs conducted in this area are also found in this volume.

The geochemical studies project has two components: interpretation of available RGS data for the study area and for adjacent terranes, and geochemical case

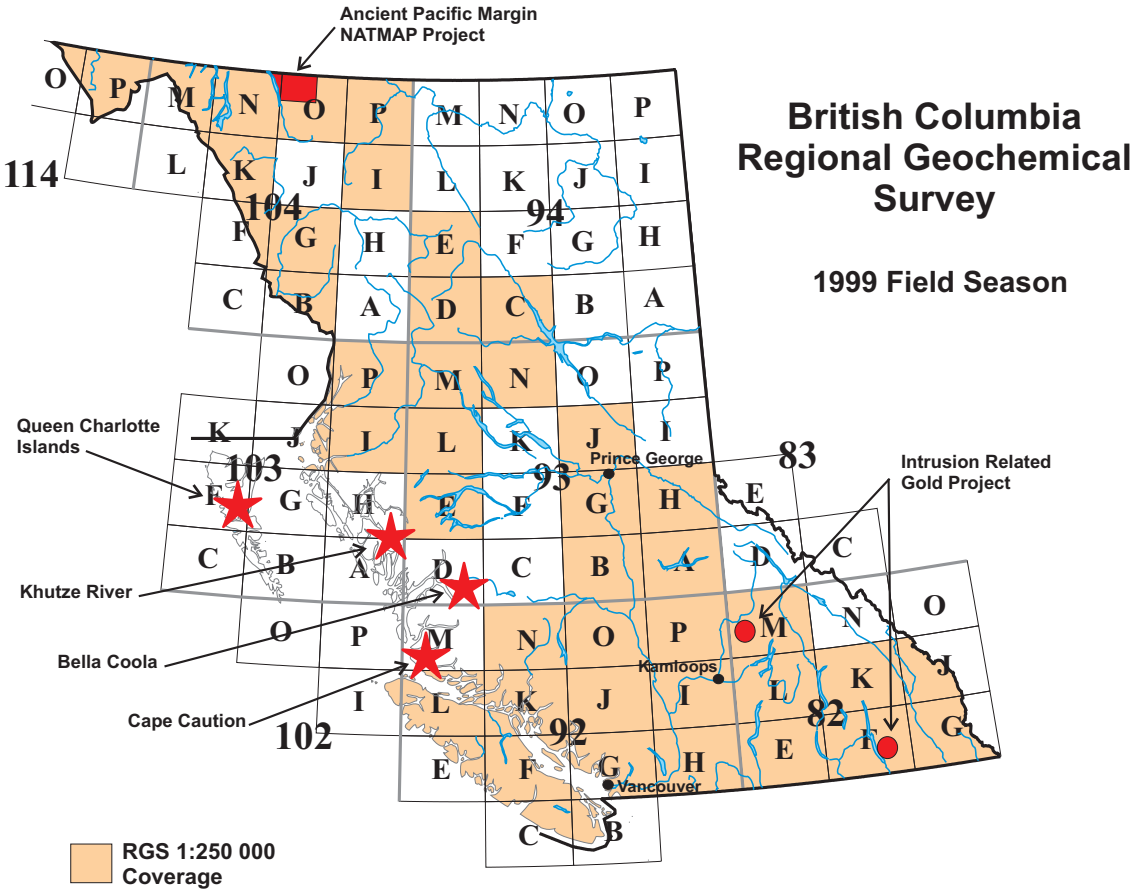

Figure 1. Location map of RGS and related projects.

studies. Both interpretive and field studies concentrate on that part of the Atlin (NTS 104N) and Jennings River (NTS 104O) map areas immediately east of Teslin Lake and just south of the Yukon border, where most of the 1999 NATMAP bedrock and surficial geology mapping programs were conducted. RGS stream sediment and lake sediment data is available for both the Atlin and Jennings River areas, and some preliminary interpretive results are shown by Cook and Pass (this volume). The objective of the case studies is to characterize the geochemical responses of known VMS showings and felsic metavolcanic packages in the area. Case studies were conducted in several areas, notably in the vicinity of meta-exhalative crinkled chert units identified by Mihalynuk *et al.* (1998), the Arsenault copper prospect (MINFILE 104O 011), and several small copper showings. A variety of surficial media were collected here, including stream sediments, moss mat sediments, stream waters, soil profiles, vegetation and rock, in an attempt to characterize the geochemical signature and dispersal of VMS-related metals at these sites. Case studies were also conducted in groups of adjoining watersheds in two parts of the Nisutlin Plateau and Cassiar Mountains which have anomalous RGS Zn-Cu-Pb-Ag-Co-Fe results. The geochemistry of stream waters and suspended stream sediments in these areas is the object of a University of Victoria B.Sc. thesis by Heidi Pass.

Cook and Pass (this volume) provide a brief outline of some preliminary geochemical results for soil profiles and rock samples. Geochemical data for other sample media are pending, and will be published as it becomes available In addition, Dixon-Warren and Hickin (this volume) provide geochemical results for a suite of till samples. The development of recommendations as to the most effective geochemical exploration methods for VMS deposits in the Big Salmon Complex area will be an important outcome of this project.

Intrusion Related Gold Project

Discovery of gold mineralized quartz veins related to Cretaceous granitic intrusions in Alaska and the Yukon has generated new exploration interest for similar deposits in British Columbia. Deposits of this type are difficult to locate using traditional stream sediment surveys because associated metals such a gold, tin, bismuth and tungsten are relatively immobile and tend to be erratically distributed in the sediment. In addition, the metal anomaly contrast may be subdued because of dilution from barren glacial material. Stream geochemical studies carried

out to better understand this type of deposit in B.C. are described by Lett and Jackaman (this volume).

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