

# GEOSCIENCE STUDIES IN THE INTERIOR PLATEAU REGION: BRITISH COLUMBIA GEOLOGICAL SURVEY 1994-95 ACTIVITIES

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(B.C. Ministry of Energy, Mines and Petroleum Resources Contribution to the Interior Plateau Program, Canada - British Columbia Mineral Development Agreement 1991 - 1995)

**KEYWORDS:** Interior Plateau, integrated project, regional geology, surficial geology, economic geology, lake sediment geochemistry, till geochemistry.

## INTRODUCTION

The Interior Plateau program is a major multi-disciplinary geoscience initiative that is funded under the guidelines of the Canada - British Columbia Mineral Development Agreement. Provincial contributions to the program are the responsibility of the Ministry of Energy, Mines and Petroleum Resources. The activities of the British Columbia Geological Survey Branch in the program are summarized here and details of studies conducted during the 1994 field season are provided in the papers that follow. Summaries of federal activities in the program are included in overview papers by Diakow and van der Heyden (1993) and Matysek and van der Heyden (1994).

Provincial activities have focused mainly on integrated bedrock and surficial geology mapping and till and lake sediment geochemical studies. A multi-disciplinary approach has been highly successful and has led to the discovery of a number of new mineral prospects including the Tommy and Malaput occurrences (Diakow and Webster, 1994, Diakow *et al.*, 1994) and several coincident till and lake sediment anomalies with elevated concentrations of gold, silver, copper, arsenic, antimony, lead and/or zinc that are similar or higher than values in the same media at advanced prospects in the area (Levson *et al.*, 1994; Cook and Jackaman, 1994a, b; Cook *et al.*, in press).

Most of the provincial studies have been conducted in the Nechako River map area (NTS 93F) for several reasons. Outdated 1:250 000 bedrock mapping in the region has made it difficult to define important lithologic and structural controls for mineralization, and hindered geological syntheses and metallogenic studies. In addition, more than half of the area is drift covered and few detailed Quaternary geology studies have been conducted. There is also a need to develop and evaluate drift exploration models and geochemical exploration techniques applicable to drift-covered plateau regions, and to determine geochemical pathfinder elements and their significant thresholds in tills and lake sediments representative of mineralization in the Interior Plateau.

In order to address some of these problems the following objectives were established:

- define time-space relationships of stratigraphic units, plutonism, deformation and mineralization by completing 1:50 000 bedrock geology mapping;
- determine the geologic framework for known mineral deposits by identifying and evaluating metallogenetic and conducting detailed mineral deposit studies;
- determine the extent, thickness and stratigraphy of Quaternary units and collect provenance and glacial paleoflow data by completing 1:50 000 surficial geology mapping;
- delineate buried bedrock units and locate regions of potential mineralization in drift-covered areas by conducting regional lake sediment and till geochemical surveys;
- define models of glacial dispersal and evaluate the effects of surficial processes on geochemical distribution patterns by conducting detailed geochemical and surficial geology studies around areas of known mineralization;
- evaluate the response of different geochemical sampling techniques and sample media (biogeochemical, lake sediment, soils and drift) to known mineralization.

## BEDROCK AND SURFICIAL MAPPING

A number of bedrock mapping surveys (Figure 1) have been conducted in the Nechako Plateau region to develop a better understanding of the stratigraphy, structure and geologic controls on mineralization. These studies have included bedrock mapping in the Natalkuz Lake area (Diakow *et al.*, 1993; Green and Diakow, 1993) and bedrock and surficial geology mapping in the Fawnie Creek (Diakow and Webster, 1994; Diakow *et al.*, 1994; Levson and Giles, 1994), Tsacha Lake (Diakow *et al.*, 1995a, b; Giles and Levson, 1995) and Chedakuz Creek (Diakow *et al.*, 1995a, c; Weary *et al.*, 1995) map areas (Giles *et al.*, 1995, this volume). Surficial geology mapping in the Anahita Lake map area (NTS 93C) has also been completed for the Chilanko Forks and Chezacut map areas (Giles and Kerr, 1993; Kerr and Giles, 1993a, b) and the Clusko River and Toil Mountain areas (Proudfoot, 1993; Proudfoot and Allison, 1993a, b).



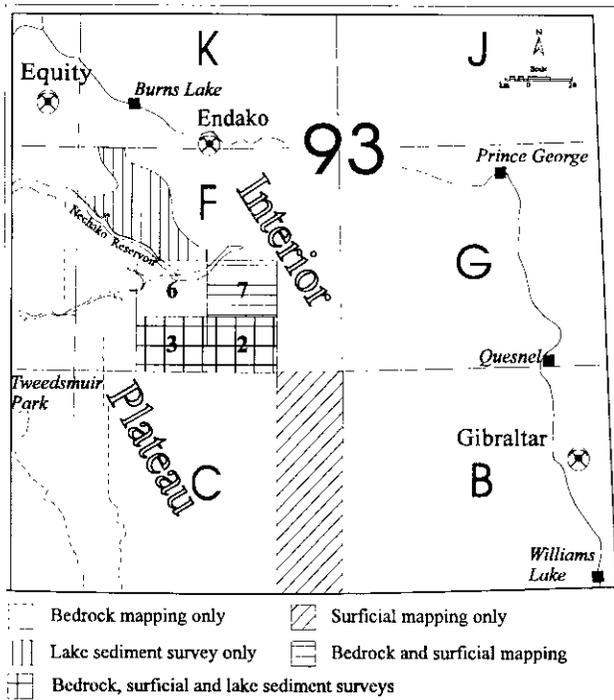


Figure 1. Location map of B.C. Geological Survey Branch studies conducted in the Nechako Plateau region as part of the Interior Plateau program.

## LAKE SEDIMENT AND TILL GEOCHEMISTRY STUDIES

Regional lake sediment geochemical surveys have been completed over approximately one quarter of the Nechako River map area (Figure 1). The results of these surveys were provided by Cook and Jackaman (1994a, b). Lakes found to have elevated concentrations of gold and other elements during the regional survey were studied in more detail by Cook and Luscombe (1995). Detailed geochemical studies of lake sediments around a number of areas of known epithermal and porphyry style mineralization have also been conducted (Cook, 1993, 1995).

Regional till geochemistry surveys (Levson *et al.*, 1994) and drift prospecting potential studies (Giles and Levson, 1994a) have been completed in the Fawnie Creek map area. The results of detailed geochemical dispersal studies around known mineral prospects in the Interior Plateau region were compiled by Levson and Giles (1995) and Kerr and Levson (1995). New studies were conducted in the Fawnie Creek area in 1993 (Giles and Levson, 1994b) and this work was continued in 1994 (O'Brien *et al.*, this volume).

## MINERAL DEPOSIT STUDIES

Mineral deposit studies in the Clisbako area in 1991 were discussed by Schroeter and Lane (1992). More

recently, several mineral deposit studies were conducted in conjunction with regional bedrock mapping in the Nechako River area (Schroeter and Lane, 1994; Lane and Schroeter, 1995). Study areas include the following prospects with MINFILE identification numbers in parentheses: Wolf (93F 045), Fawn (Gran; 93F 043), Fawn 5 (93F 053), CHU, C (CH; 93F 04), Blackwater-Davidson (PEM; 93F 037), Uduk Lake (93F 057), Tommy (Tsacha; 93F 055), Malaput (93F 056), April (93F 060), Ben (93F 059), Buck (93F 050), Paw (93F 052), Ned (93F 039), Yellow Moose (93F 058), Holy Cross (93F 029), Baez (Oboy; 93C 015) and Trout (93F 044).

## INTEGRATED GEOLOGICAL STUDIES

An important focus of the Interior Plateau program has been the integration of geological studies in a number of different disciplines. One of the first products of these multi-disciplinary studies was the production of a combined bedrock and surficial geology map of the Fawnie Creek map area (Diakow *et al.*, 1994). This was the first map of this type produced by the B.C. Geological Survey Branch in many years and, due to a positive reception given to it by mineral exploration companies working in the region, two more maps of this type were produced for the 1994 map areas (Diakow *et al.*, 1995b, c). Other integrated studies include a detailed comparison of geochemical results from till and lake sediment surveys conducted in the Fawnie Creek map area (Cook *et al.*, in press) and the identification of several new exploration targets in the same area using data from bedrock geology as well as till and lake sediment geochemical studies (Cook and Jackaman, 1994a, b; Cook *et al.*, 1994; Levson *et al.*, 1994). Further interdisciplinary work is planned for the Interior Plateau program and may lead to the identification of other areas with high mineral potential as well as the development of exploration techniques specifically suited to this part of British Columbia.

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