2005 Regional Geochemical Survey, NTS Areas 083C, 083D, 083E and 082N, Southeastern British Columbia[1]

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INTRODUCTION

Reconnaissance-scale stream sediment and water surveys have a history of success in British Columbia and are widely recognized as one of the more important exploration tools in the Cordillera. In 2005, this important geochemical data source was expanded with a new program conducted in the Valemount and Golden areas.

The stream sediment and water survey in NTS map sheets 083C (Brazeau Lake), 083D (Canoe River), 083E (Mount Robson) and 082N (Golden) will complete the coverage in the southeastern portion of the province. Funding for this program was made available by Geoscience BC.

The 2005 Regional Geochemical Survey program was carried out between August 26 and October 23, 2005 by CME Managing Consultants Inc. The survey covered a total of 21 560 km^2 (including approximately 7% glacier and icefield coverage) at an average density of approximately one sample site per 15 km^2.

Samples were collected from a total of 1409 sites. Sample sites were accessed via truck, trail bike or helicopter. Sample collection, data recording, drying, packing and shipping standards were undertaken according to standards set by the BC Geological Survey and the Geological Survey of Canada for the Regional Geochemical Survey program, which is part of the Federal National Geochemical Reconnaissance program.

REGIONAL SETTING

Location

The area surveyed covers southeastern BC from 51° to 53°N and from 116° to 120°W (Fig. 1). Sampling was not undertaken in national or provincial parks.

Physiography

From east to west, the study area consists of the Rocky Mountains, the Rocky Mountain Trench, the Columbia Mountains and the Quesnel and Shuswap highlands (Holland, 1976). The Quesnel and Shuswap highlands make up a small portion of the study area, as they occur in the southwestern corner of map sheet 83D. The Columbia Mountains, from north to south, consist of the Cariboo, Monashee, Selkirk and Purcell mountains.

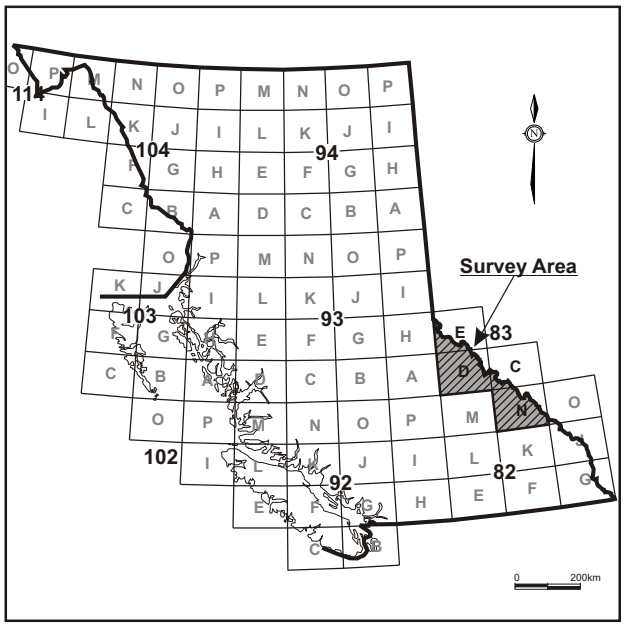

Figure 1. Location of 2005 regional geochemical survey.

Both the Rocky and Columbia mountains are glaciated and consist of extremely rugged terrain. Massive and bold sharp peaks are separated by deep and narrow valleys. The peaks and ridges are predominantly exposed bedrock and typically range between 2500 and 3000 m in elevation. The steeply sloping valley sides are covered with talus and colluvium, and the valley bottoms with alluvium and till.

Geology

The survey area includes parts of two of the five morphotectonic belts that constitute the Canadian segment of the North American Cordillera. These are the Foreland Belt to the east and the Omineca Belt to the west.

Several gneissic bodies crop out adjacent to and along the Rocky Mountain Trench. To the east of the Rocky Mountain Trench, rocks of the Main Ranges of the Rocky Mountains form an imbricate thrust package of Hadrynian to Triassic metasedimentary and sedimentary rocks of the ancestral North American craton (Mountjoy, 1992).

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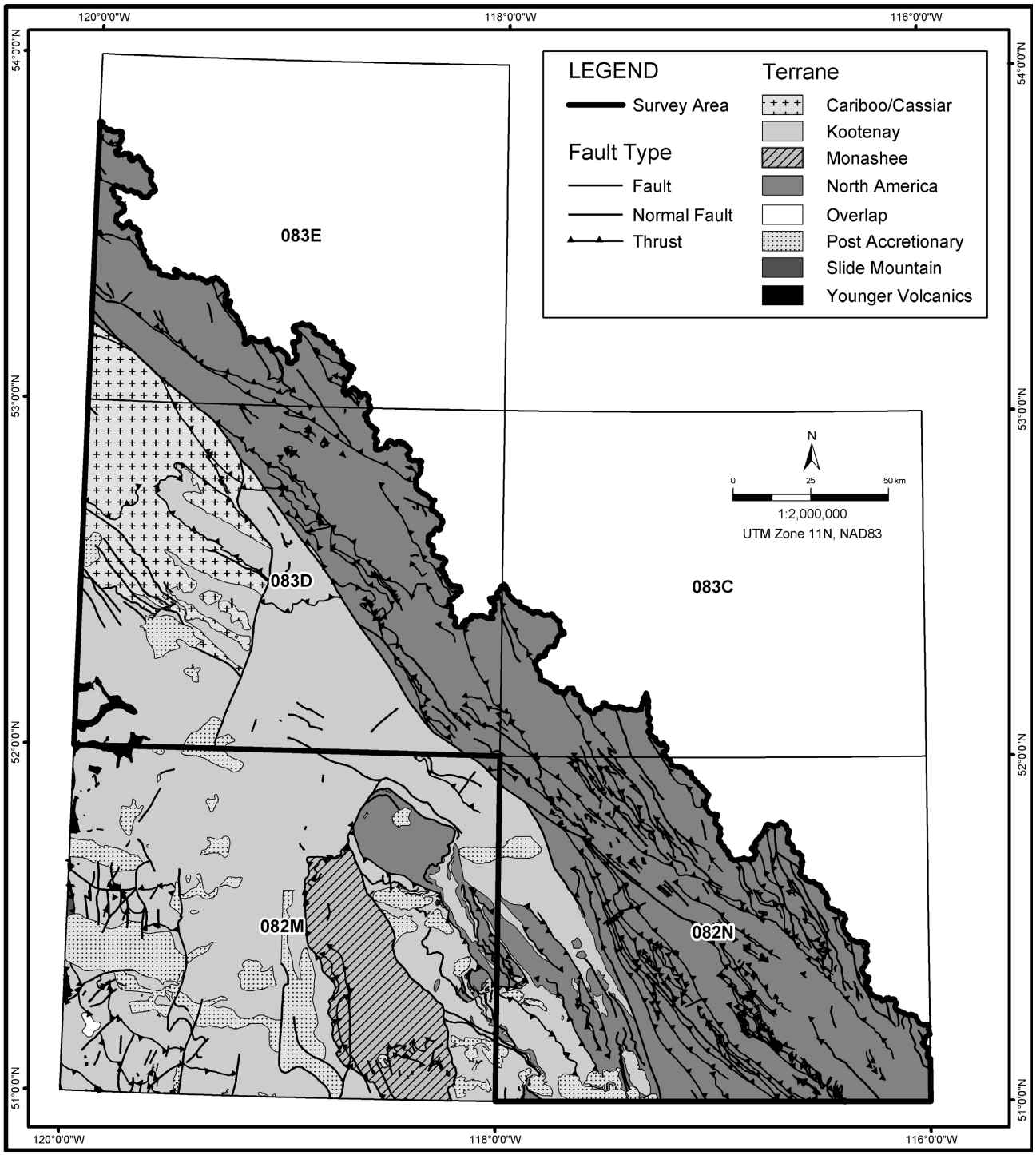

Figure 2. Terrane map, east-central British Columbia.

To the west of the Rocky Mountain Trench in the Canoe River and Mount Robson map areas are the Kootenay and Cassiar-Cariboo terranes (Fig. 2). Rocks of the Kootenay Terrane include the Hadrynian Horsethief Creek Group and the overlying Kaza and Cariboo groups (Mountjoy, 19932. The Cassiar-Cariboo Terranes include Late Proterozoic to Late Triassic passive continental margin sedimentary rocks displaced along the Rocky Mountain Trench transcurrent faults (Wheeler *et al.*, 1988). East of the Rocky Mountain Trench is the Foreland Belt, represented by the Rocky Mountains. In this area, the Foreland Belt consists primarily of a sequence of quartzite, carbonate and pelite from the Hadrynian Miette Group through the Late Cambrian Gog Group to the Middle Cambrian Chancellor Group (MINFILE 083D001; MINFILE, 2005).

Hadrynian rocks on both sides of the Rocky Mountain Trench have been intensely deformed by at least three folding events and affected by Barrovian metamorphism

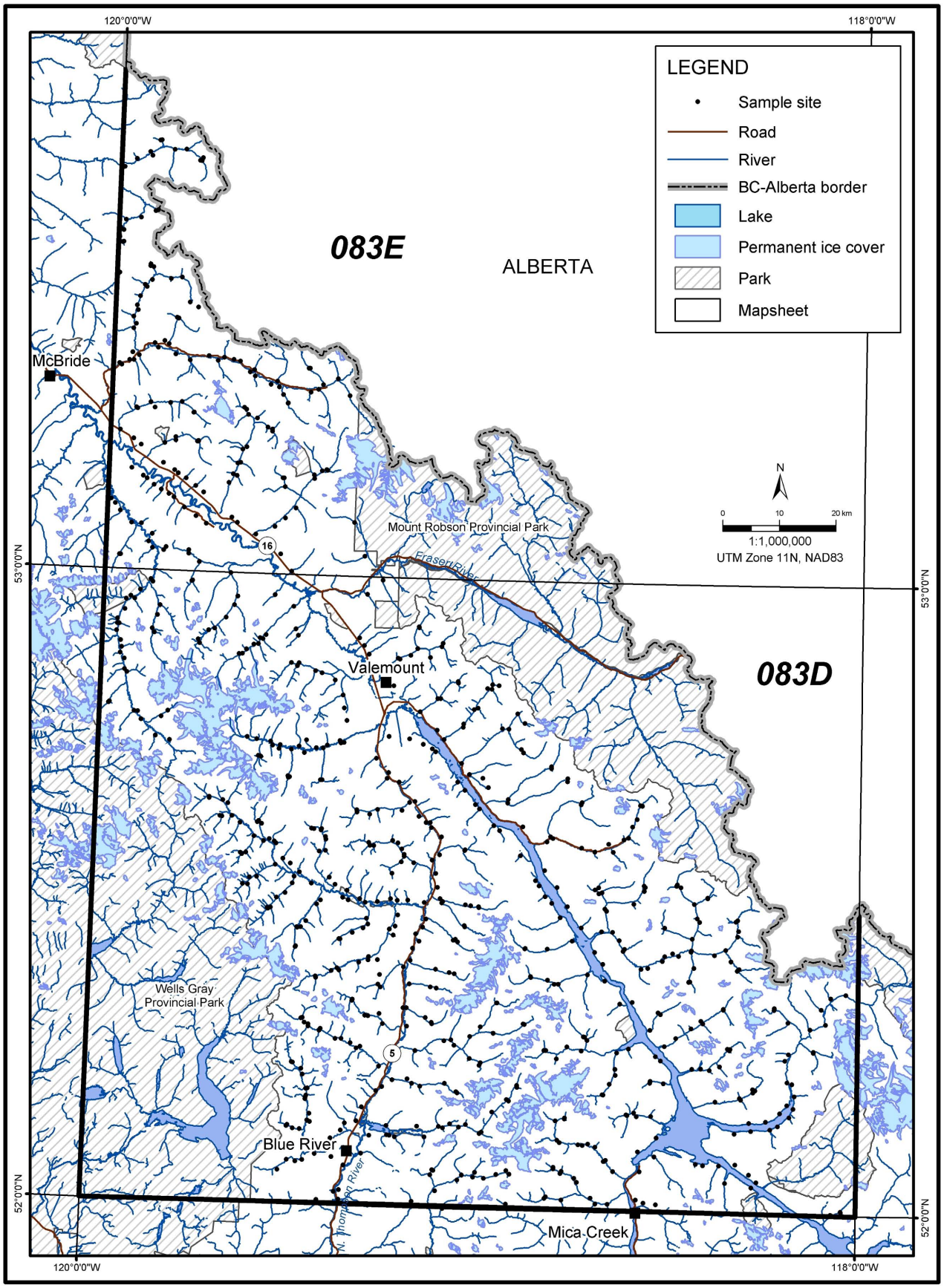

Figure 3. Sample site locations, NTS areas 083D and 083E.

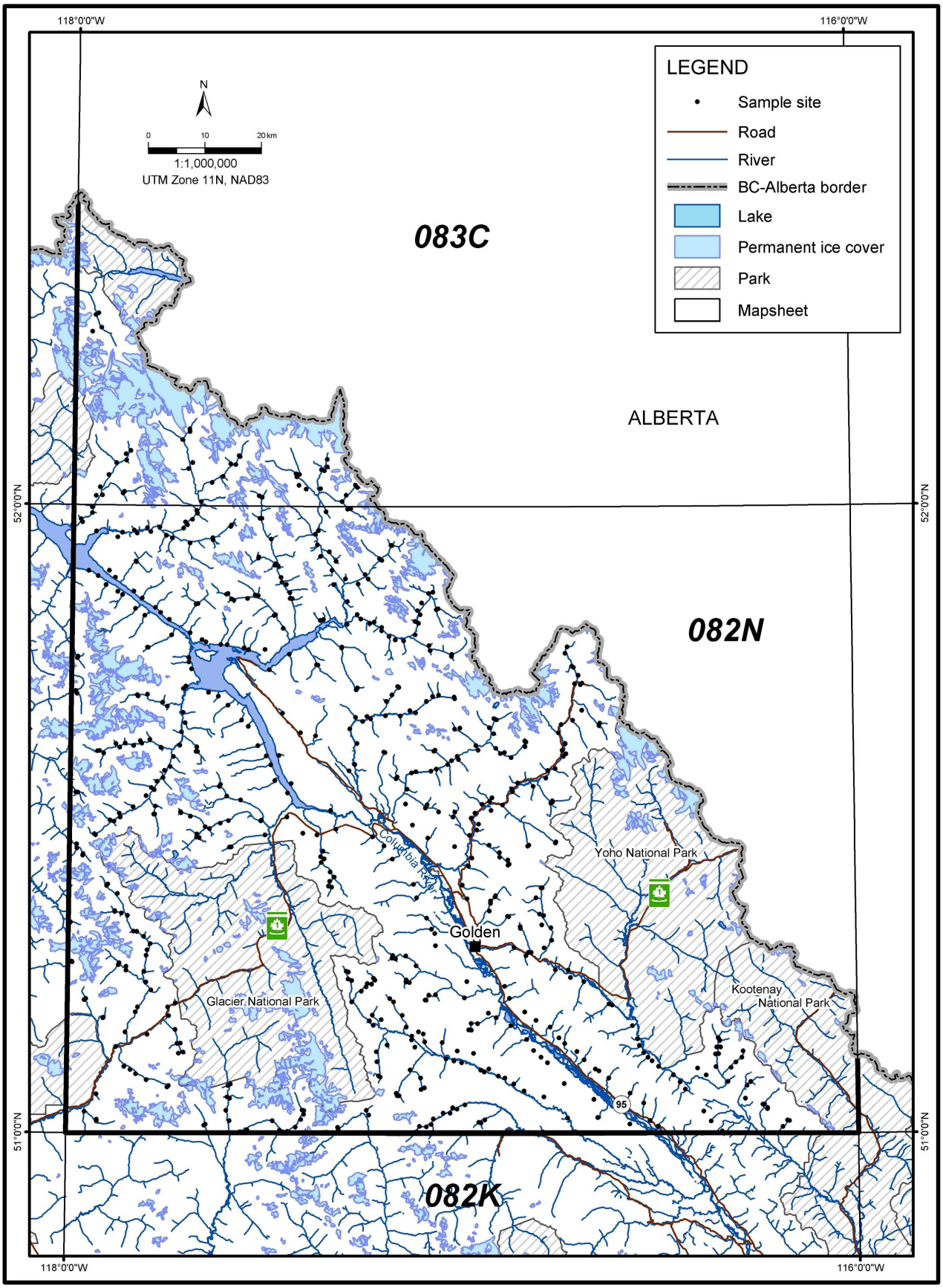

Figure 4. Sample site locations, NTS areas 082N and 083C.

Figure 5. Helicopter sampling in the Mount Robson map area.

(~160–60 Ma; Crowley *et al.*, 2000), ranging in grade from the biotite to the sillimanite zone (Mountjoy, 1992).

West of the Rocky Mountain Trench in the Golden area lies the Purcell Anticlinorium, within which a thick succession of Proterozoic (*i.e.*, Horsethief Creek and Miette groups) and Paleozoic (Hamill, Lardeau and Gog groups; Eager, Badshot, Mohican, Donald, Reno, Laib and Quartzite Range formations) miogeoclinal rocks has been deformed by imbricate thrust faults, normal faults, complex folds and widespread penetrative deformation (Owsiacki, 1993).

Mineralization

In the Canoe River and Brazeau Lake map areas, most of the known mineral occurrences are located adjacent to or west of the Rocky Mountain Trench and consist of industrial mineral as well as precious and base metal occurrences. The precious and base metal occurrences are dominated by Pb-Zn-Ag showings, with lesser numbers of Au showings. Industrial mineral occurrences of mica and kyanite, with lesser garnet and beryllium, are generally hosted in the semipelite-amphibolite unit of the Hadrynian Horsethief Creek Group (Mountjoy, 1992).

Several small alkaline ultramafic diatremes, intruding Late Cambrian carbonate strata, have been discovered and explored in the Bush River area for diamonds (Mountjoy, 1992).

A number of carbonatite and nepheline syenite layers occur within the semipelite-amphibolite unit of the Horsethief Creek Group in the Monashee Mountains. These have been examined for their vermiculite, U, Nb and Ta potential.

The documented occurrences in the Golden map area are evenly distributed on both sides of the Rocky Mountain Trench. Approximately two-thirds of the total occurrences are Pb-Ag-Zn-(Cu-Au) replacement-type mineralization hosted primarily in carbonate rocks, and Pb-Ag-Zn-(Au-Cu-W) quartz veins in metasedimentary rocks, chiefly slate, graphitic slate, schist and argillite. Industrial mineral occurrences make up the remaining third of the occurrences in the Golden map area (Owsiacki, 1993).

Figure 6. Sample collection site in the Golden map area.

REGIONAL GEOCHEMICAL SURVEY PROGRAM

CME Managing Consultants Inc. of Richmond, BC was selected by competitive bid to manage and carry out the 2005 regional geochemical survey sampling program in southeastern BC.

Sample Collection

The sample-collection team consisted of three samplers and a crew chief. The sample preparation facility was supervised by a lab manager. Field operations were conducted from several strategically located base camps. Sample collection, data recording, drying, packing and shipping were in accordance with standards set by the BC Geological Survey and required by Geoscience BC.

Stream sediment and streamwater samples were collected from 42 sites in the Brazeau Lake map area (83C), 603 sites in the Canoe River map area (83D), 152 sites in the Mount Robson map area (83E) and 612 sites in the Golden map area (82N; Fig. 3, 4).

The surveys covered approximately 21 560 km^2 at an average density of approximately one sample site per 15 km^2. Sampling was not undertaken in national or provincial parks. Approximately 7% of the area surveyed is covered by glaciers and icefields.

Access to the sample sites was gained by truck or trail bike for 36% of the sites, with the remainder being accessed by helicopter (Fig. 5).

In general, sample sites were restricted to primary and secondary drainages having catchment basins of less than 10 km^2 (Fig. 6). Contaminated or poor-quality sample sites were avoided by choosing an alternative stream or sampling a minimum of 50 m upstream from the identified problem.

Sample Preparation

Collected samples were field processed by CME at a central facility in Valemount. Sediment samples were dried and sediment material finer than 1.7 mm was recovered by sieving each sample through a –10 mesh ASTM screen.

Sediment samples were further sieved to –80 mesh ASTM to produce a minimum of 50 g of material. Blind duplicate samples and control reference materials were inserted into each analytical batch of 20 sediment samples. Control reference water standards were also inserted into each analytical batch of 20 water samples.

Analytical Procedures

The –80 mesh material and water samples were delivered to Eco Tech Laboratories of Kamloops, BC for analytical testing.

Analysis of sediments will include 37 elements by inductively couple plasma – mass spectrometry, 35 elements by neutron activation, fluorine, and loss-on-ignition. Water analysis will include pH, conductivity and fluorine.

In order to monitor the integrity of the geochemical database and to provide a measure of precision, accuracy and confidence, a quality-control program was implemented for all samples. Field site duplicates, blind analytical duplicates and control reference materials were used to ensure that analytical data satisfy the quality-control standards established by the BC Geological Survey.

The expected release date for the results is early spring 2006.

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