Spatsizi River Stream Sediment and Water Survey, Northwestern British Columbia (NTS 104H/1, 2, 3, 4, 5, 6, 7, 11, 12 & 13)

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KEYWORDS: mineral exploration, multi-element, stream sediment, stream water, National Geochemical Reconnaissance Program, Spatsizi Plateau

INTRODUCTION

During June 2004, a helicopter and truck supported drainage sediment and water survey was successfully completed in parts of the Spatsizi River map sheet (NTS 104H). The reconnaissance-scale program covered a 5000 km^2 area southwest of the Spatsizi Plateau Wilderness Provincial Park in northwestern British Columbia (Fig. 1). Funded by the BC and Yukon Chamber of Mines' Rocks to Riches program, all aspects of the sample collection, preparation and analysis activities have been conducted according to current National Geochemical Reconnaissance (NGR) program standards and specifications (Ballantyne, 1991). Survey results are expected to fit seamlessly into the existing provincial NGR and BC Regional Geochemical Survey (RGS) databases and will compliment the Bowser Lake (NTS 104A) NGR program that was also completed in 2004 (Lett *et al.*, 2005).

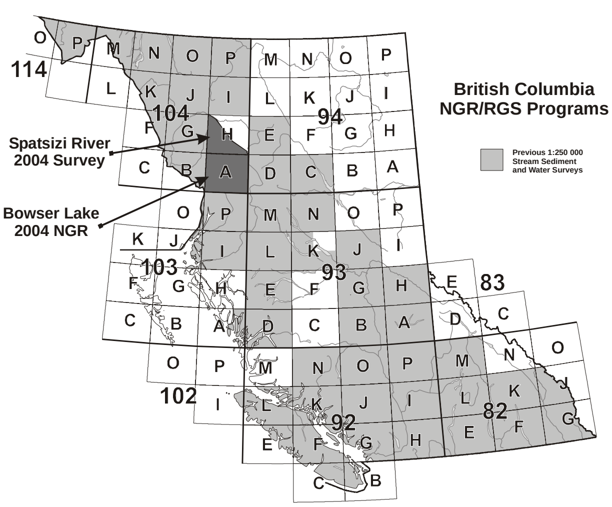

Figure 1: Location map of NGR surveys.

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REGIONAL SUMMARY

Situated approximately 300 km north of Terrace, the Spatsizi River map sheet can be accessed from Highway 37. Bordering the region to the west is the Iskut River Valley and the Klappan River Valley follows the park boundary along the northeast edge of the survey area. Helicopter support services are available at the Bob Quinn airstrip and limited road access exists at Coyote Creek and extends along an abandoned rail grade. Located within the Northern Skeena Mountain Range, the region is characterized by extreme variations in elevation, which range from high mountainous and heavily glaciated peaks (2500 to 2800 m) to low river valleys (less than 750 m).

The map sheet lies within the Stikinia Terrane of the Intermontane Belt (Fig. 2). The regional geology consists of the east-trending Stikine arch rocks along the northern portion of the map sheet and by the Bowser and Sustut basins over the remainder of the sheet. Mineralization found in the area includes vein and porphyry-style copper (gold, molybdenum) deposits, limestone bodies found along the southern flank of the Stikine arch and coal found in the Groundhog coalfield of the Bowser basin.

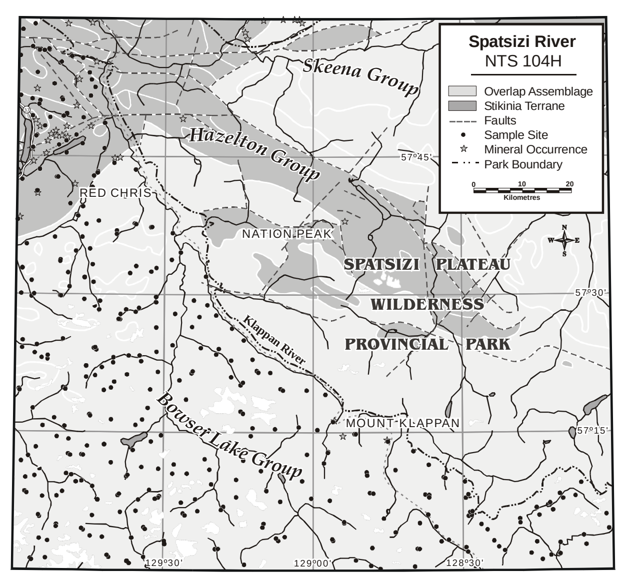

Figure 2: Generalized geology map showing sample sites and known mineral occurrences.

TABLE 1. DETECTION LIMITS: ICPMS (SEDIMENTS).

VARIABLE	D.L.	UNITS
Aluminum	0.01	%
Antimony	0.02	ppm
Arsenic	0.1	ppm
Barium	0.5	ppm
Bismuth	0.02	ppm
Cadmium	0.01	ppm
Calcium	0.01	%
Chromium	0.5	ppm
Cobalt	0.1	ppm
Copper	0.01	ppm
Gallium	0.2	ppm
Iron	0.01	%
Lanthanum	0.5	ppm
Lead	0.01	ppm
Magnesium	0.01	%
Manganese	1	ppm
Mercury	5	ppb
Molybdenum	0.01	ppm
Nickel	0.1	ppm
Phosphorus	0.001	%
Potassium	0.01	%
Scandium	0.1	ppm
Selenium	0.1	ppm
Silver	2	ppb
Sodium	0.001	%
Strontium	0.5	ppm
Sulphur	0.02	%
Tellurium	0.02	ppm
Thallium	0.02	ppm
Thorium	0.1	ppm
Titanium	0.001	%
Tungsten	0.1	ppm
Uranium	0.1	ppm
Vanadium	2	ppm
Zinc	0.1	ppm

The BC MINFILE database identifies only 37 known mineral occurrences in the map sheet including the Red Chris (104H 005) developed prospect. The porphyry-style copper-gold mineralization found at the East and Main zones of the Red Chris deposit is hosted by Tsaybahe Group volcanics, which have been intruded by hornblende-feldspar porphyry of monzonite composition. Indicated reserves of the combined zones are 39.6 million tonnes grading 0.28 g/t gold and 0.56% copper (Ash *et al.*, 1996).

SURVEY DETAILS

At an average sample site density of one site every 14 km^2, field observations, site location information and a total of 379 sediment and water samples were systematically collected from 360 sample sites (Fig. 2). In addition, 72 water samples (one in every five sites) were collected, filtered and acidified.

Aqua regia digestion-inductively coupled plasma mass spectroscopy (ICPMS) and epithermal instrumental neutron activation analysis (INAA) are the analytical methods being used to determine elements in stream sediments. Natural stream water samples were analyzed for pH and conductivity in the field and will be further analyzed for uranium. Multi-element ICP anal-

TABLE 2. DETECTION LIMITS: INAA, F AND LOI IN SEDIMENTS, AND NATURAL WATERS.

VARIABLE	D.L.	UNITS
Antimony	0.1	ppm
Arsenic	0.5	ppm
Barium	50	ppm
Bromine	0.5	ppm
Cerium	5	ppm
Cesium	0.5	ppm
Chromium	20	ppm
Cobalt	5	ppm
Europium	1	ppm
Gold	2	ppb
Hafnium	1	ppm
Iron	0.2	%
Lanthanum	2	ppm
Lutetium	0.2	ppm
Rubidium	5	ppm
Samarium	0.1	ppm
Scandium	0.2	ppm
Sodium	0.02	%
Tantalum	0.5	ppm
Terbium	0.5	ppm
Thorium	0.2	ppm
Tungsten	1	ppm
Uranium	0.2	ppm
Ytterbium	2	ppm
Fluorine	10	ppm
Loss on Ignition	0.1	%
pH		
Uranium	0.01	ppb
Conductivity	0.01	uS

TABLE 3. DETECTION LIMITS: TRACE AND MAJOR ELEMENTS IN PROCESSED WATERS.

VARIABLE	D.L.	UNITS
Aluminium	2	ppb
Antimony	0.01	ppb
Arsenic	0.1	ppb
Barium	0.2	ppb
Beryllium	0.005	ppb
Boron	0.5	ppb
Cerium	0.01	ppb
Cesium	0.01	ppb
Chromium	0.1	ppb
Cobalt	0.05	ppb
Copper	0.1	ppb
Dysprosium	0.005	ppb
Erbium	0.005	ppb
Gadolinium	0.005	ppb
Lanthanum	0.01	ppb
Lead	0.01	ppb
Lithium	0.02	ppb
Manganese	0.1	ppb
Molybdenum	0.05	ppb
Neodymium	0.005	ppb
Nickel	0.2	ppb
Praseodymium	0.005	ppb
Rubidium	0.05	ppb
Samarium	0.005	ppb
Strontium	0.5	ppb
Titanium	0.5	ppb
Uranium	0.005	ppb
Vanadium	0.1	ppb
Ytterbium	0.005	ppb
Yttrium	0.01	ppb
Zinc	0.5	ppb
Calcium	0.02	ppm
Iron	0.005	ppm
Magnesium	0.005	ppm
Potassium	0.05	ppm
Silicon	0.02	ppm
Sodium	0.05	ppm
Sulphur	0.05	ppm

ysis of trace and major element constituents will be completed on the processed water samples that were collected at every fifth sample site. A complete list of elements and stated detection limits are provided in Tables 1, 2 and 3.

Results from the Spatsizi survey will be published in the spring of 2005. The information will be released as a CD-ROM and will include complete data listings, statistical summaries, sample location map and single element plot maps for each of the geochemical variables. The data will be provided in digital and printable hardcopy formats.

ACKNOWLEDGMENTS

Individuals and companies that contributed to the successful completion of the Spatsizi field program include Peter Friske (GSC), Ray Lett (BCGS), McElhanney Consulting (Vancouver), Lakelse Air (Terrace) and Bell II Lodge.

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