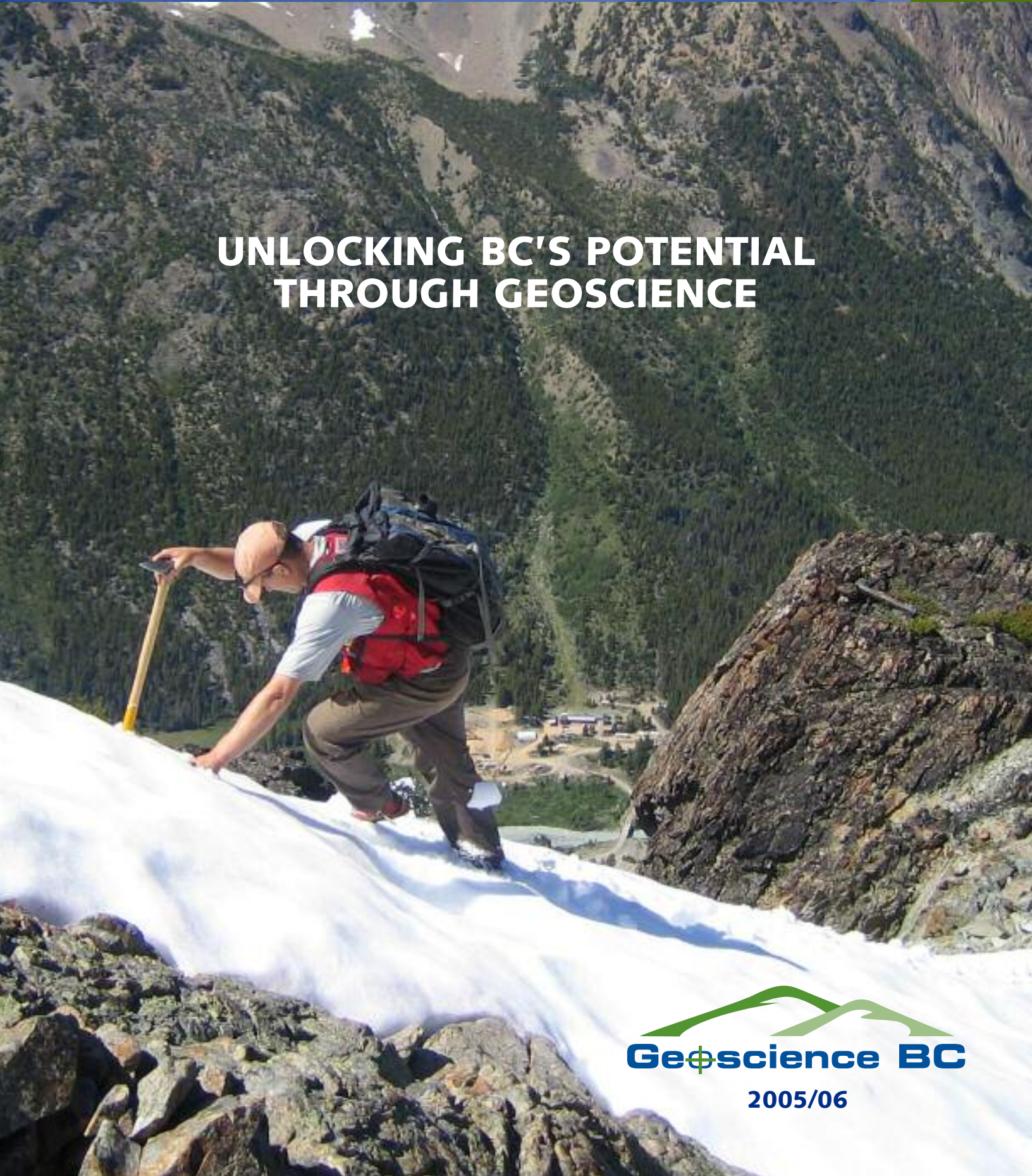




# UNLOCKING BC'S POTENTIAL THROUGH GEOSCIENCE



  
**Geoscience BC**

2005/06



Geoscience BC is an industry-led, industry-focused not for profit society that works in partnership with industry, academia, government, First Nations and communities, to attract mineral and oil and gas investment to British Columbia.

Our mandate includes the collection, interpretation, and delivery of geoscience data and expertise, to promote investment in resource exploration and development in British Columbia. We are focused on developing an organization that further strengthens BC as the leading global centre of exploration expertise.

Most of our projects are identified through a process of an open and transparent request for proposals. Proposals are reviewed by a volunteer team of experts on our Technical Advisory Committee, and approved by our Board of Directors.

We encourage involvement of First Nations and communities in generating project proposals, and we place a priority on projects that include opportunities for the education and training of students.

Front cover photo by Lucy Hollis.

*Gabe Jutras climbing up a snow patch on top of Pellaire Ridge.*



## MESSAGE FROM THE CHAIRMAN OF THE BOARD

It is my pleasure to present Geoscience BC's first Annual Report for 2005 – 2006. Geoscience BC was created with a grant from the Provincial Government of BC and has developed into an innovative geoscience agency that is industry-led and industry-focused. The overriding goal of Geoscience BC is to encourage both mineral and oil & gas investment in exploration in British Columbia through the delivery of geoscience, including: new results, repackaged and reprocessed existing data, and new ways to generate or interpret data.



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Our vision is that Geoscience BC will add to the critical mass of existing exploration geoscience expertise in the province and make British Columbia a world centre in exploration geosciences. In addition, we aim to be a key facilitator of research, professional development and advanced education of exploration geoscientists in Canada.

Our first year and a half has been very successful with a total of 32 geoscience projects supported. Eight of these projects have been completed and 24 are ongoing. You will find brief descriptions of our projects, our organization and our financial statements included in this report. We are in the process of developing a new suite of programs, including those that will focus on the mountain pine beetle infested area of BC. We continue to see the challenges of the mountain pine beetle as an opportunity for investment in geoscience and exploration that will assist in the economic diversification of the communities most affected by this unprecedented epidemic. This epidemic is likely to encompass a significant part of south-central British Columbia, much of it with recognized mineral and oil & gas potential.

In our first year and a half of operation we have established a Board with seven directors, hired our President and CEO Dr. Lyn Anglin, and committed over \$5.5 million to geoscience projects in BC. An investment has been levered with another \$5 million in funding through partnerships with industry, university, governments and communities for a total commitment of over \$10 million in new geoscience information for BC since April of 2005.

A large part of our success in our first year and a half of operation was due to the leadership of a small but dedicated Interim Board, and a tremendous contribution to the establishment of the organization on the part of our Interim Executive Director Dr. Rob Stevens. In addition to the volunteer Interim Board and our Interim executive Director, Geoscience BC has benefited substantially from the enthusiastic and dedicated support and contributions of our volunteer Technical Advisory Committee, with Dr. Rob Stevens continuing as Chair of the committee. The TAC has provided excellent technical expertise, advice and guidance to the Board and the Executive of Geoscience BC as we move forward in developing programs, reviewing requests for proposals, and preparing calls for bids on regional geochemical and geophysical surveys.

In 2007, Geoscience BC will further expand the Board of Directors to include a total of nine directors representing the diverse mineral interests of British Columbia. The Board will also include three designated representatives of industry associations to further broaden the Board and to insure that the direction of Geoscience BC represents its major stakeholders. Further development of complete terms of reference and guidelines (including conflict of interest) for both the Board and technical advisory committees will solidify governance.

On behalf of the Board of Directors, I would like to thank all of our partners and supporters, past present and future, who have helped Geoscience BC achieve such success in our first year of operation. We look forward to continuing to develop new projects and partnerships, and we encourage your comments and suggestions to help us achieve our mandate for the benefit of all British Columbians.

**Dr. John Thompson**

Vice President Technology, Teck Cominco



## REPORT OF PRESIDENT AND CEO – 2005-2006

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It has been my pleasure to take on the role of President and CEO of Geoscience BC as of January 2006. Prior to my appointment, the organization had key policies and procedures in place, an established Technical Advisory Committee (TAC), and an impressive suite of projects underway. The interim Board of Directors and Interim Executive Director, Dr. Rob Stevens, deserve much of the credit for getting Geoscience BC off to such a successful start. The Association for Mineral Exploration BC and numerous individuals from industry and government have also been a large part of the successful launch of this new organization.



Geoscience BC presents a unique opportunity for the exploration industry to have direct involvement in designing and delivering public geoscience for the benefit of all British Columbians. The creation of the organization has, in itself, sent a very positive message to the exploration community worldwide that BC is indeed 'open for business' for exploration, mining and petroleum resource development. While Geoscience BC operates as an industry-led and industry-focused organization independent of government, we ensure that our activities complement those of the provincial and federal geoscience agencies and are focused on accelerating exploration-related data collection and knowledge advancement of BC's mineral and energy resource potential.

In addition to the successful initiation of a number of geoscience projects, and significant leveraging of our project financial commitments, Geoscience BC has also staffed some key operational positions in our first year. We have filled the positions of Office Manager and of Project Manager. We have also retained a contractor to provide governance and accounting support, and two technical consultants to provide minerals and oil and gas geoscience project advice and support. And Geoscience BC attends key meetings and conferences, presenting project results and promoting BC as a prime destination for exploration investment and a key centre of innovative geoscience.

### **Geoscience BC and the Mountain Pine Beetle**

Geoscience BC was instrumental in establishing a working group of community, government and mineral industry representatives to discuss potential mineral sector activities in support of community planning and mitigation of some of the socio-economic effects of the mountain pine beetle infestation. We continue to advocate for geoscience as a key component of an economic diversification strategy for forestry-based communities in the beetle-affected area.



### **Nechako Basin Oil and Gas Potential**

Geoscience BC is establishing a technical advisory subcommittee for oil and gas, and a working group focused on advancing our understanding of the petroleum potential of the Nechako Basin in central BC. To date, we have committed almost \$1 million to new data collection and to the acquisition of the existing Canadian Hunter Exploration seismic and gravity data sets, collected in Nechako in the early 1980s. This data will be reprocessed to modern standards and marketed to interested explorations companies, and also made available to Geoscience BC's research partners.

### **Future Programs**

Geoscience BC's Board and Technical Advisory Committee have recently taken a strategic decision to focus Geoscience BC's future activities on two or three key geologic domains. In addition to maintaining our oil and gas focus on the Nechako Basin, the TAC is in the process of prioritizing key metallogenic domains of primary interest to industry to help direct planning and funding decisions.

### **Project Results to Date**

Project results have been made available to the public through Geoscience BC's and the Ministry of Energy, Mines, and Petroleum Resources's web-sites. In addition, Geoscience BC is initiating regular workshops to maximize technology and knowledge transfer from project proponents to interested clients and stakeholders.

I invite you to review the project descriptions provided in this Annual Report and see the broad range of activities supported and significant investments made by Geoscience BC. We look forward to any comments or suggestions that you may have on this report or any of Geoscience BC's programs or activities.

**C.D. ('Lyn) Anglin**  
President and CEO



## BOARD MEMBERS

### **Lyn Anglin**

President & CEO  
Geoscience BC

### **James Gray**

Partner  
DeVisser Gray Chartered Accountants

### **David James**

Manager of Geology (Petroleum)  
Ind. Consultant

### **Michael McPhie**

President & CEO  
Mining Association of British Columbia

### **Harlan Meade**

President & CEO  
Yukon Zinc

### **David Strong**

Founder & President  
University Canada West

### **John Thompson, Chairman of the Board**

VP Technology  
Teck Cominco Ltd

## GEOSCIENCE BC STAFF

### **Lyn Anglin**

President & CEO

### **Lauren Elliott**

Office Manager & Executive Assistant

### **Marlene Mathison**

Project Manager

### **Rhonda Schultz**

Accountant & Corporate Secretary

## Technical Consultants

### **Andy Calvert**

Professor, Simon Fraser University

### **Rob Stevens**

Program Head, Mining, British Columbia  
Institute of Technology

## Legal Counsel

## Auditors

Beauchamp & Company  
Chartered Accountants



## TECHNICAL ADVISORY COMMITTEE

### Henry Awmack

Equity Engineering Ltd.

### Lindsay Bottomer

Entrée Gold Inc.

### Peter Bradshaw

First Point Minerals Corp.

### Derek Brown

BC Ministry of Energy, Mines, and Petroleum Resources  
Oil & Gas Division

### Rob Brown

Barrick Gold Corp.

### Rob Cameron

Phelps Dodge Canada

### Bob Cathro

Retired

### Stephen Cook

Teck Cominco Ltd.

### Andrew Davies

Teck Cominco Ltd.

### Carl Edmonds

Northgate Minerals Corp.  
Teck Cominco Ltd.

### Steve Gordey

Natural Resources Canada

### Brian Grant

BC Geological Survey

### Brad Hayes

Petrel Robertson Consulting

### Jacques Houle

Consultant

### Ward Kilby

Cal Data Ltd.

### Bob Lane

BC Ministry of Energy, Mines, and Petroleum Resources  
Minerals Division

### Carmel Lowe

Natural Resources Canada

### Ian Paterson

Retired

### Rob Pease

Teranne Metals Corp.

### Wayne Roberts

Badger and Co.

### Steve Robertson

Imperial Metals Corp.

### Hans Smit

Grayd Resource Corp.

### Rob Stevens, CHAIR

British Columbia Institute of Technology

### Dick Todsal

UBC – Mineral Deposit Research Unit



## SUMMARY OF THE TECHNICAL ADVISORY COMMITTEE

The Technical Advisory Committee (TAC) is an independent group of technical personnel from industry, academia and government that provide technical advice and recommendations to the Board of Directors of Geoscience BC. The TAC has two primary functions: to review and recommend proposals for funding that are received by Geoscience BC; and to provide advice and guidance on geoscience priorities, needs and directions across BC.



The strength of the TAC is in its industry focus, the diversity of its membership and the dedication of its members to encourage exploration for minerals or oil and gas in BC. The industry focus ensures Geoscience BC's projects generate the data needed by industry to select and advance exploration projects. The diversity of its membership means that expertise in all aspects of geoscience and on the geology and resource potential of BC are well represented on the committee. The commitment of its membership ensures that the advice and recommendations provided to the Board are based on a thorough review and consideration of the proposals received or topics under consideration.

It has been a great pleasure to serve as the Chair of the TAC and to work with its dedicated members in supporting the success of Geoscience BC. I would like to thank all members for volunteering their time and expertise and look forward to future discussions and deliberations in 2007.

**Robert Stevens, Ph.D., P.Geo.**

Chair, Technical Advisory Committee, Geoscience BC  
Mining Technology Program Head, BCIT



## PROJECT LIST

### British Columbia

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Aeromagnetic Survey Over the Jennings River Map Area .....	page 12
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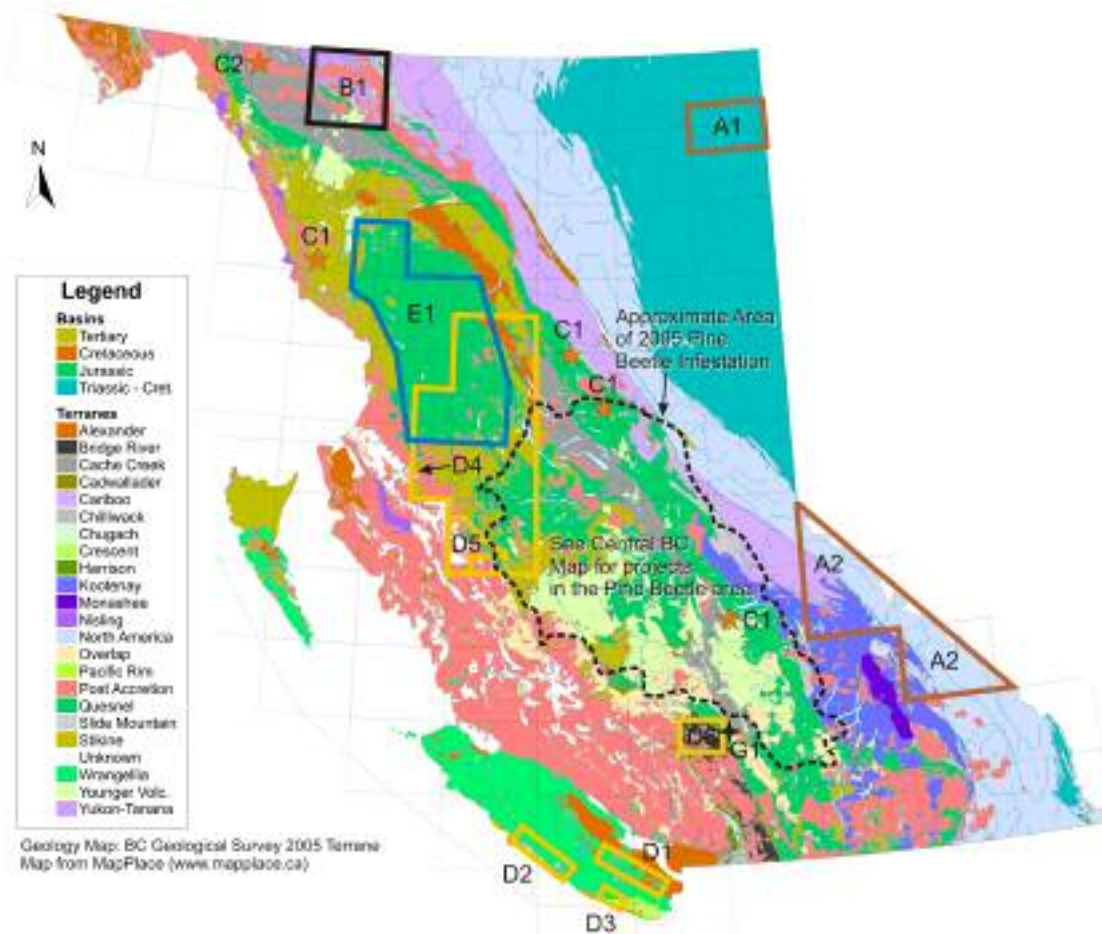
### Central British Columbia

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## BRITISH COLUMBIA (AS OF JULY 1, 2006)

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Geology Map: BC Geological Survey 2005 Terrane Map from MapPlace ([www.mapplace.ca](http://www.mapplace.ca))

### — Geochemistry (A)

- A1 - RGS and Kimberlite Indicator Surveys - Plouffe et al., GSC
- A2 - Southeast Rockies RGS Project - CME Managing Consultants

### — Geophysics (Mineral and Oil & Gas) (B)

- B1 - Regional Airborne Magnetics - Jennings River

### ★ Mineral Deposit Studies (C)

- C1 - Alkalic Porphyry & Epithermal Deposits - Tosdal, MDRU & CODES
- C2 - Porphyry Molybdenum Deposits - Aehart, U. Nevada

### — Mapping & Mineral Potential (D)

- D1 - Sicker Group Study - Mortensen, UBC
- D2 - West Coast Crystalline Complex, Marshall - SFU
- D3 - Ultramafic Rocks SW Vancouver Island, Canil - Uvic.
- D4 - Skeena Arch Compilation - MacIntyre, Consultant
- D5 - Whitesail Lake Map Area - Mahoney et al., U. Wisconsin
- D6 - Bralorne-Bridge River Metallogeny - Hart, U. West Australia

### — Oil & Gas; Hydrocarbon Potential (E)

- E1 - Bowser & Sustut Basin Energy Potential - Evenchick et al., GSC

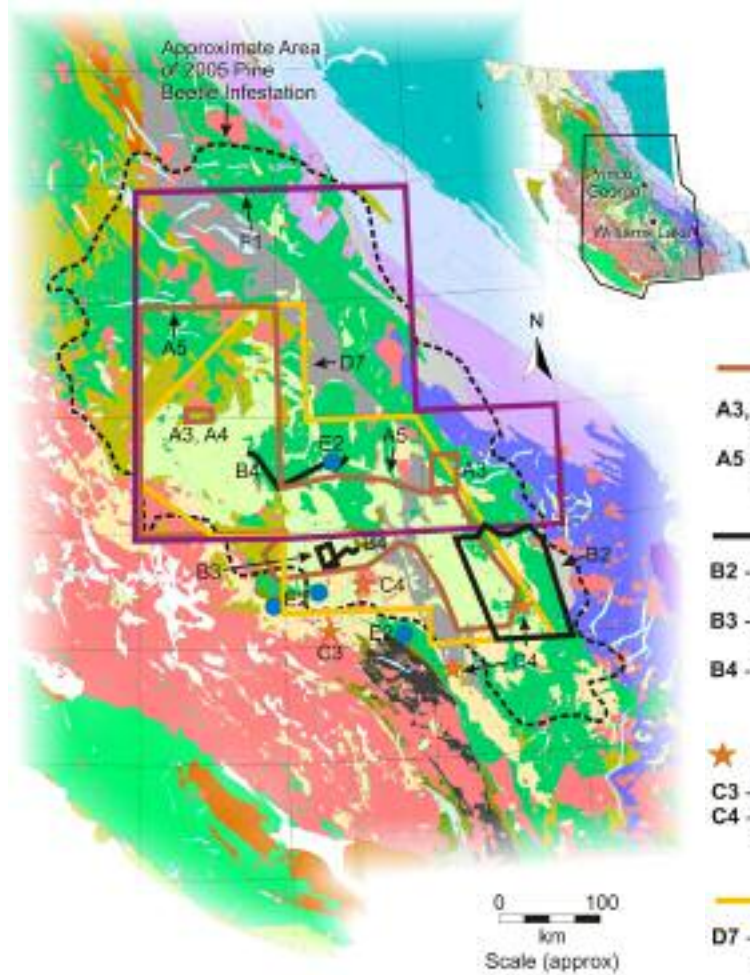
### Other Projects (G)

- G1 - Lillooet Area Geoscience Needs - Community and Industry Consultation
- G2 - ASTER Multispectral Imagery Project - Phase I & II - Kilby, Consultant (not on the map)



## CENTRAL BRITISH COLUMBIA (AS OF JULY 1, 2006)

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### — Geochemistry (A)

- A3, A4** - Geochemical Methods for Detecting Buried Mineral Deposits in Central BC - Dunn et al., (A3), Cook and Dunn (A4), Consultants
- A5** - RGS Projects - Anahim Lake, Nechako Lake, southern Nechako Basin and Cariboo Basin - Jackaman, Consultant

### — Geophysics (Mineral and Oil & Gas) (B)

- B2** - Airborne Magnetic/Radiometric Survey - Bonaparte Lake - collaboration with the GSC's TGI-3
- B3** - Passive Seismic Transmission Tomography - Pilot Study - Microseismic Inc. and Bemex Consulting
- B4** - Magnetotelluric Profiles of the Nechako Basin - Pilot Study - Craven, GSC

### ★ Mineral Deposit Studies (C)

- C3** - Porphyry & Epithermal Mineralization, Taseko Lakes - Kennedy, UBC
- C4** - Geochemical Characterization of Mesozoic Igneous Intrusions in Southern BC's Cu-Mo-Au Porphyry Belt - Breitsprecher, UBC

### — Mapping & Mineral Potential (D)

- D7** - Lithofacies Mapping and 3D GIS Visualization of the Chilcotin Flood Basalts - Russell, UBC

### ● Oil & Gas; Hydrocarbon Potential (E)

- E2** - Stratigraphic Analysis of Cretaceous Strata of the Southern Nechako Basin and their Petroleum Potential - Mustard, SFU

### — Data Archives and Database Compilations (F)

- F1** - Placer Dome Data Archives Pilot Project - Placer Dome Exploration
- F2** - Pine Beetle Area Geochemical Database - Jackaman, Consultant (Not on map)
- F3** - Rock Property Relational Database for BC - Lans, CAMIRO (not on map)



## Surficial Geochemistry and Mineralogy of Selected Areas in Northeast BC

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PROJECT FUNDING: GBC \$251,400  
Government \$366,950

**PROJECT PROPONENT:** Alain Plouffe, Natural Resources Canada  
**PROJECT AUTHORS:** M.W. McCurdy, I.R. Smith, A. Plouffe, J. Bednarski, S.J.A. Day, P.W.B. Friske, R.J. McNeil, T. Ferbey, V.M. Levson, A.S. Hickin, M. Trommelen, and T.E. Demchuk  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 2 years  
**PROJECT START:** 2005

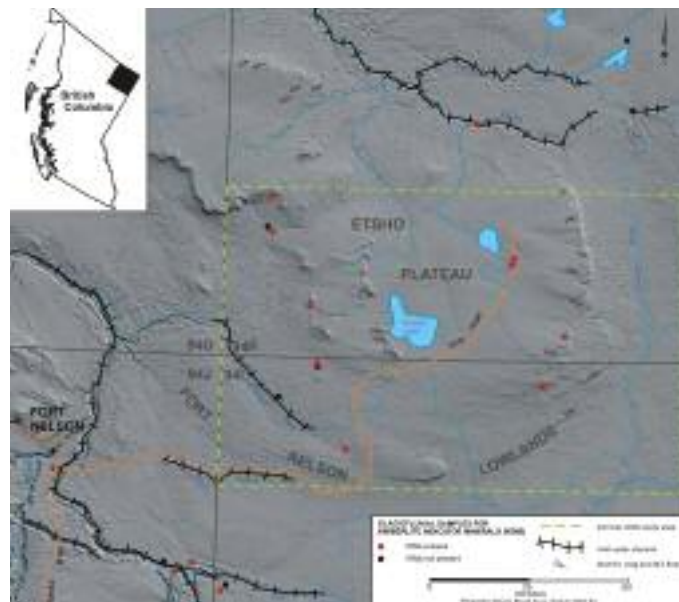
As part of a collaborative project between the British Columbia Ministry of Energy, Mines and Petroleum Resources (BCMEMPR) and the Geological Survey of Canada (GSC), kimberlite indicator minerals (KIM) were identified in glaciofluvial sediments from the Etsho Plateau region of northeast British Columbia (Simandl et al., 2005). Localized staking occurred immediately after this data was released at the Cordilleran Roundup in January 2005.

This project consists of a multidisciplinary effort to further investigate the resource potential for kimberlites, diamonds, gold, base metal and other economic commodities in the Etsho Plateau region of Northeastern B.C. (see map). A stream sediment, water, and heavy mineral concentrate survey, conducted over two years (2005 and 2006), and a glacial sediment survey conducted in 2005 are the two principal research foci of the project.

The stream sediment, water, and heavy mineral survey consists of two components: the collection of stream sediment and water at every site, and the additional collection of a bulk sediment sample for heavy mineral determination (10-15 kg wet-screened through a #12-mesh sieve (1.68 mm) from every second site (on average). Sampling procedures will follow established National Geochemical Reconnaissance guidelines.

The glacial sediment survey will follow methodologies which have proven efficient at identifying the presence of kimberlite bedrock elsewhere in Canada by analyzing bulk glacial sediment samples for their KIM content. Bulk glacial sediment samples will be collected in the field from in borrow and sump pits, river bluffs and in hand dug pits.

Stream and glacial sediment samples will be shipped to a commercial laboratory which will conduct the heavy mineral separation using a combination of shaker tables and heavy liquids. Geochemical analyzes (including INAA and ICP-MS) will be conducted in commercial laboratories. Spiked, duplicate and analytical standard samples will be included to ensure data quality and control.





## Regional Stream Sediment and Water Geochemical Data Golden, Brazeau Lake, Canoe River and Mount Robson, Southeast BC (NTS 82N, 83C, 83D and 83E)

PROJECT FUNDING: GBC \$558,678

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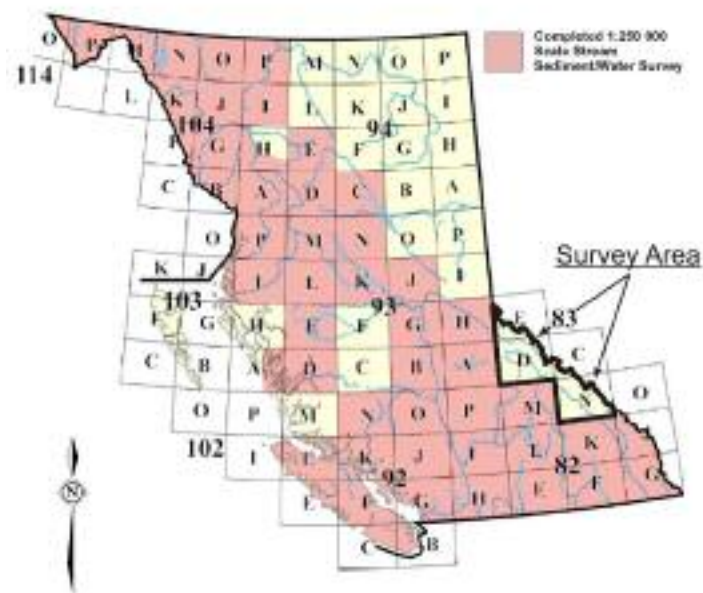
PROJECT PROPONENT: CME Managing Consultants Inc.  
PROJECT STATUS: Complete  
PROJECT DURATION: 1 year  
PROJECT START: 2005

A stream sediment and water survey within map sheets 82N, 83C, 83D and 83E completes the coverage within the southeastern portion of the province. The program will report analytical data for an estimated 1,353 sites from approximately 19,600 square kilometers. Sample coverage does not include areas that lie within a local, regional, provincial or federal park.

Survey analysis on sediments include 37 elements by ICP-MS, 35 elements by Neutron Activation, Fluorine and LOI. Water analysis includes pH, conductivity and Fluorine. Field observations regarding sample media, sample site and local terrain were recorded during the collection process.

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.

For a comprehensive look at the project findings please refer to the final report located on the web at:  
[http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat\\_gbc.htm](http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat_gbc.htm)





## Aeromagnetic Survey Over the Jennings River Map Area (NTS 104 O), Northern BC

PROJECT FUNDING: GBC \$605,485  
Industry \$125,000  
Government \$125,000

PROJECT PROPONENT: Warner Miles, Natural Resources Canada  
PROJECT AUTHORS: W. F. Miles, R. Dumont, C. Lowe  
PROJECT STATUS: Active  
PROJECT DURATION: 1 year  
PROJECT START: 2006

A high-resolution aeromagnetic survey was flown over the Jennings River map area (NTS 104 O), northern British Columbia. The survey was flown under contract by Goldak Airborne Surveys, Saskatoon. The survey provides public, 1:250,000 scale aeromagnetic coverage where none previously existed. This type of survey often sparks new private sector investment in resource exploration, consistent with the mandate of Geoscience BC, as well as Natural Resources Canada's Earth Science Sector's Northern Resource Development Program.

The Jennings River map area in northern BC is considered prospective for a number of mineral deposit types including carbonate hosted Ag-Pb-Zn deposits, porphyries (Mo and W), and skarns (Cu and Mo). In addition, the possibility of volcanogenic massive sulphide occurrences is indicated by belts containing felsic rock contemporaneous with such deposits in neighbouring Yukon. Despite these positive factors exploration in the region has been limited. In part this can be attributed to the extensive Quaternary cover, the lack of public-domain geophysical data, and the status of geological mapping. Although regional bedrock maps were produced for the northern half of the map area in the past decade or so (Mihalynuk et al., 2000, 2001; Nelson and Bradford 1993; Nelson et al., 2000, 2001), mapping in the southern half of the map area dates from the 1960's and is reconnaissance in scale (Gabrielse, 1969).

Aeromagnetic surveys provide a rapid, cost-effective means of preliminary geological evaluation of large tracts of bedrock and are an integral component of basic resource exploration infrastructure. The data acquired by these surveys provide information on lithology and the extent of regional rock units, help delineate fault and dyking patterns, and allow for the estimation of source depths. In regions of poor exposure, aeromagnetic data would be valuable for extrapolating mapped geology beneath areas of cover. Therefore, it is expected that the new data acquired in Jennings River will significantly advance understanding of the geologic and mineral resource potential of the area.





## Shallow and Deep-Level Alkalic Porphyry Deposits

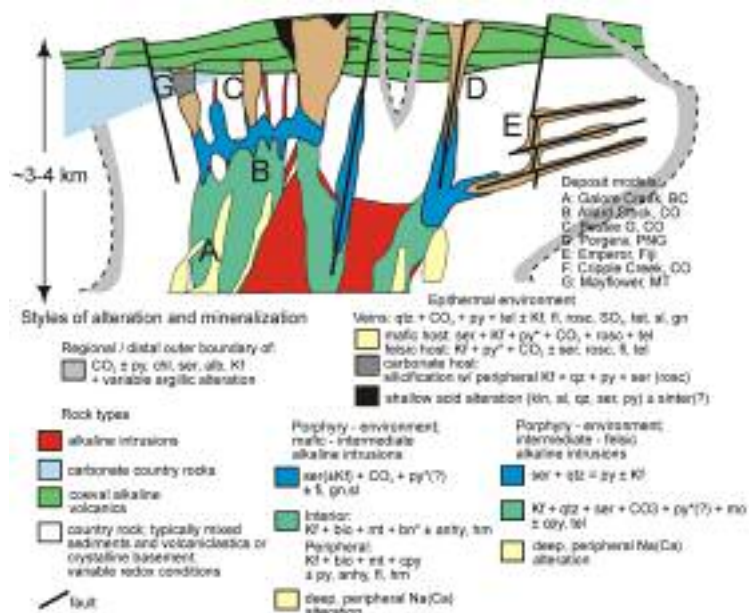
PROJECT FUNDING: GBC \$270,000  
Industry \$470,000  
Academia \$720,000

13

**PROJECT PROPONENT:** Dick Tosdal, Mineral Deposits Research Unit  
**PROJECT AUTHORS:** D.R. Cooke, C.M. Chamberlain, M. Jackson, C.P. Jago, H.E. Pass, K.A. Simpson, R.M. Tosdal  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 3 years  
**PROJECT START:** 2005

Alkalic gold-(copper) deposits are of increasing economic significance and can be an attractive exploration target. They include some of the world's highest grade and largest porphyry-related gold resources (e.g., Ridgeway: 77 Mt @ 1.87 g/t Au, 0.63 % Cu – 5.09 Moz Au; Galore Creek resource of 13.75 Moz Au, 156.4 Moz Ag, and 12.0 billion pounds Cu), as well as some of the largest gold accumulations in epithermal settings (Ladolam, ~48.6 Moz Au; Porg-era, ~19.6 Moz; Cripple Creek, ~26.7 Moz; and Emperor ~9.5 Moz) (<http://geopubs.wr.usgs.gov/open-file/of99-556/>). Furthermore, alkalic porphyry Cu deposits contribute to the economy of British Columbia, and are driving significant new exploration in the province. The economic importance of the alkalic class of porphyry deposits to British Columbia is thus well established. However, exploration for them is difficult because of their small footprint and alteration assemblages that are different in significant details from those characteristic of porphyry Cu deposits associated with subalkalic igneous complexes. Hence, there is a need to better define the characteristics of the somewhat anomalous but potentially very metal-rich alkalic porphyry systems from the academic perspective of building a holistic model but also from a practical perspective of providing simple tools for exploration in British Columbia.

This multi-disciplinary research project will advance the understanding of the characteristics of individual alkalic porphyry systems and integrate that information into a holistic model for the deposit class. The project will address fundamental questions regarding deposit genesis that will provide practical criteria useful for exploration. The proposed project is part of a larger project investigating epithermal and porphyry environments associated with alkalic rocks.





## New Models for Mineral Exploration in BC: Is there a Continuum Between Porphyry Molybdenum Deposits and Intrusion-hosted Gold Deposits?

14

PROJECT FUNDING: GBC \$42,089

Industry \$42,089

Academia \$60,000

PROJECT PROPONENT: Greg Arehart, University Nevada Reno  
PROJECT AUTHORS: G. B. Arehart, J. L. Smith, and R. Pinsent  
PROJECT STATUS: Active  
PROJECT DURATION: 2 years  
PROJECT START: 2006

This project comprises research on porphyry molybdenum systems that will lead to new exploration models at scales from the deposit to regional. The first stage of the research focuses on developing a mineralogical, trace element, and alteration zoning pattern for the Adanac molybdenum deposit. This will allow us to better understand how these patterns can be utilized in exploration both within the Adanac area and for other similar deposits, as well as provide important constraints on fluid flow within and peripheral to the deposit.

Second-stage research will focus on examining the origin of the plutonic suite responsible for mineralization (Surprise Lake Batholith, which is a large, composite, highly-evolved granitic pluton surrounded by polymetallic mineralization) and comparison of that suite to other Mo ± Sn ± W ± Au ± Cu deposits. Of particular interest is the potential linkage between porphyry Mo and intrusion hosted Au deposits. This linkage will be tested by examining the isotopic signature (Re-Os) of the molybdenum deposit and comparison to the isotopic signature of nearby placer Au deposits which may have originated geologically above the molybdenum mineralization. Obtaining evidence for or against this geochemical link will be extremely important in helping to focus exploration for both types of deposit at several scales. Finally, these comparisons will add considerably to our understanding of tectonics and metallogeny of western Canada.





## Mineralization, Alteration and Structure of the Taseko Lakes Region, Southwestern BC: Preliminary Analysis

PROJECT FUNDING: GBC \$61,400

Industry \$100,000

Academia \$60,000

15

PROJECT PROPONENT: Lori Kennedy, University of British Columbia

PROJECT AUTHORS: L. Hollis, S.K. Blevings, C.M. Chamberlain, K. A. Hickey and L. A. Kennedy

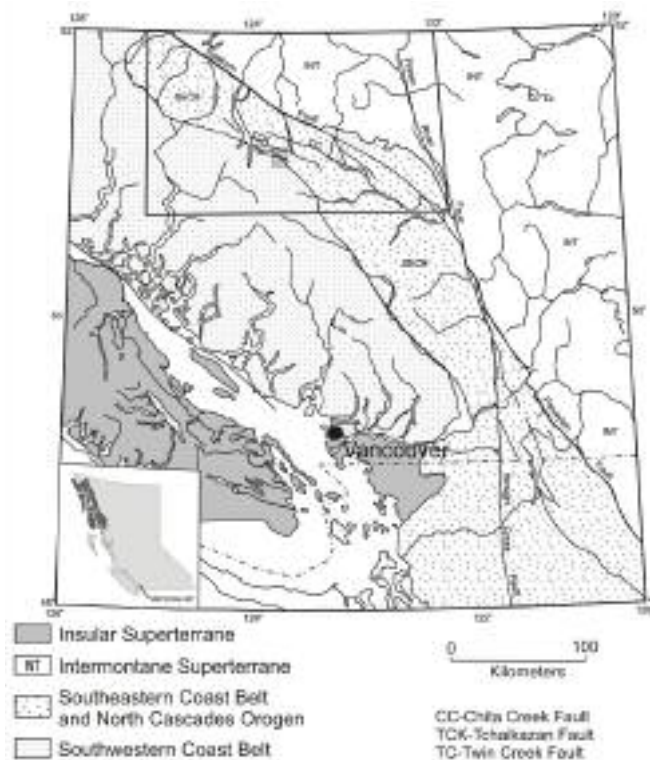
PROJECT STATUS: Active

PROJECT DURATION: 2 year

PROJECT START: 2006

This two-year research project will investigate the characteristics of volcano-plutonic architecture and associated porphyry-epithermal mineralization in the Taseko Lakes region, located in southwestern British Columbia. We will integrate detailed geological, structural and alteration mapping, petrology, isotope geochemistry and geochronological analyses with the aim of developing a conceptual geological model for the structural and economic evolution of the area for the purpose and application of predictive exploration.

The project area is located within the Coast Belt, along the boundary between the Southeast Coast Belt and Southwest Coast Belt (Monger and Journeay, 1994). This area is located at the eastern limit of the Coast Plutonic Complex, and it is along this boundary that many Cu-Mo-Au showings are located in the southern Coast Belt (McLaren, 1990). This highly tectonized belt includes Paleozoic to mid-Mesozoic oceanic and volcanic arc rocks assigned to several different terranes, together with Late Middle Jurassic through mid-Cretaceous sedimentary rocks of the Tyaughton-Methow basin, Upper Cretaceous continental arc volcanic rocks of the Powell Creek formation and mid-Cretaceous to Tertiary intrusive rocks of the Coast Plutonic Complex (Schiarizza et. al., 1997).





## Mineral Potential of the Westcoast Crystalline Complex, Western Vancouver Island

16

PROJECT FUNDING: GBC \$95,920

Industry \$20,000

Academia \$127,500

PROJECT PROPONENT: Dan Marshall, Simon Fraser University

PROJECT AUTHORS: D.Marshall, E. Street, T. Ullrich, G. Xue, S. Close, K. Fecova

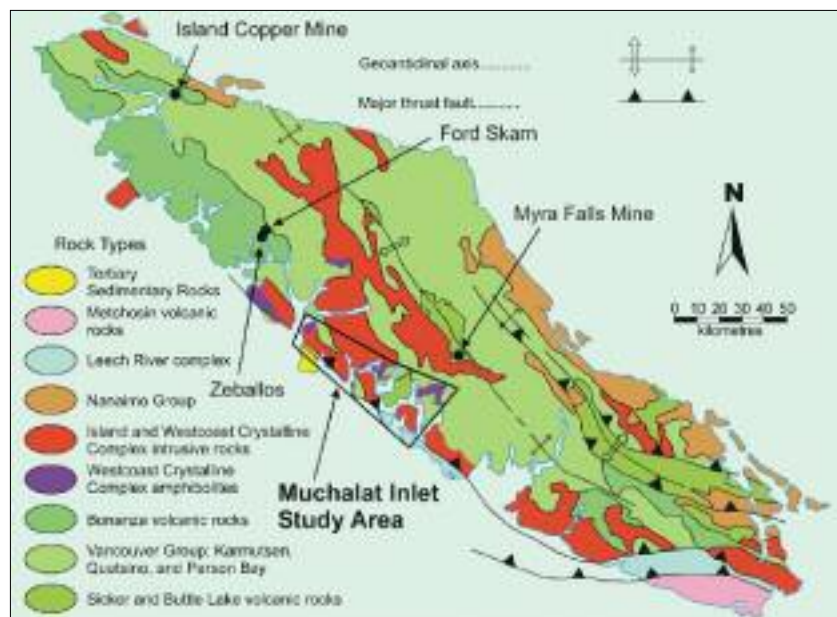
PROJECT STATUS: Active

PROJECT DURATION: 2 years

PROJECT START: 2005

The goal of this study is to determine the lithological, geochemical and structural controls for potential mineralization in the northern parts of the Westcoast Crystalline Complex, focusing primarily on the area to the southwest of Muchalat Inlet. This area may be significantly under-explored due to its poor access, and the relative lack of modern geological research in the area. The study will use an array of techniques including mapping, radiogenic isotope studies, petrographic analyses, thermobarometry, fluid inclusion and stable isotope studies. These techniques will be integrated into a geological framework of tectonics and mineralization, with the major points addressed in this study being:

1. Characterization of the potential and prospectivity of different styles of mineralization in the Westcoast Crystalline Complex.
2. Additional geochemical data to be added to the publicly available compilation.
3. Geological and tectonic setting of mineralization, relating specific mineralization styles to rock type, proximity to intrusions and crustal breaks.





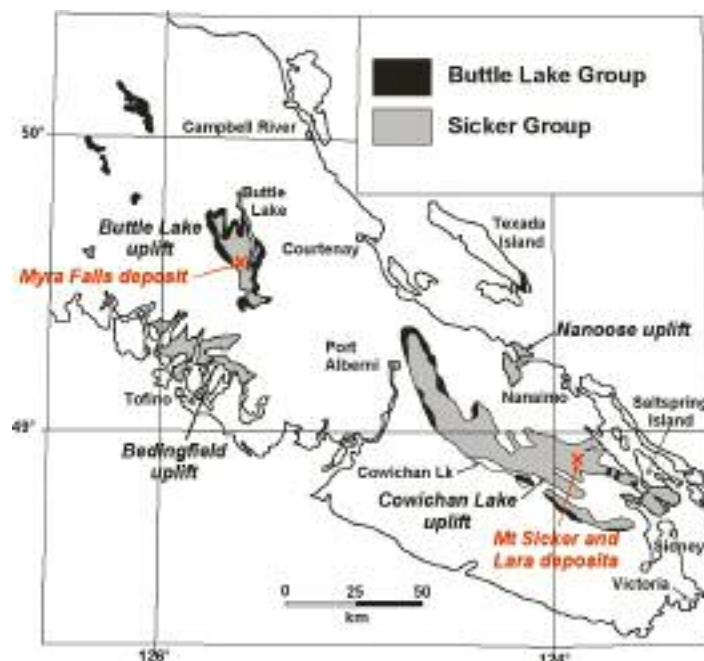
## Stratigraphic and Paleotectonic Studies of the Middle Paleozoic Sicker Group and Contained VMS Occurrences, Vancouver Island, BC

PROJECT FUNDING: GBC \$45,000  
Academia \$45,000

17

PROJECT PROPONENT: Jim Mortensen, University of British Columbia  
PROJECT AUTHORS: T. Ruks and J.K. Mortensen  
PROJECT STATUS: Active  
PROJECT DURATION: 2 years  
PROJECT START: 2005

The mid-Paleozoic Sicker Group forms the basement of Wrangellia Terrane on Vancouver Island. Volcanic strata of the Sicker Group are currently interpreted to represent an oceanic arc assemblage which is overlain by a variety of Upper Paleozoic sedimentary rock units. The arc sequence hosts the Myra Falls volcanogenic massive sulphide (VMS) deposit, which is currently the largest and most productive VMS mine in western Canada. VMS occurrences are known to occur elsewhere in the Sicker Group, especially in the Cowichan Lake Uplift (Mt. Sicker and Lara occurrences); however the setting of these occurrences is too poorly understood at present to permit detailed comparison with those of the Myra Falls deposit. The relatively poor overall understanding of the age and petrotectonic evolution of the Sicker Group makes it difficult to develop a sound strategy for regional VMS exploration within the sequence based on typical stratigraphic and volcanological criteria. This study will employ detailed geological mapping and sampling of key sections of the Sicker Group, especially in the Cowichan Lake Uplift, together with U-Pb zircon dating and petrochemical and isotopic studies of the volcanic rocks and associated intrusive and sediment strata as well as contained potential VMS occurrences. The main goal of the study is to develop a well constrained model for the evolution of the Sicker Group on Vancouver Island and compare and contrast the stratigraphic and tectonic setting of known VMS deposits and occurrences and assess the potential for other occurrences of this type.



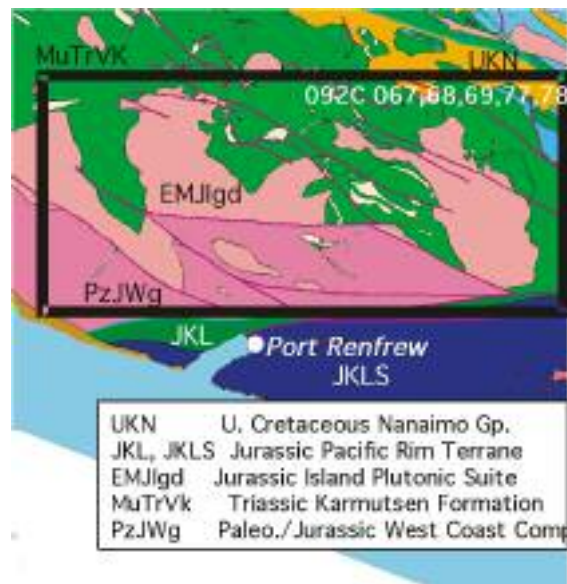


## Geological Mapping & Mineral Potential for Ultramafic Rock Occurrences, Port Renfrew Area, Southwestern Vancouver Island

PROJECT FUNDING: GBC \$33,535  
Industry \$33,535  
Academia \$98,500

PROJECT PROPONENT: Dante Canil, University of Victoria  
PROJECT AUTHORS: J. Larocque, D. Canil  
PROJECT STATUS: Active  
PROJECT DURATION: 2 years  
PROJECT START: 2005

An anomalous occurrence of ultramafic rocks associated with high Ni, Cu, Cr and PGE anomalies in soils and streams is documented near the western edge of Wrangellia terrane, at its southern contact with the Jura-Cretaceous Pacific Rim terrane on southwestern Vancouver Island (NTS092C). Rocks of this portion of Wrangellia belong to the Paleozoic-Jurassic West Coast Crystalline Complex, Jurassic Island Plutonic Suite and Triassic Karmutsen metabasalts. The area has only been mapped at 1:100,000 scale by Mueller (1977). Specific goals of this project are to undertake geological mapping at 1:10,000 scale of an area surrounding the anomalous ultramafic rocks near Port Renfrew, and to follow-up with geochemical and petrological study of the ultramafic rocks explaining processes for their occurrence. Stream sediment sampling of key streams draining the region of anomalous ultramafic rocks will be used to identify possible anomalies and host minerals for Ni, Cu or PGE, and to determine the nature and/or extent of Ni, Cu and PGE mineralization. Geochronological information on pertinent rock units will put the area in a regional and stratigraphic context with that known for other parts of Wrangellia. Research at this detailed scale will be brought into the broader context to provide a better geological database outlining the process, age, tectonic setting and possible metallogenic significance for PGE, Ni, and Cu mineralization within the Wrangellia terrane on Vancouver Island.





## Regional Metallogeny and Geochronology of the Bridge River District

PROJECT FUNDING: GBC \$36,333  
Academia \$41,200

19

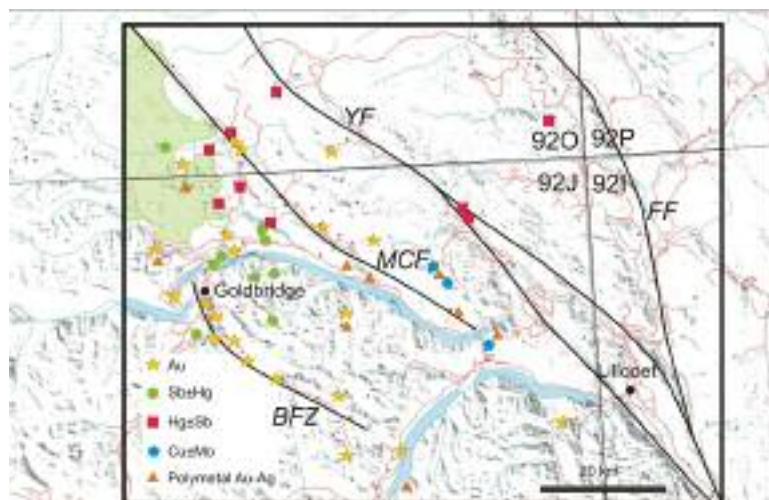
PROJECT PROPONENT: Craig Hart, University of Western Australia  
PROJECT AUTHORS: C. Hart, R. Goldfarb  
PROJECT STATUS: Active  
PROJECT DURATION: 1 year  
PROJECT START: 2006

Orogenic gold vein deposits are among the most lucrative deposit type to mine, characteristically with high gold grades, focused mineralization, large vertical extents, easy metallurgy, and reasonably small environmental footprints. The hydrothermal systems that form these deposits span a wide range of crustal levels, but this crustal-continuum concept for Orogenic gold deposits hasn't been well-appreciated or applied in exploration. Deposits rich in antimony and mercury are traditionally considered to be associated with, typically small, epithermal styles of mineralization, but there is an increased recognition that some of these deposits may represent the epizonal portions of potentially larger orogenic gold deposits.

The Bridge River mineral district in southwestern British Columbia is well-known for the Bralorne-Pioneer orogenic gold system that yielded over 4.1 million ounces of gold during its long history (1897-1971). Gold was also produced from a few other small mines, but this area has recently seen an increase in exploration activity. Throughout the broader district, between the Coast Plutonic Complex and the Yalakom Fault, there are a large number of small stibnite, mercury and polymetallic vein occurrences, many of which have been interpreted as epithermal in origin, or related to Eocene magmatism.

Within the diversity of mineralization in the region, specific aspects, such as age, structural setting, crustal level and fluid types can be used to determine the most appropriate gold deposit model and thereby assess prospectivity and effective exploration targeting. In simple language, "Which occurrences are worthy of aggressive exploration efforts". Although the few age dates that exist on mineralization are generally Late Cretaceous, the data aren't precise enough to allow comparisons between deposits, or with magmatism such as the Bendor plutonic suite. Additionally, most dates are by the K-Ar method and are likely variably reset by younger thermal events. Other data, such as mapping, geological and descriptive information, and fluid and stable isotope data, are generally good, but require new sampling and analysis, compilation, and interpretation.

A regional scale program of data compilation, field examinations, and sampling, supported with precise age dating and filling in gaps in fluid and stable isotope geochemistry, will allow assessment of appropriate deposit models and provide confidence in exploration programs. This project will be done in concert with exploration companies active in the area, and participation from recognized experts (including the BCGS and GSC) will be encouraged.





## ASTER Multispectral Satellite Imagery and Product Coverage

20

PROJECT FUNDING: GBC \$143,380

**PROJECT PROPONENT:** Ward Kilby, Independent Consultant  
**PROJECT AUTHORS:** W.E. Kilby, C.E. Kilby  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 2 years (Phase I&II)  
**PROJECT START:** 2005

The purpose of the project is to increase the number of ASTER (Advanced Spaceborne Thermal Emission and Reflection Radiometer) images available through the MapPlace to the exploration community in British Columbia. A number of ASTER based products have been developed and will be provided for all new imagery. Previous projects have made 138 ASTER images and derivative products available through the Image Analysis Toolkit (IAT) portion of the MapPlace. Significant regions and gaps between existing images remain unrepresented in this database. ASTER imagery with its 14 spectral bands and one back-looking band provide information in the visible, near infrared (VNIR), short wave infrared (SWIR) and thermal infrared (TIR) range of the electromagnetic spectrum as well as the ability to generate stereo images.

New images will be orthorectified and atmospherically corrected and then added to the IAT for online image analysis by MapPlace users. The most recent good quality imagery with the maximum possible rock exposure will be selected. A number of derivative products will be provided for each image.

ASTER products will include;

- downloadable copy of the original ASTER data
- downloadable DEM generated from the ASTER data
- inclusion of the atmospherically corrected and orthorectified data in the IAT
- downloadable anaglyph images for 3D viewing
- anaglyph image based MapPlace maps
- downloadable orthorectified stereo pair images
- downloadable virtual worlds for desktop analysis
- Mineral Alteration Maps (4 commonly used band combinations)
- Google Earth views of each ASTER image and associated Mineral Alteration Maps.



Location map of 138 ASTER images available in the MapPlace. An additional 100 images will be added during this project.



## Development and Application of a Relational Rock Property Database System for BC

PROJECT FUNDING: GBC \$20,000

Industry \$7,500

Academia \$2,500

Government \$5,000

21

PROJECT PROPONENT: Tom Lane, CAMIRO – Exploration Development

PROJECT STATUS: Active

PROJECT DURATION: 1 year

PROJECT START: 2006

3D models are becoming standard for exploration data interpretation. Drill hole targeting based on the integration of geophysical inversions with geological interpretation requires understanding of the relationships between physical rock properties, lithology, and alteration typical of the relevant exploration setting. This understanding in turn requires a technology capable of accessing and querying large volumes of measured physical rock property data. Improved understanding of rock property relationships in mineral exploration settings is the objective of this project.

It has been recognized that access to physical rock properties is a primary requirement to model geophysics of rocks under cover. Mira Geoscience, the Geological Survey of Canada (GSC) and CAMIRO are moving forward to develop a fully operative, web-based and populated National Rock Property Database System (RPDS). This project intends to achieve the following objectives:

- enter a significant amount of BC data into the system including all existing well-log data;
- set up a rock property database for the Central BC Priority MPB study area;
- set up a database for the southern BC study area for Targeted Geoscience Initiative 3;
- carry out initial analysis and demonstrate applied use of the data at UBC under direction of Nigel Phillips and the GSC in collaboration with Mira Geoscience; and
- hold a workshop for the BC Industry to explain the rock property database system and its application to modeling and interpretation of regional geophysics.

RPDS is a mature, relational rock property database in continuous development since 1998. Its development has been funded through a series of R&D initiatives, originally by a consortium of industry sponsors and the GSC.

This one-year project focused in British Columbia will enable entry of a significant amount of BC data into the RPDS and allow immediate application to programs in the Central BC MPB Area and the Southern BC TGI 3 area. The built-in analysis applications between UBC and GSC will demonstrate utility of the RPDS system for subsurface interpretations. A workshop at project-end will educate users on how the database can be accessed and used and will serve as a check on fulfilment of delivery.



# Halogens in Surface Exploration Geochemistry; Evaluation and Development of Methods for Detecting Buried Mineral Deposits

PROJECT FUNDING: GBC \$75,000  
Industry \$38,700

PROJECT PROPONENT: Colin E. Dunn, Independent Consultant  
PROJECT AUTHORS: Colin E. Dunn, Stephen J. Cook, Gwendy E.M. Hall  
PROJECT STATUS: Complete  
PROJECT DURATION: 1 year  
PROJECT START: 2005

A significant part of central British Columbia has yielded few mineral occurrences due to a blanket of younger glacial materials concealing the rocks of interest. Development of an effective geochemical tool to detect concealed deposits would provide significant assistance to mineral exploration within these areas.

Volatile elements, such as the halogens (F, Cl, Br, I), are potential 'pathfinder' elements for locating mineral deposits. Halogens have been little-used in Canadian mineral exploration, partly because of a lack of easily accessible analytical methodologies. Their relationship to mineral deposits was investigated in this study and cost-effective analytical methodologies were developed for detecting low concentrations. The halogen data was examined in context of known deposits and conventional multi-element geochemical signatures.

Investigations involved the geochemical response in vegetation and soils at three Cu-Au and Au-Ag deposits in central British Columbia – Mount Polley, QR, and 3Ts..

Selected principal outcomes of the project:

- The levels of labile halogens that can be expected in soils and vegetation from central BC have been defined;
- Optimum cost-effective digestion and analytical procedures for determining labile components of halogens in soils and vegetation have been established.
- Halogen signatures vary according to the nature of the mineralization. This indicates that each style of mineralization is likely to generate a different suite of positive halogen responses that have yet to be clearly defined; hence analysis for all four halogens is advisable.
- Pine bark is the vegetation medium that best concentrates iodine, and gives good contrast for the other halogens.

For a more comprehensive look at the project findings please refer to the final report which will be posted as a BCGS Geofile in early 2007:  
[http://www.em.gov.bc.ca/Mining/Geolsurv/Publications/catalog/cat\\_gbc.htm](http://www.em.gov.bc.ca/Mining/Geolsurv/Publications/catalog/cat_gbc.htm)





## Cordilleran Geochemistry Project – A Comparative Assessment of Soil Geochemical Methods for Detecting Buried Mineral Deposits

PROJECT FUNDING: GBC \$86,500

PROJECT PROPONENT: Stephen Cook, Independent Consultant (at time of project)  
PROJECT AUTHORS: Stephen J. Cook, Colin E. Dunn  
PROJECT STATUS: Complete  
PROJECT DURATION: 1 year  
PROJECT START: 2005

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The study investigated the geochemical response, in soils and Quaternary materials, of a Au-Ag epithermal deposit (3T's deposit) in central BC. The study comprised an integrated field and laboratory investigation focusing on comparative analytical digestions and selective extraction studies from various soil profiles across the deposit. The project objective was to determine and recommend the most effective geochemical methods for property-scale evaluation of buried mineral targets in drift-covered terrain by evaluating and comparing commercially-available analytical methods and evaluating the most suitable soil media and horizons. Effective mineral exploration in this region has been hindered by thick forest cover, an extensive blanket of till and other glacial deposits and, locally, widespread basalt cover. Together these barriers to exploration have obscured the potential for discovery of new deposits. Regional geochemical surveys have been effective as reconnaissance exploration techniques, but few studies have been conducted into the use of surficial geochemistry to aid in prioritizing regional geochemical anomalies at property scale.

This project was complementary to the project: "Halogen Geochemistry: Development of New Geochemical Methodology, Using Soils and Vegetation, for Detecting Mineral Deposits Concealed by Volcanic Rocks and Overburden in Central British Columbia." (Dunn, Cook and Hall). Samples from a range of soil horizons were submitted for comparative analysis by several selective extraction analytical methods. This project was envisioned as a smaller Cordilleran analogue of the successful central Canadian CAMIRO Deep Penetrating Geochemistry project and its successors. No such publicly available comparative geochemical methodology studies have been conducted in the Cordillera. Comparative extractions and analyses included:

- aqua regia digestion/ICP-MS
- Na-pyrophosphate extractions
- Enzyme Leach
- MMI Mobile Metal Ion
- Soil Gas Hydrocarbons
- Soil Desorption Pyrolysis
- soil pH

Results will assist companies in mounting effective geochemical exploration programs for blind targets, particularly those smaller exploration companies that do not have in-house geochemical staff.

For a comprehensive look at the project findings please refer to the final report which will be posted as a BCGS Geofile in early 2007: [http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat\\_gbc.htm](http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat_gbc.htm)





## Regional Drainage Sediment and Water Geochemical Data – Anahim Lake and Nechako River, Central BC (NTS 93C & 93F)

PROJECT FUNDING: GBC \$591,041

24

**PROJECT PROPONENT:** Wayne Jackaman, Independent Consultant  
**PROJECT STATUS:** Complete  
**PROJECT DURATION:** 1 year (2 separate surveys)  
**PROJECT START:** 2005

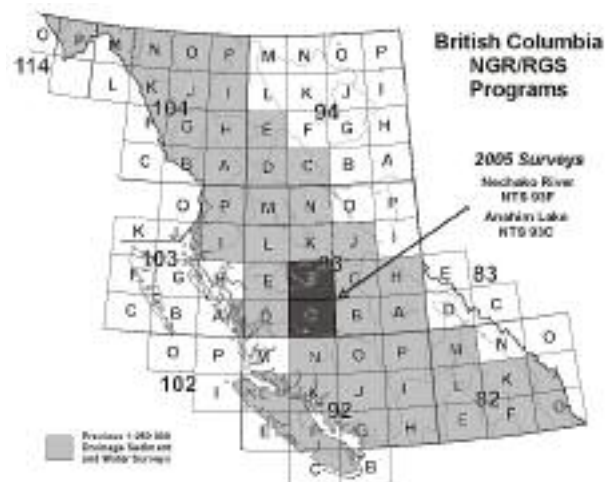
The Anahim Lake (NTS 93C) and Nechako River (NTS 93F) surveys provide new geochemical data covering a number of highly prospective unsurveyed areas within the region.

The survey reports analytical data for base and precious metals, pathfinders and rare earth elements for over 1,950 sites located in the 20,000 square kilometre survey areas. This information compliments the existing geoscience data-base and will also contribute to ongoing efforts to complete initial geochemical coverage of the entire province. These map sheet areas were selected because they have potential for the discovery of porphyry-related precious and base metal mineralization as well as precious metal epithermal and intrusion-related copper-gold and molybdenum deposits.

While stream sediments are most commonly used for regional geochemical surveys in BC, the subdued topography, poor drainage and abundance of lakes in the northern Interior Plateau region of central BC make lake sediments an appropriate geochemical sample medium in this area. Lake sediment surveys are an effective tool to delineate regional geochemical patterns and anomalous metal concentrations related to mineral deposits. The discovery of epithermal precious metal prospects such as the Wolf, Capoose and Tsacha prospects, and porphyry base metal prospects such as the Mac deposit, are examples of the successful application of lake sediment geochemistry in this area.

Survey results provide the exploration community access to new geochemical information for under-explored areas of high mineral potential and will stimulate future exploration activities. The survey results were released in July 2006 and within three months 193,000 hectares were staked.

For a comprehensive look at the project findings please refer to the final report located on the web at:  
[http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat\\_gbc.htm](http://www.em.gov.bc.ca/Mining/Geosurv/Publications/catalog/cat_gbc.htm)





## Mountain Pine Beetle Infestation Area – Regional Geochemical Data Repository Project

PROJECT FUNDING: GBC \$12,778

PROJECT PROPONENT: Wayne Jackaman, Independent Consultant  
PROJECT STATUS: Active  
PROJECT DURATION: 1 year  
PROJECT START: 2006

25

Over the last 25 years several federal and provincial geoscience programs have been undertaken in the areas of BC now experiencing the mountain pine beetle (MPB) infestation. Results of this previous work have produced a large collection of publicly available multi-media regional geochemical information. Previous surveys include regional scale stream sediment and water surveys, lake sediment and water surveys, till programs, biogeochemistry studies plus numerous associated research activities. To date, over 12,000 regional sites have been sampled within the 150,000 square kilometre MPB infestation area. Survey results include in excess of 600,000 analytical determinations for a wide range of metals and pathfinder elements.

The MPB Infestation Area Regional Geochemical Data Repository Project will produce a GIS ready database of existing regional geochemical data and associated geospatial information. The resulting digital framework will improve access to the information, assist in the planning of detailed surveys and targeted studies, identify geochemical data gaps that can be profiled for future attention, and provide long-term data management advantages.

To demonstrate the utility of the collection, a number of geochemical atlas style thematic maps will be produced. The initial series of maps plus the first version of raw geochemical data, statistical summaries and associated geospatial data coverages will be presented on a CD and distributed at Mineral Exploration Roundup in 2007. The compilation will also be made available on the Ministry of Energy, Mines, and Petroleum Resource's MapPlace website: [www.em.gov.bc.ca/mining/Geosurv/MapPlace](http://www.em.gov.bc.ca/mining/Geosurv/MapPlace).







## 3-D Seismic Survey in the Nechako Basin of BC Utilising Passive Seismic Transmission Tomography

PROJECT FUNDING: GBC \$30,000  
Government \$30,000

27

**PROJECT PROPONENT:** Microseismic Inc., Bemex Consulting  
**PROJECT AUTHORS:** C. Neale, M.E. Best, J. Lakings  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 1 year  
**PROJECT START:** 2006

This project is the first phase of a proposed two phase project. The overall objective of the proposal is to demonstrate the utility of passive seismic transmission tomography (PSST) to map structure and sediment thickness beneath basalt flows within the Nechako basin. Specific objectives are: 1) to map the area outlined on the location map to determine if there is a sedimentary sub-basin underlying the gravity low; 2) to integrate the seismic data with the potential field and well data to obtain a detailed sub-surface interpretation of the region; and 3) to compare the results from the passive seismic survey with the 2D data collected in the 1980s.

The justification for selecting the outlined area near Big Creek was based on geophysical mapping (seismic and gravity) and drilling conducted by Canadian Hunter in the early 1980s. The PSST method utilizes local, small magnitude earthquakes (microseismic events) as a source for tomographic inversion of the ray paths to produce P- and S- wave velocity volumes within the subsurface. The resolution of the velocity volume depends on the seismic activity within and near the survey area, the number and location of the geophones, and the acquisition time. Areas with significant microseismic activity require less time to reach the desired resolution for the velocity cube. The advantage of using the PSST technique in basalt covered areas is that the ray paths only travel through the basalt once, rather than twice as in conventional reflection seismic methods. There is very little environmental impact from the PSST method as well.

The first phase of this project consists of a reconnaissance test to ensure there is sufficient seismic activity within the study area to meet the objective outlined above. Five 3-component geophone arrays will be installed, one near each corner and one near the middle of the area outlined on the location map. Data will be collected at each site at a sampling rate of 2 ms for a period of 8 weeks.





## Airborne Gamma-Ray Spectrometric and Magnetic Surveys over the Bonaparte Lake Area (NTS 92 P), BC

PROJECT FUNDING: GBC \$650,000  
Industry \$180,000  
Government \$806,000

**PROJECT PROPONENT:** Mike Thomas, Natural Resources Canada  
**PROJECT AUTHORS:** W. F. Miles, R.B.K. Shives, J. Carson, J. Buckle, R. Dumont and M. Coyle  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 1 year  
**PROJECT START:** 2006

Airborne gamma-ray spectrometric and magnetic geophysical surveying was completed over the Bonaparte Lake area, BC, in the eastern half of NTS 92 P in the fall of 2006. The aim of the survey was to encourage new private sector investment in resource exploration, to aid in the assessment and development of targets for mineral exploration, and to support future bedrock and surficial geological mapping.

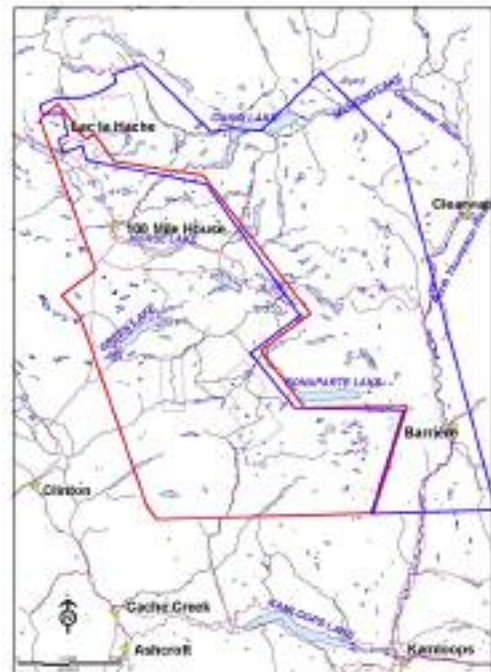
The Bonaparte Lake area in south-central British Columbia is prospective for a number of mineral deposit types, particularly copper porphyries. However, an extensive Quaternary cover, Tertiary volcanic cover and a lack of public domain geophysical data have limited exploration in the region.

Airborne gamma-ray spectrometry provides a physical measurement which contributes to geochemical mapping of the top 30 cm of the earth's surface. The technique provides bedrock and overburden mapping assistance by fingerprinting the radioactive element signatures inherent in all rocks and soils. Where the normal signatures are disrupted by mineralizing processes, anomalies provide direct exploration vectors.

Aeromagnetic surveys provide structural and lithological information from rocks located at surface down to considerable depths. In the proposed surveys area, the technique allows determination of magnetic source depths, key to understanding lithology and mineral potential under the extensive cover sequences.

When these two techniques are integrated into a single-pass airborne survey, they provide complimentary information that serves as a long-standing geophysical/geochemical framework, supporting new geological and practical mineral exploration models for a wide variety of commodities. For example, similar surveys conducted recently in areas adjacent to the Bonaparte Lake Survey have improved geological understanding and exploration for porphyry Cu-Au, skarn, and other deposit types.

Bonaparte Lake, BC  
Helicopter (blue) and Flood Wing (red) Areas





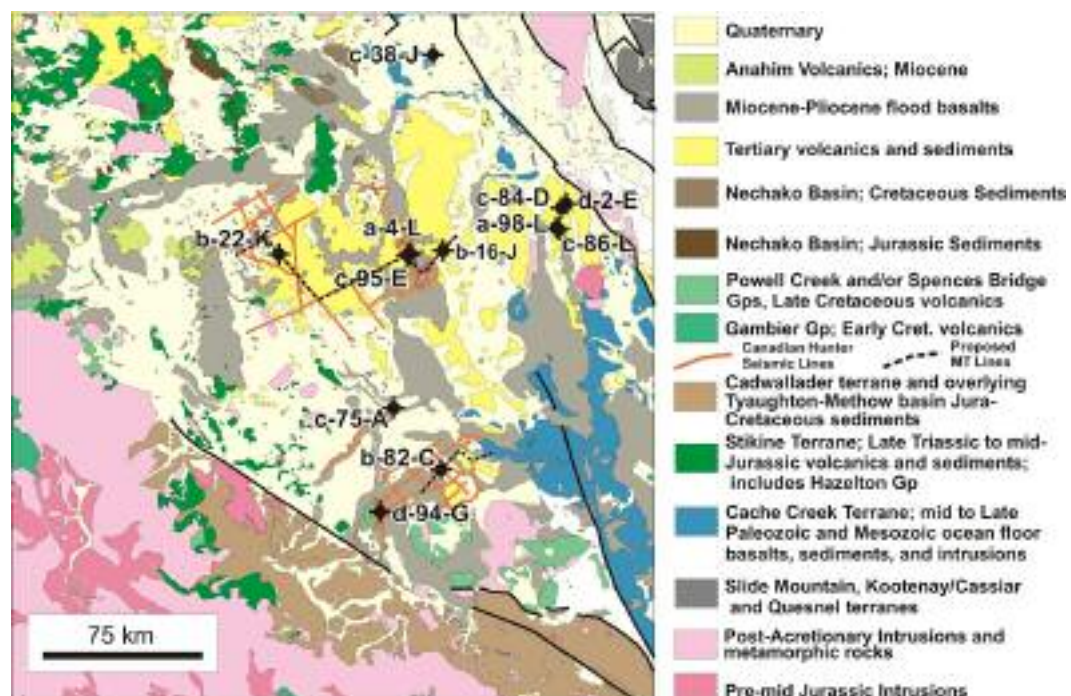
## Magnetotelluric Profiles of the Nechako Basin

PROJECT FUNDING: GBC \$100,000  
Government \$200,000

29

PROJECT PROPONENT: Jim Craven, Natural Resources Canada  
PROJECT AUTHORS: J.F. Spratt, J. Craven, A.G. Jones, J. Ridell  
PROJECT STATUS: Active  
PROJECT DURATION: 2 years  
PROJECT START: 2006

The Nechako Basin is an interior basin within central British Columbia wherein only limited hydrocarbon exploration has been carried out. This can be attributed to a number of factors particularly the limited number of outcrops of the rocks of interest. Another of the challenges in this basin is imaging potential sedimentary sequences through Paleogene and Neogene basaltic flows. Classic seismic techniques have had mixed results due to energy absorption and reflection by the volcanic units. These rocks also hamper the interpretation of gravity and magnetic data. As MT is sensitive to an independent parameter, namely electrical conductivity, it may be a useful tool for exploring the subsurface of the Basin. As such, the primary objectives for this project are the determination of the appropriate acquisition parameters for magnetotellurics as a tool for both oil and gas exploration and geological characterization of the Nechako Basin, and to directly evaluate the use of the technique via a test survey.





## Isotopic and Geochemical Fingerprinting of Mesozoic Igneous Units, Stikinia and Northern Quesnelia Terranes

30

PROJECT FUNDING: GBC \$24,500  
Academia \$128,000

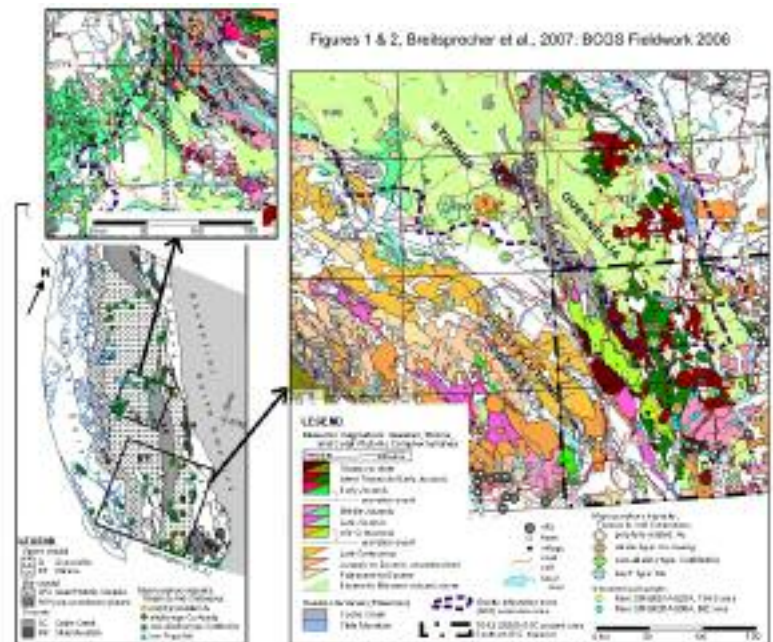
**PROJECT PROPONENT:** Katrin Breitsprecher, University of British Columbia  
**PROJECT AUTHORS:** K. Breitsprecher, J.S. Scoates, R.G. Anderson, D. Weis  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 1 year  
**PROJECT START:** 2006

This project will provide detailed geochemical (major and trace element) and isotopic (Sr, Nd, Pb, and Hf) compositional information for latest Triassic to late Jurassic porphyry intrusions in south-central British Columbia (Quesnellia and Stikinia terranes, NTS mapsheets 92I, 92O, 92P, 93C). The late Triassic intrusions in this area tend towards alkalic compositions (monzonitic), and many host significant porphyry deposits (Cu-Mo-Au-Ag; e.g. Copper Mountain, Afton/Ajax, Highland Valley). The younger phases under study are calc-alkaline (e.g. early Jurassic hornblende-biotite granodiorites, middle Jurassic granites, latest Jurassic tonalites).

These phases are not recognized as significant hosts to mineralization in southern British Columbia, although contemporaneous mineralizing events are recognized in central to northern British Columbia (e.g. Eskay Creek). Publication of the results of the proposed geochemical and isotopic study will achieve three goals:

- Provide comprehensive compositional information for the targeted intrusions
- Provide a petrologic and tectono-magmatic framework to explain the apparent change from alkalic (mineralized) to calc-alkalic (non-mineralized) compositions in earliest Jurassic time.
- Test whether attenuated Precambrian crust (ancestral North America) lies beneath Quesnellia by using radiogenic isotopic systematics of granitic rocks as crustal probes.

The work to be undertaken in this project forms part of a larger PhD study, which re-examines the tectonic affinity and history of the upper crustal Quesnel and Stikine terranes of the Intermontane belt relative to mid-crustal plutons of the Coast Plutonic Complex situated to the west.





## Geology and Mineral Resources of the Skeena Arch, Central BC

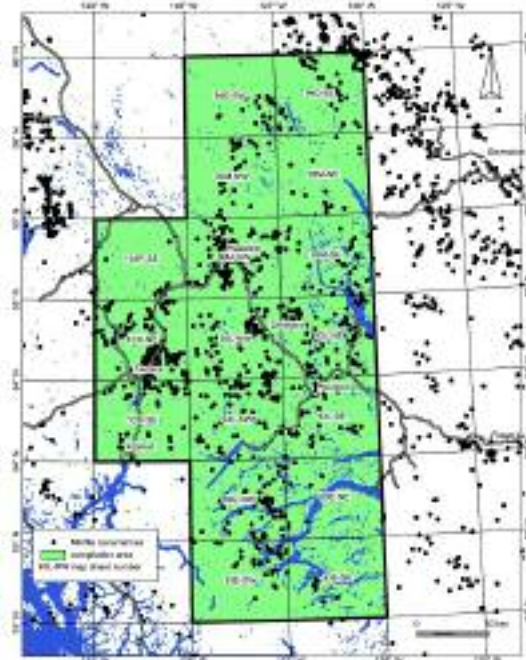
PROJECT FUNDING: GBC \$40,000

31

**PROJECT PROPONENT:** Don McIntyre, Independent Consultant  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 2 years  
**PROJECT START:** 2005

The Skeena Arch transects central British Columbia and represents a long lived magmatic arc that has produced a diverse range of mineral deposits in a wide variety of geologic settings. It is some of the most richly endowed terrain in British Columbia and has been the site of mineral exploration since the turn of the century. Since 1985 the BC Geological Survey Branch and the Geological Survey of Canada have been involved in regional mapping projects along the Skeena Arch, first as part of the Whitesail and Smithers projects and more recently as part of the Interior Plateau and Nechako NATMAP projects. This work has resulted in a much better understanding of the geologic evolution of the arch, particularly during the metallogenically important Jurassic through Cretaceous time periods. Although there are gaps in the map coverage, a large part of the proposed project area (80%) has now been mapped in detail. The project will provide a means of bringing existing data together as a series of standardized, digital, geology maps with linked databases for structure, mineral occurrences, geochemistry, geophysics, geochronology and paleontology. A new series of 17, 1:100,000 scale maps will be produced for the area and made available in digital and hardcopy format.

This project will help to stimulate mineral exploration by providing mineral explorationists with a comprehensive, up-to-date, all inclusive, GIS compatible compilation of existing geoscience data in one of the most prospective areas of BC. The current database for this area is a mixture of digital and non-digital data from a wide range of projects that were done at different times and scales by different government agencies and exploration companies. This data needs to be compiled, integrated and standardized into a format that can be used in a GIS. Building such a database will help explorationists identify new exploration targets and re-evaluate areas of known mineral occurrences using new geologic and metallogenic models. Particular focus will be directed toward porphyry Mo and Eskay Creek type deposits. In addition to providing a comprehensive, standardized database, this project will also analyze the data and generate a list of potential target areas for consideration thus assisting the exploration community in their evaluation of the potential for new discoveries.



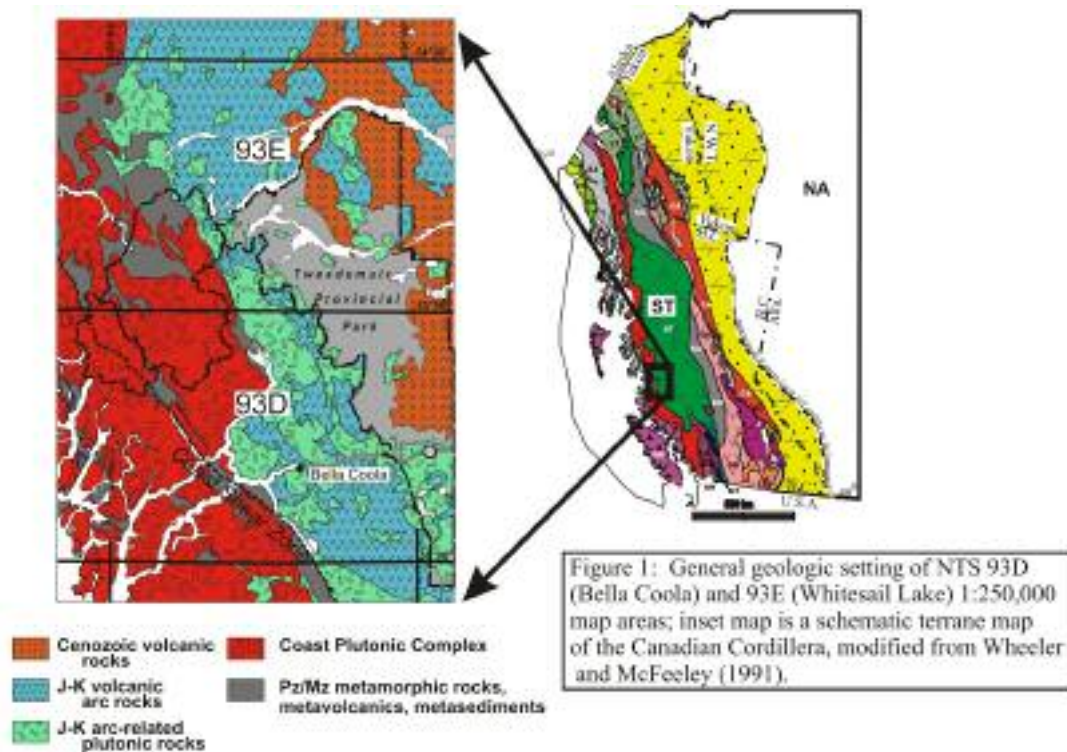


## Distribution and Controls of Economic Mineralization along Intermontane/Coast Belt Boundary, Whitesail Lake Map Area, BC

PROJECT FUNDING: GBC \$309,250  
Academia \$142,409  
Government \$104,950

PROJECT PROPONENT: Brian Mahoney, University of Wisconsin  
PROJECT AUTHORS: J.B. Mahoney, J.W. Haggart, R.L. Hooper, L.D. Snyder, G.J. Woodworth, R.M. Friedman  
PROJECT STATUS: Active  
PROJECT DURATION: 2 years  
PROJECT START: 2005

The primary objective of this project is detailed geologic mapping (1:50,000) and economic mineral assessment of the eastern Coast Plutonic Complex and western Stikinia in the southwestern and western Whitesail Lake map-area (including parts of 93E04, 05, 06, 12). The map-area straddles the transition between the Coast and Intermontane morphogeologic belts, and contains significant exposures of Mesozoic arc assemblages, including the Jurassic (Hazelton) and Cretaceous (Monarch, Kasalka) volcanic arc successions. These units are known hosts of vein, porphyry, and volcanogenic massive sulfide (VMS) mineralization (e.g., the Nifty occurrence in Bella Coola map-area), and are known metal producers in other parts of the Cordillera. Stream sediment geochemistry, MINFILE data and detailed geologic mapping farther north in Whitesail Lake map-area, and to the south (eastern Bella Coola map-area), indicate potential for volcanogenic massive sulphide, Cu±Mo±Au porphyry, and Ni-Cu-Cr-PGE mineralization. Detailed geologic mapping, systematic geochemistry, geochronology, petrology and economic mineral evaluation will constrain the distribution of and controls on potential economic mineralization in the region.





## Mapping the Resource Potential Beneath the Chilcotin Flood Basalts (CFB): Volcanic Lithofacies Constraints on Geophysical Surveys

PROJECT FUNDING: GBC \$157,000

Academia \$129,766

Government \$60,000

33

PROJECT PROPONENT: Kelly Russell, University of British Columbia

PROJECT AUTHORS: J.K. Russell, G.D.M. Andrews, S. Gordee, K.A. Simpson, R.E. Farrell, R.G. Anderson

PROJECT STATUS: Active

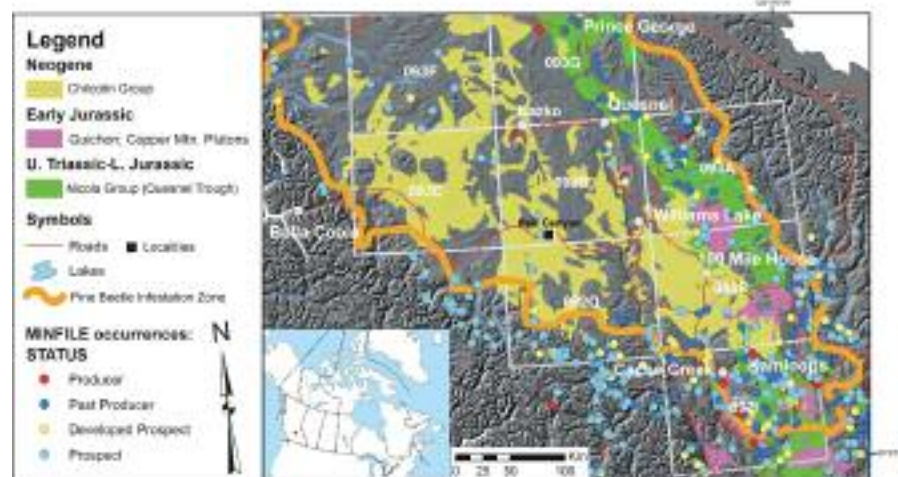
PROJECT DURATION: 2 years

PROJECT START: 2006

The Neogene (25– 3 Ma) Chilcotin flood basalt province, in the Interior Plateau physiographic region of central British Columbia overlies an area of nearly 36,500 km<sup>2</sup>. It comprises mainly basaltic lava flows that blanket ~ 36,500 km<sup>2</sup> of the Interior Plateau region of British Columbia (NTS sheets 92O, P, and 93A, B, C, F, G, K, J). Previous studies of the CFB mainly involved reconnaissance-scale fieldwork or geochemical studies. It obscures the distribution of Paleozoic-Mesozoic basement rocks with high mineral potential (e.g., Quesnel Trough) and petroleum prospective Cretaceous-Eocene sedimentary rocks of the Nechako Basin, except in scattered basement “windows”. The Chilcotin flood basalts (CFB) reach thicknesses of ~200 m and are partially overlain by late Quaternary glacial deposits. Their distribution is entirely within the region of BC that is most affected by Pine-beetle kill.

The distribution of resources and prospects on the periphery of the CFB province makes the potential for unexploited mineral resources extending beneath the cover compelling. However, there is currently little coherent data on the spatial distribution (e.g., thicknesses), the lithostratigraphy (facies variations) and physical properties (density, porosity, magnetic susceptibility, conductivity) of the CFB deposits. The incompleteness of geoscience information for this unit is a significant impediment to successful exploration for the resources underlying the CFB because the depth through cover (glacial and basalts) to basement targets is largely unknown, and the dearth of rock property data for the basalts hinder unambiguous interpretations of geophysical datasets.

Our goal is to generate a 3-D facies and thickness model for the CFB that can be used to aid resource exploration. Our map products will be used to: (1) extrapolate regional geology, metallogeny and structure beneath the CFB cover; (2) identify more windows to the basement and the identity and geophysical signature of those basement rocks; (3) delineate areas where the CFB is thin and exploration drilling for “blind” deposits becomes feasible; and to (4) provide a 3-D representation of physical property variations within the CFB to allow the basalt signature to be accurately stripped from total field geophysical datasets.





## Targeted Energy Resource Studies in the Bowser and Sustut Interior Basins of BC

PROJECT FUNDING: GBC \$151,600  
Government \$400,000

**PROJECT PROPONENT:** Carol Evenchick, Natural Resources Canada  
**PROJECT AUTHORS:** W. Loogman, J.-F. Gagnon, J.W.F. Waldron, C.A. Evenchick, F. Cordey  
**PROJECT STATUS:** Active  
**PROJECT DURATION:** 2 years  
**PROJECT START:** 2005

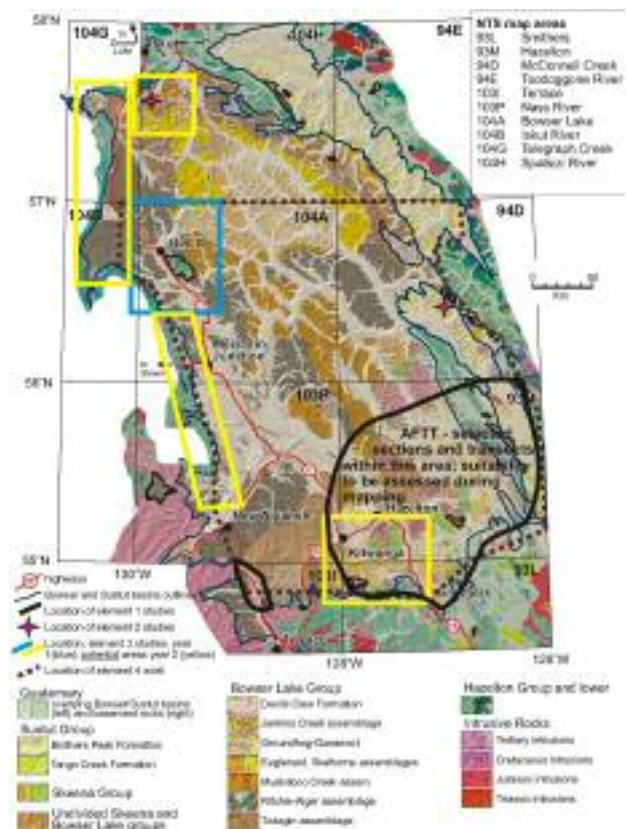
The Bowser and Sustut basins are Interior Basins of Jurassic and Cretaceous age in north-central British Columbia. They have been under-explored in terms of hydrocarbon resources because of widespread misperceptions of their prospectivity, largely due to the reconnaissance nature of all geoscience work there until recently. This project is focussed on specific, detailed, energy resource studies which will complement an existing regional GSC project titled "Integrated Petroleum Resource Potential and Geoscience Studies of the Bowser and Sustut Basins".

Four elements of the project are:

- 1) sample, analyse, and prepare and publish reports of data and interpretation, for Apatite Fission Track Thermochronology (AFTT) of the southern basins;
- 2) sample, analyse, and prepare and publish reports of data and interpretation, for petroleum generation, migration, and entrapment studies;
- 3) conduct fieldwork, sample, analyse results, and prepare and publish reports for detailed study of the early Bowser Basin history and structural development;
- 4) data management, integration, and digital publication.

The third element will provide detailed field data on the important early history and geometry of the basin. The fourth element on data management, integration, and publication is critical because communication of data and interpretations are key to attracting investment to the region.

The sample analysis and interpretation aspects of this proposal are studies critical to understanding petroleum systems in sedimentary basins, which is an essential element of a geoscience/resource framework on which to base sound exploration decisions.





# Stratigraphic Analysis of Cretaceous Strata Flanking the Southern Nechako Basin: Constraining Basin Architecture and Reservoir Potential

PROJECT FUNDING: GBC \$250,500

Academia \$293,050

Government \$52,250

PROJECT PROPONENT: Peter Mustard, Simon Fraser University

PROJECT AUTHORS: P. Mustard, J.B. Mahoney

PROJECT STATUS: Active

PROJECT DURATION: 3 years

PROJECT START: 2006

Accurate assessment of the petroleum potential of the Nechako Basin hinges on a comprehensive understanding of the basin architecture developed within Cretaceous strata, which represent the most prospective targets in the subsurface. Modeling the subsurface facies distribution of these Cretaceous strata requires detailed stratigraphic analysis of coeval, laterally adjacent strata exposed along the basin margins. This three-year project will provide a detailed analysis of the Cretaceous stratigraphy of the northern Methow Basin, including the Lower Cretaceous Jackass Mountain Group (JMG), which is probably the best candidate for a major reservoir system in the subsurface of the Nechako Basin. Additional examination of other early Cretaceous sedimentary units of the south central Nechako Basin, commonly termed Skeena Group or "Skeena Assemblage" will help resolve the confusion in terminology for these early Cretaceous units, which may largely represent northern continuations of Methow Basin deposystems. The JMG and associated strata include thick (100's m), laterally extensive (10's km) marine sandstone successions that overlie and interfinger with marine mudstones. Previous studies of the JMG and bounding successions have been primarily "first order" stratigraphic assessments commonly associated with government regional mapping projects. This study will significantly expand and supersede earlier studies and emphasize more detailed stratigraphic analysis. This investigation will provide comprehensive sedimentologic and stratigraphic analysis of Cretaceous strata in the southern part and along the southern margin of the Nechako Basin, including detailed petrologic analysis (with porosity/permeability estimates), provenance studies (detrital mica and zircon, Nd analysis of fine-grained units, geochemistry of conglomerate clasts), biostratigraphic studies and assessment of hydrocarbon reservoir rock potential. Integration of these data sets will be the basis for a comprehensive model of basin evolution during Early Cretaceous time, which should in turn allow prediction of regional changes in facies associations into the subsurface of the Nechako Basin.

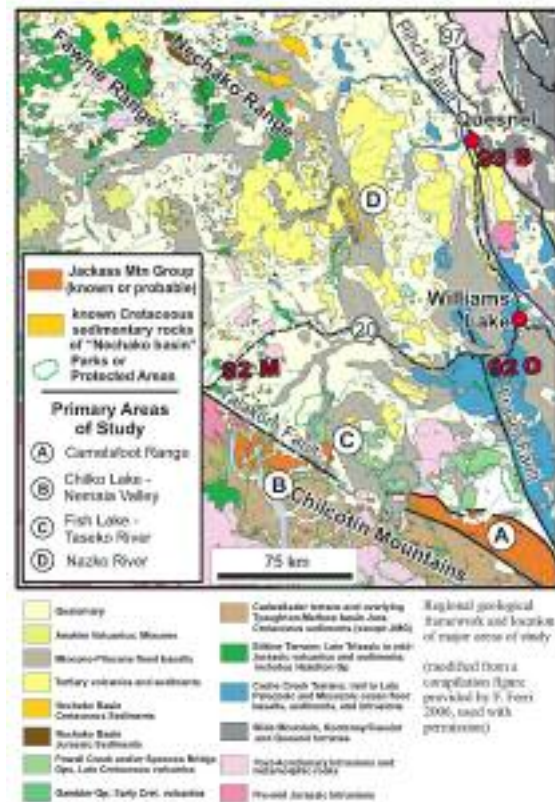




Photo by Graham Andrews.



## **FINANCIAL STATEMENTS**

**MARCH 31, 2006**

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## AUDITORS' REPORT

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### To the Members of Geoscience BC Society

We have audited the statement of financial position of Geoscience BC Society as at March 31, 2006 and the statements of revenues and expenditures, cash flows, and changes in net assets for the period from incorporation on April 26, 2005 to March 31, 2006. These financial statements are the responsibility of the society's management. Our responsibility is to express an opinion on these financial statements based on our audit.

We conducted our audit in accordance with Canadian generally accepted auditing standards. Those standards require that we plan and perform an audit to obtain reasonable assurance whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation.

In our opinion, these financial statements present fairly, in all material respects, the financial position of the society as at March 31, 2006 and the results of its operations and its cash flows for the period from incorporation on April 26, 2005 to March 31, 2006 in accordance with Canadian generally accepted accounting principles.

Vancouver, B.C.

May 12, 2006

*Beauchamp & Company*

Chartered Accountants



## STATEMENT OF FINANCIAL POSITION

EXHIBIT A

AS AT MARCH 31, 2006

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	2006
<b>ASSETS</b>	
<b>Current Assets</b>	
Cash and cash equivalents	\$ 21,527,741
Restricted cash and cash equivalents (Note 3)	815,132
Accrued interest receivable	205,415
Amounts receivable	10,133
Prepaid expenses and deposits	6,730
	<u>22,565,151</u>
<b>Equipment (Note 4)</b>	<u>32,586</u>
	<u>\$ 22,597,737</u>
<b>LIABILITIES</b>	
<b>Current Liabilities</b>	
Accounts payable and accrued liabilities	\$ 23,316
<b>NET ASSETS</b>	
<b>Net Assets Invested In Equipment</b>	32,586
<b>Net Assets Restricted For Approved Programs</b>	815,132
<b>Unrestricted Net Assets</b>	<u>21,726,703</u>
	<u>22,574,421</u>
	<u>\$ 22,597,737</u>

Approved By The Board:

James D. Gray  
Director

C.D. ('Lyn) Anglin  
Director

See accompanying notes.

**STATEMENT OF REVENUES AND EXPENDITURES**

EXHIBIT B

FOR THE PERIOD FROM INCORPORATION ON APRIL 26, 2005 TO MARCH 31, 2006

	2006
<b>Revenues</b>	
Grants – B.C. Ministry of Energy and Mines	\$ 25,000,000
Interest income	636,563
	<u>25,636,563</u>
<b>Expenditures – Program Costs</b>	
Program costs incurred	2,584,761
Publishing costs	20,802
	<u>2,605,563</u>
<b>Expenditures – Administrative Costs</b>	
Advertising and promotion	17,650
Amortization of equipment	3,501
Consulting (Note 6)	110,505
Dues and memberships	2,749
Equipment lease (Note 5)	701
Executive recruitment	56,588
GST, non-refundable portion	9,833
Insurance	2,862
Management and administration fees (Note 7)	136,754
Office and sundry	7,533
Professional fees	18,703
Rent and utilities (Note 5)	8,573
Salaries and benefits	46,596
Travel, conferences and meetings	23,908
Website, internet and e-mail	10,123
	<u>456,579</u>
<b>Excess Of Revenues Over Expenditures</b>	<b>\$ 22,574,421</b>

See accompanying notes.



## STATEMENT OF CASH FLOWS

EXHIBIT C

FOR THE PERIOD FROM INCORPORATION ON APRIL 26, 2005 TO MARCH 31, 2006

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	2006
<b>CASH PROVIDED BY (USED FOR):</b>	
<b>Operating Activities</b>	
Grant – B.C. Ministry of Energy and Mines	\$ 25,000,000
Interest income	431,148
Payments for program expenditures	(2,605,563)
Payments for administrative expenditures	(442,107)
Payments of refundable portion of GST	(9,833)
Cash provided by operating activities	22,373,645
<b>Investing Activities</b>	
Payments for equipment	(30,772)
Cash used for investing activities	(30,772)
<b>Increase In Cash</b>	22,342,873
<b>Cash, Beginning Of Period</b>	–
<b>Cash, End Of Period</b>	\$ 22,342,873
<b>Cash And Cash Equivalents</b>	
Funds held in treasury account	\$ 28,485
Term investments due within one year	22,314,388
	\$ 22,342,873

See accompanying notes.



## STATEMENT OF CHANGES IN NET ASSETS

EXHIBIT D

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FOR THE PERIOD FROM INCORPORATION ON APRIL 26, 2005 TO MARCH 31, 2006

	INVESTMENT IN EQUIPMENT	RESTRICTED FOR APPROVED PROGRAMS	UNRESTRICTED	2006
<b>Balance, Beginning Of Period</b>	\$ -	\$ -	\$ -	\$ -
(Deficiency) Excess of				
revenues over expenditures	(3,501)	(2,584,761)	25,162,683	22,574,421
Investment in equipment	36,087	-	(36,087)	-
Internally imposed restrictions	-	3,399,893	(3,399,893)	-
<b>Balance, End Of Period</b>	\$ 32,586	\$ 815,132	\$ 21,726,703	\$ 22,574,421

See accompanying notes.

## NOTES TO FINANCIAL STATEMENTS

EXHIBIT E

MARCH 31, 2006

### 1. Incorporation And Nature Of Operations

Geoscience BC Society (the "Society") was incorporated under the Society Act (British Columbia) on April 26, 2005 as a not for profit organization. The Society is exempt from taxation under Section 149(1) of the Income Tax Act of Canada. The purpose of the Society is promoting, funding, and otherwise supporting applied geoscience research in British Columbia. The Society had its genesis in the \$25 million funding commitment announced by the government of British Columbia in January 2005 in respect to the establishment and initial financing of such an organization, which unrestricted funding was subsequently received and the Society was incorporated. The Society has had certain members and directors in common with, and its creation was promoted by, both the Association for Mineral Exploration British Columbia ("AME BC") and the Mining Association of British Columbia. However, the Society operates independently of both organizations and is controlled by neither.

### 2. Significant Accounting Policies

#### Basis of presentation

These financial statements have been prepared in accordance with Canadian generally accepted accounting principles which necessarily involves the use of estimates. The preparation of financial statements requires management to make estimates and assumptions which affect the reported amounts of assets and liabilities and the disclosure of contingent assets and liabilities at the date of the financial statements and the revenues and expenditures for the period reported. Actual results could differ from those estimates. The financial statements of the Society have, in management's opinion, been properly prepared within reasonable limits of materiality, and within the framework of the significant accounting policies summarized below.

**Financial instruments**

The Society's financial instruments consist of cash and cash equivalents, amounts receivable, and accounts payable and accrued liabilities. Unless otherwise noted, it is management's opinion that the Society is not exposed to significant interest, currency or credit risks arising from its financial instruments. The fair values of the financial instruments approximate their carrying values, unless otherwise noted.

**Revenue recognition**

The Society follows the deferral method of accounting for contributions. Restricted contributions are recognized as revenue in the year in which the related expenditures are incurred. Unrestricted contributions are recognized as revenue when received or receivable if the amount to be received can be reasonably estimated and collection is reasonably assured. Endowment contributions are recognized as direct increases in net assets. Restricted investment income is recognized as revenue in the year in which the related expenditures are incurred. Unrestricted investment income is recognized as revenue when earned.

**Donated materials and services**

Donated materials and services are recorded only when a fair value can be reasonably estimated and when they would be paid for by the Society if they had not been donated.

**Contributed services**

Significant volunteer labour is contributed to assist the Society in carrying out its activities, but is not recorded in the Society's financial statements due to the difficulty of determining the fair value of those services.

**Cash and cash equivalents**

Cash and cash equivalents consist of cash on deposit with banks and other financial institutions, and highly liquid short-term interest bearing securities that are readily convertible to known amounts of cash. As at March 31, 2006, the Society's term investments had an effective annual interest rate of 3.00%, and were due December 8, 2006.

**Equipment**

Equipment purchases made by the Society are capitalized and are recorded at cost less accumulated amortization. Amortization is recorded as disclosed in note 4 on a straight-line basis, commencing in the quarter of acquisition, as follows:

Computer equipment	3 years
Furniture and office equipment	5 years

**3. Restricted Cash And Cash Equivalents**

	2006
Cash in term investment	\$ 815,132

Restricted cash and cash equivalents are used for future payments of undisbursed, but approved funding commitments, whose payment is contingent upon the Society receiving acceptable deliverables from the projects principal proponent in accordance with executed agreements. These internally restricted amounts are not available for other purposes without the approval of the Society's Board of Directors.



#### 4. Equipment

	COST	ACCUMULATED AMORTIZATION	NET BOOK VALUE 2006
Computer equipment	\$ 19,785	\$ 2,686	\$ 17,099
Furniture and office equipment	16,302	815	15,487
	\$ 36,087	\$ 3,501	\$ 32,586

#### 5. Contractual Obligations

The Society has a base rental commitment relating to the lease of its office premises, inclusive of monthly charges in respect to operating and common area costs and property taxes, totalling approximately \$163,000 to January 31, 2011. The Society also has a commitment relating to the lease of its photocopy equipment totalling \$13,321 to November 17, 2010.

Pursuant to a contract of employment with its President and Chief Executive Officer, the Society would be committed, in the event that it terminates its employment of this individual without cause prior to January 11, 2007, to pay \$36,250 in termination benefits, and \$145,000 in termination benefits thereafter. In addition, the President and Chief Executive Officer may terminate employment with the Society at any time by providing three months written notice.

#### 6. Related Party Transactions

During the period ended March 31, 2006, the Society paid \$92,500 to a private company controlled by a now former director of the Society for management and consulting services.

#### 7. Administrative Services Contract

During the period from incorporation to December 31, 2005, the Society paid AME BC an aggregate of \$136,754 pursuant to a contract based on a sliding-scale percentage of program grants distributed by the Society to that date. The contract was inclusive of accounting and legal services, the provision of office rent and meeting space, and other management services rendered by AME BC staff to the Society during its initial start up phase.

#### 8. Subsequent Event

Subsequent to period end, the Board of Directors of the Society approved an additional \$1,362,992 in project funding at their May 4th, 2006 meeting.

#### 9. Comparative Figures

No comparative figures have been disclosed in these financial statements as the period ended March 31, 2006 is the Society's initial since incorporation



Photo by Danette Schwab  
*Janina Micko at the Westrim in front of Galore Camp.*



Suite 410 – 890 West Pender Street  
Vancouver, BC Canada V6C 1J9  
Tel 604.662.4147 Fax 604.662.4107  
[www.geosciencebc.com](http://www.geosciencebc.com)