

GEOSCIENCE BC SUMMARY OF ACTIVITIES 2022: MINERALS

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Front cover photo and credit: A view across British Columbia’s Golden Triangle, captured during fieldwork conducted on Scottie Resources Corp. properties in 2022. Photo by A. Hutchison.

Foreword

It has been another busy and exciting year at Geoscience BC. We launched a membership program early in 2022 and introduced ‘Project Concepts’, which are outlines of future research programs, in July. And throughout, we continued to support leading-edge geoscience research in British Columbia, highlights of which are presented in our annual *Summary of Activities* publication. Papers are published in two separate volumes: *Energy and Water*, and this volume, *Minerals*. Both volumes are available in print and online via www.geosciencebc.com.

Summary of Activities 2022: Minerals

This *Summary of Activities 2022: Minerals* volume contains eight papers from ongoing Geoscience BC projects and 2022 Geoscience BC Scholarship recipients that are within Geoscience BC’s strategic focus area of minerals. The papers are divided into two sections, based on Geoscience BC’s strategic objectives of

- 1) Identifying New Natural Resource Opportunities, and
- 2) Advancing Science and Innovative Geoscience Technologies.

The ‘Identifying New Natural Resource Opportunities’ section starts off with Mitchinson introducing a new project that will integrate electromagnetic and gravity data to resolve the deep geology of the Quesnel terrane in central British Columbia (BC). This is followed by two Geoscience BC 2022 scholarship recipients examining mineral deposits in BC’s Golden Triangle. Hutchison et al. consider the Blueberry zone of the Scottie Gold Mine project, and Ng et al. report on work at the Brucejack deposit of Newcrest Mining Ltd.

All five papers in the ‘Advancing Science and Innovative Geoscience Technologies’ section are led by Geoscience BC Scholarship 2022 recipients. Eaton et al. investigate the use of unsupervised machine learning to improve and expedite the identification of Cu-porphyry–related mineralization. Lu et al. consider the reactivity of ultramafic minerals and tailings for carbon capture and storage. Iulianella Phillips et al. contribute an update on using microbes as biosensors to see through overburden materials, and Hendi et al. consider the use of fibre-optic sensors in geoscience projects. Finally, Shapka-Fels summarizes the development and highlights results of selected Finite-Discrete Element Method models of Red Chris mine operations.

Geoscience BC Minerals Publications 2022

Geoscience BC published the following nine Minerals geoscience reports in 2022:

- Nine technical papers in the **Geoscience BC Summary of Activities 2021: Minerals** volume (Geoscience BC Report 2022-01)
- **Mineralogical and Geochemical Vectors within Advanced Argillic-Altered Rocks of British Columbia**, by F. Bouzari, R.G. Lee, C.J.R. Hart and B.I. van Straaten (Geoscience BC Report 2022-03/MDRU Publication 456)
- **A Geo-Exploration Atlas of the Mt. Milligan Porphyry Copper-Gold District**, by F.A.M. Devine, P. Kowalczyk and D.R. Heberlein (Geoscience BC Report 2022-04)
- **Identification of New Porphyry Potential Under Cover in British Columbia**, by D.E. Mitchinson, D. Fournier, C.J.R. Hart, T. Astic, D.C. Cowan and R.G. Lee (Geoscience BC Report 2022-07/MDRU Publication 457)
- **Surficial Geology, Drift Thickness and Till Sampling Suitability Maps (NTS 093A/13; 093G/01, 07, 09, 10, 16), British Columbia**, by Palmer (Geoscience BC Report 2022-08)
- **Geology and Mineral Potential of the Western Skeena Arch: Evolution of an Arc-Transverse Structural Corridor, West-Central British Columbia**, by J.J. Angen, C.J.R. Hart, J.L. Nelson and M. Rahimi (Geoscience BC Report 2022-09/BCGS Open File 2019-09/MDRU Publication 458)
- **Developments in the Real-Time Detection of Buried Mineralization and Geological Structures Using Soil Gas Concentrations**, by R.E. Lett, D.A. Sacco, E. Elder and C. Knox (Geoscience BC Report 2022-12)
- **Georeferencing and Data Capture of 2019–2021 National Instrument 43-101 Reports in British Columbia to Update the Existing Dataset**, by N.D. Barlow, J.R. Barlow and K.E. Flower (Geoscience BC Report 2022-13)
- **Summary Report on U-Pb and Ar-Ar Age Dating, Penticton Map Sheet (082E)**, by T. Höy, J. Gabites and R. Friedman (Geoscience BC Report 2022-16)

All releases of Geoscience BC reports, maps and data are published on our website and announced through our website and e-mail updates. Most final reports and data can be viewed or accessed through our Earth Science Viewer at <https://gis.geosciencebc.com/esv/?viewer=esv>.

Looking Forward: 2023 and Beyond

Project Concepts

As Geoscience BC looks ahead to 2023 and beyond, we are working with partners and members to develop project concepts: proposed research relating to critical minerals and metals, geological carbon capture and storage, generating cleaner energy (including geothermal, hydrogen and low carbon intensity natural gas), and monitoring and mitigating greenhouse gas emissions. These are designed for a collaborative funding model with input and contributions from federal and provincial governments, industry, trusts and others. Geoscience BC is currently applying for research funding and reaching out to prospective project sponsors for all project concepts.

New project concepts include ‘Critical Minerals and Metals in BC Mine Tailings and Waste Rock Facilities’, which would study tailings and waste rock from some of BC’s current and past mining operations to see if they may host economic concentrations of critical minerals or metals, and new ‘Regional-Scale Geophysical and Geochemical Surveys’, which would help focus critical mineral and metal greenfields exploration in the province. Finally, the project concept ‘CO₂ Storage in Ultramafic Rocks: Development of a Pilot-Scale Demonstration Project’ would continue the development of an innovative method for storing carbon outside of sedimentary basins.

Membership

Geoscience BC membership opportunities make it easy for a wide range of partners to learn about new project concepts, as well as support, provide input, network and stay up to date on Geoscience BC minerals, energy and water research. Corporate, Individual, Student and Associate memberships provide a variety of opportunities to suit industry, academia, communities, Indigenous groups and governments as we work toward shared goals. Geoscience BC launched the membership program early in 2022 and, as of mid-December 2022, has 140 members.

Acknowledgments

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Geoscience BC would like to thank all members, project sponsors and champions for their ongoing support of public geoscience. As well, Geoscience BC would like to express our appreciation for the leaders and volunteers in British Columbia’s mineral exploration, mining and energy sectors who support our organization through their guidance and their use and recognition of the data and information that we collect and distribute.

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Vice President, Minerals
Geoscience BC
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