



Vancouver Geotechnical Society

A Local Section of the
Canadian Geotechnical
Society

www.v-g-s.ca

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NOTICE OF UPCOMING TECHNICAL PRESENTATION Wednesday, May 02, 2018

TOPIC: Mountain Permafrost Engineering and Mining

SPEAKER: Lukas Arenson, Ph.D., P.Eng. – *BGC Vancouver & Adjunct Professor @ University of Manitoba*

Dr. Lukas Arenson has more than 16 years of expertise in frozen soil mechanics, periglacial risk assessments and geothermal modelling. He has worked on infrastructure and mining projects in the South American Andes, the Arctic, Asia and on various other mountain permafrost projects, including the stability of frozen slopes in the European Alps and the Andes. Additional work has concentrated on the thermo-mechanical processes of frozen and freezing soils at a microstructural level to better understand the hydraulic, strength and deformation properties of frozen soils with changing stress, temperature and salinity. He developed a probabilistic permafrost distribution model for mountainous terrain, extensively used in South America. He has taught permafrost engineering courses at universities and for industry, and published over 60 scientific publications on topics related to cold regions engineering. He is on the Editorial Board for the Canadian Geotechnical Journal, the Journal of Cold Regions Science and Technology, as well as Permafrost and Periglacial Processes. He is currently Board Member of the Canadian Permafrost Association and was chair of the Cold Regions Engineering Division of the Canadian Geotechnical Society. He was the recipient of the Troy L. Pêwé award in 2003 and was awarded the Roger J. E. Brown Memorial Award from the Canadian Geotechnical Society in 2010 for his contributions to permafrost engineering research and to the cold regions engineering division.

CONTENT: Many mineral resources are in polar regions or at high elevations attracting mining companies from around the world. In Northern BC, or the South American Andes, such deposits are typically in remote mountainous locations and often at high elevations characterized by its challenging glacial and periglacial environments. Climate change is currently changing these mountainous regions rapidly, creating new landscapes and forming major changes to geo-hazards that affect the design of infrastructure. In the dry Andes, periglacial landforms such as rock glaciers, protalus ramparts, gelifluction slopes, pattern ground and ice wedges dominate over glaciers and glaciarets. And despite the dry conditions, excess ground ice is frequently found resulting in challenges for infrastructure design.

The presentation focuses on engineering as well as environmental challenges that exist on developing and operating large mining projects in such mountainous environments. Results from complex site investigations recently carried out using advanced geophysical analysis techniques, as well as experience from the first sonic drill carried out in a South American in a rock glacier are presented. Finally, challenges in communicating complex processes as well as how public perception affects large controversial projects are discussed.

DETAILS: **Location:** Executive Inn, 4201 Lougheed Highway, Burnaby, BC V5C 3Y6
Social Hour: 5:30 to 6:30 pm (drinks available at the hotel bar)
Technical Presentation: 6:30 to 7:30 pm (No need to RSVP)
Dinner: 8:00 pm (\$20 will be charged for dinner). If you would like to stay for dinner, please RSVP to Tim Morton via email (timothy.morton@ghd.com) or at the door.