

PROGRAMMING

Short Courses *Admission with ticket*

The Professional Geoscientists Ontario (PGO) supports participation of its members in these courses as an acceptable Continuing Professional Development activity. This program may also be eligible toward the Law Society of Upper Canada's CPD Requirement as Substantive Hours. Please note that this program is not accredited.

Space is limited for Short Courses. Register early to avoid disappointment. All Short Courses take place in the MTCC, South Building.

PDAC reserves the right to cancel Short Courses that do not meet minimum attendance requirements. To qualify for student rates, you must be a PDAC student member and enrolled full time in a recognized academic program. Student spaces are limited.

Unless otherwise noted, all full-day Short Courses include continental breakfast, three-course lunch and refreshments.

FRIDAY, FEBRUARY 28

8:30 am – 4:30 pm

Minimizing environmental impact

ORGANIZER: Golder Associates Ltd.

The aim of this course is to assist exploration companies to minimize the impact of their field operations on the environment, and in so doing lay down foundations for acquiring a "social licence to operate" from local communities, government agencies and other stakeholders, reduce costs, and add value. Using parts of the environmental toolkit from PDAC's online guidance, e3 Plus: A Framework for Responsible Exploration, and drawing on the expertise of experienced practitioners, the course will emphasize the practical aspects of operating in the field. Attendees will receive a sound grounding in what are the potential environmental impacts, and related mitigation and management measures, associated with exploration field operations. It is intended that this course, and the PDAC Health and Safety Course, are separate but complimentary.

The objective is to cover the main topics relating to mineral exploration impact on the environment from the point of view of an active mineral exploration program, including camp construction and management, access trails and roads, water resources, waste management, regulatory considerations and supporting governance for drill programs. Some aspects of community engagement related to environmental stewardship will be referred to but community relations are not the focus of this course. It will be a how-to course both for those starting out in their exploration careers and for more experienced people who want to update their knowledge. Participants could include geologists, diamond drillers, camp operators, and others.

Speakers will include geologists, environmental experts, and a senior diamond drill company representative—all with decades of experience and knowledge in field operations.

The course should appeal to Canadian and international participants.

PRESENTERS:

Amiel Blajchman, Cedar Water Strategy
Tim Bremner, Foraco Canada Ltd.
David Brown, Golder Associates Ltd.
Bill Mercer, Avalon Advanced Materials Inc.
Mark Wiseman, Avalon Advanced Materials Inc.

LEVEL OF COMPREHENSION: ENTRY LEVEL

Some knowledge of e3 Plus (available free of charge at www.pdac.ca/e3plus) would be helpful but not essential.

COURSE FEE:

Includes course material, continental breakfast and lunch



PDAC is pleased to offer this course at a special rate as part of the association's ongoing leadership in sustainability and its commitment to improving responsible exploration.



8:30 am – 4:30 pm

An in-depth overview of US mining law relating to acquiring, developing, permitting, financing and closing hard rock mining claims and projects.

ORGANIZER: Parsons Behle & Latimer

This full-day course is a comprehensive overview of the mining law in the United States relating to the acquisition, exploration, development, operation and closure of hard rock mining projects. The course will provide in-depth coverage of types of land and mineral ownership in the US, types of mineral claims, historical and current issues under the Mining Law of 1872, the process and issues involved in obtaining, holding and financing mineral tenures, an overview of water law in the Western US, and issues relating to acquisition and generation of electrical power for the operation. The course will include an overview of the typical methods for entering into exploration and development joint venture arrangements, including the revised Rocky Mountain Mineral Law Foundation "Form 5" limited liability company agreement, lease, purchase and sale of exploration and mining project issues, as well as discussion of the standard royalty mechanisms, including net smelter return and net profits interest royalties.

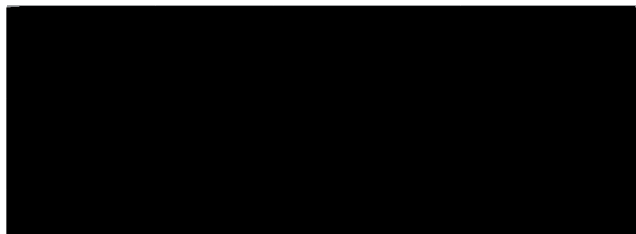
The course will also cover current significant environmental issues in the exploration and development of operations, including key air and water discharge issues, environmental impact statements, permitting of tailings facilities, bonding, and mine closure and reclamation issues. Attendees will leave with an excellent foundation for understanding the major issues involved in acquiring, holding, financing and developing mining interests in the US and the related environmental, water, power and closure issues. The course is ideal for persons who are interested in acquiring mining projects in the US, or simply wish to have a refresher on key concepts.

PRESENTERS:

Richard J. Angell, Parsons Behle & Latimer
Chad C. Baker, Parsons Behle & Latimer
Rew R. Goodenow, Parsons Behle & Latimer
Kevin W. Johnson, Parsons Behle & Latimer
Gregory H. Morrison, Parsons Behle & Latimer
Jason D. Steiert, Parsons Behle & Latimer

LEVEL OF COMPREHENSION: ENTRY-LEVEL

COURSE FEE:



8:30 am – 5:00 pm

Mining financial modeling

ORGANIZER: The Marquee Group

This is an interactive, hands-on course focused on the skills required to create a best-in-class financial model of a mining project. The course is case-based and uses an example of a company developing an open-pit mine. Issues related to mining, milling and processing will be covered in the course. A powerful scenario page is included to test sensitivities to key drivers. The model includes detailed schedules for mining sequencing, production, operating costs, capital costs and reclamation costs. Valuation concepts covered include net present value, internal rate of return, and payback period. Participants will learn the best practices for designing and building financial models of a mining projects.

They will also come away with many new intermediate and advanced Excel skills commonly used in financial models. Upon course completion, all the participants will take away a completed model that can be used as a template on future mining projects.

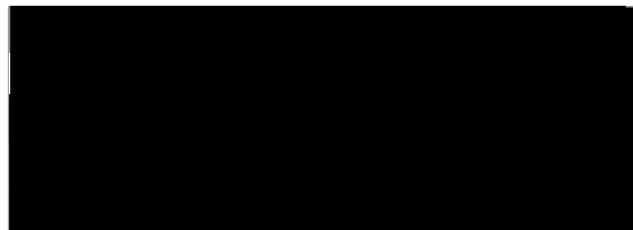
PRESENTER:

Duncan McKeen, The Marquee Group

LEVEL OF COMPREHENSION: INTERMEDIATE

Participants should have basic knowledge in mining, accounting, finance and Excel. **Participants are required to bring a laptop (PC preferred) equipped with MS Excel to the course.**

COURSE FEE:



PROGRAMMING

Short Courses *Admission with ticket*

FRIDAY, FEBRUARY 28

9:00 am – 5:00 pm

Geological interpretation of aeromagnetic data

ORGANIZER: Southern Geoscience Consultants

This introductory course aims to enlighten participants on the strengths and weaknesses of potential field methods, and to illustrate how best they can be used to progress exploration programs. This course is designed for the geologist who wants to improve their understanding of aeromagnetism and the geophysicist who wants to improve their understanding of the geology responsible for aeromagnetic anomalies.

This is an introductory day designed to inform attendees of the range of applications of aeromagnetic data and the key steps involved in the integration of aeromagnetic data with geology. Participants will be introduced to the concept of mapping geology and structure as expressed in the magnetic response to develop a lithostratigraphic interpretation using aeromagnetic data through hands-on exercises.

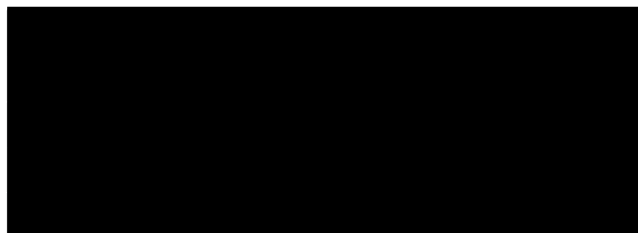
PRESENTERS:

David Isles, Southern Geoscience Consultants
Anne Tomlinson, Southern Geoscience Consultants

LEVEL OF COMPREHENSION: INTERMEDIATE

Participants should have a general knowledge of geology, general knowledge or exposure to aeromagnetic data.

COURSE FEE:



Friday, February 28 8:30 am – 4:30 pm

Saturday, February 29 8:30 am – 4:30 pm

Concepts and application of machine learning to mining geoscience: A practical course

ORGANIZER: SRK Consulting (Canada)

Over the last five years machine learning (ML) has been a growing subject of conversation in the mining industry. From targeting of mineral deposits to connected mining environment, there is no doubt that artificial intelligence will play a key role in our industry in the near future. However, the subject can seem obscure and is often hard to grasp, which creates apprehensions from geoscientists. This workshop will introduce the participants to the applications and evaluation of machine learning in mining geoscience. The main concepts and best practices for applied machine learning to exploration and mining will be reviewed. The course will be set in a practical framework, with a focus on the understanding and usage of different algorithms without detailing the mathematics behind each algorithm. Through a series of case studies, examples and hands-on exercises the attendees will learn how to best apply machine learning to different datasets and most importantly, evaluate the results produced by the algorithms.

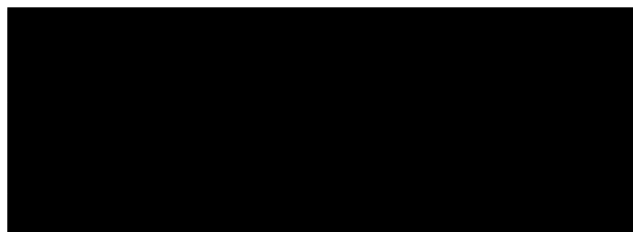
PRESENTERS:

Antoine Caté, SRK Consulting (Canada)
Jean-Philippe Paiement, Mira Geoscience
Erwan Gloaguen, INRS
Martin Blouin, Geolearn

LEVEL OF COMPREHENSION: INTERMEDIATE

Participants should have a strong interest in either statistics, modelling or data analysis. No prior coding or data science knowledge is required. Exercises will be completed using a user-friendly and intuitive interface for data mining and machine learning. **Participants are required to bring a laptop.**

COURSE FEE:



Friday, February 28 8:30 am – 4:30 pm

Saturday, February 29 8:30 am – 4:30 pm

Gold: Geology, geochemistry, genesis and exploration

ORGANIZER: Society of Economic Geologists (SEG)

This two-day-long workshop will focus on the present day understanding of the most widespread mineral deposit types that host much of the global gold resource. Leading experts will provide descriptions on some of the most important examples of each deposit type, with detailed material on tectonic and structural controls, geological characteristics, geochemical and geophysical signatures, geochronological relationships, and exploration strategies. Presented material will include characterization of orogenic gold deposits, low and high sulfidation epithermal gold deposits, gold-rich porphyry deposits, Carlin-type, and intrusion-related gold systems. The most up-to-date evidence for ore-formation processes and development of genetic models for these various deposit types will be described. The course is aimed for geoscientists from both industry and academia, as well as students of economic geology, who desire a comprehensive understanding of modern concepts on the geology of gold deposits.

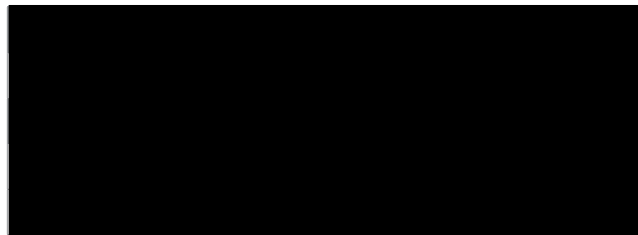
PRESENTERS:

Richard J Goldfarb, China University of Geosciences & Golden Predator Mining Corp.

Stuart F. Simmons, Hot Solutions Ltd.

LEVEL OF COMPREHENSION: ADVANCED

COURSE FEE:



Friday, February 28 9:00 am – 5:00 pm

Saturday, February 29 9:00 am – 5:00 pm

Will this exploration project become a mine?

ORGANIZER: RPA

There are many decisions that need to be made early on in exploration projects. Should we continue drilling? What grade and tonnage do we need to make this into an economic project? How would we develop this project? These questions can usually be answered early on in the development cycle, and the answers can provide valuable guidance on making a decision to continue investing or to walk away from a project.

This course is designed to give insight into early stage projects from a mining engineer's perspective. We will look at all the key aspects required for determining early stage cost estimates, including: mining method selection, processing methods, infrastructure requirements, environmental management, and social licence. We will also review key inputs to revenue, including: metal prices, metallurgical recoveries, payable metal, transport costs, treatment and refining charges, and royalties.

Ultimately, we will be able to use this information to develop an early stage cash flow that will give us an indication of a project likelihood of success.

PRESENTERS:

Jason Cox, RPA

Ian Weir, RPA

David Robson, RPA

David Ritchie, SLR

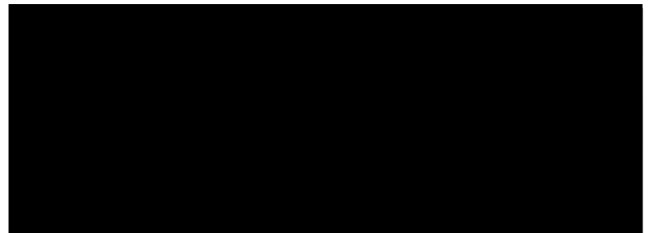
Elise Ho-Foong, SLR

Lance Engelbrecht, RPA

LEVEL OF COMPREHENSION: ALL LEVELS

This course is primarily designed for geologists, executives and investors. **Participants are requested, but not required, to bring a laptop.**

COURSE FEE:



PROGRAMMING

Short Courses *Admission with ticket*

SATURDAY, FEBRUARY 29

8:00 am – 4:30 pm

Health & safety for mineral exploration

ORGANIZER: Bill Mercer, Avalon Advanced Minerals Inc.

The objective of the course is to give participants sufficient training in understanding what the typical risks are in mineral exploration, how to run a simple risk assessment, an introduction to accident root cause analysis, as well as the gathering and use of H&S statistics and some emphasis on the special higher risks associated with drilling (accidents) and helicopters (fatalities). For the more experienced participants, they will understand what a company should have in place to implement effective, high level H&S practices from the Board level to operations.

Participants will have enough information to start a health and safety (H&S) program, and given one existing at their company, they will understand better what a H&S program is attempting to achieve. The course is suitable for people with a range of experience levels. Speakers include seasoned experts in H&S from exploration, management, drilling and aviation (helicopters).

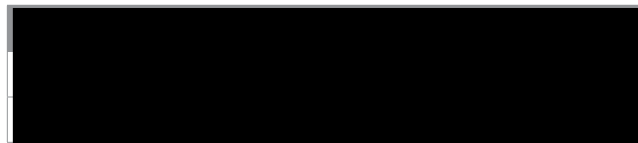
PRESENTERS:

Bill Mercer, Avalon Advanced Materials Inc.
Mark Wiseman, Avalon Advanced Materials Inc.
Jimmy Barrieau, Boart Longyear
Corey Taylor, Universal Helicopters

LEVEL OF COMPREHENSION: ALL LEVELS

COURSE FEE:

Includes course material, continental breakfast and lunch



The PDAC is pleased to offer this course at a special rate as part of the association's ongoing leadership in Health & Safety and its commitment to improving responsible exploration.

9:00 am – 4:30 pm

Environmental intelligence: A tool box to decrease risk, improve performance and increase bottom line performance

ORGANIZER: EcoMetrix

The environment factors into every stage of the mine life cycle. Forward-thinking companies understand this and make the environment part of their overall corporate strategy, with the benefits being accurate financial forecasting, optimized resource allocation, and enhanced social license. This course encourages participants to think proactively about the environment — in a unique way. The course introduces environmental intelligence, focusing on behaviours we see as critical to successful outcomes. We distill behaviours into a tangible tool-box to plan, manage and ensure project success. The course has been taught previously with broad appeal — from senior level mining executives, regulators, environmental practitioners/consultants and students — and has established industry wide that:

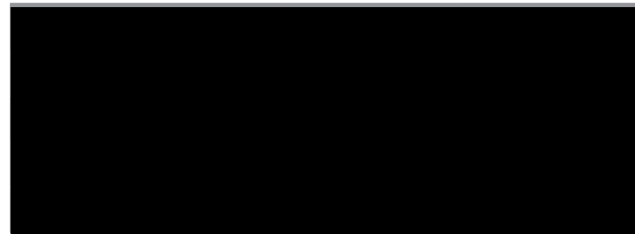
1. It is critical to develop a clear conceptual model of the project up front to avoid costly errors;
2. Strategies are required to move from data collection to clear communication of outcomes;
3. Implementation strategies for company-wide review of environmental performance are required to anticipate risks.

PRESENTERS:

Elizabeth Haack, EcoMetrix
Sarah Barabash, EcoMetrix
Lesley Warren, University of Toronto
Brent Murphy, Seabridge Gold

LEVEL OF COMPREHENSION: ALL LEVELS

COURSE FEE:





9:00 am – 4:30 pm

Greenstone belt architecture and metal endowment within the Abitibi Terrane

ORGANIZER: Mineral Exploration Research Centre (MERC)

The course will focus on the gold and base metal endowment of Archean granite to greenstone terranes within the Superior Craton at regional to camp and deposit scales utilizing integrated 4D architecture interpretations derived from surface geology, geochronology and geophysical surveys. The course will highlight new results from Laurentian University's Metal Earth program where in excess of 1,000 km of reflection seismic, magnetotelluric and gravity surveys have provided some of the highest resolution crustal imaging across transects of up to 130 km in length within the Abitibi and the Wabigoon terranes. The geophysical studies are complemented by studies at craton to transect scales, which emphasize integration of field, laboratory, geochemical and isotopic results providing new insights into the geological and metallogenic framework of Archean granite to greenstone terranes, their relationship to metasedimentary terranes, the mantle metal reservoirs underlying granite-greenstone terranes, and the architecture of the structural conduits controlling endowment via upward migration of melts and mineralizing hydrothermal fluids. The course will consist of presentations by Metal Earth's principal investigators and researchers.

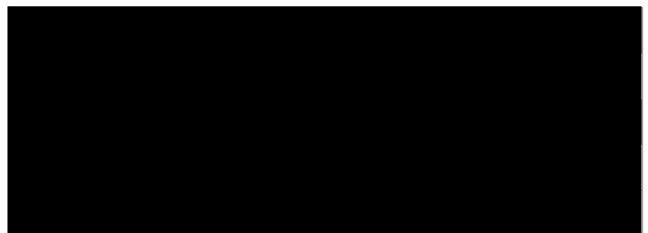
PRESENTERS:

Ross Sherlock, Laurentian University
David Snyder, Laurentian University
Lucy Mathieu, Laurentian University
Rasmus Haugaard, Laurentian University
Xiaohui Zhou, Laurentian University
Kate Rubingh, Laurentian University
Zsuzsanna Toth, Laurentian University
Taus Jøergensen, Laurentian University

LEVEL OF COMPREHENSION: INTERMEDIATE

Participants should have a BSc in Geology.

COURSE FEE:



PROGRAMMING

Short Courses *Admission with ticket*

SATURDAY, FEBRUARY 29

Saturday, February 29 8:30 am – 4:30 pm

Sunday, March 1 8:30 am – 12:00 pm

Fundamentos de estimación de recursos minerales



ORGANIZER: RPA

RPA and the PDAC will present the popular Fundamentals of mineral resource estimation course in Spanish.

Este curso, presentado por un equipo de expertos profesionales de RPA, introduce los fundamentos de estimación de recursos minerales. El contenido se ha preparado para una audiencia de geólogos de exploración y mina ya que estos son los principales responsables en el descubrimiento, definición y producción de depósitos minerales. El propósito de este curso es delinear los componentes clave y las consideraciones de importancia en la estimación de recursos minerales para que la audiencia pueda incorporar lo aprendido a su trabajo.

El curso comienza con bases de datos de perforación y avanza cubriendo dominios de recursos, análisis de tendencias, análisis exploratorio de datos, técnicas de estimación, cálculo de leyes de corte y criterios de clasificación. Se explorarán consideraciones específicas para el modelo de recursos minerales, incluyendo aspectos prácticos como el método de minado propuesto y el equipo, así como aspectos geoestadísticos tales como criterios en la selección adecuada de dominios. RPA explicará los fundamentos y la importancia de cada paso, y mencionará riesgos y errores comunes.

Los ejercicios que complementan el contenido del curso pueden incluir: interpretación geológica, verificación de base de datos, tratamiento de valores extremos, cálculo de leyes de corte, análisis exploratorio de datos, estimación de ley de bloques, estrategias para elipses de búsqueda, clasificación y verificación de modelos de bloques.

PRESENTADORES:

Sean Horan, RPA

Jose Texidor Carlsson, RPA

Rosmery Cardenas, RPA

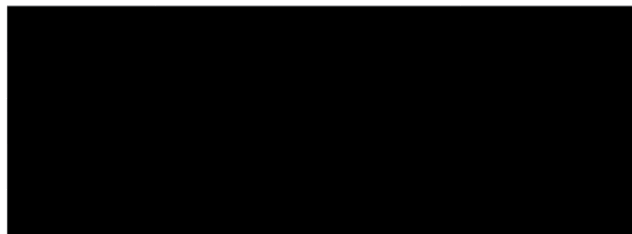
Ian Weir, RPA

NIVEL DE COMPRENSIÓN: PRINCIPIANTE A INTERMEDIO

Los participantes deberían tener un entendimiento de depósitos minerales y un nivel básico de exploración minera, incluyendo perforación.

PRECIO DEL CURSO:

Incluye material del curso, desayuno continental el Sábado y el Domingo, almuerzo de tres platos el Sábado y café ambos días.



SUNDAY, MARCH 1

8:00 am – 12:00 pm

Public reporting, professional practice, and industry guidance: Meeting expectations of securities regulators

ORGANIZER: Ontario Securities Commission

While NI 43-101 is the “public face” of mining disclosure in Canada, there are several key organizations that play a significant role in the overall stability of the mining disclosure rule. This course will discuss the interdependence of securities regulators, professional geoscience regulators, and technical societies in maintaining the confidence in public reporting.

NI 43-101 sets minimum standards for disclosure—it does not prescribe how exploration programs are designed and executed or how mineral resource and mineral reserve estimates are prepared. This means the qualified person, with the required technical competence, relevant experience, and professional ethics plays a critical role in upholding the success, or failure, of the disclosure regime. Presenters from Professional Geoscientists Ontario will cover the ethical obligations of professional geoscientists, including procedures when practitioners fail in their duty to uphold or protect the public interest. Members from the CIM Best Practice Committee will discuss recent updates to the best practice guidance documents for mineral exploration and estimation of mineral resources and mineral reserves. Securities regulators will present findings from recent compliance reviews, particularly disclosure of mineral resource estimates in technical reports.

PRESENTERS:

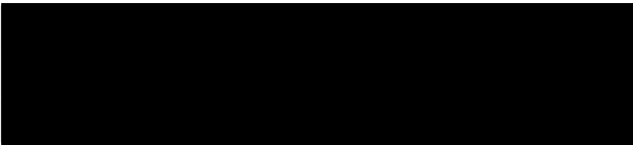
Craig Waldie, Ontario Securities Commission
James Whyte, Ontario Securities Commission
Reno Pressacco, CIM Mineral Resource and Mineral Reserve Best Practices Committee
John Ryder, Chair, Professional Geoscientists Ontario

LEVEL OF COMPREHENSION: ALL LEVELS

Participants should have a basic understanding of NI 43-101.

COURSE FEE:

Includes course material, hot buffet breakfast and refreshments



WEDNESDAY, MARCH 4

8:30 am – 4:30 pm

Qualitative and quantitative prospectivity mapping and assessment of undiscovered mineral resources

ORGANIZER: Beak Consultants GmbH

This short course provides an overview of several commonly used knowledge- (conceptual) and data-driven (empirical) methods for qualitative mineral prospectivity mapping (MPM), and the three-part methodology for quantitative mineral resource assessment (QMRA) of undiscovered mineral resources. The development and integration of these methods are reviewed, including theoretical underpinnings, practical implementation and recently developed software tools. Workflows and best-practices based on case studies in the USA, Finland, Sweden, Greenland and Germany are demonstrated and discussed.

The short course will provide the participants with:

- 1) a knowledge of the commonly used methods;
- 2) an understanding of the basic principles of these methods;
- 3) an understanding how the methods can be applied; and,
- 4) an understanding of the possibilities and limitations of the methods.

More importantly, the course will focus on the practical demonstration of the methods by introducing selected software tools and highlighting results that can be acquired by using these tools.

PRESENTERS:

Joshua Coyan, United States Geological Survey (USGS)
Vesa Nykänen, Geological Survey of Finland (GTK)
Johanna Torppa, Geological Survey of Finland (GTK)
Kalevi Rasilainen, Geological Survey of Finland (GTK)
Simon Mose Thaarup, Geological Survey of Denmark and Greenland (GEUS)
Andreas Brosig, Beak Consultants GmbH
Andreas Knobloch, Beak Consultants GmbH
Jens Rönqvist, Scandinavian GeoPool

LEVEL OF COMPREHENSION: ENTRY-LEVEL, INTERMEDIATE

Participants should have a basic understanding of the concepts of GIS (geographic information systems).

COURSE FEE:



PROGRAMMING

Short Courses *Admission with ticket*

WEDNESDAY, MARCH 4

2:00 pm – 5:30 pm

The value proposition for geophysics: It's not just discovery

ORGANIZER: Condor Consulting

The minerals exploration industry services the larger mining industry to primarily locate and define new resources, as well as to help mining firms undertake the cost-effective exploitation of nature resources from development, through to production, and then mine closure and remediation. Within the minerals exploration industry, the geophysical component of this is a large, and in many ways quite complex, sub-community, made up of a number of generally privately-held companies with numbers ranging from the singular for many consulting groups to 125-150 for the larger service companies offering ground and airborne services.

The mining companies themselves employ a number of geoscientists who apply their talents to the task of seeking greenfield opportunities, evaluating submissions from third parties, or assisting the with geoscience tasks on the company's own deposits. Geophysical staff, outside contractors or consultants have the opportunity to add value in all aspects of the task cycle, but their contributions in a fiscal sense are seldom cited beyond when actual discoveries are made. In such situations, it has historically been very difficult to apportion what could be considered fractional contributions to success. The client for the work seldom seems to have much interest in how the discovery comes to pass, or if they do, it's a personal memory that will either fade with time or be carried off with the individual.

These difficulties in documenting outcomes using geophysics does not mean this has not been done, and part of the workshop will be to review the role of geophysics going back to the start of the 20th century. Following this review, the remaining speakers will endeavor to define in a variety of sub-areas, how in the modern geophysics is adding significant value to the mining industry. This sort of information potentially has significant value to stakeholders, investors, others in the minerals geoscience profession, governments, academia and end-users of geophysical services.

PRESENTERS:

Richard Schodde, MINEX

Ken Witherly, Condor Consulting

Rob Gordon, Quantec Geoscience Ltd.

Joel Jansen, Anglo American

Daryl Ball, Glencore Canada

Jon Woodhead, JAW Consulting

LEVEL OF COMPREHENSION: ALL LEVELS

COURSE FEE:

