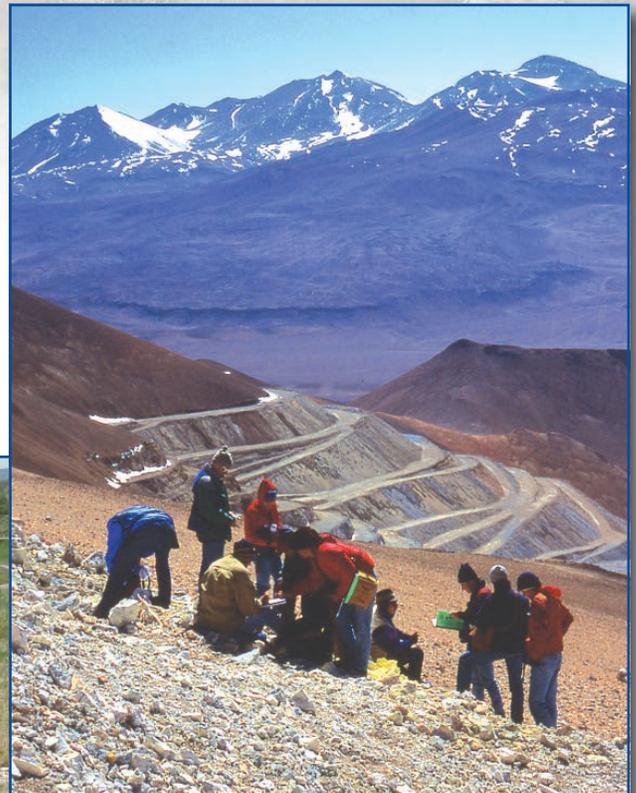




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Education and Training Curriculum Course Catalog 2016

- ✕ **Mentorship**
- ✕ **Education**
- ✕ **Opportunity**
- ✕ **Exploration**
- ✕ **Discovery**



SOCIETY OF ECONOMIC GEOLOGISTS



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The 2016 Committee

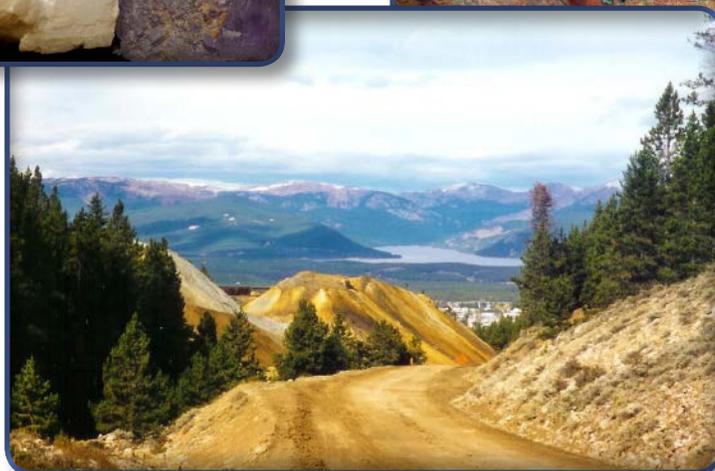
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2016 Education and Training Curriculum

The following is a preliminary list of short courses (**SC**) and field trips (**FT**) scheduled for 2016. SEG reserves the right to cancel courses or modify speakers, topics, and locations.

Official registration information will be available about three months prior to the courses. Visit segweb.org/events for the latest updates on courses and events!

SEG Short Course/Field Trip	SEG SC/FT Dates	Conference Dates	Venue/Location	Presenter(s)/Leader(s)
SC Geology of Granite-Greenstone Terranes and Their Mineral Deposits	January 23–24	AME BC Roundup January 25–28	Vancouver, Canada	Poulsen, Robert
SC Mineral Resource Estimation: An Introduction	February 7	Mining Indaba February 8–11	Cape Town, South Africa	Duggan
SC The Metallogeny and Exploration for Zinc Ores	March 4–5	PDAC March 6–9	Toronto, Canada	Leach, Franklin, Megaw
SC/FT SEG-SGA-UNESCO Latin American Metallogeny Course	April 20–30	N/A	Copiapo, Chile	Hedenquist, Mpodozis, Sillitoe, Tornos, Fontboté
SC Exploration in the 21st Century	May 19	SIMEXMIN May 15–18	Ouro Preto, Brazil	Aguirre
FT SEGF Student Field Trip to Porphyry Deposits of BC, Canada	August 17–25	N/A	Central and Southern BC	Schroeter, Logan
SC Gold Deposits: Their Geology, Geochemistry, and Genesis	August 27–28	35th IGC August 27– September 4	Cape Town, South Africa	Goldfarb, Simmons
SC Economic Geology 101	August 28	35th IGC August 27– September 4	Cape Town, South Africa	Robb, Kinnaird
FT1 Biga Peninsula: Au-Cu-Mo-Pb-Zn Deposits	September 20–24	SEG 2016 September 25–28	Departs from and returns to İzmir, Turkey	Ceyhan
FT8 Balkans II: Tour of Greece and Bulgaria with a Mix of Porphyry-Epithermal Deposits and Recent Discoveries	September 29– October 3	SEG 2016 September 25–28	Departs from and returns to İzmir, Turkey	Voudouris, Siron
SC Senior Exploration Management	November 29– December 2	N/A	Littleton, Colorado	Hronsky, Suchomel, Margeson, Bussey, Welborn

Geology of Granite-Greenstone Terranes and Their Mineral Deposits

January 23 – January 24, 2016 | 8:30 AM – 5:00 PM
Vancouver Convention Centre East Meeting Level, Room 11



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DESCRIPTION

Granite-greenstone terranes are remnants of once larger tracts of meta-volcanic, meta-plutonic and meta-sedimentary rocks now surrounded and / or intruded by granitoid rocks of similar absolute age. They are composed mainly of subaqueous volcanic and sedimentary rocks which have been metamorphosed from sub-greenschist to amphibolite facies mineral assemblages and are important sources of gold as well as other commodities.

The course will provide an overview of the fundamental geological principles and tools needed to work effectively in this geological setting with reference to illustrations from both Precambrian shields and younger accretionary orogens. The recognition, in outcrop and diamond drill core, of volcanic, sedimentary and plutonic protoliths which have been altered, metamorphosed and deformed is a recurring practical problem: the application of basic field criteria along with supporting geochemical, geophysical and geochronological data will be demonstrated as a means of establishing a structural-stratigraphic framework for gold exploration.

Geological descriptions of the main types of gold deposits typically found in this setting will be augmented by a discussion of commonly accepted exploration guidelines for them. The geological history of gold districts and gold belts will be illustrated with numerous case histories to build an overall picture of the tectonic and metallogenic evolution of these terranes.

The course will be delivered over **two days** and consist of **eight two-hour modules** including questions and breaks.

It will be aimed particularly at individuals involved in, or anticipating to be involved in, mineral exploration and mining in granite-greenstone terranes including young professionals and students, as well as managers who possess some geological background.

PRESENTERS



■ **K. Howard Poulsen** specializes in structural aspects of exploration. With more than 40 years experience in research and exploration, Howard has numerous publications in peer-reviewed journals and has consulted for the U.S. Geological Survey, the USSR Institute of Geology and Applied Mineralogy, Shenyang Institute, P.R.C., the BGR (gold deposits in Africa), and UNESCO (the Carpathian arc). His focus is on problems of significance to global mineral exploration. Most recently, Howard has worked for industry on gold deposits in the Canadian Shield, eastern Africa, Western Australia, and in the North American Cordillera, from Honduras to Alaska.



■ **François Robert** began working with the Geological Survey of Canada in 1985 as a research scientist with the Mineral Deposits Division, for which he conducted applied research on the geology of gold deposits in Canada and abroad. In 1997, he joined Barrick Gold Corporation, first as Senior Research Geologist, and subsequently in various positions in Australia, South America, and Canada. He is currently VP and Chief Geologist, Global Exploration. In the last 30 years, François has developed extensive expertise on the geology, structure, and setting of gold deposits in granite-greenstone terranes around the world, including Australia, Brazil, Canada, and Tanzania. François is a recipient of the SEG Lindgren Award and the SEG Silver Medal.

REGISTRATION Online at <http://www.amebc.ca/roundup/short-courses>

SEG & AME BC Member Price: CAD\$695 • Non-member Price: CAD\$850 • Student Fee: CAD\$295



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Mineral Resource Estimation: An Introduction

The University of Cape Town | Rondebosch, South Africa • February 7, 2016

DESCRIPTION

This SEG workshop will be held at the University of Cape Town on February 7, 2016, **the Sunday prior to the Mining Indaba meeting**. The workshop will focus on the fundamentals of geology and sampling that are required for robust mineral resource estimation and will include an introduction to variography and kriging. Industry geologists, mine managers and investors, and upper level undergraduate and graduate students in economic geology will find the workshop relevant and useful.

Session 1: Introduction to Mineral Resource Management (MRM), the importance of geology for estimation, and correct modeling, drilling and sampling, QA/QC.

Session 2: Data validation, statistics and Exploratory Data Analysis (EDA), introduction to geostatistics.

Session 3: Spatial analysis, variogram modeling and ordinary kriging.

Session 4: Mineral resource classification and introduction to non-linear geostatistics.

Informal reception and networking.

PRESENTER



Sean Duggan

Geologist with more than 30 years of international experience in mineral exploration and mineral resource evaluation. Currently enjoying working as a Z* consultant evaluating mineral resources. Previously employed by De Beers, Namdeb, and Anglo American in

various capacities, estimating and classifying mineral resources. His main focus is currently on diamonds and base metals.

Specialties: mineral resource estimation, mineral resource classification, evaluation and mining of marine diamond placers, optimizing drilling and sampling programs, resource geology, evaluation of diamond placers, mineral resource valuation, mineral resource due diligence, and technical reviews.

REGISTRATION

Online at segweb.org/events#16RMRUCT

Early Registration

(through January 18, 2016)

Member: US\$395

Non-member: US\$495

Student: US\$195

Student Non-member: US\$245

Late Registration

(after January 18, 2016)

Member: US\$495

Non-member: US\$595

Student: US\$245

Student Non-member: US\$295

Please note that SEG reserves the right to cancel this event should minimum attendance numbers not be met by January 18, 2016. For further information on cancellation policy, event photography, and dietary restrictions, visit www.segweb.org/tc.



SEG at PDAC 2016

www.segweb.org

Metallogeny and Exploration for Zinc Ores: Meeting the Challenge for New Resources

Short Course: Friday, March 4 and
Saturday, March 5, 2016 | 8:00 am–5:00 pm

DESCRIPTION

This short course provides an overview of the metallogeny of the most important sources of zinc ores: clastic-dominated, Mississippi Valley-type, volcanic-hosted massive sulfides and carbonate replacement deposits. The focus of the short course is to provide the exploration geologist with practical, process-based exploration tools and concept-based targeting based on insights into why and where these ores form in the Earth's crust. The course will benefit graduate students interested in recent advances in ore models, exploration geologists targeting deposit to belt-scale resources and exploration managers wanting an update on the most recent ore guides and ideas.

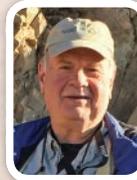
Examples of the world's important mineral districts and giant deposits will be discussed to provide insights into the coupling of geological and geochemical host-rock attributes with tectonics, structural features and fluid-flow that controlled ore deposition. To illustrate the variations within each ore type, discussions on the geological, structural and tectonic settings, alteration, zoning attributes, petrochemical constraints and distal footprints to ores will emphasize the spectrum of deposits.



PRESENTERS



- Peter K.M. Megaw**, President of IMDEX/Cascabel and co-founder and CXO of MAG Silver, brings 37 years of exploring Mexico for carbonate replacement deposits (CRDs) and epithermal veins to the course. He has published extensively on CRDs and he and his team are credited with the significant Juanicipio-Fresnillo, Zacatecas; Platosa, Durango; and Cinco de Mayo, Chihuahua discoveries. Peter was awarded the SME 2012 Robert M. Dreyer Award for Excellence in Applied Economic Geology and the Carnegie Mineralogical Medal for 2009.



- David Leach** is an Affiliated Professor at the Colorado School of Mines and a consultant to the minerals industry. After 32 years at the US Geological Survey, he has spent most of his time consulting internationally for base and precious metals. He authored or co-authored more than 200 papers on the geology and geochemistry of ore deposits. His career focused on sediment-hosted Pb-Zn deposits, ore formation in metamorphic environments, global metallogeny and deposit targeting.



- Jim Franklin** began his VMS career with Sturgeon Lake and soon extended his work to northern Manitoba. In 1981 he initiated the GSC's Marine Minerals Program, discovering, mapping and drilling "black smoker" seafloor systems: From both the land and seafloor work he developed a robust set of guidelines that help steer modern exploration. In 1992 he became Chief Scientist for the Geological Survey of Canada, and since 1998 he has been advising about 50 companies on VMS-related exploration in every continent except Antarctica.

REGISTRATION

Online at www.segweb.org/events. For SEG members to receive the discounted course registration rate, please download the registration form at www.segweb.org/16PDACSEG-Form. Your SEG Member ID is required.

Course Fee (including course material, continental breakfast, 3 course lunch, and refreshments):

Early Registration

(through February 6, 2016)

PDAC or SEG Member: US\$699
Non-member: US\$799
Student Member: US\$359

Late Registration

(after February 6, 2016)

PDAC or SEG Member: US\$899
Non-member: US\$999
Student Member: US\$359

Please note that SEG reserves the right to cancel this event should minimum attendance numbers not be met by February 6, 2016.



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SEG Workshops at 35th IGC



Gold Deposits: Their Geology, Geochemistry, and Genesis (Sat-Sun 27-28 August, 2016)

Description:

This two-day workshop is for those who want to improve their understanding about the geology and genesis of gold deposits. The course will provide a comprehensive overview of all aspects of the geology of gold ores in arc environments and metamorphic terranes. Geology, geochemistry, mineralogy, alteration, structure, tectonics, and exploration approaches will be covered for the main gold deposit types.



Presenters:



Richard J. Goldfarb was senior research geologist with the Minerals Program of the U.S. Geological Survey, where he was employed for more than 32 years. His expertise is in the geochemistry and geology of ore deposits, with emphasis on Phanerozoic orogenic gold. Earlier career work concentrated on the Tertiary orogenic gold deposits of southern Alaska. Results were used to develop ore genesis models for giant gold deposits. In recent years, Rich has conducted detailed studies on the distribution of orogenic gold deposits through space and time. He has senior- and co-authored more than 195 refereed publications in economic geology.

Stuart F. Simmons is a research geoscientist at EGI-University of Utah and a consulting geoscientist, with >30 years' experience in hydrothermal processes, epithermal mineralization, and geothermal resources. Much of his professional career was spent in New Zealand, at the Geothermal Institute, University of Auckland. As a consultant, Stuart serves clients around the Pacific Rim in the exploration and development of gold-silver and geothermal resources (website: www.hotsolutions.co.nz).



Economic Geology 101 (Sun 28 August, 2016)

Description:

This one-day course will introduce participants to the discipline of economic geology in terms of opportunities for career paths and for academic research. A series of short modules on ore deposit topics, prepared by experts in the field, will range from global metallogeny to deposit scale analysis.



Presenters:



Laurence Robb was Professor of Economic Geology at the University of the Witwatersrand (Wits), South Africa, 2001-2005, and Director of its Economic Geology Research Institute (EGRI). He is currently Visiting Professor in the Department of Earth Sciences at the University of Oxford. He has worked for over 30 years on many the great mineral districts of the African continent and is currently involved in research on the metallogeny of Myanmar/Burma and Western Sahara. He served as a technical consultant with The Mineral Corporation and remains directly involved with various exploration ventures in Africa.

Judith A. Kinnaird has spent most of her career as a University lecturer and has taught at University College Cork in Ireland as a distance tutor for the Open University in Scotland and Ireland. For the last 13 years, she has been at the University of the Witwatersrand in Johannesburg, where she is Associate Professor. She is Deputy Director of the Economic Geology Research Institute within the University. Project interests include dimension stone, gem deposits, Li-Be, Nb-Sn-W, REE-U, and Pb-Zn mineralization. Current research includes platinum and chromium mineralization of the Bushveld Complex with a focus on the northern limb, the link between the Damaran Orogen of Namibia and the Katangan-Lufilian of Zambia, and uranium deposits of southern Africa.



Early Registration Rates: until May 31, 2016

Members (R6,000); (US\$400)
Non-Members (R7,000); (US\$467)
SEG Students (R3,000); (US\$200)
Non-member Students (R3,500); (US\$233)

Standard Registration Rates: June 1, 2016

Members (R7,000); (US\$467)
Non-Members (R8,000); (US\$533)
SEG Students (R3,500); (US\$233)
Non-member Students (R4,000); (US\$267)

Early Registration Rates: until May 31, 2016

Members (R2,000); (US\$133)
Non-Members (R3,000); (US\$200)
SEG Students (R1,000); (US\$67)
Non-member Students (R1,500); (US\$100)

Standard Registration Rates: June 1, 2016

Members (R3,000); (US\$200)
Non-Members (R4,000); (US\$267)
SEG Students (R1,500); (US\$100)
Non-member Students (R2,000); (US\$133)

Approximately R15 = US\$1

Register online at www.35igc.org

Short Courses

Due to low registration, SEG has cancelled all short courses. There are plenty of guest activities to enjoy during your stay in Çeşme.

Field Trips

Due to low registration, SEG has scaled back on the field trips. FT1 and FT8 will proceed as planned and there are still plenty of guest activities to enjoy during your stay in Çeşme.

FT1 Biga Peninsula: Au-Cu-Mo-Pb-Zn Deposits

Pre-conference field trip
departure and return site: Izmir

September 20–24, 2016

Field Trip Leader

- **Nuri Ceyhan**, MSc. Principal Geologist, Teck Madencilik A.S. (Subsidiary of Teck Resources)

Description

Biga Peninsula in northwestern Turkey, located within the Tethyan metallogenic belt, is an emerging gold-copper district with a number of new discoveries in the last two decades. Mineral deposits of the Biga Peninsula district are dominated by magmatic arc-related hydrothermal systems. Epithermal Au-Ag (HS & LS), porphyry Au-Cu-Mo and base-metal skarn deposits are associated with Tertiary calc-alkaline magmatism and include the economically most important deposits. We will visit Ovacık (Au), Tepeoba (Cu, Mo, Au), Balya (Pb, Zn) active operations and Kestanelik (Au), TV Tower (Au, Ag, Cu), and Halılağa (Au, Cu, Mo) deposits. Discussions on the current understanding of the geology, genesis of the deposits, discovery history, and key outcrops

and deposit visits will be the main focus of the trip. In addition to site visits, participants will have the opportunity to visit the ancient cities of Troy and Pergamon on the return trip to Izmir.

FT8 Balkans II: Tour of Greece and Bulgaria with a Mix of Porphyry-Epithermal Deposits and Recent Discoveries

Post-conference field trip
departure site: Izmir

September 29–October 3, 2016

Field Trip Leader

- **Dr. Panagiotis Voudouris**, Associate Professor, National and Kapodistrian University of Athens
- **Chris Siron**, Eldorado Gold Corporation
- **Dr. István Márton**, Dundee Precious Metals Inc, Toronto, Canada and University of Babeş-Bolyai, Cluj-Napoca, Romania

Description

This field trip will introduce participants to the geology and mineralization that characterizes selected gold deposits in Greece and Bulgaria. It will include site visits to Eldorado's gold operations and development projects in Greece and Dundee's gold deposit in Bulgaria.

The Skouries porphyry gold-copper deposit is a Miocene pencil-porphry stock that intruded into schists and gneisses within the Serbo-Macedonian massif. The Olympias and Stratonis orebodies are Au-Pb-Zn-Ag-Cu carbonate replacement deposits hosted in marbles of the southern Rhodope core complex. Sapes Au-Cu-Te deposit is a telescoped porphyry-epithermal system with spectacular outcrops of advanced argillic alteration within an eroded Oligocene volcanic edifice. Perama Hill is an epithermal high sulfidation gold deposit hosted within sandstone, conglomerate, and andesite of the Petrota graben. Dundee's Adatepe development project located in south of the town of Krumovgrad in southeastern Bulgaria is an epithermal low sulfidation adularia-sericite gold-silver deposit hosted within Paleocene sedimentary rocks overlying the Kessebir core complex. Kavala is a newly-recognized intrusion-related gold system (IRGS) with gold-rich sheeted veins hosted within the Miocene Kavala granodiorite. The field tour will also include tourist-type site visits in both countries.

All trip participants will be guests of Eldorado and Dundee and will need to abide by the occupational health and safety requirements of the operations while on site.



Ovacık Mine Open Pit



Madem Lakkos

Senior Exploration Management Course



SEG Course Center | Littleton, CO, USA
November 29–December 2, 2016, 8:30am – 5pm



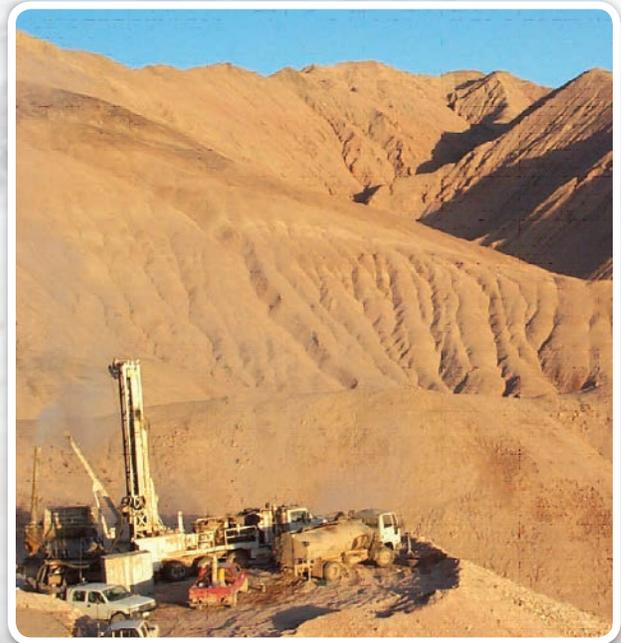
Organizer: Society of Economic Geologists (SEG)
Presenter: Western Mining Services (WMS)

SCOPE

This four-day training course concerns the principles and practices of effective mineral exploration management. The curriculum covers the broad spectrum of technical and business issues that senior exploration managers typically face.

- Mineral exploration at the strategic scale – the roles of greenfields and brownfields exploration in development and implementation of corporate growth strategies
- The design and management of exploration programs and portfolios
- The importance of group structure, program design, process discipline, and effective people management in achieving exploration group objectives
- Opportunity generation including the exploration search space concept, targeting science and the application of targeting models
- How to negotiate land and minerals access deals, identify and manage nontechnical project risks, engage in early stage evaluation of project economics, and maintain the important social license to operate exploration projects in varied risk environments

The course format utilizes lecture and workshop and stresses interactive thinking and problem solving. Participants work in teams to design solutions for exploration management challenges and present their results to the larger group.



WHO SHOULD ATTEND?

This course is ideal for regional and country exploration managers, for senior project managers who are on track to move into positions of senior responsibility, and for geoscientists who aspire to senior exploration management roles. The course is also recommended for commercial managers who participate in mineral exploration programs as well as government and academic professionals who interact with the mineral exploration industry.

This course is fundamental to the understanding of complexities in managing and leading exploration programs in the modern minerals industry. The highly trained and experienced team from WMS provides tools to design and execute the different aspects of exploration strategy and process. All the key topics are presented in a methodical and systematic way, and enriched with real case studies. I strongly recommend this course to any professional explorer who wishes to excel in the business of mineral exploration.

*César Aguirre - VP Exploration Hochschild Mining (2011),
SEG Regional VP Lecturer (2016)*

This SEG-sponsored course in November-December 2016 will be the eleventh SEM Course presentation. WMS has also presented numerous in-house courses, each tailored to the needs of the individual client.

Senior Exploration Management Course

SEG Course Center | Littleton, CO, USA | Nov. 29–Dec. 2, 2016



FACULTY

■ Jon Hronsky (BAppSci, Ph.D., MAIG, FSEG)



With more than 30 years of experience in mineral exploration, Jon has worked across a diverse range of commodities, including discovery of the West Musgrave nickel sulfide province in Western Australia. Prior to joining Western Mining Services (WMS), he served as Manager of Strategy & Generative Services for BHP Billiton Mineral Exploration and as Global Geoscience Leader for WMC Resources Ltd. He is chairman of the board of the Centre for Exploration Targeting in WA.

■ Steven Bussey (BA, M.Sc, PhD)



At WMS, Steve's focus is on framework studies, mineral exploration targeting, and project due diligence. He has more than 35 years experience in mineral exploration. Before joining WMS in 2007, Steve worked in a number of senior exploration roles, including principal geoscientist for WMC Resources Ltd.

■ Brad Margeson (BA, M.Sc., SME, FSEG)



Brad held several senior management roles for WMC Resources Ltd. prior to co-founding WMS in 2005. At WMC, he was global manager of exploration projects, leading teams that discovered gold deposits in Canada. With 35 years experience in the industry, Brad's focus is on exploration strategy/planning, greenfield and brownfield exploration targeting, and due diligence.



■ Jeff Welborn (BA, JD)



Jeff is a co-founder and partner at WMS and has more than 40 years' experience as a mining, oil & gas and natural resources lawyer. His experience covers a broad range of commercial, legal, and risk management matters in mineral exploration and mining. He assists WMS clients globally with commercial strategy development, program design and planning, deal analysis and negotiation, and minerals and land access.

Registration *(early deadline: November 10, 2016)*

Register online: segweb.org/events#16RWMSSEM

Member (Early / Late) – US\$3,200 / US\$3,400

Non-member (Early / Late) – US\$3,500 / US\$3,700

CURRICULUM

Day 1	Day 2	Day 3	Day 4
<ul style="list-style-type: none"> Mineral Exploration Principles, Philosophies and Culture Mineral Exploration Strategy, Business Planning and Portfolio Management People in Mineral Exploration <i>Introduction of Exploration Strategy Exercise</i> 	<ul style="list-style-type: none"> Minerals Access and Deal Making Commercial Risk Management Mineral Exploration Targeting <i>Introduction of Commercial Risk Management Exercise</i> 	<ul style="list-style-type: none"> Group Discussion Mineral Exploration Targeting (cont.) Mineral Exploration Tactics <i>Group Exercise</i> 	<ul style="list-style-type: none"> Commercial Risk Management Exercise Presentations Exploration Strategy Exercise Presentations Feedback, Awards, and Group Discussion <i>Wrap-up</i>

Please note that SEG reserves the right to cancel this event should minimum attendance numbers not be met by November 10, 2016. For further information on cancellation policy, event photography, and dietary restrictions, visit www.segweb.org/tc.



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