



Mineralogical Society of America and Geochemical Society



Short Course Announcement



Environmental Geochemistry, Mineralogy, and Microbiology of Arsenic

Dates: Short Course sessions are Sunday and Monday, June 15-16, 2014 (following Goldschmidt2014 Sacramento in June 2014).

Location: Short Course sessions are at the Miners Foundry, 325 Spring St., Nevada City, CA 95959 USA.

Convenors: *Robert J. Bowell*, SRK Consulting (UK) Limited, 5th Floor, Churchill House, 17 Churchill Way, Cardiff, CF10 2HH, Wales, UK, e-mail: rbowell@srk.co.uk
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Short Course Description: This short course and the associated *Reviews in Mineralogy and Geochemistry*, volume 79, will provide a comprehensive understanding of arsenic geochemistry in the near-surface environment. Topics to be covered include the mineralogy, thermodynamics, geochemistry, analysis, microbiology, and bioavailability of arsenic, with emphasis on implications for arsenic toxicity, geochemistry in natural groundwaters, and mine-associated impacts and possible mitigation options. The short course and *RiMG* volume will be useful for those seeking to understand arsenic geochemistry and biological interactions in the near-surface environment as well those working for mining companies, the chemicals industry, NGO's or government bodies concerned with reducing the impact of arsenic on the environment.

Agenda:

Day 1

- (9:00 – 9:10) Introduction and logistics (the organizers)
- (9:10 – 10:00) Introduction to the arsenic biogeochemical cycle (R. Bowell)
- (10:00 – 10:40) Mineralogy of arsenic in the near-surface environment (P. Drahotta)
- (10:40 – 12:10) Geochemical occurrence of arsenic in the geosphere, and distribution and speciation of

- arsenic in natural waters (K. Campbell and D.K. Nordstrom)
- (12:10 – 12:50) Lunch, at Miners Foundry
- (12:50 – 14:00) Thermodynamic properties for arsenic minerals and aqueous species (D.K. Nordstrom)
- (14:00 – 15:10) Chemical analysis of arsenic (M. Leybourne)
- (15:10 – 15:40) Break (check out bicycle race on Broad Street!)
- (15:40 – 17:00) Arsenic speciation in solids using x-ray absorption spectroscopy (C. Kim and A. Foster)
- (17:00 – 17:30) Additional discussion, questions for Day 1 speakers
- (17:30 – 18:30) Break
- (18:30 – 20:00) Dinner, at Miners Foundry

Day 2

- (8:00 – 9:00) Geomicrobiology of arsenic (J. Amend and C. Saltikov)
- (9:00 – 10:00) Arsenic toxicology and epidemiology (V. Mitchell)
- (10:00 – 10:20) Break
- (10:20 – 11:30) Arsenic bioavailability and bioaccessibility: in vivo and in vitro testing (N. Basta)
- (11:30 – 12:00) Discussion of regulatory approaches to arsenic bioavailability (M. Parsons)
- (12:00 – 12:40) Lunch, at Miners Foundry
- (12:40 – 13:00) Arsenic in Mother Lode gold deposits of California -- Recap of Empire Mine field trip (C. Alpers)
- (13:00 – 13:50) Legacy of mining and processing refractory gold ore at Giant Mine, Yellowknife, Northwest Territories, Canada (H. Jamieson)
- (13:50 – 14:40) The hydrogeochemistry and mineral speciation of arsenic in the Tsumeb ore deposit, Namibia (R. Bowell)
- (14:40 – 15:00) Break
- (15:00 – 16:00) Characterization of Arsenic in mine waste (D. Craw and R. Bowell)
- (16:00 – 17:00) The management and remediation of arsenic in industrial and mining effluent (R. Bowell and D. Craw)

Affiliations of the Organizers:

Rob Bowell, SRK Consulting, Cardiff, Wales, UK
 Charles N. Alpers, USGS, Sacramento, California, USA
 Heather E. Jamieson, Queen's University, Kingston, Ontario, Canada
 D. Kirk Nordstrom, USGS, Boulder, Colorado, USA
 Juraj Majzlan, Friedrich-Schiller University, Jena, Germany

Affiliations of other presenters:

Jan Amend, University of Southern California, Los Angeles, California, USA
 Nicholas T. Basta, The Ohio State University, Columbus, Ohio, USA
 Kate Campbell, USGS, Boulder, Colorado, USA
 David Craw, University of Otago, New Zealand
 Petr Drahota, Charles University and Academy of Sciences, Prague, Czech Republic
 Andrea L. Foster, USGS, Menlo Park, California, USA
 Christopher S. Kim, Chapman University, Orange, California, USA
 Matthew Leybourne, ALS Global, Vancouver, British Columbia, Canada
 Valerie Mitchell, DTSC, Sacramento, California, USA
 Chad Saltikov, University of California at Santa Cruz, California, USA

Chapter Titles for RiMG Volume

Chapter 1: Introduction to the Arsenic biogeochemical cycle
 Rob Bowell, SRK Consulting, UK
 Juraj Majzlan, Friedrich-Schiller University, Jena, Germany
 Chapter 2: Mineralogy of arsenic in the near-surface environment

- Petr Drahota, Charles University, Prague, Czech Republic
 Michal Filippi, Charles University, Prague, Czech Republic
 Juraj Majzlan Friedrich-Schiller University, Jena, Germany
- Chapter 3: Distribution and speciation of arsenic in natural waters
 Kate Campbell, USGS, Boulder, Colorado, USA
 Kirk Nordstrom, USGS, Boulder, Colorado, USA
- Chapter 4: Thermodynamic properties for Arsenic minerals and aqueous species
 D. Kirk Nordstrom USGS, Boulder, Colorado, USA
 Juraj Majzlan Friedrich-Schiller University, Jena, Germany
 Erich Konigsberger Murdoch University, Perth Australia
- Chapter 5: Measuring Arsenic Speciation in Environmental Media: Sampling, Preservation & Analysis
 Mathew Leybourne ALS Global
- Chapter 6: Arsenic Speciation in Solids Using X-ray Absorption Spectroscopy: Synopsis
 Andrea L. Foster, USGS, Menlo Park, California, USA
 Christopher S. Kim, Chapman University, Orange, California, USA
- Chapter 7: Geomicrobiology of Arsenic
 Jan Amend, University of Southern California, Los Angeles, California, USA
 Chad Saltikov, University of California at Santa Cruz, California, USA
- Chapter 8: Arsenic toxicology and epidemiology
 Valerie Mitchell, DTSC, Sacramento, California, USA
- Chapter 9: Using In Vivo Bioavailability and/or In Vitro Gastrointestinal Bioaccessibility Testing to Adjust Human Exposure from Soil Ingestion
 Albert Juhasz, CERAR, Univ. of S. Australia, Mawson Lakes, Salisbury, Adelaide, Australia
 Nicholas T. Basta, The Ohio State University, Columbus, Ohio, USA
- Chapter 10: Arsenic mineralogy and bioavailability at the Giant Mine
 Heather E. Jamieson, Queen's University, Kingston, Ontario, Canada
- Chapter 11: The hydrogeochemistry and mineral speciation of arsenic in the Tsumeb ore deposit, Namibia
 Rob Bowell, SRK Consulting, UK
- Chapter 12: Arsenic geochemistry in mine waste
 Dave Craw, University of Otago, Dunedin, New Zealand
 Rob Bowell, SRK Consulting, UK

Fees:	Professional Registration	
	Members (MSA, GS, DMG, EAG, EMU, and GSJ)	\$ 467
	Non-members:	\$ 578
	Student Registration:	\$ 208

Registering: The deadline for the short course registration is 8 May 2014. Online registration is at <<http://goldschmidt.info/2014/>>. You must sign in or register at website in order to register for the course and Conference.

To register for ONLY the short course, please send email to <helpdesk@goldschmidt.info> to request assistance.

Participants in the short course do not have to register for the Goldschmidt Conference, but may wish to consider a one-day registration which will entitle them to visit arsenic-related posters on Thursday afternoon 12 June (16:30–18:30) and oral presentations on Friday 13 June that will focus on arsenic geochemistry, bioavailability, and bioaccessibility (session 20g).

Includes: Registration fee includes MSA/GS short course sessions, the *Reviews in Mineralogy and Geochemistry* volume, lunch and dinner on 15 June, lunch on 16 June, and transportation from Sacramento to Nevada City and return. Those participating in both the field trip and short course will leave from the Sacramento Convention Center on 14 June at 7:30 and return on 16 June at 18:00. Those participating in the short course but not the field trip will leave from the Sacramento Convention Center on 15 June at 7:00 and return on 16 June at 18:00.

Transportation will also be provided between hotels in Grass Valley and Nevada City area and the short course venue, the Miners Foundry, on 15 June and 16 June.

Lodging: Registration fees do not include lodging or other meals. A limited number of hotel rooms have been reserved in the Nevada City / Grass Valley area for short course participants. Each participant must contact a hotel of their choice and make their own reservation.

Details for individual hotels and distance to the short course venue are listed below. Most hotels will hold the group reservation only until about 30 days before the reservation (14 May).

Hotels with Group Reservations – ask for “Arsenic Short Course”

1. Northern Queen Inn 400 Railroad Ave. Nevada City, CA 95959, Tel. 1-530-265-5824, 1-800-226-3090 (from North America) <<http://www.northernqueeninn.com/>>. Single room rate: 83.00\$US plus tax (93.55\$US) per night Cabins may also be available. Distance to Miners Foundry: 1 km / 0.6 miles (~15 minute walk)

2. National Hotel 211 Broad St., Nevada City, CA 95959 Tel. 1-530-265-4551, Fax 1-530-265-2445 <<http://thenationalhotel.com/>>. Single room rate: 76\$US plus tax (85.66\$US) per night Double room rate: 92\$US plus tax (103.69\$US) per night Suite rate: 125\$US plus tax (140.89\$US) per night. Distance to Miners Foundry: 2 blocks / 0.1 mile (~3 minute walk)

3. Holbrooke Hotel 212 West Main St. Grass Valley, CA 95945, Tel. 1-530-273-1353, 1-800-933-7077 (from North America) <<http://holbrooke.com/>>. Single room rate – queen bed: 125\$US plus tax (138.61\$US) per night (Sat. 14th June) Single room rate – queen bed: 107.10\$US plus tax (118.61\$US) per night (Sun. 15th June) Single room rate – king bed: 134.10\$US plus tax (148.51\$US) per night (Sat. 14th June) Single room rate – king bed: 116.10\$US plus tax (128.71\$US) per night (Sun. 15th June). Distance to Miners Foundry: 7 km / 4.3 miles

4. Best Western Gold Country Inn 972 Sutton Way, Grass Valley, CA 95945, Tel. 1-530-273-1393, 1-888-839-6035 (from North America) <<http://www.bwgrassvalley.com/>>. email: info@heritagehotelgroup.com. Single room rate – king bed: 149.99\$US plus tax (169.05\$US) per night. Distance to Miners Foundry: 4.2 km / 2.6 miles

5. Gold Miner’s Inn – Holiday Inn Express 121 Bank St., Grass Valley, CA 95945, Tel. 1-530-477-1700, 1-888-465-4329 (from North America) <<http://www.ihg.com/holidayinnexpress/hotels/us/en/grass-valley/gsvca/hoteldetail>>. Single room rate – studio suite, king bed: 187.01\$US plus tax (210.78\$US)

Other lodging in the Nevada City / Grass Valley area

Although no rooms have been reserved, there are a number of small bed and breakfast locations in the area. For example:

1. Parsonage Bed & Breakfast 427 Broad St., Nevada City, CA 95959 Tel. 1-530-265-9478, <<http://theparsonage.net/rooms/index.html>>. Distance to Miners Foundry: 0.3 km / 0.2 miles (~5 minute walk)

2. Sierra Mountain Inn 816 West Main St. Grass Valley, CA 95945, Tel. 1-530-273-8133, <<http://www.sierramountaininn.com/>>. Distance to Miners Foundry: 7.4 km / 4.6 miles

For other B&B’s in the area, see:

<<http://www.nevadacitychamber.com/c/biz/bed-breakfasts/>>
<<http://www.downtowngrassvalley.com/grass-valley/places-to-stay.html>>

Conference

Field Trip: There is a one-day field trip (14 June 2014) before the short course to the Empire Mine State Historic Park in Grass Valley, CA, where arsenic-contaminated mine waste and mine drainage are undergoing remediation <<http://goldschmidt.info/2014/uploads/events/eventPDFaOh1ZD.pdf>>. The field trip has been scheduled such that participants can stay in Nevada City or Grass Valley overnight afterwards and then attend the short course.

The deadline for the field trip registration is 8 April 2014. The field trip is not part of the short course and requires a separate registration <<http://goldschmidt.info/2014/>>. You must sign in or register at website in order to register for the field trip and Conference.

To register for ONLY the field trip, please send email to <helpdesk@goldschmidt.info> to request assistance.

Participants in the field trip do not have to register for the Goldschmidt Conference, but may wish to consider a one-day registration which will entitle them to visit arsenic-related posters on Thursday afternoon 12 June (16:30–18:30) and oral presentations on Friday 13 June that will focus on arsenic geochemistry, bioavailability, and bioaccessibility (session 20g).

Participants on the field trip to Empire Mine State Historic Park on 14 June who are also attending the short course will be provided transportation to their hotel after the field trip.
