

Colorado Scientific Society

*In pursuit of the promotion of knowledge,
the understanding of science,
and its application to human needs.*

Metal Cycling in Lakes Resulting in Closure of Open Pit Mines in Nevada

by

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Evaluation of waste rock materials and existing pit lakes in Nevada indicates that bulk input of metals and acid is a function of pyrite oxidation in pit walls. However, the biogeochemical cycling pit often will determine the final pit lake water quality. Important processes may include sorption of metals to hydrous ferric oxide (HFO) minerals, settling of HFO in the water column, and the release of metals from lake sediments during diagenesis. Studies of existing Nevada pit lakes in porphyry copper and disseminated gold mines indicate that precipitation of HFO, and subsequent sorption of metals to these minerals as they settle, effectively removes As, Pb, Cu, Cd, and Zn from the water column to levels <50 $\mu\text{g/L}$ and this process can be effectively modeled using electrostatic sorption models. A perturbation study, in which an existing 200,000 L pit-bottom pond was spiked with acid leachate, indicated that HFO settles at a rate of $1.4 \times 10^{-6} \text{ m s}^{-1}$, lowering dissolved metals concentrations, due to sorption and coprecipitation of metals on HFO. Microcosm studies show that the release of arsenic from HFO-rich sediments is closely related to the type and amount of organic matter in the sediments, and the extent of sulfate reduction reactions. Base metals are generally not released from these sediments, due to the formation of insoluble sulfide minerals.

Expansive Soils, Heaving Bedrock and Modern Development: New Legislation for Respecting Geological Hazards in the West Denver Metro Area, Colorado

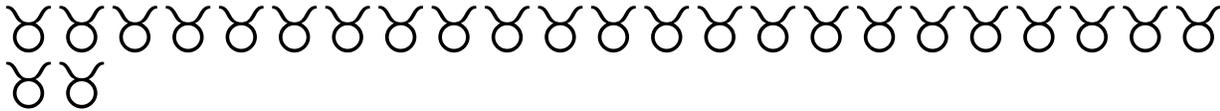
by

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Branch of Earthquake and Landslide Hazards
Golden, Colorado 80401

The Expansive Soils/Heaving Bedrock Task Force, appointed by the Jefferson County Board of County Commissioners, has been meeting since January 1994 to suggest changes in development regulations for the County. The desires for changes are driven by unique geological conditions, primarily in the Pierre Shale where it tilts steeply against the mountain front of the western Denver metro area. In this region, building practices based on experiences with flatter-lying expansive soils have frequently proven to be ineffective, and new practices were promulgated to mitigate costly damages to new and remedial construction in a special geological hazards overlay district. The multidisciplinary task force has

carefully constructed legislation that takes into account the needs of virtually all stakeholders in the overlay zone. We made extraordinary efforts to involve all stakeholders on the task force and in its deliberations consulting engineers, builders, developers, planners, home-warranty providers, roads and utilities experts, landscape architects, geologists, homeowners' representatives, real-estate agents, university professors, and local, state, and Federal officials_so that no interests would be neglected. This presentation examines the evolution of policy based heavily on geological considerations, and the respective roles of the U.S. Geological Survey and other participants on the task force in formulating that policy.

Society Notes



An Important Forthcoming Event

(as relayed by CSS member Marjorie E. Mac Lachlan)

The Colorado Scientific Society is likely to be featured this April 15 as a "Colorado Historical Moment" on the **Colorado Getaways** television program of Denver station KCNC, channel 4. The show airs at 6:30 p.m. Society memorabilia_the logo, banner, silver gavel, pictures of the founders and inventors, etc._and a brief text will describe our past and present activities.

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Colorado Scientific Society Spring Field Trip to Porcupine Cave

The Spring Field Trip will take place on Sunday, May 14, 1995. Don Rasmussen and Steve Sonnenburg will lead us to the southern reaches of South Park to visit the famous Porcupine Cave, site of one of the largest Pleistocene fossil vertebrate deposits in North America.

The cave has been excavated under the guidance of Rasmussen for the past several years and the recovered fossil materials are currently under study at the Denver Museum of Natural History.

Our traverse of South Park will include discussion of the structural evolution and Tertiary geomorphology of this area.

Costs of the trip will be on the order of \$35-\$40. Call Bob Reynolds to sign up and receive additional details at 762-9379.

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New members of the Colorado Scientific Society

Welcome!!

Peter E. Barkmann

Grant A. Richardson, Pacific Western Technologies

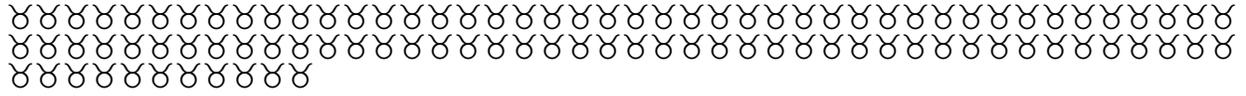
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Items for Newsletter

We would like to include any items of general interest regarding members, new programs, scientific meetings, etc., in future newsletters. Please submit materials (hardcopies and/or computer disk) to Brad Van Gosen, USGS, Box 25046, M.S. 905, Denver Federal Center, Denver, CO 80225, or call (303-236-

1566) or fax (303-236-5603). Please send items to the editor before the 20th of the month to ensure inclusion in the next newsletter.
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Earth Science Meetings



Colorado Scientific Society. The next regular meeting will be held on May 9, 1995, in the Green Mountain Room (second floor, southwest corner), Sheraton Hotel, 360 Union Boulevard, Lakewood, Colorado. Social time is 7:00 p.m., meeting starts at 7:30 p.m.

"The surprising discovery of oil in Mesozoic sediments in the San Luis Basin, Saguache County, Colorado" by Tom Watkins, Challenger Gold, Inc.

"Active volcanoes in the Goma region, Zaire, and their role in the Rwandan refugee crisis" by Tom Casadevall, U.S. Geological Survey

Rocky Mountain Association of Geologists. Regular meetings, held on the first and third Fridays of each month, consist of a lunch at 11:55 a.m. and a lecture at 12:25 p.m. in the New Banquet Room of the Wynkoop Brewing Co., 18th and Wynkoop Streets, lower downtown Denver. **Note that the April 7 meeting has been temporarily relocated to the Adams Mark Hotel (formerly the Radisson Hotel), Majestic Ballroom, 1550 Court Pl., downtown Denver.** Cost of the luncheon buffet is \$11. Reservations are taken on a recording line (303-623-5396) until 10:30 a.m. on the Wednesday before the luncheon. Reservations are **not** necessary to attend the talk only; however, there will be a \$2 charge at the door.

Apr. 7 **Meeting to be held at the Adams Mark Hotel, 1550 Court Pl., downtown Denver.** "Characteristics of Abnormally Pressured Compartments in the Southeastern Piceance Basin, Colorado" by Michael Wilson, Consultant (Presenter), Bret Gunneson, Legacy Energy Corp., Royale Honore, Mobil E & P, and Roy Enrico, Mobil E & P. Bret Gunneson and Michael Wilson will also display their AAPG Poster "A Structural History of Divide Creek Anticline, Piceance Basin, Northwest Colorado" for this luncheon meeting.

Apr. 21 Meeting returns to the Wynkoop Brewing Co. "Sleeping Giants" by A.T. (Toby) Carleton, President of AAPG and President of Tocar Exploration

Denver Mining Club. All regular meetings are on Thursdays, from 11:30 a.m. to 1:00 p.m. at the Denver Federal Center, Building 41 Cafeteria (south entrance), Lakewood. For

more information call Jane Ohl, Program Chairperson (303-237-4043).

Apr. 6 "Geology and mineralization of the Dewey deposit, Thunder Mountain District, Valley County, Idaho" by Pete Parsley, Special Projects Geologist, USMX, Inc.

Apr. 13 "Cretaceous tectonics and mineralization history of Idaho" by Lawrence W. Sneek, Geologist, Branch of Isotope Geology, USGS

Apr. 20 "ISO 9000 (quality standards) and its place in the industrial minerals world" by David A. Holmes, Industrial Minerals Consultant

Apr. 27 To be announced

Rocky Mountain Section-SEPM (Society for Sedimentary Geology). All lectures held at the Denver Press Club, downtown Denver, 1330 Glenarm Place, unless otherwise noted. Cash bar at 11:30 a.m., lunch at 12:00, speaker at 12:30 p.m. For reservations, call and leave message at 303-697-6698 by 5:00 p.m. of the Friday prior to the luncheon. For further information, call Dave Eby at 303-738-9697. Lunch reservation **not** required to attend lecture.

Next luncheon tentatively scheduled for April 25.

Denver International Petroleum Society ("D.I.P.S."). Meetings held on 2nd Friday of the month at the Wynkoop Brewing Co., 18th and Wynkoop Streets, lower downtown Denver. Reception at 11:30 a.m., luncheon at 12:00, program at 12:30 p.m. Reservations required by calling RMAG recording line (303-623-5396). Reservations accepted after 2:00 p.m. on Friday and before 10:30 a.m. on Wednesday before the meeting. Cost: \$13.00. Contact Keith Murray, 303-986-8554, for information.

Next luncheon to be held April 14.

Colorado School of Mines Department of Geology and Geological Engineering, Golden: Van Tuyl Lecture Series. Lectures are on Thursdays at 4:30 p.m. in Berthoud Hall, Room 108, followed by a social hour in the Fireside Lounge at the Student Center. For further information, call Greg Holden (303-273-

3855) or the Geology Department (303-273-3800).

Lectures are on Thursdays at 4:30 p.m. in Berthoud Hall, Room 108, followed by a social hour in the Fireside Lounge at the Student Center. For further information, call Greg Holden (303-273-3855) or the Geology Department (303-273-3800).

- Apr. 6 Michael West, Michael West & Assoc.
"Late Quaternary co-seismic surface deformation, Yakima Foldbelt, Washington."
(AEG Student Chapter Sponsor).
- Apr. 13 Fred Julander, Julander Energy Co.
"Rocky Mountain natural gas: A place in the sun in the future of energy"
- Apr. 20 Norman H. Foster, Independent Geologist
"Creative thinking in the earth sciences"
(Last lecture of the Spring semester_lecture series resumes on August 31, 1995)

American Institute of Hydrology – International Mine Water Association. The next annual meeting_ "Water Resources at Risk" _ will be held on May 14-18, 1995, at the Red Lion Hotel near Stapleton Airport in Denver, Colorado. For more information, contact Joe Downey or Ed Gutentag at 303-425-0419; fax 303-425-1053; Internet e-mail address is 76330.3650@CompuServe.COM.

Association for Women Geoscientists. New and prospective members are encouraged to find out more about AWG. For information contact Peggy Ganse, AWG President, 303-832-9636; fax 303-832-9616.

University of Colorado Department of Geological Sciences, Boulder. Lectures are held on Wednesdays at 4:00 p.m. in the Geology Building, Room 121 (unless otherwise noted). For more information about lectures call Joseph Smyth (303-492-6109) or the Geology Department (303-492-8142).

Friends of Dinosaur Ridge. Friends of Dinosaur Ridge and cooperating institutions conduct guided tours for visitors to the Ridge, and many people visit on their own. In all, at least 38,000 people visited Dinosaur Ridge during 1994. Friends wishes to spread the word that they plan to accommodate all groups interested in a tour, but do need to schedule groups in advance to avoid conflict. Groups can call Friends at **303-697-DINO** to schedule a tour or for information about Dinosaur Ridge activities and location of lectures. In addition to tours of the Ridge, Friends can provide talks, lectures, and slide shows. Call Bob Kosiba at 303-399-7556 and he'll arrange a trained volunteer to speak to your group.

"Open Ridge" tours of Dinosaur Ridge will take place on the following dates during 1995. All are Saturdays except July 4th.

April 22, May 13, June 10, July 4, August 12, September 23, and October 14.

For new and present members of Friends of Dinosaur Ridge who are interested in helping as volunteer guides, an orientation training field trip to Dinosaur Ridge is scheduled for Saturday, April 8, 1995. Prospective volunteers may call Karen Hester at 697-DINO or 420-0059 to register.

Teacher's Workshops. The Dinosaur Ridge Teacher's Workshop, a two-day one-credit class about Dinosaur Ridge for teachers, will be held on April 22 and 29, and on July 10 and 11. Register with the Colorado School of Mines Continuing Education Office at 273-3303. The continuing education fee is \$85.00.

Tracking Dinosaurs Exhibit. A new exhibit on "Tracking Dinosaurs" opened in November, 1994 at the University of Colorado Museum, Henderson Hall, Boulder Campus (near Euclid and Broadway). The exhibit will remain open through 1995. The exhibit includes casts of iguanodon tracks newly discovered at Dinosaur Ridge during excavations of the past several years.

USGS Central Region Open House

The USGS offices in Golden, Colorado, will be open to the public on "Earth Science Day", Saturday, April 29th. The Open House will be held at the USGS offices located on the Colorado School of Mines campus at 1711 Illinois Ave. The doors will be open from 10:00 a.m. to 4:00 p.m. The National Earthquake Information Center will conduct tours of their facilities: three tours in the morning and three tours in the afternoon. Additional information will be available in the lobby and conference area. The Water Resources Division will have a demonstration on "Measuring Surface Water". The focus of the Geologic Division displays will be geologic hazards. Staff members from the National Mapping Program will describe their data services available to the public, and will display topographic maps, thematic maps, as well as other earth science and cartographic publications and products. The focus will be on digital mapping data with hands-on computerized demonstrations and applications. Admission is free. For more information, contact Lisa Bader at 303-236-5547.

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USGS Environmental Geoscience Seminar Series

This series, presented by members of the U.S. Geological Survey, includes presentations with discussion and questions to follow. The seminar series is sponsored by the Environmental Team and Center for Environmental Geochemistry and Geophysics. The talks are held 1:00-2:30 p.m. in Lecture Halls A & B, Building 25 of the Denver Federal Center, Lakewood, Colo.

April 5 "Agrogeology" by George Desborough, Larry Gough, and Pete McMahan

May 3 "Mineral Environmental Studies" by Roger Clark, John Gray, and Sherm Marsh

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Call for Volunteers from the Peace Corps

After 30 years, Americans of all ages continue to actively promote development programs through the efforts of Peace Corps. The Peace Corps currently sends volunteers to 93 countries throughout the world. Their goal is to promote international understanding, while sharing American knowledge with people who look to the United States for support in their struggle to promote their standard of living.

The help of volunteers is needed to make the efforts of the Peace Corps more successful. In developing countries, Peace Corps is able to utilize the skills that American volunteers develop in their volunteer positions. Volunteers may be assigned to work with women and girls to improve pre- and post-natal care, teach simple life-saving techniques and first aid, encourage the support of local leaders and organizations to develop activities for at-risk youth, work full time in AIDS education programs, or one of a number of other assignments. Volunteers will encounter other cultures first hand, gain entree in the lives of people in remote parts of the world, and have some very exciting experiences.

To learn more about the Peace Corps, please contact Karen Nakandakare, Area Manager, Rocky Mountain Region, (303) 866-1057 or (800) 424-8580; fax (303) 866-1068.

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Mineral Development and Land Use Symposium

The Rocky Mountain Mineral Law Foundation is sponsoring a two-day institute in Denver on Mineral Development and Land Use, May 4 & 5, 1995. This program presents a comprehensive look at fundamental issues sweeping the West regarding the escalating and contentious conflict between mineral development and competing land uses. This will be a pioneering, intensive examination of the role of government and the competing rights of mineral developers and property owners in determining the location, scope, timing, and nature of mineral development. The program will consist of scholarly

presentations on these issues as well as debates among program participants and is intended to present both the theoretical and the practical aspects of resolving these conflicts.
Contact the Foundation at (303) 321-8100 for additional information.

Colorado Scientific Society
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Colorado Scientific Society

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