

UNESCO-SEG Latin American Metallogeny Course Devoted to Mine Waste Management

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The XXIV edition of the Latin American Metallogeny Course “Geochemistry and geomicrobiology of mine waste management” was held at the Pontificia Universidad Católica del Perú (PUCP), Facultad de Ciencias e Ingeniería, Departamento de Ingeniería, Sección Ingeniería de Minas, from August 22 to September 2, 2005, in Lima, Peru. The course, traditionally sponsored by the Society of Economic Geologists and UNESCO, had the additional generous support this year of the KFPE agency of the Swiss Agency for Development and Cooperation (SDC) and the Society for Geology Applied to Ore Deposits (SGA), as well as logistic support from the Peruvian Geological Survey (INGEMMET) and the Peruvian Ministry of Energy and Mining. The six-day field trip was in part sponsored by Southern Peru Copper Corporation (SPCC), Volcan S.A.A., and Centromin, Peru. Altogether, the financial support funded 22 travel grants among the 43 Latin American and 2 Spanish geologists, mining engineers, chemists, metallurgists, biotechnologists, and ecologists coming from universities (15), research institutes and geologic surveys (7), mining companies (10), consultants (5) and postgraduate students (8) from Argentina, Bolivia, Chile, Colombia, Cuba, Dominican Republic, El Salvador, Mexico, Nicaragua, Peru, Spain, Uruguay, and Venezuela who attended the course.

The 2005 edition was for the second time (after the 2002 edition) completely devoted to the geochemical and geomicrobiological aspects of mine waste management. During the six days of lectures, a broad overview was given about the environmental problems of mining activities with special focus on the formation, control, and prevention of acid mine drainage. Topics covered in the course included a general introduction to the metallogeny of Peru (Miguel Cardozo, Exploandes), “Risk, rewards and returns

of copper exploration in the 20th Century and beyond” (SEG Regional Vice President Lecturer, Richard Leveille, Phelps Dodge), Peruvian legislation in relation to the environmental impact of mining (Ing. Julio Bonelli, General Director of Environmental Affairs, Ministry of Energy and Mining), a general introduction to the aquatic geochemistry, geochemistry of mine waste management, and remediation, prevention, and treatment strategies of mine waters, including sampling and analytical approaches (Bernhard Dold, University of Lausanne, Switzerland), geomicrobiology and bioremediation (Ricardo Amils, Universidad Autónoma de Madrid y Centro de Astrobiología, Spain), as well as an introduction to geochemical modeling with practical experiences in the Computer Laboratory (Carlos Ayora, Instituto de Ciencias de la Tierra, Jaume Almera, CSIC, Barcelona, Spain).

During the six-day-long field trip, the group was able to view examples of environmental contamination by mine waste, remediation projects in central Peru from CENTROMIN, Peru, the polymetallic Zn-Pb-(Ag-Bi-Cu) Cerro de Pasco deposit (Volcan S.A.A.), the Toquepala porphyry copper deposit, and the remediation approach at the Bahía de Ite tailings deposit (Southern Peru Copper Corporation), covering the complete mining process from the mineral extraction in the open pit, through crushing, milling, flotation, to the tailings disposal, and mine waste remediation in these world-class deposits. The difference in the behavior of mine waste in high sulfide and low sulfide systems, the influence of the

climate, and theoretical aspects were dealt with in the course, and sampling techniques were illustrated in the field.

Among the 22 grant holders, the two best presentations were honored with a one-year *Mineralium Deposita* subscription (courtesy of SGA). The best presentation this year was given by Katya Reátegui Palomino from the Universidad Central de Venezuela in Caracas. In second place, two young scientists from the Universidad Nacional de Colombia in Medellín will share their subscription: Clara Lamus Molina and Alexandra Muñoz Blandon. We congratulate them for their excellent presentations.

Course coordinators Silvia Rosas (PUCP, Lima, Peru) and Bernhard Dold wish to thank the course sponsors UNESCO, SEG, SGA, and KFPE; the management of all supporting mining companies and institutions, including Ing. Oscar González Rocha, President, and Dr. Ezio Buselli, Director of Environmental Services and their staff at the Southern Peru Copper Corporation; Ing. Jack Timmers, General Manager, and Ing. Arturo Salvador, General Superintendent, of the Cerro de Pasco Unit of Volcan S.A.A.; Ing. Juana Rosa del Castillo, General Manager, and Ing. Abdel Arroyo Coordinator of Environmental Affairs of Centromin Perú S.A.; Ing. Víctor Lay, President of the Council of INGEMMET, and all the instructors, who, with their support and enthusiasm, made the course and the field trip a great success. Further information on this and past editions of the course can be obtained from the web page <http://www.unige.ch/sciences/terre/mineral/seminars/latinometal.html>. 



FIGURE 1. Group photo in the Toquepala mine, Southern Peru Copper Corporation, Peru.