

## A Word from the Secretary General

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Dear Colleagues and Friends,  
I found some entertaining articles while I was browsing the internet searching for topics for this month's "Mine Water Notes". One is a newspaper article from 1894 about a diver who had to repair a mine water pump and the other is about a Korean mineral water that seems to have a misleading name: 'Ulleung Minewater'. I hope you enjoy reading them as you take a quick break between more serious reports or applications.

Abstract deadline for IMWA 2010 was at the end of January and we received a total of 222 abstracts, including 15 from students applying for the IMWA Student Award. Of the 13 symposium topics, 'Active treatment,' 'Mine Water & Innovative Mining Methods,' and 'Mine Closure' seem to be of special interest to authors, as nearly half of the abstracts relate to those three topics, but based on the abstracts, it appears that we will have high quality papers for all 13 topics. Consequently, we are looking forward to having an interesting IMWA 2010 Symposium and I am looking forward to seeing you in Sydney, Nova Scotia, Canada (YQY). You can already register at [www.registration.IMWA2010.info](http://www.registration.IMWA2010.info) or browse the abstracts under [www.IMWA2010.info](http://www.IMWA2010.info).

In addition, I am very pleased to report that at the end of 2009, IMWA membership is now up to 488, including 30 corporate memberships (Fig. 1). Thanks to you, for promoting IMWA and for being a member in our Association! Should you have ideas of how we could broaden our membership or how IMWA can improve, contact me or the President.

Finally, please pay your IMWA membership fees as soon as possible! For only 32 EUROS, you are getting four issues of this excellent journal, an informative web-page and IMWA forum, and you will receive a 50 EURO

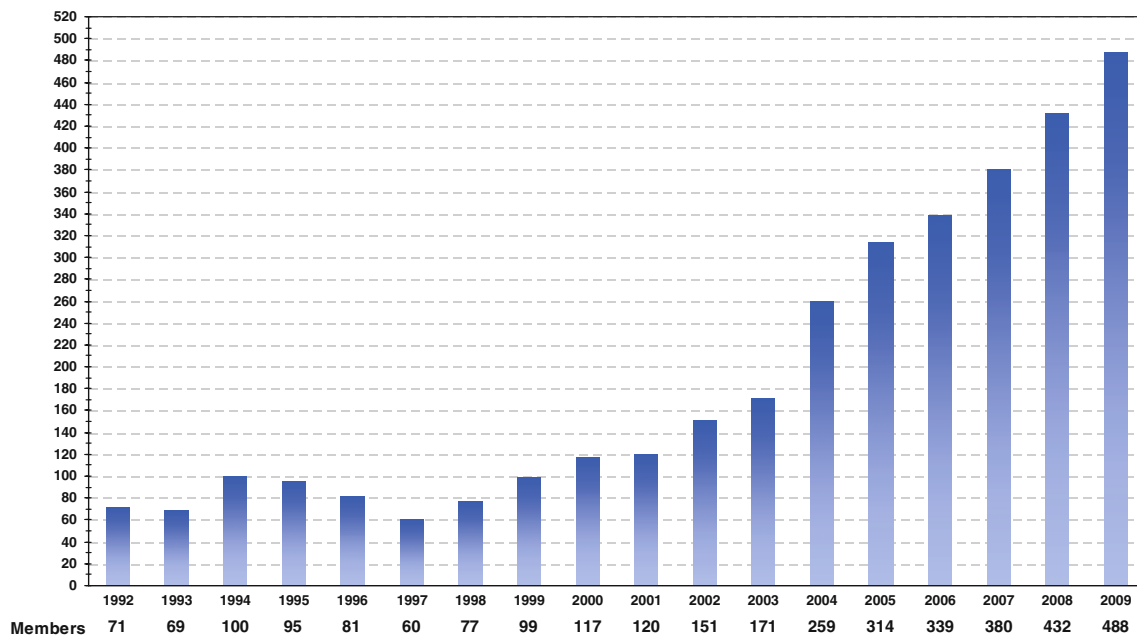
reduction on the IMWA 2010 Symposium registration—even after the Early Bird deadline of May 31st—but keep in mind, only Early Bird registrations will get the opportunity to win the "Early Bird Registration Prize".

Glückauf, and enjoy whatever you are doing at the moment!

Christian Wolkersdorfer

### Diving in a Coal Mine

"Diving in a coal mine is something out of the usual line for a man who makes a business of exploring the depth of water, but that is just what a fellow did recently up near Harrisburg," said Philip A. Green, of that city, to a Washington Star reporter. "The Short Mountain mine near our town was flooded some time ago, and the pumps refused to work, so that the shaft got filled up with mine water. Now mine water is as black as any ink you ever wrote with in your life, and pretty nearly as thick, and when the operators of the property, after exhausting every other means of getting at the pumps, suggested the idea of employing a professional diver to go down and find them and fixed them everybody hooted. However, a man from Philadelphia was brought up, and came equipped for the work. He got into his diving suit, and down he went into the water, but he came up almost immediately, saying it was too hot for him. He was told to go deeper and he would find it cooler. He went down again, but failed to find the pumps, and he was about to give up the job, when he was persuaded to make another trial. At the third dive he located the machinery, and the fourth time he went down he managed to fix one of the pumps so that it would work, and the chances are that mine will be



**Fig. 1** Development of IMWA's membership between 1992 and 2009. The jump between 2003 and 2004 is attributed to the fact that we improved our membership management and started to send out regular invoices, and because we improved IMWA's web page

pumped out in 3 or 4 days, and a couple hundred men allowed to go to work.”

The Twillingate Sun and Northern Weekly Advertiser; Vol. XV, No. 34, Page 1, Twillingate, New Foundland, Saturday, August 25, 1894.

### CJ CheilJedang Introduces New Package Design for Deep Seawater

What do you get when you drill 650 m below the ocean floor? Not surprisingly, water, although we are surprised to learn that it is characterized as “bacteria-free, mineral and nutrition-rich” (surf to <http://www.IMWA.info/ulleung> to see a commercial). Ulleung Mine-water is made from deep-sea water, extracted 130 km away from the eastern coast of South Korea's Ulleung Island. According to the Korea Times, industry experts predict that CJ's product is the first among many to come, pushed by the improvement of extractive technologies, involvement of large corporations, and government support.

CJ CheilJedang, the first in Korea to commercialize deep seawater through desalination and purification, introduced a new package for Ulleung Mine-Water in July 2008 (Fig. 2). The new transparent glass bottle replaces the existing PET package to accentuate the premium quality of the product. By harmoniously using black and silver, this new package emphasizes a simple and sophisticated image. Considering that the major consumers of Ulleung Mine-Water are women in their 20 s, this package was created to



**Fig. 2** Bottle of Ulleung Minewater, a Korean mineral water company

be portable (330 mL) so that can be held in one hand or carried in a bag. The bottle is 30% harder than the conventional PET package to give Ulleung Mine-Water an image as a product rich in healthy mineral content.

Somehow ‘Mine-Water’ doesn’t sound like it will be a marketing wonder, but it has been positioned as a premium water. With this step, the CJ Cheil Jedang hopes to set a new direction in the bottled water market. CJ Cheil Jedang’s deep seawater specialist, Yoo Cheol-an, explained “the mineral content of Minewater was increased to satisfy health-conscious consumers searching for ‘good water’” and said that “The new bottle is stylish and luxurious enough to pass for a fashion item. We predict it will become a ‘Must have’ item for young women.” CJ is planning to focus Minewater’s distribution to famous restaurants, hotels, coffee shops, and bars frequented by young women. Distribution in convenience stores and warehouses started in mid- August 2008.

modified from CJ.net; CJ News No. 290 and Lloyd Alter: “Strange Waters: From Under the Sea and Out of the Amazonian Rainforest” (2007-05-10, Treehugger.com); Christina Marx (10.10.07 | WASSER; New Mine Water by CJ Cheil Jedang; about-drinks.de); INNO News (2008-07-29; innodesign.com).

### Paul Younger Awarded Honorary Doctorate

Our editorial board and IMWA member Prof. Paul Younger, whose groundbreaking work has seen communities around the world provided with supplies of clean water, has been given a prestigious honour. Paul, a specialist in energy and environment and Newcastle University’s Pro-Vice Chancellor for engagement, was awarded an honorary doctorate by the National University of St Augustine, in Arequipa, Peru. The honour was bestowed in recognition of his work to improve water quality in rivers in Peru, which are affected and contaminated by mine workings.

Prof. Younger and his team began their investigations into ways to combat the threat to humans and the environment from closed mines in north-eastern UK in the 1990 s. They were able to transfer techniques they had developed to South America, where some of the driest places on Earth are found. Competition for water between communities and mine operators is so severe in countries like Peru and Chile that deaths have been caused by large-scale conflict over resources.

Prof. Younger, 47, was presented with his honorary doctorate in a ceremony hosted by the Rector of the National University, Professor Valdemar Medina Hoyo. The Hebburn-born professor said: “This is a huge honour, which I never imagined would be coming my way. The work which is honoured is not solely mine, but is in large measure due to the efforts of my close colleague at Newcastle University, Dr Jaime Amezaga, as well as to the efforts of many collaborators in universities, community organisations, and mining companies in Peru, Chile, and

Bolivia. I like to think of this honorary doctorate as recognition of the substantial contribution which Newcastle University is making worldwide, within the framework of co-ordinated European actions, to advance the urgent cause of sustainability.”

Dr Amezaga said: “This is clear acknowledgement that what we’re doing is worthwhile. It’s a very uncommon step for the university to give this award to Paul. It’s an awareness that what we have done there is unique and important. It is also an example of how work started here is having an impact worldwide. It’s difficult for us here to appreciate the situation in Peru, where about 60% of conflicts are over water.”

Prof. Younger is a Fellow of the Royal Academy of Engineering and is well-known for his work on the science and engineering of environmental sustainability. He is also fluent in Spanish. He and his colleagues have worked with the Regional Institute of Environmental Sciences, which is based at the National University of St. Augustine, and with the Peruvian organisation LABOR, since 2005. The team has managed to develop an agreed Water Agenda, in which mining companies work with environmental campaigners and communities to adopt a model of good practice to secure all demands for water in an area where it is in short supply. The work has extended to Peru’s neighbouring countries, Bolivia and Chile, where a similar approach has been adopted.

One of the projects involved a case study of Peru’s Chili River Basin, which flows through Arequipa, and is the major lifeline to the communities of this extremely dry region. This work has been funded over the last 4 years by the European Commission. In 2006, Prof Younger and his team won the Queen’s Anniversary Prize for a technique that they developed for cleaning water contaminated by mines, which has been used around the world.

After receiving his degree, Prof Younger gave a 45 min lecture in Spanish, entitled Natural Resources and Human Resources: Towards an Inclusive Environmentalism. Drawing on thinking from all around the world, and reflecting on his own experiences of almost 20 years’ of work in the Andes as well as in the UK, he argued that the rest of the world should pay attention to the ancient traditions of respect for the earth, which are still a vibrant part of culture in South America. Adapted from [www.journallive.co.uk](http://www.journallive.co.uk), 2010-01-07.

### GARD Guide Launched at ICARD

The Global Acid Rock Drainage (GARD) Guide was officially launched at the 8th ICARD to much acclaim. The GARD Guide describes proven techniques for characterization, prediction, monitoring, treatment, prevention, and

management of drainage produced by sulphide mineral oxidation. It also addresses metal leaching caused by sulphide mineral oxidation. The Guide will assist industry to provide high levels of environmental protection, support government efforts in assessing and regulating mining activities, and enable the public and other stakeholders to gain a higher degree of understanding of acid prevention plans and practices. The Guide applies to all commodities, from base and precious metals to uranium and diamonds, and to all phases of mining, from exploration to post-closure. It also takes into account climate, environmental, and other geographic factors. The GARD Guide is based on a ‘Wiki’ model and resides at <http://www.gardguide.com>, so that it is accessible to practitioners around the globe. Information on ARD/ML has been compiled in over 700 pages, and organized into chapters and subchapters. Development of the GARD Guide was sponsored by INAP, with the support of the Global Alliance. Golder Associates was retained to develop the Guide, and assembled a global team of recognized experts for this tremendous effort, including many IMWA and WISA members.

The GARD Guide will now enter into a phase of continual improvement, which will result in upgrades and revisions. They are particularly looking for companies willing to provide case studies so that others can learn from your experience. Users of the GARD Guide can leave comments and suggestions on the Wiki, or provide feedback directly to Gilles Tremblay, GARD Guide Secretariat. Adapted from The MEND Monitor November 2009.

### **Mine Pit Lakes—Characteristics, Predictive Modeling, and Sustainability**

The water quality of pit lakes is one of the most critical environmental issues facing the global mining industry. As ore grades decrease and operators strive to improve efficiency, the number of active pit mines will continue to outpace their underground counterparts. How will water resources be protected for future generations while the mining industry continues to meet society’s growing demands for raw materials? The key to solving this dilemma is accurately predicting water quality in advance of open pit mining. That is the purpose of *Mine Pit Lakes: Characteristics, Predictive Modeling, and Sustainability*. The 312 page book, edited by Devin N. Castendyk and L. Edmond Eary, is the third in a series of six handbooks by the Acid Drainage Technology Initiative-Metal Mining Sector (ADTI-MMS). This volume includes the theory and science of predicting pit lake water quality and provides insights into the best practices of pit lake management. It is a useful resource for mining professionals and environmental regulators who are considering new open pit mines

or are developing monitoring programs or closure strategies for existing ones. It was published in 2009 by SME, 8307 Shaffer Pkwy, Littleton, CO 80127, USA, e-mail: [books@smnet.org](mailto:books@smnet.org), web site: [www.smenet.org](http://www.smenet.org), ISBN 13: 978-0-87335-305-2, list price \$US109, from the publisher.

### **New Members**

We welcome our following new members:

Kelly Boutilier, Whitehorse, Canada  
 Arijit Dey, New Dehli, India  
 Gregory Fagerlund, Vancouver, Canada  
 Denver Harper, Bloomington, USA  
 Denis Isabel, Quebec, Canada  
 Joelle Janes, Whitehorse, Canada  
 James Johnson, Cooma, Australia  
 Anna Kluza, Tom Price, Australia  
 Faradiella Kusin, Newcastle upon Tyne, United Kingdom  
 Danita LaSage, Frankfort, USA  
 Versiane Albis Leao, Minas Curais, Brazil  
 Geordie McMillan, Footscray, Australia  
 Martin Mkandawire, Dresden, Germany  
 Raymond Philippe, Las Condes, Chile  
 Dyllon Randall, Cape Town, South Africa  
 Carola Scheu, Whitehorse, Canada  
 Caesar Sebina, Gaborone, Botswana  
 Gerard Shaw, Sydney, Canada  
 Neil Slavin, Whitehorse, Canada  
 Stephanie Somot, Quebec, Canada  
 Luiz Alberto Cesar Teixeira, Rio de Janeiro, Brazil  
 Katherine Walton-Day, Denver, USA

We hope that our new colleagues will benefit from and contribute to the extensive mine water knowledge and expertise gathered within our group of international experts. Please use your membership number in any correspondence, especially money transfers with IMWA. You can find it easily on your journal’s address label, in front of the word “GES”.

Lee C. Atkinson, Treasurer, Lakewood, Colorado, USA;  
 Chris Wolkersdorfer, Secretary General, Cape Breton, Canada.

### **Forthcoming Events**

May 3rd–6 th 2010, Toronto, ON, Canada

13th International Seminar on Paste and Thickened Tailings. The theme is “Paste Technology—Improving our World.”

<http://www.paste2010.com>.

September 5th–12th 2010, Sydney, Nova Scotia, Canada

*IMWA 2010 Symposium “Mine Water & Innovative Thinking”*

The IMWA 2010 Organizing Committee is working to create a memorable and enjoyable experience for conference delegates and accompanying persons.

Conference Themes:

1. **Mine Water Issues and Innovative Mining Methods**  
Speakers in this session will present existing or evolving methodologies that prevent the pollution of mine water during operations, produce a smaller water footprint and limit impacts on surrounding ecosystems.
2. **Mine Water Engineering**  
Papers will deal with engineering infrastructure, such as pumps, dams, groundwater diversions, and pipes to direct mine water through or around the mining operation to treatment and finally to receiving water bodies with minimal impact. It will also include innovative solutions for designing on-going and final reclamation schemes that will benefit local communities.
3. **Mine Water Treatment—Active Systems**  
If mine water becomes polluted, treatment is necessary before it is either discharged into receiving water bodies or used for other purposes, such as cooling, fire suppression, cleaning equipment, or as drinking water. This session will deal with the techniques used in active mine water treatment.
4. **Mine Water Treatment—Passive Systems**  
Passive treatment is an environmentally friendly technology to treat mine water. Under normal operating conditions, no chemicals are used and the only energy sources are natural: sunlight, potential energy or ‘biological’ energy from plants or microorganism, wetlands for final polishing, limestone for natural buffering, or forest buffers for noise and dust suppression. Passive systems can also use ‘natural’ chemical reactions between carbonate rich rocks and acidic waters.
5. **Mine Water Uses—Geothermal, Geochemistry, Biochemistry**  
Mine water can be used in several ways: as geothermal energy, as cooling liquid, in agriculture, for recreation, as drinking water, or enhancing stream flow. Papers presented in this session will focus on those mine water uses.
6. **Analysis of Mine Water and its Chemistry**  
Mine water chemistry usually differs significantly from the chemistry of ground and surface water. In this session, the problems encountered with developing appropriate field sampling protocols, selection and deployment of real time monitors, laboratory analysis techniques, and selection of tracers will be explored. It will also include modelling the results and consideration of legal and funding issues associated with long term monitoring after operations cease. The session also covers general aspects of mine water.
7. **Coal Mining—Underground Mining, Surface Mining**  
Coal is one of the most important solid fuels for electricity production and heating. Consequently, mine water issues for both surface and underground coal mines are an important part of operational management, consultancy, and research. Speakers for this session will focus on mine water issues related to coal mining, such as acid mine drainage, pumping, prevention of pollution, geochemical aspects of coal mine drainage, encountering deep saline groundwater, sub-sea mining, multi-seam mining, in situ gasification, and CO<sub>2</sub> sequestration.
8. **Mine Closure—Coal, Metal**  
Mine closure has become an important environmental issue worldwide. To ensure that mines are closed in a way that long term pollution of receiving water courses is minimized, special techniques have been developed in recent years. This session will address mine closure strategies relative to mine water and related aspects of subsidence, reclamation bonding, long term monitoring, meeting a changing regulatory framework, public perception issues, and the potential impact of a changing climate.
9. **Legal and Social Aspects of Mine Water**  
Use of mine water and discharges of mine water into receiving water courses need special legal consideration in most countries of the world. One of the many examples covering discharges is the European Water Framework Directive. Talks in Section 9 will focus on legal and social questions concerning mine water, impact on surface landowners, ISO accreditation, due diligence, and environmental impact assessments.
10. **Mine Tailings**  
Mine tailings and their associated emanating waters need experienced operators, consultants, and researchers to ensure proper handling and treatment. This theme will be the platform for presentations dealing with water flowing through or emanating from mine tailings and coarse waste rock piles, as well as long term groundwater contamination plumes, and demolition of facilities.

11. The ‘Cape Breton Development Corporation’ Legacy In 1672, Nicholas Denys, described the occurrence of coal seams on Cape Breton Island. On December 31, 2009, the Cape Breton Development Corporation—the last large scale mining operator in the Sydney Coal Field—will cease as an entity and will amalgamate into ‘Enterprise Cape Breton Corporation’. Papers presented in this section will deal with the mine water issues of four decades of coal mining on Cape Breton Island by the Corporation, and more than three centuries of coal mining on the Island.

June 21st–23rd 2011, Aberystwyth, Wales, UK

Frontiers in Environmental Geoscience; <http://www.miner.soc.org/pages/meetings/frontiers-2011/frontiers-2011.html>; [njp@aber.ac.uk](mailto:njp@aber.ac.uk).

September 4th–11th 2011, Aachen, Germany

*11th IMWA Congress*

<http://www.IMWA2011.info>; [info@IMWA2011.info](mailto:info@IMWA2011.info).
12. Discussing the concept of a ‘Zero Waste Mine’ Most mine operations produce large amounts of unwanted material, such as overburden, waste rock, mine water, sludges, or tailings, that can not be readily sold to market. In most cases, the mine operator must dispose of these substances. Commonly, these unwanted substances are referred to as mine waste. This moderated discussion theme will investigate the potential for a Zero Waste Mine, and discuss the techniques and research that is needed to operate a mine as a Zero Waste Mine.

2012, Denpasar, Bali, Indonesia

*IMWA 2012 Symposium*

<http://www.IMWA2012.info>; [info@IMWA2012.info](mailto:info@IMWA2012.info).

2012, Ottawa, Canada

*ICARD 2012—MEND Canada*
13. Fracture Flow to Mines (Special Session) The aim of this Special Session is to look at how fractured rock is characterised and how data are used to design large pit slopes or underground mines, assess dewatering, depressurisation, and water inflow volume or rates, and site water monitoring and management during mining.

Mark your calendars; the 9th International Conference on Acid Rock Drainage (ICARD) is coming to Ottawa, the birthplace of MEND, in May/June 2012. The Conference will include 3 days of technical presentations, a suite of short courses and field trips.

<http://www.gtrembla@nrcan.gc.ca>.

<http://www.IMWA2010.info>; [info@IMWA2010.info](mailto:info@IMWA2010.info).