

NEWSLETTER
INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS
AUSTRALIAN CHAPTER

VOLUME 1 NO 1

OCTOBER 1984

1 PRESIDENT'S NOTE

Greetings colleagues, in this our first newsletter. Although it is nearly a year since our inaugural meeting at the Groundwater and Man Conference in Sydney, you will see from the contents that things have been going on behind the scenes.

It is pleasing to note that our formation has been recognized by such august bodies as the Australian Academy of Science and the Australian Geoscience Council and that we are seen as the appropriate body to represent hydrogeological interests in Australia. (See Items 3 and 4.)

While the Australian membership of I.A.H. has soared since 1983, I am concerned that the membership list shows a poor response in some States. I urge all members, particularly those in States having low membership, to spread the word amongst their non-member colleagues. Encourage them to join pointing out the need and value of having our own national body and that, in addition, there are the activities and publications of the parent international body. Showing them this newsletter should help. The larger our membership the more we will be able to provide technical exchange and promotion of interests specific to hydrogeologists and associated specialists.

I wish you well.

Bill Williamson

2 MEMBERSHIP NEWS
2.1 Current Membership

At October 1, 1984, the total membership of IAH Australia, according to our records, stood at 88. Member's names and addresses follow in alphabetical order. Please check that your title and address are correct and if not please advise the National Secretary at 32 Blair Street Coburg, Victoria 3058; so the records can be corrected. We are required to provide a list of members and their addresses to the Secretary General by November 1 each year.

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2.2 Eligibility of Technical Support Staff for Membership of IAH

This matter was raised at the inaugural meeting of the National Chapter in December 1983 and again recently by the Western Australian Branch; the issue is also being addressed by the Canadian Nat. Comm. of IAH. After due consideration, your Executive Committee has decided that technical support staff interested in joining IAH, should be invited to apply. The Executive Committee will recommend sponsored applications from Technical Support Staff to the Executive Council of IAH for membership. If such applications are rejected the Committee will request the Executive Council to consider the provision of an associate membership category.

3 NATIONAL RECOGNITION

The National Chapter has been invited to become a corresponding member of the Australian Academy of Science and an associate member of the Australian Geoscience Council. At the Executive meeting on October 16 a decision was taken to accept these invitations with a view to developing a mutually fruitful and active collaboration.

4 REPORTS RECEIVED

4.1 Proposal for an Institute of Freshwater Studies, Report of Interim Council

We forwarded a submission to the Interim Council in 1983 regarding the establishment of an Institute of Freshwater Studies and recently received a copy of the Interim Council's Report. The Executive Summary contained within that report is reprinted below. Members wishing to obtain copies of the report should contact the Department of Resources and Energy GPO Box 858, Canberra ACT 2601. Phone (062) 45 8211.

Executive Summary

In the view of the Interim Council, there are important water research needs requiring enhanced effort in the areas of water quality and the equitable and effective management of the Murray/Darling Basin.

In assessing the various options available to meet research needs, the Interim Council concluded that an Institute of Freshwater Studies was not the appropriate response.

The Interim Council concluded that the weight of argument was heavily in favour of the establishment of an Australian Water Research Advisory Council (AWRAC), to be responsible for advising the Minister for Resources and Energy on the disbursement of monies under a substantial program of Commonwealth-funded water research.

A Water Research Assistance Fund (WRAF) should be established to encourage the continued commitment of resources to priority water research by relevant authorities, tertiary education institutions and other organisations and individuals. The Interim Council believes that a program of research funding growing to \$8.0 M per annum over, say five years is warranted.

The operations of AWRAC should be supported by a National Office of Water Research (NOWR) within the Department of Resources and Energy.

The Interim Council recommends that \$0.8 M per year be provided to CSIRO to maintain an enhanced program of applied limnological research based on the Till Laboratory at Albury-Wodonga.

Finally, the Interim Council believes that a cost-effective way of progressing some national priorities is to increase the annual funding to CSIRO by a further \$2.5 M.

4.2 International Legend for Hydrogeological Maps - Revised Edition 1983

The Executive Committee recently received a copy of this interim document. It is suggested that members involved in the preparation of hydrogeological maps should familiarise themselves with the symbols and guidelines contained within this document and adopt these where possible. The report is available from the National Secretary.

5 STATE REPORTS

5.1 Western Australia

The Western Australian membership formed a State Branch on December 16, 1983 and elected the following Committee : Chairman, R I J Vogwill; Vice Chairman, M Preston; Secretary, A C Deeney.

Since their formation, the WA Branch have been very active and are to be congratulated on their success and endeavour.

- . Several Branch meetings and one Committee Meeting have been held.
- . It appears that they may have secured a permanent meeting venue. The Department of

Mines, W.A., kindly allowed them to use the Lecture Theatre/Canteen on the 9th Floor, Mineral House for their first meeting.

- . A joint technical meeting was held with the Institution of Engineers, W.A. Division, Hydrology and Water Resources Section on September 9, 1985. Meeting entitled "Investigations into Shallow Groundwater in Agricultural Areas of W.A." by R George (IAH) and J Cox from University of W.A.
- . Their current membership stands at 37.
- . They have written to all Tertiary Institutions in W.A. and have compiled an inventory of hydrogeology-related courses being offered in W.A. This list is available to all members.
- . They have compiled and circulated their first newsletter, highlights of which are repeated here.

5.1.1 Saline Groundwater Use, Kalgoorlie

A number of goldmine operators in the Kalgoorlie region are to use hypersaline water for gold extraction. Bore water supplies with 60 to 190 gm/L salts are to be used (seawater averages 35 gm/L). The high salinities do not, it seems, lessen the efficiencies of ore processing.

5.1.2 Underground Mining Trials, Collie

At present deep mines take some 35% of the coal because pillars and rooves of coal have to be left to guard against groundwater inflows from sandstone aquifers. The introduction of total extraction techniques, in which roof collapse is deliberately allowed, requires the reliable control of this groundwater. The control means chosen for the trials combine conventional corrosion resistant bores and the innovative use of bores drilled 'upside down' from in the workings. These holes drain down to sumps from which the water is pumped to the surface for disposal. An indication of the importance of these drain holes to the dewatering and depressurization may be gauged from the fact that one 50 mm hole has maintained a flow of 2 ML/d from a 75 m²/d aquifer.

5.1.3 The Peel Inlet - Harvey Estuary Algal Problem

The intermittently massive blooms of macroalgae and cyanobacteria in the Peel Inlet-Harvey Estuary System during recent years occurred primarily as a result of increased phosphorous input. Most of the phosphorous is leached from fertilizers applied to the catchments draining into the system.

The Geological Survey has recently carried out an investigation of groundwater in the Cainozoic Sediments on the coastal plain adjacent to the Peel Inlet-Harvey Estuary System including a detailed chemical sampling programme designed to indicate the magnitude of the groundwater borne phosphorous input. A preliminary assessment suggests that the groundwater component of the phosphorous flux is very small in comparison to the surface water component and it would appear that most of the phosphorous does not enter the main groundwater body. Adsorption onto clays may cause the removal of a proportion of the phosphorous. It must be concluded that most of the phosphorous is carried to the water courses in shallow interflow, often via land-drains, so that at the water table and below, the shallow groundwater body shows less phosphorous than might be expected.

5.1.4 Jarrah Transpiration Studies, Dwellingup

The Forests Department is studying jarrah transpiration by instrumentation of an enclosed mature (30 m) jarrah tree. The project results should prove of value in the very wide fields of water resources and environmental science and for the groundwater orientated

scientist the tree study data will be useful for recharge/discharge assessments throughout the jarrah forested south west. It appears that the jarrah are truly phreatophytic trees with roots going as much as 40 m so that they draw on moisture from the full soils profile to the water table. Evapotranspiration figures may be as much as 98% of the rainfall.

5.1.5 A Kalgoorlie Meeting of Hydrogeological Interest : October 1984.

A Symposium : Alternative Treatment and Uses of Mining and Processing Residues (Thurs. 4 October 1984) as part of the Australian Mining Industry Council Environmental Workshop in Kalgoorlie (October 2-5). For more information contact Warren Tacey of Alcoa at Pinjarra (095) 311 611.

5.2 SOUTH AUSTRALIA

5.2.1 Groundwater Micro-Computer Programmes :

A number of programmes of use to the practising hydrogeologist have been developed within the Groundwater and Engineering Branch of S.A. Dept. of Mines and Energy. Prices range from \$10 to \$90 which cover documentation and programme listing. For programmes required on disc, add \$5. Postage and packaging within Australia costs \$1.20. A complete list of programmes and prices are available from Mr David K Clarke, P O Box 118, Crystal Brook 5523, phone (086) 36 2002.

5.2.2 8th Australian Geological Convention

The Convention sponsored by the GSA will be held between the 16th and 21st February 1986 at Flinders University Campus, Adelaide. The theme is "Earth Resources in Time and Space" and one of the Conference topics is "Groundwater - resource or problem". Planned excursions, with a groundwater component include, 'Murray Basin', 'Opal Fields' and 'Rocks Water and Wine'. The last is subtitled, 'Geology and hydrogeology of the Barossa Valley and problems of winery waste disposal'. The first circular is available through the Soil Secretary, 8th AGC, P O Box 292, Eastwood 5063, phone (08) 274 7580, Telex AA88692.

5.2.3 Reginald George Shepherd

Reg retired from the Dept. Mines and Energy in March 1984 after 34 years with the Department. He is well known throughout Australia for his wide knowledge of groundwater in South Australia, his membership of many National Committees and his involvement and convenorship of the immensely successful Groundwater Schools. Reg however 'keeps in touch' as a consultant to the Department on groundwater issues.

5.2.4 Coober Pedy Town Water Supply

Tenders have recently been let for the construction of a wellfield, pipeline and desalination plant for Coober Pedy in South Australia's far north. The scheme replaces an existing Government supply and is to be run by the Coober Pedy Progress Association. The well field is about 23 km NE of the town in an area of brackish groundwater discovered during a mining company exploration programme. The present system located on the town outskirts produces feed water to the R O desalination plant with a salinity of about 19 000 mg/L⁻¹ cf. the proposed well field groundwater with input salinity of 5 000 mg/L⁻¹. The cost of the scheme is \$2 million.

5.2.5 Woolpunda Groundwater Interception Scheme

Between Waikerie and Overland Corner, groundwater seepage from the Murray Group limestone aquifer is thought to contribute about 250 tonnes of salt per day to the River Murray. In September 1983, the SA Government approved a \$1.56 million preliminary investigation involving the E&WS Department and the Department of Mines and Energy. This work includes:

- . detailed salinity and flow measurements in the river to determine where salt inflows occur
- . investigation of the Murray Group aquifer by core drilling, aquifer testing and geophysical surveys
- . evaluation of potential evaporation basins sites for disposal of saline groundwater.

5.2.6 Proclaimed Areas

Areas recently Proclaimed under the State's Water Resource Act are the Mallee and Keith-Willalooka Proclaimed Areas. Both are areas of large scale irrigation. Investigations to better quantify aquifer characteristics, safe yields, plant water use and irrigation withdrawals are being conducted by several Government agencies. Advisory Committees have been formed to liaise with farmers and irrigators.

The Mallee Proclaimed area includes part of the Designated Area of the proposed Border Groundwater Agreement between South Australia and Victoria.

5.3 VICTORIA

The Victorian Branch of IAH was successfully launched at a meeting of local IAH members held at the University of Melbourne on 17 April 1984.

Professor E S Hills gave the inaugural address in which he reviewed the history of hydrogeology during the last fifty years, with particular reference to Australia, and to the arid lands work of UNESCO.

Following Professor Hills' address, the Victorian Branch of IAH was officially formed. Mr E B Joyce was elected to the office of Chairman and Mr J Leonard, State Secretary. The Victorian Branch meets quarterly. Other guest speakers to date have been Dr P Macumber who spoke on the characteristics of groundwater discharge zones in arid and semi-arid regions and Mr R Lakey who enlightened those present with a description of various aspects of North American Hydrogeology as gleaned during his recent overseas 'holiday'.

5.3.1 Salinity Investigation

A multidisciplinary investigation into the causes, effects, prediction and control of salinity in Northern Victoria involving various State Government departments and private consulting firms has been in progress for some time and is ongoing.

Earlier this year, a study team of specialists from Government departments and private consulting firms completed a report for the Victorian Parliamentary Salinity Committee on the causes and effects of salinity in Northern Victoria. (Report available from G Hunter, Director of Research, Parliamentary Salinity Committee, 14 Parliament Place, Melbourne, 3000.)

Recently a similar study team completed another important document for the Salinity Committee. This document presents a detailed strategic study of salinity control options and makes recommendations for short term and long term action on salinity control. (Working papers in press; copies will be available from G Hunter.)

5.3.2 Groundwater to Augment the Otway Supply System

The Rural Water Commission presently diverts water from the Gellibrand River to supply urban and rural areas in southwestern Victoria; townships supplied from this system include Warrnambool, Camperdown, Simpson, Cobden, Lismore, Derrinallum, Terang, Noorat, Glenormiston and Allansford.

A number of schemes to augment supplies to the Otway system are being assessed. Investigations carried out by the Department of Minerals and Energy have identified a suitable source of water in the Dilwyn Formation in the Curdie Vale area. The aquifer interval being tested occurs at a depth of 770 to 815 metres, the groundwater from this interval has a salinity of 300 mg/L and the temperature of the water is about 47°C. Results of pumping tests indicate that production bores constructed into the Dilwyn Formation could be designed to yield from 8 to 10 ML/day. Investigations to delineate the extent of groundwater of suitable quality for urban supply are continuing.

5.3.4 Parliamentary Inquiry into Water Resource Management in Victoria

The Victorian Government, Natural Resources and Environment Committee is holding an inquiry into water resources management in Victoria. This inquiry is initially concerned with the development of a regional water strategy plan for southwestern Victoria. A major part of this inquiry involves assessment of the potential of groundwater resources to meet present and projected future demands for water, particularly for urban supply.

Stage 1 of the above inquiry is concerned with augmentation of Geelong's water supply to the year 1995, - Geelong's water supply is derived primarily from surface storages, however, a borefield capable of supplying about 35 ML/day has recently been installed near Barwon Downs, on the western flanks of the Otway Ranges. The Committee recently heard evidence from government agencies, local authorities and concerned individuals. The DME submission included an evaluation of additional borefield development strategies to augment Geelong's supply.

5.4 NEW SOUTH WALES

5.4.1 Successful 7th Australian Geological Convention, Sydney, August 1984

There were three sections in the Technical Water Division with 20 papers being delivered. A further two papers were presented in poster form. Papers on groundwater and mining were presented in the Engineering Geology Specialist Group, the AGID (Association of Geoscientists for International Development) workshop had 2 papers on hydrogeology. This totals 27 papers which is quite encouraging.

Several keynote lectures involving groundwater were delivered. A stimulating one way discussion by Dr Karos Cartwright, Chief Hydrogeologist from the Illinois Geological Survey titled "Hydrogeological investigation of failures at Hazardous Waste Disposal Sites".

The abstracts of the papers have been published by the Geological Society of Australia, Abstracts No.12, Geoscience in the Development of Natural Resources. Seventh Australian Geological Convention Sydney 1984.

The conference included 4 symposia in which groundwater related papers were presented :

B1	Hydrogeology - convener	W Williamson
B4	Hydrogeochemistry - convener	A Giblin
B5	Modification of water quality - convener	Dr M Knight
S7	Engineering Geology - convener	Dr M Knight

The reader is referred to the abstracts for more detailed information.

6 SYMPOSIA, CONFERENCES, AND MEETINGS

1984

October - 12TH SESSION OF THE IHP BUREAU, Paris France. Contact : Dr Sorin Dumitrescu, Director, Division of Water Sciences, UNESCO, 7, place de Fontenoy, 75700 Paris, France. Telephone : (33) (1) 568.40.02.

October 1-4 : 5TH INTERNATIONAL CONFERENCE ON WATER RESOURCES PLANNING AND MANAGEMENT, "WATER IN THE YEAR 2000", Athens, Greece. Includes post-congress 5th International Conference on Water Resources Planning and Management, C/- EGA Productions, Piazza Trento, 2, 95128 Catania, Italy. Telephone : 095 43 4633. Telex : 614357 EGAPLI.

October 29 - November 2 : 15TH INTERNATIONAL CONGRESS OF THE INTERNATIONAL WATER SUPPLY ASSOCIATION, Tunis, Tunisia. Contact : R Clark, International Water Supply Association, 1 Queen Anne's Gate, London SW1H 9Bl, England. Telephone (01) 222 8111.

November 11-16 : CONFERENCE ON GROUNDWATER CONTAMINATION, Santa Barbara, California USA. Co-sponsored by The Engineering Foundation and the Universities Council on Water Resources. Contact : Dr Sanford S Cole, Director, Engineering Foundation Conferences, 345 East 47th Street, New York, New York 10017, USA. Telephone (212) 705 7835.

1985

INTERNATIONAL CONFERENCE ON WATER POLLUTION RESEARCH, THE NETHERLANDS

17TH INTERNATIONAL SYMPOSIUM ON REMOTE SENSING OF ENVIRONMENT, Ann Arbor, Michigan, USA. Contact : Jerald J Cook, Environmental Research Institute of Michigan, P O Box 8618, Ann Arbor, Michigan 48107, USA. Telephone (313) 994 1200

January 7-12 : 17TH CONGRESS OF IAH : "HYDROGEOLOGY OF ROCKS OF LOW PERMEABILITY", Tucson, Arizona, USA. Co-sponsored by the US National Committee of Scientific Hydrology. Contact : Prof. E S Simpson, Chairman, Arrangements Committee, 17th Congress of IAH, Dept. of Hydrology and Water Resources, College of Earth Sciences, The University of Arizona, Tucson, Arizona 85721, USA. (See Item 6.1.3).

April 22-28 : INTERNATIONAL CONGRESS; Wasser, Berlin. Contact : Ausstellungs-, Messe-Kongress-, GmbH M2, Postfach 19 17 40, D-1000 Berlin 19. No further details at hand.

May 27-31 : INTERNATIONAL SYMPOSIUM ON REMOTE SENSING APPLICATIONS TO CONTEMPORARY HYDROLOGICAL PROBLEMS (with AGU SPRING MEETING), Baltimore, Maryland, USA. Contact : American Geophysical Union, 2000 Florida Avenue, N.W., Washington, D.C. 20009, USA.

June 9-15 : IWRA 5TH WORLD CONGRESS ON WATER RESOURCES : "WATER RESOURCES FOR RURAL AREAS AND THEIR COMMUNITIES", Brussels, Belgium. Organized by the International Water Resources Association and the Association Internationale des Ressources en Eau. Call for papers. Contact : Glenn E Stout, President, US Geographical Committee, Water Resources Centre, 208 N Romaine Street, University of Illinois, Urbana, Illinois 61801, USA; or Dr L W DeBacker, Chairman of the Belgium Geographical Committee, C/- Brussels International Conference Centre, Parc des Expositions, Place de Belgique, B-1020 Brussels, Belgium.

July 4th : 4TH INTERNATIONAL SYMPOSIUM IN HYDROLOGY : "MULTIVARIATE PROCESSES OF HYDROLOGY", Fort Collins, Colorado, USA. Contact : Prof. H W Shen, Dept. of Civil Engineering, Colorado State University, Fort Collins, Colorado 80523, USA.

- July 7-19 : INTERNATIONAL SYMPOSIUM ON KARST WATER RESOURCES, Antalya/Ankara, Turkey.
 Contact : Prof. G Gunay, Hydrogeological Engineering Department, Hacettepe University, Beytepe, Ankara, Turkey; or A Ivan Johnson, Water Resources Consultant, Woodward-Clyde Consultants, 7600 East Orchard Road, Harlequin Plaza North, Englewood, Colorado 8011, USA. (See Item 6.1.1)
- August 11-15 : 21ST ANNUAL AMERICAN WATER RESOURCES ASSOCIATION CONFERENCE AND SYMPOSIUM, Tucson, Arizona, USA. Conference : "Water Demand : Sharing a Limited Resource".
 Symposium : "Ground Water Contamination and Reclamation". Contact : Dr Nathan Buras, Head, Dept. of Hydrology and Water Resources, University of Arizona, Tucson, Arizona 85721, USA.
- August 18-24 : INTERNATIONAL SYMPOSIUM AND WORKSHOP ON HYDROLOGICAL APPLICATIONS OF SPACE TECHNOLOGY, Cocoa Beach, Florida, USA. This WMO co-sponsored event was originally planned to be held alongside the AGU Spring Meeting in Baltimore in May 1985. Contact Mr A I Johnson, 7474 Upham Court, Arvada, Colorado 80003, USA.
- August 20-24 : 21ST IAHR CONGRESS, Melbourne Australia. Contact : J D Lawson, Civil Engineering Department, University of Melbourne, Parkville N2, Victoria, Australia. No further details at hand.
- Mid to Late 1985 : INTERNATIONAL WORKSHOP ON HYDROLOGIC APPLICATIONS OF SPACE TECHNOLOGY : Input to Hydrological Models and Geographic Information Systems. IAHS/WMO sponsored. Contact : A Ivan Johnson, President, IAHS International Committee on Remote Sensing and Data Transmission, 7474 Upham Court, Arvada, Colorado 80003, USA.
- September : INTERNATIONAL SYMPOSIUM ON COMPREHENSIVE MANAGEMENT OF WATER RESOURCES, Jerusalem, Israel. Contact : Prof. U. Shamir, Dept. of Civil Engineering, Technion, Haifa 32000, Israel.
- September 8-13 : INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS 18TH CONGRESS : "Hydrogeology in the Service of Man", Cambridge, United Kingdom. Languages : English and French. Contact : Mr A Hunter-Blair, IAHS 18th Congress, Anglian Water, Ambury Road, Huntingdon, Cambridgeshire PE18 6NZ United Kingdom.
- September 15-20 : INTERNATIONAL SYMPOSIUM ON ACID RAIN, Lake Rosseau, Ontario.
- September 17-21 : Second International Congress of the International Mine Water Association, Granada, Spain; (See Item 6.1.2.)
- Late September : ICSI SYMPOSIUM ON GLACIER MASS BALANCE, RUNOFF, WATER STORAGE IN GLACIERS AND CLIMATE, Alma Ata, USSR. Contact : Dr V M Kotlyakov, Institute of Geography, USSR Academy of Sciences, Starometny Street, 109017, Moscow, USSR.
- October 9-10 : INTERNATIONAL SYMPOSIUM ON MANAGEMENT OF HAZARDOUS CHEMICAL WASTE SITES, Winston-Salem, North Carolina, USA. contact : Prof. Norman R Tilford, General Chairman, c/- Department of Geology, Texas A & M University, College Station, Texas 77843-3115, USA. Telephone : (409) 845 9682.

6.1 Conference Details

6.1.1 International Symposium on Karst Water Resources

An International symposium on Karst Water Resources is scheduled for July 7-19, 1985 in Ankara and Antalya, Turkey. The symposium will be sponsored by the Karst Water Resources Research Center Project of Hacettepe University, the United Nations Development Program,

United Nations Technical Co-operation Department, and the Turkish State Hydraulic Works (DSI). Co-sponsorship will be received from a number of international societies and from organizations of the United Nations family. Activities will take place in Ankara, Antalya and points in-between. Papers may be presented in Turkish and English with simultaneous translation.

Because of the unique problems associated with water resources development and construction in karstic areas, this symposium is organized to bring together international interdisciplinary specialists in karst in various parts of the world. Turkey provides an especially appropriate location for the symposium because of the quantity, variety and importance of the karstic areas found there. Interesting field trips to points of interest around Antalya on the beautiful Mediterranean and between there and Ankara, will be planned for the second week of the symposium. The first week will be occupied with presentations and poster papers.

The topics related to karst that will be considered for the symposium include hydrogeology, geochemistry, modeling, laboratory testing, tracer techniques, geophysics and other exploration methods, land subsidence and sinkhole formation, remote sensing techniques, groundwater and surface water hydraulics and interpretation, engineering properties and problems, water-supply estimation, irrigation potential and irrigation practice among other potential subjects.

Notice of intent to offer a paper and/or to attend the symposium should be sent to Associate Professor Dr Gultekin Gunay, Hydrogeological Engineering Department, Hacettepe University, Engineering Faculty, Beytepe, Ankara, Turkey, or to A Ivan Johnson, Water Resources Consultant, Woodward-Clydy Consultants, 7600 East Orchard Road, Harlequin Plaza North, Englewood, Colorado 80111, USA. Details concerning the symposium arrangements and instruction on preparation of abstracts will be sent to those persons indicating interest in the symposium.

6.1.2 Second International Congress of the International Mine Water Association, Granada, Spain; 17 - 21 September 1985

The International Mine Water Association is organizing the second International Congress on Mine Water, in Granada, Spain, following the decision adopted by the General Assembly of IMWA held in Budapest in April, 1982.

This Congress will offer a forum for all those concerned with water in surface and underground mining, in order to discuss recent developments in this field, and evaluate the present state-of-the-art.

The Congress proceedings will be published in a comprehensive monograph dealing with all the aspects of water in mining.

The scope of this Congress extends to specialists from many fields, especially those in Mining, Civil Engineering, Geology, Hydrogeology, Environmental Control and Protection specialists.

Objectives

The general objective of this congress is to update the technical knowledge of specialists and engineers, from different parts of the world, with practical experience in mining and underground excavations and to provide open discussion and interchange of ideas.

The specific objectives of the Congress are to :

- . Exchange results from studies and research in water as it affects mining or other underground excavations.
- . Exchange scientific knowledge and achieve a better co-ordination of research work.
- . Discuss methods of study and technology in relation to underground water problems.
- . Enhance further interprofessional contact among participants, and publish a monograph on the subjects presented at the Congress.

Congress Themes

- 1 Investigations concerning the origin of mine water.
- 2 Surface mine dewatering techniques.
- 3 Underground mine dewatering techniques.
- 4 Role of water in the behaviour of excavations.
- 5 Mine workings in the presence of water dangers.
- 6 Special techniques (freezing, injection, cementing, etc.)
- 7 Mathematical models applied to the prediction of mine water inflows.
- 8 Environmental protection related to mine water discharges.
- 9 Miscellaneous topics.

Abstracts

Abstracts must be submitted before September 10, 1984. Titles should be short and explicit, and should include the key words on the subject of the paper. The official languages will be English and Spanish.

The length of the abstracts should be about 1000 words. They should be typewritten, double spaced, on A-4 (210-297 mm) format sheets. One or two diagrams should be included.

A selection of the papers from the abstracts submitted will be made by a technical committee during the IMWA Executive Committee Meeting on September 15, 1984. Authors of accepted abstracts will be informed immediately and should submit a completed text of the papers before March 31, 1985.

Articles will not be allowed to exceed 15 pages including illustration. All papers submitted and accepted in accordance with the instructions will be printed and distributed among participants.

Venue

The Congress will be held at the Manuel de Falla Auditorium, in the impressive surrounding of the Alhambra. The Auditorium itself, with a capacity of 1311, is excellently equipped, with good acoustics and unobstructed view.

Simultaneous translation facilities will be provided from English and Spanish.

Important Dates

Preliminary registration :	before September 10, 1984
Abstract due date :	before September 10, 1984
Final registration and payment of fee :	before March 31, 1985
Final paper due date :	before March 31, 1985

Correspondence

Please address all communication to :

Professor R Fernandez Rubio
School of Mines
Technical University of Madrid
Rios Rosas, 21
Madrid, 3, Spain.

Sponsored by : National Association of Mining Engineers Superior Council of the
Institution of Mining Engineers, Spain.

6.1.3 17th Congress of I.A.H. Hydrogeology of Rocks of Low Permeability : Summary of
Technical Sessions

HYDRAULIC STUDIES IN IGNEOUS AND METAMORPHIC ROCKS : Including methods for parameter
estimation. Invited Speaker : J E Gale, Memorial University of Newfoundland, Canada.

HYDRAULIC STUDIES IN SEDIMENTARY ROCKS : Including methods for parameter estimation.
Invited Speaker : J D Bredehoeft, US Geological Survey; C W Kreitler, University of
Texas, USA.

FLOW AND MASS TRANSPORT IN UNSATURATED ZONE : Invited Speakers : E P Weeks, US Geological
Survey.

FLOW AND MASS TRANSPORT IN SATURATED ZONE : Invited Speakers : G de Marsily, Ecole des
Mines, France ; I Meretnieks, Royal Instit. of Tech., Sweden; G E Grisak, GTC, Ltd.,
Canada.

HYDROGEOCHEMISTRY AND ENVIRONMENTAL ISOTOPEs : Invited Speakers : W Back, US Geological
Survey; P Fritz, University of Waterloo, Canada.

NUMERICAL AND ANALYTICAL MODELS OF MASS TRANSPORT : Including Stochastic Methods of
Analysis; Invited Speakers : L W GeThar, Massachusetts Instit. of Tech., USA; T N
Narasimhan, University of California, USA.

REGIONAL STUDIES : Invited Speaker : M R Llamas, University, Autonoma, Madrid, Spain.