

International Association of Hydrogeologists
AUSTRALIAN NATIONAL CHAPTER

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NEWSLETTER

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IAH-AUSTRALIA: PRESIDENT'S MESSAGE

The International Association of Hydrologists XXI Congress in Adelaide was undoubtedly the biggest event so far for IAH in Australia; the largest ever accumulation of hydrogeologists in the one place in this country. The congress was a resounding success and the influx of delegates from overseas, including members of the International IAH executive, greatly extended the depth of the conference. The organisers did an excellent job. An international conference of this size takes a lot of organising to run as smoothly as this conference did. The Australian IAH owes the South Australian contingent a large thank-you for all their hard work.

But what did we, the attendees, gain from it? There were the workshops which provided a chance to learn the state of the art developments in a variety of fields, as well providing the much interaction between workers in like-fields as workshops should. There were many more presented papers than we could possibly attend (6 streams) but the selection was excellent. There were the poster papers, most presenting results of recent research or investigation, to browse through during breaks. But there was also the interaction of professionals at social occasions, coffee breaks, lunches and after session discussions and drinks. I don't think anyone who attended could have failed to have benefited in some way, made new contacts and come away richer for the experience.

Also at the conference the National Executive was passed over to Queensland!

So what does the future hold now? The new National Executive has inherited a strong, growing organisation from the previous executive and we hope to keep it moving forward. We offer the IAH an initial boost of enthusiasm which we hope we can maintain, and our desire see the IAH grow. We would like to see the membership expand both within Australia and in our Southeast Asian and Southern Pacific neighbouring countries. Hence the current IAH policy of sponsoring members in developing countries is a direction which we will do all we can to promote.

We (the new National Executive) would like to see an increased public awareness of groundwater matters, particularly regarding the role that they all have to play in preventing deterioration of groundwater quality. Probably we should be involved in the education process to ensure such matters are part of the teaching syllabus. We would like to ensure that IAH members are aware of new developments, trends, ideas and directions in groundwater matters and we will attempt to do this through the newsletter. Probably most importantly, we would like to promote the IAH as a body that decision-makers consider essential to consult before major development or natural resource decisions are made.

We can only achieve this by being more visible. Where controversial matters are raised, the IAH should have a stance, based on sound hydrogeological facts, not emotions. At times, State IAH committees should comment on issues or reply to inaccurate articles in the press or other media. At times it may have more impact coming from the National Executive. We should not just shrug our shoulders and ignore inaccurate or biased reports. If a matter concerns any member and they consider it to be of sufficient importance that IAH should take a stand, any member of the National Executive would welcome a letter or a phone call.

We in Queensland are new at running this association. Comments are very welcome, as we will represent the members throughout Australia. Please let us know your thoughts, either by direct communication or by letter to the secretary or newsletter editor.

John Hillier
President,
Australian Chapter,
International Association of Hydrogeologists

EDITORIAL COMMENT

The highlight of 1994 was the combined IAH-AIE *Water Down Under* Conference at Adelaide in November. This was a truly international conference, and had an impressive range of topics presented and discussed. In some ways there were almost too many disciplines to consider, which required careful selection of talks to attend from the eight concurrent sessions. The effort that was given by the chairpersons to follow the clock, and enable interchange between talks must be commended. The various groups and people involved, largely Adelaide-based, must be complimented on a particularly successful conference, and the venue lent itself well to such a meeting. Of note was the extremely good blend between the various talks, posters, commercial displays, workshops, discussion groups, and social events. The field trips presented a range of themes, and were all very well attended and enthusiastically received. The intimate association between water supply and quality, with good wine became quite apparent on all trips! Many colleagues that I spoke to referred to the importance of such a conference in not only transfer of information, but in developing contacts and future cooperation. In addition, the proceedings and format of the papers provides a valuable resource for reference.

Very evident through 1994 was the development and growth within Australia of a much wider range of sub-disciplines within "hydrogeology". A particular development is work in the shallow unsaturated zone. Many of these trends are quality oriented, and follow trends that are well established within North America, and in western Europe. Of importance to us in Australia and neighbouring countries is that many of these trends are already impacting us here. A major effect of this will be within regulation and monitoring requirements of various government bodies. We are already beginning to see this, and there will be many changes introduced in 1995.

Another major happening in Australia, is the recent change in view by state/territory governments to the support of "groundwater" or "hydrogeology" type divisions or departments. Budgets are of course of major importance, and while rationalisation is accepted as needed in certain areas we hope that a balanced, and longer term consideration is maintained in respect to the importance of groundwater/surface water assessment and monitoring requirements. All indications are that the need for these will become greater, not less. It should also be remembered, that on a world-wide basis Australia has been a groundwater leader, and an innovator in a range of groundwater technologies and utilisation, and these skills and associated data should be augmented, not diluted.

We would also like to extend our thanks and appreciation to the previous editor of the Newsletter Dr Garry Pantelis, and his assistants, and hope thank we can follow the good example.

Proceedings of Water Down Under Conference

After some detective work, we found that there still remain additional copies of the proceedings of the IAH-AIE conference that can be purchased. Prices (\$) are:

Volume	Member IAH or AIE	Non-member
1	66.00	88.00
2 (two parts)	72.00	96.00
3	57.00	76.00
Complete set	180.00	240.00

From: EA BOOKS
PO Box 588, Crows Nest, NSW, 2065

tel (02) 438 1533 fax (02) 438 5934

CONTRIBUTIONS TO NEWSLETTER

We encourage any members or branches to submit items of any type. These can be happenings in your state or territory, movements of members, changes in government departments or the private sector, new policies and regulations, conferences or seminars, research, current or new projects, publications and books, software or projects you are working on. Anything that you would like to share.

We have had quite a bit of comment from regional centres and other country members that they would like to see abstracts of talks given at meetings. Perhaps all states could do this. It would be good to use the Newsletter as a national information exchange. We also will be pleased to receive ideas and suggestions on how to make the Newsletter more effective Australia-wide. We are aiming at a Newsletter every three months (March, June, September, December) but this depends on input, and our own ability to keep it up.

We have discussed at our national committee meeting the topic of advertising in the Newsletter. Our conclusion was that it is reasonable, and that we will accept it. Advertising can be in the form of a submitted A5 fullpage (\$100), half page (\$55), or business cards (quarter page, \$25). Our view is that this will help support the Newsletter, plus is bona fide as information exchange. We will, however, add a disclaimer for the Association in regard to such advertising.

To send items to the Newsletter, there are several ways:

- (a) post office box as per front cover,
- (b) fax: M.E. Cox, IAH Editor, (07) 864 1535
- (c) email: m.cox@qut.edu.au

Items in camera ready form will be helpful, A4 to reduce to A5.

ARTICLE ON AUSTRALIAN PRODUCED SOFTWARE

Next issue of the Newsletter we would like to include an article on Australian produced computer software that covers hydrogeology and related or interactive fields. We ask the authors, or agents, if they would submit around 100-150 words about their program, containing information such as its name, purpose, capability, requirements to run, cost, and where available. Elaborate a bit on the technical details if you wish, and especially note if it interfaces with other software.

COMPETITION FOR NEWSLETTER NAME

We have had some suggestions that the Newsletter would be more unique, or identifiable if it had its own name instead of the generic title *Newsletter*. As an example, in Victoria they have a newsletter called *Flow Lines*. This seems to be a reasonable idea, and we ask members to submit their selection. One suggestion to date, *Transmissivity*. If you could get your idea to us by the end of April we will make a choice. The selection panel will be the current national executive. Unfortunately we cannot offer a prize for the winner, but there would be much self-satisfaction involved, if not glory.

OTHER ITEMS FOR NEWSLETTER

We would encourage any member who wishes to contribute a longer article, especially of a technical nature to do so. Comments we receive confirm that members overall are keen to gain as much information as they can from the Newsletter. Does anyone have some interesting results from a field programme that they have recently completed and would like to share?

Humour? What about a hydrogeological joke or anecdote. These will help fill up the bottoms of some pages. After a series of IAH conferences and seminars, we know that hydrogeologists are not without humour, although some of it may be a little dry!

INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS
NATIONAL EXECUTIVE MEETING
(IAH-Australia)
17 January, 1995

1. First Meeting of National Executive based in Queensland

The meeting was held at DPI-Water Resources, Mineral House, George St, Brisbane, commencing at 5.30pm.

The committee is as follows:

President	John Hillier
Vice President	Iain Hair
Secretary	Robert Ellis
Treasurer	Peter Evans
Editor	Malcolm Cox
Assistant Editor	Magdalena Steffens
Committee Member	Colin Laing
Committee Member	Lindsay Furness
Committee Member	Bruce Pearce
Committee Member	Paul Smith
Committee Member	John Harman

2. Meetings for 1995

It was decided to hold the IAH-Australia meetings on the second Tuesday in the *odd* months, at 5.30 pm for a 6.00 pm start.

Procedure for new applications. It was agreed that in future, all applications for membership should be approved at the state level (two signatures required), before being sent to the national executive. Overseas applicants would refer to their sponsoring states. Application forms may need changes to be easier to follow and include some more relevant information.

Newsletter Advertising. Business card/quarter page \$25, half page \$50, full page, \$100.

Subscriptions for 1995. After discussions, it was decided that the rate for 1995 should remain at regular member \$75, and \$45 for students.

Sponsorship for members from undeveloped countries. There was full support of sponsorship. It was decided that a request for sponsorship would be put on the Membership Renewal form, suggesting that \$10 would be a good amount. This would be used to sponsor nominated people, and if there was excess money, it would be up to the International Secretariat to put the funds in to the area requested. See inside rear page.

Members details for advertising. The International Secretariat sells the membership list to selected organisations. The membership renewal form will have a box to tick or cross, depending on a members wish to receive information selected by the executive. The executive will make decisions on each case. Those requesting lists will be "encouraged" to put a paid advertisement in the newsletter.

REPORTS FROM IAH BRANCHES

IAH - Australian Capital Territory



Australian Geological Survey Organisation

Hydrogeological activities in the Australian Geological Survey Organisation are carried out in the Environmental Geoscience and Groundwater Division.

Projects for 1994-1995 include:

- Murray - Darling Basin Hydrogeology
- Australian Groundwater Quality Assessment
- Great Artesian Basin Hydrogeology
- Groundwater in Aboriginal Lands

Great Artesian Basin - The AGSO ORACLE GAB hydrogeological database of waterbore data from QDPI-WR, NSW DWR, SADME and NTPWA, and AGSO datasets, and the ARC/INFO GIS have been completed. The GIS pre- and post-processor for the GAB groundwater model is being completed, and the model geometry and input data are being prepared. Digitising of wire-line logs from waterbores in the GAB is complete, and a digital package of wire-line logs and well data is being prepared. The GAB model and the logs support the GAB Bore Rehabilitation Program, carried out by the State Water Authorities.

Work was carried out on the regional hydrochemistry, and isotope hydrology studies, including radio-active (^3H , ^{14}C and ^{36}Cl) and stable environmental isotopes to determine the groundwater origin and residence times, and flow-rates in the GAB, and on recharge (jointly with QDPI-WR) and discharge projects. Sampling and thermoluminescence analyses of spring deposits were undertaken to improve earlier dating of the spring deposits by carbon-14 and U/Th techniques. Monitoring of springs in the SW part of the GAB continued.

The Cape York Peninsula Groundwater Investigation to assess the nature, extent and availability of groundwater resources which was carried out jointly with QDPI-WR, and field sampling for hydrochemistry and isotope hydrology, and remote sensing analyses, bore census, drilling of test and observation holes, and data compilation, analyses and interpretation was completed.

Groundwater in Aboriginal Lands

A new project in the Northern Territory is being developed jointly by Gerry Jacobson with Peter Jolly and Michael Jamieson of NTPAWA and people from the Central Land Council. The project is to create a groundwater information system for aboriginal lands in the southwest NT, and facilitate access to this information by aboriginal community groups. The project will include the revision of geological maps, hydrogeological mapping and groundwater resource assessment for a region of 80000 km² as well as a study of community water use and management.

Libbie Lau, in collaboration with Sandy Dodds and Patricia Tewkesbury of SADME, has recently completed the compilation of two hydrogeological maps of the South Australian sector of the Officer Basin at 1: 1 million scale. The maps show the groundwater systems of the basin and its surrounds, and the salinity of the groundwater. This is an arid region with sparse freshwater resources. The maps form part of a joint AGSO-SADME project to develop a geological atlas of the Officer Basin under the National Geoscience Mapping Accord.

Gerry Jacobson and John Bauld were in Kathmandu recently to develop a collaborative project for AGSO with the Nepal Groundwater Development Board. The project, under the auspices of the Australian aid program, aims at characterising the pollution of groundwater in the Kathmandu valley. Kathmandu, with a burgeoning population of one million people, lacks coherent water supply, sanitation and garbage disposal facilities, and has a serious problem of environmental degradation. It is feared that the top aquifer, which is an important water resource, may be badly polluted.

Murray-Darling Basin - The Hydrogeological Map Series of the Murray Basin has been completed. This was a joint project with NSW DWR, HydroTechnology, Victoria, and Mines and Energy, SA. The Hydrogeological Map of the Darling River Drainage Basin at 1:1 000 000 scale has also been completed jointly with NSW DWR and QDPI-WR. Both these products were the subject of a launch by Senator Bob Collins at the December meeting of the Murray-Darling Basin Ministerial Council. Work is progressing on groundwater modelling in the Lachlan Fan/Ivanhoe Block area (nearly completed) and commencing for the Lower Darling region (in association with NSW DWR and MESA).

Work on the Murray Basin Discharge Zone project continued. This is a joint project with CSIRO Water Resources for the Murray-Darling Basin Commission, to understand the dynamics of Disposal Basins as an aid to their management.

Land Degradation Mapping - This new project has commenced in the Environmental Geoscience and Groundwater Division. Dealing primarily with land degradation issues it has important linkages with groundwater-related processes of degradation. Three project areas are currently being studied collaboratively - Liverpool Plains, Boorowa River Catchment, Wagga. Though concentrating on NSW sites at present the program will eventually develop into one with a national focus.

**INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS
QUEENSLAND BRANCH**

February 1995 Report

Committee of IAH-Queensland (current to next AGM in April, 1995)

Chairman	Malcolm Cox
Vice Chairman	John Harman
Secretary/Treasurer	Robert Ellis
State liaison	Bruce Pearce
Committee	Magdalena Steffens Paul Smith Colin Laing Lindsay Furness John Hillier Iain Hair

1. Meetings in 1994

- 1 February, 1994 Speaker: Gerard McMahon
Acidification of a suburban stream by groundwater baseflow - is it produced by quarrying?
- 12 April, 1994 Annual General Meeting
Speaker: Ian Hair
Groundwater investigations for the Yandi iron ore project, Newman, WA
- 7 June, 1994 Speaker: Colin Laing
Hydrological aspects of the PNG Fold Belt, particularly in relation to Kubutu Oilfields
- 26 July, 1994 Business meeting
- 9 August, 1994 Speaker: Jaya Dharmasiri
Isotopic studies in groundwater and soil/sediment management - Sri Lankan experience
- 11 October, 1994 Speaker: Peter Evans
Fluoride anomalies in aquifers of the Great Artesian Basin in Queensland
- 26 October, 1994 Combined meeting with Geological Society of Australia
Speakers: Malcolm Cox, John Hillier and John Harman
Groundwater and mining in NW Queensland
- 1 December, 1994 End of year celebration
at home of committee member Magdalena Steffens

2. Meetings for 1995

It was decided to hold the IAH-Qld Branch meetings on the second Tuesday in the *even* months, at 5.30 pm for a 6.00 pm start.

- 7 February, 1995 Speaker: Andrew Moser
Northern Territory hydrogeology and water supplies for Aboriginal and other isolated communities.

*ISOTOPIC STUDIES IN GROUNDWATER AND
SOIL/SEDIMENT MANAGEMENT
- SRI LANKAN EXPERIENCE*

JAYA K. DHARMASIRI

(ENVIRONMENTAL ISOTOPES CONSULTANTS)

ABSTRACT

Naturally occurring isotopes (^2H , ^3H and ^{18}O) are part of the natural water cycle and used extensively to obtain information on origin and recharge of groundwater, recharge areas, residence times, inter-relations between stratified aquifers etc. Man-made isotopes (^3H , ^{82}Br) have been used widely to obtain point information on infiltration rates, pollutant dispersion in rivers, river flows and travel times in catchments, direction of groundwater flow and aquifer parameters. Fall-out isotope ^{137}Cs , has been used in studying recent (since 1950s) soil erosion in catchments and sedimentation rates in surface waters storages.

Extensive rainwater infiltration measurements have been carried out in Sri Lanka using man-made tritium as a tracer in different soil types. Infiltration rates varied from 4% - 54%. Stable isotopes ^{18}O and ^2H , measured in monthly rainwater samples at 7 locations in Sri Lanka over a period of 6 years, helped establish the source areas for moisture in the two monsoon seasons. These two isotopes have also been used to indicate the importance of recharge to groundwater due to water losses from rice growing areas. Tracing and stable isotopes have been used to locate the origin of the sacred water drip in an old cave temple in an effort to save historical paintings from water damage.

Fallout ^{137}Cs has been used as a tracer for the study of soil redistribution in catchments and siltation rates in reservoirs over the last four decades. A siltation rate of 1cm per year was measured in a man-made reservoir in Sri Lanka. By studying ^{137}Cs distribution with depth under various land uses in a given area can yield valuable information on stability of soils and sheet erosion rates.

COMBINED MEETING GSA/IAH
Wednesday, 26 October, 1994
6.00 pm

GROUNDWATER and MINING in NORTHWEST QUEENSLAND

The presentation was by three guest speakers who are involved in groundwater and represent different organisations: Dr Malcolm Cox, Lecturer, School of Geology, QUT; Mr John Hillier, Manager, Groundwater Assessment, DPI-Water Resources; and Mr John Harman, Principal Groundwater Engineer, Rust-PPK. The proposed fourth speaker, Mr Iain Hair, Supervising Hydrogeologist, Woodward-Clyde, was unable to attend due to illness. The speakers each provided a different perspective and have working experience in different aspects of groundwater.

The basic idea of the meeting was to promote inter-disciplinary exchange between the mining-related sector of the geological community, and the hydrology-related sector. In many cases geologists within the mining-exploration sphere are not fully aware of the close involvement of groundwater with the development and running of a large mining operation. This is especially the case in the unique conditions of an arid environment. Because of the current importance of the discovery of bulk base metals deposits, and development of large scale mining operations in north-western Queensland it was considered timely to provide an outline of the role of water in such operations, as well as in Queensland in general. Groundwater is not only a major resource, but is a major factor in the economics of any mining operation. This factor varies state to state, and Queensland has some unique features of its own, but many of the fundamentals apply in different locations.

After an introduction by David Horton, Mal Cox provided some general comments and background, and an introduction to the speakers. Mal is the current chairman of the IAH (Queensland) and explained the Australian Chapter of the International Association of Hydrogeologists (IAH) has around 350 members, of which 52 belong to the Queensland branch. The local branch has meetings every two months. A major happening this year is the international conference *Water Down Under 94* organised jointly by the IAH and the IEA. This will be in Adelaide 21-25 November, and will bring together over 400 delegates representing the various sciences and engineers involved in groundwater work. By the nature of the work groundwater investigations are very much cross-disciplinary, whether they are supply or quality oriented. From 1995 the National Executive of the IAH will be based in Queensland for the four year term.

Mal introduced the groundwater industry of Queensland, outlining the various divisions in DPI that are involved and the associated groups in surface water studies; the associated activities of local authorities and of AGSO were noted. This work tends to be more directed to monitoring, regulation and testing, i.e. defining and protecting the resource. The private sector, mainly consulting groups, has a wider range of activities but tends to be more involved in exploration, development and specific studies related to quality or problems. A new direction here is in shallow groundwater in urban settings. The activities of the different university departments were outlined, including undergraduate teaching but in particular the increase in research. The research is receiving increased cooperation from government, and is being encouraged and supported "in-kind" by various sections of DPI and several of the consulting groups. An interesting newer development is the consideration of the chemistry of sedimentary basin groundwater in mineral and petroleum exploration.

John Hillier provided an informative view of the current and changing role of the groundwater group in DPI, noting its regulatory functions and responsibilities. He outlined their typical tasks and the importance of the data base they have established. John gave an overview of the hydrogeology of Queensland in particular the GAB, and general migration models of groundwater in this large basin. He provided some good examples of chemical variations in the GAB groundwater and some amusing anecdotes on its history and use. He explained how water chemistry is useful in indicating flow paths both current and previous, and noted some of

the interesting trends such as areas of high fluoride, and decreasing pH southward. What was evident is the intimate association between this groundwater resource and the development of much of western Queensland. John explained the hydrogeological relation between the Mt Isa Block and the western part of the GAB which abutts onto it, and the importance of groundwater in this arid region. An interesting part of the talk was the explanation of artesian water and how it responds to large scale use.

John Harman's talk was directed to water supply investigations in the Mt Isa Block, especially its eastern margin, and outlined some case histories that he had been involved in, permission being kindly given by the client companies. John outlined the drill testing approach taken, and the type of modelling then used to develop groundwater occurrence and migration information. He specified the type of groundwater requirements needed for a large mining project in this part of Queensland, and demonstrated the importance of a good flow model. John outlined some problems typical in using groundwater from the GAB and noted the inter-action between the consultants and DPI. Of interest in this talk was the range of groundwater-related aspects that John noted need to be considered in a large mining operation in addition to water supply, such as quality water for consumption, lower quality for processing, groundwater seepage into an open cut and its dewatering, leachate considerations with tailings impoundments and the impacts on surface water and seasonal effects.

IAH COMMISSION ON MINERAL and THERMAL WATERS, SLOVAKIA.

Colin Laing

From 25th to 30th September 1994 I attended a meeting of the IAH's Commission on Mineral and Thermal Waters in Slovakia. I had been invited to attend, having expressed interest in the commission's work and having corresponded with them for some years on mineral water which is one of my main interest. As a result of this attendance which was at my own expense, I was proposed and accepted as a member of the CMTW.

The meeting was held at Bojnice Spa, some 180km NE of Bratislava. The various members present reported on mineral and thermal water projects in their various countries. We were shown round five of the spas and mineral and thermal water occurrences in Slovakia mostly coming from carbonates associated with the Alpine - Caucasus thrust belt. The spa resorts all employ medical staff and are an accepted part of the health system in Slovakia as indeed in most other European countries.

Current projects of the CMTW include the preparation of a world bibliography on mineral and thermal waters. I have supplied data with assistance from Andrew Shugg on Australian mineral water occurrences; and with assistance from Dick Glover of the NZ Institute of Geological and Nuclear Sciences on New Zealand thermal waters.

The CMTW would like to hold a future meeting in Australia. Ballarat in two or three years would be ideal because of its proximity to Daylesford.

Colin is a Queensland member and a private consultant in the groundwater industry. He is well known to members, having worked in many parts of Australia, and in Victoria for many years. A point of note is that Colin was one of the founding members of the IAH in Australia.

The following two articles appeared during the height of the drought in late 1994 when groundwater was in vogue as an alternative to dwindling surface supplies. Unfortunately for Sydney's water supply the plausibility of extracting groundwater in reasonable quantities for drinking purposes is low.

Found: water galore under Sydney

By JAMES WOODFORD
Environment Writer

As Sydney's water restrictions take hold, it has been revealed that a supply of up to 5,300 billion litres of water a year that could be used for drinking or industry has been found under the city.

The groundwater, discovered by Mr Erin Workman, research and development manager for a private consortium, Geo-Sydney Pty Ltd, is contained in aquifers - water-bearing layers of rock - in the sandstone surrounding the Sydney plain.

Although reaching the water would mean drilling as deep as 100 metres, it is claimed that the supply may cost a fraction of the price of water from Warragamba Dam.

The discovery is outlined in an issues paper prepared by the Sydney Water Project for the Water Board, a copy of which has been obtained by the *Herald*. The board has yet to see the findings.

Senior scientists and bureaucrats have supported the plausibility of Mr Workman's claims, saying that the discovery was not made earlier because the technology had not existed.

The aquifers are estimated to contain more than twice the amount that the Water Board can hold in all of its dams - 2,200 billion litres.

Because of the severe drought, Warragamba Dam is now at only 59.6 per cent of its capacity and Sydneysiders may face further water restrictions if dam levels fall below 55 per cent.

Eventually, the Water Board plans to increase its storage capacity by building the Welcome Reef Dam on the Shoalhaven River.

GROUNDWATER AND THE DROUGHT



Groundwater is tapped to supply in excess of 650,000 ML/year of low salinity groundwater to high yield bores. This is used for irrigation, industrial and urban enterprises. Groundwater is a dynamic resource that recharges from rainfall, normal stream flow, floods, leakage from other aquifers or infiltration from human activities (irrigation infiltration, canal leakage, industrial effluent, etc). Also like on other systems there is also outflow to the sea, rivers or wetlands. In drought the recharge sources cease, but the outflow will continue for some time (like a dam), and the water table can fall by up to 10 metres.

Unfortunately many users do not understand that groundwater is not necessarily 100% reliable in terms of a back up supply. In this current drought, this lack of planning has seen some towns with as little as 3 months supply available, irrigators with no water available to pump, bore failure due to poor maintenance/construction and lack of access as the water tables fall below the depth of bores. The drought is also highlighting the poor planning decisions, the pollution of the groundwater system by towns, industry and waste disposal has effectively sterilised large tracks of previously potable aquifers.

Currently the Department's groundwater advice service is taking an estimated 150 telephone calls a week and providing paid bore siting and construction advice to over 30 landholders per week. These people are often in the situation where there is no water from any source available. Many of the staff taking these calls need almost to be social workers directing callers to the various forms of assistance available. In addition we are assisting the Departments Drought Coordinator, Bob Parker, in providing advice on alternative water supply sources to all towns and cities in New South Wales. This effort is taxing all staff associated with groundwater as the normal activities and projects must still be completed.

R.M. Williams Manager, Hydrogeology
DWR

**INTERNATIONAL ASSOCIATION OF HYDROGEOLOGISTS
VICTORIAN COMMITTEE**

February 1995 Report

1. Meetings

- 13 September, 1994: Solute transport in the unsaturated zone. Prof E. White
12 October, 1994: Bioremediation - past, present and future. Dr S. Rhodes,
R. Harwood, Dr B. Davey, P. Mirkov
17 November, 1994: The future of the IAH. Dr J. Moore
1 December, 1994: State Environment Protection Policy - Groundwaters of Victoria.
Joint meeting with the Victorian Environment and Law Planning
Association.
Followed by Annual Dinner

2. Draft State Environment Protection Policy - Groundwaters of Policy

The Victorian Environment Protection Authority launched its long awaited (almost 10 years in the making!) Draft SEPP on Groundwaters of Victoria. This policy statement, which is designed to set a policy framework for the protection of groundwater in Victoria, is open for comment until February, 1995.

3. Drought

Drought conditions in north/central Victoria have gradually intensified in recent months. There has been a significant increase in demand for groundwater in northern Victoria.

4. Water Industry Reforms

Reform of the Victorian water industry continues at a pace, as follows:

Melbourne Water has recently been broken up into 5 separate companies comprising a headworks company, three retail/supply companies and a parks and waterways company.

The *Rural Water Corporation* has been dismembered with the creation of 5 separate regional rural water authorities. HydroTechnology, the technical service company is likely to be privatised.

The hundred or so small urban water supply authorities are being combined into 18 regional urban water authorities.

5. Groundwater Asset Review

The Department of Conservation and Natural Resources has initiated a review of the State's observation bores and is specifically focussing on the need for and cost of maintaining the 1800 or so State groundwater observation bores.

WESTERN AUSTRALIA

BRANCH MEETINGS

5 December 1994 Student Night

Sam Burton: UWA (now Rust-PPK)

**A new link between mafic dykes and saline seeps
in a small catchment in Southwest WA.**

Toby Whincup: UWA

**Sorptive properties of the 'Coffee Rock' in relation to
a dissolved petroleum contaminant plume.**

Abbas Kazemi: Curtin University

Hydrogeology of Lake Thompson

20 February 1995

Vernon Wilson: Curtin University

**High resolution imaging of regional geology using
geophysical methods**

LEGISLATIVE ASSEMBLY SELECT COMMITTEE ON METROPOLITAN DEVELOPMENT AND GROUNDWATER SUPPLIES

A number of IAH members made submissions to the committee on behalf of their organisations. The report was released in November 1994, and it was gratifying to see that the committee had taken a strong position in relation to the protection of groundwater resources. Some of the major recommendations are:

- Strengthening the mechanisms which control the protection of groundwater resources
- Maintaining the currently permitted landuses in Priority 1 protection areas over groundwater mounds, so as to ensure the groundwater remains in a pristine condition
- Establishing a Groundwater Research Coordinating body housed in a new Centre for Groundwater Studies in Perth

GENERAL ITEMS

UPCOMING CONFERENCES

MESOZOIC GEOLOGY CONFERENCE

23-26 September, 1996

On the following page is a flyer for the Mesozoic Geology Conference. The Conference is being hosted by the Queensland Division of the Geological Society of Australia (GSA), and the IAH-Australia has accepted an invitation to participate and be sponsor of one session. The preliminary programme outline has three streams, within each of which are three fullday sessions. One session is proposed as "Hydrogeology of Mesozoic Basins" and will cover "groundwater occurrence, geochemistry, genesis, and environmental considerations of groundwater use".

Please note a minor error in print in the above advertisement: last paragraph, line 4, should be "International Association of Hydrogeologists" not "International Association of Hydrologists". This conference has the potential to allow development of some very specific aspects of eastern Australian and offshore groundwater studies. Please note on the conference application form if you are an IAH member.

IAH-CANADA, EDMONTON, ALBERTA

4-10 June, 1995

This conference is called "Solutions '95" and is dedicated to managing the effects of Man's activities on groundwater. It is the IAH Congress XXVI. The contact is:

Allan Kerr, Chair
10769-99 Street, Edmonton, Alberta, CANADA, T5H 4H6
tel: (403) 429 1472 fax: (403) 424 5306

INTERNATIONAL WORKSHOP on WATER QUALITY and CATCHMENT MANAGEMENT

2-5 May, 1995

Organised by Prince of Songkla University, Thailand and Griffith University, Australia. The conference is sponsored by UNFSCO UNITWIN Program. The objective is a forum for exchange of views and experiences on current status and future directions. Registration fee after 31 March, 1995 is US \$144; this date is also deadline for completed papers. The contact is:

Dr Somtip Danteravanich, Secretary Organising Committee,
Faculty of Environmental Management, Prince of Songkla University,
PO Box 50, Kho Hong, Hat Yai 90112, THAILAND

MURRAY-DARLING 1995 WORKSHOP, WAGGA WAGGA

11-13 September, 1995

The title of the workshop is "Groundwater and the community", and the objective is to enhance the integration of groundwater issues into natural resource management along the Murray-Darling Basin. The role of the community is emphasised. This year it is coordinated by AGSO. Submit an abstract (100 words) by 31 March. Contact is,

Australian Convention and Travel Services
GPO Box 2200, Canberra, ACT, 2601
tel: (06) 257 3299 fax: (06) 257 3256

Mesozoic Geology of the Eastern Australia Plate

23-26 September 1996, Brisbane

MESOZOIC 96 will be an international conference held over three days to discuss the geological evolution and economic potential of the Mesozoic rocks of the eastern Australia Plate. Hosted by the Queensland Division of the Geological Society of Australia, researchers and explorationists are invited to participate.

The eastern Australia Plate, preserved in and around the Tasman and Coral Seas in Australia, Papua New Guinea, New Caledonia, and New Zealand records a history of continental convergence during the Late Palaeozoic through continental breakup into the Tertiary. MESOZOIC 96 aims to bring together earth scientists from a broad range of disciplines with academic and industry perspectives to discuss current research relevant to the Mesozoic rocks of this region.

The principal themes of the conference will embrace:

- The evolution of the eastern Australia Plate from Gondwanaland to continental breakup discussing the deformation and distribution of terrains, nature and scale of magmatic events, styles of metamorphic and metallogenic pathways, and development of continental basins.
- The economic potential of this region including a discussion of metallogenic deposits, Mesozoic hosted gemstone and industrial mineral deposits, the formation of coal deposits, and the generation of hydrocarbon and water resources.
- Related topics such as palaeogeography and palaeoclimates during the Mesozoic as well as a special session discussing new techniques and advances in looking through Mesozoic cover utilising geophysics, geochemistry, remote sensing, and computer modelling.

As host of MESOZOIC 96, the Queensland Division of the Geological Society of Australia is pleased to have the support of affiliated organisations and societies including the Geological Society of New Zealand, International Association of Hydrologists, Petroleum Exploration Society of Australia (Queensland), GSA Coal Geology Group and the University of Papua New Guinea.



Hosted by the Geological
Society of Australia
(Queensland Division)

For further information about presenting, attending or exhibiting at the conference, please complete and return this form.

- Please add my name to the conference mailing list to receive further information
- Please provide
 trade exhibition details
 sponsorship details
- I am interested in attending conference excursions

Title: (eg Prof/Dr/Mr/Mrs/Ms/Miss) _____

Surname: _____

Given Name: _____

Position: _____

Organisation: _____

Postal Address: _____

Suburb/City: _____

State: _____

Country: _____

Postcode: _____

Tel (wk) () _____

Fax () _____

Please return to:
MESOZOIC 96,
PO Box 1280 Milton Qld 4064
Tel (07) 369 0477
Fax (07) 369 1512

AUSTRALIAN SYSTEMS CONFERENCE
26-28 September, 1995

From: Tony Ladson <tony_ladson@muwayf.unimelb.edu.au>
Subject: Systems Conference

A conference announcement for Hydrologists with interests in Environmental Management. An Australian Systems Conference will bring together systems practitioners and academics from all disciplines in fields such as environmental management and information technology. Abstracts and ideas for workshops to be in by March 31.

Contact:
Bill Hutchinson, Lecturer in Environmental Management, University, School of MIS,
Pearson St, Churchill Square, Brisbane, QLD 4001, Australia, 40018
tel (09) 383 8283, fax (09) 383 8754, email w.hutchinson@cowan.edu.au

AUSTRALIAN WATER & WASTEWATER ASSOCIATION (AWWA)
April, 1995

The association will hold a 3 or 4 day conference in Sydney which is described as an "Environmental Forum". Contact the AWWA for details.

BRGM, FRANCE
Scientific Correspondents

The French semi-government organisation BRGM produces a quarterly journal called *Hydrogeologie*. They have a new incentive and in one issue per year they are including lists of research into hydrogeology-related topics and abstracts of these produced. The Publications Manager, Dr Gerard Sustrac, has been contacting institutions world-wide to develop a network of Scientific Correspondents to contribute annually (usually in February).

They currently have over 100 correspondents, with four in Australia: A. Chivas (Canberra), M.E. Cox (Brisbane), A.Q. Rathur (Perth), C.R. Ward (Kensington) and J.A. Webb (Bundoora). Correspondents, or their institution, are also offered a 50% discount on *Hydrogeologie*. The journal has papers in English, as well as in French, with all abstracts in both languages. The research/thesis issue has both English and French translations. For information contact:

Gerard Sustrac
BRGM, Science & Technical Centre, Ave da Concyr,
Orleans-La Source-BP 6009
45060 Orleans cedex 2, FRANCE
tel: (33) 38 64 33 21 fax: (33) 38 64 39 90
email: g.sustrac@brgm.fr

EMAIL BULLETIN BOARD IN HYDROLOGY

The Department of Civil Engineering at Monash University, Victoria has a bulletin board in hydrology. To be included on the list, send the message:

"Subscribe hydrology *your name*" to LISTSERVE@eng.monash.edu.au

After this you can then send messages to the bulletin board to,

HYDROLOGY@eng.monash.edu.au

IAH COMMISSION FOR GROUNDWATER IN URBAN AREAS ON INTERNET

This Commission is run by IAH-International and aims to advance scientific understanding of the interactions between groundwater and the urban environment, and to improve the hydrogeological basis which underlies the relevant aspects of policy making and management in urban areas.

Members of the IAH Commission of Groundwater in Urban Areas and other IAH members can now use the internet to communicate with each other and discuss any topic related to groundwater in urban areas on the network. A mailing list server at CSIRO Division of Water Resources manages the urban groundwater email list "urban_gw@adl.dwr.csiro.au"

HOW TO SUBSCRIBE

to subscribe to the list send a message to the listserver address:
mailist@adl.dwr.csiro.au

saying in the body of the email text:

subscribe urban_gw

The subscription request will be approved by the TownerU of the list. You can at any time remove your name from the list.

For further information contact,
Dr Claus Otto, CSIRO Division of Water Resources,
Private Bag, PO Wembley, WA, 6014
Tel. (09) 387 0200, Fax (09) 387 8211, email: "claus@per.dwr.csiro.au"

AUSTRALIAN TO NOMINATE FOR IAH INTERNATIONAL PRESIDENT

Assoc Prof Michael Knight of the UTS National Centre for Groundwater Management is to be nominated to run for the position of President of the International Body of the IAH. Michael was approached by Dr John Moore, current President of IAH, to nominate for his position when John's term expires in August, 1996. The elections will be held at that time at the IGC, Beijing, China.

The IAH-Australia National Executive have discussed this matter, and fully support Michael's nomination. We consider that not only does he have the commitment required and correct attributes for such a role, but that he would be able to raise the profile of groundwater matters of the Southern Hemisphere. The position is for a four year term. In a latter newsletter we will include a comment from Assoc Prof Knight about this nomination.

Bright SPARCS

ASAP has undertaken an ambitious program to make information about Australian scientists available free-of-charge, internationally, through the Internet. The project is known as Bright SPARCS (Scientists Present in Australia's history Resource Collection Strategy). Already data on over two thousand scientists, from the 18th century to the present has been published electronically. ASAP invites you to use, enjoy and contribute to Bright SPARCS.

What is Bright SPARCS?

Bright SPARCS is not a static directory or database. As part of the World Wide Web, Bright SPARCS uses hypertext links to connect data, documents, even images into a biographical network. From a biographical summary of a particular scientist you might be able to go to an illustrated article about them, examine a guide to their archival records, or view a portrait photograph. You can choose to browse scientist by scientist, or search for a specific individual. You can follow up on your research by accessing the contact details of repositories holding relevant archival sources. Bright SPARCS is not just a query-and-answer system, it encourages exploration.

At the heart of Bright SPARCS are three data sets: Biographical Summaries; Archival Sources; and Repositories. You can move easily between the three, or browse alphabetically through a particular set using 'Next record' and 'Previous Record' buttons.

Where additional biographical or archival information is available, hypertext links take you directly to it.

You can start using Bright SPARCS right now. There are no registration fees or subscription procedures. All you need is access to AARNet. If you have a networked computer in a university or other organisation linked to AARNet, you probably just need to set up the correct WWW browser software - Mosaic, for example, is available for free on the 'Net and comes in Mac, Windows and Unix flavours. If you have a dial-up line it might be trickier, but it's certainly still possible.

Once you're set up, just tell your browser to go to the following address (or URL): <http://coombs.anu.edu.au/SpecialProj/ASAP/ASAPHome.html>. From there it's just a matter of following the hypertext links wherever you want to go.

Our current plans include a comprehensive on-line bibliography of the history of Australian science and technology. From a biographical summary of a particular scientist you will be able to view a list of relevant archival and published sources.

We also intend to add data to the biographical summaries, to provide a standard set of details for every scientist, including important dates, positions and awards. To these will be linked an ever growing web of biographical articles, memoirs and photographs.

Bright SPARCS will provide a comprehensive resource for researchers, students and teachers, as well as the casual browser.

What you can do

The successful development of Bright SPARCS will require the co-operation of a wide range of individuals and institutions with an interest in the history of science and technology in Australia. That means you!

- First of all, please *use* it. If you have any problems or suggestions let me know.
- Secondly, please send us information on possible additions to our list of scientists, with as many details as possible.
- Thirdly, think about materials that you might like to publish as part of Bright SPARCS. Over the next year or so we will be seeking to develop links with scientific societies and organisations that will enable us to republish a wide range of obituaries and memoirs in hypertext format. Can you contribute to this biographical library?

To discuss any of these, or for more information please contact:

Tim Sherratt
ASAP Canberra Office
GPO Box 783
Canberra ACT 2601

Ph: (06) 257 7985
Email: Tim.Sherratt@anu.edu.au

This list of Australian Academy of Science exchanges and awards was sent in by Phil Commander, Department of Minerals and Energy, WA. For further information write to:

Dr Clinton Foster, Secretary/Treasurer, Australian Geoscience Council,
GPO Box 378, Canberra, ACT, 2601
tel: (06) 249 9447; fax: (06) 249 9972; email: cfoster@agso.gov.au

**AUSTRALIAN GEOSCIENCE COUNCIL INC
(AGC)**

Please find below a list of Australian Academy of Science exchanges, fellowship and award programs with France, the UK, Korea, Taiwan, China & Japan and French Embassy program which you may find of interest.

Japan Society for the Promotion of Science Postdoctoral Fellowships in Japan, Awards for Scientists 1996-97. Deadline for Applications 1 September 1995, Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Science and Technology Agency Postdoctoral Fellowships in Japan, Awards for Scientists 1996-97. Deadline for Applications 1 September 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Scientific Exchanges With China 1996-97. Deadline for Applications 1 October 1995, Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Scientific Exchanges with Japan 1996-97. Deadline for Applications 1 November 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Japanese Government Research Awards for Foreign Specialists 1996-97. Deadline for Applications 1 November 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Agency of Industrial Science and Technology of Japan, Foreign Researcher Invitation Program. Applications are accepted throughout the year. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

French Government Scientific Fellowships 1996. Deadline for Applications 15 July 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Scientific Exchanges with Taiwan 1996. Deadline for Applications 1 August 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Scientific Exchanges with Korea 1996. Deadline for Applications 1 August 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Scientific Exchanges with the United Kingdom 1996. Deadline for Applications 1 July 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

French Embassy Fellow under the Bede Morris Fellowship Scheme, Grant for Scientific Visit to France 1996. Deadline for Applications 1 June 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Commonwealth Fellows under the Bede Morris Fellowship Scheme, Grants for Scientific Visits to France 1996. Deadline for Applications 1 June 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.

Rhone-Poulenc Fellow under the Bede Morris Fellowship Scheme, Grant for Scientific Visit to France 1996. Deadline for Applications 1 June 1995. Contact Therese Lewis, Australian Academy of Science (06) 2473966.



Clinton Foster, Secretary
28 February 1995

FOREIGN EXCHANGE GRANTS

(These are the same Australian Academy of Science grants as those in the previous item. However, this list was summarised by Rob Virtue in Brisbane, and as he went to the trouble, plus there is additional information to that sent by Phil Commander, we have included them both).

Fancy a bit of lab work in Japan? Want to brush up on artesian aquifers in France? Check out the chalk in the Old Dart? If you have the urge to travel and learn there are several exchanges available through the Australian Academy of Science. Destinations include Japan (5), France (3), United Kingdom (1), Korea (1), Taiwan (1) and China.

The primary purpose of the grants is to support collaboration between Australia and the host country, in the fields of natural science, basic and applied, including mathematics and engineering science. Applicants should propose a collaborative research project, or a specific activity, which has been developed in consultation with scientists or technologists in host institutions. Most require a PhD. Terms vary from 10 days to 12 months.

The available exchanges, academic requirements, terms and awards are:

1. Scientific exchanges with Korea 1996: PhD. 10-28 days and 1-3 months. Living and travel
2. Scientific exchanges with Taiwan 1996: PhD. <4 weeks. Travel and living.
3. Scientific exchanges with China 1996-7: PhD. Travel and living.
4. Scientific exchanges with Japan 1996-97: PhD. 3-6 weeks and 6-12 months. Travel and living.
5. Japan Society for the Promotion of Science, Post Doctoral Fellowships in Japan, Awards for Scientists 1996-97. PhD. 12 months. 270,000 yen/month living and travel, housing allowance, settling in allowance, family allowance, medical and accident cover.
6. Agency of Industrial Science and Technology (AIST) of Japan, Foreign Researcher Invitation Program. PhD. Age < 35 years. 6-12 months. Travel, living, housing, family and relocation. Must learn Japanese.
7. Japanese Government Research Awards for Foreign Specialists 1996-97: Government employees. >3 years post-grad experience. Remain employed by department while in Japan <6 months. Travel, accommodation.
8. Science and Technology Agency, Post Doctoral Fellowships in Japan, Awards For Scientists 1996-7:-PhD. Age < 35 years. 6 months to 2 years. 270,000 yen/month living and travel, housing allowance, settling in allowance, family allowance, medical and accident cover.
9. French Embassy Fellow, Under The Bede Morris Fellowship Scheme, Grant For Scientific Visit to France 1996. PhD. >4 weeks. \$7,000.
10. Commonwealth Fellows, Under The Bede Morris Fellowship Scheme, Grant For Scientific Visit to France 1996. PhD. <6 weeks. Airfare and \$125/day.
11. French Government Scientific Fellowships 1996. BSc. or equivalent. Age 25-45 years. <6 months. FF4700 to FF5500. French language.
12. Scientific Exchanges With The United Kingdom 1996. < 6 weeks. Airfare \$125/day.

Written requests for application forms (except No. 11) to,

International Exchanges
Australian Academy of Science
GPO Box 783
CANBERRA ACT 2601

For No.11,

French Embassy - Scientific Section
French Government Scientific Fellowships
6 Perth Avenue
YARRALUMLA ACT 2600

IAH WORKING GROUP ON GROUNDWATER-RELATED SALINISATION

The Working Group will draw together case studies and experience of the hydrogeological aspects of salinisation from as many countries and major regions as possible. The objective is to produce a volume that will be a reference source, and stimulate comparative studies and international research and technical cooperation in this field. The likely title for the volume is "Groundwater Processes in Land and Water Salinisation: an International Perspective".

I invite you to submit a paper for the volume - the paper might be a case study, a regional review or a research contribution. Your commitment would be to submit a draft manuscript for consideration one year from now, March 1996, or earlier if possible. Around 20 manuscript pages would be an appropriate length. Manuscripts should be prepared in the style of the IAH journal, Applied Hydrogeology (now renamed Hydrogeology Journal), and will be subject to peer review. For consistency between the papers it is suggested that your paper include sections covering:

- Regional hydrogeology;
- Groundwater quality (and surface water quality);
- Background to salinisation;
- The salinisation process;
- Socio-economic aspects;
- Strategies for remediation.

Please advise me as soon as possible if you are able to write an appropriate paper, and let me know the likely title and authorship.

GERRY JACOBSON
Principal Research Scientist
Environmental Geoscience
and Groundwater

Telephone (06) 249 9758
Facsimile (06) 249 9985
Int. Facs. 61 6 249 9985

AGSO
AUSTRALIAN GEOLOGICAL
SURVEY ORGANISATION

Cnr Constitution Avenue and
Anzac Parade, Canberra
GPO Box 378, Canberra, ACT 2601

**MEMBERS, MOVEMENTS
and
NEW ADDRESSES**

(please send in details, to keep our lists current)

- BATCHELOR, Daud** Has now joined AGC Woodward-Clyde in Brisbane (Qld).
49 Park Rd, Milton, QLD, 4064
tel (07) 364 7444, fax (07) 364 7477
- HAIR, Iain** Has now joined Coffey Partners International in Brisbane (Qld).
53B Fairlawn St, Nathan, QLD, 4111
tel (07) 274 4411, fax (07) 274 4977
- JENSEN, Gary** Transferred from DPI-Water Resources at Bundaberg (Qld) to DPI-
Water Resources Mareeba (Qld).
167 Walsh St, PO Box 156, Mareeba, QLD, 4880
tel (070) 92 2555, fax (070) 92 3939
- LAIT, Rob** Transferred from DPI-Water Resources at Mareeba to be manager of
the Innisfail District Office (Qld)
88 Rankin St, PO Box 74, Innisfail, QLD, 4860
tel (070) 61 2822, fax (070) 61 4028

NEW MEMBERS

We would like to welcome the following new members who have recently been accepted into the IAH.

Raj Aseervatham	QLD	Philip Bourgault du Coudray	WA
Christopher Clarke	WA	James Finegan	VIC
Terence Flynn	VIC	Alison Jennings	VIC
Fiona Jerinic	WA	Gholam Kazemi	WA
Janusz Kwiatkowski	VIC	Alan Lee	QLD
Gregory Muir	NSW	Andrew Moser	QLD
Stephen Pugh	SA	Karin Schwab	VIC
William Scott	WA	Peter Sinclair	NSW
Catherine Stone	SA		

A full and updated Australian membership list will be printed in the last newsletter of the year.

IAH FEES

FEES ARE NOW DUE

Fees have received appreciable discussion by the National Executive. The main concern is that as part of an international organisation we must be considerate of exchange rates. At the moment this is of particular concern as the bulk of fees paid is remitted to Germany. We have therefore voted that a fee rise is necessary. The IAH will still remain one of the cheapest professional organisations with an international journal.

The approach to annual Association fees now is to have them based on a calendar year. Therefore for 1995 the fees became due from the 1 January, 1995. As a further reminder an account will be sent with the next newsletter. Fees must be paid before 30 June, otherwise a penalty will be levied. Remember that fees for IAH as a professional association are tax-deductible. The new fee schedule will commence 1 April, 1995 and will not affect those already paid. The fees are,

Member	\$80.00
Student Member	\$50.00
Member (full sponsor)	\$130.00
Member (partial sponsor)	\$90.00
Corporate Member	\$400.00
Organisation/corporate sponsor	\$50.00

A new fee category was established in 1994, that of "Sponsored Member". This category has been created for members in developing countries of our region, such as SW Pacific countries like Fiji, Solomons, Tonga, Vanuatu and Papua New Guinea, and SE Asian countries like Laos, Thailand, Vietnam, and Indonesia. This is a guide, but there are quite a few others, plus territories. There are, however, some potential members already in Australia who could be eligible, such as those who are refugees or newly arrived. We have attempted to clarify this here, following various queries and requests.

Member (full sponsor): pay \$80 + \$50, and nominate the person they wish to sponsor.

Member (partial sponsor): pay \$80 + \$10, and the \$10 will be put towards potential members on the IAH-Australia list. They are welcome to provide names to add to the list.

Organisation/corporate sponsor: \$50 per person sponsored, they may nominate a person, or leave it to the IAH-Australia selection. This could be used by companies, consultants or IAH state bodies. A 50% discount in advertising rates will then be available for 12 months.

We are attempting to building up a list of potential members who can then be selected. Are there other acceptable people that members know of? The main criteria is that they are eligible to join IAH, but due to salary considerations would find the fees difficult. We will later print lists of members who have participated.

Applied Hydrogeology

Official Journal of the
International Association
of Hydrogeologists



International Journal for Hydrogeologists

co-sponsored by the Hydrogeology Division of the Geological Society of America

Applied Hydrogeology publishes the following types of articles:

- **Papers:** Full articles that report new scientific results of general interest
- **Reports:** Review of a specific topic, or descriptions of the hydrogeology of an area
- **Technical notes:** Short articles that describe new or innovative techniques of data collection or analysis
- **Profiles:** Biographical sketches of eminent hydrogeologists, emphasizing their contributions to the science
- **Publication notes:** Short descriptions or reviews of new or little-known but significant publications
- **Comments and replies:** Discussions related to articles published in the journal

EDITOR

(Submission of papers and other inquiries should be made to this address)

Dr. Clifford I. Voss
U.S. Geological Survey
431 National Center
Reston, Virginia 22092 USA
E-MAIL: cvoss @usgs.gov
TEL: +1 703-648-5885
FAX: +1 703-648-5274

MODFLOW for GROUNDWATER FLOW MODELLING

Murdoch University
20 - 23 March 1995

Please direct enquiries and mail to:

Dr Colin Walker
Groundwater Training
Division of Environmental Sciences
Murdoch University
Murdoch WA 6150
Tel: 09 360 2738
Fax: 09 310 4997
Mobile: 015 775 711
e-mail: walker@essun1.murdoch.edu.au

Course Description

This course is designed to introduce you to key concepts in applying ground water flow models for analysis of complex hydrogeologic systems. After completing the course, modelling of real-world situations will be under your control.

The course combines classroom discussions with hands-on laboratory sessions. The lab sessions are designed to complement the discussions, allowing you to immediately apply what you learned during the lectures. You will be able to input data, run a model, and retrieve output as you would in an every-day work environment.

Course Materials

Students will be provided with the following materials: a copy of MODFLOW/EM, MODPATH/EM and MODPATHPLOT/EM (on diskettes for use with an IBM or compatible computer) and a copy of the new USGS pre-processor MFI for use with MODFLOW and MODPATH. Students will also receive extensive written documents: a copy of the report documenting MODFLOW and copies of reports and journal articles pertaining to groundwater model applications.