

# THE HYDROLOGICAL SOCIETY OF S.A.

% Water Resources Branch

Box 1751, Adelaide, S.A. 5001

NEWSLETTER NO. 52

MAY 1987

## EDITORIAL

### STORM RUNOFF : RESOURCE OR REFUSE ?

Can you imagine refusing the offer, free of all supply and home delivery charges, of \$50 worth (annually) of sediment- and salt-free water? Yet this is exactly what most of us do in the way we manage storm runoff from the roofs of our homes.

Indeed, the building regulations of many of our Councils require us to treat this resource as though it were refuse to be collected and removed from sight as quickly and as efficiently as possible. So committed are they to this course of action that extensive networks of underground pipes and drains are provided at ratepayers' expense to implement this policy.

Is there a better way ?

A recent report published by Australian Road Research Board (Argue, 1986) says there is and devotes one chapter to a review of methods including soakage wells, porous paving, retention/overflow wells, Dutch drains, seepage beds, roof storage, rainwater tanks, etc. The benefits which, it is claimed, flow from these measures are :

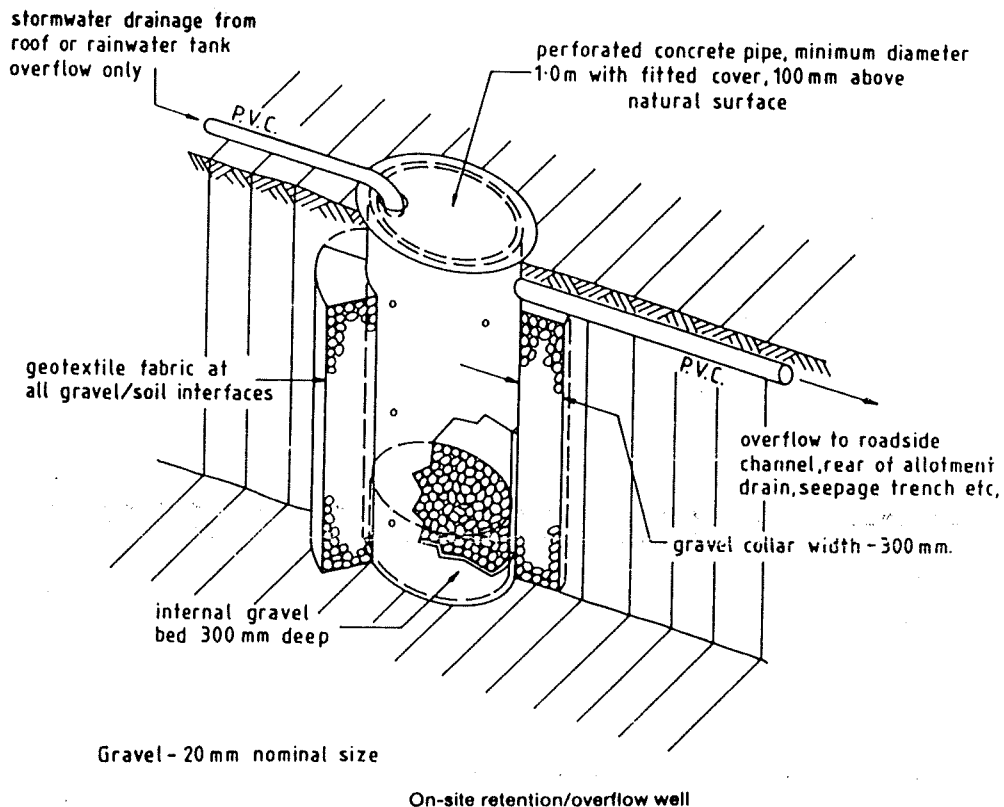
- wise use of a valuable natural resource;
- maintenance of soil moisture resulting in more attractive urban living environments;
- reduced use of mains water and, hence, reduced excess water payments by householders;
- reduced need for underground networks to collect and dispose of storm runoff; and
- reduced risk of injury, drownings, etc. associated with flows in large, open drainage channels.

The retention/overflow well, one of the available domestic options (see next page), has attracted the attention of S.A. Housing Trust and three metropolitan councils who are co-operating with S.A. Institute of Technology (Civil Engineering) in a study of the behaviour, performance and feasibility of these installations. Not all soil types and/or site situations are appropriate for retention/overflow wells and the present enquiry aims to identify suitable soils in the Adelaide metropolitan area and also to answer crucial questions concerning soil swelling or "heave" in the immediate vicinity of the wells.

So, next time you hear the pitter-pat of rain on your roof and you've just received a bill for excess water, give some thought to installing a retention/overflow well or seepage bed in your backyard. You may be doing your bank balance and your environment a favour !

Reference :

Argue, J.R. (1986) - Storm drainage design in small urban catchments: a handbook for Australian practice. Australian Road Research Board. Special Report SR34, Vermont South, December



#### HONORARY LIFE MEMBERSHIP

In the 17 years since its inception, HSSA has conferred Honorary Life Membership on only one of its distinguished members - Mr. B.C. (Skip) Tonkin. There are a number of members of our Society for whom this honour would be appropriate. Accordingly, nominations for this category of membership are sought from members.

The main criteria for selection are current membership and distinguished service to HSSA. In addition the candidate's contribution to hydrology may be taken into account.

Nominations should be supported by a citation (200-400 words), which should be forwarded, in confidence, to the Secretary for consideration by the Executive Committee. It is hoped that the number admitted to Honorary Life Membership of our Society will be significantly increased at the AGM in August.

RE DIVINERS, DOWSERS, ET AL ....

A recent spate of letters to the Editor of the "West Australian" newspaper on the subject of water divining ended with the following contribution :

Dear Sir,

The members of our association, which represents hydrogeologists throughout Australia and most countries of the world, come into contact with water diviners frequently.

There is no doubt that a rod or twig or whatever device used by the diviner reacts to some unknown force, possibly located beneath the earth's surface. There is also no doubt that when people have explored beneath the surface at divined sites, water is often found.

Does this conclusively mean that the diviner has located water by some mystic power? We think not. In many areas there is more water underground than you can poke a stick at.

Water moves in underground streams only under exceptional and specific geological conditions. In the Perth metropolitan area there is a vast underground lake of water stored in the interstices between the sand grains, moving very slowly toward the ocean or river.

We mean no disrespect to water diviners, who often perform an invaluable service - particularly in areas where the occurrence of water is related to vegetation, topography drainage and soil type. A "successful" diviner in these areas would normally take account of all these factors as would a hydrologist.

However all tests, including those undertaken by the Australian Society of Sceptics in NSW in July 1980 and the ABC in Perth in September 1980, supported by the wide-spread experience of our members, lead to the conclusion that underground water is not the trigger which activates the diviner's rod.

Paul Whincup  
Australian President  
International Association  
of Hydrogeologists Stirling  
Street, Perth

THE MURRAY-DARLING BASIN COUNCIL (Contributed by Claus Schonfeldt)

Following the droughts of the late 1960's there has been a progressive change for managing the resources of the Murray-Darling Basin. To that point the principle concern had been for water regulation and distribution. Subsequently the maintenance of acceptable quality of the water, particularly salinity, has assumed increasing importance. It was of course recognised that land management both adjacent to the river, in its main tributaries and throughout the catchment more generally has an impact.

Hence, to properly manage the quality as well as the quantity of the water in the River Murray there needed to be properly co-ordinated management of the land throughout the catchment.

Today of course this is recognised by the philosophy of TOTAL CATCHMENT MANAGEMENT. That this philosophy now has appeal to resource managers is evidenced by the NSW Government's explicit policy for total catchment management.

For the River Murray however total catchment management requires co-operation and integration of the efforts of three State Governments as well as the Commonwealth. To date, Queensland has not been a party to any of the arrangements.

The 1983 amendments to the River Murray Waters Agreement certainly provided some expanded ability for the River Murray Commission to deal with water quality issues. But the broadened functions were still seen as being rather limited.

Hence in November 1985 the Murray-Darling Basin Ministerial Council was established.

The Murray-Darling Basin Council is constituted of the Ministers of the Commonwealth, New South Wales, Victorian and South Australian Governments holding portfolios concerned with water, agriculture and the environment. The Council's objective is to promote and co-ordinate effective planning and management for the equitable, efficient and sustainable use of the land, water and environmental resources of the Murray-Darling Basin.

The Council immediately set about its task by initiating the preparation of proposals for early action to deal with the most urgent problems of the basin, namely river salinity and land degradation, and the development of a comprehensive natural resource management strategy for the basin.

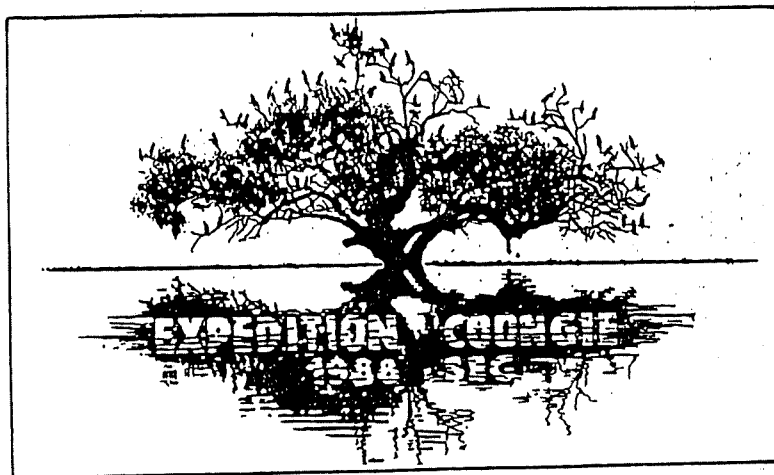
To facilitate this the Council established an interim organisation comprising a Standing Committee (of Departmental Heads representing the land, water and environment interests of each government) to oversee the work of a number of Steering Committees and Working Groups, with provision for interaction with the River Murray Commission.

However at its most recent meeting Council reviewed these interim arrangements and agreed to the establishment of a Murray-Darling Basin Commission to encompass the statutory responsibility provided for under the River Murray Waters Agreement and to undertake an advisory role to the Council on land, water and environmental matters not covered in the Agreement.

The Commission will comprise two Commissioners from each Government representing between them water, land and environmental interests.

Legislation to implement the changes is to be enacted in the four parliaments involved by September 1987, to take effect from 1 January 1988.

Provision will be made in the legislation for later participation by Queensland following further negotiation.



## EXPEDITION COONGIE - 1988

The Scientific Expedition Group is seeking volunteer leaders to organise and conduct an expedition to the Coongie Lakes area in June 1988.

The expedition, intended for young people (17-25 years), will combine biological and landform field studies with adventurous outdoor activities in the unique Coongie Lakes area (on Coopers Creek in the far north-east of SA).

Needed are an expedition leader, deputy expedition leader (or two co-leaders) and about six group leaders. Experience in field scientific disciplines and/or outdoor activities is required. Appointments will be made during June 1987.

For further information, either :

write to : SEG, PO Box 501, Unley, S.A. 5061  
or contact : Dr. Richard Willing - phone : 332 9977 (work)  
or : Ms Jill Tideman - phone : 363 0804 (home)  
: 343 2686 (work)

Applications or expressions of interest must be received by Friday 12 June 1987 so HURRY! HURRY! HURRY!

## FROM THE HYDROLOGICAL TRAPS ....

### STORMWATER RETENTION DAMS AT SALISBURY

(Reporter : Chris Wright)

Kinhill Engineers' work on design of retention dams No. 9 and No. 15 for City of Salisbury is nearing completion. The dams are being constructed following a study by B.C. Tonkin and Associates which identified potential flooding problems in the Salisbury/Enfield and Para Hills areas due to lack of provisions for stormwater drainage and extensive development within the catchment. Dams 9 and 15 each control a catchment of approximately 100 hectares and will fully contain the 20 year average recurrence interval flood, releasing water after the storm has passed through a low-level culvert outlet pipe. The dams are also efficient attenuators of more intense storms and are designed with emergency spillways capable of handling a storm greater than the estimated 1/3 Probable Maximum Precipitation.

Design work has been supervised by the Highways Department, Drainage Section, and Design Branch of the Engineering and Water Supply Department. It is expected that Dam 9 will be constructed within the next few months.

FACTORS AFFECTING RESIDENTIAL WATER  
CONSUMPTION IN ADELAIDE

(Reporter : Graeme Dandy)

A research project with the above title was recently completed in the Department of Civil Engineering, University of Adelaide. The study basically involved a survey of 600 households in Adelaide to obtain socio-economic data. These were then related to the water consumption of individual households using statistical analysis. The study found that the most significant variables in explaining variations in annual household water consumption were the annual allowance, the number of residents in the household and the watered area of the plot. Surprisingly, meteorological factors such as temperature, rainfall or evaporation did not have a large influence.

Only about 50% of residents surveyed correctly indicated the trend in their water consumption over the last seven years (i.e. increasing, decreasing or relatively constant).

Models for forecasting annual consumption for individual households were developed. These were used to forecast 1985/86 consumptions and the results compared favourably with the actual values.

OPTIMUM OPERATING POLICIES FOR  
MULTIPLE RESERVOIR SYSTEMS

(Reporter : Graeme Dandy)

The Department of Civil Engineering, University of Adelaide, has received a joint grant from AWRAC and the EWS to continue research into the use of optimisation techniques as an aid in determining operating policies for multiple reservoir systems. Work carried out to date on the southern part of the Adelaide headworks systems indicates that savings of about 7% of total pumping cost can be achieved using this approach with no loss in system reliability. The next step is to extend the work to include the more complex northern part of the Adelaide system. Future extensions of the model could include water quality considerations.

Editor's note : I'm sure there are more hydrological 'happenings' in SA than these entries indicate. How about writing a 5-10 line contribution about your current project and mailing it off to the Editor right NOW!

ABOUT PEOPLE AND ORGANISATIONS ....

KINHILL ENGINEERS

Since the last newsletter, Kinhill Stearns has reverted to Kinhill Engineers, ending the association with Stearns-Roger of Denver, California. As far as the Water Resources operations of Kinhill, there has been no noticeable change, since the water resources group is entirely Australian based. The firm is hoping to expand its water resources workload in New South Wales and Dr. Ron Black will be pursuing new prospects over there.

## NEW LECTURER IN WATER ENGINEERING AT THE UNIVERSITY OF ADELAIDE

The Department of Civil Engineering at the University of Adelaide recently appointed ANGUS SIMPSON as a lecturer in water engineering. Angus completed a Ph.D. at the University of Michigan with a thesis on the subject of water hammer in pipes. Angus's earlier education included a B.E.(Hons) at Monash University and a M.Sc. in hydrology and water resources at Colorado State University. His practical experience includes 3 years with the Harza Engineering Company in the USA and 4 years with the MMBW. Despite his leaning towards hydraulics, Angus has been persuaded to join the Hydrological Society.

## NEW GROUNDWATER/ENVIRONMENTAL MERGER

In a move to improve the co-ordination of their complementary consulting activities, environmental consultants Paul Manning and Associates have merged with Australian Groundwater Consultants Pty. Ltd. The new home for the combined operation is in 'Braham Straight' at No. 28 Dequetteville Terrace, Kent Town (Tel 31 0647).

## CONGRATULATIONS TO CHRIS McQUADE

HSSA member and committee-man Chris McQuade received the degree of Master of Engineering (Civil Engineering) at the SA Institute of Technology's graduation ceremony, 4 May 1987.

Chris commenced work on his master's project shortly after completing his B.Sc. degree in earth sciences at Flinders University. Work on his thesis "An Evaluation of the Neutron Moisture Meter for estimating Evapotranspiration in the Adelaide Hills, South Australia" was carried out in conjunction with his work at SA Department of Agriculture.

Earlier this year Chris accepted a position with Ranger Uranium in the Northern Territory. We wish him well in this new endeavour.

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## SEMINAR

### THE GREENHOUSE EFFECT

HOW SHOULD WE RESPOND TO THREATENED CLIMATE CHANGE ?

A seminar organised by Conservation Council of SA in association with United Nations Association (SA Branch) and the Adelaide Chapter of Australian Conservation Foundation.

It is the intention of the seminar to increase awareness of the nature and scale of predicted climatic change, its causes and consequences, and to discuss responses in the areas of monitoring, planning, policy and legislation.

THURSDAY 4 JUNE 1987 - 7.30 till 10.30 pm  
Convention Centre, Education Department Building, Flinders Street,  
Adelaide

Registration Fee : \$5.00  
Enquiries : John Rolls (ph : 269 3879 after hours)

## FROM THE SECRETARY . . . .

The Executive Committee has elected Graeme Dandy as Acting Chairman and has co-opted Chris Purton of B.C. Tonkin and Associates and Anwen Auckland of the Water Resources Branch (E&WS) to serve on the Committee until the August elections. Many thanks to them both for offering their willing help.

The proposed meeting on Flood Frequency Analysis on the Murray had to be postponed since the studies by Ken Potter of Lange Dames and Campbell and the Water Resources Branch are not yet far enough advanced. Instead, Dr. Ron Black of Kinhill was called on to talk about the Statistical Rational Method for flood estimation in the Adelaide/Mount Lofty Ranges, a method which is included in the new edition of Australian Rainfall and Runoff.

At the next general meeting, Jay Punthakey of the Department of Agriculture gave an introduction to the ANSWERS model for prediction of catchment behaviour during storm events. The model was being run primarily as a means of determining soil losses from the catchment. Jay has only been working on it for 6 months and could give only indicative results at this stage. He gave a brief explanation of the advantages and limitations of the model, and a comparison with other models which are being developed. The method of dividing the catchment into small elements offers potential advantages to hydrologists who are attempting to simulate the response of a whole catchment consisting of many units of different soil and vegetation types all of which will respond differently to rainfall and runoff. The model offers the capability of simulating such differences, however at present the difficulty is in establishing the values of the basic parameters.

A day trip is being planned to the Barossa Valley, tentatively in the spring of this year. Possible items of interest, apart from the product for which it is best known, are the stream gauging of the Little Para, the groundwater issues (Mike Cobb), effluent treatment from the wineries and pollution from winery waste. It should prove an interesting day and it is hoped that it can be a family occasion. If possible it would be preceded by an evening meeting at which the problems and developments would be discussed.

### NEXT MEETING REMINDER

June 25 : "Coring of the Blue Lake, Mount Gambier"

**SPEAKERS:** Fred Leaney and John Dighton - from CSIRO Division of Water Resources Research.

Analysis of deep sediment cores from the bed of Blue Lake Mt Gambier has revealed some interesting facts which have altered current thinking on its history.