

3rd Hydrochemistry and Environmental Isotope Workshop



Established in 1987, the Centre for Groundwater Studies (CGS) has now merged with the National Centre for Groundwater Research and Training (NCGRT).

When	Where
3 rd Hydrochemistry and Environmental Isotope Workshop Wednesday 29 Sept – Friday 1 Oct 2010	Stamford Grand Hotel, 2 Jetty Rd, GLENELG, ADELAIDE SA

Who should attend

The course is aimed at environmental scientists, groundwater consultants, engineers, project managers, and regulatory/compliance officers in the public and private sectors. A basic understanding of the principles of groundwater flow is desirable. However, the course introduces all the required concepts pertaining to hydrochemistry and environmental isotopes from first principles. **Please Note: This course is being restricted to 25 attendees.**

Course Description

The objectives of this workshop are to provide introductory training in the principles of aqueous chemistry and the application of hydrochemical and isotope tracers for evaluation of groundwater systems (water-rock interactions, recharge rates/mechanisms, flow direction, inter-aquifer mixing, groundwater residence time, hydraulic processes affecting water quality). The workshop will include: formal lectures, informal sessions discussing case histories and a field demonstration.

- Characterising groundwater quality
- Geochemical processes that control water quality
- Behaviour of isotopes in groundwater systems
- Groundwater dating with carbon-14, chlorine-36, tritium and chlorofluorocarbons (CFCs)
- Estimation of recharge using chloride profiles

Industry and government are struggling with issues related to groundwater and surfacewater quality, contaminated land and water resources. Initiatives such as the National Environmental Protection Measure (NEPM) have highlighted a risk-based approach for defining optimum remediation options for subsurface contamination. The prime objective of this course is to provide understanding of the important facets of natural groundwater chemistry. The course will review the fundamentals of groundwater hydrology, hydrochemical reactions controlling baseline groundwater composition, techniques used to assess groundwater flow and age, and the implications of contamination. The state-of-the-art in groundwater tracers will be explored through the use of case studies. Course content will thoroughly cover the most important processes controlling groundwater chemistry and evolution. The presenters will teach correct methods to collect hydrogeochemical data and methods of interpretation. Attendees will be led through the process of groundwater sampling, the presentation and interpretation of hydrochemical data and implications for designing monitoring strategies to help in the characterization and sustainability of groundwater bodies.

This specialist course offers excellent teaching on groundwater chemistry, by an eminent international consortium of presenters and organisations including Flinders University and CSIRO.

Course Outline

- Water as a solute
- Sources of dissolved ions
- Chemical processes leading to observed variations in groundwater chemistry
- How chemistry and environmental isotopes can be used to trace groundwater flow and recharge
- Groundwater dating methods

Expected Outcomes

This specialist course is aimed at helping participants and their organisations:

- Understand the major controls on groundwater chemistry
- Become aware of up-to-date techniques for investigating groundwater quality and evolution
- Be exposed to national and international experience using case studies of regional aquifer systems across the world
- Become aware of societal issues relating to groundwater sustainability

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Course Leaders

Andrew Love, PhD is a Senior Industry Research Fellow at Flinders University. He is a member of NCGRT as well as the Chief Investigator on the Project: "Allocating water and maintaining springs in the Great Artesian Basin". Andrew has extensive experience in government and now in academia and has worked on the application of environmental tracers in a number of different hydrogeological settings including surfacewater-groundwater integrations, fractured rock aquifers and large groundwater basins.

Paul Shand, Ph.D is a CSIRO Landscape Geochemist and Stream Leader of the Environmental Contaminants Stream within the Healthy Water Ecosystems Theme of CSIRO's Water for a Healthy Country Flagship. He has extensive international experience in the characterisation and evolution of groundwaters, surfacewater-groundwater interactions and more recently in hazard assessments of inland acid sulfate soils across Australia.

Course Fees

AU\$2200 (incl GST) includes: notes, tuition, morning and afternoon teas, and lunches. **NB: This course is being restricted to 25 attendees.**
REGISTER NOW TO AVOID DISAPPOINTMENT.

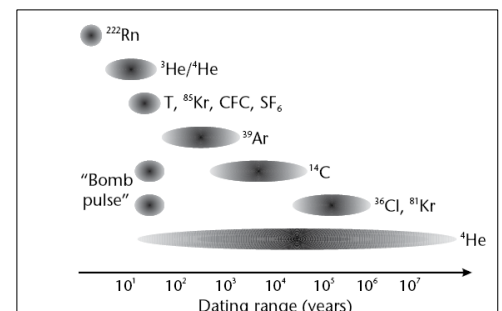
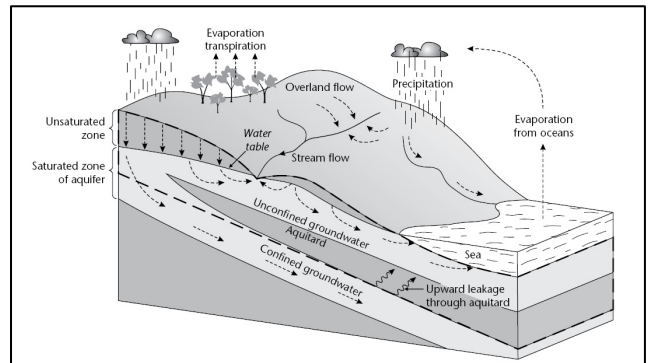
Accommodation

Attendees are to **arrange own accommodation**.

If you mention that you are part of this Course, you **may** be eligible for an accommodation discount at the course venue.

Stamford Grand Adelaide Hotel: 2 Jetty Rd, Glenelg, SA, Australia.

Ph: +61 8 8376 1222 **Fax:** +61 8 8376 1111 **Email:** sales@sga.stamford.com.au



To register please see over leaf.

For more information contact: **Phone:** +61 8 8201 5632 **Fax:** +61 8 8201 5635

Email: industrytraining@groundwater.com.au

Web: www.groundwater.com.au/industrytraining

REGISTRATION FORM / TAX INVOICE

ABN: 65 542 596 200

Please register early by faxing this form to **FAX: +61 8 8201 5635**

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TITLE: FIRST NAME: SURNAME:

EMAIL: *...NB: Most communication will be via email*

JOB TITLE:

COMPANY:

DEPARTMENT:

ADDRESS (Postal):

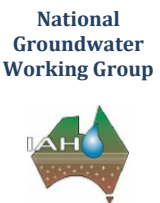
CITY: COUNTRY/STATE: POSTCODE:

PH: MOB: FAX:

WEB:

DIETARY REQUIREMENTS:

Fees – AU\$

Course Title	Course Fee Includes GST	
3rd Hydrochemistry & Environmental Isotope Workshop, Wed 29 Sept—Fri 1 October SA <i>Early bird before Friday 13 Aug</i> <i>NB: Limited places available</i>	<input type="checkbox"/> \$ 2200.00 <input type="checkbox"/> \$ 2310.00 <i>After Friday 13 Aug</i>	
Less (choose 1 option only): <input type="checkbox"/> 5% discount on <u>*Course Fee only</u> for IDA, IAH, AWA, NZHS, SIA, ACLCA Members (Member No.....) <input type="checkbox"/> 10% discount on <u>*Course Fee only</u> for NCGRT, NCED Partner Staff (Partner name.....) <input type="checkbox"/> 15% discount on <u>*Course Fee only</u> for Full-time Students (Institution name.....)	-\$	
TOTAL AU\$	\$	

PAYMENT – Please select payment method below:

ABN: 65 542 596 200

1. **Credit Card** Please debit my: Visa Mastercard

Card Number: _____

Cardholder's Name: Signature:

Expiry Date: __ / __ / __

2. **Cheque** Payable to: **"NCGRT Groundwater Industry Training"**
 Addressed to: NCGRT Groundwater Industry Training, Attn: Glenys Flight
 GPO Box 2100,
 ADELAIDE, SA 5001, Australia

3. Please send me a Tax Invoice Purchase order number:



Terms, Conditions, Transfers and Cancellations for all NCGRT Groundwater Industry Training:		
1 CONFIRMATION letter will be sent to all participants prior to a course. Participants must have received their confirmation letter before attending a course. 2 TRANSFER of your registration to a different course must be made in writing. This will incur an additional administration fee of \$220.	3 CANCELLATIONS must be made in writing. Then the following terms will apply: <i>a. Less than 3 business days before a course: No refund</i> <i>b. Between 3 business days and 3 weeks before a course: 50% refund</i> <i>c. More than 3 weeks before a course: Refund of the course fee minus an administration fee of \$220</i> <i>d. However, to avoid loss of the course and administration fees, a substitute attendee is welcome, by submitting a new Registration Form</i>	4 If attendees CANCEL Field Trips, generally no refund will be paid. 5 While every attempt will be made to deliver courses as advertised, we reserve the right to cancel a course at short notice for conditions beyond our control. Notification of any such cancellation will attract a refund.

For more information contact: **Phone:** +61 8 8201 5632 **Fax:** +61 8 8201 5635
Email: industrytraining@groundwater.com.au **Web:** www.groundwater.com.au/industrytraining