

# Program

Australian Groundwater School – Adelaide  
 Flinders Uni, Victoria Square Campus  
 Monday 11 November 2019



NATIONAL CENTRE FOR  
**GROUNDWATER**  
 RESEARCH AND TRAINING

TIME		THEME/TOPIC	PRESENTERS
8.30am		<b>Registrations and Coffee</b>	
8.45am		<b>Welcome and Introduction</b>	
9.00am	1	<b>The Importance of Groundwater In Australia</b> <ul style="list-style-type: none"> <li>• What is groundwater</li> <li>• Where is groundwater found?</li> <li>• The hydrologic cycle</li> <li>• What is hydrogeology and its history?</li> <li>• Australian groundwater facts and figures</li> <li>• Australian aquifer map. sedimentary basin/fractured province, inset on map</li> <li>• GDE's</li> </ul>	
10.00am	2	<b>Introduction to Hydrogeology</b> <ul style="list-style-type: none"> <li>• Factors affecting groundwater</li> <li>• Introduction and examples of aquifer types</li> <li>• Water table and capillary zone</li> <li>• Aquifers &amp; aquitards</li> </ul>	
11.45am		<b>Morning Tea</b>	
12.00pm	3	<b>Introduction to Groundwater Hydraulics</b> <ul style="list-style-type: none"> <li>• Groundwater flow systems</li> <li>• Storage in aquifers</li> <li>• Hydraulic Head</li> <li>• Physical &amp; hydraulic parameters</li> </ul>	
12.45pm		<b>Lunch</b>	
1.30pm	4	<b>Surface Water – Groundwater Interactions</b> <ul style="list-style-type: none"> <li>• Introduction to surface water hydrology</li> <li>• Locations and modes of interaction between surface water and groundwater</li> <li>• Water balance</li> <li>• Human impacts</li> <li>• Recharge/discharge definitions and estimation</li> </ul>	
2.45pm		<b>Afternoon Tea</b>	
3.00pm	5	<b>Practical session</b>	
5.15pm		<b>Networking Drinks – Treasury: 2 Flinders St, Adelaide SA 5000</b>	
6.15pm		<b>End Day 1</b>	

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Australian Groundwater School – Adelaide (Flinders Uni Vic Square)  
 Tuesday 12 November 2019

TIME		THEME/TOPIC	PRESENTERS
9.00am	6	<b>Groundwater Hydraulics</b> <ul style="list-style-type: none"> <li>• Groundwater flow equations</li> <li>• Borehole pumping tests</li> <li>• Single borehole test</li> <li>• Lab measurements of hydraulic conductivity</li> </ul>	
11.00am		<b>Morning Tea</b>	
11.15am	7	<b>Tutorial</b> <ul style="list-style-type: none"> <li>• Pumping to test an aquifer- a simple example</li> <li>• Groundwater Budget</li> </ul>	
1.15pm		<b>Lunch</b>	
1.45pm	7	<b>Tutorial</b> <ul style="list-style-type: none"> <li>• Unconfined groundwater contours</li> </ul>	
3.00pm		<b>Afternoon Tea</b>	
3.15pm	8	<b>Fractured Rock Aquifers</b> <ul style="list-style-type: none"> <li>• Fractured rock provinces in Australia</li> <li>• Classification</li> <li>• Basic Characteristics</li> <li>• Groundwater flow</li> <li>• Locating and mapping fractures</li> </ul>	
4.15pm	9	<b>Mining Hydrogeology</b> <ul style="list-style-type: none"> <li>• Mine Dewatering</li> <li>• Dewatering Methods</li> <li>• Impacts of dewatering</li> <li>• Design of dewatering system</li> </ul>	
5.15pm		<b>End Day 2</b>	

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Australian Groundwater School – Adelaide  
 Wednesday 13 November 2019

FIELD TRIP

TIME	THEME/TOPIC	PRESENTERS
8.45am	Depart from 182 Victoria Square, Adelaide Field trip location - Brukunga Mine Office	
10:00 am	Sign in at Brukunga Mine Office (Nairne)	
10:00 am	Short presentation by Department of Sate Development: <ul style="list-style-type: none"> <li>• History,</li> <li>• Current Acid WTP operation, AMD &amp; WQ monitoring,</li> <li>• Water diversion &amp; Rehabilitation,</li> <li>• Site map &amp; handouts</li> </ul>	
11.00am	Site tour: <ul style="list-style-type: none"> <li>• Acid WTP, Tailings Storage Facility, acid &amp; clarifying ponds,</li> <li>• North &amp; South open pits &amp; Waste Rock Dumps,</li> <li>• Retention dam, Diversion channel/pipe, Creeks &amp; Water monitoring wells</li> </ul>	
12.30pm	Sign out & departure	
12:45pm	Lunch – Millie’s bakery (Nairne)	
1.45pm	Field site in the Adelaide Hills	
3.15pm	Bus departs back to Flinders University Victoria Square	
4.30pm	Bus to arrive back in Adelaide	

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Australian Groundwater School – Adelaide (Flinders Uni Vic Square)  
 Thursday 14 November 2019

TIME		THEME/TOPIC	PRESENTERS
9.00am	10	<b>Groundwater Modelling</b> <ul style="list-style-type: none"> <li>• What is a model and what is its purpose?</li> <li>• Modelling groundwater flow</li> <li>• Modelling process</li> <li>• Groundwater modeling codes</li> </ul>	
10.00am	10	<b>Groundwater Modelling Application</b> <ul style="list-style-type: none"> <li>• Modelling guidelines</li> <li>• Limitations and pitfalls in modelling</li> <li>• Modelling case study</li> <li>• Management, regulatory issues</li> </ul>	
11.00am		<b>Morning Tea</b>	
11.15am	11	<b>Groundwater Chemistry</b> <ul style="list-style-type: none"> <li>• Why study groundwater chemistry?</li> <li>• Physical and chemical composition of GW</li> <li>• Origin of solutes, evolution in groundwater</li> <li>• Field parameters</li> </ul>	
12.15pm	12	<b>Environmental Isotopes in Groundwater</b> <ul style="list-style-type: none"> <li>• What are isotopes and their use?</li> <li>• Types of isotopes</li> <li>• Australian examples</li> </ul>	
1.15pm		<b>Lunch</b>	
2.00pm	13	<b>Groundwater Chemistry / Isotopes</b> <ul style="list-style-type: none"> <li>• Practical session</li> </ul>	
3.00pm		<b>Afternoon Tea</b>	
3.15pm	14	<b>Groundwater Microbiology</b> <ul style="list-style-type: none"> <li>• Introduction to microbiology</li> <li>• Pathogens in groundwater</li> <li>• Microbial metabolism in groundwater</li> <li>• Bioremediation</li> </ul>	
4.15pm	15	<b>Groundwater Contamination and Remediation</b> <ul style="list-style-type: none"> <li>• Introduction and definitions</li> <li>• Sources of contamination</li> <li>• Fate of contaminants in the sub surface</li> <li>• Groundwater remediation</li> </ul>	
5.00pm		<b>End Day 3</b>	

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 Friday 15 November 2019

TIME		THEME/TOPIC	PRESENTERS
9.00am	16	<b>Drilling Methods and Bore Design</b> <ul style="list-style-type: none"> <li>• Types and purposes of various bores</li> <li>• Drilling methods</li> <li>• Databases in Australia</li> <li>• Methods, variability &amp; limitations of data collection</li> </ul>	
10.00am	17	<b>Managed Aquifer Recharge</b> <ul style="list-style-type: none"> <li>• What is MAR and what is it for?</li> <li>• MAR structure types</li> <li>• Water sources to MAR</li> </ul>	
11.00am		<b>Morning Tea</b>	
11.15am	18	<b>Managed Aquifer Recharge</b> <ul style="list-style-type: none"> <li>• The Australian Guidelines for Water Recycling: Managed Aquifer Recharge</li> <li>• Risk-based water quality assessment of MAR schemes</li> <li>• Managing human health and Environmental risks</li> <li>• Worked examples and practical session</li> </ul>	
12.15pm	19	<b>Groundwater Governance – Water Law</b> <ul style="list-style-type: none"> <li>• Development of water resources law in Australia</li> <li>• Essential aspects of the current legal framework</li> <li>• Groundwater and water trading</li> </ul>	
1.15pm		<b>Lunch</b>	
2.00pm	19	<b>Groundwater Governance – Water Law</b> <ul style="list-style-type: none"> <li>• Case studies / practical session</li> </ul>	
3.00pm		<b>Afternoon Tea</b>	
4.15pm	20	<b>Groundwater Management</b> <ul style="list-style-type: none"> <li>• What, why, when and how we manage GW?</li> <li>• Principles</li> <li>• Tools for groundwater management</li> <li>• Management issues</li> <li>• Climate change</li> <li>• Salinity issues</li> </ul>	
4.20pm		<b>Wrap-up</b>	
4.30pm		<b>End Day 4</b>	

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