# SHORTLIST NOMINEES

## 1: GROUNDWATER INDUSTRY EXCELLENCE

### Jacobs, Mallee CMA

Salinity is a significant challenge in the Victorian Mallee region. The Victorian Mallee Model Refinement Project (MRP) was undertaken by Jacobs and the Mallee CMA to address this issue and it has delivered major steps forward – and represents a first for the basin. It incorporates uncertainty analysis and the development of four, large and hydrogeologically-complex numerical groundwater models – a new and novel approach for salinity assessments. The MRP will enable industry to reliably self-fund irrigation impact prevention and protect environment and community values.

### EMM Consulting, Snowy Hydro 2.0

Snowy Hydro 2.0 is emerging as one of Australia's largest infrastructure projects. It is set to increase NSW's pumped hydro-electric power capacity and support increased penetration of renewable energy. The project presents hydrogeology challenges, including tunnel-groundwater interactions. EMM Consulting has led a complex hydrogeology program that includes site-characterisation, impact assessments and complex modelling.

### Jacobs, West Gate Tunnel Project

The West Gate Tunnel Project (WGTP) in Melbourne presents unique hydrogeological challenges, environmental risks and construction risks. Jacobs has led the design of five temporary groundwater recharge schemes, with each scheme comprises 7–22 recharge wells. This recharge scheme is to manage WGTP's groundwater drawdown, contaminant movement and potential ground settlement. This project required a high level of technical leadership, collaboration and stakeholder-engagement with engineering, construction, regulatory and interest-group teams. A key outcome has been stakeholders' trust in the technical outcomes of the project.

### Watermark Numerical Computing, Surat Cumulative Management Area model

Watermark contributes to major modelling initiatives, including the design and oversight of the biggest and most complicated model in Australia: the Office of Groundwater Impact Assessment's (OGIA) Surat Cumulative Management Area model in Queensland. This model utilises industry-leading techniques and addresses model-complexity and uncertainty via calibration- and predictive-uncertainty techniques. John Doherty from Watermark has also contributed to ongoing numerical modelling education initiatives, including the 2019 Darcy Lecture series and the recent $2.6m collaborative model-uncertainty initiative.

## 2: IAH GROUNDWATER INNOVATION AND TECHNOLOGY

### RPS Group, Urban subsurface drainage as an alternative water supply

The Swan Coastal Plain in Western Australia represents an opportunity to: provide sustainable management solutions; address groundwater impacts on low-lying development areas; and implement managed aquifer recharge (MAR). RPS Group, led by Carl Davies, is a major contributor to the CRC for Water Sensitive Cities. This research group is a key stakeholder in reforms in Perth's urban groundwater practices. It has involved detailed modelling and stakeholder-engagement. The CRC has been pivotal in developing groundwater solutions for major development regions in Perth.

### QTEQ, Borehole magnetic resonance logging

QTECQ under the leadership of Benjamin Birt, has been at the forefront of the introduction of Borehole Magnetic Resonance (BMR) logging techniques into the Australian and global groundwater industries. BMR has been applied in a number of major drilling programs, including the West Australian Water Corporation groundwater replenishment program and DWER's ongoing drilling programs. QTEQ have continued to develop workflows that utilise BMR data to estimate cumulative transmissivity parameters.

### Fortescue Metals Group, Solomon dewatering

Fortescue Metals Group's (FMG) Solomon deposit in the Pilbara region of Western requires dewatering to achieve dry mining conditions. FMG, under the leadership of Chris Oppenheim, engaged a major HDD boring team to develop a dewatering solution involving a 1 km horizontal dewatering bore. This work included hydrogeological and geomechanical characterisation, numerical modelling and bore-hydraulics assessments. The horizontal bore has a 300 L/s submersible pump and FMG are planning the construction of a second horizontal bore.

### Hydro Algorithmics, AlgoMesh

Hydro Algorithmics, under the leadership of Dr Damian Merrick, developed AlgoMesh, software that enables users to develop groundwater model grids for use with MODFLOW-USG. This software has been broadly adopted globally, with licences across 30 countries. The software enables modellers to quickly and easily develop unstructured grids for use in various platforms, including Groundwater Vistas.

## 3: IAH GROUNDWATER PROFESSIONAL

### Dr Noel Merrick

Noel is a groundwater modeller, hydrogeologist and geophysicist with over 45 years of experience in groundwater science. Noel is passionate about groundwater and sharing knowledge with others. He regularly acts as a mentor and engages in the industry. He was Associate Professor and Director of the National Centre for Groundwater Management at UTS until 2009. He's continued research and consultancy, including engaging in research projects with the Aquaculture, Rice, Cotton and Contaminant CRCs. He's been a key member of the NSW working group for the NSW Aquifer Interference Policy (2012). He participates on a number of expert panels and regularly reviews groundwater resource models for regulators. He's: a long-time member of the MBD Independent

Audit Group – Salinity; a member of the Surat CMA Technology Advisory Panel; and an author of sections of the MDBC groundwater flow modelling guidelines.

### Dr Rick Evans

Dr Rick Evans has 40 years' experience in hydrogeology and has made significant contributions to hydrogeology in Australia. In the 1980s Rick helped develop national groundwater management goals, including the notion of groundwater management plans. He wrote the National Groundwater Management Policy for the Federal Government in 1996, which was adopted across all States and the Commonwealth. Rick undertook wide-ranging GDE assessments in the 1990s. He's been at the forefront of groundwater-surface water studies (including undertaking the Inaugural Land and Water Australia Senior Research Fellowship in 2005 to study groundwater-surface water interactions). Rick quantified the impact of groundwater usage on Murray River flows, leading to numerous subsequent studies. In 2005 he undertook a major study for the World Bank on Groundwater Adaptation Measures for Climate Change. He's made a significant lecturing contribution to the Australian Groundwater School and has written over 70 papers and contributions to books. He's a major IAH contributor, including the President role from 2010 to 2014. He was a member of the World Bank Groundwater Management Advisory Team from 2004 to 2010.

### Dr James Underschultz

James (Jim) is a respected expert on groundwater with over 30 years of experience and over 100 publications. Jim has worked extensively in petroleum hydrogeology, unconventional hydrocarbons and carbon storage research. He's currently serving as President of Petroleum Hydrogeology International. He shares his knowledge through community engagement, senate estimates inquiries and working extensively with executive management teams and boards of directors. His numerous career highlights include: groundwater advisor for ANLEC R&D, Geotechnical Reference Group chair for the CTSCo Surat CCS Project; Science Advisory Committee member for the Peter Cook Centre for CCS Research; Professorial Chair of Petroleum Hydrodynamics at UQ; General Manager Science for ANLEC R&D; CSIRO Theme Leader for Unconventional Petroleum and Geothermal Energy R&D; SKA geothermal project team member; and he managed the hydrodynamics and geochemistry discipline group within the Australian Cooperative Research Centre on CO2.


## 4: IAH YOUNG PROFESSIONAL

### Rhona Cartwright

Rhona is a key team member for a huge variety of hydrogeological projects: from Great Artesian Basin studies to working on Lihir Mine's +100°C dewatering operations in PNG. Rhona invests a great deal of time into the industry – she's an IAH QLD branch committee member, an active Women in Mining participant and a hydrogeology educator (including primary school incursions). Rhona participates in and contributes to KCB's social events and graduate development program.

### Dua Klaas

Dr Klaas' postgraduate studies at Swinburne University of Technology in 2019 helped local communities and regulators in managing karst groundwater resources. This research has resulted in 15 research articles and 10 conference presentations. Dua Klaas was awarded the 2019 Swinburne University of Technology HDR publication award and the 2018 IPWEA Victoria scholarship. Dua Klaas continues to contribute to hydrogeology and sustainability in the education sector.

### Madelyn Harp

Madelyn is passionate about the engagement of young hydrogeologists within the industry. She provides her time to hydrogeology outreach opportunities, including the Early Career Hydrogeologist Network (ECHN). She also interfaces and engages with the AGC, AIG and EIANZ. She works to expand her hydrogeology skill set by engaging with peers and industry leaders.

### Adam Skorulis

Adam has undertaken an impressive list of projects since graduation, including complex groundwater modelling projects and EISs. Adam demonstrates a consistent commitment to further exploring hydrogeology expertise via formal education initiatives and peer collaboration. Highlights include his coordination and running of a groundwater modelling course for international visiting hydrogeologists. Adam has developed and implemented innovative uncertainty analysis techniques for projects such as the Hume Coal project.

## 5: IAH STUDENT AWARD

### James Stanley, QUT

James (Jim) Stanley first showed his enthusiasm for hydrogeology during his undergraduate science degree, where he achieved a High Distinction in the Groundwater Systems unit. During his undergraduate years he took the initiative to commence a small hydrogeology research project, which he then developed into a Masters level hydrogeology project. In his Masters project he contributed to the Queensland Government Paddock to Reef monitoring and modelling program by filling data gaps related to groundwater nitrate attenuation in the Wet Tropics. His approach to this research project provides an excellent example of how groundwater-related problems can be effectively tackled by drawing on multiple scientific disciplines. Jim presented his research at the 2018 American Geophysical Union Fall Meeting and is currently finalising journal articles. Jim is a demonstrator at QUT and Communications Manager at IAH QLD.

### Stephanie Watson, UWA

Stephanie has consistently demonstrated exceptional aptitude and dedication to the study of hydrogeology throughout her Master of Hydrogeology at UWA. Stephanie's critical thinking and hydrogeology knowledge is acknowledged at UWA, as is her willingness to help her fellow students. Her leadership capacity was demonstrated when she led workshops on groundwater modelling within the mining hydrogeology topic at UWA. Her diligence and aptitude are reflected in an exceptionally high weighted average mark of 90% for the course. Her MSc research project assesses the fate of managed aquifer recharge (MAR) water in the environment, using numerical modelling of multiple data sets, with important implications for how the Water Corporation manages groundwater resources.

### Reuben Parige, ANU

Reuben is an honours student in hydrogeology at ANU. His project relates to understanding the hydrogeological landscapes around the NSW alpine areas, through spatial and temporal variability of stable isotope compositions. His studies are supported through scholarship based on his excellence in undergraduate earth science studies, as he is a recipient of the GSA Endowment fund and AINSE stipend. Reuben has enthusiasm for hydrogeology, seeking out an honours topic relating to the

discipline. He's currently a part-time research assistant with the Groundwater Branch at Geoscience Australia, contributing to the team's hydrogeological conceptualisations and interpretations.

## 6: BEST GROUNDWATER PHOTO

Angus McFarlane

Luis Suescún

Craig Flavel

Maria Prskalo