Australasian Groundwater & Environmental Consultants

Water Supply

Supporting the future of water

The future of water security is a global issue. In Australia, it is an ever-present challenge due to our unreliable climate, relatively dry conditions, and competing demands between agriculture, industry and communities.

Put simply, our water resources are scarce and often difficult to access. Robust assessments are needed to understand water availability and to explore potential impacts of abstraction on others and the environment. It's crucial you're equipped to meet both your supply needs and the relevant regulatory requirements.

With an increasing dependence on groundwater in Australia, sourcing and monitoring your water resources appropriately to ensure long-term sustainability has never been more important.

About AGE Consultants

We're Australia's groundwater specialists, providing groundwater and environmental advisory across Australasia for more than 25 years. We have a depth of experience and technical excellence borne out of more than 2,500 projects across major industries, agriculture, government and communities in Australasia and beyond.

We specialise in end-to-end groundwater services, from field work and modelling, to analysis and reports, to expert advisory and peer review. That means we understand the commercial, environmental, government and community challenges you face in supplying quality and sustainable water resources for your community or project.

Our expertise

From regional water supply to large intensive agribusiness operations, industrial zones to small-scale land holdings, we can provide end-to-end groundwater services to evaluate and develop sustainable water supplies.

We ensure informed decisions through innovative data collection, such as airborne geophysics and large-scale special data sets, to source sustainable water resources and assess their potential. We help you find optimal supply locations and unallocated groundwater, assess water quality, analyse for impacts on neighbouring licences and groundwater dependent ecosystems, predict groundwater supply capture zones and navigate approvals for abstraction. We also supervise the drilling process and test your bores for yield and quality over time to ensure sustainability, even in times of drought.

Our modelling team is the largest consulting groundwater modelling team in the country. Through analytical and numerical models, we evaluate the viability of a groundwater supply for your project while optimising water stewardship. Our models can simulate a fully integrated surface and groundwater system. We seek to use simple models wherever possible so that uncertainty of the predictions is not compromised.

We take care of every stage of your project to build your quality, sustainable water resource for now and the future

Local Government

Local councils are increasingly concerned about managing regional water requirements with more extreme droughts and weather events, combined with the pressing demand for economic development and population growth.

Our team conducts desktop evaluation of groundwater resources through to bore installation, test pumping and prediction of sustainable supply rates.

We support your complex water security decisions through robust research, modelling and analysis. Our groundwater modelling can integrate surface water data and historic weather records, which enable us to make reliable predictions for diverse climate scenarios. We provide access to dynamic 3D imagery for all stakeholders involved in these decisions. In collaboration with our trusted partners, we have the capability to provide integrated models and plans for complex systems and regions.

Mining, coal seam gas and quarrying

Processing water requirements for mining and other resource industries is critical to ensure long-term operation. A large proportion of these industries occur inland in semi-arid to arid environments or regions where surface water harvesting is unreliable during the summer months. This results in a heavy reliance on groundwater supply to meet demand.

We understand how complicated your water management systems can be as you meet your site requirements through several water sources. Our team can help you with dewatering and water supply borefield design, as well as integration of groundwater resources into your wider water management system to enable you to achieve self-sufficiency, despite the weather conditions.

We undertake desktop assessments to identify groundwater resources and available entitlements, followed by site investigations to prove resources and modelling to optimise borefield performance and licensing requirements for water take.

Agribusiness

One of the primary inhibitors to value-adding in Australian agriculture and agribusiness is reliable access to water. Small to large feedlots cannot bank on surface water supplies with its high levels of evaporation and Australia's variable rainfall.

Our team can help you assess groundwater potential and, if available, assist in locating production bores and supervise the drilling and construction processes. We have assisted pastoral and agricultural clients with finding the best location, as well as with the design of production bores. We work with you to ensure bore designs are completed in accordance with national and state guidelines and are appropriate for your pumping and infrastructure requirements. For existing bores, we have considerable experience in working with local drilling and pumping contractors to troubleshoot construction or drilling issues and assure quality control.

De fence

Identifying and proving groundwater supplies that are fit for purpose is critical in supporting Defence Training Area (TA) capability. Many TAs are located in remote areas where groundwater is the only feasible water supply.

We can identify and prove the groundwater resource quantity and quality and determine if it's suitable for your project's needs and constraints. We can assess water demand and supply management options, tailored to individual TA requirements, optimise borefield performance and model potential impacts to other groundwater users and the environment.

Water chemistry and treatment

Due to our Australian climate and our high levels of salinity and evaporation, it's important to understand what groundwater quality, in order to identify what treatment (if any) is required to ensure your water supply is fit for purpose.

Our specialists assess the water quality to give you a greater understanding of your groundwater environment and its possibilities. Our hydrogeochemistry expertise enables a deeper level of data interpretation and predictive capability. This means we're not just identifying the impacts, but we're also identifying the real risks of these impacts, paving the way for the appropriate treatment to ensure your water supply suits your needs.

In addition to the above areas of specialisation, our team also manages water supply for industry, infrastructure and energy transition.

We deliver end-to-end water supply solutions which might involve:

01 Site evaluation
- Legislative compliance
- Comparative analysis for optimal siting
- Proving the resource to confirm short and long-term yield and sustainability of supply
- Water quality verification

02 Drilling & testing supervision
- Successful construction of infrastructure
- Evaluation of long-term water yield and quality
- Ensure industry standards are met
- Achieving bore objectives
- Compliance with legislation

03 Modelling
- Interference issues
- Optimal placement
- Sustainable extraction
- Environmental impact on creeks and springs
- Contamination pathways

04 Approvals
- Compliance with relevant legislation
- Facilitating effective stakeholder engagement

05 Monitoring & troubleshooting
- Enduring and sustainable water supply
- Monitoring impacts of use
- Evaluation of level, quality and flow data
- Assistance with government reporting
- Troubleshooting ad hoc issues: water quality, output issues, neighbouring bore impacts
- Understanding why issues have occurred
- Rehabilitation: camera survey, mineral fouling assessment, and resolve with chemical or physical treatment

Integrated insights across the full water cycle
- Partnership with associated experts in surface water and ecological engineering
- Integration of surface water and climate scenarios into groundwater modelling
- Salinity and revegetation management
- Environmental impact on creeks and springs

Our services

Water supply

- Obtaining regulatory approval
- Desktop evaluation of prospective aquifers to meet demand in an area of interest
- Field investigations including bore census, hydrogeological and spring mapping, surface water flow monitoring and water quality
- Bore design, tender documentation, and contract supervision
- Designing and supervising the installation of water bores, including deep bores in the Great Artesian Basin
- Test pumping and hydraulic analysis
- Numerical modelling for borefield design, operations and impact assessment
- Bore rehabilitation
- Catchment scale analysis for government sectors
- Irrigation demand, soil moisture, and detailed recharge modelling
- Water balance modelling

Geochemistry

- Water quality analysis and monitoring
- Geochemistry modelling and contamination transport
- Assessment of leachate and mixing interactions
- Groundwater chemistry assessment for environmental assessments including EIS
- Isotopic age dating and isotopic tracer studies to determine solute flow paths and timelines

Our experience

Our highly technical advisory team has a depth of knowledge in water supply across major industries and sectors. Our experience includes evaluating, developing and managing groundwater supplies for government, agriculture, towns and mines throughout Australasia and overseas. We've helped ensure safe and sustainable water supplies for communities from inland areas to the coast.

With an up-to-date understanding of state policies and frameworks that determine groundwater rights, entitlements and allocations, we help you navigate government legislation and provide reliable, independent advice to inform your project. Independent and employee-owned, we feel privileged to take on the role of a specialised impartial advisor in assessments.

Our projects

Industrial and agricultural water supply

Cadia Valley Operation – Orange, NSW

Detailed groundwater resource assessments in the local area as well as the greater region due to water deficits on site. Required a detailed conceptualisation of potential groundwater resources informed by a comprehensive review of available geological and hydrogeological data. Detailed investigation of NSW groundwater licensing requirements to guide optimal future water procurement for the client's needs.

Drought Relief Project – Kwazulu Natal, South Africa

Installation of drought relief production boreholes to supply eight rural communities with water in the short timeframe of three months during the prolonged drought period. Borehole drilling targets were identified through remote sensing and ground geophysical methods. More than 85 percent of boreholes were successfully installed, and a groundwater management plan was completed for the bores and submitted to the local municipal council.

Bylong Mine Project Water Supply – Upper Hunter Valley, NSW

Assessment of groundwater yields available from an alluvial aquifer to supply a proposed opencut and underground coal mine. This involved characterisation of the aquifer including drilling, installing test bores, trial pumping and numerical modelling. Preparation of reporting allowed for government review and assessment.

QGC Accommodation Camps Water Supply – South West Queensland

Assessment of groundwater supply target for four accommodation villages operated by QGC. Included drillhole supervision and the installation and testing of production bores at Ruby Jo and Woleebee camps.

Feedlot water security – NSW and Queensland

Analysing test pumping and water quality data for sustainable yields and suitability for livestock consumption in intensive settings. Mapped and modelled site geology and hydrogeology to assess potential for groundwater and surface water contamination, as well as integrated water supplies, in various weather scenarios. Assisted new and expanding feedlot and aquaculture planners with required regulatory processes, test-hole drilling, bore design, optimal drilling locations, drilling supervision, and ongoing groundwater monitoring. Feedlot clients from Western Downs, Southern Downs, Scenic Rim, Gwydir, Maranoa, Central Highlands Region, North Burnett and Somerset local government areas.

Kogan Creek Power Station – McAlistair, Queensland

Multiple projects looking at ash disposal impacts on groundwater from both in-pit and out-of-pit settings, with assessment, modelling and project management of groundwater licensing and drilling for the construction and operation water supply. Scope included ongoing sampling and analysis of groundwater; development of groundwater monitoring standards; assessment of clay dispersion from Lagoon Gully water storage dam; assistance in applying for groundwater licensing and allocations; bore construction supervision of monitoring and supply bores up to 1,100 metres below ground level; and siting of optimal bores for supply and back-up water security.

Community water security

Rainbow Beach Town Water Supply – South East Queensland

Assessment of the sustainability and impacts of groundwater from the Cooloola Sand mass to supply for the township of Rainbow Beach with potable water.

University of Queensland (UQ) Gatton Water Supply – Gatton, Queensland

Assessment of groundwater availability within the UQ Gatton College Campus to aid in the decision process for undertaking future capital works. The project took into consideration regionally declining groundwater levels of the Lockyer Valley, where the college is located, and included a review of Queensland Department of Natural Resources and College records in addition to physical testing of a main production bore on campus.

Toowoomba Emergency Water Supply – Toowoomba, Queensland

Exploration and investigation of potential groundwater sources as a short-term emergency option for water supply for Toowoomba City Council as it faced depleting surface water supplies during drought. Scope included pumping from the Helidon Sandstone aquifer, which underlies Toowoomba and surrounds and forms part of the Great Artesian Basin, as well as assessment of the potential impact on existing users to determine if extraction of groundwater at selected locations was a viable option.

Construction Water Supply

Our team

Keith Phillipson

Senior Principal Hydrogeologist

Keith specialises in the use of groundwater models to assess and manage the impacts of a broad range of developments on groundwater and surface water resources, with more than 25 years' experience working in jurisdictions including Queensland, New South Wales, Victoria and Europe. In particular, Keith has undertaken, overseen and peer reviewed a wide variety of modelling studies focused on assessing the cumulative impacts of large-scale water supply for regional communities and economies in Australia, Britain and Europe.

James Barratt

WA Region Manager | Principal Hydrogeologist

James has been involved with numerous groundwater resource and mine feasibility studies throughout Southern, Central and West Africa. He has conducted and managed field data collection services ranging from groundwater and geophysical surveys, drilling supervision and data collection, and packer and aquifer testing. James has also developed conceptual, analytical and numerical groundwater models to assess groundwater inflows into mining areas and simulated dewatering scenarios to optimise and inform mine dewatering planning and decision-making. He is well-versed at managing groundwater studies for large-scale planned and operational mines and the compilation of technical reports to comply with international standards.

Dr Angela Bush

Principal Hydrogeologist

Angela specialises in integrated groundwater assessments, contaminant investigations and geochemical analyses, with more than 15 years' experience in consulting, research, and education. One of her strengths is underpinning water supply decisions with groundwater quality and contamination assessments. With detailed knowledge of groundwater systems in various settings, specifically focussing on fractured rock groundwater flow systems of North Queensland, she has supported clients across metalliferous and coal mines, regional councils, industrial operations, unconventional gas projects, state and federal governments, and agriculture bodies.

Pieter Labuschagne

Central South QLD Region Manager | Principal Hydrogeologist

Pieter has 20 years of experience in Southern Africa, Africa, South America and Australia including more than 15 years in a South African based consultancy as director and principal scientist. Having started his career in the development of groundwater monitoring systems for coal fired power stations, Pieter's expertise includes project management and delivery of hydrogeological conceptual models, groundwater impact and liability assessments, development of groundwater management plans, consultant reviews and numerical applications.

We empower informed water decisions that help our clients, communities and environment thrive.
If you're looking for an expert partner to secure your water supply for the long term, get in touch with us

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