WAMBO COAL PTY LIMITED

SOUTH BATES EXTENSION UNDERGROUND MINE

EXTRACTION PLAN
LONGWALLS 24 TO 26

ATTACHMENT 2
RELEVANT CONSULTATION RECORDS

Peabody

Resources Regulator
Department of Regional NSW

Monday 3 July 2023

Peabody Energy
Via: Major Projects Portal

To whom it may concern,

I refer to your request of 5th June 2023 for advice regarding Wambo Mine Extraction Plan LW24-LW26 (DA305-7-2003-i-PA-72). The Resources Regulator has reviewed the request.

Based on the review of the documents, the Resources Regulator provides the following comments:

The proposed Extraction Plan (Wambo Mine Extraction Plan LW24-26) satisfies the requirements of the Wambo Mine Extraction Plan LW24-26 (DA305-7-2003-i-PA-72 condition B7 (e) of schedule 2). Note the proposed mining will be regulated under relevant WHS law, as a High-Risk Activity notification under Clause 35 and Schedule 3 Section 17(3)(e) of the Work Health and Safety (Mines and Petroleum Sites) Regulation 2022.

The expectation would be that the operator submits a relevant High Risk Activity notification at the appropriate time. As part of this submission, it is expected that a further review of the Land Management Plan will be required to detail the proposed subsidence monitoring program to assess the potential impacts from far-fielded subsidence movement of the remote cliffs in Wollombi National Park, located 760m away from LW26.

Regarding mine rehabilitation matters, the Resources Regulator advises that it has no specific comments regarding mine rehabilitation matters in relation to the proposals.

LIMITATIONS
The Extraction Plan is assessed and determined by Department of Planning and Environment (DPE) under the conditions of the development consent. The Resources Regulator provides advice to DPE to assist in the determination.

REGULATORY REQUIREMENTS IF APPROVED

The authorisation holder is required to ensure that the rehabilitation commitments outlined in any approved Extraction Plan are regulated by the Resources Regulator under the conditions of the mining lease and the *Mining Act 1992*.

The Resources Regulator may undertake assessments of the mine operators' proposed mining activities under the *Work Health and Safety (Mines and Petroleum Sites) Act 2013* and Regulation as well as other WHS regulatory obligations.

Subsidence associated with the proposed Extraction Plan will be regulated by under relevant provisions of WHS laws in particular Clause 35 and Clause 70 of the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2014* relating to High-Risk Activities and Subsidence.

BACKGROUND

The NSW Resources Regulator is responsible for compliance and enforcement of the Extraction Plan is so far as it relates to requirements under the *Mining Act 1992* and Work Health and Safety legislation. This role principally relates to rehabilitation, workplace safety and public safety.

The Mining Act Inspectorate within the Resources Regulator undertake risk-based compliance and enforcement activities in relation to obligations under the *Mining Act 1992*. This includes undertaking assessment and compliance activities in relation to mine rehabilitation activities and determination of security deposits.

The Mine Safety Inspectorate within the Resources Regulator is responsible for ensuring the mine operators' compliance with the Work Health and Safety (WHS) legislation, in particular the effective management of risks associated with the principal hazards as specified in the *Work Health and Safety (Mines and Petroleum Sites) Regulation 2022.*

CONTACT

Should you require any further information or clarification, please contact the Regulator on 1300 814 609 (Press Option 2 Press Option 5) or email nswresourcesregulator@service-now.com.

Yours sincerely,

Anthony Margetts

Acting Chief Inspector of Mines

Resources Regulator

Department of Planning and Environment

Our ref: DA305-7-2003-i-PA-69

Mr Peter Jaeger
Manager – Environment and Community
Wambo Coal Pty Limited
100 Melbourne Street
South Brisbane QLD 4101

24/03/2023

Subject: Appointment of Suitably Qualified and Experienced Persons to Prepare Revised Extraction Plan for Wambo Coal Mine

Dear Mr Jaeger,

I refer to your request dated 9 March 2023 seeking the Planning Secretary's endorsement of suitably qualified and experienced persons to prepare the revised Extraction Plan required by condition B7 of Schedule 2 of DA305-7-2003-i.

The Department has reviewed the nominations and information you have provided and is satisfied that following persons are suitably qualified and experienced to prepare the relevant sections of the Extraction Plan as outlined in your request.

- Mr James Barbato;
- Mr Adam Skorulis;
- Mr Brian Rask;
- Mr Roha Lucas;
- Mr Peter Kuskie;
- Mr Liam Scanlan; and
- Mrs Joanna Hinks.

Accordingly, I can advise that the Planning Secretary endorses the appointment of the above experts in accordance with condition B7 of Schedule 2 of DA305-7-2003-i.

If you wish to discuss the matter further, please contact me on (02) 4908 6896.

Yours sincerely

Joe Fittell
Team Leader
Resource Assessments

As nominee of the Planning Secretary

WAMBO COAL PTY LTD

ABN: 13 000 668 057

100 Melbourne Street
South Brisbane Qld 4101

PMB 1
Singleton NSW 2330
Australia
Tel + 61 (0) 2 6570 2200
Fax+ 61 (0) 2 6570 2290

9 March 2023

Department of Planning and Environment
Locked Bag 5022
Parramatta NSW 2124

Attention: Steve O'Donoghue, Director Resource Assessments – Energy, Resources and Industry

RE: WAMBO COAL MINE DEVELOPMENT CONSENT (DA 305-7-2003) – APPOINTMENT OF SUITABLY QUALIFIED AND EXPERIENCED PERSONS AND INTERACTION WITH COMPLEX-WIDE MANAGEMENT PLANS

Interaction between Longwalls 24 to 26 Extraction Plan and Complex-wide Management Plans

Wambo Coal Pty Ltd (WCPL) is currently preparing an Extraction Plan for the next set of longwall panels at the South Bates Extension Underground Mine (i.e. Longwalls 24 to 26). Longwall 24 is scheduled for commencement in November 2023. The Longwalls 24 to 26 Extraction Plan is anticipated to be submitted by the end of March 2023.

A summary table of the plans that will be updated and included in the Longwalls 24-26 Extraction Plan is provided below.

Plan	Updated for LW24-26 Extraction Plan
Longwalls 24-26 Water Management Plan	✓
Surface Water Monitoring Program*	×
Groundwater Monitoring Program*	×
Site Water Balance*	×
Longwalls 24-26 Land Management Plan	✓
Erosion and Sediment Control Plan*	×
Biodiversity Management Plan	✓
Heritage Management Plan	✓
Longwalls 24-26 Built Features Management Plan	✓
Longwalls 24-26 Public Safety Management Plan	✓
Longwalls 24-26 Coal Resource Recovery Plan	✓
Longwalls 24-26 Subsidence Monitoring Program	✓
Rehabilitation Management Plan*	×

* Currently approved version will be included in the LW24-26 Extraction Plan.

The Longwalls 24 to 26 Extraction Plan requires endorsement by the Secretary of suitably qualified and experienced person/s. The below sections describe the teams that WCPL propose to prepare these documents.

Extraction Plan for Longwalls 24 to 26 – Suitably Qualified and Experienced Persons

WCPL is currently preparing an Extraction Plan for Longwalls 24 to 26 at the South Bates Extension Underground Mine.

We refer to Condition B7, Schedule 2 of the Development Consent (DA 305-7-2003) for the Wambo Development Project:

> *B7. The Applicant must prepare an Extraction Plan for all second workings on the site to the satisfaction of the Planning Secretary. Each Extraction Plan must:*
>
> *(a) be prepared by a suitably qualified and experienced person/s whose appointment has been endorsed by the Planning Secretary;*
>
> *…*

In accordance with Condition B7 (a), Schedule 2 of the Development Consent (DA 305-7-2003), WCPL kindly requests the endorsement of the Secretary of the team outlined in this letter and listed below, as suitably qualified and experienced persons for the review and preparation of the Longwalls 24 to 26 Extraction Plan.

Background of Suitably Qualified and Experienced Persons

WCPL considers that the proposed team is suitable for preparation of the Extraction Plan, Water Management Plan, Biodiversity Management Plan and/or Heritage Management Plan. The curriculum vitae of the primary contributing suitably qualified and experienced persons are attached with a summary provided below.

Team Member	Role
Dr James Barbato (Mine Subsidence Engineering Consultants)	Preparation of relevant subsidence components, including prediction of subsidence effects and assessment of potential impacts.
Mr Adam Skorulis (SLR Consulting Pty Ltd)	Preparation of relevant groundwater components.
Mr Brian Rask (SLR Consulting Pty Ltd)	Preparation of relevant groundwater components.
Mr Rohan Lucas (Alluvium)	Preparation of relevant surface water components.
Mr Peter Kuskie (South East Archaeology)	Provision of advice on monitoring and management of Aboriginal Cultural Heritage sites.
Mr Liam Scanlan (Eco Logical Australia)	Provision of advice on biodiversity monitoring and management measures.
Mrs Joanna Hinks (Resource Strategies)	Preparation of management plans and overall Extraction Plan documentation.

The following experienced WCPL employees would also be involved in preparation of the Extraction Plan, Water Management Plan and/or Biodiversity Management Plan.

Team Member	Role
Mr Peter Jaeger (Manager: Environment & Community)	Responsible for review, sign-off and implementation of the Extraction Plan.
Mrs Nicole Dobbins (Senior Environmental Advisor)	Review of management plans and overall Extraction Plan documentation.
Mr Timothy Chisholm (Technical Services Superintendent)	Review of management plans and overall Extraction Plan documentation.
Mr Malcolm Walker (Registered Mine Surveyor)	Preparation of survey plans.

Dr Barbato

Mine Subsidence Engineering Consultants Pty Ltd (MSEC) is a private engineering consultancy company specialising in the fields of mine subsidence prediction and mine subsidence impact assessment. Dr Barbato is an Associate Director at MSEC and has written or co-written more than 350 subsidence prediction and assessment reports. Dr Barbato has significant experience at Wambo, having undertaken subsidence assessments in support of several Extraction Plan and Modification applications.

Dr Barbato has been involved in recent subsidence studies for the Wambo Coal Mine, including development of the subsidence components of the approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20, and Longwalls 21 to 24. Dr Barbato also prepared the Subsidence Assessment for the recently approved Longwalls 24 to 26 Modification (i.e. Modification 19).

Mr Skorulis

Mr Skorulis is an associate hydrogeologist and groundwater modeller at SLR Consulting Pty Ltd with experience in hydrogeological studies involving data analysis, groundwater and surface water modelling and groundwater-surface water interactions. Mr Skorulis has further experience in field planning, analysis of data and interpretation of geological and geophysical data, compliance reporting, hydrogeological mapping and groundwater dependent ecosystem assessments.

Mr Skorulis has been involved in groundwater analysis and groundwater modelling projects for regional water resources studies, Environmental Impact Statements, site-scale and excavation and mine inflow and dewatering jobs. Mr Skorulis has expertise within hydrogeological analysis, groundwater modelling and the MODFLOW software and associated packages. Mr Skorulis also prepared the Groundwater Assessment for the recently approved Longwalls 24 to 26 Modification (i.e. Modification 19).

Mr Rask

Mr Rask is a technical director at SLR Consulting Pty Ltd with extensive experience in hydrogeology in the US and Australia. Mr Rask's project experience includes surface and groundwater assessments, Environmental Impact Statements, mine site water supply management, water supply, storage and operational management programs, contaminates site/surface and groundwater transport assessments/modelling.

Mr Rask is a leader in his field and has been recognised as winner of the 2008 NSW AWA Water Research Merit Award for his work. Mr Rask has expertise in Mine closure assessments, conceptual hydrogeology, groundwater modelling, surface and groundwater interactions, groundwater impact assessments, mine inflow risk assessments and hydrogeologic risk assessments. Mr Rask prepared the Groundwater Assessment for the recently approved Longwalls 24 to 26 Modification (i.e. Modification 19).

Mr Lucas

Mr Lucas has over 25 years of experience in environmental and natural resource management with a focus on waterways. This experience has been gained in a consulting role to government and industry in Australia and Asia-Pacific. Mr Lucas is a Registered Professional Engineer Queensland (RPEQ).

Mr Lucas has significant experience in designing and managing diversions. In addition, he has experience in modelling, assessment, design and documentation of subsidence impact management on waterways and diversions. Alluvium staff (principally Rohan Lucas and Ross Hardie) were the authors of the ACARP diversion projects (C8030 and C9068) in 1999-2002 that have been adopted by the Queensland government as a guideline against which diversions have been assessed and licensed since. This body of work has recently been updated to provide current leading practice guidance on constructed diversions through ACARP projects C20017 and C23030.

Mr Lucas was also principal author of the *Isaac River cumulative impacts assessment of mine developments* (2008). This project developed the hierarchy for assessing subsidence impacts on waterways which has been adopted by Queensland Government as their guidance and is now routinely utilized in subsidence impact assessments, including the extraction plans at Wambo Coal Mine.

Mr Lucas has been involved in recent surface water studies for the Wambo Coal Mine, including development of the surface water components of the approved South Bates Extension Underground Mine Extraction Plan for Longwalls 17 to 20, and Longwalls 21 to 24. Mr Lucas also prepared the Surface Water Assessment for the recently approved Longwalls 24 to 26 Modification (i.e. Modification 19).

Mr Kuskie

Mr Kuskie is the director of South East Archaeology with 33 years experience in Aboriginal cultural heritage issues, Aboriginal community consultation, and legislative requirements. Mr Kuskie's experience includes conducting surface surveys, salvage collections and excavations. He has prepared Indigenous and non-Indigenous components of Environmental Impact Statements, Aboriginal Heritage Impact Permit applications, Aboriginal Heritage Management Plans and Aboriginal Heritage Impact Assessments compliant with Office of Environment and Heritage, Department of Planning and Environment and other Government requirements. Mr Kuskie has strong familiarity with the area, having completed surveys at the Wambo Coal Mine.

Any updates to the Heritage Management Plan based on the advice of Mr Kuskie will be implemented by WCPL and subject to consultation with the Aboriginal community and the Department of Planning and Environment - Biodiversity and Conservation Division.

Mr Scanlan

Mr Scanlan is an Ecologist specialising in botany and restoration ecology for Eco Logical Australia with more than 5 years of experience in biodiversity related issues. Mr Scanlan has been involved in the preparation of multiple biodiversity assessments of plant communities and threatened flora for major developments in New South Wales. Eco Logical Australia have been involved at the Wambo Coal Mine for a number of years and has a comprehensive understanding of the site.

Updates to the Biodiversity Management Plan will be based on the advice of Mr Sullivan and subject to consultation with Department of Planning and Environment – Biodiversity and Conservation Division.

Mrs Hinks

Mrs Hinks has extensive experience in the project management of complex environmental approvals, environmental engineering, environmental impact assessment, environmental management, subsidence assessment and management, surface water management and planning legislation. Mrs Hinks has been involved at the Wambo Coal Mine for a number of years, managing the preparation of the Environmental Impact Statement, Environmental Assessments, and Environmental Management Plans for the Wambo Coal Mine.

Summary

It would be greatly appreciated if the Department would consider the above details regarding the qualifications and experience of the persons proposed to review and prepare the Extraction Plan, Water Management Plan and/or Biodiversity Management Plan and provide the Secretary's endorsement in accordance with Conditions B7(a), B66(a) and B74(a), Schedule 2 of the Development Consent (DA 305-7-2003).

It would also be appreciated if the Department could confirm if the interaction between the Longwalls 24 to 26 Extraction Plan and complex-wide management plans (and associated timing) outlined above is suitable.

If you have any queries or would prefer to organise a meeting to discuss, please do not hesitate to contact Nicole Dobbins, Senior Environmental Advisor on 0408 969 988.

Yours faithfully

Peter Jaeger
Manager: Environment & Community
WAMBO COAL PTY LIMITED

Enclosure 1. Dr James Barbato's Curriculum Vitae.
Enclosure 2. Mr Adam Skorulis' Curriculum Vitae.
Enclosure 3. Mr Brian Rask's Curriculum Vitae.
Enclosure 4. Mr Rohan Lucas' Curriculum Vitae.
Enclosure 5. Mr Peter Kuskie's Curriculum Vitae.
Enclosure 6. Mr Liam Scanlan's Curriculum Vitae.
Enclosure 7. Mrs Joanna Hinks' Curriculum Vitae.

ENCLOSURE 1

DR JAMES BARBATO'S CIRRICULUM VITAE

Dr James Barbato, Associate Director

Company:	Mine Subsidence Engineering Consultants Pty Ltd
Profile:	James Barbato has had 8 years' experience as a structural engineer and 18 years' experience as a specialist in mine subsidence engineering. His roles include the prediction, assessment and management of mine subsidence due to underground mining. Specialist advice is provided to manage potential impacts to surface infrastructure and natural features and to minimise risk to public safety.
Education:	Bachelor of Engineering (Civil, Hons.), 1995 UNSW – School of Civil Engineering Doctor of Philosophy (PhD), 2017 UNSW – School of Mining Engineering
Affiliations:	MIEAust, CPEng, NER

James joined Mine Subsidence Engineering Consultants (MSEC) in July 2004 and has worked on many subsidence studies and reports, some of which are listed below. He has extensive experience in the prediction of mine subsidence effects, the assessment of mine subsidence impacts on natural features and built features and the development of strategies to manage the potential impacts from mine subsidence.

He has been deeply involved in developing the analytical methods to improve the speed and reliability of subsidence predictions. Software has been developed using C#, Java and SQL for the subsidence prediction models, survey database and libraries. The survey database is now one of the largest collections of ground monitoring data for underground longwall mining in Australia.

James has completed post graduate research at the University of New South Wales in 2017. The title of the thesis is *Development of improved methods for the prediction of horizontal movement and strain at the surface due to longwall coal mining*.

He has written or co-written more than 350 subsidence prediction and assessment reports and has been involved in a number of Technical Committees to manage the potential subsidence impacts on natural and built features.

Some recent projects in which James has been involved include the following:

- Appin Longwalls 709 to 711 and 905 – subsidence report to support the Extraction Plan Application, including mining beneath houses, services and steep slopes;
- Chain Valley Miniwalls S2 and S3 – subsidence report to support the Extraction Plan Application for mining beneath Lake Macquarie;
- Integra Underground Longwalls 17 to 20 – subsidence predictions and the Management Plans for mining beneath the Mt. Owen Railway and Bridges;
- Maxwell Project – subsidence report to support the Environmental Impact Statement;
- Springvale Longwalls 428 to 432 – subsidence report to support the Extraction Plan Application; and
- Tahmoor Longwalls 26 to 30 – co-author of the subsidence report to support the SMP Application including mining beneath houses, services and other built infrastructure; and
- Wambo Coal Mine – subsidence reports to support the Modification and Extraction Plan Applications for the North Wambo Underground Mine, South Bates Underground Mine and South Bates Extension Underground Mine.

James is a current member of the Mine Subsidence Technological Society (MSTS) and has been involved in the preparation of the previous four conferences (2007, 2011, 2014, 2017 and 2022), which included the review of technical papers, compilation of the conference proceedings and organisation of the presentations.

He has also assisted in two ACARP Research projects and have presented or co-authored a number of technical papers including:

1. Waddington, A.A. and Barbato, J.P. *The Undermining of Railways*. Mine Subsidence Technological Society, Sixth Triennial Conference – Subsidence Management Issues. Maitland, October-November 2004, pp. 173-182.
2. Barbato, J.P., Kay, D.J., Pinkster, H. & de Somer, B. *Monitoring of subsidence movements at major infrastructure.* Seventh AusIMM Australasian Institute of Mining and Metallurgy Underground Coal Operators Conference on Sustainable Coal Mine Development. University of Wollongong, 2006, pp. 305-312.
3. Kay, D.J., Barbato, J.P., Brassington, G. & de Somer, B. *Impacts of Longwall Mining to Rivers and Cliffs in the Southern Coalfield*. Seventh AusIMM Australasian Institute of Mining and Metallurgy Underground Coal Operators Conference on Sustainable Coal Mine Development. University of Wollongong, 2006, pp. 327-336.
4. Kay, D.R., Barbato, J.P. & Mills, K.W. *Review of Mechanisms resulting in Observed Upsidence and Closure Movements.* Mine Subsidence Technological Society, Seventh Triennial Conference, University of Wollongong, Nov. 2007, pp. 197-205.
5. Barbato, J.P. & Sisson, S.A. *Analysis of Mining Induced Strains*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 15-24.
6. Barbato, J.P. & Garlinge, S. *Continuous Monitoring of Longwall Undermining – Blakefield South LW1*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 131-136.
7. Waddington, A.A., Barbato, J.P., Bullock, D.W. & Kay, D.J. *The Assessment of Subsidence Impacts on Building Structures*. Mine Subsidence Technological Society, Eighth Triennial Conference, Management of Subsidence: State of the Art, Pokolbin, 15 to 17 May 2011, pp. 155-166.
8. Barbato, J.P., Brassington, G. and Walsh, R. *Valley Closure Impact Model for Rockbar Controlled Streams in the Southern Coalfield.* Mine Subsidence Technological Society, Ninth Triennial Conference, Mine Subsidence: Risk Management in Action, Pokolbin, NSW, 11 to 13 May 2014.
9. Barbato, J., B. Hebblewhite, R. Mitra, and K. Mills (2016). *Review of horizontal surface movements due to longwall coal mining using numerical modelling*. In: Proceedings of the Coal Operators Conference. University of Wollongong, 10-12 February 2016, pp. 213-223.
10. Barbato, J., B. Hebblewhite, R. Mitra, and K. Mills (2016). *Prediction of horizontal movement and strain at the surface due to longwall coal mining*. In: International Journal of Rock Mechanics and Mining Sciences, Volume 84, April 2016, pp. 105-118. https://doi.Org/10.1016/j.ijrmms.2016.02.006.
11. Barbato, J., B. Hebblewhite, R. Mitra, K. Mills, and A. Waddington (2017). *Development of predictive methods for strain at the surface due to longwall coal mining*. In: Mining Technology, October 2017. http://dx.doi.org/10.1080/14749009.2017.1386815.
12. Barbato, J., et al. (2017). *Development of Predictive Methods for Horizontal Movement and Strain at the Surface due to Longwall Mining*. Proceedings of the tenth triennial Mine Subsidence Technological Society Conference, Pokolbin, Hunter Valley, NSW, 5-7 November 2017. pp. 207-222.

ENCLOSURE 2

MR ADAM SKORULIS' CURRICULUM VITAE

CURRICULUM VITAE

ADAM SKORULIS

ASSOCIATE HYDROGEOLOGIST

Hydrology and Hydrogeology, Asia-Pacific

QUALIFICATIONS

International BSc (Hons) 2014	International Bachelor of Science (Hons), Geosciences, University of Wollongong, NSW, Australia

EXPERTISE

- Hydrogeological Analysis
- Groundwater Modelling
- MODFLOW
- GIS

Adam is an associate hydrogeologist and groundwater modeller with experience in hydrogeological studies involving data analysis, groundwater and surface water modelling and groundwater-surface water interactions.

During his career Adam has been involved in groundwater analysis and groundwater modelling projects for regional water resources studies, EIS, site-scale and excavation and mine inflow and dewatering jobs. This includes development of conceptual groundwater models and numerical groundwater models to address State and Commonwealth requirements. As well as experience working with MODFLOW-SURFACT, MODFLOW-USG model code and associated packages. Adam has also led external modelling training courses in the MODFLOW-USG using Groundwater Vistas software.

Further to this, Adam has experience in field planning, analysis of data and interpretation of geological and geophysical data, compliance reporting, hydrogeological mapping and groundwater dependent ecosystem (GDE) assessments.

PROJECTS

	Project Experience
	Groundwater Modelling – Mining EIS, Modifications and Other Assessments
Wambo Coal Mine – MOD19 Groundwater Assessment (2021/22)	Lead hydrogeologist and groundwater modelling support for the Groundwater Impact Assessment completed for Wambo Coal's MOD19, which involved the re-orientation of LW24 and 25 and the addition of LW26.
Wambo Coal Mine – North Wambo Creek GDE Study NSW, Australia (2019)	Lead groundwater modeller for a study focussing on the interaction between vegetation and an alluvial aquifer, and determining the likelihood and magnitude of impacts to the alluvium aquifer following nearby longwall mining. The study was conducted in an iterative approach that involved collaboration between the client, consultants from multiple disciplines, and a government agency. The outcomes and process of the study was presented at the 2019 Australasian Groundwater Conference – Multidisciplinary and adaptive approach to assessing groundwater dependence of a River Oak community in NSW Hunter Coalfields.

Groundwater modelling (MODFLOW) training and construction of Pale Sub-basin groundwater model, Australian Water Partnership, NSW Australia (2019-20)	Instructor and primary contact during a two-week intensive groundwater modelling course for two Myanmar Hydrogeologists from the Irrigation Water Utilisation Management Department (IWUMD). The modelling training was in the use of Groundwater Vistas, a graphic user interface (GUI) for MODFLOW groundwater modelling code, and to assist in conceptualisation, model planning and construction for a numerical groundwater model of the Pale Sub-Basin
Galilee Basin Hydrogeological Model NSW, Australia (2015)	Geoscience Australia assessment of the cumulative impacts of new coal mining developments on water dependant assets and receptors, utilised as part of the Bioregional Assessment Program being undertaken by the Commonwealth Department of the Environment for the Galilee Subregion of the Lake Eyre Basin bioregion.
Hume Coal Project, NSW, Australia (2017-2020)	Lead groundwater modeller for additional work undertaken on the Hume Coal Project groundwater model developed for the EIS, following HydroSimulations' inheritance of the project from Coffey Consulting. The modelling work was aimed at responding to public and agency submissions against the project, and addressing issues identified in the peer review process. Developed methods of visualising key model outputs from an uncertainty analysis conducted on the revised groundwater model. Visualisation was consistent with IESC (Independent Expert Scientific Committee) Draft Guidelines on Uncertainty Analysis in Groundwater Modelling.
Mt Pleasant Operations, NSW, Australia (2017-2018)	Construction and local calibration of regional groundwater model containing the Hunter River and its associated alluvium as well as historic and ongoing open cut and underground longwall coal mining.
	Compliance and Data Analysis
Annual Compliance Reporting • **Wambo Coal Mine (Peabody)** (2015-22) • **United Wambo Joint Venture (Glencore/Peabody)** (2020-22) • **Wilpinjong Coal Mine (Peabody)** (2015-22) • **Moolarben Coal Operations (Yancoal)** (2020-2021)	Carried out annual compliance reporting at various New South Wales coal mining operations since 2015. This involves the assessment of environmental performance with respect to groundwater, including the determination of whether groundwater level and quality trends are due to the operation being assessed, or are within the limits of normal pre-operational observations. Groundwater inflow and incidental take is also assessed against hard-rock and alluvial licences held by each site. The compliance reporting determines whether the site is compliant with consent conditions or performance measures defined in groundwater management and monitoring plans.
Water Management Plan and Trigger Development • **Wambo Coal Mine (Peabody)** (2020-2023) • **United Wambo Joint Venture (Glencore/Peabody)** (2020) • **Wilpinjong Coal Mine (Peabody)** (2020-2023)	Assist clients to review and update water management documentation. This documentation provides the groundwater related consent conditions for each operation and details the operations approach to complying with these conditions including, the groundwater monitoring network, performance indicators and trigger levels, responses to exceedances or non-compliance. Recent reviews and updates of groundwater management documentation have focused on the rationalisation of monitoring networks, the development and revision of trigger levels, and revision of response requirements to exceedances.

Water and Tailings Storage Seepage Investigations • **Wambo Coal Mine (Peabody)** (2020-22)	Lead hydrogeologist investigating the potential for seepage from water and tailings storage facilities at Wambo Coal Mine, both within the mine footprint and to external environment receptors. This involved detailed review of site geology, groundwater monitoring data, stored water elevations, and historical and planned future mining operations. The investigations determined potential seepage pathways and receptors as well as recommended groundwater monitoring and geological investigation holes where required.
	Mine Closure
Dendrobium Mine – Closure Modelling, NSW, Australia (2021)	Undertake and support sensitivity and uncertainty analysis groundwater modelling in support of the Illawarra Metallurgical Coal (IMC) Dendrobium Mine Closure Plan. This included the development of modelling scenarios and hydraulic parameters appropriate to test model uncertainty, as well as the presentation of model results in a format suitable to demonstrate model sensitivity/ uncertainty in relation to key modelling objectives.
Dendrobium Mine Extension Project– Closure Water Management Objectives, NSW, Australia (2021-22)	Work within a multidisciplinary team (Geotechnical, Civil/ Environmental Engineering, Hydrogeology) to address water related mine closure concerns raised by the IAPUM and IPC. This involved the development of mine closure strategies for Dendrobium Mine that consider groundwater recovery, the location and volume of long-term seepage from the mine, and post closure strategies for managing this seepage.
Final Void Modelling, NSW Australia (2021-22)	Technical and conceptual assistance to undertake final void groundwater modelling for a revised final landform at coal mine within the NSW Western Coalfield. The modelling focused on understanding likely differential fluxes and final void water levels between an approved and modified final landform, with a focus on identifying any additional impacts to nearby groundwater receptors.
Wallerawang Closure Groundwater Assessment, NSW, Australia (2017-2018)	Construction and technical assistance on the groundwater model developed for the Wallerawang Closure Groundwater Assessment. The modelling aimed to assist the development of closure strategies that would limit the potential migration of poor - quality groundwater toward the Cox's River in the Central Tablelands of NSW.
	GIS/Hydrogeological Mapping
	Adam has conducted hydrogeological mapping, using bore databases, existing literature, geophysics and published geological outcrop mapping, for use in groundwater assessments and is a competent user of GIS and databases.

memberships

Member	NSW International Association of Hydrogeologists

ENCLOSURE 3

MR BRIAN RASK'S CURRICULUM VITAE

CURRICULUM VITAE

BRIAN RASK

TECHNICAL DIRECTOR

Hydrogeology and Numerical Modelling

QUALIFICATIONS

BSc	1999	Bachelor of Science, (Watershed Science) Colorado State University, Fort Collins, Colorado USA
MBA	2003	Master of Technology Management, University of Phoenix, Lone Tree, Colorado USA

EXPERTISE

- Mine Closure Assessments
- Conceptual Hydrogeology
- Groundwater Modelling
- Surface and Groundwater Interaction
- Groundwater Impact Assessments
- Mine Inflow Risk Assessments
- Hydrogeologic Risk Assessments

Brian has extensive experience in hydrogeology, providing management and technical services throughout his career.

Brian is a leader in his field and has been recognised as winner of the 2008 NSW AWA Water Research Merit Award for his work as lead researcher on a project which evaluated and quantified the surface and groundwater interaction within a fractured rock system.

Brian has extensive experience in hydrogeology in the US and Australia. His project experience includes surface and groundwater assessments; environmental impact statements; mine site water supply management; water supply, storage and operational management programs; contaminated site/surface and groundwater transport assessments/modelling; remedial action plans; project and financial management; drilling and well design/construction management.

Brian is also experienced in the use of numerous surface and groundwater modelling programs including, but not limited to, MODFLOW (Visual and Groundwater Vistas), MODFLOW-SURFACT, FEFLOW, HEC-RAS, Quickflow, WinFlow, WinTrans, and GoldSim.

PROJECTS

	Environmental Assessment and Approvals
BMA – Caval Ridge Mine Horse Pit Extension Project, Bowen Basin, QLD, Australia	Technical Director for the production of the Groundwater Impact Assessment supporting the environmental approvals for a coal mine extension development including post-mining assessment. Technical Lead for the groundwater modelling component.
BMA – Caval Ridge Mine 2021 Water License Reporting, Bowen Basin, QLD, Australia	Technical Lead (groundwater modelling) for groundwater modelling supporting Water License reporting obligations for the 2021 water year.

Buck Reef West In-Pit Tailings - Feasibility Design and Risk Assessment, Carpentaria Gold Pty Ltd	Brian conducted a feasibility design and hydrogeologic risk assessment for the placement of tailings from the Sarsfield Pit into the proposed Buck Reef West Pit. Based upon the feasibility design\plan, Brian then developed a risk assessment and gap analysis associated with the requirements for environmental approvals. Brian developed a GoldSim model to assess the risk of water within the final void above the proposed tailings interacting with groundwater. The model incorporated analytical methods for groundwater inflow estimates along with AWBM surface runoff estimation methods. The model was developed to assess effects the uncertainties of the input parameters have on the final design, which were then used to guide the data gap analysis and recommendations for future work.
BMA – Daunia Mine 2021 Water License Reporting, Bowen Basin, QLD, Australia	Project Director for groundwater modelling supporting Water License reporting obligations for the 2021 water year. Technical Lead for the groundwater modelling component.
Oceanic Coal Australia Limited (Glencore) – OCAL Complex Closure Plan of Underground Water Management, Newcastle, Coalfields, NSW, Australia	Technical Director for the development of a Plan of Underground Water Management related to the planning of closure works and lease relinquishment at a large integrated open cut and multi-level underground mining complex. Technical Lead for the groundwater modelling component (lead modeler).
Glencore Coal Australia, Newlands Mine Complex Closure, Bowen Basin, QLD, Australia	Technical Lead (groundwater modelling) for the groundwater assessment associated with closure planning and PRCP development at a large integrated open cut and underground mining complex.
Whitehaven Coal Ltd, Winchester South EIS, Bowen Basin, QLD, Australia	Project Director for the production of the Groundwater Impact Assessment supporting the EIS for a new coal mine development including detailed final void modelling and post-mining assessment. Technical Lead for the groundwater modelling component.
BHP Mitsui Coal Pty Ltd – Poitrel Coal Mine, Bowen Basin, QLD, Australia	Project Director for the 2015 to 2020 reviews of groundwater monitoring at the Poitrel mine in accordance with EA conditions.
BHP Coal Pty Ltd – GCOS Project, Bowen Basin, QLD, Australia	Project Director for a groundwater gap analysis and forward work plan development to assist in environmental regulatory approvals studies for a brownfields underground coal mine development.

	Groundwater Modelling
Synergy Kwinana Power Station (360 Environmental)	Project Director for the development of a 3D density dependent flow and transport model using FEFLOW. The transient model was calibrated to historical data. The model was used to assess sustainable yield and abstraction bore design to limit saltwater intrusion.
Laminex Groundwater Modelling (360 Environmental)	Project Director for the development of a 3D groundwater model using MODFLOW_USG. The model was calibrated to historical data. The model was used to design a borefield for the capture and retention of contaminants on-site.
G2Konnect Consortium Inland Rail G2K Section Tender Design (2020-2021)	Brian was the lead design Hydrogeologist and Numerical Modeller for the hydrogeologic components of the tender design package submitted on behalf of G2Konnect Consortium. The hydrogeologic design works included but was not limited to the assessment of potential inflows and associated environmental and design impacts associated with the proposed design and construction of 3 tunnels and over 42 hillside cuts. An assessment of risk to the project and recommendations for modifications to design and construction were provided.
Jellinbah Resources Ltd, Lake Vermont North Project, Bowen Basin, QLD, Australia	Project Director for the development of a groundwater model for a proposed coal mine expansion including post-mining assessment. Technical Lead for the groundwater modelling component.
New Hope Coal Pty Ltd - New Acland Stage 3 Project EIS, Clarence-Moreton Basin, Southeast Queensland, Australia	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using a Monte Carlo approach. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
Santos– Fairview Springs - Modelling in support of Extractive Approval Application, QLD, Australia (2015)	As Senior Hydrogeologist and Modeller, Brian provided modelling using industry standard groundwater software in support of regulatory approvals sought by Santos to extract groundwater from GAB aquifers located within the vicinity of GAB springs. Conducted an assessment of the potential impact of numerous extraction scenarios on adjacent springs.
Glencore – Mt Owen Expansion – Groundwater Impact Assessment, NSW, Australia (2013-2015)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using a Monte Carlo approach. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
Glencore– Liddell Modification EA – Groundwater Impact Assessment, NSW, Australia (2013-2014)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using a Monte Carlo approach. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.

Glencore– Ravensworth East TP2 – Groundwater Impact Assessment, NSW, Australia (2013-2014)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using a Monte Carlo approach. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
Santos– Brine Injection Modelling in support of Environmental Approval Studies, QLD, Australia (2013)	Brian provided stochastic and solute transport modelling using industry standard groundwater software in support of regulatory approvals sought by Santos to inject RO brine concentrate into deep basement rocks. SKM conducted an assessment of the potential impact of saline effluent injection on adjacent aquifers including those supporting urban community drinking water supplies in the vicinity of the target injection site.
Cockatoo Coal– North Surat – Collingwood Coal Project – Groundwater Impact Assessment, QLD, Australia (2011-2012)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using the PEST Null Space Monte Carlo package. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
Cockatoo Coal– North Surat – Taroom Coal Project – Groundwater Impact Assessment, QLD, Australia (2011-2012)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using the PEST Null Space Monte Carlo package. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
Cockatoo Coal– North Surat – Woori Coal Project – Groundwater Impact Assessment, QLD, Australia (2011-2012)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed using the PEST Null Space Monte Carlo package. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results were provided for the groundwater impact assessment technical report.
BHP– Mine Development project in Central Queensland, QLD, Australia (2011-2012)	Brian developed an analytic groundwater flow modelling module within GoldSim that could provide direct input into the site water balance model. The end results provided the client with a stochastic risk-based assessment of potential inflows to the workings and a site water balance assessment that included the uncertainties associated with the unknown hydrogeologic characterisation. A numeric groundwater model was developed that utilised the time-varying parameter package (TMP1) of MODFLOW:SURFACT to allow for the changing material properties resulting from mining induced subsidence. In addition to the time varying properties, Brian utilised the PEST Null Space Monte Carlo package, which aids in the running of stochastic simulations with numeric models. The results of the numeric modelling provided the client with a risk-based assessment of inflows (peaks, timing and spatially (panels) during the initial feasibility studies of the project. These stochastic results were then used in the stochastic based GoldSim water balance and water management models providing a complete stochastic approach to the water balance assessment.

Department of Transport and Main Roads – Cross River Rail North-South Rail Track, Groundwater Impact Assessment, QLD, Australia (2011)	The proposed project is approximately 19 km in length and extending from Salisbury to Wooloowin. It is anticipated that the Project will consist of a new tunnel (or tunnels) under the Brisbane River and four new underground train stations. Brian conducted a recalibration of the groundwater model late in the project based upon field data gathered during the overall work program. The recalibration and subsequent simulation provided a greater confidence in groundwater modelling results for the submission of the EIS because it was based upon more site-specific field testing
Sagittarius Mines– Tampakan Power Station, Port and Filter Plant ESIA - Groundwater Impact Assessment, Philippines (2011)	Brian conducted numerous simulation runs to evaluate the potential groundwater available for construction and operations of the power station, port and filter plant. Final operational and construction scenarios were simulated for the impact assessment to neighbouring groundwater users. A final report was edited to reflect final construction and operational water supply planning and associated estimated impacts.
Middlemount Coal – Groundwater Impact Assessment, QLD, Australia (2010)	A groundwater model was created using the Groundwater Vistas MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was calibrated with extensive calibration sensitivity assessments performed. One operational scenario was simulated with multiple predictive sensitivity simulations performed. Results of all modelling and a final report were provided within the aggressive 4-week project delivery schedule.
Cobbora Management Company – Cobbora Coal Mine Project - Groundwater Impact Assessment, NSW (2019-2010)	A groundwater model was created using the Visual MODFLOW pre-processor in conjunction with MODFLOW SURFACT. The model was suitably calibrated for the project requirements. Two operational scenarios were simulated with respect to how the pit is dewatered, as well as numerous recovery simulations. An additional water balance model was developed to estimate the filling duration and long-term water level fluctuations within the final voids (2). Results of all modelling provided the quantitative basis for the groundwater impact assessment.
Thiess-John Holland – Airport Link, Brisbane QLD, Australia (2008-2009)	A three-dimension numerical model was developed in MODFLOW to simulate the inflow rates, drawdown and potential contaminant transport associated with the construction of the project. The results of the model were used for water management, treatment and disposal planning.
	Groundwater Technical Review
Tomingley Gold Operations Pty Ltd - Peer Review of In Pit Tailing Assessment – Modification 4 Groundwater Impact Assessment Report, QLD, Australia (2016)	Brian was commissioned to conduct an independent peer review of the hydrogeologic and hydrogeochemical impact assessment. The peer review consisted of reviewing previous hydrogeologic and hydrogeochemical investigations, conceptualisation, modelling and reporting with a view of assessing if the impact assessment and modelling were fit for purpose.
Eagleton Rock Syndicate Pty Ltd - Eagleton Quarry Hydrogeological Investigation Report, QLD, Australia (2016)	Brian was commissioned to conduct an independent peer review of the hydrogeologic impact assessment. The peer review consisted of reviewing previous hydrogeologic investigations, conceptualisation, modelling and reporting with a view of assessing if the impact assessment and modelling were fit for purpose.

Queensland Department of Natural Resources and Mines– Tamborine Mountain Groundwater Investigation, QLD, Australia (2015)	Brian was commissioned to provide a peer review of the Tamborine Mountain groundwater investigation report prepared by Andrew Todd from QUT in 2011. The objective of the review was to provide an independent assessment of the appropriateness of the assumptions made to support the assessment made in the investigation. The review also assessed the suitability of the 2011 QUT report for providing suitable information to Department Natural Resources and Mines (DNRM) and the public about the groundwater resources of Tamborine Mountain.
Bandanna Energy - Springsure Creek Coal Mine Environmental Impact Assessment– Hydrogeologic Impact Assessment, QLD, Australia (2012)	Brian was commissioned to conduct an independent peer review of the hydrogeologic impact assessment. The peer review consisted of reviewing previous hydrogeologic investigations, conceptualisation, modelling and reporting with a view of assessing if the impact assessment and modelling were fit for purpose.
Victoria Department of Sustainability and Environment– Ecomarkets, Melbourne, VIC, Australia (2009-2010)	Brian was the lead peer reviewer for the North Central and North East catchment models. Through a series of meetings at strategic model development stages (steady state and transient calibration) Brian was able to provide comments and recommendations throughout the process to assist DSE and their modelling contractor to deliver a groundwater model that met all project specifications. A final model review report was prepared by Brian that documented the model development, key assumptions, limitations and recommendations for model use and improvements.
MCC Australia Sanjin Mining Pty Ltd – Cape Lambert Magnetite Project: Hydrogeological Assessment, WA, Australia (2010)	Brian was commissioned to undertake hydrogeologic assessment for the Cape Lambert Magnetite Project. The hydrogeologic assessment included the development, calibration, and sensitivity assessment of a groundwater numeric model. The model was then used to assess the potential impacts associated with assumed mining conditions. Modelling was undertaken using the pre-processor Visual MODFLOW Pro in conjunction with MODLFOW: SURFACT software. Brian provided technical peer review of the groundwater modelling and associated report.
Department of Defence, Garden Island - Groundwater Fate and Transport Model, Stage 3 Remediation Powerhouse Fuel Spill Plume, WA, Australia (2010)	As part of a previous role, Brian was commissioned to undertake Stage 3 works for environmental remedial works associated with the Powerhouse diesel fuel spill Part of the Stage 3 works includes undertaking groundwater modelling to simulate observed groundwater contamination; and scenario modelling to simulate options for aquifer remediation. Modelling undertaken included both flow and solute transport. Groundwater flow and transport modelling was undertaken using Visual MODFLOW Pro and MT3DMS software respectively. Brian provided technical peer review of the groundwater modelling and associated report.
Department of Defence– Groundwater Fate and Transport Model, Stage 3 Remediation Powerhouse Fuel Spill Plume, Garden Island, WA, Australia (2010)	PB was commissioned to undertake Stage 3 works for environmental remedial works associated with the Powerhouse diesel fuel spill Part of the Stage 3 works includes undertaking groundwater modelling to simulate observed groundwater contamination; and scenario modelling to simulate options for aquifer remediation. Modelling undertaken included both flow and solute transport. Groundwater flow and transport modelling was undertaken using Visual MODFLOW Pro and MT3DMS software respectively. Brian provided technical peer review of the groundwater modelling and associated report.

AquaSure Joint Venture– Melbourne Desalination Treatment Plant, VIC, Australia (2009-2010)	As one of the Joint Venture's associates, Brian was commissioned to provide hydrogeologic assessments associated with the design and construction of a desalination plant in Victoria. These technical studies include the assessment of impacts during and after construction. Numerous models (3D MODFLOW and analytical models) were developed at various stages as part of the assessment. The assessments include estimated inflows to tunnels and excavations as well as the short and long-term drawdown associated with the project. These results are then provided as part of an overall assessment of follow-on impacts such as acid-sulphate soils, subsidence, and ecological impacts. Brian was commissioned to provide technical peer review of the groundwater models being prepared as well as ongoing modelling/technical support.
Thiess-John Holland – Airport Link, Brisbane, QLD, Australia (2008-2009)	A three-dimension numerical model was developed in MODFLOW to simulate the inflow rates, drawdown and potential mitigation measures for the entire project area (global model). Numerous sensitivity runs and adjustments to model and structural designs were done in order to provide a best for project, client, and environmental outcome. Brian provided technical reviews of various versions as well as providing some strategic advice throughout the review and internal and external commenting processes.
Queensland Department of Infrastructure and Planning– Abbot Point State Development Area Infrastructure Corridor Study, QLD, Australia (2008)	Brian conducted a review of the groundwater conditions in the area(s) proposed and provided a hydrogeologic constraints analysis and recommendations for work to be performed in order to further develop the preferred option(s) for the infrastructure corridor. Significant constraints were identified as the proposed area is a wetland and as such require significant risk mitigation.
Rio Tinto Hunter Valley– Groundwater Due Diligence, NSW, Australia (2008)	A due diligence assessment was conducted for all operations in the Hunter Valley as it pertains to commitments made regarding groundwater investigations, monitoring, licensing, etc. The results of the investigation provided Rio Tinto with a roadmap of what further works need to be completed as well as a general prioritisation of tasks.
Iluka Resources Limited– Jacinth Ambrosia Project, SA, Australia (2008)	Brian was responsible for the technical and fit-for-purpose peer review of all groundwater borefield construction design and tendering documents. Brian worked closely with the team to ensure that he understood the key demands and drivers to ensure the design and tender packages were appropriate for the intended purpose.
Delta Electricity – Old State Mine, Lithgow, NSW, Australia (2007-2008)	Brian was commissioned to conduct a groundwater model using FEFLOW to estimate potential water supply from the old State Mine at Lithgow. Brian provided peer review of the model and reporting through two rounds of model calibration and predictive simulations. The nature of the old workings for the longwall mining operation, known discharge points from the mine workings, outcropping and local groundwater users provided many challenges for the modelling and thus a significant modelling effort was required.
	Groundwater-Surface Water Interaction

Sydney Catchment Authority – Collaborative Research Program: Conceptualisation and Modelling of Surface Water – Groundwater Interaction in the Upper Nepean Fractured Aquifer System, NSW, Australia (2007-2008)	A Collaborative Research project to investigate the surface water and groundwater interaction in Doudles Folley Creek was undertaken near Bowral, NSW. The investigation comprised a comprehensive suite of hydrogeologic and hydrogeochemical tools, and tracers (environmental and applied) to quantify the natural interaction of the two systems and how it changes under a trial borefield simulation. Brian was the project manager and lead hydrogeologist for the project. The results of the eight-month field program and later desk top analyses has provided the Sydney Catchment Authority with clear and quantifiable evidence of the background interaction and changes associated with localised pumping. The innovative approach, application of tools, and results on the project were recognised by Brian, his team, and the SCA being awarded the 2008 NSW AWA Water Research Merit Award.
Sydney Catchment Authority– Collaborative Research Program: Impacts of Longwall Mining in the Waratah Rivulet, NSW, Australia (2007-2008)	A Collaborative Research project to investigate the changes to surface water and groundwater interaction in Waratah Rivulet as a result of longwall mining was undertaken near Helensburgh NSW. The investigation comprised a comprehensive suite of hydrogeologic and hydrogeochemical tools, and tracers (environmental and applied) to quantify the post-mining interaction of the two systems and how it might have changed as a result of longwall mining. Brian was only involved as the project manager and lead hydrogeologist for the project for the initial stages of the project. This project was a three year long project and as project manager Brian was responsible for the initial project reviews, such as literature review of longwall mining impacts and baseline dataset, and the development of the methodology for the field studies.
	Groundwater Development / Management
Delta Electricity – Emergency Drought Supply Evaluation: Pinedale Mine, Lithgow, NSW, Australia (2009)	Provided technical guidance and oversight of a desktop investigation into the feasibility of extracting water for the mine void. The feasibility investigation included estimating volumes potentially available within the mine void, identification of permitting requirements, a conceptual model, and the conceptual design and placement of potential extraction bores.
Sydney Gas – Hydrogeological Assessment of Broke Gas Prospect, Broke, NSW, Australia (2006-2009)	Desktop assessment(s) of groundwater and surface water resources, groundwater quality and potential impacts from extraction of coal seam methane from Wittingham and Wollombi Coal Measures. Brian also provided strategic planning advice for throughout his 4 years of project involvement.
Sydney Catchment Authority– Supervision and Hydrogeological Analysis of Drilling and Testing Program – Warragamba and Wallacia Investigation Sites, Wallacia, NSW, Australia (2006-2007)	Brian was project manager of the Drilling and Supervision project at the Warragamba and Wallacia Investigation Sites, which included the supervision of drilling two bores at the Warragamba site and three bores at the Wallacia site and the supervision of geophysical logging and pump testing of these test bores. Four bores were installed in the Hawkesbury Sandstone, with one bore (3A) drilled to 450 m into the underlying Narrabeen Group sediments. 7-day pumping and recovery tests were conducted at each site with water levels monitored in all bores. A final report documenting all field work, water quality, pumping test results and estimated safe yields were provided at the completion of the project.

Sydney Catchment Authority – Supervision and Hydrogeological Analysis of Drilling and Testing Program – Illawarra Investigation Sites, Wollongong, NSW, Australia (2006-2007)	Brian was project manager of the Drilling and Supervision project at the Illawarra site. The primary objective of the investigation was to establish the potential groundwater yield and water quality, and to determine the potential for borefield construction. One bore was drilling on site, which had below average yields and water quality not ideal for borefield development. Further drilling and exploration was consequently cancelled. A final report documenting all field work, water quality and yield measurements was provided at the completion of the project.
Delta Electricity – Emergency Drought Supply Evaluation: Lithgow Mine, Lithgow, NSW, Australia (2006-2007)	Evaluated and managed the project to identify potential water sources for drought supply. One site identified was the Lithgow Mine. Conducted numerous desktop and field investigations into the feasibility of extracting water for the mine void. Feasibility investigations have ranged from estimating volumes potentially available within the mine void, identification of permitting requirements, a conceptual model, and the conceptual design and placement of potential extraction bores.
Boral Resources– Greystanes Estate - Southern Employment Lands Groundwater Drainage Concept Design, Sydney, NSW, Australia (2006)	Brian was coordinator for the groundwater design team; organising a team of hydrogeologists, geochemists, civil engineers, waste water treatment engineers and draftsmen to provide a comprehensive concept design of the groundwater drainage network. The network was designed to maintain water levels below ground surface to a sufficient level to prevent, salinity and negative impacts to shallow piping networks, utilities, and other features associated with the 160-hectare development. Groundwater was then designed to be treated to a sufficient level for discharge to Prospect Creek.
MEMBERSHIPS	
Member	International Association of Hydrogeologists
AWARDS	
NSW AWA Merit Award (2008)	NSW AWA Water Research Merit Award

ENCLOSURE 4

MR ROHAN LUCAS' CURRICULUM VITAE

Rohan Lucas

Education and training:

Bachelor of Engineering (Honours) (Environmental)
University of Melbourne, 1996

Bachelor of Science (Earth Sciences)
University of Melbourne, 1994

Other ongoing training in river sciences and engineering

Industry affiliations:

Registered Professional Engineer Queensland (RPEQ)

Engineers Australia

Professionals Australia

Institute of Engineers in Papua New Guinea

Rohan is a Principal Consultant – Environmental Engineering and Geomorphology and Director of Alluvium Consulting. He has over 25 years' experience in environmental and natural resource management with a focus on waterways. This experience has been gained in a consulting role to government and industry in Australia and Asia-Pacific for the assessment, design, review and implementation of waterway management and rehabilitation programs and of the interactions of resource and infrastructure projects with surface water systems and the risks posed to each other.

Rohan has had extensive involvement in the planning and implementation of catchment and watercourse management programs for Catchment Management Authorities or equivalents in Queensland, Victoria, South Australia and New South Wales. Rohan also has extensive experience with private industry clients including mining and gas companies and infrastructure developers and associated regulator engagement across Australia and parts of the Asia-Pacific.

Key skill areas:

- Fluvial geomorphology, hydrology and hydraulics
- Design, rehabilitation and monitoring of waterway diversions for mining companies
- Watercourse rehabilitation program priority setting, design and implementation of works
- Waterway crossing assessments for large linear infrastructure projects
- Mining related subsidence impact assessment and management measures for waterways
- Development impact assessment on waterways
- Programs – RORB, HECRAS, 12d Model, Chute, RipRap

Relevant projects:

Project	Description	Role	Client	Year
Lakeland Irrigation Project	Environmental assessment of surface water quality, geomorphology and sediment transport.	Geomorph lead	SMEC	2022
Blackwater Mine	Back Access Road and levee assessment and design	Geomorph lead	SMEC/BMA	Current
Raising The Burdekin Falls Dam EIS	Environmental assessment of surface water quality, geomorphology and sediment transport.	Geomorph lead	SLR / Sunwater	2021
Hells Gate Irrigation Project EIS	Environmental assessment of surface water quality, geomorphology and sediment transport.	Geomorph lead	SMEC / TEL	2021
Major Watercourse Diversion Monitoring	Geomorphic monitoring of major waterways at BMA Mines including Blackwater	Geomorph lead	BMA	2020-21

m. 0429 610 001
e. rohan.lucas@alluvium.com.au
w. www.alluvium.com.au

Quarry Management Plan for the Lower Burdekin River	This project required a review of catchment sediment source rates as well as sediment transport rates to determine if continued sand mining from the riverbed is sustainable.	Geomorph lead	DNRME	2019
Gully Erosion Control	Multiple designs and oversite of construction works for gully erosion in the Bowen, Broken and Bogie catchments.	Principal Engineer /Geomorphologist	NQ Dry Tropics	2018-current
Surface Water Technical Report for South Bates Underground Extraction Plan	Geomorphology and surface water existing conditions and impact assessment of longwalls LW11-16 at Wambo Coal Mine.	Project Director, Geomorphologist	Wambo Coal	2016-17
North Wambo Creek Diversion review of condition	Development and implementation of a monitoring program to understand diversion condition and condition trajectory.	Principal Engineer /Geomorphologist	Wambo Coal	2016-18
Wilpinjong Mine final landform waterway requirements	Regional assessment of geomorphology of valley and waterway character and behaviour to inform design of final landforms and their hydrologic and geomorphologic characteristics.	Principal Engineer /Geomorphologist	Wilpinjong Coal	2016-18
Murragamba and Eastern Creek diversion designs	Concept designs of diversions at Moolarben Coal Mine that optimise environmental outcomes associated with the mine plan and final landforms	Principal Engineer /Geomorphologist	Moolarben Coal	2017
Sydney Basin Bioregional Assessment	Workshop to determine impacts of underground coal mining on water resources of the Sydney Basin Bioregion	Technical expert	Australian Government	2017
Sydney drinking water catchment audit	As required by legislation an audit of Sydney's drinking water supply catchments is required every three years.	Mining impacts chapter	NSW Government	2017
Western Slopes Pipeline EIS	Geomorphologic and flood behaviour assessments to inform the EIS of the Western Slopes Pipeline EIS from Narrabri to central southern NSW.	Geomorphologist	APA	2017-18
MRA diversion of Walker Creek	To allow continuation of the South Walker Creek mine in central Queensland a significant diversion of Walker Creek was required. This was undertaken from concept design, detail design, approvals and construction. Capital cost ~$25M.	Technical Director and principal Owners Engineer	BHP	2014-2017
Diversions at Roy Hill Mine	Review of designs, development and implementation of monitoring programs for diversions	Project Director, Engineer, Geomorphologist	Roy Hill	2016
Marillana Creek diversion	Expert review of proposed diversions of Marillana Creek at Yandi Mine	Project Director, Engineer, Geomorphologist	BHP Billiton	2016
Design and rehabilitation criteria for Bowen Basin River Diversions	Undertaken for the Australian Coal Association Research Program (ACARP) this project (C9068) developed design and rehabilitation criteria for diversions in mining in Australia. The criteria developed in the project have been adopted and utilised by the Queensland Government since as their guidelines.	Geomorphologist	ACARP	2001-2
Criteria for functioning river landscape units in mining and post mining landscapes	ACARP (http://acarp.com.au/abstracts.aspx?repId=C20017). This project reviewed the performance of diversions implemented since the C9068 project a decade earlier and incorporated best practice improvements internationally into a revised set of criteria for diversions in the mining industry. The project clearly demonstrated those implemented to the C9068 standard are performing much better than those which don't meet the standard.	Project director, geomorphologist	ACARP	2012-14
Collaborative performance trajectories for diversion approvals relinquishment	ACARP (http://acarp.com.au/abstracts.aspx?repId=C23030). This project developed a stakeholder assessment tool for assessing diversion condition and suitability for relinquishment of approvals by mining companies. The project also developed a vegetation condition trajectory tool to assist in the relinquishment process.	Project director	ACARP	2014-16
Subsidence Management Plans	Modelling, assessment, design and documentation of subsidence management plans for 4 major underground coal mines in central Queensland. These focus on the management of impacts to the waterways impacted by subsidence.	Project Director, Engineer, Geomorphologist	AAMC, Peabody, BMA	2011-2016

ENCLOSURE 5

MR PETER KUSKIE'S CURRICULUM VITAE

CURRICULUM VITAE

NAME: **(Mr) KUSKIE, PETER JAMES**

Position: Director, South East Archaeology Pty Limited

Address: 24 Bamford Street
Hughes ACT 2605

Mobile: 0417 691 231
Email: *peter@southeastarchaeology.com.au*

Relevant Employment Experience:

Consultant Archaeologist, South East Archaeology, 1989 - present.

Key projects as principal consultant include:

- Part 3A assessment of Ulan Coal Mine's Continued Operations Project near Mudgee, involving extensive survey of a 50 square kilometre area over 21 weeks, with in excess of 900 Aboriginal sites recorded, including open artefact sites, rock shelters, grinding grooves, scarred trees, stone arrangements and art sites (UCML/Glencore);
- Survey over a five week period, with over 1,000 Aboriginal sites recorded, and salvage excavations over a 27 week period at the 37 square kilometre Mount Arthur North Coal Mine (URS Australia, BHP Billiton);
- Part 3A and Part 4.1 State Significant Development assessments of major coal mining Projects, Extensions and Modifications including at Spur Hill (Spur Hill Management / Resource Strategies), Tasman (Donaldson Coal), Abel Mine (Ellemby Resources / Donaldson Coal), Bloomfield (Bloomfield Colliery), Wilpinjong (Peabody) and Moolarben (Yancoal);
- Part 3A assessment of the Australian Rail Track Corporation's 32 kilometre Maitland to Minimbah and 11 kilometre Minimbah to Wittingham rail upgrades in the Hunter Valley, involving surveys and mitigation measures (Hunter 8 Alliance);
- Pacific Highway Upgrades, including extensive survey and test excavations of the 37 kilometre Oxley Highway to Kempsey route near Port Macquarie and survey of the 27 kilometre Woolgoolga to Wells Crossing route near Coffs Harbour (GHD/RTA);
- Surveys, test excavations and salvage excavations for large residential developments at Thornton North in the Hunter Valley (Investa Property Group, County Property Group and Defence Housing Australia);
- Surveys and mitigation projects for numerous water and sewerage pipeline routes in the Hunter Valley and Central Coast (GHD, Hunter Water Corporation, Department of Commerce, Wyong Shire Council);
- Surveys and mitigation projects for The Vintage residential golf course (Stevens Group);
- Salvage and test excavations over an 18 week period for 'The Dairy' ('The Lakes') residential development near Ulladulla (Elderslie Property Investments) and over a 10 week period for Australian Property Growth Fund;
- Salvage excavations over a 12 week period at Lemington Mine, near Singleton (Lemington Coal Mines);
- Salvage excavations over a 14 week period of two Aboriginal sites along the F3 Freeway (M1) at Black Hill, near Maitland (RTA);

- Survey of BHP Petroleum and Westcoast Energy Australia's 740 kilometre long Eastern Gas Pipeline, from Longford, Victoria, to Wilton, NSW;
- Surveys of Optus Communications' mobile telecommunications network throughout NSW and Queensland and fibre optic cable network from Sydney to Brisbane and Cootamundra to Canberra (Optus Communications, Landscan);
- Survey for Dorrigo Three Year Environmental Impact Study (State Forests of NSW);
- Heritage studies at Coffs Harbour (Coffs Harbour and District Local Aboriginal Land Council), Bingie Bingie Point (Cobowra LALC) and the Hunter Valley (Mindaribba LALC);
- Excavations in Guam, Micronesia, USA (Dames and Moore, National Heritage Studies);
- Acting Senior Conservation Officer, Australian Heritage Commission (1993);
- Additional sub-surface investigations and salvage projects in NSW at numerous locations, including Rothbury (RTA), Thornton (GHD, Beechwood Homes, CPG, UrbisJHD), St. Georges Basin (Shoalhaven City Council), Cudmirrah National Park (DECCW), Bewong (Cowman Stoddart), Wollongong (Wollongong City Council), Merimbula (Ridge Consolidated, Bega Valley Shire Council, RTA and Bega Traditional Aboriginal Elders Council), Old Erowal Bay (Matrix Planning), Fishermans Paradise (Matrix Planning) and various locations (Optus Communications).
- Additional surveys throughout NSW, including:
  - Hunter Valley - numerous locations, such as Anna Bay, Bayswater, Beresfield, Cessnock, Fishermans Bay, Jerrys Plains, Lemington, Maitland, Rothbury, Singleton, Thornton, Tomago, Wambo and Wyong - for clients including Egis, Devine Erby Mazlin, GHD, HWC, Lemington Mine, MPE, Newcastle City Council, Rail Access Corporation and Umwelt;
  - Central Coast - numerous locations, including Wyong, Warnervale, Mardi, Wamberal, Ourimbah, Dora Creek, Toronto, Fennell Bay, Boolaroo, West Wallsend and Woy Woy - for clients including GHD, Department of Commerce, Wyong Shire Council and Connell Wagner;
  - South Coast - numerous locations, including Batemans Bay, Bendalong, Berry, Bewong, Broulee, Callala Beach, Cobargo, Congo, Conjola, Cudmirrah, Dapto, East Nowra, Eurobodalla NP, Fishermans Paradise, Jervis Bay NP, Kangaroo Valley, Lake Conjola, Milton, Moruya, Nowra, Potato Point, St. Georges Basin, West Dapto, Wollongong - for clients including Bullock Walters & Associates, Cowman Stoddart, Crescent Home Plan & Design Service, Eurobodalla Shire Council, Forbes Rigby, Glenshaw Holdings, Grenon-Walker, Horseshoe Pastoral Company, Matrix Planning, Maunsell, Miltonbrook, Niche Environmental Information, DECCW, P.W. Rygate & West, Shoalhaven City Council, State Forests of NSW, Town & Country Real Estate and Travers Morgan;
  - Far South Coast - numerous locations, including Bournda NP, Dalmeny, Bega, Merimbula, Tuross Falls - for clients including Bega Valley Shire Council, Great Southern Energy, GHD, Caddey Searl and Jarman, DECCW and RTA;
  - Southern and Central Tablelands - numerous locations, including Goulburn, Marulan, Yass, Snowy Mountains, Tallaganda, Gundagai, Cowra and Ulan - for clients including Ulan Coal Mine, Cowra Shire Council, Matrix Planning, Cowman Stoddart, SMEC, State Forests of NSW, DECCW and Gundagai Shire Council;
- Surveys in the ACT at Mitchell, Hume, Conder, Banks, Gungahlin and West Belconnen (ACT Government) and ACT site mapping project (Canberra Archaeological Society).

Professional Skills:

- Managing and conducting large-scale and small-scale Aboriginal heritage projects;
- Planning and conducting archaeological surveys of Aboriginal heritage sites;
- Planning and conducting archaeological excavations of Aboriginal sites, including artefact scatters, shell middens and rock shelters;
- Preparation of Aboriginal Heritage Impact Permit applications and the conduct of sub-surface investigations and other mitigation measures;
- Preparing Aboriginal heritage management plans and Aboriginal heritage impact assessment reports compliant with Heritage NSW, Department of Planning and other Government requirements;
- Liaising with Aboriginal communities, clients and government agencies;
- Assessing heritage site significance; and
- Analysing shell midden deposits and stone artefacts.

Academic Qualifications:

Tertiary degree: Bachelor of Arts (Honours) Australian National University
Result, 1989 Prehistory IV Honours: H2A

ENCLOSURE 6

MR LIAM SCANLAN'S CURRICULUM VITAE

Liam Scanlan **ECOLOGIST**

Liam Scanlan is an Ecologist based in the Newcastle office, specialising in botany and restoration ecology. Liam completed his Honours degree researching the phylogenetic diversity and conservation of rainforests on the Sunshine Coast. He is now undertaking biodiversity assessments of plant communities and threatened flora for major developments in New South Wales. Liam has also managed the propagation of threatened subtropical rainforest plants in South-East Queensland and supported bushfire management.

QUALIFICATIONS

- Bachelor of Science (Honours), University of the Sunshine Coast 2016
- Thesis title "Phylogenetic diversity and conservation of rainforests in the Sunshine Coast region, Queensland, Australia"
- Bachelor of Science (Environmental Studies and Plant Science), University of Tasmania 2015
- Certificate III Conservation and Land Management, 2018

ADDITIONAL CERTIFICATION AND TRAINING

- Certificate III Conservation and Land Management
- Agricultural chemical distribution control training, QLD commercial operator's license
- Level II Chainsaw operation
- Firefighter crew member accreditation
- Provide First Aid and provide CPR
- Occupational Health and Safety Construction Induction (White Card)
- Operate and maintain and four-wheel drive vehicle

PROJECT EXPERIENCE

2022

Flora surveying and monitoring

- Targeted threatened flora surveys for major renewable and extractive projects (Muswellbrook, Coolah, Walcha, Euston and Narrabri, NSW)
- Vegetation condition monitoring and weed management planning for biodiversity offsets and rehabilitated areas (Warkwork, Narrabri and Swan Bay NSW)
- Broad-scale vegetation ground-truthing and BioCondition assessments (Upper Burdekin region, North Queensland)
- Vegetation mapping and vegetation integrity assessments of private native forestry areas (Northern NSW)

Assessment and strategic planning

- Threatened Flora Seed Collection Procedures (Santos, NSW)

2021

Flora surveying and monitoring

- Broad-scale vegetation ground-truthing and mapping in high priority conservation areas (MidCoast, NSW)
- 'Saving our Species' Littoral rainforest monitoring (North Coast, NSW Parks and Wildlife Service)
- Monitoring of vegetation restoration sites and threatened rainforest flora (Ballina, NSW)
- Saltwater Creek vegetation validation and mapping (Southwest Rocks, NSW)
- Broad-scale vegetation ground-truthing (Yass region, NSW)
- Vegetation integrity plots and vegetation mapping for major renewable energy development (Coolah, NSW)
- Threatened flora targeted surveys (Coolah, NSW)

Assessment and strategic planning

- Threatened Allocasuarina translocation management plan (Port Macquarie, NSW)
- Weed management plan for Wambo Colliery (Warkworth, NSW)

Fauna surveying

- Targeted surveys for threatened amphibians (Uki, NSW)
- Pre-clearing surveys for threatened amphibians (Kooragang, NSW)

2020

Flora surveying and monitoring

- Threatened flora targeted surveys for rainforest flora for state significant project (Uki, NSW)
- Vegetation integrity plots and vegetation mapping (Uki, NSW)
- Vegetation integrity plots and vegetation mapping of a Biodiversity Stewardship site (sites including Narrabri NSW, Stroud NSW and Putty Valley NSW)
- Post-fire rainforest monitoring (North Coast, NSW Parks and Wildlife Service)
- 'Saving our Species' Littoral rainforest monitoring (North Coast, NSW Parks and Wildlife Service)
- 'Saving our Species' Endangered Ecological Community monitoring (Coffs Harbour City Council)
- Vegetation validation and identification of ecological values (Central Coast, NSW Parks and Wildlife Service)
- Threated flora targeted surveys and vegetation integrity plots (Somersby region, NSW)
- Threatened flora targeted surveys (Pilliga Forest, NSW)
- Vegetation rapid sampling and vegetation mapping (MidCoast Council, NSW)
- Biodiversity Offset monitoring and weed survey (Warkworth, NSW)

Assessment and Strategic Planning

- Field assessment for bushland reserve Site Management Plans (Central Coast, NSW)
- Leumeah Vegetation Management Plan (Leumeah, NSW)

Fauna surveying

- Targeted surveys and clearing supervision for Green and Golden Bell Frog (Newcastle, NSW)
- Targeted surveys for Eastern Cave Bat (Central Coast, NSW)
- Targeted surveys for threatened microbats (Uki, NSW)
- Targeted surveys for threatened birds (Narrabri, NSW)

2019

Flora surveying and monitoring

- 'Saving our Species' Littoral rainforest monitoring (NSW Parks and Wildlife Service)
- Coolah Tops vegetation surveys for mapping (NSW Parks and Wildlife Service)
- Manning River Wetlands vegetation surveys for mapping (MidCoast Council)
- Burwood and Belmont Water Treatment Plants Biodiversity Assessment (Veolia)
- Biodiversity Offset and Rehabilitation monitoring (Gunnedah, NSW)
- Biodiversity Offset monitoring and weed survey (Singleton, NSW)
- Threatened flora targeted surveys (Central Coast, NSW)
- Threatened flora targeted surveys and rehabilitation monitoring (Pilliga Forest, NSW)
- *Grevillia parviflora* subsp*. parviflora* translocation (Newcastle, NSW)

Assessment and Strategic Planning

- Hunter Regional Strategy for Chinese Violet Eradication and Containment (Port Stephens Council)
- Flora and Fauna Assessment and Management Plan templates (Port Stephens Council)
- Coastal Integrated Forestry Operations Approval Threatened Flora Management Plans (Natural Resources Commission)
- Pilliga Forest Rehabilitation and Significant Species Management Plans (Santos, NSW)
- Wambo Coal Mine Weed Treatment Plan (Singleton, NSW)

Fauna surveying

- Targeted survey for threatened fauna (Somersby, NSW)
- Preclearing surveys and clearing supervision (Bennetts Green, NSW)

2017-2019

- Threatened rainforest flora mapping and propagation (Noosa Shire Council)
- Bushfire management plans for bushland reserves (Noosa Shire Council)
- Supervisor of conservation and land management trainees (Noosa Landcare)
- Fire spotting and planned burn assistance (HQ Plantations)
- Bush regeneration and native plant nursery assistance (Noosa Landcare)

ENCLOSURE 7

MRS JOANNA HINKS' CURRICULUM VITAE

JOANNA HINKS

project and portfolio management
environmental impact assessment
environmental engineering
stakeholder engagement
planning legislation and planning strategy

Certified Environmental Practitioner No. 1500/IA11065
NSW Registered Environmental Assessment Practitioner (REAP) R80005

EDUCATION

Bachelor of Engineering (Environmental) (Hons I), University of Queensland, Brisbane.

Master of Science (Project Management) (Distinction), Curtin University, Perth (external).

PROFESSIONAL HISTORY

- Resource Strategies Pty Ltd, Environmental Project Manager, 2008 – 2015
- Resource Strategies Pty Ltd, Senior Environmental Manager, 2015 – 2019
- Resource Strategies Pty Ltd, General Manager / Principal, 2020 – current

EXPERIENCE

Joanna has specific experience in the project management of complex environmental approvals, environmental engineering, environmental impact assessment, environmental management, subsidence assessment and management, surface water management and planning legislation.

Joanna has directed Resource Strategies' involvement for a number of approval processes, including project oversight, cost and schedule control, risk management and government and community consultation. Joanna is also skilled in the resolution of key technical issues and the development of approval strategies.

Joanna was responsible for coordinating and preparing the EIS for the Tasman Extension Project in 2012, which was the first SSD mining project EIS to go on exhibition and be approved in NSW following the repeal of Part 3A. Since then, Joanna has directed Resource Strategies' involvement with the approval processes for another SSD coal mining project (the Maxwell Project), two Gateway Certificate Applications (the Spur Hill Underground Project and Maxwell Project) and numerous modifications for mining projects (including business-critical and urgent applications).

Joanna has gained experience in the preparation of a range of regulatory approval documents. She has been a key team member in delivering the following approval documents:

- Environmental Impact Statements/Environmental Assessments (Maxwell Project, Tasman Extension Project, Vickery Extension Project, Caroona Coal Project, Wilpinjong Extension Project, Cadia East Project, Bulli Seam Operations, Duralie Extension Project, and Tarrawonga Coal Project).
- Approval Condition Negotiation, Response to Submissions and Public Hearings (Tasman Extension Project, United Wambo Open Cut Coal Mine Project, Bulli Seam Operations, Millennium Expansion Project and Eaglefield Expansion Project).
- EPBC Act Documentation (Bulli Seam Operations Environmental Impact Statement, Maxwell Project Referral, Tasman Extension Project Referral, Spur Hill Underground Coking Coal Project Referral).
- Project/Environmental Approval Modifications (Wambo Coal Mine, Metropolitan Mine and Abel Underground Mine).
- Environmental Management Plans (Wambo Coal Mine, Moolarben Coal Complex, Cowal Gold Mine, Ulan Mine, Duralie Coal Mine and Stratford Coal Mine). A wide range of plans have been prepared addressing overall environmental management strategies, subsidence management and water management.

Joanna also has a thorough understanding of planning legislation and regularly provides advice to operational sites and the NSW Minerals Council on existing planning legislation and proposed. Joanna also provides direct advice to DPIE regarding draft DPIE environmental assessment policy and guideline documents, and has assisted with a non-mining related preliminary regional impact assessment.