The series of International Conferences on Mine Closure is a fixture on the calendars of many mining professionals, providing topical and high quality papers and presentations on a range of topics of immediate interest and relevance. A key feature of the conference series is the diversity of disciplines and expertise that come together to focus on the pressing issues facing the mine closure community globally.

KEYNOTE SPEAKERS INCLUDE:

Professor Angus Morrison-Saunders  
*Professor, Environmental Management*  
*Edith Cowan University*

Laura Tyler  
*Asset President Olympic Dam and Chief Geoscientist, BHP*

Dr Benjamin Warr  
*Founder & Director, Betterworld Energy Ltd, Zambia*

Professor Laco Mucina  
*Iluka Chair in Vegetation Science and Biogeography, Harry Butler Institute, Murdoch University*

Principal Sponsor

**BHP**

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<th>SUNDAY 1 SEPTEMBER</th>
<th>MONDAY 2 SEPTEMBER</th>
<th>TUESDAY 3 SEPTEMBER</th>
<th>WEDNESDAY 4 SEPTEMBER</th>
<th>THURSDAY 5 SEPTEMBER</th>
<th>FRIDAY 6 SEPTEMBER</th>
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<tr>
<td>Reimagine, Repurpose, Relinquish Workshop</td>
<td>Landform Design, Modelling for Mine Rehabilitation and Closure Workshop</td>
<td>13th International Conference on Mine Closure</td>
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<td>BHP Beenup Rehabilitation Project Site Visit</td>
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<tr>
<td>Pit Lakes Closure Planning Workshop</td>
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<td>Iluka Resources' Tutunup South Site Visit</td>
<td>Restoration Science and Botanic Garden Tour</td>
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www.mineclosure2019.com
08:30 KEYNOTE: Why should we ‘think big’ on closure? J Tyler, J Heyes, BHP, Australia

09:00 KEYNOTE: The action is where the social is! The ecosystem services concept and other ideas for enhancing stakeholder engagement in integrated mine closure planning A Morrison-Saunders, Edith Cowan University, Australia; North West University, South Africa

09:30 Achieving restoration targets and addressing completion criteria with remote sensing C Richardson, AH Grigg, Alcoa of Australia Ltd, Australia; T Robinson, G Wardell-Johnson, Curtin University, Australia

10:00 MORNING BREAK

SESSION ONE – GRAND BALLROOM 2
CHAIR: C Lockhart, BHP, Australia

10:30 Current practice and innovation in decommissioning, rehabilitation and monitoring on Barrow Island: applications for mine closure DA Jasper, Stantec, Australia; P Hoffman, Chevron, Australia; NC Banning, Stantec, Australia; GS Wiseman, Stantec, Canada; KE Stansbury, SJ Annison, GR Henderson, Stantec, Australia

11:00 Challenges for the closure and natural rehabilitation of bauxite residue disposal sites O Torgersen, Norwegian Geotechnical Institute (NGI), Norway; G Okkenhaug, University of Oslo/NGI, Norway; B Malme, Norsk Hydro, Norway; P Catalyst, Norsk Hydro, Brazil

11:30 Mine site rehabilitation conditions in Western Australia ME Kragt, The University of Western Australia, Australia; C Lison, ARC Centre for Mine Site Restoration, Australia; A Manero, J Hawkins, The University of Western Australia, Australia

12:00 A framework to prioritise high-risk abandoned mine features for rehabilitation in Western Australia I Mitchell, K Hryczyszyn, T Read, Department of Mines, Industry Regulation and Safety, Australia

12:30 LUNCH
### SESSION FIVE – GRAND BALLROOM 3

**Chair:** D. Jaster, Stantec, Australia

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>13:30</td>
<td>Geomorphic rehabilitation in Europe: recognition as best available technology and its role in LIFE projects</td>
<td>JF Martin, Duque, Complutense University of Madrid, and Geosciences Institute, Spain; M Tejedor, C Martin-Morero, Complutense University of Madrid, Spain; JM Nicolau, University of Zaragoza, Spain; J Zapico, Complutense University of Madrid, Spain</td>
</tr>
<tr>
<td>13:50</td>
<td>Understanding the Latrobe Valley Regional Rehabilitation Strategy and why it is essential</td>
<td>A. Feigl, B. Davis, M. Pratt, A. Kinwan, B. Millson, M. Mazing, E. Rampa, State Government of Victoria, Australia</td>
</tr>
<tr>
<td>14:10</td>
<td>Ecological engineering to accelerate mineral weathering and transformation underpins sustainable tailings rehabilitation</td>
<td>E. Ling, AL Guzzomi, The University of Western Australia, Australia; DJ Merritt, Department of Biodiversity, Conservation and Attractions, Australia; M. Renton, TE Erickson, The University of Western Australia, Australia</td>
</tr>
<tr>
<td>14:30</td>
<td>Flash flaming technology shows promise to improve seed-based rehabilitation outcomes</td>
<td>Tails storage facility landform evolution modelling H. Thomson, SRK Consulting (Australia) Pty Ltd, Australia; L. Chandler, Ethos Consulting, Australia</td>
</tr>
<tr>
<td>14:50</td>
<td>Designing for success: applying ecological criteria to restoration at BHP Beenup, Australia</td>
<td>Whole-of-landform erosion assessment using unmanned aerial vehicle data M. Brainbridge, S. Mackenzie, Mine Earth Pty Ltd, Australia; M. Lyons, T. Clarke, Regis Resources Limited, Australia; B. Bow, Atlas Iron Pty Ltd, Australia</td>
</tr>
<tr>
<td>15:10</td>
<td>Improvements to mechanical direct seeder design guided by the optimal sowing depth of soft spinifex (Triodia pungens) M. Massarei, AL Guzzomi, The University of Western Australia, Australia; DJ Merritt, Department of Biodiversity, Conservation and Attractions, Australia; TE Erickson, The University of Western Australia, Australia</td>
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### SESSION SIX – CASSIA & KARRI ROOMS

**Chair:** B. Warr, Betterworld Energy Ltd, Zambia

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>13:30</td>
<td>Mine landforms in Western Australia from dump to landform design: review, reflect and a future direction</td>
<td>HWB Lacy, Mine Closure Management Services Pty Ltd, Australia</td>
</tr>
<tr>
<td>13:50</td>
<td>How can frameworks inform water quality objectives for the closure of the Ranger mine?</td>
<td>M. Iies, Energy Resources of Australia Ltd, Australia</td>
</tr>
<tr>
<td>14:10</td>
<td>The multi-risk vulnerability of global coal regions in the context of closure planning</td>
<td>Clarifying closure scenarios through integrated planning at Creerjone mine in Colombia J. Rualat, Creerjone Coal Mine, Colombia; CD Grant, Anglo American, Australia; A. Freitas, Golder Associates Brasil Consultoria e Projetos Ltda., Brazil; PR Botha, Anglo American, South Africa, Presented by T. Sharman, Anglo American, Australia</td>
</tr>
<tr>
<td>14:30</td>
<td>Roy Hill waste landform design and construction process V. de San Miguel, T. Stone, Roy Hill Iron Ore Pty Ltd, Australia; M. Brainbridge, S. Mackenzie, Mine Earth Pty Ltd, Australia</td>
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</tr>
<tr>
<td>14:50</td>
<td>A case for consequence categories to guide the closure design of landforms P. Chapman, A. Kemp, Golder Associates Pty Ltd, Australia</td>
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<tr>
<td>15:10</td>
<td>Developing a rehabilitation standard for landform stability for a uranium mine in northern Australia BCC Lawry, MJ Soynor, Department of the Environment and Energy, Australia</td>
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<tr>
<td>15:30</td>
<td>Foresight in hindsight JF Martín, Deswik Mining Consultants</td>
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### SESSION SEVEN – GRAND BALLROOM 2

**Chair:** DP. Murphy, Golder Associates Pty Ltd, Australia

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>14:00</td>
<td>Mine closure residual risk management: identifying and managing credible failure modes for tailings and mine waste J. Sanders, H. McLeod, A. Small, Kłożn Crippen Berger Ltd, Canada; C. Strachotte, Kłożn Crippen Berger Ltd, Australia</td>
<td></td>
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<tr>
<td>14:20</td>
<td>Mine closure residual risk management: identifying and managing credible failure modes for tailings and mine waste J. Sanders, H. McLeod, A. Small, Kłożn Crippen Berger Ltd, Canada; C. Strachotte, Kłożn Crippen Berger Ltd, Australia</td>
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<tr>
<td>14:40</td>
<td>Will tree colonisation increase the risks of serious performance loss for tailings facilities?</td>
<td>Tailings storage facilities store-and-release cover design for the Cobar region NP. Janssen, TK Rohde, SGM Environmental Pty Ltd, Australia</td>
</tr>
<tr>
<td>14:50</td>
<td>Coal ash waste categorisation to determine a regulatory capping profile for coal ash pond rehabilitation PS. Fridell, C. Pearson, Environmental Resources Management Australia Pty Ltd, Australia; F. Woskoboenko, HRL Technology Group Pty Ltd, Australia; B. Brooker, MK Senkeln, ENGIE Australia Pty Ltd, Australia, Presented by T. Weaver, ERM Australia Pty Ltd, Australia</td>
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<tr>
<td>15:00</td>
<td>Analysis of dry cover systems composed of tropical soils for mining waste DA. Perotti, Universidade de Sao Paulo, Brazil; GFN Gitanjana Jr, Universidade Federal de Goias, Brazil; MD. Fredlund, SoilVision Systems Ltd., Canada. Presented by K. Mersey, 3rd Rock Consulting, Australia</td>
<td></td>
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<tr>
<td>15:20</td>
<td>Six years of cover performance data for leading practice store and release cover trials at Century Mine PL. Defferrard, New Century Resources Limited, Australia; TK. Rohde, SGM Environmental Pty Ltd, Australia</td>
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### SESSION EIGHT – GRAND BALLROOM 3

**Chair:** RE. Bartolo, AJ Harford, Department of Environment and Energy, Australia

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<tr>
<th>Time</th>
<th>Title</th>
<th>Speaker</th>
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<tbody>
<tr>
<td>15:00</td>
<td>An interjurisdictional approach to designing residual risk policy A. Shrivastava, S. Cooper, Queensland Government, Australia</td>
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<tr>
<td>15:20</td>
<td>An interjurisdictional approach to designing residual risk policy A. Shrivastava, S. Cooper, Queensland Government, Australia</td>
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<tr>
<td>15:40</td>
<td>Whole-of-landform erosion assessment using unmanned aerial vehicle data M. Brainbridge, S. Mackenzie, Mine Earth Pty Ltd, Australia; M. Lyons, T. Clarke, Regis Resources Limited, Australia; B. Bow, Atlas Iron Pty Ltd, Australia</td>
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<td>15:50</td>
<td>Whole-of-landform erosion assessment using unmanned aerial vehicle data M. Brainbridge, S. Mackenzie, Mine Earth Pty Ltd, Australia; M. Lyons, T. Clarke, Regis Resources Limited, Australia; B. Bow, Atlas Iron Pty Ltd, Australia</td>
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### DAY ONE CLOSE

- 17:40 Major Sponsor presentation Deswik Mining Consultants
- 17:45 Major Sponsor presentation Stantec
KEYNOTE: Ecology, biodiversity and mining: science solving the challenges

08:00 KEYNOTE: Ecology, biodiversity and mining: science solving the challenges
J Muñoz-Rojas, UNSW Sydney, Australia; AL Guzzomi, M Masarei, E Ling, AM Bateman, OA Kildisheva, AL Ritchie, SR Turner, The University of Western Australia, Australia

08:30 Too much of a good thing: phosphorus over-fertilisation in rehabilitated landscapes of high biodiversity value
M Tibbett, R O’Connor, MI Davis, University of Reading, UK

09:00 Combining seed burial, land imprinting and an artificial soil crust dramatically increases the emergence of broadcast seed
MP Dobrowolski, Iluka Resources Limited, and The University of Western Australia, Australia

09:30 A case study of seed-use technology development for Pilbara mine site rehabilitation
JE Erickson, The University of Western Australia, Australia; MJ Thomas, UNSW Sydney, Australia; AL Guzzomi, M Masarei, E Ling, AM Bateman, OA Kildisheva, AL Ritchie, SR Turner, The University of Western Australia, Australia; B Parsons, Greening Australia, Australia; PC Chester, Rio Tinto (Iron Ore Division, Western Australia), Australia; T Webster, S Wishart, BHP Western Australia Iron Ore Pty Ltd, Australia; JJ James, University of California, USA; MD Madsen, Brigham Young University, USA; SR Abella, University of Nevada, USA; DJ Merritt, Department of Biodiversity, Conservation and Attractions, Australia

10:00 MORNING BREAK

SESSION NINE – GRAND BALLROOM 2

10:30 Applied phosphorus has long-term impacts on vegetation responses in restored jarrah forest
ML Davis, University of Reading, UK; AH Grigg, Alcoa of Australia Ltd, Australia; RJ Standish, Murdoch University, Australia; M Tibbett, University of Reading, UK

10:50 Target Ecosystem Assessment Model: a process to develop target revegetation prescriptions in the mine closure landscape
B Logan, V Futoransky, S Dietrich, BH Flemming, V Wilson, L Waterman, Paragon Soil and Environmental Consulting Inc., Canada

11:10 Harnessing ecological processes in the Ranger Uranium Mine revegetation strategy
PL Lu, I Meek, Energy Resources of Australia Ltd, Australia

11:30 Growth of rye grass and clover in artificial topsoils: a case study
MLundord, M Yellishetty, V Wong, A Walmsley, Monash University, Australia; J Missen, N Anderson, AGL Loy Yang, Australia

11:50 A ground up approach to revegetation in the arid zone
G Christie, BH Horner, AT Scanlon, J Lemon, Succession Ecology Pty Ltd, Australia; B Williams, Flinders Power, Australia

12:10 Bang for your buck: revegetating arid sites using coloniser species
BH Horner, G Christie, Succession Ecology Pty Ltd, Australia; B Williams, Flinders Power, Australia; AT Scanlon, J Lemon, Succession Ecology Pty Ltd, Australia

12:30 LUNCH

HARNESSING RISK TO GUIDE MINE ROCK LANDFORM CLOSURE AND LONG-TERM COST REDUCTION

SC Lamoureux, Okane Consultants Pty Ltd, Australia; MA O’Kane, Okane Consultants Inc., Canada

RIO TINTO’S FRAMEWORK FOR EVALUATING RISKS FROM LOW SULFUR WASTE ROCK

R Green, Rio Tinto, Australia; C Linklater, SRK Consulting (Australia) Pty Ltd, Australia; S Lee, L Terrusi, K Glasson, Rio Tinto, Australia

KEY OUTCOMES OF FUNCTIONAL BENCHMARKING FOR WASTE ROCK LANDFORM CLOSURE AT A WESTERN AUSTRALIAN IRON ORE MINE

SL Robinson, formerly Bioscope Environmental Consulting Pty Ltd, Australia; SJ Finucane, Bioscope Environmental Consulting Pty Ltd, Australia

OPTIMISING WASTE MANAGEMENT ASSESSMENT USING FRAGMENTATION ANALYSIS TECHNOLOGY

S Pearce, Mine Environment Management Consultants Ltd, UK; D Brookshaw, Caulim Ltd, UK; S Mueller, Boliden Mines, Sweden; A Barnes, Geochemic Ltd, UK

A DEMONSTRATION OF THE CESSION OF SPONTANEOUS COMBUSTION IN A COAL OVERBURDEN SPOIL PILE

A Garvie, SRK Consulting (Australia) Pty Ltd, Australia; K Donaldson, B Williams, Flinders Power, Australia; J Chapman, SRK Consulting (Australia) Pty Ltd, Australia

BIOLOGICAL MANGANESE REMOVAL FROM MINE DRAINAGE IN A FIXED-BED BIOREACTOR AT PILOT-SCALE

J Jacob, BRGM, France; I Raignault, Rio Tinto SA, France; F Battaglia-Brunet, BRGM, France; C Mailhan-Muxi, Rio Tinto SA, France; J Engevin, MJ Dijeml, BRGM, France

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<th>SESSION FOURTEEN – CASSIA &amp; KARRI ROOMS</th>
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<tr>
<td><strong>Post-Mining Land Use</strong></td>
<td><strong>Mine Closure Planning</strong></td>
<td><strong>Case Studies and Remote Survey</strong></td>
</tr>
<tr>
<td>CHAIR: S Mackenzie, Mine Earth Pty Ltd, Australia</td>
<td>CHAIR: R Mackay, Latrobe Valley Mine Rehabilitation Commissioner, Australia</td>
<td>CHAIR: C McCullough, Mine Lakes Consulting, Australia</td>
</tr>
<tr>
<td>13:30 Applying ecosystem services assessment in closure planning to enhance post-mining land-use outcomes: learning from bauxite mining in Brazil and Australia</td>
<td>Systems thinking: embedding closure planning within the management operating system is the key to drive closure performance</td>
<td>Methods for assessing acid and metaliferous drainage mitigation and carbon sequestration in mine waste: a case study from Kevitsa mine, Finland</td>
</tr>
<tr>
<td>13:50 Pre- and post-mine land-use trends across the New South Wales and Queensland coal industry</td>
<td>Digitalisation of continuous mine closure planning and management: an EIT RawMaterials initiative</td>
<td>A case study: consolidation properties of Hazelwood Power Station ash</td>
</tr>
<tr>
<td>14:10 Applying a regional land-use approach to mine closure: opportunities for restoring and regenerating mine-disturbed regional landscapes</td>
<td>Mine closure plans assumptions and optimism</td>
<td>Quality management during closure works at the Telfer mine: a case study</td>
</tr>
<tr>
<td>14:30 Maximising post-mining land use: Queensland Government reforms</td>
<td>Why mines should look at total life to achieve tailings facility closure</td>
<td>Using aerial drones to select sample depths in pit lakes</td>
</tr>
<tr>
<td>14:50 Post-closure land uses – defined through a strategic land use planning approach</td>
<td>Closure planning challenges associated with mining adjacent to large creek lines</td>
<td>The analysis and validation of landform stability using unmanned aerial vehicles</td>
</tr>
<tr>
<td>15:10 Uranium mining: post-closure land uses – a personal global review</td>
<td>Setting objectives: the key to successful mine closure</td>
<td>Selection of a representative dolerite waste sample for use in erosion assessments using remote sensing techniques</td>
</tr>
<tr>
<td>15:30 <strong>AFTERNOON BREAK</strong></td>
<td><strong>PLENARY SESSION THREE – GRAND BALLROOMS 2 &amp; 3</strong></td>
<td><strong>PANELLAR SESSIONS PARALLEL SESSIONS PARALLEL SESSIONS PARALLEL SESSIONS PARALLEL SESSIONS PARALLEL SESSIONS</strong></td>
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<tr>
<td><strong>CHAIR:</strong> K Beckett, Fortescue Metals Group Ltd, Australia</td>
<td><strong>Managing Tailings</strong></td>
<td><strong>Session Sponsor</strong></td>
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<tr>
<td>16:00 Elliot Lake, Ontario uranium mines: a legacy perpetual care case study</td>
<td>DS Berthelot, BHP, Canada; D Place-Hoskie, D Willems, K Black, BHP, USA</td>
<td>DigiPHER</td>
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<tr>
<td>16:20 Life cycle assessment of tailings management options: a conceptual case study in Western Australia</td>
<td>A Correia, AB Fourie, The University of Western Australia, Australia</td>
<td></td>
</tr>
<tr>
<td>16:40 Wind erosion design considerations for closure of tailings storage facilities in South Africa: a case study</td>
<td>SJ van Wyk, J Hatting, ASH Haagner, Agreenco Environmental Projects (Pty) Ltd, South Africa</td>
<td></td>
</tr>
<tr>
<td>17:00 Three case studies: mechanisms other than spillage and leaks that change groundwater quality and inhibit closure certification</td>
<td>TL Patterson, M Trevor, SLR International, Inc., USA</td>
<td></td>
</tr>
<tr>
<td>17:20 Integrated life-of-mine waste characterisation, scheduling, and quality control for progressive closure at Martabe multi pit gold mine</td>
<td>K Grohs, PT Agincourt Resources, Indonesia; S Pearce, Mine Environment Management Ltd, UK</td>
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<tr>
<td>17:40 Major Sponsor Presentation</td>
<td>Alcoa of Australia Limited</td>
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<td>17:45 Major Sponsor Presentation</td>
<td>Golder Associates Pty Ltd</td>
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<td>17:50 Major Sponsor Presentation</td>
<td>Emapper Pty Ltd</td>
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<td>17:55 <strong>DAY TWO CLOSE</strong></td>
<td><strong><a href="http://www.mineclosure2019.com">www.mineclosure2019.com</a></strong></td>
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As of 2 September 2019. Programme is subject to change. For updates, please visit www.mineclosure2019.com

DAY THREE PROGRAMME

THURSDAY 5 SEPTEMBER 2019

KEYNOTE ADDRESS AND PLENARY SESSION FOUR – GRAND BALLROOMS 2 & 3

CHAIR: M Dobrowolski, Iluka Resources Limited, Australia

08:00 KEYNOTE: Designing contextual, efficient, and resilient land regeneration systems for mine closure under conditions of extreme uncertainty and resource constraints B Warr, BetterWorld Energy Ltd, Zambia; Stellenbosch University, South Africa

08:30 Strengthening BHP’s closure framework: a strategy to realise enduring value J Heyes, T Cooper, BHP, Australia

09:00 Rehabilitation of the North End Box Cut dump at Tom Price mine operation: a legacy management case study W Worthington, R Green, CL Latham, B Yaqub, Rio Tinto Iron Ore, Australia

09:30 Problematic pit: closure liability to operational opportunity CL Latham, C Lazo-Skold, Rio Tinto, Australia

10:00 MORNING BREAK

SESSION FIFTEEN – GRAND BALLROOM 2

CHAIR: L Mucina, Murdoch University, Australia

10:30 Evaluating the effectiveness of Sunnyside Gold Corporation’s reclamation, San Juan County, Colorado, USA S Lange, Knight Piésold and Co., USA

10:50 An approach to an ecosystem restoration standard for Ranger Uranium Mine RE Bartolo, J Nicholson, Department of the Environment and Energy, Australia; M Rudge, The University of Queensland, Australia; D Loewensteiner, T Whiteside, Department of the Environment and Energy, Australia; P Erskine, The University of Queensland, Australia; M Barnes, CL Humphrey, Department of the Environment and Energy, Australia

11:10 Environmental assessment and reclamation of abandoned marl mining dumps in the Northwest Caucasus AV Alekseenko, Saint Petersburg Mining University, Russia

11:30 Implementation of offshore reclamation methods on an old tin-mined area in Bangka Island, Indonesia IA Syari, University of Bangka Belitung, Indonesia; J Sudrajat, HA Octaviano, Ministry of Energy and Mineral Resources, Indonesia; B Hutahaean, R Adnis, OA Taruk Allo, PT Timah Tbk, Indonesia

11:50 The application of an agro-hydrological model for a data limited closure study of a bauxite mine in Australia HH Bulcock, J Heaslop, Klohn Crippen Berger Limited, Australia

SESSION SIXTEEN – GRAND BALLROOM 3

CHAIR: C Linklater, SRK Consulting (Australasia) Pty Ltd, Australia

10:30 Simplified method to predict final void water levels H Morgan, WRM Water & Environment, Australia; A Hocking, BHP, Australia; S Henderson, Henderson Geotech Pty Ltd, Australia

10:50 Hydrogeological modelling to inform closure planning for Hazelwood Mine R Gresswell, G Foley, GHD Pty Ltd, Australia; J Faithful, ENGIE, Australia

11:10 Key considerations that can make or break a closure-focused groundwater-monitoring program WJ Gemson, TR Weaver, BL Heemink, Environmental Resources Management Australia Pty Ltd, Australia


11:50 Modelling the long-term water balance of a pit lake with recreational end uses AM Carlino, Golder Associates Pty Ltd, Australia; CD McCullough, Mine Lakes Consulting, Australia

12:10 LUNCH

*As of 2 September 2019. Programme is subject to change. For updates, please visit www.mineclosure2019.com

Conference App

The ACG is committed to providing our delegates with the best conference experience that we can, and in an effort to increase the value and interactivity of our event, we are pleased to announce we have created a dedicated Mine Closure 2019 conference app to assist delegates in getting the most out of the conference via their phone, tablet or laptop.

All registered attendees will receive an invitation email with a link to follow the easy download process, so keep an eye on your inbox!

# Session Seventeen – Grand Ballroom 2

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Chair</th>
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<tbody>
<tr>
<td>13:10</td>
<td>Engaging stakeholders to achieve rehabilitation completion: a case study of the BHP Beenup Project</td>
<td>R Norrish, B Lyon, W Russell, G Price, BHP, Australia</td>
<td>How long is long enough? Adopting a risk-based approach to inform drainage management in closure designs</td>
</tr>
<tr>
<td>13:30</td>
<td>Overcoming adverse stakeholder perception affecting tenement relinquishment</td>
<td>MJF Finucane-Woodman, SJ Finucane, Bioscope Environmental Consulting Pty Ltd, Australia</td>
<td>Global acid and metalliferous drainage management standard: BHP’s approach to reducing global acid and metalliferous closure risk</td>
</tr>
<tr>
<td>13:50</td>
<td>Mine relinquishment policy in Australia</td>
<td>CD Tiemann, Curtin University and Independence Group NL, Australia; MC McDonald, Society for Ecological Restoration Australasia, Australia; G Middle, KW Dixon, Curtin University Australia</td>
<td>Development of a vulnerability assessment framework to evaluate potential effects of mine water discharges from Ranger Uranium Mine, Northern Territory</td>
</tr>
<tr>
<td>14:10</td>
<td>Relinquishment criteria verification: quality assurance/quality control using unmanned aerial vehicles</td>
<td>PL Jones, Flinders Power, Australia; C Franklin, CLD Mining, Australia</td>
<td>Stress testing geomorphic and traditional tailings dam designs for closure using a landscape evolution model</td>
</tr>
<tr>
<td>14:30</td>
<td>Engineering a path to relinquishment: an Australian case study in ecological conservation</td>
<td>R Marten, C Bagnall, BHP, Australia</td>
<td>Acceptable erosion rates for mine waste landform rehabilitation modelling in the Pilbara, Western Australia</td>
</tr>
<tr>
<td>14:50</td>
<td>Contamination assessment of mine infrastructure areas for closure and relinquishment: Hazelwood Coal Mine, Victoria, Australia</td>
<td>TS Weaver, PS Fridell, MB Ospina, Environmental Resources Management Australia Pty Ltd, Australia; R Brooker, MF Schenkel, AM Scrase, ENGIE Australia Pty Ltd, Australia</td>
<td>Integration of field erosion measurements with erosion models and 3D civil design tools for development of erosion resistant cover systems</td>
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## 15:10 Afternoon Break

### Plenary Session Five – Grand Ballrooms 2 & 3

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<th>Time</th>
<th>Session Title</th>
<th>Chair</th>
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<tbody>
<tr>
<td>15:40</td>
<td>Repurposing closure cost estimation tools: a Gold Fields case study of the benefit of integration</td>
<td>R Getty, SRK Consulting (Australasia) Pty Ltd, Australia; D Caporn, Gold Fields Ltd, Australia; D Kyan, J Beltran, SRK Consulting (Australasia) Pty Ltd, Australia</td>
<td>SRK Consulting (Australasia) Pty Ltd, Australia</td>
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<tr>
<td>16:00</td>
<td>Financial concepts for mine closure: information document</td>
<td>D Brock, International Council on Mining and Metals, UK; M Slight, Mike Slight &amp; Associates, Australia; C McCombe, Minerals Council of Australia, Australia</td>
<td>Stantec</td>
</tr>
<tr>
<td>16:20</td>
<td>Spatial data-based closure costing integrated with life of mine planning: a key enabler facilitating value realisation</td>
<td>P Kumari, Anglo American PLC, South Africa; M Cooper, Deswik Mining Consultants Pty Ltd, South Africa. Presented by T Sherman, Anglo American, Australia</td>
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<tr>
<td>16:40</td>
<td>Progressive release of security to incentivise and fund closure</td>
<td>KA Bocking, Golder Associates Ltd., Canada; K Lewis, Lupin Mines Incorporated, Canada</td>
<td></td>
</tr>
</tbody>
</table>

## 17:00 Conference Announcement: Mine Closure 2020
ASSOCIATED EVENTS

Pit Lakes Closure Planning Workshop
1 September 2019 | Wisteria Room, The Westin, Perth, Western Australia

Workshop Overview
The objective of this workshop is to introduce attendees to key issues that should be addressed in the mine planning process to increase the likelihood of successful rehabilitation and closure of mine operations with pit lakes. Examples of issues and potential management strategies to address them are given with reference to presenter’s experiences in Australia and overseas.

Workshop Facilitators
Dr Cherie D. McCullough
Director, Principal Environmental Scientist
Mine Lakes Consulting
Dr Devin Castendyk
Senior Geochemist
Golder Associates Inc., United States of America

Programme*
08:00 Registration
08:30 Welcome and introduction to pit lakes Dr Cherie McCullough, Mine Lakes Consulting
09:00 Key issues with pit lakes: Dr Cherie McCullough
• General
• Australia and international examples
10:00 Morning break
10:30 Key opportunities with pit lakes: Dr Cherie McCullough
• General
• Australia and international examples
11:00 Water balance strategies Dr Cherie McCullough
12:00 Lunch
13:00 Interactive break-out session 1 Dr Cherie McCullough
14:00 Pit lake water quality modelling: Theory Dr Devin Castendyk, Golder Associates Inc., United States of America
15:00 Pit lake water quality modelling: Case studies Dr Devin Castendyk
15:30 Afternoon break
15:45 Lessons learned Dr Devin Castendyk
16:30 Interactive breakout session 2 and synthesis Dr Cherie McCullough
17:00 Workshop close

Please note: the programme is subject to change. For updates, please visit www.mineclosure2019.com

Reimagine. Repurpose. Relinquish. Workshop
1 September 2019 | Cassia & Karri Rooms, The Westin | Perth, Western Australia

This one day workshop includes presentations and interactive sessions. In the morning, the programme will discuss the challenges, barriers and opportunities associated with relinquishment; and discuss current policy and practical issues associated with custodial transfer of risk. During the afternoon, we will reimagine the closure planning process to repurpose this for relinquishment planning.

Workshop notes will be available to registered workshop delegates, post workshop.

Workshop Facilitator
Sonia Finucane
Director and Principal Consultant
Bioscope Environmental Consulting Pty Ltd

Programme*
08:00 Registration
08:30 Welcome and introduction Sonia Finucane, Bioscope Environmental Consulting Pty Ltd
08:45 Relinquishment practices, policies and frameworks Chris Tiemann, Independence Group
09:45 Defining success Sonia Finucane; and Dr Kamila Svobodova, The University of Queensland
10:30 Morning break
11:00 Next land use: Relinquishment in the mining lifecycle and challenging the status quo Chris Tiemann
11:30 Reimagining and repurposing the closure landscape to facilitate relinquishment Dr Kirsty Beckett, Fortescue Metals Group Ltd
12:15 Social transitioning Sonia Finucane
12:30 Lunch
13:30 Challenges and enablers for relinquishment Panel discussion
14:15 Mapping the relinquishment process Chris Tiemann and Dr Kirsty Beckett
15:10 Engagement and transparency Sonia Finucane
15:30 Afternoon break
16:00 Measuring success Dr Kamila Svobodova
16:30 Re-defining success measures Sonia Finucane and Dr Kamila Svobodova
17:00 Wrap-up
17:15 Workshop close

For more information on these associated events, visit
mineclosure2019.com/associated-events
Landform Design and Modelling for Mine Rehabilitation and Closure Workshop
2 September 2019 | Cassia & Karri Rooms, The Westin | Perth, Western Australia

About the Workshop
The post-mining landform is the canvass for all other aspects of ecological rehabilitation. Traditionally, the design approach to these landforms has been linear using empirical methods or generic designs. With the development of computer-aided construction equipment, designers are no longer confined to straight lines, benches, contour banks and drop structures.

Popular with the community, geomorphic designs claim to ensure greater connectivity with the surrounding environment, visually and functionally by emulating fluvial geomorphic processes. But are these more complex designs cost effective? Are the outcomes more stable, and likely to function ecologically than traditional approaches? and how do we assess that? What is the role of Landscape Evolution Models (LEMs) and how significant are their limitations?

This workshop will provide a practical view of landform design both world-wide and in Australia. Presenters will discuss successes and failures, provide an integrated perspective of the different directions in which this field may develop, and interact with the attendees during question times, breaks and during the panel discussion.

Workshop Presenters

- Associate Professor Jose F. Martín Duque, Complutense University of Madrid and Geosciences Institute, Spain
- Associate Professor Gregory Hancock, The University of Newcastle
- Harley Lacy, Director-Advisor, MCMS Pty Ltd
- Chris Waygood, Principal Mine Closure Specialist, Golder Associates Pty Ltd
- Professor David Williams, Director, Geotechnical Engineering Centre, The University of Queensland

Programme*

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Title</th>
<th>Presenter(s)</th>
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</thead>
<tbody>
<tr>
<td>07:30</td>
<td>Registration</td>
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<tr>
<td>08:30</td>
<td>Welcome and introduction</td>
<td>Harley Lacy, MCMS Pty Ltd and Associate Professor Jose F. Martín Duque, Complutense University of Madrid and Geosciences Institute, Spain</td>
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<tr>
<td>08:45</td>
<td>Setting the scene: what have we done historically in landform design, how has it worked, what lessons can we learn</td>
<td>Harley Lacy, MCMS Pty Ltd</td>
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<tr>
<td>09:10</td>
<td>The importance of geotechnical stability in landform design – toward sustainability</td>
<td>Professor David Williams, The University of Queensland</td>
</tr>
<tr>
<td>09:40</td>
<td>Understanding the tension between material movement optimisation, ensuring erosional stability and geomorphic/ hydrological considerations</td>
<td>Chris Waygood, Golder Associates Pty Ltd</td>
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<tr>
<td>10:00</td>
<td>Morning break</td>
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<tr>
<td>10:20</td>
<td>Erosional stability: an overview on soil erosion modelling (RUSLE, WEPP) and landscape evolution modelling (SIBERIA, CAESAR, others)</td>
<td>Associate Professor Greg Hancock, The University of Newcastle</td>
</tr>
<tr>
<td>11:00</td>
<td>Geomorphic/hydrological considerations – landform design tools and software - GeoFluv-Natural Regrade, natural landform replication at rock highwalls, Talus Royal, River Morphology and the Canadian fluvial geomorphic approach</td>
<td>Associate Professor Jose F. Martín Duque</td>
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<tr>
<td>11:45</td>
<td>Integration of landform design and landscape evolution modelling</td>
<td>Associate Professors Greg Hancock and Jose F. Martín Duque</td>
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<tr>
<td>12:00</td>
<td>Panel discussion – challenges and observations, practitioners’ experience with these tools</td>
<td>All presenters</td>
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<td>12:30</td>
<td>Lunch</td>
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<td>13:30</td>
<td>Potential case studies and interactive workshop:</td>
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<td>15:20</td>
<td>Afternoon break</td>
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<tr>
<td>15:40</td>
<td>River restoration and stream diversion approaches</td>
<td>Associate Professor Jose F. Martín Duque and Chris Waygood</td>
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<tr>
<td>16:20</td>
<td>Integrating ideas, developing new ideas, addressing ongoing challenges in implementation and philosophy</td>
<td>Panel discussion</td>
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<tr>
<td>17:00</td>
<td>Workshop close</td>
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*Please note that the programme is subject to change. For updates, please visit www.mineclosure2019.com
ASSOCIATED EVENTS

BHP Beenup Rehabilitation Project Site Visit
6 September 2019 | Margaret River region, Western Australia

In 2018, 19 years after closure, rehabilitation of the former Beenup Titanium Minerals project has achieved regulatory sign-off against the 21 completion criteria, as agreed with stakeholders.

The Beenup Consultative Group, formed ten years prior to closure, played an integral part in the planning, design and oversight of rehabilitation, including independent peer review, and remains active.

The site is now transitioning, with stakeholder input, to a monitoring and relinquishment phase requiring only minimal resources to ensure that the project tenements continue to meet the remaining statutory obligations and that design features are not compromised while also considering the opportunities that could be realised for the site into the longer term post-relinquishment.

The ACG thanks BHP for freely donating their time and resources to host this visit.

Restoration Science and Botanic Garden Tour
6 September 2019 | Kings Park, Perth, Western Australia

Duration: Half day 9:00am - 12:00pm

Kings Park Science is the State’s premier restoration science and ex-situ conservation research provider, having developed a strong restoration science brand over the past 30 years in collaboration with the mining sector.

The laboratory and glasshouse tour will highlight leading technologies and concepts across these key areas as related to mine rehabilitation and closure. A guided walk will then allow guests to experience key features of the Kings Park’s Botanic Garden and adjacent bushland.

The ACG thanks the Department of Biodiversity, Conservation and Attractions, Kings Park Science for generously giving their time and resources in facilitating this activity.

Spaces will be limited to 40. Morning tea provided.

Contact details for bookings: Lyndsey Osborne | scienceadmin@dbca.wa.gov.au | + 61 8 94803614

Iluka Resources’ Tutunup South Site Visit
6 September 2019 | Busselton region, Western Australia

Iluka Resources is currently rehabilitating its Tutunup South mine, located in the southwest of Western Australia, approximately 16 km southeast of Busselton. Tutunup South was mined between 2011 and 2018 for zircon and ilmenite for the production of synthetic rutile at Iluka’s Capel processing facilities. Rehabilitation commenced in 2018 and will be completed in 2021. The site is one of numerous mines that Iluka has closed or is progressively rehabilitating in Australia, the US and Sierra Leone.

Tutunup South is mainly agriculture land (192 ha) that will be returned to productive pasture. Native vegetation makes up the remaining 17 ha and includes 2 ha of paluslope wetland. This wetland contains plant species that are difficult to propagate so Iluka used an innovative approach for its rehabilitation. The entire wetland vegetation, including its soil, was transplanted to an irrigated nursery area in 2010. The plants have survived and flourished in the nursery and will be transplanted into the reinstated wetland in 2019.

To register your interest, email info-acg@uwa.edu.au
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## Payment

Total payment AUD __________

Payment to be received by 30 August 2019. All bank fees are the responsibility of the registrant. All prices include GST. ABN 37 882 817 280

## Payment Options

- **Credit Card:** Please register online at [mineclosure2019.com/product/registrations/](http://mineclosure2019.com/product/registrations/) or alternatively, return this completed form to info-acg@uwa.edu.au and contact us by phone to make payment. (Visa and Mastercard are the only cards we accept).
- **Electronic Funds Transfer (EFT):** Please return this completed form to info-acg@uwa.edu.au and the ACG will send you an invoice with EFT details included. PO# (if required) ___________________

## Contact Details

Please print. * mandatory fields.

- **Title (Mr, Mrs, Miss, Ms, Dr, Prof., Other) __________________________**
- **Family Name __________________________________________________**
- **First Name _____________________________________________________**
- **Preferred Name _________________________________________________**
- **Position ________________________________________________________**
- **Organisation ____________________________________________________**
- **Mine/Dept ______________________________________________________**
- **Address ________________________________________________________**
- **Phone __________________________________________________________**
- **Fax ____________________________________________________________**
- **Mobile __________________________________________________________**
- **Email __________________________________________________________**

*All confirmations/event updates will be sent via email.*

Registrant contact details are intended to be published in the events authorised attendee list made available to event attendees, sponsors and exhibitors, who may contact you, including electronically, in the promotion of their products and services.

- **I give permission for my details to be included in the Mine Closure 2019 and associated events attendee lists.**
- **I give permission for the ACG to forward me ACG research, training and/or education information advice, including electronic communications.**
- **I require an invitation letter for visa purposes (please forward a copy of your passport information page).**

For more information regarding Australian visas, please visit [acg.uwa.edu.au/about-events-and-courses/](http://acg.uwa.edu.au/about-events-and-courses/)


**Contact:**

- **Australian Centre for Geomechanics**
- **The University of Western Australia**
- **35 Stirling Highway (M600)**
- **Crawley WA 6009**

**How to register:**

- **+61 8 6488 3300**
- **info-acg@uwa.edu.au**
- **www.mineclosure2019.com**

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## Delegate Cancellations

Up to 8 days before event commencement: an administration fee of AUD 150 will be charged. 7 or less days before: no refund. Non-attendance: no refund. Substitutions will be accepted at any time. The ACG reserves the right to cancel the conference and associated events if insufficient registrations are received.

Delegate Terms and Conditions are available at [acg.uwa.edu.au/disclaimer/](http://acg.uwa.edu.au/disclaimer/)

† Visit [acg.uwa.edu.au/corporate-affiliate/](http://acg.uwa.edu.au/corporate-affiliate/) to view the list of ACG Corporate Affiliates. ^ Students are required to provide proof of full-time enrolment.

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## Payment Form

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<th><strong>Landform Design and Modelling for Mine Rehabilitation and Closure Workshop (1913)</strong></th>
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Please note that a two-volume set of the Mine Closure 2019 printed proceedings will weigh roughly 4.5 kg.

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## Online Registration


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## Special Dietary Requirements

Please notify us below of any special dietary requirements.

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All full registrations will receive luncheons and refreshments. Conference papers will be accessible at [papers.acg.uwa.edu.au](http://papers.acg.uwa.edu.au) from 26 August 2019. If you would like a printed copy of the proceedings, please tick the box below.

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All prices include GST.

ABN 37 882 817 280