GOVERNMENT OF WESTERN AUSTRALIA

mriwa
Minerals Research Institute of Western Australia

Minerals Research Institute of Western Australia

Annual Report 2022-23

Minerals Research Advancing WA

Statement of Compliance

For year ended 30 June 2023

HON BILL JOHNSTON MLA
Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations

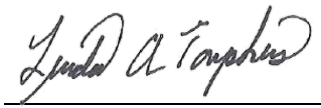
In accordance with section 63 of the *Financial Management Act 2006* (WA), we hereby submit for your information and presentation to Parliament, the Annual Report of the Minerals Research Institute of Western Australia (MRIWA or the Institute) for the reporting period ended 30 June 2023.

The Annual Report has been prepared in accordance with the provisions of the *Financial Management Act 2006* (WA) and any other relevant written law.

The financial statements comply with Australian Accounting Standards – Reduced Disclosure Requirements issued by the Australian Accounting Standards Board.

Miriam Stanborough
Chairperson of the Board

Date: 14 August 2023



Linda Tompkins
Deputy Chairperson of the Board

Date: 14 August 2023

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Overview

This section provides an overview of the Minerals Research Institute of Western Australia (MRIWA or the Institute), our vision and values and the broader MRIWA team who work to deliver on our strategic plan.

Highlights

COLLABORATIVE RESEARCH LEADERSHIP

Industry, academic and government relationships activate innovation and research networks attracting investment in high value activities

Partnering with Clean Energy Finance Corporation to deliver the Mining in a Low Emissions Economy[1] report series, supporting industry to develop technology-based decarbonisation pathways.

Signing a Memorandum of Understanding with the Korea Institute of Geoscience and Mineral Resources (KIGAM), establishing a framework to exchange scientific and technical knowledge relating to areas of shared interests, particularly critical minerals.

IMPACTFUL RESEARCH

Applied research creates capability and delivers economic and social benefit for Western Australia

Completed a three-year program of professional development for MRIWA PhD scholars to provide them with the skills to operate as industry thought leaders in both the mining and research sectors.

Delivering Labor Government election commitment to investigate the viability of sustainable processing of Western Australian iron ore to produce green steel, or the inputs necessary for green steel.

[1] https://www.mriwa.wa.gov.au/minerals-research-advancing-western-australia/focus-areas/net-zero-emission-mining/nzem-resources/

Highlights (continued)

KNOWLEDGE TRANSFER

MRIWA is well-known and its minerals research outcomes are implemented

Launching the inaugural MRIWA Science Communication Awards to encourage and recognise the value of high-quality, high-impact communication of minerals research outcomes.

Hosted events to engage the minerals research stakeholder community, including the annual Net Zero Emission Mining WA Conference, educational development seminars, report summary webinars and interactive networking through the MRIWA College, Women Advancing Minerals Research (WAMR) and PhD communities.

GOVERNANCE

Robust governance and contemporary fit-for-purpose corporate practices

Achieved Level 1 Maturity for the Essential Security Controls to manage the Institute's cyber security risks ahead of the Western Australia Government's Cyber Security Policy target date of the end of 2024.

Recognised by Office of Auditor General as being in the top 20 small best practice entities for financial reporting and financial controls.

Message from the Chair

It is my pleasure, on behalf of the board of MRIWA, to present our Annual Report for 2022-2023. The Institute exists to advance Western Australia through minerals research, and we find ourselves at a particularly interesting point in time, with significant attention being focussed on the role of critical minerals in global decarbonisation efforts.

Western Australia's outstanding geological endowment, along with increasing interest in revisiting the debate about the extent of domestic downstream processing that is strategically appropriate and economically viable, create many new opportunities for minerals research.

This year was characterised by substantial progress in a number of key focus areas, underpinning our current strategy. Convening the second successful Net Zero Emission Mining conference was a highlight, which extended to a full 2-day program and saw attendance grow to 200 delegates.

We were also delighted to extend our partnership with the Clean Energy Finance Corporation to commission and publish the Mining in a Low Emissions Economy report series, tailoring information in different publications for executive, technical and operational employees in our industry.

Late in the year, the much-anticipated Green Steel Opportunity Report, commissioned by MRIWA to map pathways for Western Australia iron ore to be used to reduce emissions in steelmaking, was released. The report provides clarity on the opportunities for Western Australia to benefit from the growth in global demand for green steel, both now and longer-term.

During the year, MRIWA also commissioned a report into the potential for growth of a platinum group metals (PGM) industry in Western Australia and undertook extensive consultation in the development of a Mineral Carbonation Roadmap, both of which we look forward to releasing in the coming year.

In addition to enabling impactful research, MRIWA also recognises the critical importance of supporting knowledge transfer, so the valuable work of our research partners is communicated, understood, and applied in practice.

In addition to the many knowledge transfer events hosted during the year, we also established the Women Advancing Minerals Research group late in the period, with our inaugural networking event very well supported by women from a wide range of research disciplines relevant to our industry.

A significant development during the year was the decision by government to expand the scope of MRIWA's activities to include clean energy and emissions reduction. These are areas of natural adjacency to MRIWA's existing remit, and we look forward to amendments to our Act being put to parliament next year to enable us to expand our research scope.

This year we bid farewell to directors Hailey Packer, Melinda Hodkiewicz and Helen Cook. I thank each of them for their contributions to the governance and strategic direction of MRIWA, and particularly acknowledge the long and distinguished contribution made by Helen over nine years, most recently as Deputy Chair of the board and Chair of the Audit and Risk Committee.

We are fortunate to have welcomed Michele Spencer and Rylee Campbell to the board during the period and look forward to benefiting from their respective experience and perspective. I would like to thank all my fellow directors for their diligence and commitment to the organisation and the state.

As always, I would like to acknowledge the tremendous support from our Minister, the Hon. Bill Johnston, who takes an active interest in MRIWA's focus areas and challenges us to find new and impactful ways of advancing Western Australia through minerals research and thought leadership.

Research timelines can often be long and require sustained investment throughout commodity cycles. We are extremely fortunate to enjoy the support of a Minister who has a long-term vision for our industry, and its potential to contribute even more to the prosperity of our state.

Finally, I would like to acknowledge our CEO, Nicole Roocke and her dedicated team for delivering a significant and high-quality program of work during the year. I am constantly impressed by the volume and quality of output from our small team, who maintain very high standards of professionalism.

Miriam Stanborough
Chairperson of the MRIWA Board

Responsible Minister

Hon. Bill Johnston MLA, Minister for Mines and Petroleum; Energy; Hydrogen Industry; Industrial Relations

About Us

The Minerals Research Institute of Western Australia (MRIWA) is a statutory body established by the Western Australian Government in 2013 under the *Minerals Research Institute of Western Australia Act 2013 (WA)* (the MRIWA Act).

Our Work

MRIWA fosters and promotes minerals research for the benefit of the State by:

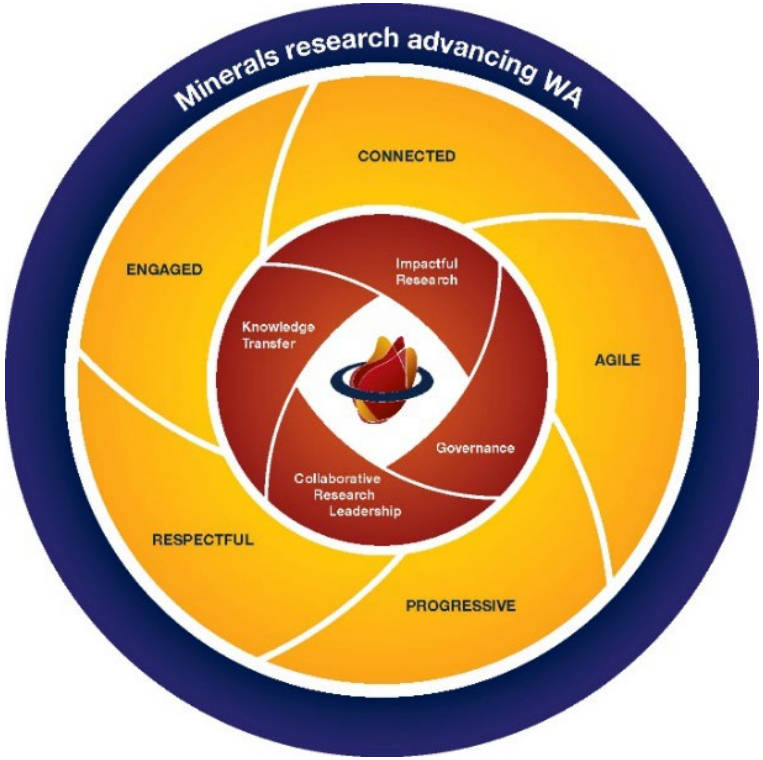
- Undertaking, procuring or managing minerals research projects;
- Fostering academic activities;
- Conferring and collaborating on matters relating to minerals research;
- Maintaining current knowledge of minerals research;
- Promoting awareness of and fostering public interest in matters relating to minerals research; and
- Providing advice to the Minister.

MRIWA may administer and co-invest in research projects undertaken within Western Australia, nationally and internationally. MRIWA collaborates with industry, research institutions and government partners to support research which will deliver tangible economic, environmental or social benefit for Western Australia.

As well as directly supporting minerals research projects, MRIWA funds are available for projects, programs and events that promote public awareness of, and interest in, minerals research.

Through our Education Program, we offer financial assistance in the form of scholarships to PhD and postgraduate candidates pursuing studies that align with MRIWA's objectives. Tailored professional and communication skills training is provided for postgraduate students accepted into the MRIWA program.

Vision and Values



Message from the CEO

Over the last financial year, the MRIWA team has continued to grow and support the delivery of minerals research with a focus on how the outcomes of this can benefit Western Australia.

Key highlights

A further $4 million of funding has been secured by the Minister for Mines and Petroleum, the Hon. Bill Johnston, MLA for the agency over the next four years. The focus of this is to enable progress in the areas of alternative use of tailings and waste and support the development of our Mining, engineering and technology services (METS) initiative to progress net zero emissions and critical minerals initiatives.

Work completed this year includes:

- Investigation into the iron ore-to-steel value chain and identification of opportunities and barriers for Western Australia to support the global steel industry's green ambitions.
- The publication of the Mining in a low emissions economy report series, in partnership with the Clean Energy Finance Corporation.
- Four PhD scholarships with a further three awaiting acceptance of their thesis.
- 17 research projects completed across a range of programs and focus areas.

Significant Issues and Trends

Current and Emerging Issues and Trends

MRIWA's research program is highly regarded and funded through a combination of state government appropriation, federal government research grants and sponsorship from third parties.

Delays resulting from the impact of COVID are still being felt across some projects, including being able to recruit and onshore PhD students engaged to undertake the work.

Strategic changes in government policy, global economic conditions and decisions by other research grant bodies all influence the success and efficiency of this model. Maintaining key sponsor relationships is crucial to ensuring the continuity and momentum of key research programs.

Global decarbonisation efforts and demand of critical minerals required to achieve this create significant opportunity for Western Australia. Increased global focus on research and innovation to address these trends creates competition for research funding and talent.

Likely Developments & Forecast Results of Operations

Expansion of MRIWA's research scope to include clean energy and emissions reduction will provide new opportunities. Planning has commenced to ensure this expanded scope supports broader government policy for sectoral emissions reduction and to target priority activities of high value and high impact for the State.

Changes in personnel and resource constraints have limited progress in the focus areas of:

- Precision and low impact mining.
- METS company innovation.
- Supply chain risks.

Through the support of the Minister, we have again received additional funding which will enable us to progress work in some of these focus areas, taking a long-term view on what is needed for the State to prosper while also delivering on its decarbonisation ambitions.

Foundation work is underway to develop the strategy for the alternative use of tailings and waste focus area to enable MRIWA to more proactively lead campaigns to stimulate research activities which will deliver benefit to Western Australia.

The team has again grown this year to enable us to have the necessary skills to progress the work in our focus areas and enhance communications on not only our own work, but also promote the extensive research activity here in the state.

I would like to acknowledge the MRIWA team, their commitment to robust governance while pursuing generation of knowledge and technology to ensure our mineral research work delivers benefit to the State is a credit to them.

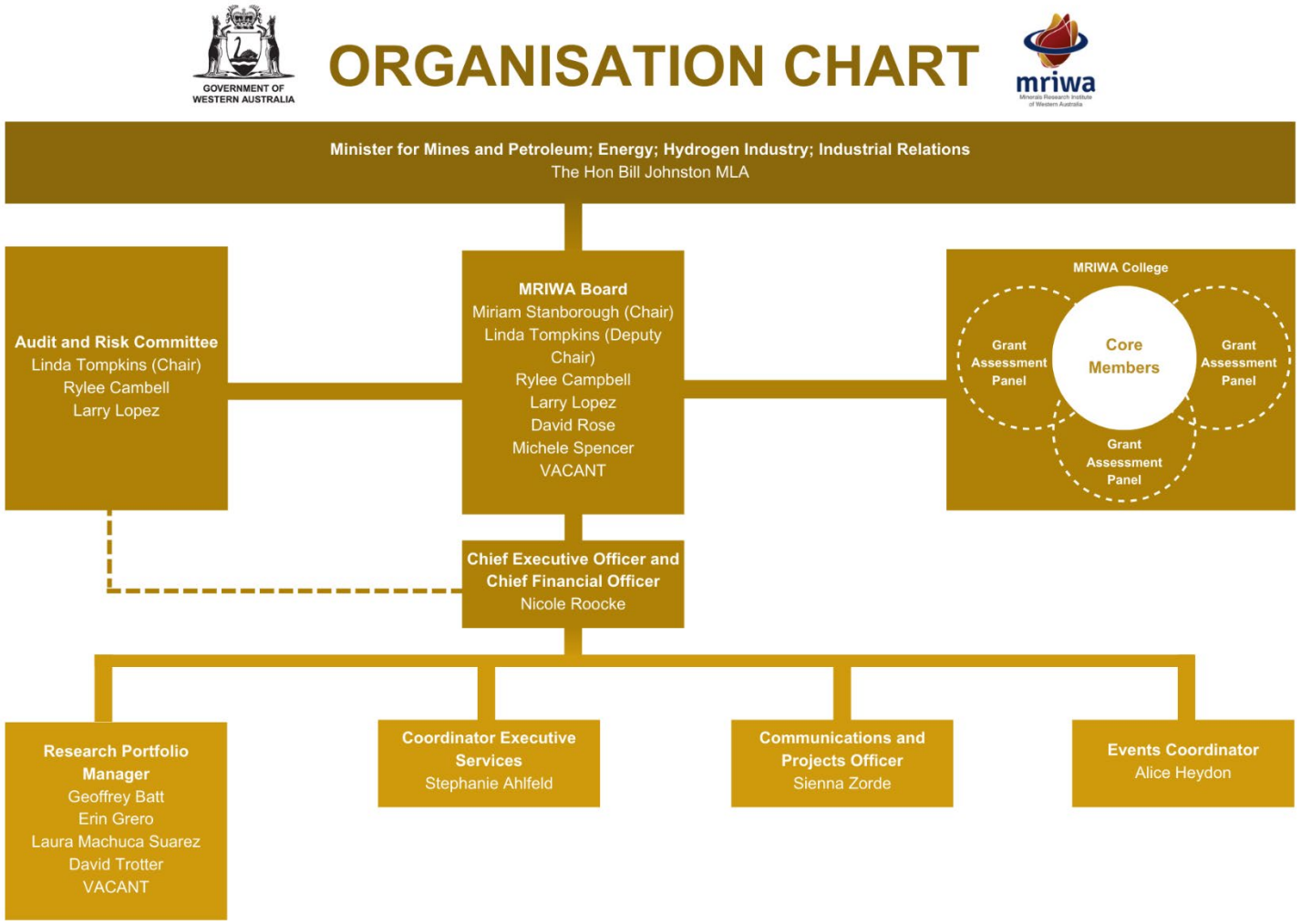
While we have seen several changes in the MRIWA Board, their focus on robust decision-making leads to continuous improvement opportunities for the organisation.
Once again, I thank them for their commitment to MRIWA and the insights and opinions they provide to enable us to be well positioned going forward.

Minister Johnston continues to be a champion of our organisation and his staff provide valued advice and support.

Nicole Roocke
Chief Executive Officer and Chief Financial Officer

Our Structure

The Organisation Chart is published on the MRIWA website https://www.mriwa.wa.gov.au/about-us/our-people/



Our Team

Ms Nicole Roocke

Chief Executive Officer and Chief Financial Officer

Appointed Chief Executive Officer and Chief Financial Officer in November 2018, Nicole joined MRIWA after spending 15 years at the Chamber of Minerals and Energy of Western Australia coordinating industry input on a variety of government regulatory and policy issues and facilitating collaboration within the resources sector.

Nicole holds a Master of Science in Industrial and Organisational Psychology from the University of Western Australia (UWA) and a Master of Risk Management from the University of New South Wales (UNSW). She is a graduate of the Australian Institute of Company Directors.

Ms Stephanie Ahlfeld

Coordinator Executive Services

Stephanie's career in the public service started in a Regional Local Authority and included roles in administration, finance, and human resources. She commenced with the Institute at the end of 2015 with a focus on service delivery, compliance, and continuous process improvement.

Stephanie holds a Bachelor of Commerce (Accounting) from Curtin University.

Dr Geoffrey Batt

Research Portfolio Manager

Geoff has been a Research Portfolio Manager for MRIWA since 2019 and leads the Institute's Exploration Amplification focus area and Education Program.

An experienced research scientist focused on the accessibility and transferability of research and innovation in the applied mining sector, Geoff came to MRIWA from a private sector consulting role and has spent 20 years as a successful and respected researcher and educator at leading institutions around the globe.

Geoff holds a PhD in Earth Science from the Australian National University (ANU), and an MBA from UWA.

Mr David Trotter

Research Portfolio Manager

David is a metallurgist who has over 35 years of experience in the iron ore and steel industry in a variety of technology, logistical, and technical roles.

Before joining MRIWA, David was providing advice on green steelmaking technologies including the use of hydrogen in steelmaking, Transport, and Handling of HBI and DRI. His previous roles include Regional Manager Iron Ore for Rio Tinto Commercial Singapore and Head of Global Sales and Trading, Anglo American Singapore.

Ms Erin Grero

Research Portfolio Manager

Erin joined the MRIWA team as a Research Portfolio Manager in May 2021, bringing experience in strategic policy and program development, stakeholder engagement, project and contract management across the public and private sectors. She is leading MRIWA's focus area on Net Zero Emission Mining as well as the expansion of MRIWA's legislative scope to include clean energy and emissions reduction research.

With a passion for sustainability and a background in clean energy and regional development, Erin came to MRIWA having been involved in the development of State Government renewable energy priorities including COVID-19 recovery projects and the WA Renewable Hydrogen Strategy.

Originally from the United Kingdom, she holds an MSc in International Development and a Bachelor's degree in Law from the University of Bristol.

Dr Laura Machuca Suarez

Research Portfolio Manager

Laura joined the MRIWA team in 2022 as a Research Portfolio Manager to lead the work on precision and low impact mining, alternative use of tailings and waste, and the Expand the Mining Envelope and Remediation and Mine Closure Program areas.

Laura came to MRIWA from Curtin University where she was an Associate Professor in the WA School of Mines and has led research collaborations with industry and Government. Prior to her 10+ year academic career in Australia, Laura worked in the oil and gas industry in South America for several years.

Laura holds a PhD in Chemistry from Curtin University. Her expertise encompasses materials and corrosion, metals and alloys, environmental microbiology, biotechnology, and bioremediation.

Laura is passionate about gender equity in STEMM, education, mentoring, and collaborative research leadership.

Ms Sienna Zorde

Communications and Projects Officer

Sienna joined MRIWA as Communications and Projects Officer in 2023. Starting her career in the public sector, she supports the MRIWA team with external communications for both projects and events. With a passion for project development and media communications, she seeks to create engaging content encouraging knowledge transfer between industry and public.

Sienna holds a Bachelor of Media and Communications from Edith Cowan University.

Ms Alice Heydon

Events Coordinator

Alice joined MRIWA in 2023 as Events Coordinator. Alice's hospitality career has spanned a variety of sectors including hotels, bars, cafés and function venues specialising in organisation and operation in the private event sector. She has commenced with MRIWA to help communicate research projects to the wider minerals community through face to face and online events.

Alice holds a Bachelor of Science (International Hospitality Management) from Oxford Brookes University (UK.)

Our Board Members

Ms Miriam Stanborough became Chair of MRIWA in January 2020.

Miriam is a chemical engineer with more than 20 years' experience in the minerals processing industry, across commodities including copper, uranium, gold, silver, alumina, lithium, salt, vanadium and mineral sands.

Miriam has held roles in technical development, production management, project management, business improvement, HR and diversity strategy, and sales and marketing.

She holds additional degrees in Arts and Mineral Economics, is a member of the Australasian Institute of Mining and Metallurgy (AusIMM) and is a graduate of the Australian Institute of Company Directors.

Miriam's other current board roles include Non-Executive Director of Pilbara Minerals, BCI Minerals and Australian Vanadium, Director of ChemCentre and Deputy Chair of the Northern Agricultural Catchments Council. With her husband, she runs a beef cattle operation in the south-west of Western Australia.

Dr Linda Tompkins became Deputy Chair of MRIWA and Chair of the Audit and Risk Committee in February 2023.

Linda has over 35 years of global experience in the resource sector through professional roles as a research and exploration geologist, technical director of an ASX- and AIM- (London) listed exploration company, corporate and resource lawyer, and group general counsel and company secretary of an ASX-listed company with overseas mining interests.

She has on-site experience in Australia, Brazil, China, and Africa in exploration, development, and mining operations for diamonds, lead-zinc, nickel and gold.

Linda has a PhD (Geology) and LLB (Hons) from The University of Western Australia (UWA) and is a member of the Energy & Resources Law Association (formerly AMPLA).

Her past board roles include director of the AMPLA national board, member of the advisory board of the UWA Geoscience Foundation, and other roles in the resources sector.

Mr Rylee Campbell is a Chartered Accountant and Wardandi Noongar man. He began his career within the External Audit division of a Big 4 accounting firm in Perth, auditing the financial statements of clients within the resources sector. Rylee's clients included ASX listed companies with operations in exploration, development, production, and rehabilitation, across multiple commodities.

He is passionate about volunteering in the Indigenous community and has spent time in the West Kimberley region of Western Australia consulting with an Indigenous owned NFP organisation on providing affordable beef to remote Aboriginal communities.

Rylee is currently working in the Corporate Finance team of a green energy and resources company with operations in the Pilbara and overseas.

Mr Larry Lopez is a Partner at Perth-based Australian Venture Consultants focussed on providing consulting and advisory services to the mining industry, venture capital investors and governments. He is also a General Partner in AC Ventures, a national venture capital fund focussed on investing in start-ups.

Larry has over 40 years of experience financing innovative projects and companies. He has held numerous executive roles in government, and private and public companies that enable the commercialisation of research outputs and intellectual property.

Larry is a director Fulbright Australia and a non-executive director of several private companies. He also sits on a number of not-for-profit boards including the Centre for Entrepreneurial Research and Innovation. He has been a director or partner in four venture capital funds, including funds investing in technology that enables the mining sector.

Larry obtained a BSc from Menlo College, School of Business Administration and is a graduate of the Pacific Coast Banking School at the University of Washington.

Mr David Rose is a Director in mining consulting with KPMG, with 35 years of diverse experience in the mining industry across gold, base metals, coal, diamonds and iron ore, in both open pit and underground operations.

David's most recent executive roles were Chief Operating Officer, St Barbara Ltd, and Managing Director, Rio Tinto (Argyle Diamonds and Rio Tinto Iron Ore).

His consulting engagements have included expert panel reviews, operational improvement projects and management systems upgrade projects for mature operating mines. He has also undertaken operational readiness and systems design engagements for pre-start-up and transitional mines, in Australia and overseas.

David is a past Deputy Chairman and now Honorary Fellow of Leadership WA, a Fellow of the Australasian Institute of Mining and Metallurgy (AusIMM), a Graduate of the AICD, President of Rowing WA and the Deputy Chair of St Catherine's College (UWA).

Ms Michele Spencer is the Executive Director of the Geological Survey and Resource Strategy Division at the Department of Mines, Industry Regulation and Safety where she leads a talented team of geoscientists and support staff to acquire data and conduct research to benefit the community and resources sector and inform government policy and legislative reform.

As a mining professional, Michele has worked in Australia and internationally accruing more than 20 years multi commodity experience including in gold, nickel, copper, cobalt and iron ore – magnetite. Michele has experience across exploration, open pit and underground mining, business development, and strategic planning as well as executive-level government experience within a regulatory environment.

She holds a BSc with Honours and a graduate certificate in International Relations and National Security and is a member of the Australasian Institute of Mining and Metallurgy (AusIMM). Michele has a keen interest in foreign policy and international investment.

MRIWA team and Minister Bill Johnston. Pictured (L-R) David Trotter, Sienna Zorde, Stephanie Ahlfeld, Erin Grero, Hon. Bill Johnston MLA, Geoffrey Batt, Alice Heydon, Nicole Roocke, 2023

MRIWA Board

MRIWA Board members are appointed by the Minister for Mines and Petroleum, in accordance with Section 27(1) of the MRIWA Act and are remunerated by an annual fee set by the Public Sector Commissioner. The fee has not been varied since first established on 20 December 2013.

Membership as of 30 June 2021	Initial Appointment	Term Expiry	No. of Meetings Attended	Sitting fees ($)
Miriam Stanborough (Chair)	1 Oct 2017	31 Dec 2025	5 of 5	24,620[(a)]
Linda Tompkins (Deputy Chair and Chair, Audit and Risk Committee)[(b)(h)]	1 Mar 2020	28 Feb 2026	5 of 5	13,637
Rylee Campbell[(b)(i)]	1 Feb 2023	31 Jan 2026	2 of 2	5,214[(a)(f)]
Larry Lopez[(b)]	1 Jan 2016	31 Dec 2024	3 of 5	11,405[(d)]
David Rose	1 Jun 2018	31 Apr 2024	4 of 5	11,405[(d)]
Michele Spencer	1 Feb 2023	31 Jan 2026	2 of 2	0[(c)]
Melinda Hodkiewicz	1 Jan 2022	30 Apr 2023	3 of 3	9,504[(e)]
Helen Cook[(g)]	28 Jan 2014	31 Jan 2023	3 of 3	8,775
Hailey Packer	1 Feb 2020	31 Jan 2023	3 of 3	0[(c)]

(a) Foregoes a portion of remuneration for use in the MRIWA Directors' Scholarship.
(b) Audit and Risk Committee Member - the Committee assists the MRIWA Board by providing an objective review of the effectiveness of the financial management and reporting, risk management, audit and compliance framework. The Chief Financial Officer and Deloitte attend ex-officio.
(c) Ineligible for remuneration in accordance with Premier's Circular 2022/02 State Government Boards and Committees.
(d) Foregoes all remuneration for use in the MRIWA Directors' Scholarship.
(e) Foregoes all remuneration for use in the MRIWA Education Program.
(f) Foregoes a portion of remuneration for use in the MRIWA Education Program.
(g) Chair of Audit and Risk Committee until the cessation of Board term.
(h) Chair of Audit and Risk Committee from 1 February 2023
(i) Member of Audit and Risk Committee from 1 February 2023.

Legislation

Enabling and Administered Legislation

MRIWA was established as an agency in February 2014, under the *Minerals Research Institute of Western Australia Act 2013* (WA).

The Institute administers only the *Minerals Research Institute of Western Australia Act 2013* (WA).

Other Key Legislation Impacting on our Activities

In the performance of its functions, the Institute complies with other relevant written laws including the following Western Australian legislation:

- *Auditor General Act 2006*
- *Disability Services Act 1993*
- *Electoral Act 1907*
- *Equal Opportunity Act 1984*
- *Financial Management Act 2006*
- *Freedom of Information Act 1992*
- *Government Employees Superannuation Act 1987*
- *Industrial Relations Act 1979*
- *Interpretation Act 1984*
- *Minimum Conditions of Employment Act 1993*
- *Procurement Act 2020*
- *Public Interest Disclosure Act 2003*
- *Public Sector Management Act 1994*
- *Salaries and Allowances Act 1975*
- *State Records Act 2000*
- *Work Health and Safety Act 2020*
- *Workers' Compensation and Injury Management Act 1981*

Report on Operations

Actual Results versus Budget Targets

	2023 Target $	2023 Actual $	Variation $
Total cost of services	8,335,500	7,696,217	(639,283)
Net cost of services	5,339,011	5,200,828	(138,183)
Total equity	14,317,805	14,207,782	(110,023)
Net increase / (decrease) in cash held	1,845,730	807,183	(1,038,547)
Approved salary expense level	1,379,000	1,269,000	110,000

For detailed information on MRIWA's financial performance, refer to the *Financial Statement and Notes* section of this report.

Summary of Key Performance Indicators

Key Effectiveness Indicator	*2022-23 Target*	2022-23 Actual
Ratio of total cash value of research projects to total MRIWA cash investments in those research projects	≥ 4	5.11

Key Efficiency Indicator	*2022-23 Target*	2022-23 Actual
Total administration cost for the year as a percentage of the total cash value of research projects and scholarships under management during the year.	≤ 2.5%	2.08%

MRIWA's Outcome Based Management Framework did not change during 2023.

For detailed information on MRIWA's Key Performance Indicators refer to the *Our Performance* section of this report.

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Our Projects

This section outlines our applied research projects, how we create capability and deliver economic, environmental, and social benefit for Western Australia.

Through the MRIWA research portfolio, industry, academic and government relationships are activated enabling innovation and research networks to attract investment in high-value research activities.

Highlights for 2022 – 2023

17 Projects Completed[a]

New Projects

- **27** New projects approved[b]
- **$23.6M** Total value new projects approved

- **$48.7M** Total value of CRC/Research Centre projects supported by MRIWA
- **$8.1M** CRC/Research Centre funds managed by MRIWA
- **21** CRC/Research Centre Projects
- Participating in **5** CRCs/Research Centres

- **$25.6M** Total Value of standalone research supported by MRIWA
- **33** Current standalone research projects
- **$16.9M** Third parties' contribution to projects
- **$8.7M** MRIWA's contribution

- **$1.3M** Invested by MRIWA in PhD Scholarships
- **15** Current PhD Scholarship recipients
- **4** New PhD Scholarships awarded
- **3** Scholarships completed

a. Includes PhD Scholarships
b. Includes PhD Scholarships and CRC/Research Centres

Our Focus Areas

MRIWA Focus Areas are campaigns targeting specific areas which seek to stimulate and amplify activities of high value to the State.

Focus Areas may fall in areas specific to parts of the mining value chain or have impact across the entire value chain, with the benefit to be realised in Western Australia.

MRIWA will use these Focus Areas to enable industry, academic and government relationships to activate innovation and research networks and attract investment in high value activities. Calls to action, objectives and anticipated outcomes will vary for each Focus Area.

Areas for focus are selected by the MRIWA Board and informed by government priorities and the Research Priority Plan, with input from the MRIWA College and MRIWA networks.

The following are MRIWA's focus areas:

- Net Zero Emission Mining
- Green Steel
- Critical Minerals
- Exploration Amplification
- Precision and Low Impact Mining
- Alternative Use of Tailings and Waste
- Mineral Carbonation
- Supply Chain Risk (work on this is not yet commenced)

View the full list of projects for each focus area and find out more information on our website.[1]

Net Zero Emission Mining

The Challenge

This strategic focus area aims to reduce the carbon footprint, lower overall energy costs and improve the energy efficiency of the Western Australian mining sector through harnessing collective efforts, enabling decarbonisation to become an opportunity for the sector, not a cost.

The Context

With a global shift towards decarbonisation, the need for mineral resources to support the energy transition places Western Australia at the forefront of a significant economic opportunity.

Western Australia supplies the minerals used for wind and solar energy generation, electric vehicles, and battery storage which will enable the international community to achieve the Paris Agreement goals of net zero emissions by 2050.

With this opportunity also comes a challenge, in ensuring new and increased demand for these resources meets rising environmental, social and governance (ESG) expectations and does not negatively impact on the competitiveness of the mining sector.

Innovation is needed for our mining sector to capture this opportunity, develop new ways of working and transform how energy is generated and used. The lead time to new technology development and deployment means preparations need to start now.

[1] https://www.mriwa.wa.gov.au/minerals-research-advancing-western-australia/focus-areas/

Green Steel

The Challenge

Green Steel – the question is not ‘is it possible’, but rather ‘how to make it possible’.

This MRIWA Focus Area aims to promote further research identified in the green steel study to enable Western Australia to understand and identify magnetite and hematite iron ore resources best suited to supporting the global green steel ambitions, creating new markets and industries for this state.

The Context

Western Australia accounts for 38% of the global supply of iron ore and is the leading Australian state in iron ore production – 934 million tonnes (mt) in 2022 – according to the Australian Government’s Office of the Chief Economist. Brazil, our major competitor, accounted for only 17% of the global supply.

The iron ore industry is the State’s largest and most important industry, providing direct and indirect economic and social contributions which are greater than any other industry to the State. Its contribution is also significant to the national economy.

It is for this reason we are developing opportunities for further testing the iron ore and energy requirements in the identified pathways to green iron in Western Australia. A capability to produce green iron will attract further investment in sustainable processing of iron ores to produce green steel. Work includes a pre-feasibility study for a low emission iron plant. With the steel industry generating more than 7% of global carbon emissions, there is a significant focus on the development of green steel technology.

Western Australian iron ore will have a key role to support the steel industry decarbonise.

Critical Minerals

The Challenge

The critical minerals challenge is to meet the demand for processed metals driven by changing technical requirements and metal types for a low emissions economy.

The Context

The industry recognises critical minerals present a once in a generation opportunity to re-strategise global supply chains. There is a collective demand from countries around the world to democratise the production, transmission, and consumption of energy, which is altering international balances and requirements of minerals.

A new national critical minerals strategy was released by the Federal Critical Minerals Office in June 2023. MRIWA will be working to help align Western Australian research programs led by the state’s universities, industry, and the Western Australia government.

Exploration Amplification

The Challenge

Mineral exploration and discovery represent the foundations of Western Australia's successful mining sector. The future productivity of this key industry will require discovery and characterisation of ore bodies deeper below the surface and hidden from traditional methods of discovery, pushing industry to reduce both the cost and the environmental footprint of exploration technology.

The Context

Investment in exploration innovation is critical for Western Australia to meet the emerging challenges of mineral discovery and maintain the State's position as a preferred supplier of mineral commodities.

Through our Exploration Amplification Focus Area, MRIWA works to define a future vision of productive mineral exploration for Western Australia and to support the areas of priority research and education needed to deliver on this vision.

In striving toward this goal, MRIWA encourages collaboration between the minerals industry, researchers and government to:

- Create and nurture global networks and knowledge leadership in mineral exploration.
- Increase adoption and implementation of exploration research outcomes.
- Maintain strategic foresight regarding research and education needs related to mineral exploration.
- Stimulate partnership opportunities in areas of exploration research initiated by industry.
- Generate awareness of and enthusiasm for career pathways in exploration, and in broader geoscience and technology as they relate to mineral exploration.

Precision and Low Impact Mining

The Challenge

The extractive nature of mining operations creates a variety of impacts on the environment before, during and after mining operations. MRIWA seeks to activate research and innovation for precision and low impact mining, which will lead to a reduction of tailings, waste, and pollution, contributing to social and environmental performance of Western Australia's mining sector.

The Context:

The impact of the mining industry on the environment has been a public concern. Inherent to mining and mineral processing operations is the generation of mine waste.

Over the years, the minerals and mining sector has started to develop a strategy that is more aligned to the UN sustainable development goals (SDGs). Considering the principles of the circular economy and the waste management hierarchy, this focus area aims to contribute to preventing or reducing waste and pollution from mining operations and its potential to cause environmental and social harm.

MRIWA encourages and supports science, technology, and innovation for sustainable, cost-effective mining, particularly from low-grade ores and challenging deposits. This includes efforts to reduce generation of waste and tailings, assess and address social and environmental impacts, and improve safety of operations.

Alternative Use of Tailings and Waste

The Challenge

Mining waste is one of the largest waste streams generated globally, estimated to exceed 100 billion tonnes every year. Our goal is to enable scientific advances and technology development for mining waste valorisation and resource recovery, contributing to environmental protection and creating business and social opportunity for Western Australia.

The Context

Australia produces large volumes of mine waste across a range of commodities, as tailings, waste rock and pyrometallurgical wastes. This is a growing problem with the volume of tailings expected to double by 2035, as the transition to renewable energy increases the demand for critical minerals.

One way to better manage mine waste is repurposing it and turning it into valuable resources. Mine waste can contain concentrations of critical metals and minerals currently in short supply. The value of precious, critical, and strategic metals contained in tailings worldwide is estimated to exceed US$3.4 trillion.

The residual mineral fraction in the tailings can be valorised, for example, upcycled into high-value products such as materials for the construction and ceramic industry, low-carbon geopolymer concrete and mineral fertilisers, or downcycled for backfilling, road construction and carbon capture (mineral carbonation).

Creating a circular economy for mine residues creates cost-effective benefits through offsetting raw material requirements, reducing the carbon footprint associated with obtaining them, and reducing the volumes of waste and related environmental impacts. It also delivers social benefits, boosting job creation, manufacturing self-sufficiency and opportunities for regional growth.

Mineral Carbonation

The Challenge

Increasing the rate of direct air capture and the rate of reaction via mineral carbonation to enable cost effective rapid, large-scale carbon dioxide (CO_2) sequestration.

The widespread, industrial-scale utilisation of mineral carbonation has enormous potential to sequester CO_2 emissions but is inhibited by technological and economic challenges.

The Context

The goal of the 2015 Paris Agreement is to limit global warming to well below 2, preferably to 1.5 degrees Celsius, compared to pre-industrial levels. To achieve this long-term temperature goal will require not only global peaking of greenhouse gas emissions as soon as possible but will also require the removal of CO_2.

Mineral carbonation, one form of carbon capture, use and storage (CCUS), has the potential to be a versatile approach to both remove and permanently store carbon dioxide at the gigatonne scale while also providing strategic economic advantage to quickly transition Western Australia to a low carbon economy supporting global low carbon supply chains.

The best types of materials for mineral carbonation are those rich in the metals calcium, magnesium and iron. Mafic and ultramafic rocks found within Western Australia's prolific greenstone belts are particularly rich in magnesium and calcium-rich minerals, hence are particularly prospective for mineral carbonation.

Calcium, magnesium and iron rich solids which may be suitable for mineral carbonation are also present in many industrial wastes.

Mineral carbonation combined with direct air capture provides added opportunity for Western Australia.

Our Research

The Minerals Research Institute of Western Australia (MRIWA) is focused on the research and development needs of the Western Australian minerals industry to ensure it remains an engine of responsible economic growth and social benefit for Western Australia.

The MRIWA Research Priority Plan[2] identifies the areas where MRIWA may make investment into high-impact research and development. Priorities included in the Plan reflect those issues which industry, the research sector and the MRIWA Board agree present real and significant challenges inhibiting Western Australians from fully benefiting from the minerals sector; and where resolution of these challenges will create opportunities and deliver value.

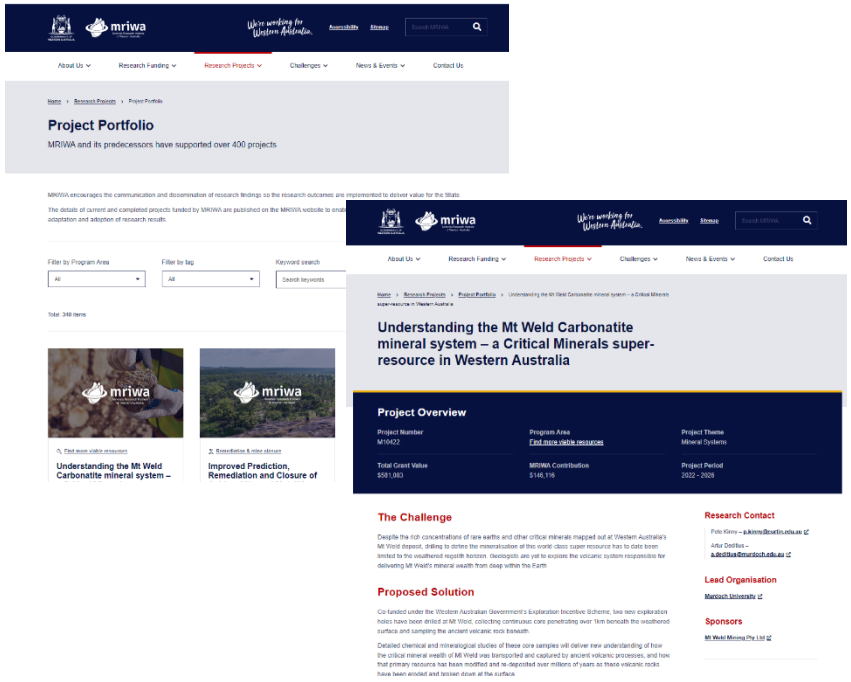
The revised Research Priority Plan was released in February 2020 and describes the medium to long term knowledge and technology needs of the State's minerals industry.

Those seeking to work with MRIWA on our **Impactful Research** program need to demonstrate alignment with the priorities outlined in the Plan, and establish how their proposals would deliver economic, social or environmental benefit for Western Australia.

The priorities fall across six broad areas of research (Program areas). The Program areas incorporate priorities specific to parts of the mining value chain, and broader themes applicable across the value chain, with an integrated approach required to achieve the intended outcomes outlined in the Plan.

MRIWA Project Portfolio

The MRIWA website features current and completed MRIWA-funded research projects, the challenges they are seeking to address and the intended benefits the projects will deliver to Western Australia.



[2] See next page for MRIWA's Research Priority Plan Program Summary.

Research Priority Plan Summary

Research Portfolio Summary 2022-2023

No. Projects	17	7	11	3	10	6
MRIWA Contribution[3]	$5.5M	$1.4M	$3.1M	$800K	$3.7M	$464K
Third-Party Contribution	$16M	$2.5M	$7.8M	$2.5M	$25.2M	$5.4M
Total Grant Value	**$21.5M**	**$3.9M**	**$10.9M**	**$3.3M**	**$28.9M**	**$5.8M**

Note: Due to rounding, some totals may not correspond with the sum of the separate figures
Does not include scholarships

[3] Includes the contribution from Department of Jobs Tourism Science and Innovation for the FBI CRC ($500,000) and HILT CRC ($1 million)

CRC/Research Centre Participation

The Cooperative Research Centre for Transformations in Mining Economies (CRC TiME) brings together mining companies, regulators and community participants to deliver coordinated investment into research addressing the challenges underpinning mine closure and relinquishment.

CRC TiME's research mission is structured around four program areas targeting those aspects of the transition from mining to post-mine scenarios to which Australia's economic, environmental and social resilience is most vulnerable.

Over its lifetime, this research centre is intended to deliver practical outcomes empowering and supporting transformational and world-leading change in the Australian mine closure sector.

In 2022-23, six CRC TiME projects were supported by allocation of MRIWA funds.

Commenced operation:	2020
Funding duration:	10 years
Participants:	74 participants including leading mining and METS companies, regional development organisations, government and research partners
Total Project Value:	$130M comprised of $29.5M cash from the CRC Program $30.5M cash from industry and research participants $70M in-kind support
MRIWA contribution: (M0558)	$300,000 over 10 years Additional $460,000 in project funding

ARC Industrial Transformation Training Centre (ITTC) in Transforming Maintenance through Data Science.
This ITTC was established to support the development and implementation of techniques to deliver transformational value in mining industry maintenance through application of innovative Data Science technology, and to support the training of a data-science-savvy future workforce.

MRIWA is supporting the development and research training of two PhD students working within the ITTC.

Commenced operation:	2019
Funding duration:	5 years
Participants:	Partners from mining companies and research
Total Project Value:	$9.10M comprised of $3.95M cash from the ARC ITTC program $3.05M industry cash contributions $1.88M university cash contributions
MRIWA contribution: (M0508)	$240,000 over 5 years

MinEx CRC is delivering coordinated investment in research to develop more productive, safer and more environmentally friendly drilling technologies and workflows to improve the success rate and efficiency of discovering and defining mineral deposits.

Key deliveries from the MinEx CRC will include development of a new style of mineral exploration drilling rig incorporating revolutionary coiled tubing drilling technology, and a suite of new and innovative technologies for collecting data while drilling.

MinEx CRC will operate for three contract phases. Phase 1 of the MinEx research program was completed at the end of December 2021, with phase 2 commencing in January 2022 and due to run until the end of December 2024.

Three phase 2 projects were supported by allocation of MRIWA funds in 2022-23.

Commenced operation:	2018
Funding duration:	10 years
Participants:	Over 40 partners from mining and METS companies, government, and research
Total Project Value:	$219M comprised of $50M cash from the CRC Program $42M cash industry and research participants $52M non-staff in-kind $74M staff in-kind
MRIWA contribution: (M0509)	$1M over 10 years Additional $560,000 in project funding

HILT CRC will enable our heavy industry sector to compete in the low-carbon global economy for carbon-neutral materials such as 'green' iron, alumina, cement and other processed minerals. The Australian Heavy Industries sector will benefit substantially from a carefully considered mix of electrification and hydrogen.

HILT CRC has commenced delivery of the research strategy outlined in 2022. The 16 quickstart projects are nearing completion and have resulted in 12 new stage 2 projects between 1 and 3 years being approved in 2013.

MRIWA has approved 4 projects for in-kind and allocated funding support including Beneficiation of iron ores, Hydrometallurgical treatment of iron ores using brines, green steel market evaluation and China green steel outlook study. The second HILT CRC conference is being held in Perth in October 2023.

Commenced operation:	2021
Funding duration:	10 years
Participants:	Partners from mining and METS companies, government, and research
Total Project Value:	$176M comprised of $39M cash from Dept Industry, Science & Technology $34M cash from the CRC Program $43M cash industry and research participants $29M non-staff in-kind $31M staff in-kind
MRIWA contribution: (M10425)	$1M over 10 years

FUTURE BATTERY INDUSTRIES CRC

The Future Battery Industries Cooperative Research Centre (FBI CRC) is enabling the growth of battery industries to power Australia's future and ensure Australia plays a leading role in the global battery revolution.

The FBI CRC brings together organisations covering the full extent of the battery value chain, including mining, extraction, processing, and refining of battery minerals, metals and materials, as well as downstream uses such as precursor chemical manufacture, battery cell manufacture, battery recycling and battery deployment in defence, electrical utilities, mining, and other mobile and stationary applications.

At the end of 2022-23 MRIWA was actively involved in twelve FBI CRC projects.

Commenced operation:	2019
Funding duration:	6 years
Participants:	73 participants from mining and METS companies, government, and research partners
Total Project Value:	$129.1M comprised of $25M cash from the CRC Program $38.6M cash industry and research participants $32M non-staff in-kind $33.5M staff in-kind
MRIWA contribution: (M0533)	$6M over 6 years ($500,000 contributed by Department of Jobs, Tourism, Science and Innovation)

FBI CRC Research Seminar June 2023

Our Research

PROGRAM 1: Find More Viable Resources

Western Australia's known mineral deposits in the economically viable domain near to the surface are being exploited faster than they are being replenished by new discoveries.

To meet the challenge of finding significant new discoveries and building on the focus of UNCOVER Australia and the Western Australian Government's Exploration Incentive Scheme, the research priority areas in Program 1 are intended to systematically advance knowledge and capability in detection, exploration technology and prediction performance to improve mineral exploration productivity.

In doing so, research under this program will inform the pre-competitive geological, geochemical and geophysical knowledge base and create exploration capability to:

- position Western Australia as a global leader in exploration technology
- facilitate private sector investment in existing and newly-identified Western Australian mineral provinces to develop the State's rich natural resources

Themes

- Mineral Systems
- Detection Technology
- Data Driven Decisions
- Regulatory Tools and Processes
- Safety, Social and Environmental Sustainability
- Workforce of the Future

$5.5M	$21.5M	4	3	14
MRIWA contribution	Total value of research projects	Projects completed	CRC/Research Centre projects	Standalone research projects

Project Case Studies

Coiled tubing drilling for definition of Mineral Deposits: MinEx CRC Project 2

Program 1 – Find More Viable Resources

STATUS: Final Report Published[4] **Project No: M0509a**

THE CHALLENGE

Modern mineral exploration relies on drilling to provide physical samples to test mineralisation potential beneath the surface. Operating current drilling technology in remote landscapes is expensive and resource intensive, and as explorers push deeper in search of new mineral discoveries these costs risk becoming unsustainable.

KEY FINDINGS

This project resulted in development of an advanced prototype lightweight, agile Coiled Tubing (CT) drilling platform (the RoXplorer) and integrated Hydraulic Processing System (HPS) support unit delivering the performance and environmental benefits of CT drilling to a reach of 500m.

BENEFIT TO WA

Cheaper drilling with a lower environmental footprint will be an important enabling technology for future mineral exploration in Western Australia, where many of the most exciting exploration targets are expected to lie below cover in areas where the State's proven and richly-endowed mineral provinces plunge beneath more recent layers of rock.

Sponsors
MinEx CRC

Lead Organisation
MinEx CRC

Research Contact
Soren Soe

Total Grant Value
$2,165,800

MRIWA Contribution
$110,000 [5]

M0509a Coiled tubing drilling for definition of Mineral Deposits: MinEx CRC Project 2, site photo

[4] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/coiled-tubing-drilling-for-definition-of-mineral-deposits-phase-1minex-crc-project-2/
[5] Funds drawn down from MRIWA's contribution to the MinEx CRC

Project Case Studies

Petrophysics for Mineral Discovery during Drilling: MinEx CRC Project 4

Program 1 – Find More Viable Resources

STATUS: Final Report Published[6] **Project No: M0509b**

THE CHALLENGE

Drilling can provide physical samples of rock hidden deep beneath the surface, but with conventional 'blind' drilling it can take many holes for an explorer to develop enough understanding of the buried geology and structures to properly define and test potential mineralisation targets.

KEY FINDINGS

This project delivered a working prototype of a novel sensor for measuring total count gamma radiation in an active drilling environment.

Total gamma count registers the presence of naturally occurring radioactive elements within the sensed volume surrounding a drill hole, providing a real-time proxy for lithology.

The prototype sensor is capable of real-time logging-while-drilling in the RoXplorer Coiled Tubing (CT) drilling system.

BENEFIT TO WA

By improving the accuracy of drill targeting and quality of information returned, this technology could reduce the drilling required to identify and define buried mineralisation. In addition to making exploration cheaper and easier, this efficiency would reduce the environmental impact of exploration in remote and sometimes sensitive areas of Western Australia.

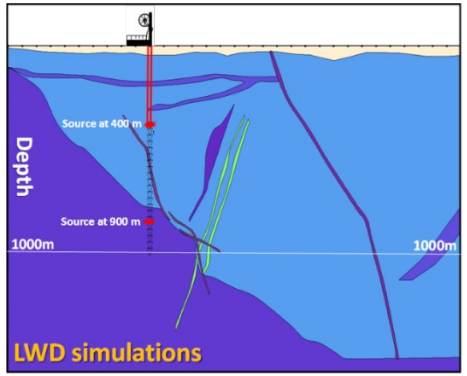
Sponsors
MinEx CRC

Lead Organisation
MinEx CRC

Research Contact
Brett Harris

Total Grant Value
$1,020,700

MRIWA Contribution
$111,700[7]



M0509b Petrophysics for Mineral Discovery during Drilling: MinEx CRC Project 4, LWD simulations model
Image source: final report

[6] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/petrophysics-for-mineral-discovery-during-drilling-phase-2-minex-crc-project-4-2/
[7] Funds drawn down from MRIWA's contribution to the MinEx CRC

Project Case Studies

Seismic in the Drilling Workflow: MinEx CRC Project 5

Program 1 – Find More Viable Resources

STATUS: Final Report Published[8] **Project No: M0509c**

THE CHALLENGE

Modern mineral exploration – particularly beneath cover – is dominated by the use of invasive drilling to access and sample below the surface. By improving technologies for the non-invasive imaging of buried geology, we could reduce the amount of drilling needed to discover and characterise hidden mineral systems.

KEY FINDINGS

- Development of a performance matrix for choosing between optical fibre cable designs for use in low-cost Distributed Acoustic Sensing (DAS) seismic imaging in different mineral exploration environments.
- Development of a seismic exploration workflow for the coal industry, integrating low-cost surface and borehole DAS imaging to define a high-resolution 3D seismic cube.
- Development and validation of a full-waveform inversion (FWI) method providing subsurface models of lithological properties from seismic data.

BENEFIT TO WA

Many of the most exciting exploration targets in Western Australia lie in areas where the richly-endowed geology of proven mineral provinces plunges beneath more recent layers of rock. Lowering the barriers to understanding these buried targets will reduce exploration risk, encouraging investment to underpin the productive future of the State's minerals industry.

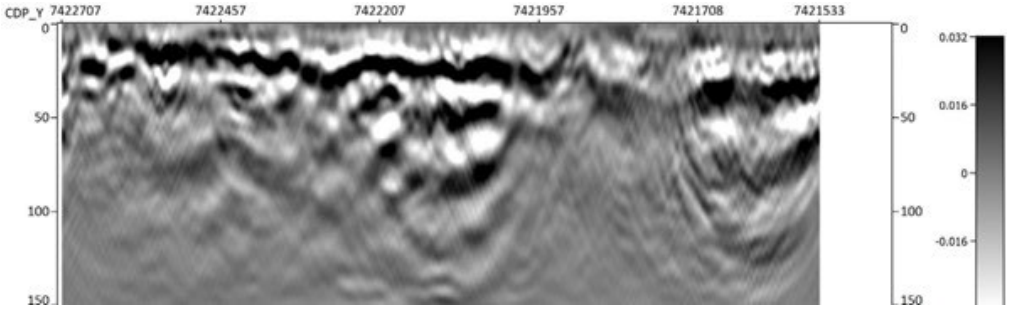
Sponsors
MinEx CRC

Lead Organisation
MinEx CRC

Research Contact
Andrej Bona

Total Grant Value
$1,291,900

MRIWA Contribution
$111,700[9]



M0509c Seismic in the Drilling Workflow: MinEx CRC Project 5
Image source: final report

[8] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/seismic-in-the-drilling-workflow-phase-1-minex-crc-project-5/
[9] Funds drawn down from MRIWA's contribution to the MinEx CRC

Project Case Studies

Centrifuge optimisation for fluid management in Coiled Tubing drilling: MinEx CRC Project 20.1

Program 1 – Find More Viable Resources

STATUS: Final Report Published[10] **Project No: M0509d**

THE CHALLENGE

Current Hydraulic Processing Systems (HPS) cannot recycle the large volumes of fluid required to deliver drilling power and bring rock cuttings to the surface in Coiled Tubing (CT) drilling. This elevates drilling fluid consumption and restricts capacity of the CT system to deliver representative sampling

KEY FINDINGS

This project delivered systematic characterisation of centrifuge performance under the range of flow rates relevant to CT drilling, supporting definition of optimum operating conditions for solid-liquid separation and fluid recycling.

As the basis of guidelines for real-time control of a decanter centrifuge incorporated as an integral component of the integrated Hydraulic Processing System (HPS) developed for the RoXplorer CT drilling platform, these findings represent key enabling knowledge for this innovative drilling technology.

BENEFIT TO WA

Resolution of the fluid management and performance issues identified with CT drilling would help support use of the efficient low-cost RoXplorer CT drilling system in areas of Western Australia where there is a need for deeper exploration with a low environmental footprint.

Sponsors
MinEx CRC

Lead Organisation
MinEx CRC

Research Contact
Masood Mostofi

Total Grant Value
$1,923,125

MRIWA Contribution
$471,875[11]

M0509d Centrifuge optimisation for fluid management in Coiled Tubing drilling: MinEx CRC Project 20.1, site photo

[10] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/centrifuge-optimisation-for-fluid-management-in-coiled-tubing-drilling/
[11] Funds drawn down from MRIWA's contribution to the MinEx CRC

Current Projects/ Contracts Executed

Program 1 – Find More Viable Resources

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0462a	Detection technology	(Was M556) The paradigm shift for minerals exploration using ultrafine soils and intelligent data integration tools - Extension to M462	Commonwealth Scientific Industrial Research Organisation (CSIRO) Dr Ryan Noble	Anax Metals Limited Condamine Resources De Grey Mining Department of Mines, Industry Regulation and Safety (GSWA) Dreadnought Resources Emmerson Resources Limited Fortescue Metals Group Ltd Geological Survey of New South Wales Geological Survey of Queensland Geological Survey of South Australia Greenmount Resources Pty Ltd Hexagon Energy Materials Limited IGO Limited Kaiross Minerals Kalamazoo Resources Lodestar Minerals Limited MCA Nominees Mining Investments Australia Monger Gold Ltd New Age Exploration Limited Newmont Goldcorp Tanami Pty Ltd Northern Star Resources Limited Northern Territory Geological Survey Ozz Resources Limited Strategic Energy Resources Limited Tojo Minerals Western Gold Resources Limited	3	1,238,249	117,000

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0470a	Mineral systems	(WAS M555) A multi-scale approach to controls on mineralisation in the Fraser Zone, Western Australia	Curtin University Katy Evans	Curtin University Department of Mines, Industry Regulation and Safety - Geological Survey of Western Australia IGO Limited Legend Mining Limited MG Creasy	3.67	1,023,300	341,300
M0521	Mineral systems	Lithospheric and crustal-scale controls on multi-stage basin evolution: Impacts on Mineralising System	University of Western Australia (CET - Centre for Exploration Targeting) Weronika Gorczyk	Centre for Exploration Targeting (UWA) Department of Mines, Industry Regulation and Safety - Geological Survey of Western Australia First Quantum Minerals Ltd First Quantum Minerals Exploration (Australia) Pty Fortescue Metals Group	4	1,493,737	733,737
M0530	Mineral systems	Yilgarn 2020	University of Western Australia (CET - Centre for Exploration Targeting) Nicolas Thebaud	BHP Billiton Nickel West Bogada Gold Pty Ltd Evolution Mining Limited Gold Fields Australia Gold Road Resources Ltd Newmont Mining Services Pty Ltd Northern Star Resources Ltd Saracen Mineral Holdings Ltd	4.58	2,346,000	796,000
M0543	Detection technology	Field-based XRF for prompt Au analysis	Portable PPB Pty Ltd Simon Bolster	Barrick Gold Corporation Bellevue Gold Mines Ltd Centerra Madencilik A.Ş. Fosterville Gold Mine Pty Ltd Gold Fields St Ives Gold Mining Company Pty Ltd Gold Road Resources Ltd Newcrest Mining Limited Perseus Mining	1	658,000	218,000

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0551	Mineral systems	Integrated 3G - Geochronology-geochemistry-grain shape: a new toolkit for mineral sands understanding	Curtin University Milo Barham	Curtin University Iluka Resources	4	979,000	345,000
M0554	Mineral systems	Evolution of Proterozoic multistage rift basins – key to mineral systems - ARC Linkage proposal linked to M521	University of Western Australia Mark Jessell	Anglo American Exploration (Australia) Anglo American PLC Australian Research Council BHP Group Operations Pty Ltd IGO Limited Monash University Teck Australia Ptd Ltd	4	2,041,040	540,837
M0557	Mineral systems	Orebody knowledge, landscape history and mineralisation of Martite–Goethite Ores in the Hamersley Province (WA)	Commonwealth Scientific Industrial Research Organisation (CSIRO) Erick Ramanaidou	BHP Billiton Iron Ore Pty Ltd Bureau Veritas Minerals Pty Ltd FMG Resources Pty Ltd Rio Tinto Pilbara Iron Company (Services) Pty Ltd CSIRO Roy Hill Iron Ore Pty Ltd	2	1,552,000	388,000
M10412	Mineral systems	Primary and secondary high-grade gold mineralisation processes in orogenic systems: key to a sustainable mining?	University of Western Australia (CET - Centre for Exploration Targeting) Nicolas Thebaud	Australian Research Council Fosterville Gold Mine Pty Ltd Karora Resources Pty Ltd Monash University Newmont Australia Pty Ltd Northern Star Resources Limited University of Western Australia (CET - Centre for Exploration Targeting)	3	1,942,114	450,417
M10422	Mineral systems	Understanding the Mt Weld Carbonatite mineral system - a Critical Minerals super-resource in Western Australia	Murdoch University Artur Deditius	Curtin University Murdoch University Lynas Corporation Ltd	3.5	581,083	146,116

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M10426	Mineral systems	Indicator Minerals for Nickel Exploration	Commonwealth Scientific Industrial Research Organisation (CSIRO) Louise Schoneveld	Anglo American Technical & Sustainability Services Ltd Ardea Resources Limited Australian Vanadium Ltd BHP Pty Ltd Bryah Resources Estrella Resources IGO Limited St George Mining Limited Western Areas NL	2.17	1,469,677	354,914
M10433	Mineral systems	Distal footprints in the South West Terrane	Commonwealth Scientific Industrial Research Organisation (CSIRO) Ignacio Gonzalez-Alvarez	Anglo American Exploration (Australia) Department of Mines, Industry Regulation and Safety - Geological Survey of Western Australia Ramelius Resources Limited	3.17	1,233,000	308,000
M10444	Detection technology	Coiled Tubing Drilling for definition of Mineral Deposits - Phase 2: MinEx CRC Project 2	University of South Australia Soren Soe	Anglo American Services (UK) Ltd Anglo American Technical & Sustainability Services Ltd BHP Billiton Iron Ore Pty Ltd Department of Regional New South Wales Epiroc LKAB Wassara MinEx CRC South32 Ltd	3	2,833,505	207,561[12]

[12] MRIWA support for M10444 consists of $121,000 drawn down from MRIWA's commitment to the MinEx CRC, and an additional $86,561 cash contribution.

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M10445	Detection technology	Petrophysics for Mineral Discovery during Drilling - Phase 2: MinEx CRC Project 4	Curtin University Brett Harris	Imdex Limited MinEx CRC Rio Tinto Technological Resources Pty Ltd South32	3	816,000	123,000[13]
M10446	Detection technology	Seismic in the Drilling Workflow - Phase 2: MinEx CRC Project 5	Curtin University Andrej Bona	Anglo American Exploration (Australia) Pty Ltd BHP Pty Ltd MinEx CRC Rio Tinto Technological Resources Pty Ltd Sercel	3	940,000	123,000[13]
M10472	Regulatory tools and processes	Amplification of Exploration Education and Research Collaboration	CRU International (Australia) Pty Ltd Allan Trench		0.5	306,758	306,758
M10513	Data driven decisions	A Value Case for Exploration Research: Establishing the ASX Market Value of Minerals Research in the Exploration Sector	University of Western Australia Sistine Sun		0.6	20,000	20,000

M0509c Seismic in the Drilling Workflow: MinEx CRC Project 5, site photo

[13] MRIWA contributions are drawn down from MRIWA's commitment to the MinEx CRC.

PROGRAM 2: Expand the Mining Envelope

A significant proportion of the future Western Australian resource base is likely to reside in deep and complex geotechnical environments. Additionally, most major open-cut and underground operations are known to have extensions to their mineralisation, albeit at possibly lower grade. Mining methods need to adapt to allow continued economic and safe extraction of resources.

The research priority areas in Program 2 are intended to systematically advance knowledge and capability toward solutions for mining more ore from challenging deposits.

In doing so, the research will create engineering capability and demonstrate technical feasibility of mining more selectively and deeper to:

- position Western Australia as a global leader in extraction technologies
- decrease the capital and operating costs associated with mining
- allow for safer and increased productivity from existing mines and for a new generation of deposits to be brought into production

Themes

- Deep and complex extraction systems
- Engineering in highly stressed and complex rock masses
- Mining technology
- Data driven decisions
- Energy utilisation
- Regulatory tools and processes
- Safety, social and environmental sustainability
- Workforce of the future

$1.4M
MRIWA contribution

$3.9M
Total value of research projects

3
Project completed

7
Standalone research projects

Project Case Studies

Rock properties to predict rockburst vulnerability in three dimensions

Program 2 – Expand The Mining Envelope

STATUS: Final Report Published[14]

Project No: M0464

THE CHALLENGE

Unpredictable rockburst and strainburst events create significant safety hazards for mining personnel and operations, however these phenomena are poorly understood.

The challenge for this project was to understand the influence of rock properties on the proneness to strainburst.

KEY FINDINGS

For the first time, this research has enabled direct measurement and understanding of in situ stress, 3D rock properties (static and dynamic), influence of rock fabric and anisotropy, extensional strain in 3D, field observations of bursting, fractography, disking and borehole breakout, and unravelling of support structures around bolts.

The additional measurements can be obtained from oriented drillcore, enabling cost effective development of new strategies to improve design and safety solutions for mining operations.

The process of determining the in situ stress led to development of a 3D extensional strain approach using a fully compliant orthotropic strain matrix that can be used in regular 3D numerical modelling software.

BENEFIT TO WA

This research makes a significant contribution to mine safety, hazard awareness and opportunities for improvements to bolt behaviour.

Sponsors

Agnico Eagle Mines Ltd
AngloGold Ashanti Australia Limited
BHP Nickel West Pty Ltd
BHP Olympic Dam
Glencore Ernest Henry Mining Pty Ltd
Glencore Sudbury Integrated Nickel Operations
Gold Fields Agnew Gold Mining Company Pty Ltd
Gold Fields Australia GSM Mining Company Pty Ltd
Gold Fields Australia Pty Ltd
Gold Fields St Ives Gold Mining Company Pty Ltd
Iamgold Mine Westwood
LKAB Sweden
Newcrest Mining Limited
Northern Star (Kanowna) Pty Ltd
Tritton Resources Limited
University of Western Australia (ACG - Australian Centre for Geomechanics)

Lead Organisation

University of Western Australia (ACG - Australian Centre for Geomechanics)

Research Contact

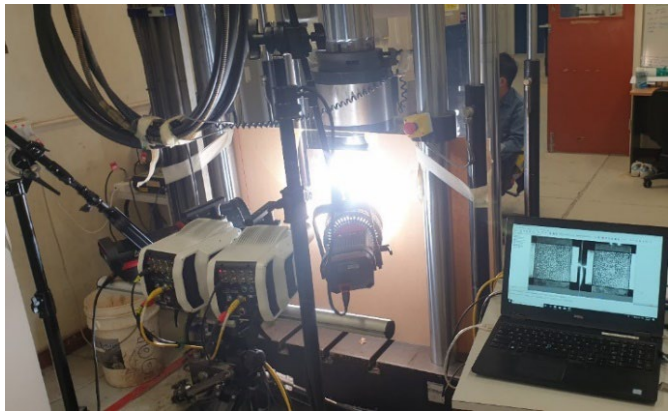
Phil Dight

Total Grant Value

$2,140,000

MRIWA Contribution

$1,100,00



M0464 site photo - Biaxial device in operation, showing cameras, lighting, and camera control. Load frame is controlled by another operator, visible at rear.

[14] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/rock-properties-to-predict-rockburst-vulnerability-in-three-dimensions/

Ground Support Systems Optimisation - Phase 2: Extension to M431

Program 2 – Expand The Mining Envelope

STATUS: Final Report Published[15] **Project No: M0497**

THE CHALLENGE

Ground support is one of the major costs in mining and it is of critical importance to mitigate the risk of rockfalls and maintain the safety of mine workers. As underground mines operate at greater depth, the ground support system design becomes more challenging.

KEY FINDINGS

This project offers several new guidelines and a suite of tools to improve ground support design in very challenging ground conditions, such as squeezing ground and rockburst/strainburst prone environments.

In more common ground conditions, a new understanding of shotcrete support mechanisms can now be applied in the mining environment.

The project has also developed innovative software for the probabilistic design of ground support systems, which is key to optimising support systems to reduce costs and improve safety.

BENEFIT TO WA

Western Australia operates underground mines which are amongst the deepest and highest stress environments in the world. Providing these critical ground support design tools to the industry will enable reduction in ground support costs while improving safety and ensuring the competitiveness of current and future Western Australian mines at depth.

This project is an extension to M0431.

Sponsors

Agnico Eagle Mines Ltd
Dywidag-Systems International Pty Ltd (formerly Fero Strata Systems Pty Ltd T/As DSI Underground)
Dywidag-Systems International Pty Ltd (T/As DSI Underground)
Garock
Gold Fields Agnew Gold Mining Company Pty Ltd
Gold Fields St Ives Gold Mining Company Pty Ltd
Iamgold Mine Westwood
IGO Limited
Jennmar Australia Pty Ltd
New Concept Mining
Newcrest Cadia Holdings Pty Ltd
Sandvik Mining and Rock Technology
University of Western Australia (ACG - Australian Centre for Geomechanics)

Lead Organisation

University of Western Australia (ACG - Australian Centre for Geomechanics)

Research Contact

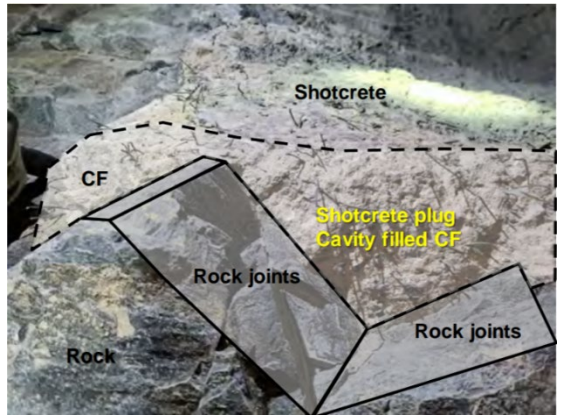
Yves Potvin

Total Grant Value

$1,931,250

MRIWA Contribution

$671,250



M0497 - Upward photograph of a shotcrete plug at the intersection of two joint planes.
Image source: final report

[15] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/ground-support-systems-optimisation-phase-2/

Development of a drilling fluid system for RoXplorer coiled tube drilling

Program 2 – Expand The Mining Envelope

STATUS: Final Report Published[16] **Project No: M0515**

THE CHALLENGE

Innovative Coiled Tubing (CT) drilling is incompatible with conventional drilling fluid processing systems, with at least partial automation of monitoring, cleaning and maintenance of fluid properties required to deliver the high rates of drilling fluid recirculation required by this method.

KEY FINDINGS

Automated fluid loss control together with measurement and maintenance of drilling fluid properties deliver a drilling fluid workflow optimised for CT drilling.

An improved hydrocyclone developed through this project further delivers improved separation of solid materials from recirculated drilling fluid, providing efficient sampling and improved cleaning of the fluid for reuse.

The outcomes of this research pave the way toward automation of drilling fluid handling, and have been incorporated into the work of the MinEx CRC.

BENEFIT TO WA

The drilling fluids and accompanying management systems developed through this research will help support a practical CT drilling system. Widely implemented in the Western Australian mining sector, this new system could reduce the cost and environmental impact of exploration drilling.

Sponsors
Curtin University
Deep Exploration Technologies CRC

Lead Organisation
Curtin University

Research Contact
Masood Mostofi

Total Grant Value
$400,000

MRIWA Contribution
$150,000

M0515 - Collection of drill cutting samples in one of the RoXplorer drilling trials. Image source: final report

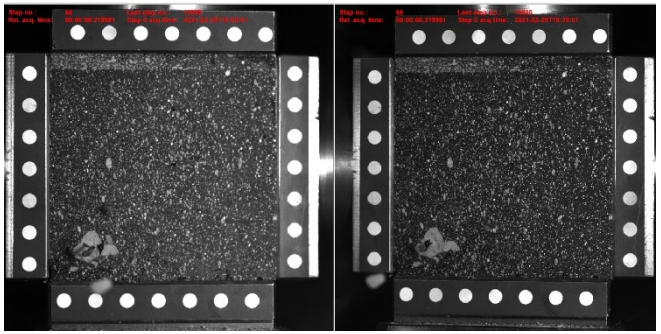
[16] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/development-of-a-drilling-fluid-system-for-roxplorer-coiled-tube-drilling/

Current Projects/ Contracts Executed

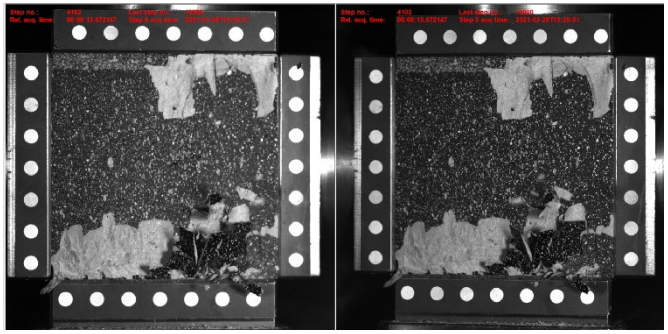
Program 2 – Expand the Mining Envelope

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0499	Engineering in highly stressed and complex rock masses	Establishing the in situ rock bolt behaviour underground in order to model and design improved rock bolt support systems	CMTE Development Ltd T/As Mining3 Ewan Sellers	Curtin University CMTE Development (trading as Mining3) Peabody Australia	3	1,270,000	400,000
M0510	Mining technology	Safe, sustainable management of filtered tailings	University of Western Australia Prof. Andy Fourie	Alcoa of Australia Ltd Alumina Quality Workshop (Inc) BHP Billiton Group Operations Pty Ltd International Aluminium Institute Rio Tinto Technological Resources Pty Ltd	3	482,500	142,000
M0522	Mining technology	Physics Models for Ore Tracking in Surface Mines	CMTE Development Ltd T/As Mining3 Ewan Sellers	CMTE Development (trading as Mining3) Fortescue Metals Group South32	3.5	760,000	380,000
M0529	Deep and complex extraction systems	Lixiviant access creation in impermeable hard rock mass for the in situ underground leaching of metals from ore	Murdoch University Aleks Nikoloski	CMTE Development (trading as Mining3) Murdoch University	5.54	120,000	30,000
M0544	Deep and complex extraction systems	Towards a mechanistic understanding of electrokinetic in-situ leaching	University of Western Australia Andy Fourie	BHP Pty Ltd Evolution Mining Limited Newcrest Mining Limited Newmont Goldcorp Services Pty Ltd	6	842,605	290,605

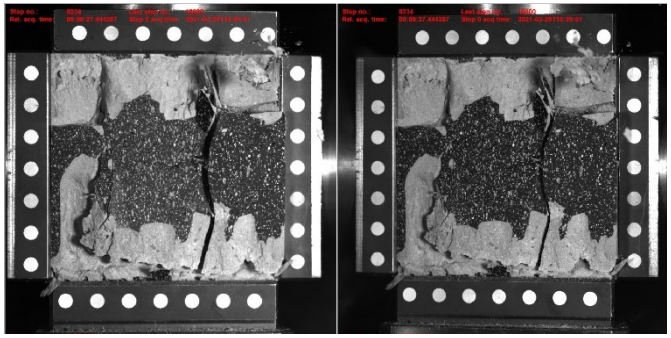
Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0545	Deep and complex extraction systems	Evaluation of in-situ barrier technology for risk mitigation and extraction optimisation for in-situ recovery operations	Curtin University Navdeep Dhami	BHP Pty Ltd CMTE Development (trading as Mining3) Newcrest Mining Limited Orano Mining	3.25	225,000	75,000
M10430	Data driven decisions	Sustainable Optimisation of Mining Complexes through Innovative Algorithms.	Curtin University Dr Waqar Asad	Norton Gold Fields Ltd	3.5	165,000	60,000



M0464 - Early spallation, prior to peak load. A thin lenticular slab breaks up (buckles?) and the fragments eject with rotation and velocity towards the cameras. Image source: final report



M0464 - Buckling-type spallation has occurred at lower left and upper right and is now occurring at lower-right. This image was taken at the peak load. Thin fragments are ejected with rotation and velocity towards the cameras.



M0464 - Ultimate spallation and detachment of the free face occurs in the post-peak. Some ejection is visible at upper right; however, the majority of large fragments simply fall by gravity.

PROGRAM 3: Increase Recovered Value Through Processing

More complex and lower-grade orebodies, combined with higher energy costs and the need for a lower environmental footprint, are driving development of advanced methods of processing to transform low value deposits to be economic.

The research priority areas in Program 3 are intended to systematically advance knowledge and capability toward solutions for increasing yield and throughput and optimising the use of raw materials by breaking down operational silos.

In doing so, the research will create mineral processing capability and accelerate the development, testing, piloting, scale-up and other technical de-risking activities associated with new processing technologies to:

- position Western Australia as a global leader in mineral processing
- decrease the capital and operating costs associated with mineral processing
- allow for safer and increased productivity from processes and for a new generation of processing technologies to be deployed

Themes

- Processing Technology
- Data driven decisions
- Energy utilisation
- Regulatory tools and processes
- Safety, social and environmental sustainability
- Workforce of the future
- Interoperability

$3.1M	$10.9M	1	4	7
MRIWA contribution	Total project value	Project completed	CRC/Research Centre projects	Standalone research projects

Geology, Mineralogy and Metallurgy of eMaterials Deposits in WA

Program 3 – Increase Recovered Value Through Processing

STATUS: Final Report Published[17] **Project No: M0532**

THE CHALLENGE

Western Australia is the world's largest producer of lithium, however development of these complex deposits has only recently become economic due to the growth in demand for lithium in battery electric vehicles. Optimising the value of this emerging industry begins with a geometallurgical understanding of each unique orebody.

KEY FINDINGS

Australia's hard-rock lithium resource inventory was emplaced during a narrow window of geological time (2,630-2,640 Myr).

A higher degree of mineralogical and geochemical variability in lithium deposits exists than previously thought, making the ore body knowledge and geometallurgical data critical factors in optimizing the economics of lithium mining operations in Western Australia.

BENEFIT TO WA

Despite over a century of resource development experience in Western Australia, the downstream processing of hard rock lithium deposits is a relatively new industry. This project has shed light on Western Australia lithium deposits, and provides a new geometallurgical framework applicable to mining and processing optimisation.

Sponsors
Department of Mines, Industry Regulation and Safety (GSWA)
Lithium Australia NL
Rio Tinto Exploration Pty Limited

Lead Organisation
Curtin University

Research Contact
Mark Aylmore

Total Grant Value
$525,146

MRIWA Contribution
$175,146

M0532 – Mt Cattlin pegmatite open pit operation. View 1 shows exposure of the pegmatite in the pit wall and View 2 shows the pegmatite/greenstone contact in the southeast corner of the pit.
Image source: final report

[17] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/geology-mineralogy-and-metallurgy-of-ematerials-deposits-in-wa/

Current Projects/ Contracts Executed

Program 3 – Increase Recovered Value Through Processing

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0508a	Data driven decisions	Unlocking Knowledge from Technical Texts using Deep Active Learning and Entity Typing	University of Western Australia Tyler Bikaun		3.5	120,000	120,000[18]
M0508b	Data driven decisions	Risk-based Inspection Intervals: A Practical Approach	Curtin University Gabriel Gonzalez		3.5	120,000	120,000[18]
M0519	Processing technology	Broadening the opportunity for in-situ recovery of value from mineral deposits	CMTE Development (trading as Mining3) Ewan Sellers	Barrick Gold Corporation CMTE Development Ltd T/As Mining3 Environmental Copper Recovery Pty Ltd Freeport Minerals Corporation Gold Fields St Ives Gold Mining Company Pty Ltd Hatch Heathgate Resources Pty Ltd Mining and Process Solutions Pty Ltd Newcrest Mining Limited Newmont USA Limited Solvay-Cytec Industries Inc. BHP Group Operations Pty Ltd	4.25	960,000	240,000

[18] Projects are supported by funds drawn down from MRIWA's contribution to the Centre for Transforming Maintenance Through Data Science

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533f	Processing technology	Hydrometallurgical processing for nickel and cobalt ores, concentrates, tailings, wastes - Stage 2 (FBI CRC)	Curtin University Elsayed Oraby	Ardea Resources Limited BASF Australia Ltd BHP Nickel West Pty Ltd Blackstone Minerals Limited Future Battery Industries CRC Ltd IGO Limited JordProxa Pty Ltd Lycopodium Pty Ltd Mineral Carbonation International Pty Ltd Mining and Process Solutions Pty Ltd Pure Battery Technologies Pty Ltd	3.5	3,607,080	562,500[19]
M0533v	Processing technology	Beneficiation and chemical processing of lithium minerals - Phase 2 (FBI CRC)	Murdoch University Aleks Nikoloski	Allkem Ltd BASF Australia Ltd Calix Limited Department of the Chief Minister and Cabinet (Northern Territory) EV Metals Group PLC Future Battery Industries CRC Ltd IGO Limited JordProxa Pty Ltd Lycopodium Pty Ltd	3.42	3,195,000	673,000[19]
M0537	Processing technology	The effect of water quality on rare earth minerals flotation	Curtin University Bogale Tadesse	Curtin University Lynas Corporation Ltd Mt Weld Mining Pty Ltd	4.25	210,500	70,000
M0541	Processing technology	Organic acid leach system for rare earth extraction technology development	Curtin University Laurence Dyer	Curtin University Department of Industry, Innovation and Science Lynas Corporation Ltd Mt Weld Mining Pty Ltd	5.08	345,160	115,000

[19] Projects M0533f and M05033v MRIWA Contribution drawdown from FBI CRC MRIWA Contribution

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M10475	Safety, social and environmental sustainability	Green Steel Value Chain Model Demonstration Upgrade	GHD Pty Ltd Abhishek Tammina		0.25	45,000	45,000
M10477	Safety, social and environmental sustainability	Advanced electrometallurgy for improved recovery of green metals	University of Sydney Prof. Alejandro Montoya	ECOX Australia PTY LTD	3	1,515,139	378,785
M10480	Processing technology	Flexible pilot plant for low emissions iron making prefeasibility study	Commonwealth Scientific Industrial Research Organisation (CSIRO) Adrien Guiraud		0.83	450,000	450,000
M10481	Processing technology	New Opportunities for the PGM Industry in WA	Acil Allen Pty Limited Mr. Ryan Buckland		0.58	292,678	292,678

M0532 – open pits at Greenbushes pegmatite mine. Views 1 and 2 in the Lithium pit show exposure of the pegmatite.
Image source: final report

PROGRAM 4: Infrastructure and Logistics

Western Australia's export-oriented mining projects place heavy demands on regional infrastructure, requiring long term planning and a high level of capital investment by both government and industry. As the sector moves to adopt automated technologies, greater demand will be placed on network bandwidths.

The research priority areas in Program 4 are intended to systematically advance knowledge and capability to:

- optimise supply chain infrastructure usage, haulage and export logistics
- enable enhanced networks and accurate geo-positioning
- decrease the capital and operating costs associated with getting commodities to market

Themes

- Communications and Positioning Technology
- Data Driven Decisions
- Energy Utilisation
- Safety, Social and Environmental Sustainability

$800K	$3.3M	3	3
MRIWA contribution	Total project value	Projects completed	CRC/Research Centre projects

Project Case Studies

QA4UAV: a standard workflow to quality assure UAV products

Program 4 – Infrastructure and Logistics

STATUS: Final Report Published[20]

Project No: M0507

THE CHALLENGE

Unpiloted Aerial Vehicle (UAV) imagery has become widely applied in the mining industry in recent years, but variable spatial accuracy and lack of traceability in the range of systems used mean that much data gathered in this way is not standardised or fit-for-purpose for advanced scientific analysis.

KEY FINDINGS

This project created operational Minimum Viable Product (MVP) software suitable for undertaking a range of checks required to automate imagery quality assurance, including 11 metadata checks and three photogrammetric checks.

The standardisation provided by this tool is intended to establish a universal framework allowing integration of image data collected from diverse sources, and supporting future development of a broader set of improved aerial imagery analysis products.

BENEFIT TO WA

Application of a standard UAV workflow across the Western Australian mining sector would help the industry operate at the leading edge of technological development globally, and prepare Western Australia mines for future developments in remote analysis and operations.

Sponsors

CRC for Spatial Information

Department of Water, Environment and Regulation

Lead Organisation

CRC SI

Research Contact

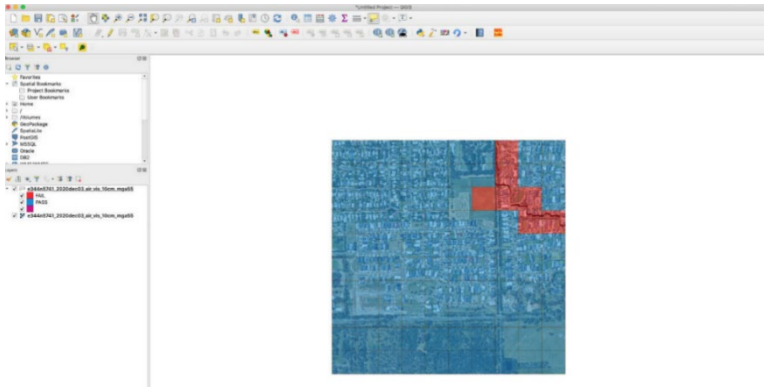
Nathan Quadros

Total Grant Value

$250,000

MRIWA Contribution

$75,000



M0507 – Desktop Application, revies of photogrammetry checks output shapefile.
Image source: final report

[20] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/qa4uav-a-standard-workflow-to-quality-assure-uav-products/

Project Case Studies

Renewable Energy Storage Roadmap

Program 4 – Infrastructure and Logistics

STATUS: Final Report Published[21] **Project No: M10464**

THE CHALLENGE

With variability of renewable energy presenting challenges to reliable energy supply for remote mine sites, there is a need to consider the range of available energy storage technologies and understand the required research and development to support wider implementation within the Western Australian mining sector.

KEY FINDINGS

A significant amount of energy storage will be required to facilitate a net zero future. The Roadmap demonstrates the need for development of a range of energy storage technologies to support the transition to net zero, with recommendations across a range of end use applications.

Storage will be particularly important to support remote or off-grid applications, and/or in industrial processes that will continue to have mid-to-high heat requirements (such as manufacturing, metals and mineral refining). Case study analysis of remote mining and alumina processing applications provide initial insights into lowest cost solutions and recommended next steps for technology development.

BENEFIT TO WA

Energy Utilisation is a priority theme under MRIWA's Net Zero Emission Mining (NZEM) focus area, with energy storage a critical enabler for decarbonisation of Western Australian mining operations through greater integration of renewable energy.

Understanding lowest cost energy storage technologies suited to the unique conditions of remote mining provides greater confidence to support deployment and trial new technologies.

Sponsors

APA Group
Australian Renewable Energy Agency
BHP Billiton Iron Ore Pty Ltd
Commonwealth Scientific Industrial Research Organisation (CSIRO)
CSIRO - Australian Solar Thermal Research Institute
Department of Industry, Science, Energy and Resources
Department of Jobs Tourism Science and Innovation
Energy Policy WA
GHD Pty Ltd
NSW Dept of Planning and Environment
Woodside Energy Ltd

Lead Organisation

Commonwealth Scientific Industrial Research Organisation (CSIRO)

Research Contact

Vivek Srinivasan

Total Grant Value

$590,000

MRIWA Contribution

$25,000

M10464 – Renewable Energy Storage Roadmap official document
Image source: final report

[21] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/renewable-energy-storage-roadmap/

Mining in a low emissions economy

Program 4 – Infrastructure and Logistics

STATUS: Final Report Published[22] **Project No: M10468**

THE CHALLENGE

Western Australia's mining and resources sector has a critical role to play in the transition to net zero emissions by 2050. The potential is enormous, as are the benefits. But where are the opportunities? What should be prioritised? And how do we turn ambition into action?

KEY FINDINGS

The three-part report series seeks to build an understanding across the mining sector about what is possible today and provide practical steps to deliver on the emissions reduction targets being set across industry.

The reports demonstrate how analysis of technology driven decarbonisation pathways to form a roadmap provides a structured approach for decision makers to group and evaluate relevant technologies, while accounting for unique decarbonisation goals, budgets, risks, and other site-related constraints.

BENEFIT TO WA

The demand for low-emissions energy minerals and the decarbonisation of mining presents the greatest opportunity in a generation to diversify and grow the resources sector. Western Australia's mineral commodities are critical enablers to global decarbonisation efforts and this report series provides a practical guide to support junior to mid-tier mining companies to deliver on this demand whilst navigating the complexities of their own decarbonisation journey.

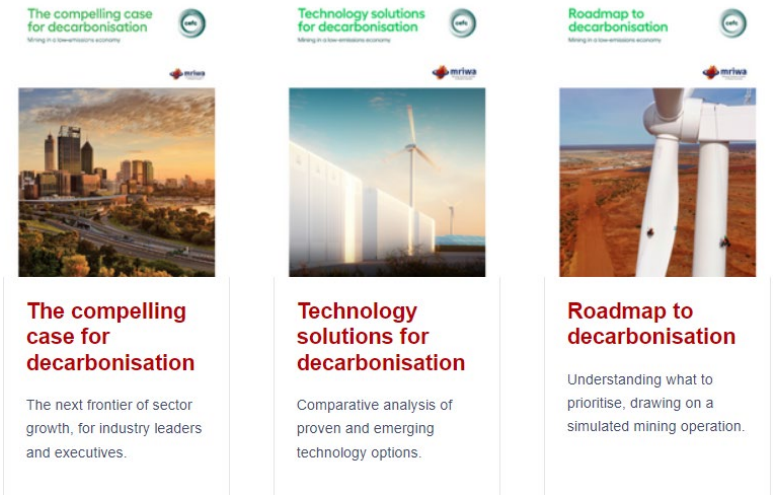
Sponsors
Clean Energy Finance Corporation

Lead Organisation
Engie Impact Australia Pty Ltd

Research Contact
Joshua Martin

Total Grant Value
$105,223

MRIWA Contribution
$52,611



M10468 – three-part report series downloadable on NZEM resources webpage*

[22] *https://www.mriwa.wa.gov.au/minerals-research-advancing-western-australia/focus-areas/net-zero-emission-mining/nzem-resources/

Current Projects/ Contracts Executed

Program 4 – Infrastructure and Logistics

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533u	Data driven decisions	Assessment, design and operation of battery-supported electric mining vehicles and machinery (FBI CRC No. 028)	University of Adelaide Ali Pourmousavi Kani	BHP Nickel West Pty Ltd Department for Energy and Mining (SA) Department of Energy and Public Works Energetics Pty Ltd Future Battery Industries CRC Ltd IGO Limited Multicom Resources Limited Galaxy Resources Limited - now Allkem Limited	3.5	1,160,000	300,000*[23]
M10443	Energy utilisation	Stationary Mine Electrification (FBI CRC No. 039)	University of Western Australia Tyrone Fernando	Energetics Pty Ltd Future Battery Industries CRC Ltd Lycopodium Pty Ltd Magellan Powertronics Pty Ltd Ultra Power Systems Pty Ltd	2.5	1,112,000	300,000*
M10451	Energy utilisation	Development of Vanadium Electrolytes (FBI CRC Project Number 038)	Murdoch University Aleks Nikoloski	Department of Energy and Public Works Department of the Chief Minister and Cabinet (Northern Territory) Future Battery Industries CRC Ltd King River Resources Limited Lycopodium Pty Ltd Lynas Corporation Technology Metals Australia Limited Ultra Power Systems Pty Ltd	3	1,073,000	200,000*

[23]*Projects M0533u, M10443 and M10451 MRIWA Contribution drawdown from FBI CRC MRIWA Contribution

PROGRAM 5: New Products and Markets

Rapid adoption of new high-tech products and manufacturing processes is changing the demand for high-value, low-volume minerals and creating opportunities for the re-use and recycling of by-products and waste.

Increasing emphasis is being placed on those critical minerals which are subject to high risks of supply but represent irreplaceable inputs for important technological and industrial innovations, especially renewable energy systems, electric vehicles, rechargeable batteries, consumer electronics, telecommunications, specialty alloys, and defence technologies.

Given Western Australia is well-positioned with significant reserves of a broad variety of minerals now required globally, the research priority areas in Program 5 are intended to systematically advance knowledge and capability which will:

- create new industries
- result in increased demand for one or more minerals found in this State
- develop and demonstrate ethical and sustainable production of minerals, metals and chemicals
- create premium products which can be marketed and sold to new generations of customers

In doing so, the research will create new niche markets for minerals and position Western Australia as a global supplier of critical minerals while also creating opportunities for progressive downstream processing activity in the State.

Themes

- Strategic Foresight
- Downstream Processing Technology
- Data Driven Decisions
- Energy Utilisation
- Regulatory Tools and Processes
- Safety, Social and Environmental Sustainability
- Workforce of the future

$3.7M	$28.9M	2	7	3
MRIWA contribution	Total project value	Projects completed	CRC/Research Centre projects	Standalone research projects

Project Case Studies

State of Play Critical Minerals Report 2022

Program 5 – New Products and Markets

STATUS: Final Report Published[24]

Project No: M10470

THE CHALLENGE

New demand for metals including rapidly changing technical requirements for: digital equipment; renewable energy builds; chemical processing advancements; electrification of industry. How can the mining industry accelerate the supply of critical minerals to meet increasing metals demand from new technologies?

KEY FINDINGS

Need to promote Australia as a low risk critical mineral supplier: Engagement from Australian businesses, senior government officials, trade delegations and NGOs with foreign investors.

Pursue cooperative arrangements with foreign investors: The creation of alliances, forging of cooperative arrangements or trade agreements should be pursued with those foreign investors

(FIRB) process: Reform targeted at streamlining the critical mineral investment review processes and increasing the flexibility of investment thresholds should be considered.

Provide direct project finance: Continue and increase the provision of government-backed grants, incentives, and debt facilities to catalyse private co-investment.

Establish waste processing hubs: Support the construction of centralised waste processing facilities.

BENEFIT TO WA

The overview given from the survey responses in the study will be an enabler for potential Critical Minerals projects. It identifies the needs of building technical knowledge, targeting resources and looking at customers for investment in Western Australia. The consideration of multiple technology solutions could also support a range of strategic investments in R&D to benefit Western Australia.

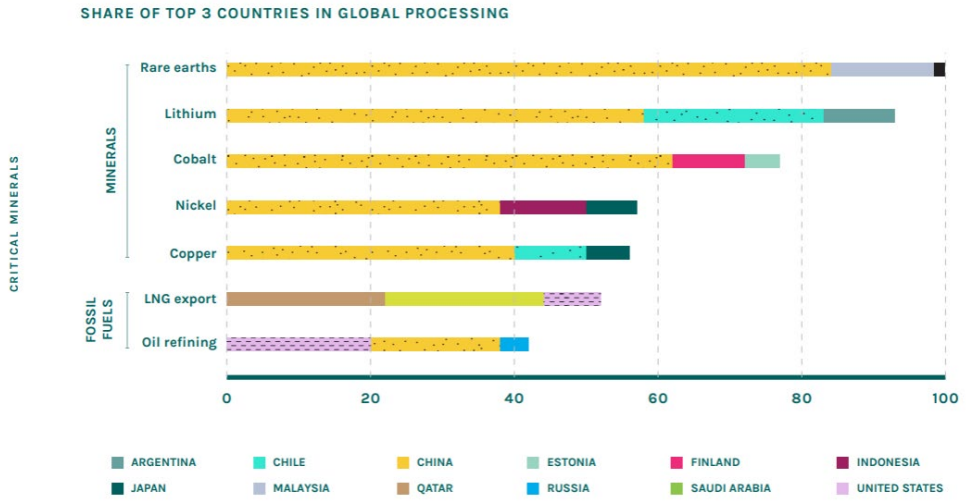
Sponsors
METS Ignited

Lead Organisation
State of Play (Slate Advisory Pty Ltd)

Research Contact
Madi Ratcliffe

Total Grant Value
$135,000

MRIWA Contribution
$45,000



M10470 – share of top 3 countries in global processing graph from state of play critical minerals report 2022.

[24] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/state-of-play-critical-minerals-report-2022/

Project Case Studies

Green Steel Value Chain Assessment

Program 5 – New Products and Markets

STATUS: Final Report Published[25] **Project No: M10471**

THE CHALLENGE

Understanding the pathways to enable Western Australia to maximise use of its hematite and magnetite iron ore resources, and to maximise emerging hydrogen and renewable energy potential to support global green steel ambitions and create new markets for Western Australian iron ores.

KEY FINDINGS

The Western Australian Green Steel Opportunities report provides important insights into the iron ore to steel making markets and what is going to be needed for the global steel industry to decarbonise. The steel industry is an important customer to Western Australia, and it is important to understand the significant challenges they are facing to reduce emissions in their operations.

The MRIWA assessment of the green steel opportunity has examined low emission scenarios around magnetite and hematite iron ores including a range of energy costs and qualities.

The key findings increase the understanding of the size and scale of the capital requirements and infrastructure needed, both energy and water, the land requirements and the energy price point at which it becomes economic to produce green iron ore, green pellets, green iron and potentially green steel in the State.

BENEFIT TO WA

Future low emission steelmaking will demand a different mixture of iron ore types and grades. With the variety of ore types in Western Australia and our natural advantages in the supply of renewable energy solutions, we are well positioned to supply new iron feedstock products into the market in addition to our existing exports. Further processing of Western Australia iron ore to green steel, or the inputs to enable green steel, is seen as a significant opportunity.

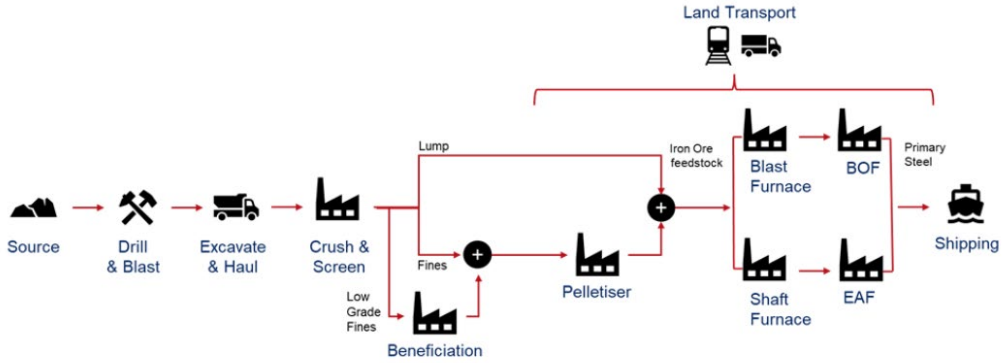
Sponsors

Lead Organisation
GHD Pty Ltd

Research Contact
Kenneth Leong

Total Grant Value
$598,908

MRIWA Contribution
$598,908



M10471 – Green steel value chain model.
Image source: mriwa green steel resources webpage

[25] https://www.mriwa.wa.gov.au/minerals-research-advancing-western-australia/focus-areas/green-steel/green-steel-resources/

Current Projects/ Contracts Executed

Program 5 – New Products and Markets

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533d	Downstream processing technology	Process Legacy - Stage 2 (FBI CRC)	Curtin University Arie van Riessen	Anax Metals Limited Australasian Pozzolan Association ChemCentre Department of the Chief Minister and Cabinet (Northern Territory) EV Metals Group PLC Future Battery Industries CRC Ltd FYI Resources Limited IGO Limited	3.5	2,957,386	589,500[26]
M0533h	Downstream processing technology	Cathode precursor production pilot plant in Western Australia - Stage 2 (FBI CRC)	Curtin University Alireza Rabieh	Alpha HPA Limited Ardea Resources Limited BASF Australia Ltd BHP Nickel West Pty Ltd Blackstone Minerals Limited Calix Limited ChemX Materials Ltd Cobalt Blue Holdings Limited EV Metals Group PLC Future Battery Industries CRC Ltd IGO Limited JordProxa Pty Ltd King River Resources Limited Lycopodium Pty Ltd Mn Energy Limited Pure Battery Technologies Pty Ltd	3	5,916,300	879,750[26]

[26] MRIWA contributions are drawn down from MRIWA's commitment to the FBI CRC and include Department of Jobs Tourism Science and Innovation (JTSI) funds.

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533j	Data driven decisions	Establishment of the National Battery Testing Centre	Queensland University of Technology Joshua Watts	Australian Vanadium Ltd BASF Corporation USA BHP Nickel West Pty Ltd Calix Limited Defence Science and Technology Department of the Chief Minister and Cabinet (Northern Territory) ESS Asia Pacific Pty Ltd Future Battery Industries CRC Ltd Lava Blue Ltd Magellan Powertronics Pty Ltd Multicom Resources Limited Sunrise Energy Metals Limited Syrah Resources Ltd Ultra Power Systems Pty Ltd	4	7,145,342	200,000[27]
M0533k	Downstream processing technology	Super Anode (FBI CRC)	University of Melbourne Amanda Ellis	AnteoTech LTD Calix Limited EcoGraf Limited Future Battery Industries CRC Ltd Koppers Carbon Minerals and Chemicals Pty Ltd Syrah Resources Ltd Talga Group Ltd	4	4,200,000	200,000[27]

[27] MRIWA contributions are drawn down from MRIWA's commitment to the FBI CRC and include Department of Jobs Tourism Science and Innovation (JTSI) funds.

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533m	Data driven decisions	Electrochemical testing of Li-ion Battery materials in standard cell formats (FBI CRC)	Queensland University of Technology Michael Horn	Alpha HPA Limited Ardea Resources Limited BASF Australia Ltd BHP Nickel West Pty Ltd Calix Limited ChemX Materials Ltd Cobalt Blue Holdings Limited EV Metals Group PLC Future Battery Industries CRC Ltd FYI Resources Limited IGO Limited Koppers Carbon Minerals and Chemicals Pty Ltd Lava Blue Ltd Pure Battery Technologies Pty Ltd Sicona Battery Technologies Pty Ltd Sunrise Energy Metals Limited Talga Group Ltd	4	4,210,396	500,000[28]
M0533q	Data driven decisions	Development of a trusted supply chain for Australian battery minerals and products (FBI CRC)	Curtin University Prokopiy Vasilyev	Ardea Resources Limited Australasian Pozzolan Association BASF Australia Ltd EV Metals Group PLC Everledger Australia Pty Ltd Future Battery Industries CRC Ltd Source Certain International Pty Ltd	3	1,688,550	500,000[28]

[28] MRIWA contributions are drawn down from MRIWA's commitment to the FBI CRC and include Department of Jobs Tourism Science and Innovation (JTSI) funds.

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0533r	Data driven decisions	Battery materials for a circular economy (FBI CRC)	University of Technology Sydney Damien Giurco	Ardea Resources Limited Australasian Pozzolan Association BASF Australia Ltd BHP Nickel West Pty Ltd Energetics Pty Ltd Future Battery Industries CRC Ltd IGO Limited Multicom Resources Limited Galaxy Resources Limited - now Allkem Limited	4.5	1,587,000	400,000[29]
M10462	Strategic foresight	Roadmap to Decarbonise WA Through Integrated Mineral Carbonation	Curtin University Michael Hitch		0.58	250,000	250,000
M10482	Safety, social and environmental sustainability	Circular Economy Assessment and Strategy	GHD Pty Ltd Huia Adkins		0.5	150,000	150,000
M10488	Safety, social and environmental sustainability	Alternative Use of Tailings and Waste - Stakeholder Engagement Workshops	Curtin University Fran Ackerman		0.92	26,000	26,000

[29] MRIWA contributions are drawn down from MRIWA's commitment to the FBI CRC and include Department of Jobs Tourism Science and Innovation (JTSI) funds.

PROGRAM 6: Remediation and Mine Closure

An increasing number of Western Australian mining operations are approaching scheduled mine closure with a lack of certainty in the process for relinquishment of rehabilitated land to the State and the potential for trailing liabilities.

To meet the challenge of mine closure and to support the Western Australian Biodiversity Science Institute's Research Priorities and other work happening across government, the research priority areas in Program 6 are intended to systematically advance knowledge and capability toward developing new technologies and approaches for mine remediation and alternative land use, while filling knowledge gaps to ensure a sustainable positive legacy for the industry and surrounding communities.

In doing so, the research will:

- position Western Australia as a global leader in mine closure
- decrease the capital and operating costs associated with remediation and mine closure
- support evidence-based decision making

Themes

- Acid Mine drainage and treatment of tailings
- Sustainable land use post-mining
- Data driven decisions
- Regulatory tools and processes
- Safety, social and environmental stability

$464K	$5.8M	1	4	2
MRIWA contribution	Total project value	Project completed	CRC/Research Centre projects	Standalone research projects

Project Case Studies

Mine pit lakes – Their characterisation, assessment, management and value as potential lead indicators for in-situ metal recovery opportunities

Program 6 – Remediation and Mine Closure

STATUS: Final Report Published[30]

Project No: M0478

THE CHALLENGE

Mine closure requires assessment and management of the pit lakes that can form in open pit mines after mining ceases. Understanding of the long-term environmental risk posed by these lakes is incomplete, which often hampers the realisation of post-mining reuse opportunities.

KEY FINDINGS

Mine pit lake waters continue to evolve for many years after mine closure, posing a significant challenge to the regulation and management of mining legacy sites.

Groundwater chemistry represents the primary control on pit lake water quality at equilibrium, particularly in regards to major ion content, pH, and water salinity.

pH represents a significant influence on metal solubility in lake waters, with mine pit lakes in some sites reaching concentrations compatible with in-situ metal recovery.

BENEFIT TO WA

This research will help address the environmental legacy of mining in Western Australia and support better planning of, and a reduced environmental footprint for future Western Australia mines. The data generated will assist government and industry in better defining the residual risks of existing pit lakes, and identify opportunities for beneficial post-closure uses.

Sponsors

CRC for Contamination Assessment and Remediation of the Environment (CRC CARE)

Lead Organisation

ChemCentre

Research Contact

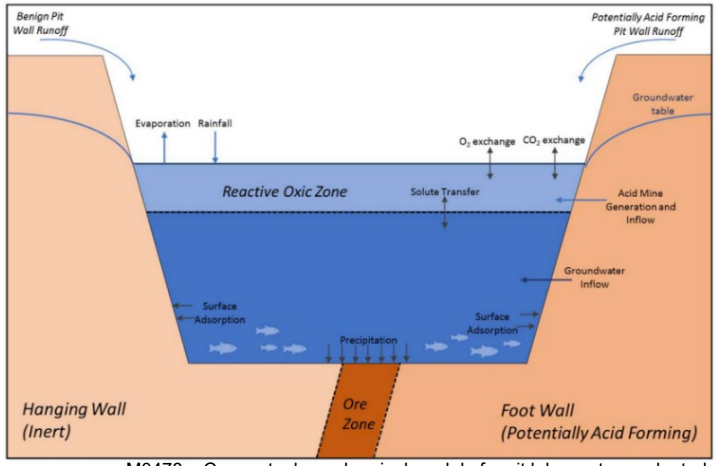
Kathryn Linge

Total Grant Value

$550,000

MRIWA Contribution

$220,000



M0478 – Conceptual geochemical model of a pit lake system, adapted from Castendyk et al. (2015)
Image source: final report.

[30] https://www.mriwa.wa.gov.au/research-projects/project-portfolio/mine-pit-lakes-their-characterisation-assessment-management-and-value-as-potential-lead-indicators-for-in-situ-metal-recovery-opportunities/

Current Projects/Contracts Executed

Program 6 – Remediation and Mine Closure

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M0513	Regulatory tools and processes	Validation and standardisation of sequential leaching tools to better predict the impact of iron ore mining on ground and surface water quality – Phase 2	ChemCentre John Moursounidis	BHP Billiton Iron Ore Pty Ltd CRC for Contamination Assessment and Remediation of the Environment (CRC CARE) Fortescue Metals Group Ltd Rio Tinto Limited (Iron Ore)	2.92	525,000	216,000
M10409	Acid mine drainage and treatment of tailings	How can CRC TiME help industry, government and communities prevent closure related acid and metalliferous drainage (AMD) impacts?	University of Western Australia Carolyn Oldham	CRC Transitions in Mining Economies	0.67	100,000	15,000[31]
M10413	Sustainable land use post- mining	Post Mining Land Use – Practice Mapping Options	University of South Australia Andrew Beer	CRC for Transitions in Mining Economies (CRC TiME)	1	149,459	15,000[31]

[31] MRIWA contributions are drawn down from MRIWA's commitment to the CRC TiME.

Project No	Theme	Project Title	Lead Org. and Contact	Sponsors	Duration (yrs)	Total Project Value $	MRIWA Contribution $
M10442	Acid mine drainage and treatment of tailings	Improved Prediction, Remediation and Closure of Acid and Neutral Metalliferous Drainage (AMD/NMD) Sites	Flinders University Sarah Harmer	Australian Genome Research Facility Limited Australian Research Council BHP Group Operations Pty Ltd CRC for Transitions in Mining Economies (CRC TiME) Fortescue Metals Group Ltd MMG Australia Ltd Newmont Mining Services Pty Ltd Rio Tinto Services Limited Teck Resources Limited	5	4,558,586	125,000[32]
M10476	Safety, social and environmental sustainability	Opportunities for Growth in Australia's Mine Closure Solutions Industry (CRC TiME Project Number 3.17)	Commonwealth Scientific Industrial Research Organisation (CSIRO) Dominic Banfield	CRC TiME	0.5	410,350	50,000
M10447	Acid mine drainage and treatment of tailings	Wetland in a Box (EnphytoBox®) - a smart water treatment system to support the decarbonisation of water in mining	Syrinx Environmental PL Kathy Meney	Syrinx Environmental PL	0.83	86,600	43,300

[32] MRIWA contributions are drawn down from MRIWA's commitment to the CRC TiME.

Education Program

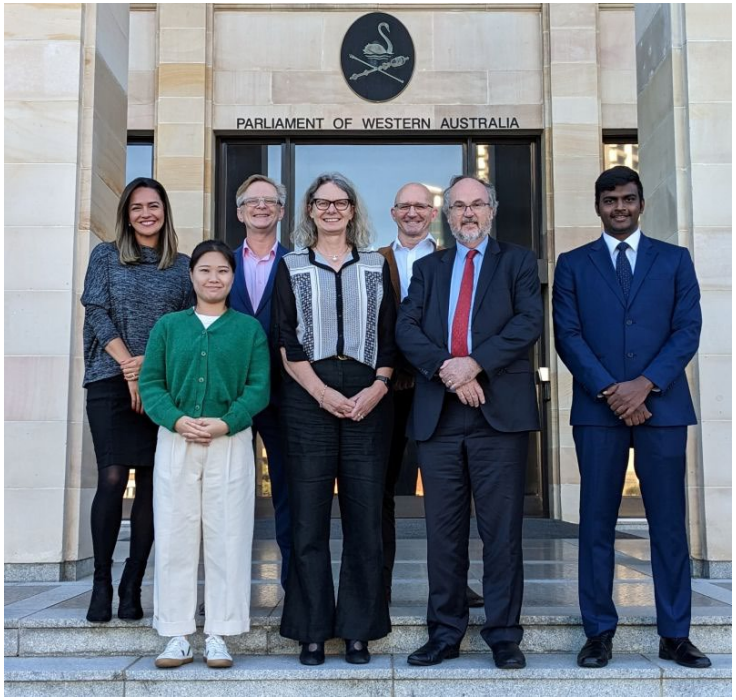
MRIWA provides a program of scholarships and education opportunities to shape and empower future mining industry thought leaders.

The MRIWA Education Program supports the development of exceptional talent to help meet the future needs of the Western Australian mining industry through:

- Attracting domestic and international applicants of exceptional academic capability to the Western Australian research community.
- Effectively marketing MRIWA and the participating universities and research institutions.
- Expanding the diversity of research supported by MRIWA.
- Producing highly skilled graduates aligned to the needs of the Western Australia mining sector.

Education program components

- A minimum of three prestigious MRIWA scholarships available each year to support post-graduate research students at Western Australian universities.
- Tailored professional and communication skills training for research students accepted into the MRIWA program.
- Outreach and mentoring to encourage students of exceptional ability to consider careers in the mining industry.
- Sponsorship of the work of Australian Earth Science Education[33] (formerly Earth Science Western Australia) supporting earth science teaching in Western Australian schools.



Pictured (L-R) MRIWA RPM Laura Machuca Suarez, MRIWA PhD Scholar Hyunjin Na, MRIWA RPM Geoff Batt, MRIWA CEO Nicole Roocke, MRIWA PhD Scholar Alex Eves, the Hon. Bill Johnston MLA, Minister for Mines and Petroleum, and MRIWA PhD Scholar Nilan Jayasiri Mudiyanselage at the 2023 MRIWA Scholarship Induction event, Parliament House 19 April 2023

[33] https://ausearthed.com.au/wa/

MRIWA Scholarships

MRIWA Scholarships are awarded through a competitive application process to students undertaking research aligned to MRIWA's Research Priority Plan at any university in Western Australia.

The MRIWA scholarship program currently supports the studies and professional development of a cohort of 15 students undertaking PhD degrees at three different Western Australian universities. Four students supported under the program successfully completed their studies in 2022-23.

This scholarship program delivers on MRIWA's mission for applied research to create capability and deliver economic and social benefit for Western Australia by supporting the development of professionals prepared for the future workforce needs of the minerals industry.

On an annual basis, subject to availability of funds and receipt of suitable applications, MRIWA may award:

- 1 MRIWA Directors' PhD Scholarship valued at no less than $45,000 per year
- 3 Postgraduate research scholarships valued at no less than $44,216 per year
    - MRIWA Odwyn Jones PhD Scholarship
    - MRIWA PhD Scholarship for Women
    - MRIWA Indigenous Postgraduate Scholarship

MRIWA's support for scholarships directed at groups traditionally under-represented in mining industry leadership positions contributes to a diverse and innovative minerals industry delivering value to all Western Australians.

MRIWA also funds the scholarships of two students undertaking PhD research within the ARC Centre for Transforming Maintenance through Data Science, and indirectly supports a further 57 PhD students and 8 students completing other higher degrees by research through scholarships funded under individual projects in the research portfolio summarised in the previous section.

Scholarship Overview

$1.29M	3	57	2	15
Value of PhD Scholarships directly funded by MRIWA	Projects completed	PhD Scholarships funded through Research Projects	MRIWA-Funded ARC ITTC PhD Scholarships	Current PhD Scholarships directly funded by MRIWA

2023 MRIWA Scholarship Recipients

Hyunjin Na – MRIWA PhD Scholarship for Women

Project Title
Development of cementation-magnetic separation method for sulfide mineral processing and AMD prevention

Host University	University of Western Australia	**MRIWA Contribution**
Project Number	M10485	$143,735 over 3.25 years
Status	Commenced	

A graduate of the Korea Maritime and Ocean University with a Master's degree in Engineering, Hyunjin was awarded the 2023 MRIWA PhD Scholarship for Women to support her PhD studies at Curtin University's WA School of Mines: Mechanical, Electrical and Chemical Engineering (WASM: MECE).

Hyunjin's research into simple, flexible technologies for separating sulfide minerals has potential application on mine sites throughout Western Australia, increasing mineral recovery and improving environmental outcomes by removing sulfide compounds from the tailings left behind after mining.

Alex Eves – MRIWA Odwyn Jones PhD Scholarship

Project Title
Petrogenesis and metallogenic significance of the Speewah V-Ti Deposit

Host University	University of Western Australia	**MRIWA Contribution**
Project Number	M10484	$48,361 over 2.92 years
Status	Commenced	

Alex is a graduate of the University of Western Australia with a first-class honours degree in Geology, and has over a decade of career experience in Western Australia minerals exploration.

He was awarded the 2023 MRIWA Odwyn Jones PhD Scholarship as a top-up to an Australian Research Training Program (RTP) award supporting his PhD studies under the supervision of Professors Marco Fiorentini and Tony Kemp at UWA's Centre for Exploration Targeting.

Alex is working to understand the formation of the Speewah Vanadium-Titanium (V-Ti) Deposit in the East Kimberley region of Western Australia, delivering new exploration models and insights to help geologists locate new economic mineralisation across the State.

Nilan Jayasiri – MRIWA PhD Scholarship

Project Title
Accelerating Consolidation of Mine Tailings using Electro-osmosis Dewatering Technology

Host University	University of Western Australia	**MRIWA Contribution**
Project Number	M10487	$58,034 over 3.5 years
Status	Commenced	

Nilan holds Bachelor's and Master's degrees in Engineering and Geotechnical and Earth Resources Engineering from the Asian Institute of Technology in Sri Lanka.

He was awarded a MRIWA PhD Scholarship to support his PhD studies under Professor Andy Fourie at UWA's Australian Centre for Geomechanics.

By contributing to new approaches for improving the strength and stability of mine tailings. Nilan's research could help increase the safety of tailings storage facilities at mines throughout Western Australia.

Daniel Goldstein – MRIWA PhD Scholarship

Project Title
Ore Body Characterisation using Machine Learning and Measure-While-Drilling Data

Host University	Curtin University	**MRIWA Contribution**
Project Number	M10486	$45,598 over 2.9 years
Status	Commenced	

Daniel is a graduate of Colgate University (USA) with a Bachelor of Arts in Biochemistry, the University of Wollongong with a Bachelor of Science in Geology, and the University of New South Wales with a Master's degree in Mining Engineering.

A previous winner of the Dr Baden Clegg award from the Australian Geomechanics Society and the 2022 Curtinnovation Student Prize, Daniel was awarded a MRIWA PhD Scholarship to support his ongoing PhD studies at WASM: MECE.

Daniel's research is connecting datasets to deliver accurate real-time models of subsurface geology and rock properties during mining. This technology will support operational decision-making and optimisation of mine performance, improving safety, and enhancing sustainability outcomes to help keep the Western Australian minerals sector at the forefront of global performance and practice.

MRIWA Directors' PhD Scholarship

The MRIWA Directors' PhD Scholarship is funded by some members of the MRIWA Board foregoing their sitting fees. This scholarship is awarded at the discretion of the MRIWA Board and is not guaranteed to be offered every year. A total of four Directors' Scholarships have been awarded since 2014.

Current recipients

Project No	Scholarship Recipient	Project Title	Host University	Duration (yrs)	Status	MRIWA Contribution $
M0501	Yihao Fu	Characterisation of ore and bulk solid systems by use of multivariate image analysis and deep learning neural networks	Curtin University	3.5	Commenced	104,006

MRIWA PhD Scholarship

MRIWA PhD Scholarships are awarded through a competitive application process to students undertaking research aligned to MRIWA's Research Priority Plan at any university in Western Australia. One or more MRIWA PhD Scholarships may be awarded annually at the discretion of the MRIWA Board.

Project No	Scholarship Recipient	Project Title	Host University	Duration (yrs)	Status	MRIWA Contribution $
M10408	Alexandra Halliday	Integrating field monitoring and numerical modelling to better quantify the stability of tailings storage facilities	University of Western Australia	3.5	Commenced	52,973

MRIWA PhD Scholarship for Women

The MRIWA PhD Scholarship for Women is awarded annually. It was first awarded in 2018 and aims to promote opportunities for women in higher-degree research in the minerals sector.

Current recipients

Project No	Scholarship Recipient	Project Title	Host University	Duration (yrs)	Status	MRIWA Contribution $
M0524	Kudzai Angeline Mchibwa	Innovative processes for leach liquor purification and production of battery grade LiOH from Li mineral resources	Murdoch University	4	Commenced	120,000
M0547	Polyanna Moro	Geodynamics and basin evolution of the Paterson Orogen from the Paleoproterozoic to Neoproterozoic based on 3D geophysical modelling and data inversion	University of Western Australia	4	Commenced	76,200
M0563	Alicja Polewacz	Processes at the interface between fluids and lithium minerals	Murdoch University	3.5	Commenced	140,000
M10407	Devika Bhatia	Taxation of Australian Mining Firms	University of Western Australia	2.67	Commenced	107,627
M10452	Bishenka Mahaulpatha	Feasibility of effective metal recovery from tailings material via electrokinetic in-situ leaching	University of Western Australia	3.5	Commenced	144,228

MRIWA Odwyn Jones PhD Scholarship

The MRIWA Odwyn Jones PhD Scholarship is awarded annually. This prestigious scholarship is named for Emeritus Professor Odwyn Jones AO, in recognition of his outstanding contribution to education in support of the mining industry in Western Australia.

Current recipients

Project No	Scholarship Recipient	Project Title	Host University	Duration (yrs)	Status	MRIWA Contribution $
M0548	Xingjie Chen	Investigating the underground support provided by shotcrete using tailings and waste rock	University of Western Australia	3.5	Commenced	105,000
M0561	John Grigson	Giant rare-metal pegmatite deposits of the East Pilbara Terrane, Western Australia: mineral systems analysis and criteria for terrane-scale exploration	University of Western Australia	3.5	Commenced	52,500
M10406	Liz Wall	Evaluating the mining industry's view of their success in delivering a positive legacy for host communities at the time of mine closure	University of Western Australia	3.5	Commenced	52,972
M10453	Kylie Ward	Beneficiation of Gold Telluride Ores	Curtin University	2.67	Commenced	41,208

2023 Completed MRIWA PhD's

Project No	Scholarship Recipient	Project Title	Host University	Duration (yrs)	Status	MRIWA Contribution $
M0502	Zela Ichlas	Development of an industrially applicable electrostatic solvent extraction column for process metallurgy	Curtin University	3.5	Completed	105,000
M0523	Keith Giglia	Monitoring and control of hydrocyclones by use of convolutional neural networks and deep reinforcement learning	Curtin University	3.5	Completed	106,050
M10454	Martin Ralph	Removal of naturally occurring radioactive materials (NORM) deposited in corrosion scale in mineral processing circuits	Edith Cowan University	2.4	Completed	47,801

Financial Statements and Notes

Certification of Financial Statements

For the year ended 30 June 2023

The accompanying financial statements of the Minerals Research Institute of Western Australia (MRIWA or the Institute) have been prepared in compliance with the provisions of the *Financial Management Act 2006* (WA) from proper accounts and records to present fairly the financial transactions for the financial year ended 30 June 2023 and the financial position as at 30 June 2023.

At the date of signing, we are not aware of any circumstances which would render the particulars included in the financial statements misleading or inaccurate.

Miriam Stanborough
Chairperson of the Board

Date: 14 August 2023

Linda Tompkins
Deputy Chairperson of the Board

Date: 14 August 2023

Nicole Roocke
Chief Financial Officer

Date: 14 August 2023

Independent Auditor's Report

Auditor General

INDEPENDENT AUDITOR'S REPORT

2023

Minerals Research Institute of Western Australia

To the Parliament of Western Australia

Report on the audit of the financial statements

Opinion

I have audited the financial statements of the Minerals Research Institute of Western Australia (Institute) which comprise:

- the Statement of Financial Position at 30 June 2023, and the Statement of Comprehensive Income, Statement of Changes in Equity and Statement of Cash Flows for the year then ended
- Notes comprising a summary of significant accounting policies and other explanatory information.

In my opinion, the financial statements are:

- based on proper accounts and present fairly, in all material respects, the operating results and cash flows of the Minerals Research Institute of Western Australia for the year ended 30 June 2023 and the financial position at the end of that period
- in accordance with Australian Accounting Standards (applicable to Tier 2 Entities), the *Financial Management Act 2006* and the Treasurer's Instructions.

Basis for opinion

I conducted my audit in accordance with the Australian Auditing Standards. My responsibilities under those standards are further described in the Auditor's responsibilities for the audit of the financial statements section of my report.

I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Responsibilities of the Board for the financial statements

The Board is responsible for:

- keeping proper accounts
- preparation and fair presentation of the financial statements in accordance with Australian Accounting Standards (applicable to Tier 2 Entities), the *Financial Management Act 2006* and the Treasurer's Instructions

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- such internal control as it determines is necessary to enable the preparation of financial statements that are free from material misstatement, whether due to fraud or error.

In preparing the financial statements, the Board is responsible for:

- assessing the entity's ability to continue as a going concern
- disclosing, as applicable, matters related to going concern
- using the going concern basis of accounting unless the Western Australian Government has made policy or funding decisions affecting the continued existence of the Institute.

Auditor's responsibility for the audit of the financial statements

As required by the *Auditor General Act 2006*, my responsibility is to express an opinion on the financial statements. The objective of my audit is to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatements, whether due to fraud or error, and to issue an auditor's report that includes my opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Australian Auditing Standards will always detect a material misstatement when it exists.

Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic of users taken on the basis of the financial statements. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations or the override of internal control.

A further description of my responsibilities for the audit of the financial statements is located on the Auditing and Assurance Standards Board website. This description forms part of my auditor's report and can be found at https://www.auasb.gov.au/auditors_responsibilities/ar4.pdf.

Report on the audit of controls

Opinion

I have undertaken a reasonable assurance engagement on the design and implementation of controls exercised by the Minerals Research Institute of Western Australia. The controls exercised by the Board are those policies and procedures established to ensure that the receipt, expenditure and investment of money, the acquisition and disposal of property, and the incurring of liabilities have been in accordance with the State's financial reporting framework (the overall control objectives).

In my opinion, in all material respects, the controls exercised by the Minerals Research Institute of Western Australia are sufficiently adequate to provide reasonable assurance that the receipt, expenditure and investment of money, the acquisition and disposal of property and in the incurring of liabilities have been in accordance with the State's financial reporting framework during the year ended 30 June 2023.

The Board's responsibility

The Board is responsible for designing, implementing and maintaining controls to ensure that the receipt, expenditure and investments of money, the acquisition and disposal of property and the incurring of liabilities are in accordance with the *Financial Management Act 2006*, the Treasurer's Instructions and other relevant written law.

Auditor General's responsibility

As required by the *Auditor General Act 2006*, my responsibility as an assurance practitioner is to express an opinion on the suitability of the design of the controls to achieve the overall control objectives and the implementation of the controls as designed. I conducted my engagement in accordance with Standard on Assurance Engagement ASAE 3150 *Assurance Engagements on Controls* issued by the Australian Auditing and Assurance Standards Board. That standard requires that I comply with relevant ethical requirements and plan perform my procedures to obtain reasonable assurance about whether, in all material respects, the controls are suitably designed to achieve the overall control objectives and were implemented as designed.

An assurance engagement involves performing procedures to obtain evidence about the suitability of the controls designed to achieve the overall control objectives and the implementation of those controls. The procedures selected depend on my judgement, including an assessment of the risks that controls are not suitably designed or implemented as designed. My procedures included testing the implementation of those controls that I consider necessary to achieve the overall control objective.

I believe that the evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Limitations of controls

Because of the inherent limitations of any internal control structure, it is possible that, even if the controls are suitably designed and implemented as designed, once in operation, the overall control objectives may not be achieved so that fraud, error or non-compliance with laws and regulations may occur and not be detected. Any projection of the outcome of the evaluation of the suitability of the design of controls to future periods is subject to the risk that the controls may become unsuitable because of changes in controls.

Report on the audit of the key performance indicators

Opinion

I have undertaken a reasonable assurance engagement on the key performance indicators of the Minerals Research Institute of Western Australia for the year ended 30 June 2023. The key performance indicators are the Under Treasurer approved key effectiveness indicators and key efficiency indicators that provide performance information about achieving outcomes and delivering services.

In my opinion, in all material respects, the key performance indicators of the Minerals Research Institute of Western Australia are relevant and appropriate to assist users to assess the Institute's performance and fairly represent indicated performance for the year ended 30 June 2023.

The Board's responsibilities for the key performance indicators

The Board is responsible for the preparation and fair presentation of the key performance indicators in accordance with the *Financial Management Act 2006* and the Treasurer's Instructions and for such internal controls as the Board determines necessary to enable the preparation of key performance indicators that are free from material misstatement, whether due to fraud or error.

In preparing the key performance indicators, the Board is responsible for identifying key performance indicators that are relevant and appropriate, having regard to their purpose in accordance with Treasurer's Instructions 904 *Key Performance Indicators*.

Auditor General's responsibility

As required by the *Auditor General Act 2006*, my responsibility as an assurance practitioner is to express an opinion on the key performance indicators. The objectives of my engagement are to obtain reasonable assurance about whether the key performance indicators are relevant and appropriate to assist users to assess the entity's performance and whether the key performance indicators are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes my opinion. I conducted my engagement in accordance with Standard on Assurance Engagements ASAE 3000 *Assurance Engagements Other than Audits or Reviews of Historical Financial Information* issued by the Australian Auditing and Assurance Standards Board. That standard requires that I comply with relevant ethical requirements relating to assurance engagements.

An assurance engagement involves performing procedures to obtain evidence about the amounts and disclosures in the key performance indicators. It also involves evaluating the relevance and appropriateness of the key performance indicators against the criteria and guidance in Treasurer's Instruction 904 for measuring the extent of outcome achievement and the efficiency of service delivery. The procedures selected depend on my judgement, including the assessment of the risks of material misstatement of the key performance indicators. In making these risk assessments, I obtain an understanding of internal control relevant to the engagement in order to design procedures that are appropriate in the circumstances.

I believe that the evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

My independence and quality management relating to the report on financial statements, controls and key performance indicators

I have complied with the independence requirements of the *Auditor General Act 2006* and the relevant ethical requirements relating to assurance engagements. In accordance with ASQM 1 *Quality Management for Firms that Perform Audits or Reviews of Financial Reports and Other Financial Information, or Other Assurance or Related Services Engagements*, the Office of the Auditor General maintains a comprehensive system of quality management including

documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Other information

Those charged with governance are responsible for the other information. The other information is the information in the entity's annual report for the year ended 30 June 2023, but not the financial statements, key performance indicators and my auditor's report.

My opinions on the financial statements, controls and key performance indicators do not cover the other information and accordingly I do not express any form of assurance conclusion thereon.

In connection with my audit of the financial statements, controls and key performance indicators my responsibility is to read the other information and, in doing so, consider whether the other information is materially inconsistent with the financial statements and key performance indicators or my knowledge obtained in the audit or otherwise appears to be materially misstated.

If, based on the work I have performed, I conclude that there is a material misstatement of this other information, I am required to report that fact. I did not receive the other information prior to the date of this auditor's report. When I do receive it, I will read it and if I conclude that there is a material misstatement in this information, I am required to communicate the matter to those charged with governance and request them to correct the misstated information. If the misstated information is not corrected, I may need to retract this auditor's report and re-issue an amended report.

Matters relating to the electronic publication of the audited financial statements and key performance indicators

The auditor's report relates to the financial statements and key performance indicators of the Minerals Research Institute of Western Australia for the year ended 30 June 2023 included in the annual report on the Institute's website. The Institute's management is responsible for the integrity of the Institute's website. This audit does not provide assurance on the integrity of the Institute's website. The auditor's report refers only to the financial statements, controls and key performance indicators described above. It does not provide an opinion on any other information which may have been hyperlinked to/from the annual report. If users of the financial statements and key performance indicators are concerned with the inherent risks arising from publication on a website, they are advised to contact the entity to confirm the information contained in the website version.

Nayna Raniga
Senior Director Financial Audit
Delegate of the Auditor General for Western Australia
Perth, Western Australia
15 August 2023

Statement of Comprehensive Income

For the year ended 30 June 2023

	Notes	2023 $	2022 $
COST OF SERVICES			
Expenses			
Research grants		5,291,879	5,313,511
Scholarships		299,655	253,013
Employee benefits expense	2.1.1	1,259,564	851,099
Board and committee fees and costs	2.2	112,201	115,269
Supplies and services	2.3	529,435	347,274
Other expenses	2.3	93,589	65,680
Accommodation expenses		109,894	54,000
Total cost of services		**7,696,217**	**6,999,846**
Income			
Revenue & Income			
Interest revenue		477,856	78,300
Other revenue	3.3	266,308	120,206
Income from Industry Sponsorship	3.2	1,751,225	2,290,297
Total Revenue & Income		**2,495,389**	**2,488,803**
Total income other than income from State Government		**2,495,389**	**2,488,803**
NET COST OF SERVICES		**5,200,828**	**4,511,043**

	Notes	2023 $	2022 $
Income from State Government			
State Government Grant	3.1	6,915,000	6,980,000
Resources received free of charge	3.1	110,034	54,000
Total income from State Government		**7,025,034**	**7,034,000**
SURPLUS FOR THE PERIOD		**1,824,206**	**2,522,957**
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD		**1,824,206**	**2,522,957**

The Statement of Comprehensive Income should be read in conjunction with the accompanying notes.

Statement of Financial Position

As at 30 June 2023

	Notes	2023 $	2022 $
ASSETS			
Current Assets			
Cash and cash equivalents	5.1.1	7,225,344	4,500,162
Restricted cash and cash equivalents	5.1.2	8,835,922	10,753,921
Receivables	4.1	489,901	570,474
Other current assets	4.2	179,752	57,447
Total Current Assets		**16,730,919**	**15,882,004**
Non-Current Assets			
Total Non-Current assets		-	-
TOTAL ASSETS		**16,730,919**	**15,882,004**

	Notes	2023	2022 $
LIABILITIES			
Current Liabilities			
Payables	4.3	77,445	48,955
Employee benefit provisions - Current	2.1.2	81,243	79,527
Deferred income	4.4	2,275,266	3,269,073
Total Current Liabilities		**2,433,954**	**3,397,555**
Non-Current Liabilities			
Employee benefit provisions - Non-Current	2.1.2	89,183	100,873
Total Non-Current Liabilities		**89,183**	**100,873**
TOTAL LIABILITIES		**2,523,137**	**3,498,428**
NET ASSETS		**14,207,782**	**12,383,576**
EQUITY			
Accumulated surplus	7.8	14,207,782	12,383,576
TOTAL EQUITY		**14,207,782**	**12,383,576**

The Statement of Financial Position should be read in conjunction with the accompanying notes.

Statement of Changes in Equity

For the year ended 30 June 2023

	Notes	Accumulated Surplus $
Balance at 1 July 2021		9,860,619
Surplus for the period	7.8	2,522,957
Balance at 30 June 2022		**12,383,576**
Balance at 1 July 2022		12,383,576
Surplus for the period	7.8	1,824,206
Balance at 30 June 2023		**14,207,782**

The Statement of Changes in Equity should be read in conjunction with the accompanying notes.

Statement of Cash Flows

For the year ended 30 June 2023

	Notes	2023 $	2022 $
CASH FLOWS FROM STATE GOVERNMENT			
State Government Grant		6,915,000	6,980,000
Net cash provided by State Government		**6,915,000**	**6,980,000**
Utilised as follows:			
Payments			
Research Grant Payments and Scholarship		(5,591,534)	(6,131,674)
Employee benefits		(1,263,045)	(812,393)
Board and Advisory committee fees		(49,468)	(55,543)
Supplies, Services and Other Expenses		(622,422)	(404,575)
GST paid on purchases		(596,872)	(570,453)
Receipts			
Receipts from Sponsors		720,109	1,514,842
Receipts from Events		236,075	60,480
Interest received		377,086	53,143
GST received on sales		112,265	113,569
Net GST refunded from ATO (or paid)		569,989	355,659
Net cash used in operating activities		**(6,107,817)**	**(5,876,945)**
Net increase in cash and cash equivalents		807,183	1,103,055
Cash and cash equivalents at the beginning of the period		15,254,083	14,151,028
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD	5.1.1	**16,061,266**	**15,254,083**

The Statement of Cash Flows should be read in conjunction with the accompanying notes.

Notes to the Financial Statements

For the year ended 30 June 2023

Note 1. Basis of preparation

The Institute is a WA Government entity and is controlled by the State of Western Australia, which is the ultimate parent company. The Institute is a not-for-profit entity (as profit is not its principal objective).

A description of the nature of its operations and its principal activities have been included in the 'Overview' and 'Our Projects' sections of the Institute's Annual Report which does not form part of these financial statements.

These annual financial statements were authorised for issue by the Accountable Authority of the Institute on 14 August 2023.

Statement of compliance

These general-purpose financial statements are prepared in accordance with:

1) The *Financial Management Act 2006* (WA) **(FMA)**
2) The Treasurer's Instructions **(TIs)**
3) Australian Accounting Standards (**AASs**) - Reduced Disclosure Requirements
4) Where appropriate, those **AAS** paragraphs applicable for not-for-profit entities have been applied.

The *Financial Management Act 2006* (WA) and the Treasurer's Instructions take precedence over AASs. Several AASs are modified by TIs to vary application, disclosure format and wording. Where modification is required and has had a material or significant financial effect upon the reported results, details of that modification and the resulting financial effect are disclosed in the notes to the financial statements.

Basis of preparation

The financial statements are presented in Australian dollars applying the accrual basis of accounting and using the historical cost convention. Certain balances will apply a different measurement basis (such as the fair value basis). Where this is the case the different measurement basis is disclosed in the associated note.

Judgements and estimates

Judgements, estimates, and assumptions are required to be made about financial information being presented. The significant judgements and estimates made in the preparation of these financial statements are disclosed in the notes where amounts affected by those judgements and/or estimates are disclosed. Estimates and associated assumptions are based on professional judgements derived from historical experience and various other factors that are believed to be reasonable under the circumstances.

Accounting for GST

Income, expenses, and assets are recognised net of the amount of goods and services tax (GST), except that the:

a) amount of GST incurred by the Institute as a purchaser that is not recoverable from the Australian Taxation Office (ATO) is recognised as part of an asset's cost of acquisition or as part of an item of expense; and
b) receivables and payables are stated with the amount of GST included.

Cash flows are included in the Statement of cash flows on a gross basis. However, the GST components of cash flows arising from investing and financing activities which are recoverable from, or payable to, the ATO are classified as operating cash flows.

Comparative Information

When the presentation or classification of items in the financial report is amended, comparative amounts are reclassified unless the reclassification is impracticable. Except when an AAS permits or requires otherwise, comparative information is presented in respect of the previous period for all amounts reported in the financial statements. AASB 1060 provides relief from presenting comparatives for:

- Property, Plant and Equipment reconciliations.
- Intangible Asset reconciliations; and
- Right-of-Use Asset reconciliations.

Note 2. Use of our funding

Expenses incurred in the delivery of services

This section provides the additional information about how the Institute's funding is applied and the accounting policies that are relevant for an understanding of the items recognised in the financial statements. The primary expenses incurred by the Institute in achieving its objectives and the relevant notes are:

	Notes	2023 $	2022 $
Research grants		5,291,879	5,313,511
Scholarships		299,655	253,013
Employee benefits expenses	2.1.1	1,259,564	851,099
Employee benefits provisions	2.1.2	170,426	180,400
Board and committee fees and costs	2.2	112,201	115,269
Other expenditure	2.3	623,024	412,954
Accommodation expenses		109,894	54,000

Research grants expense is recognised when the Institute becomes obliged to make payment to the grantee. The Institute becomes obliged to make payment when the grantee has met the conditions of the grant agreement.

Scholarship expense represents the Institute's obligation to fund approved scholarships.

Accommodation expense represents the Institute's rental expense.

2.1.1 Employee benefits expenses

	2023 $	2022 $
Wages and salaries	902,581	549,291[(b)]
Executive Salaries	227,770	221,774[(b)]
Superannuation - defined contribution plans[(a)]	129,213	80,034
	1,259,564	**851,099**

(a) Defined contribution plans include West State Superannuation Scheme (WSS), Gold State Superannuation Scheme (GSS), Government Employees Superannuation Board Schemes (GESBs) and other eligible funds.
(b) Comparative figures have been reclassified to remove allowances from executive salaries.

Wages and salaries: Employee expenses include all costs related to employment including wages and salaries and leave entitlements.

Executive Salaries: Executive salaries include the base salary of the institute's CEO.

Superannuation: The amount recognised in profit or loss of the Statement of Comprehensive Income comprises employer contributions paid to the GSS (concurrent contributions), the WSS Scheme, the GESBs or other superannuation funds.

2.1.2 Employee related provisions

Provision is made for benefits accruing to employees in respect of wages and salaries, annual leave and long service leave for services rendered up to the reporting date and recorded as an expense during the period the services are delivered.

	2023 $	2022 $
Current		
Annual leave[(a)]	81,243	79,527
Long service leave[(b)]	-	-
	81,243	**79,527**
Non-Current		
Long service leave[(c)]	89,183	100,873
	89,183	**100,873**
	170,426	**180,400**

(a) **Annual leave liabilities:** Classified as current as there is no unconditional right to defer settlement for at least 12 months after the reporting period.

The provision for annual leave is calculated at the present value of expected payments to be made in relation to services provided by employees up to the reporting date.

(b) **Long service leave liabilities**: Unconditional long service leave provisions are classified as **current** liabilities as the Institute does not have an unconditional right to defer settlement of the liability for at least 12 months after the end of the reporting period.

(c) Pre-conditional and conditional long service leave provisions are classified as **non-current** liabilities because the Institute has an unconditional right to defer the settlement of the liability until the employee has completed the requisite years of service.

The provision for long service leave is calculated at present value as the Institute does not expect to wholly settle the amounts within 12 months. The present value is measured taking into account the present value of expected future payments to be made in relation to services provided by employees up to the reporting date. These payments are estimated using the remuneration rate expected to apply at the time of settlement, and discounted using market yields at the end of the reporting period on national corporate bonds with terms to maturity that match, as closely as possible, the estimated future cash outflows.

Key sources of estimation uncertainty – long service leave
Key estimates and assumptions concerning the future are based on historical experience and various other factors that have a significant risk of causing a material adjustment to the carrying amount of assets and liabilities within the next financial year.

Several estimates and assumptions are used in calculating the Institute's long service leave provision. These include:

- Expected future salary rates
- Discount rates
- Employee retention rates; and
- Expected future payments

Changes in these estimations and assumptions may impact on the carrying amount of the long service leave provision. Any gain or loss following revaluation of the present value of long service leave liabilities is recognised as employee benefits expense.

2.2 Board and committee fees and costs

	2023 $	2022 $
Board of Directors' remuneration	80,024	81,925
Advisory Committee attendance fees	27,429	28,288
Board and Advisory Committee's expenses	4,748	5,056
	112,201	**115,269**

2.3 Other expenditure

	2023 $	2022 $
Supplies and services		
Printing and stationery	8,438	7,609
Advertising	1,655	709
Communications	23,908	9,965
Business travel	24,327	3,714
Accounting services	119,859	83,227
Consultants	77,185	69,656
Legal services	25,862	14,706
Insurance	15,195	15,703
Sponsorships	-	20,000
Events	164,484	85,154
Subscriptions	34,294	17,615
Other	34,228	19,216
Total supplies and services	**529,435**	**347,274**
Other expenses		
Audit fees	36,300	27,800
Loss allowance	-	-
Employee expenses	39,522	31,627
Worker's Compensation	4,768	4,821
Office fit out	12,999	1,432
	93,589	**65,680**
Total other expenditure	**623,024**	**412,954**

2.3 Other expenditure (continued)

Supplies and services: Supplies and services are recognised as an expense in the reporting period in which they are incurred.

Other expenses: Other expenditures generally represent the day-to-day running costs incurred in normal operations.

Employee expenses: Includes workers' compensation insurance. Superannuation contributions accrued as part of the provision for leave are employee benefits and are not included in employment on-costs.

Note 3. Our funding sources

How we obtain our funding

This section provides additional information about how the Institute obtains its funding and the relevant accounting policy notes that govern the recognition and measurement of this funding. The primary income received by the Institute and the relevant notes are:

	Notes	2023 $	2022 $
Income from State Government	3.1	**7,025,034**	**7,034,000**

3.1 Income from State Government

	2023 $	2022 $
State Government Grants	6,915,000	6,980,000
	6,915,000	**6,980,000**

Services received free of charge from other State Government agencies during the period:

	2023 $	2022 $
Department of Mines, Industry Regulation and Safety	109,894	54,000
State Solicitors Office	140	-
	110,034	**54,000**
	7,025,034	**7,034,000**

State Government Grant: Revenue is recognised at fair value when MRIWA obtains control over the assets comprising the contributions, usually when cash is received.

3.1 Income from State Government (continued)

Resources received free of charge or for nominal cost: Resources received free of charge or for nominal cost that MRIWA would otherwise purchase if not donated, are recognised as income at fair value where they can be reliably measured. A corresponding expense is recognised for services received. Receipts of assets are recognised in the Statement of Financial Position.

Resources received from other State Government agencies are separately disclosed under Income from State Government in the Statement of Comprehensive Income.

3.2 Income from Industry Sponsorship

	2023 $	2022 $
Sponsorship income	1,751,225	2,290,297

Income from Industry Sponsorship: MRIWA provides a service to sponsors by administering sponsorship funds for research projects and conferences. These services are completed under a contractual arrangement. Income from sponsors is recognised at the point in time MRIWA has completed this service

3.3 Other Revenue

	2023 $	2022 $
Misc. Revenue	62,733	59,726
Conference Sponsorship	102,550	-
Event Ticket Sales	101,025	60,480
	266,308	**120,206**

Misc. Revenue: Includes sitting fees donated by Board and advisory committee members.

Note 4. Other assets and liabilities

This section sets out those assets and liabilities that arose from the Institute's controlled operations and includes other assets utilised for economic benefits and liabilities incurred during normal operations:

	Notes	2023 $	2022 $
Receivables	4.1	489,901	570,474
Other current assets	4.2	179,752	57,447
Payables	4.3	77,445	48,955
Deferred income	4.4	2,275,266	3,269,073

4.1 Receivables

	2023 $	2022 $
Current		
Grant Receivables - Sponsorship	176,000	181,519
Less: Loss Allowance	-	-
	176,000	**181,519**
GST receivable	313,901	388,955
	489,901	**570,474**

Trade receivables are recognised at original invoice amount less an allowance for any uncollectible amounts (i.e. expected credit loss). The collectability of receivables is reviewed on an ongoing basis and any receivables identified as uncollectible are written off against the allowance account. In the current year no expected credit loss was recognised. The carrying amount is equivalent to fair value as it is due for settlement within 30 days.

4.2 Other current assets

	2023 $	2022 $
Interest Receivable	138,411	37,641
Prepayments	41,341	19,806
	179,752	**57,447**

Revenue is recognised as the interest accrues.

4.3 Payables

	2023 $	2022 $
Current		
Accrued general expenses	57,123	35,126
Accrued salaries	20,322	13,829
	77,445	**48,955**

All Payables are recognised when MRIWA becomes obliged to make future payments as a result of a purchase of assets or services. The carrying amount is equivalent to fair value, as they are generally settled within 30 days.

Accrued salaries represent the amount due to staff but unpaid at the end of the financial year. Accrued salaries are settled within a fortnight of the financial year end.

General expenses represent the amounts due to researchers and suppliers but unpaid at the end of the financial year. These payments are settled within 30 days of the financial year end. MRIWA considers the carrying amount of accrued expenses to be equivalent to its fair value.

4.4 Deferred Income

	2023 $	2022 $
Deferred Income - Sponsorship	2,275,266	3,269,073
	2,275,266	**3,269,073**

Deferred Income is recognised when the sponsorship funds are received or receivable and the Institute has not fulfilled its obligations under the terms of the sponsorship agreement. Refer to Note 3.2.

Note 5. Financing

This section sets out the material balances and disclosures associated with the financing and cash flows of the Institute.

	Notes	2023 $	2022 $
Cash and cash equivalents	5.1.1	7,225,344	4,500,162
Restricted cash and cash equivalents	5.1.2	8,835,922	10,753,921
Commitments	5.2	10,979,346	13,567,957

5.1 Cash and cash equivalents

5.1.1 Reconciliation of cash

	2023 $	2022 $
Cash and cash equivalents	7,225,344	4,500,162
Restricted cash and cash equivalents - current	8,835,922	10,753,921
	16,061,266	**15,254,083**

For the purpose of the Statement of Cash Flows, cash and cash equivalents (and restricted cash and cash equivalents) assets comprise cash on hand and short-term deposits with original maturities of three months or less that are readily convertible to a known amount of cash, and which are subject to insignificant risk of changes in value.

5.1.2 Restricted cash and cash equivalents

	2023 $	2022 $
Research grants	8,383,360	10,400,635
Scholarships	452,562	353,286
	8,835,922	**10,753,921**

Cash held in the account is to be used only for the purpose of providing grants for research and development of projects to grantees.

5.2 Commitments

	2023 $	2022 $
Other expenditure commitments		
Within 1 year	7,192,483	7,251,785
Later than 1 year and not later than 5 years	3,302,363	5,831,672
Later than 5 years	484,500	484,500
	10,979,346	**13,567,957**

The total presented for other expenditure commitments are GST exclusive.

The total commitments reported above represent only projects with completed contractual liabilities in place. MRIWA has committed additional monies to research projects during this period. The contracts for these projects are still to be finalised. These monies have not been included in the amounts reflected above.

Note 6. Financial instruments and contingencies

This note sets out the key risk management policies and measurement techniques of the Institute.

	Notes
Financial Instruments	6.1
Contingent Liabilities and Assets	6.2

6.1 Financial instruments

The carrying amounts of each of the following categories of financial assets and financial liabilities at the end of the reporting period are:

	2023 $	2022 $
Financial assets		
Cash and cash equivalents	7,225,344	4,500,162
Restricted cash and cash equivalents	8,835,922	10,753,921
Receivables[(a)]	176,000	181,519
Other current assets	179,752	57,447
Total financial assets	**16,417,018**	**15,493,049**
Financial liabilities		
Liabilities measured at amortised cost	57,123	35,126
Total financial liability	**57,123**	**35,126**

(a) The amount of receivables/financial assets at amortised cost excludes GST recoverable from the ATO (statutory receivable).

6.2 Contingent assets and liabilities

MRIWA has no contingent liabilities or contingent assets.

Note 7. Other disclosures

This section includes additional material disclosures required by accounting standards or other pronouncements, for the understanding of this financial report.

	Notes
Events occurring after the end of the reporting period	7.1
Changes in Accounting Policy	7.2
Key management personnel	7.3
Related party transactions	7.4
Related bodies	7.5
Affiliated bodies	7.6
Remuneration of auditors	7.7
Equity	7.8
Supplementary financial information	7.9
Explanatory statement	7.10

7.1 Events occurring after the end of the reporting period

MRIWA has had no events occurring after the end of the reporting period.

7.2 Changes in Accounting Policy

There have been no changes to accounting policies during the financial year.

After assessing all new or amended standards issued but not yet effective, the Institute has determined that none of those issued standards impact future reported results.

7.3 Key management personnel

The Institute has determined key management personnel including the responsible Minister, board members, and senior officers of the Authority.

The Institute does not incur expenditures to compensate Ministers and those disclosures may be found in the *Annual Report on State Finances*.

The total fees, salaries, superannuation, non-monetary benefits, and other benefits for key management personnel of the Institute for the reporting period are presented within the following bands:

	2023	2022
Compensation band ($)		
0 – 50,000	8	8
250,001 – 300,000	1	1

	2023 $	2022 $
Total compensation of senior officers	**383,964**	**373,842**

Total compensation includes the superannuation expense incurred by the Institute in respect of key management personnel.

7.4 Related party transactions

The Institute is a wholly owned and controlled entity of the State of Western Australia. In conducting its activities, the Institute is required to pay various taxes and levies based on the standard terms and conditions that apply to all tax and levy payers to the State and entities related to State.

Related parties of the Institute include:

- all Cabinet Ministers and their close family members, and their controlled or jointly controlled entities;
- all senior officers and their close family members, and their controlled or jointly controlled entities;
- the Government Employees Superannuation Board (GESB);
- other departments and public sector entities, including related bodies included in the whole of government, consolidated financial statements; and
- associates and joint ventures that are included in the whole of government consolidated financial statements.

Significant transactions with related parties throughout the year ended 30 June 2023 include:

- Department of Mines, Industry Regulation and Safety
  - Appropriations (refer note 3.1)
  - Accommodation received free of charge (included in Accommodation Expense and Resources Received Free of Charge (refer note 3.1)
  - Funds received as sponsor contribution to research projects (included within Sponsorship income) ($97,167)
- Department of Treasury
  - Funds received quarterly in relation to interest income ($377,086)
- Department of Finance
  - Western Australian Payroll tax liability for the FY22/23 year ($20,142)
- Department of Jobs, Tourism, Science, and Innovation
  - Funds received under a Memorandum of Understanding for allocation to the Future Battery Industries Cooperative Research Centre (FBI CRC) ($25,000)
  - Funds received under a Memorandum of Understanding for allocation to the Heavy Industry Low-carbon Transition Cooperative Research Centre (HILT CRC) ($175,000).
- Office of the Auditor General
  - Audit fees in relation to the FY21/22 audit ($36,300)
- State Solicitor's Office
  - Provided legal services to MRIWA throughout the year ($7,534)
- ChemCentre
  - Research grants provided (included within Research Project Expenses) ($25,685)
- Government Employees Superannuation Board (GESB)
  - Superannuation payments to GESB on behalf of the employees of MRIWA. ($26,051)

7.5 Related bodies

The Institute has no related bodies.

7.6 Affiliated bodies

The Institute has no affiliated bodies.

7.7 Remuneration of auditors

Remuneration paid or payable to the Auditor General in respect of the audit for the current financial year is as follows:

	2023 $	2022 $
Auditing the accounts, financial statements and key performance indicators	40,750	36,300[1]

[1]Remuneration paid during 2022 has been restated to the actual remuneration paid.

7.8 Equity

The Western Australian Government holds the equity interest in MRIWA on behalf of the community. Equity represents the residual interest in the net assets of MRIWA.

	2023 $	2022 $
Accumulated surplus		
Balance at start of period	12,383,576	9,860,619
Result for the period	1,824,206	2,522,957
Balance at end of period	**14,207,782**	**12,383,576**
Total Equity at end of period	**14,207,782**	**12,383,576**

7.9 Supplementary financial information

(a) Write-offs

	2023 $	2022 $
Public property written-off by the Authority during the period	-	-
	-	-

(b) There were no losses through theft, defaults and other causes.

(c) No gifts of public property were provided by the Institute

7.10 Explanatory statement

All variances between estimates (original budget) and actual results for 2023, and between the actual results for 2023 and 2022 are shown below. Narratives are provided for key variations selected from observed major variances which are greater than 10% and 1% of Total Cost of Services for either the lower of the budget or prior period actual for the Statements of Comprehensive Income and Statement of Cash Flows, and are greater than 10% and 1% of Total Assets for either the lower of the budget or prior period actual for the Statement of Financial Position.

Statement of Comprehensive Income

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
COST OF SERVICES						
Expenses						
Research grants		5,265,814	5,291,879	5,313,511	26,065	(21,632)
Scholarships	1	373,063	299,655	253,013	(73,408)	46,642
Employee benefits expense	A	1,294,766	1,259,564	851,099	(35,202)	408,465
Institute Contractor fees		52,000	-	-	(52,000)	-
Board and committee fees and costs		148,633	112,201	115,269	(36,432)	(3,068)
Supplies and services	2, B	1,034,897	529,435	347,274	(505,462)	182,161
Other expenses		107,077	93,589	65,680	(13,488)	27,909
Accommodation expense		59,250	109,894	54,000	50,644	55,894
Total cost of services		**8,335,500**	**7,696,217**	**6,999,846**	**(639,283)**	**696,371**

7.10 Explanatory statement (continued)

Statement of Comprehensive Income (continued)

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
Income						
Revenue						
Interest revenue	3, C	66,972	477,856	78,300	410,884	399,556
Other revenue	4,D	549,264	266,308	120,206	(282,956)	146,102
Income from Industry Sponsorship	5, E	2,380,253	1,751,225	2,290,297	(629,028)	(539,072)
Total Revenue		**2,996,489**	**2,495,389**	**2,488,803**	**(501,100)**	**6,586**
Total income other than income from State Government		**2,996,489**	**2,495,389**	**2,488,803**	**(501,100)**	**6,586**
NET COST OF SERVICES		**5,339,011**	**5,200,828**	**4,511,043**	**(138,183)**	**689,785**
Income from State Government						
State Government Grant		6,882,000	6,915,000	6,980,000	33,000	(65,000)
Resources received free of charge		59,250	110,034	54,000	50,784	56,034
Total income from State Government		**6,941,250**	**7,025,034**	**7,034,000**	**83,784**	**(8,966)**
SURPLUS/(DEFICIT) FOR THE PERIOD		**1,602,239**	**1,824,206**	**2,522,957**	**221,967**	**(698,751)**
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD		**1,602,239**	**1,824,206**	**2,522,957**	**221,967**	**(698,751)**

7.10 Explanatory statement (continued)

Statement of Comprehensive Income (continued)

Major Estimate and Actual (2023) Variance Narratives

1. Scholarship expense is less than originally budgeted as a result of them only being offered as a 'top-up' scholarship and delays invoicing by the host universities. One scholarship was not awarded due to a lack of applications being received.

2. Supplies and services are lower than-budgeted. This is because consultant, systems implementation and conference expenses, website upgrade not progressed and no project management expenses during period.

3. Interest Revenue is more than budgeted due to increases in interest rates.

4. Other Revenue, for example event ticket sales from the net zero mining conference are lower than budgeted.

5. Income from industry sponsorship is below estimate as it is difficult to forecast an accurate value of industry sponsorship income for new research projects. Revenue from industry sponsorship is also impacted by decisions of sponsors to pay funds direct to researchers, rather than MRIWA, for projects forecast to be approved throughout the financial year.

Major Actual (2023) and Comparative (2022) Variance Narratives

A. The Employee benefits expense has increased from the prior year due to the increase in number of employees.

B. Supplies and Services payments have increased due to the increase in financial management, legal and IT services, travel expenses and conference event costs.

C. Interest Revenue increased from prior year due to increases in interest rates.

D. Other Revenue has increased due to higher event sales compared to prior years and increase in conference sponsorships in relation to the event.

E. Income from Industry sponsorship are driven by the terms set in the Conditions of Grant at the commencement of every new research project. The decrease in income reflects the reduced level of sponsorship funds to be managed by MRIWA in accordance with the Conditions of Grants entered into.

7.10 Explanatory statement (continued)

Statement of Financial Position

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
ASSETS						
Current Assets						
Cash and cash equivalents		3,681,601	7,225,344	4,500,162	3,543,743	2,725,183
Restricted cash and cash equivalents		14,726,404	8,835,922	10,753,921	(5,890,482)	(1,918,000)
Receivables and other assets		767,549	489,901	570,474	(277,648)	(80,573)
Other current assets		16,743	179,752	57,447	163,009	122,305
Total Current Assets		**19,192,297**	**16,730,919**	**15,882,004**	**(2,461,378)**	**848,915**
Non-Current Assets						
Total Non-Current Assets		**-**	**-**	**-**	**-**	**-**
TOTAL ASSETS		**19,192,297**	**16,730,919**	**15,882,004**	**(2,461,378)**	**848,915**

7.10 Explanatory statement (continued)

Statement of Financial Position (continued)

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
LIABILITIES						
Current Liabilities						
Payables		50,000	77,445	48,955	27,445	28,490
Provisions		101,500	81,243	79,527	(20,257)	1,716
Deferred income	1, A	4,643,992	2,275,266	3,269,073	(2,368,726)	(993,807)
Total Current Liabilities		**4,795,492**	**2,433,954**	**3,397,555**	**(2,361,538)**	**(963,601)**
Non-Current Liabilities						
Provisions		79,000	89,183	100,873	10,183	(11,690)
Total Non-Current Liabilities		**79,000**	**89,183**	**100,873**	**10,183**	**(11,690)**
TOTAL LIABILITIES		**4,874,492**	**2,523,137**	**3,498,428**	**(2,351,355)**	**(975,291)**
NET ASSETS		**14,317,805**	**14,207,782**	**12,383,576**	**(110,023)**	**1,824,206**
EQUITY						
Accumulated surplus		**14,317,805**	**14,207,782**	**12,383,576**	**(110,023)**	**1,824,206**
TOTAL EQUITY		**14,317,805**	**14,207,782**	**12,383,576**	**(110,023)**	**1,824,206**

7.10 Explanatory statement (continued)

Statement of Financial Position (continued)

Major Estimate and Actual (2023) Variance Narratives

1. Deferred income is lower than the estimate as projects approved by the Board in 2022-23 had reduced level of sponsorship funds to be managed by MRIWA. The income received from sponsors and whether this is paid direct to researchers or MRIWA, has a direct relationship to the deferred revenue calculated.

Major Actual (2023) and Comparative (2022) Variance Narratives

A. Deferred income has decreased from the prior year as projects approved by the Board in 2022-23 had reduced level of sponsorship funds to be managed by MRIWA The income received from sponsors and whether this is paid direct to researchers or MRIWA, has a direct relationship to the deferred revenue calculated.

7.10 Explanatory statement (continued)

Statement of Cash Flows

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
CASH FLOWS FROM STATE GOVERNMENT						
State Government Grant						
Net cash provided by State Government		6,882,000	6,915,000	6,980,000	33,000	(65,000)
		6,882,000	**6,915,000**	**6,980,000**	**33,000**	**(65,000)**
Utilised as follows:						
CASH FLOWS FROM OPERATING ACTIVITIES						
Payments						
Research Grant Payments and Scholarship		(5,363,404)	(5,591,534)	(6,131,674)	(228,130)	540,140
Employee benefits	A	(1,148,983)	(1,263,045)	(812,393)	(114,062)	(450,652)
Institute Contractor fees		(52,000)	-	-	52,000	-
Board and Advisory committee fees		(55,543)	(49,468)	(55,543)	6,075	6,075
Supplies and Services	1, B	(1,128,717)	(622,422)	(404,575)	506,295	(217,847)
GST payments on purchases		(654,412)	(596,872)	(570,453)	57,540	(26,419)

7.10 Explanatory statement (continued)

Statement of Cash Flows (continued)

	Variance note	Original budget 2023 $	Actual 2023 $	Actual 2022 $	Variance between estimate and actual $	Variance between actual results for 2023 and 2022 $
Receipts						
Receipts from Sponsors	2, C	2,068,843	720,109	1,514,842	(1,348,734)	(794,733)
Receipts from events	3, D	549,264	236,075	60,480	(313,189)	175,595
Interest received	4, E	80,229	377,086	53,143	296,857	323,943
GST receipts on sales	5	206,884	112,265	113,569	(94,619)	(1,304)
GST receipts from taxation authority	6, F	461,569	569,989	355,659	108,420	214,330
Net cash used in operating activities		**(5,036,270)**	**(6,107,817)**	**(5,876,945)**	**(1,071,547)**	**(230,872)**
Net increase/(decrease) in cash and cash equivalents		1,845,730	807,183	1,103,055	(1,038,547)	(295,872)
Cash and cash equivalents at the beginning of the period		16,562,275	15,254,083	14,151,028	(1,308,192)	1,103,055
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD		**18,408,005**	**16,061,266**	**15,254,083**	**(2,346,739)**	**807,183**

7.10 Explanatory statement (continued)

Statement of Cash Flows (continued)

Major Estimate and Actual (2023) Variance Narratives

1. Supplies and services are lower than-budgeted. This is because consultant, systems implementation and conference expenses, website upgrade not progressed and no project management expenses during period. All resulting in lower-than-expected cash outflows.

2. Income from industry sponsorship is below estimates as it is difficult to forecast an accurate value of industry sponsorship income for new research projects. Revenue from industry sponsorship is also impacted by decisions of sponsors to pay funds direct to researchers, rather than MRIWA, for projects forecast to be approved throughout the financial year.

3. Receipts from events are below estimates due to event ticket sales from the net zero mining conference being lower than budgeted.

4. Interest received are higher than estimate due to an increase in interest rates.

5. GST Received is lower receipts than estimated in this financial year.

6. GST Receipts from taxation authority is higher than estimate due to refund of prior year GST balances and a regular refund request to the taxation office.

Major Actual (2023) and Comparative (2022) Variance Narratives

A. Employee benefits have increased due to an increase in the workforce.

B. Supplies and Services payments have increased due to the increase in financial management, legal and IT services, travel expenses and conference event costs.

C. Receipts from sponsors are driven by the terms set in the Conditions of Grant at the commencement of every new research project. The decrease in receipts reflects the reduced level of sponsorship funds to be managed by MRIWA in accordance with the Conditions of Grants entered into.

D. Receipts from events has increased as cash received from conference sponsorship and event ticket sales increased from the prior year.

E. Interest received has increased due to an increase in interest rates.

F. GST Receipts from taxation authority has increased due to refund of prior year GST balances and a regular refund request to the taxation office.

Our Governance

MRIWA's robust governance and contemporary fit-for-purpose corporate practices are outlined in this section highlighting some of the mechanisms in place to improve our performance, deliver business outcomes and ensure compliance.

Message from the Audit and Risk Committee Chair

The Audit and Risk Committee (ARC) had a number of changes to committee membership in the middle of the financial year. At the end of 2022 Helen Cook stepped down as Chair of the ARC having completed her tenure with MRIWA, and I took on the role of Chair in February 2023. In February 2023 we also welcomed Rylee Campbell onto the ARC joining myself and Larry Lopez.

Throughout the financial year, the ARC continued providing oversight to governance, risk, audit, and the financial matters of MRIWA. The strong internal audit and risk practices by the MRIWA team in the last financial year resulted in MRIWA being listed by the Office of Auditor General as one of 20 small government organisations having positively completed a 2022FY audit with best practice performance.

With the ever-increasing risk of cyber fraud and breaches, the ARC continued its strong focus on cybersecurity and related IT issues. During this financial year MRIWA achieved Essential 8 Level 1 standards for its IT systems. Monitoring of MRIWA's cybersecurity systems will continue being assessed on an ongoing basis.

Another highlight this year was an extensive review of MRIWA's Intellectual Property (IP) practices. The review has helped MRIWA work towards implementing more robust IP procedures across the organisation in line with its overall legislative remit.

Once completed, MRIWA's updated IP practices will be referenced against the WA government's ongoing review of IP policies to further strengthen and align MRIWA's IP practices with overall government procedures.

The Research Portfolio Management Manual is reviewed on an ongoing basis in the interests of continual improvement. In addition, a Work Health and Safety Framework was developed in line with legislation changes made during the financial year.

A review was undertaken of the organisation's business continuity processes which resulted in the development of an action matrix to address absences by the CEO/CFO, and separately, a review of the procedures to board appointment which led to the development of a new process to ensure the best possible candidates for future roles can be identified.

Internal audits were undertaken on the policy register, and against contract agreements and grant management processes set within the organisation's internal management software program CMAPS. Other ongoing work during the financial year included continuous improvement of the organisation's financial management practices and Internal Audit and Reporting Plan.

The ARC continues to assess ongoing emerging risks to the organisation at each committee meeting and incorporates identified risks to MRIWA into the risk register.

At the end of this financial year end, I acknowledge the tenure of the previous Chair, Helen Cook who provided strong governance, risk, and financial leadership through the ARC to MRIWA for nine years.

I also extend my appreciation to both Larry and Rylee for their attentive focus on governance, financial, and risk matters. Importantly, implementation of the operational aspects of the ARC outcomes and audit findings continued with the support of Nicole Roocke and Stephanie Ahlfeld and our financial management services provider, Deloitte.

Linda Tompkins
Chair
Audit and Risk Committee

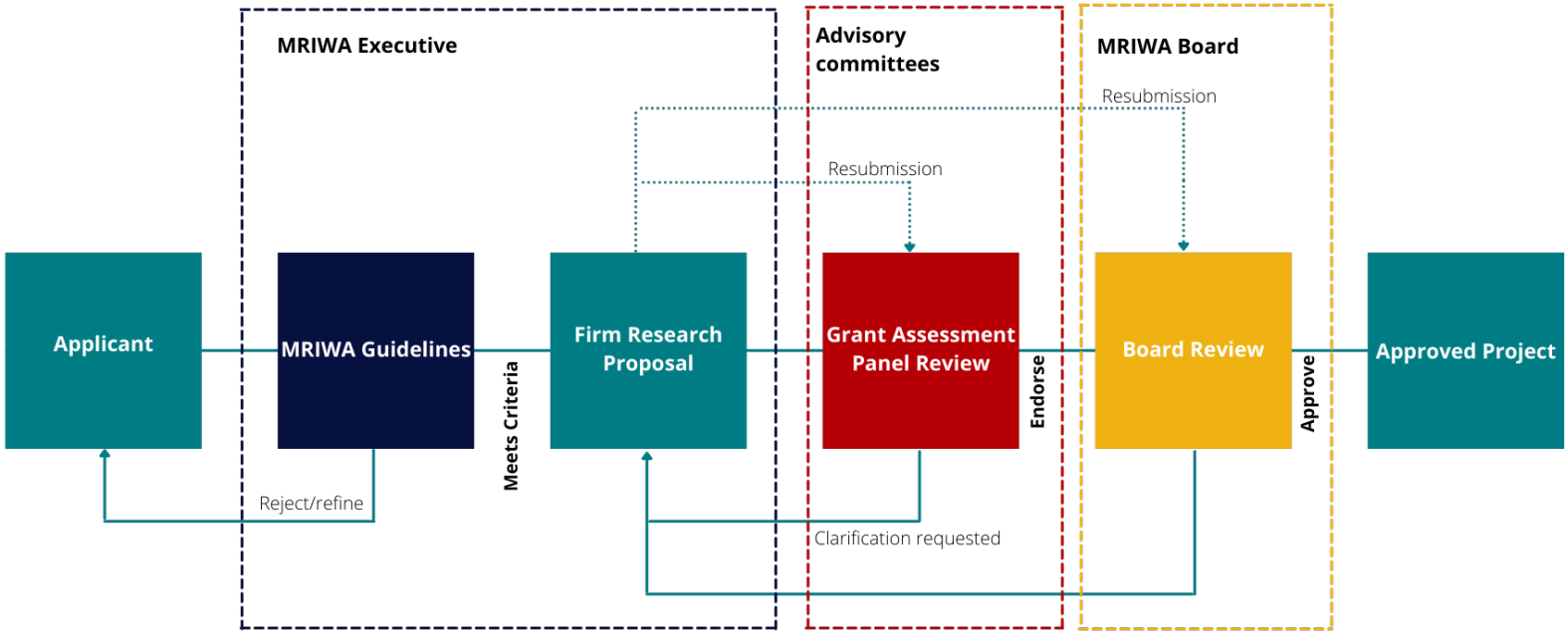
Committee Structure and Decision-Making Framework

Control and management of MRIWA is vested in a Board of seven members (MRIWA Board), who are appointed by the Minister. The CEO administers day-to-day operations, subject to the direction of the MRIWA Board.

The MRIWA College is an advisory group appointed by the MRIWA Board to provide advice to MRIWA and the MRIWA Board on minerals research priorities. The MRIWA College assists in the assessment of research grant applications which seek to address the challenges facing the State's minerals industry to ensure it can deliver an economic and social benefit for Western Australia.

The MRIWA College is comprised of individual representatives with specific knowledge and experience relevant to one or more of the program areas in the MRIWA Research Priority Plan[1]. These representatives are drawn from a range of industry, research community and government organisations.

Research applications are developed by an Applicant with input from MRIWA, before being reviewed by a Grant Assessment Panel (GAP). Members of the GAP are drawn from the MRIWA College. The GAP make a recommendation to the MRIWA Board on each project. It is the role of the MRIWA Board to approve investment decisions for all projects.



1. https://www.mriwa.wa.gov.au/research-funding/research-priorities/

Disclosures

Shared Responsibilities with Other Agencies

The Institute did not share any responsibilities with other agencies in 2022-23.

Ministerial Directives

There have been no Ministerial directives to MRIWA in 2022-23.

Other Financial Disclosures

Capital Works

MRIWA has no capital works projects.

Employment and Industrial Relations

As of 30 June 2023, MRIWA employed 8 people, with one vacant role, equating to 8.8 full-time equivalents (FTE).

During the year, 2 people ceased employment with MRIWA.

MRIWA employment profile

Employment Type	2023	2022
Permanent Full-Time	3	3
Fixed Term Full-Time	4	4
Fixed Term Part-Time	1	0

Staff Development

MRIWA is committed to supporting its employees through the provision of training and development opportunities.

Diversity Profile

Diversity Group	2023	2022
Women on the Board	50%	71%
Women in Senior Executive Services (SES)	100%	100%
Indigenous Australians on the Board	17%	0
Indigenous Australian Employees	0	0
Employees from Culturally-Diverse Background	1	1
Employees with Disabilities	0	0
Youth (under 25 years)	1	0

Occupational Safety & Health; Workers Compensation and Injury Management

MRIWA is committed to providing a safe work environment. A new Workplace Health and Safety Framework, directly linked to the MRIWA Risk Register, was introduced as the control mechanism for reducing the risk of injury to employees, contractors, students and visitors.

During 2022-23 there were no Workers Compensation claims lodged and there are no employees on return-to-work plans.

Unauthorised use of credit cards

Officers of MRIWA hold corporate credit cards where their functions warrant usage of this facility.

One instance occurred where a Western Australian Government Purchasing Card was used for personal purposes during the period.

The aggregate amount of personal use expenditure for the reporting period: **$12.23.**

This amount was settled by the due date.

The number of referrals for disciplinary action instigated by the notifiable authority during the reporting period: **None**

Governance Disclosures

Advertising

In accordance with section 175ZE of the *Electoral Act 1907* (WA), MRIWA has incurred the following expenditure for advertising agencies, market research, polling, direct mail or media advertising agencies:

Expenditure	Total	Amount
Advertising agencies, Market research organisations, Polling organisations, Direct mail organisations	Nil	Nil
Media advertising organisations	2,528	
- The Conversation (*Event advertisement)*		1820
- Initiative Media Australia *(Recruitment)*		708

Board and Committee Representation

To achieve its objective, MRIWA draws substantially on members of the minerals community contributing their experience and knowledge. This is particularly the case for the members of the MRIWA Board and supporting advisory committees.

MRIWA Board members are appointed in accordance with Section 27(1)(a) of the MRIWA Act and are remunerated by an annual fee set by the Public Sector Commissioner. The fee has not been varied since first established on 20 December 2013.

Further information on MRIWA Board membership can be located in the *Overview* section of the Annual Report.

Under the MRIWA Act, the MRIWA Board has the authority to establish any committee or appoint any organisation or individual to provide it with advice, especially on the merit of applications for research grants (section 60).

From 17 February 2020, the advisory committee convened by MRIWA has taken the form of an assessment panel comprised of Core Members and subject matter experts drawn from the MRIWA College and known as a Grant Assessment Panel.

Members of MRIWA College are appointed in accordance with Section 60(1) of the MRIWA Act and are remunerated based on attendance at a rate set by the Public Sector Commissioner.

Four Grant Assessment Panels and one Scholarship Panel were convened in 2022-23.

College members were also involved in further consultation activities including the 2022 College Colloquium.

MRIWA College Colloquium

The 2022 MRIWA College Colloquium was held on 14 October 2022, with attending members participating in focus group activities examining priority areas of minerals research activity.

Facilitated by the MRIWA Research Portfolio Manager team, attendees were led through group discussions and conversation addressing research needs and opportunities for Western Australia in relation to:

1. The Mining Equipment, Technology and Services (METS) sector;
2. Mineral exploration, and;
3. Alternative uses of tailings and waste.

The views surfaced through these workshop activities were captured by MRIWA to inform and support strategic planning for these focus areas.

The Board considered outcomes from the Colloquium as part of their strategic planning for 2023-2024.

The next MRIWA College Colloquium will be held on 30 October 2023.

College - Core Membership

Up to ten (10) persons will be appointed as Core Members of the College. At the expiry of their term as a Core Member, individuals may continue to participate in the College as a subject matter expert. Core Members are invited to attend all Grant Assessment Panel meetings, to ensure a consistent approach in the assessment of research grant applications.

Name	Position	Appointment Approved	Term Expiry	Sitting Fees $
Gerard Danckert	Chair	1-Jun-20	31-Dec-26	1,802[(a)]
Ian Suckling	Chair	1-Jun-21	13-Nov-22	2,040[(a)]
Alison Morley	Core Member	1-Jun-20	28-Feb-23	-
Allan Trench	Core Member	1-Jun-20	31-May-26	1,564[(a)]
Joanne Heyes	Core Member	1-Jun-23	31-May-26	-
Laura Kuhar	Core Member	1-Jun-20	31-May-26	1,768[(a)]
Rob Hough	Core Member	1-Jun-20	31-May-26	-[(b)]
Sara Braund	Core Member	1-Sep-22	31-Aug-25	1,122[(a)]
Vanessa Lickfold	Core Member	1-Jan-21	31-Dec-26	2,006[(a)]

(a) Foregoes all remuneration for use in the MRIWA Education Program.

(b) Ineligible for remuneration in accordance with Premier's Circular 2022/02 State Government Boards and Committees

College Members

Name	Position	Appointment Approved	Term Expiry	Sitting Fees $
Alexander Logan	Member	1-Sep-20	31-Aug-26	442[(a)]
Allon Brent	Member	1-Jan-21	31-Dec-23	-
Andy Fourie	Member	1-Jun-20	31-May-26	442[(a)]
Andy Lamb	Member	1-Sep-20	31-Aug-26	680[(a)]
Anel Joubert	Member	1-Jun-20	31-May-26	442[(a)]
Anna Kaksonen	Member	1-Jun-20	31-May-26	-
Bryan Maybee	Member	1-Jun-20	31-May-26	884[(b)]
Caroline Perring	Member	1-Jun-20	31-May-26	-[(a)]
Charles Elliott	Member	22-Jun-20	31-May-26	680
Charlotte Hall	Member	1-Jun-20	31-May-23	-[(c)]
Chitra Viswanathan	Member	1-Sep-20	31-Aug-26	-[(c)]
Chris Kirkland	Member	1-Jun-20	31-May-26	-[(a)]
Christopher Baker	Member	1-Jun-20	31-May-23	-
Deborah Lord	Member	1-Sep-20	31-Aug-23	680
Erkan Topal	Member	22-Jun-20	31-May-26	-
Eugenia Phegan	Member	1-Mar-23	28-Feb-26	442[(a)]
Fiona Haslam-McKenzie	Member	1-Jun-20	31-May-26	-[(a)]
Ian Suckling	Member	14-Nov-22	30-Nov-25	-[(a)]
Ivor Roberts	Member	1-Jun-20	31-May-26	-[(c)]
Jeremy Smith	Member	1-Jun-23	31-May-26	-
Joanne Heyes	Member	1-Jun-20	31-May-23	442[(a)]
John Clout	Member	1-Sep-20	31-Aug-23	1,122[(a)]
John Dell	Member	1-Jun-20	31-May-26	-
Jon Hronsky	Member	1-Jun-20	31-May-26	442[(a)]
Kane Moyle	Member	1-Jun-20	31-May-23	442[(a)]
Karen Caple	Member	1-Sep-20	31-Aug-23	-[(c)]
Kerryl Bradshaw	Member	1-Jun-20	31-May-23	-[(a)]
Louisa O'Connor	Member	1-Jun-20	31-May-23	680
Louise McNab	Member	1-Sep-22	31-Aug-25	680[(a)]
Marilena Stimpfl	Member	1-Sep-22	31-Aug-25	442[(a)]
Mark Jessell	Member	1-Jun-20	31-May-23	1,122[(a)]
Melanie Blanchette	Member	1-Jun-20	10-Aug-22	-
Michelle Keegan	Member	1-Jun-20	31-May-26	680[(a)]
Nicolas Herbert	Member	1-Mar-23	28-Feb-26	
Peter Bewick	Member	1-Jun-20	31-May-26	1,122
Pietro Guj	Member	1-Nov-20	31-Oct-26	-
Rathy Brandes de Roos	Member	1-Jun-20	31-May-23	-[(a)]
Renee Hallam	Member	1-Nov-20	31-Oct-23	-
Russell Staines	Member	1-Dec-22	30-Nov-25	-
Ryan Fraser	Member	1-Nov-20	31-Oct-23	-

(a) Foregoes all remuneration for use in the MRIWA Education Program.

(b) Foregoes a portion of remuneration for use in the MRIWA Education Program.

(c) Ineligible for remuneration in accordance with Premier's Circular 2022/02 State Government Boards and Committees

Contracts with Senior Officers

No member of MRIWA staff had any interest or benefit from any contract entered by MRIWA.

Freedom of Information

The *Freedom of Information Act 1992* (WA) enables the public to apply for access to documents held by MRIWA. No freedom of information request was received by the organisation in 2022-23.

Public Sector Standards and Ethical Codes

All members of MRIWA Board and MRIWA College are aware of the need to comply with Part 4 – Administration, Subdivision 3 of the *Minerals Research Institute of Western Australia Act 2013* (WA), which sets out the provisions for disclosure of material personal interest, and MRIWA's Code of Conduct.

MRIWA has complied with Section 31(1) of the *Public Sector Management Act 1994* (WA) in the administration of the MRIWA's human resource management practices relating to Public Sector Standards, Western Australian Public Sector Code of Ethics and MRIWA's Code of Conduct.

MRIWA utilises the Department of Mines, Industry Regulation and Safety's human resources services and is confident their human resources management principles have adequate checks in place to ensure compliance requirements are met.

In 2022-23 no breach claims were lodged in relation to either the Public Sector Standards or the WA Public Sector Commission's Code of Ethics.

MRIWA is compliant with the *Public Interest Disclosure Act 2003* (WA). In accordance with this Act, the Chief Executive Officer is the designated Public Interest Disclosure Officer.

In 2022-23 no public interest disclosures were lodged under the Act. MRIWA submitted the 'Public Sector Entity Survey to the Public Sector Commission with no reports for breach of discipline under the *Public Sector Management Act 1994* (WA).

Quarterly reporting of MRIWA's gift and benefits register to the MRIWA Board continues to ensure no inappropriate acceptance of gifts or benefits and to monitor any notable trends.

Record Management Plan

In line with the Digital Strategy for the Western Australian Government 2021-25, MRIWA transitioned its main systems to the Cloud. The impact on our recordkeeping practices warranted the creation of a new Recordkeeping plan.

The State Records Commission approved the Institute's Recordkeeping Plan in August 2022.

WA Multicultural Policy Framework

The MRIWA Multicultural Plan 2021-24 was submitted in January 2021.

MRIWA is committed to all opportunities to expand knowledge about Aboriginal and Torres Strait Islander culture, history and experiences for our staff, board members and PhD student cohort.

We actively strive to identify ways where we can increase the engagement of Aboriginal and Torres Strait Islander people in the work we do and ensure they are supported in doing so.

MRIWA believes in supporting and empowering mining industry thought leaders and research champions of the future. In FY22 we introduced the MRIWA Indigenous Postgraduate Research Scholarship, open to Aboriginal and Torres Strait Islander applicants only, to further enhance our multicultural engagement.

All MRIWA staff have completed the Public Sector Commission's Cultural Awareness training and Office of Multiculture Interest's Diverse WA training.

Other Legal Requirements

Annual Estimates[(a)]

Statement of Comprehensive Income

For financial year 2023-24

	Estimate 2024 $
COST OF SERVICES	
Expenses	
Research grants	11,250,629
Scholarships	486,904
Loss on disposal of assets	-
Employee benefits expense	2,008,408
Institute Contractor fees	52,000
Board and committee fees and costs	148,633
Supplies and services	1,135,815
Other expenses	139,243
Accommodation expenses	152,086
Depreciation expense	-
Total cost of services	**15,373,718**
Income	
Revenue	
Interest revenue	166,972
Other revenue	397,404
Revenue from Industry Sponsorship	1,236,826
Total revenue	**1,801,202**
Total income other than income from State Government	**1,801,202**
NET COST OF SERVICES	**13,572,516**

	Estimate 2024 $
Income from State Government	
State Government Grant	6,946,000
Resources received free of charge	152,086
Total income from State Government	**7,098,086**
Surplus/(Deficit) for the period	**(6,474,430)**
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD	**(6,474,430)**

Note:

(a) As MRIWA's Total Cost of Services has been less than $10m in the two most recent comparative periods it is exempt from preparing Annual Estimates in accordance with Treasurer's Instruction 953 'Annual Estimates' and the Treasurer's Direction dated 16 March 2022.

As a matter of good practice, and given MRIWA is still required to disclose budgets for each financial year in the Annual Report in the form of:

- Statement of Comprehensive Income
- Statement of Financial Position
- Statement of Cash Flows,

annual estimates have been prepared for this future use.

Statement of Financial Position

For financial year 2023-24

	Estimate 2024 $
ASSETS	
Current Assets	
Cash and cash equivalents	2,100,645
Restricted cash and cash equivalents	8,402,582
Receivables and other assets	570,474
Other Current Assets	41,743
Total Current Assets	**11,115,444**
Non-Current Assets	
Property, plant and equipment	-
Total Non-Current assets	**-**
TOTAL ASSETS	**11,115,444**

	Estimate 2024 $
LIABILITIES	
Current Liabilities	
Payables	48,955
Provisions	173,500
Deferred revenue	2,496,286
Total Current Liabilities	**2,718,741**
Non-Current Liabilities	
Provisions	49,000
Total Non-Current Liabilities	**49,000**
TOTAL LIABILITIES	**2,767,741**
NET ASSETS	**8,347,703**
EQUITY	
Accumulated surplus	8,347,703
TOTAL EQUITY	**8,347,703**

Statement of Cash Flows

For financial year 2023-24

	Estimate 2024 $
Cash flows from State Government	
Cash receipts from Government	6,946,000
Cash flows from operating activities	
Payments	
Research Grant & Scholarship Payments	(11,738,578)
Employee benefits	(1,975,408)
Institute Contractor Fees	(52,000)
Board and Advisory Committee Fees	(148,633)
Supplies and Services	(1,427,144)
GST Paid on Purchases	(1,189,595)
Other payments	
Receipts from Sponsors	1,433,901
Receipts from Events	397,404
Interest received	166,972
GST received on sales	100,373
Net GST refunded from ATO (or paid)	1,089,222
Cash generated from operations	**(13,343,486)**
Cash flows from investing activities	
Purchase of non-current assets	-
Net cash from investing activities	**-**

	Estimate 2024 $
Cash flows from financing activities	
Related entities loans	-
Proceeds from other borrowings	-
HP Financing	-
Finance leases	-
Net cash from financing activities	**-**
Net increase in cash and cash equivalents	(6,397,486)
Cash and cash equivalents 1 July	16,900,713
CASH AND CASH EQUIVALENTS AT END OF YEAR	**10,503,227**

Our Performance

This section contains an overview of the MRIWA Performance Management Framework and the audited key performance indicators for 2022-23

Audited Key Performance Indicators

Certification of Key Performance Indicators

For the year ended 30 June 2023

We hereby certify the key performance indicators are based on proper records, are relevant and appropriate for assisting users to assess the Minerals Research Institute of Western Australia's performance, and fairly represent the performance of the Minerals Research Institute of Western Australia for the financial year ended 30 June 2023.

Miriam Stanborough
Chairperson of the Board

Date: 14 August 2023

Linda Tompkins
Deputy Chairperson of the Board

Date: 14 August 2023

Changes to outcome-based management framework

The Agency's outcome-based management framework did not change during 2023.

Key Effectiveness Indicator

Government Goal Responsible financial management and better service delivery

Outcome 1: Fostering and promoting minerals research for the benefit of the State.

One measure of the effect of MRIWA research investments is to use minerals royalties accruing to Western Australia and the economic impact of that research more broadly. However, it is difficult to measure the direct impact resulting from minerals research due to the duration of the research projects; the many other factors influencing implementation; and the timeframe between creation of knowledge and generation of royalties.

For these reasons, the key indicator of effectiveness for MRIWA demonstrates the increased value of research enabled by leveraging funds from third parties on the State Government investment through MRIWA.

Key Effectiveness Indicator	2021-22 Actual	*2022-23 Target*	2022-23 Actual
Ratio of total cash value of research projects to total MRIWA cash investments in those research projects [(a) (b)]	5.20	≥ 4	5.11

Notes:
(a) Investment totals are for projects with an executed contract and for completed projects, where completion date is within the reporting year.
(b) Measure reported as a multiple.

Key Efficiency Indicator

Government Goal — Responsible financial management and better service delivery

Service 1: — Administer research grant applications and manage approved projects efficiently.

The primary service provided by MRIWA is to identify research opportunities and resources, support the development of Grant applications and to manage a portfolio of approved projects.

The administration effort required of MRIWA to do so is measured as a function of the total financial scale of the portfolio of research projects.

The key indicator of efficiency demonstrates the focus on maximising investment in research projects and a continued focus on minimising overheads from administration efforts.

Key Efficiency Indicator	2021-22 Actual	*2022-23 Target*	2022-23 Actual
Total administration cost for the year as a percentage of the total cash value of research projects and scholarships under management during the year.	1.44%	≤ 2.5%	2.08%

Notes:
(a) Total cash value are for projects and scholarships with an executed contract and for completed projects, where completion date is within the reporting year.

Annexure: Information Statement

Information statement 2022-23

Introduction

Part 5 of the Freedom of Information Act 1992 (WA)[1] (the FOI Act) requires each agency publish an information statement and update the statement at intervals of not more than 12 months (sections 96 and 97 of the FOI Act).

The Minerals Research Institute of Western Australia (MRIWA) publishes its Information Statement as an annexure to the Annual Report. This Annexure supplements the detail provided in the Annual Report to ensure all information required under the FOI Act is publicly available.

Details of legislation administered

Refer Annual Report – Overview > Legislation.

The *Minerals Research Institute of Western Australia Act 2013* (the Act) repealed the *Minerals and Energy Research Act 1987* thereby abolishing the Minerals and Energy Research Institute of Western Australia (MERIWA). All assets, rights and liabilities of MERIWA (the abolished Institute) were transferred to MRIWA on the commencement of the new Act.

Organisational structure

Refer Annual Report – Overview > Responsible Minister.

The current organisation chart is available on the MRIWA website[2].

Decision-making framework

Refer Annual Report – Governance > Committee Structure and Decision-Making Framework.

Agency functions

Refer Annual Report – Overview > About Us.

The Annual Report also includes independently audited financial statements and performance indicators and an overview of our performance in respect of governance requirements.

Details of functions, including decision-making functions, affecting the public

Except for those persons who are directly involved in assessing or undertaking the research projects, the general public is not involved in the day-to-day operations of the Institute.

[1] https://www.legislation.wa.gov.au/legislation/statutes.nsf/main_mrtitle_353_homepage.html
[2] https://www.mriwa.wa.gov.au/about-us/our-people/

Public participation in the formulation of policy and performance of agency functions

MRIWA regularly engages with representatives from industry, the research community and government organisations.

Details of the MRIWA College are provided in the Annual Report – Governance > Committee Structure and Decision-Making Framework. The Terms of Reference are available on the MRIWA website[3].

As required by the *Minerals Research Institute of Western Australia Act 2013*, the Minister carried out a review of the operation and effectiveness of the Act following the fifth anniversary of the commencement of the Act. This review took place in 2018-19 and included a comprehensive stakeholder consultation process. The full report is available on the MRIWA website[4].

The MRIWA Research Priority Plan identifies the key areas where investments will be made into high impact research and development. The 2019-20 review of the Research Priority Plan encompassed a broad range of preliminary stakeholder consultation which informed the development of a revised Plan. This was released for public consultation with all feedback considered by the Board prior to finalisation of the Plan.

Types of documents held by MRIWA

The MRIWA website[5] contains a broad range of publicly accessible documents relating to our functions and activities. This includes:

- annual reports;
- policies and guidelines; and
- final project reports.

MRIWA creates documents for the operation of business activities to carry out our functions and duties. This includes documents relating to:

- accounting and finance
- administrative operations
- contracts, tenders and memorandums of understanding
- governance and compliance
- grant administration
- human resources
- ministerial correspondence and briefing notes
- policy and procedure
- records management
- strategy and policy documents

Procedures for obtaining access to documents not publicly available

It is the aim of MRIWA to make information available promptly and at the least possible cost. Whenever possible, documents will be provided outside the FOI process.

If information is not routinely available, the FOI Act provides the right to apply for documents held by MRIWA and to enable the public to ensure that personal information in documents is accurate, complete, up to date and not misleading.

[3] https://www.mriwa.wa.gov.au/about-us/corporate-publications/corporate-governance/
[4] https://www.mriwa.wa.gov.au/about-us/corporate-publications/mriwa-act/
[5] https://www.mriwa.wa.gov.au/

Freedom of information application process

Access applications have to:

- Be in writing;
- Give enough information so that the documents requested can be identified;
- Give an Australian address to which notices can be sent; and,
- Be lodged at the agency with any application fee payable.

Applications and enquiries should be addressed to the CEO (postal address: 1 Adelaide Terrace, East Perth, WA 6004) or telephone (08) 6180 4340.

Applications will be acknowledged in writing and the applicant will be notified of the decision within 45 (calendar) days.

Freedom of Information Charges

A scale of fees and charges are set under the FOI Act Regulations. Apart from the application fee for non-personal information, all charges are discretionary. The charges are as follows:

1. Type of Fee	
– Personal information about the applicant	No fee
– Application fee (for non-personal information)	$30.00
2. Type of Charge	
– Charge for time dealing with the application (per hour, or pro rata)	$30.00
– Access time supervised by staff (per hour, or pro rata)	$30.00
– Photocopying staff time (per hour, or pro rata)	$30.00
– Per photocopy	0.20 cents
– Transcribing from tape, film or computer (per hour, or pro rata)	$30.00
– Duplicating a tape, film or computer information	Actual Cost
– Delivery, packaging and postage	Actual Cost
3. Deposits	
– Advance deposit of the estimated charges may be required	25%
– Further advance deposit may be required to meet the charges for dealing with the application	75%

For financially disadvantaged applicants or those issued with prescribed pensioner concession cards, the charge payable is reduced by 25%.

Access Arrangements

Access to documents can be granted by way of inspection, a copy of a document, a copy of an audio or video tape, a computer disk, a transcript of a recorded, shorthand or encoded document from which words can be reproduced.

Notice of Decision

As soon as possible, but in any case within 45 days of receipt of freedom of information application, the applicant will be provided with a notice of decision which will include details such as:

- The date which the decision was made;
- The name and the designation of the officer who made the decision;
- If the document is an exempt document the reasons for classifying the matter exempt; or the fact that access is given to an edited document; and,
- Information on the right to review and the procedures to be followed to exercise those rights.

Refusal of Access

An applicant who is dissatisfied with a decision of the Institute is entitled to ask for an internal review by the Institute. Application should be made in writing within 30 days of receiving the notice of decision.

Applicants will be notified of the outcome of the review within 15 days.

If the applicant disagrees with the result the applicant can apply to the Information Commissioner for an external review, and details would be advised to applicants when the internal review decision is issued.

Access and Points of Contact

The above documents are available on application by:

Contact:	Coordinator, Executive Services
Telephone:	(08) 6180 4340
E-Mail:	enquiries@mriwa.wa.gov.au
Mail:	1 Adelaide Terrace , East Perth, WA, 6004
Website:	www.mriwa.wa.gov.au

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This report was published by the Minerals Research Institute of Western Australia, September 2023.

Visit the MRIWA website for digital versions of this report.

Disclaimer

MRIWA makes the information in this report available on the understanding users exercise their own skill and care with respect to its use and interpretation. Changes in circumstances after this document is made available may impact on the accuracy of the information.

Contact us

Minerals Research Institute of Western Australia
1 Adelaide Terrace, EAST PERTH, 6004
Email: mail@mriwa.wa.gov.au
Website: www.mriwa.wa.gov.au