



Minerals Research Institute of Western Australia

Annual Report 2017 / 2018

MRIWA.WA.GOV.AU

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Statement of Compliance

For year ended 30 June 2018

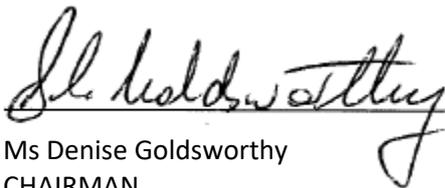
**HON BILL JOHNSTON MLA
MINISTER FOR MINES AND PETROLEUM**

In accordance with section 63 of the *Financial Management Act 2006*, we hereby submit for your information and presentation to Parliament, the Annual Report of the Minerals Research Institute of Western Australia for the reporting period ended 30 June 2018.

The Annual Report has been prepared in accordance with the provisions of the *Financial Management Act 2006*.

MRIWA's objective is to promote research for the development of the minerals industries in this State. The Board is satisfied with the performance of the Minerals Research Institute of Western Australia in achieving its objective.

On behalf of the MRIWA Board, we acknowledge the valuable support given to the Institute during the reporting period by your office, by the Department of Mines, Industry Regulation and Safety and by the members of the MRIWA advisory committees.



Ms Denise Goldsworthy
CHAIRMAN
BOARD OF DIRECTORS

Date: 13 August, 2018



Ms Helen Cook
DEPUTY CHAIR
BOARD OF DIRECTORS

Date: 13 August, 2018

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Overview

Executive Summary

Performance Highlights

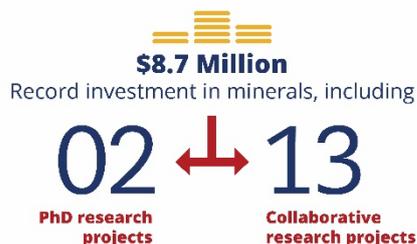
MRIWA Performance Highlights 2017/18

MRIWA is a **recognised voice** in the minerals innovation system. A statutory corporation that **fosters and promotes** minerals research to create jobs and provides financial strength **for the benefit of WA**

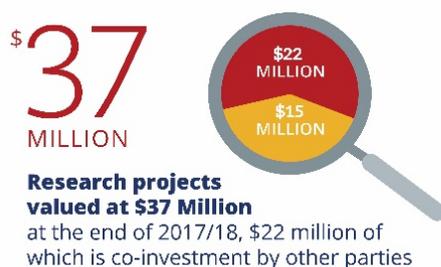


The *Minerals Research Institute of Western Australia Act 2013* (the Act) establishes the Minerals Research Institute of Western Australia (MRIWA) as a statutory corporation to foster and promote minerals research for the benefit of Western Australia. Whilst the Minister has ultimate control over the operations of the Institute, the leadership and management of the Institute are vested in the MRIWA Board.

The Institute approved investment of \$8.7 million of its funds for research projects. This includes \$5.5 million allocated to MRIWA in the 2018 State Budget for the Bid for the Future Battery Industries Cooperative Research Centre (FBICRC) and for two PhD Scholarships. (It is noted that MRIWA is also administering the \$0.5 million allocated to the Bid by the Minister for Science.)

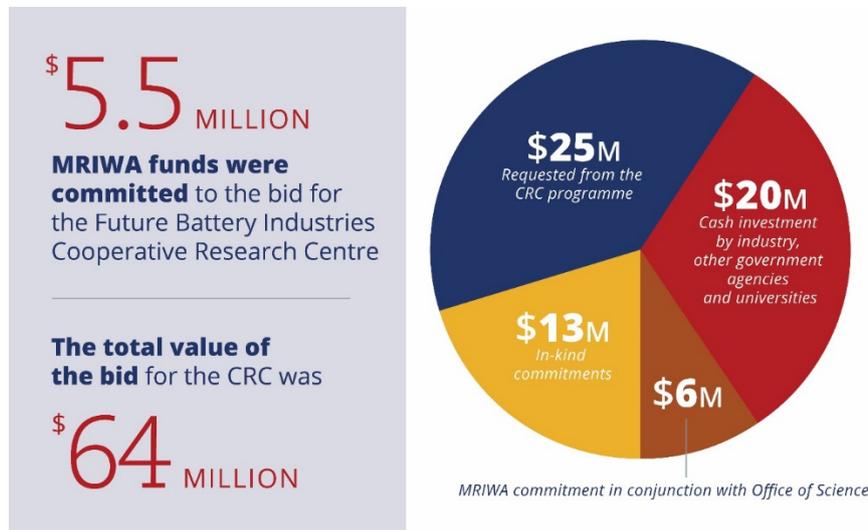


Excluding the \$5.5 million for the FBICRC, the Institute committed \$3.2 million to investments in minerals research, comprising \$3.0 million in twelve new collaborative research projects and \$0.2 million in scholarships for PhD studies.



The Institute's portfolio of research projects was valued at \$37.3 million at end 2017/18 (excluding the commitment to the FBICRC), an increase of \$7.3 million on the value reported for 2016/17. The \$37.3 million includes \$22 million co-invested by other parties. MRIWA's scholarships for the 13 PhD students accepted since 2014/15 are now valued at \$1.45 million.

The Government approved \$5.5 million for MRIWA to invest in the Bid for the FBICRC. Through this investment and others utilising MRIWA’s normal allocation in the State Budget, MRIWA is contributing to the Government’s election commitments to renewable technology manufacturing and work to develop battery technologies.



Of note for the reporting period are:

- The Institute expanded its engagement with the national minerals innovation system to benefit Western Australia. In addition to the FBICRC, MRIWA is contributing to scoping the proposed Digital Mining CRC, whilst enhancing the State’s role in the newly approved MinEx CRC and the well-established CRC ORE. MRIWA is actively working with METS Ignited, the Federal Government’s Industry Growth Centre for the mining, equipment, technology and services (METS) sector. The year also saw a significant growth in the number of METS companies co-investing in research with MRIWA.
- The Institute has established its contributions to the Western Australian minerals industry beyond being just a funding agency. The Institute is now recognised for its successes in initiating multi-disciplinary research projects; providing thought-leadership for the industry; responding quickly and effectively to emerging Government needs; providing a comprehensive, responsive and supporting process for administering Grant Applications; and, being a model for other jurisdictions.
- The financial leverage on MRIWA’s investments in research in 2017/18 (i.e. the level of co-investment by other parties), excluding the \$5.5 million for the FBI CRC and the \$0.2 million for PhD scholarships, was \$1.46 for every \$1 invested by MRIWA. For the entire portfolio current at the end of the financial year, the equivalent financial leverage is \$1.52 invested by other parties for every \$1 invested by MRIWA.

A contemporary **business strategy**



Financial strategy & business model
adapts to change in scale & scope of projects and provides new avenues for sourcing funds



Long-term vision & strategy
delivers to the State's future goals as well as immediate industry requirements



Balanced and collaborative relationships
that enable research and commercialisation

- The Institute continued to implement a contemporary business strategy that includes extending MRIWA's position and influence in the minerals innovation system; developing the research portfolio from 'enabling research' to 'enabling research and its commercialisation'; establishing a financing strategy and investment model appropriate for changing scale and scope of MRIWA activities, and sources of funds; and, creating balanced relationships that deliver to the State's long-term needs whilst also delivering to industry requirements.
- The Institute completed major improvements to its project management and administration systems during the reporting period. The Institute reports an administration cost of 3.3% of the total value of the portfolio of research projects under management during the year.

In summary, MRIWA is established as a valued partner in innovation for the State's minerals industry and is an effective agent for enhancing collaboration between researchers and industry, founded on the objective of delivering commercial returns and economic benefits for the State.

Operational Structure

Responsible Minister

Hon. Bill Johnston MLA, Minister for Mines and Petroleum.

Enabling and Administered Legislation

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

The Act encapsulates a number of key design principles for the Institute, namely:

- Funding for minerals research projects is on a competitive basis that directs State funds directly to specific research projects.
- All investment decisions made by the Institute are guided by a comprehensive Research Priority Plan (a technology roadmap of the needs of the Western Australian minerals industry).
- State funds for research projects are directed to the requirements of the Western Australian minerals endowment, as identified in the Research Priority Plan.
- State funds are not available exclusively to Western Australian research organisations: the intention is to ensure scarce funds are not wasted by replicating accessible research capability and capacity that resides elsewhere.
- The Institute is to seek to optimise industry co-investment in its research activities through a leveraged grant model: State investment is to be an incentive for industry investment.
- The Institute adopts a portfolio approach to managing its research investments across research needs and through the research-development spectrum.
- The Institute seeks to engage constructively with the challenges that face the many Small to Medium Enterprise (SME) businesses that participate in the State's exploration and mining, equipment, technology and services sectors.
- The Institute will adopt contemporary best practice principles of grant administration.

The Act provides that MRIWA's Board is its governing body, provides for appointment of its seven members by the Minister, and sets out requirements regarding its constitution and procedures.

The functions granted to MRIWA in the Act are for the specific purpose of fostering and promoting minerals research for the benefit of the State.

MRIWA's functions are to:

- Undertake, procure or manage minerals research projects;
- Provide funding to individuals or corporations to enable them to undertake or participate in minerals research or other associated activities, or to engage other persons to do so;
- Keep records about minerals research projects it undertakes, procures, manages or funds;
- Work with other people, authorities and institutions about minerals research;
- Maintain current knowledge of minerals research being undertaken;
- Promote public awareness and interest in minerals research;
- Foster academic activities related to minerals research; and
- Advise the Minister about minerals research.

The Act also has scope for regulations to be made to give additional functions to MRIWA.

(Refer <http://www.mriwa.wa.gov.au/> *Minerals Research Institute of Western Australia Act 2013*, Division 2 for a full description of the MRIWA functions).

Governance and Management Structure

Organisation

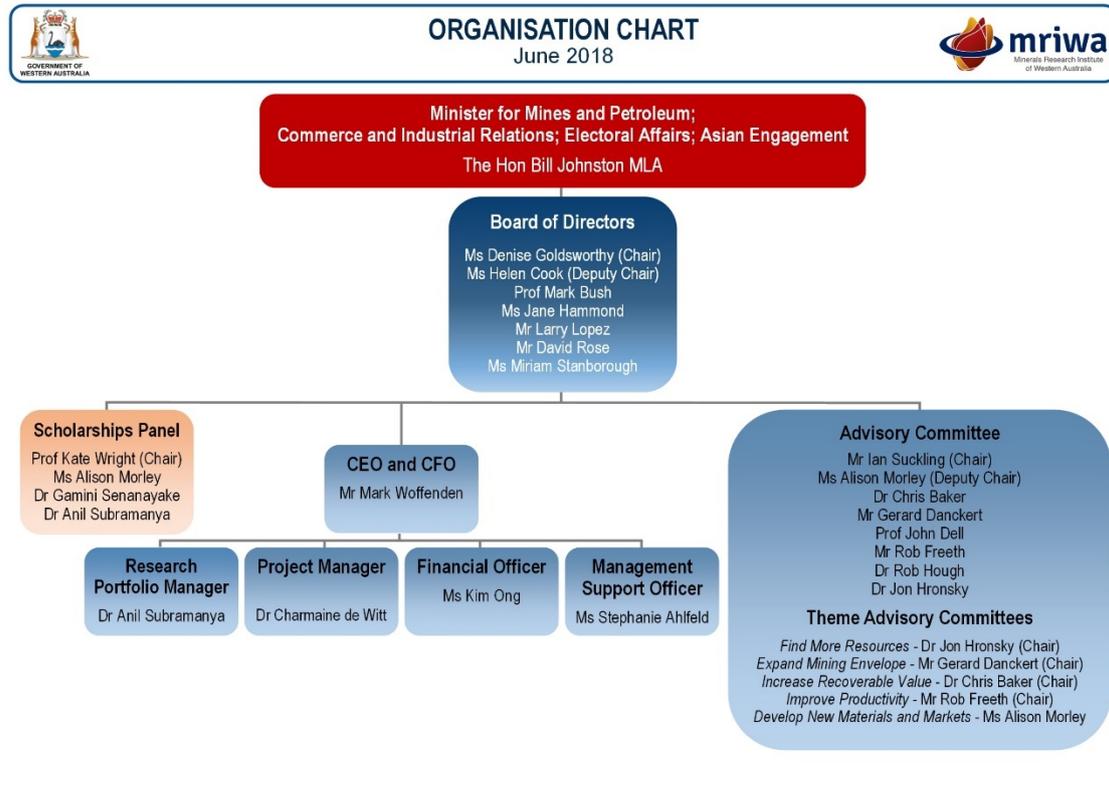


Figure 1. MRIWA Organisation Chart

Board

The Act provides for a seven-member Board for MRIWA. Board members are appointed by the Minister for Mines and Petroleum. Members are appointed according to their expertise and experience in areas relevant to the Institute's activities.

Details of the current members of the Board are provided below:

Name	Service	Current term
Prof Mark BUSH	First term	1 February 2016 - 31 January 2019
Ms Helen COOK	Second term	1 February 2017 - 31 January 2020
Ms Denise GOLDSWORTHY	First term	1 February 2016 - 31 January 2019
Ms Jane HAMMOND	First term	1 October 2017 - 31 January 2020
Mr Larry LOPEZ	First term	1 January 2016 - 31 December 2018
Mr David ROSE	First term	1 June 2018 - 31 January 2021
Ms Miriam STANBOROUGH	First term	1 October 2017 - 31 January 2020

	<p>Ms Denise Goldworthy became the Chair of the Minerals Research Institute of Western Australia in January 2018.</p> <p>Following 17 years at BHP Steel and 14 years in Mining (iron ore and minerals), including roles as Managing Director Dampier Salt, Managing Director Hismelt and Chief Commercial Officer Autonomous Haul Trucks (Rio Tinto), Denise has successfully transitioned to the third phase of her career as a Non-Executive Director and advisor on research, technology and innovation through the company Alternate Futures, of which she is the owner and Managing Principal.</p> <p>Among Denise’s honours is being named the 2010 Telstra Australian Business Woman of the Year. A member of Chief Executive Women (CEW), she was inducted into the WA Women’s Hall of Fame in 2011. Denise is a member of the Judging Panel for the Prime Minister’s Science Awards.</p> <p>Denise’s other current board positions are Chair, ChemCentre WA; Non-Executive Director, Western Power; Non-Executive Director, Export Finance and Insurance Commission (EFIC); Member of Council and Chair Quality, Audit and Risk Committee at Edith Cowan University; Member of Commercialisation Advisory Board, Curtin University; Fellow of ATSE and Chair of ATSE’s Resources Forum; and Chair for the Navy Clearance Diver’s Trust Council.</p>
	<p>Ms Helen Cook became Deputy Chair of the Minerals Research Institute of Western Australia in October 2017.</p> <p>Helen has over 20 years of Board experience across a range of sectors including energy and natural resources, arts and culture, training and finance. This has included high-profile government agency boards where she has delivered independent governance guidance and established sound relationships with Ministers and understanding of government protocols and issues.</p> <p>Prior to joining the MRIWA Board, Helen was the National Partner in charge of KPMG’s Energy and Natural Resources Group. This role has required a deep understanding of the key opportunities and challenges faced by the mining and energy sector across Australia across all commodities, markets and up and down the supply chain.</p> <p>Helen’s other current board positions are: Deputy Chair, Fremantle Port; Non-Executive Director RAC Holdings Pty Ltd, RAC Finance Ltd; UWA Mining Energy and Natural Resources Law Advisory Board; Major Performing Arts Panel, Australia Council; Chair, Chamber of Arts & Culture WA; Councillor of the National Art Gallery.</p> <p>Helen is a WA Councillor of the Australian Institute of Company Directors and a member of Chief Executive Women.</p>
	<p>Prof Mark Bush has over 30 years of experience in research, research leadership, grant assessment and grant administration, while holding various academic and leadership positions with UWA.</p> <p>Mark brings with him a broad knowledge of Engineering. He is currently Emeritus Professor with UWA and has served in the past as Head of Department of Mechanical and Materials Engineering; Dean of Faculty of Engineering, Computing and Mathematics; and Director of Animal Research Services.</p> <p>He is an Honorary Fellow of Engineers Australia (Hon FIEAust) and Chartered Professional Engineer (CPEng), and Fellow of the Academy of Technological Sciences of Engineering (FTSE), and has served in various leadership positions in both organisations.</p>
	<p>Ms Jane Hammond has 20 years’ experience in government and has worked in a range of senior legal and policy roles in State Government agencies in WA and NSW. Her home agency is the Department of Mines, Industry Regulation and Safety.</p> <p>Jane has a deep understanding of the structure, functions and strategic aims of government, as well as a strong technical understanding of the legal underpinnings of the system. Jane’s background in legislative drafting has led to her involvement in a number of legislative projects for the WA Government, including developing MRIWA’s foundation legislation.</p>

	<p>Mr Larry Lopez is the Director of the Commonwealth’s Accelerating Commercialisation Program. He is responsible for leading the Government’s efforts to identify and help businesses, entrepreneurs and researchers commercialise novel products, processes and services with significant market potential. Larry is a Partner at Perth based Australian Venture Consultants (AVC). AVC enables their clients’ decision-making processes through fact-based analytics informed by research and the insights it has acquired through almost 30 years of hands-on experience and engagements across the innovation and technology start-up ecosystem.</p> <p>Prior to moving to Australia in 2006, Larry spent 17 years at Silicon Valley Bank. During his tenure at SVB he held various senior and executive positions and played a key role in growing the company from a local community bank to a global leader in providing financial services for knowledge-based companies and investors. He was the founder and Managing Director of the Bank’s International Venture Capital Group and was an active investor in Israel, Australia and Europe.</p> <p>Larry is a Director of several IT-related private companies and sits on several not-for-profit boards. He has also been a partner or director of several venture capital funds in the US and Europe and is currently a director of Jolimont Global Mining Systems, a global venture capital fund focused on the investing in technology that enables the mining sector.</p>
	<p>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, including 15 years in executive leadership roles. 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).</p> <p>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.</p> <p>David is a past Deputy Chairman and now Honorary Fellow of Leadership WA, a Fellow of the AusIMM, a Graduate of the AICD, and is currently President of Rowing WA.</p>
	<p>Ms Miriam Stanborough is a chemical engineer with 17 years’ experience in the minerals processing industry, across commodities including copper, uranium, gold, silver, alumina and mineral sands. Miriam is Group Manager – Productivity & Innovation at Monadelphous, and previously held roles in Technical Development, Production Management, Business Improvement, HR & Diversity strategy, Project Management, and Sales & Marketing. She also holds degrees in Arts and Mineral Economics, is a member of the Australasian Institute of Mining and Metallurgy, and a graduate of the Australian Institute of Company Directors.</p> <p>Miriam’s other current board roles are: Chair of SHINE Inspire Achieve Belong Inc, and Board Member of the Northern Agricultural Catchments Council.</p>

Senior Officer

Mr Mark Woffenden (Chief Executive Officer)

Mr Woffenden has forty years’ experience in the minerals industry, notably in leading research and business operations units, change management and process and technology improvement.

Mr Woffenden took up the role of CEO of MRIWA in March 2013. Prior to joining MRIWA, Mark was Executive Director of the Resources and Chemistry Precinct at Curtin University, and prior to that CEO of the Parker Cooperative Research Centre for Integrated Hydrometallurgy Solutions: during which time Mark was also Deputy Chair of the CRC Association Committee (2005 to 2008).

Mark previously held senior management positions with Rio Tinto businesses, including Hamersley Iron and Comalco.

Mark is a Graduate of the Australian Institute of Company Directors, a Member the Australasian Institute of Mining and Metallurgy and was a member of the Premier's Science and Innovation Council of Western Australia (2007- 2009).

Mark will be retiring from MRIWA at the end of 2018.

Advisory Committees

The Act (section 60) enables the Board of MRIWA to appoint any advisory committee it requires to advise it in relation to its functions, and to appoint the members and determine the functions of such a committee. Appointment of committee members is on merit, not affiliation.

Advisory committees are subject to the reasonable directions of MRIWA and are able to determine their own procedures. The only statutory procedural requirement is that an advisory committee is to keep minutes of its meetings and to provide MRIWA with a copy.

The MRIWA Board is required to consider advice provided by an advisory committee but is not required to act on the advice, or to delay action pending its receipt.

To ensure that applications, for research grants in particular, are subject to appropriate consideration (given the breadth of the science and technology that the Institute's remit covers), the Board has appointed five Theme Advisory Committees (refer Figure 1) to bring discipline-specific expertise to the consideration of Applications for research grants.

The Board has also appointed an Advisory Committee, which considers the advice of the Theme Advisory Committees in its assessment of each Grant Application from a wider perspective.

Managing Material Personal Interest

Although members of the MRIWA Board and advisory committees are not appointed to represent any organisation or group, there is still the potential for an external observer to form a view of potential material personal interest in some circumstances.

A standing agenda item for meetings of the Board and advisory committees requires members to declare any material personal interest (real or potentially perceived) in any of the business on the agenda for that meeting.

In the case of a direct material personal interest, where, for example, a member has:

- i) a close professional or personal association with a project applicant or with the project itself; or,
- ii) a financial interest related to a party to an Application that accords, or could reasonably be perceived to accord, material personal benefit through control of the party, or material financial or other benefit derived from the party's investment in the project,

then the member is absent from the meeting room during the discussion of the matter and the decision.

In the case of a perceived material personal interest where, for example, the potential grantee organisation is the employer of a member, but the member has had no involvement in the Application and is not closely associated with any of the applicants, the member may remain in the room for the discussion and decision but should not participate. If there is any concern by the member or the committee that the project area is close to the member's own work within the organisation, the member will be absent during the discussion and decision.

In other cases, such as where applicants on the Application are from a member's employer organisation, but it is not the potential grantee organisation and the applicants are not closely associated with the member, then the member may participate normally in the deliberations of the committee. However, such cases should be declared, and the committee considers each on a case-by-case basis.

Should a conflict of interest arise in regard to the Chair, an alternate Chair will be appointed for deliberations on the relevant item of business.

MRIWA Board decisions may constitute 'market sensitive' information. Board members note the provision of the Corporations Act 2001 (s183) not to improperly use information. This duty requires directors to not improperly use the information they gain in the course of their director duties to gain an advantage for themselves or someone else, or to the detriment to the [entity of which they are a director].

Other Key Legislation Impacting on the Institute's Activities

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

- Auditor General Act 2006;
- Disability Services Act 1993;
- Equal Opportunity Act 1984;
- Financial Management Act 2006;
- Freedom of Information Act 1992;
- Industrial Relations Act 1979;
- Occupational Safety and Health Act 1984;
- Public Sector Management Act 1994;
- Salaries and Allowances Act 1975;
- State Records Act 2000; and
- State Supply Commission Act 1991.

Performance Management Framework

Outcome Based Management Framework

The Outcome-Based Management Structure and Key Performance Indicators (KPI) for the Institute were approved by the Department of Treasury in March 2015, to apply from the 2014/15 annual reporting period.

MRIWA's activities contribute to the over-arching Government goal of responsibly managing the State's finances through effective and efficient delivery of services, encouraging economic activity and reducing the regulatory burdens on the private sector.

The performance of the Institute will be measured over the longer term by the benefit derived by Western Australia from the Institute's activities and, ultimately, the impact these have on optimising the minerals royalties paid to the State.

The KPIs, revised from those applying to the predecessor Minerals and Energy Research Institute of Western Australia, are:

- Key Effectiveness Indicator: the ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects.
- Key Efficiency Indicator: total administration cost for the year as a percentage of the total cash value of research projects and the education program under management during the year.

The full KPI report is provided at page 103.

Changes to Outcome Based Management Framework

The Institute's Outcome Based Management Framework did not change during 2017-18.

Shared Responsibilities with Other Agencies

The Institute did not share any responsibilities with any other agencies in 2017-18.

Objective

The objective of the Minerals Research Institute of Western Australian is to stimulate minerals research that enables industry to continue to invest in, and operate, globally competitive minerals exploration, mining, processing and export enterprises in Western Australia, and in doing so ensure that royalties paid to the State are optimised in terms of quantum and duration so that industry will continue to provide a range of economic and social benefits to the State well into the future.

Relation to State Science Policy

From a fiscal perspective, the State Government investment in minerals research is part of the strategy to ensure that the State's mining operations are competitive with operations in lower cost jurisdictions, nationally and internationally. The State's co-investment in minerals research contributes to securing the significant revenues generated for the State by the minerals industry.

MRIWA represents a strategic model for minerals research in Western Australia. It provides an efficiency gain for the State with research for the minerals industry being better managed, coordinated and strategically targeted than would otherwise be the case.

MRIWA is contributing to implementing the Western Australia Science and Innovation Framework 2018-2022. The Institute is focused on the Mining Priority Area and its activities support many of the Framework's Outcomes, particularly:

- i) Diversification of the State's economy with attendant job creation;
- ii) Local, national and global recognition of the State's strengths; and
- iii) Collaboration and innovation are fostered across industry, researchers and government.

Research Priority Plan

Under the MRIWA Act (Division 4), the Institute is required to have a Research Priority Plan (RPP) that identifies and prioritises the medium- to long-term knowledge and technology needs of the State's minerals industry. The first edition of the RPP was completed in 2013. The Act requires that the Institute must have regard to its Research Priority Plan, as revised from time to time, when performing its functions. The timing for a review of the RPP is at the discretion of the MRIWA Board.

The current RPP provides for five Themes to guide MRIWA's investments in research (refer Figure 2).



Figure 2. Themes of the Research Priority Plan

To provide greater clarity for stakeholders, Themes 1, 2 and 3 are further defined by a number of sub-Themes.

Theme		Sub-Themes
1	Find More Resources	1.1 Mapping of the depth and character of cover progressing from shallow to deeper cover. 1.2 Distal footprints research. 1.3 Development and deployment of tools that provide improved understanding of the sub-regolith geology in Western Australia. 1.4 Advanced analysis and correlation of existing geological and geophysical datasets.
2	Expand the Mining Envelope	2.1 Deep extraction systems. 2.2 Engineering in highly stressed and complex rock masses. 2.3 Productive and safe deep in-mine environments.
3	Increase Recoverable Value	3.1 Modelling and simulation of processing circuits. 3.2 Accelerated technology development frameworks.
4	Improve Productivity	No sub-themes defined.
5	Develop New Products and Markets	No sub-themes defined.

Table 1. MRIWA Research Themes and sub-Themes

The broad relationship between Theme 1 - Find More Resources, Theme 2 - Expand the Mining Envelope, and Theme 3 - Increase Recoverable Value is illustrated schematically in Figure 3. The Research Priority Plan guides MRIWA to contribute to:

- Positioning Western Australia for more effective exploration in the vast areas of the State covered by weathered material that 'blinds' current exploration technologies;

- Extending the reach of ‘conventional’ mining practice and technology, both open-pit and underground; and
- Developing the science and technology necessary to exploit mineralisation at great depth.

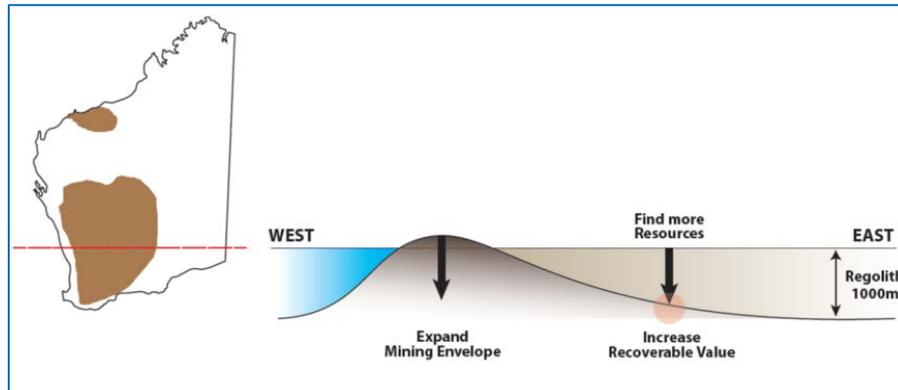


Figure 3. Schematic of the relationship between Research Themes 1, 2 and 3 that guide MRIWA to contribute to:

- Positioning Western Australia for more effective exploration in the vast areas of the State covered by weathered material that ‘blinds’ current exploration technologies (white areas on the map, light grey in the cross section);
- Extending the reach of ‘conventional’ mining practice and technology, both open-pit and underground especially in the Yilgarn and Pilbara Cratons (brown areas in the map) which host the majority of mining in the State; and
- Developing the science and technology necessary to exploit mineralisation at great depth (conceptually shown by the pink circle in the cross section).

Reviewing the Research Priority Plan (RPP) continued during the reporting period.

The current RPP was prepared in 2013 after extensive consultation with representatives from industry, research and government. This version of the Plan has proved to be well-founded and has provided a sound basis for the Institute’s investment decisions.

The Board’s view is that the research fields described in Theme 1 (Find More Resources), Theme 2 (Expand the Mining Envelope), Theme 3 (Increase Recoverable value) and Theme 5 (Develop New Products and Markets) are still entirely relevant and that Theme 4 (Improve Productivity) needs to be amplified to better describe research needs that have emerged in recent years.

The Board is mindful that whilst the RPP must remain contemporary it also needs to provide some continuity for stakeholders.

The current draft consideration for the amplification of the Productivity Theme is that it should address more specifically:

- Enabling step-change productivity optimisation (particularly with respect to whole of value chain and smaller mining footprint initiatives).
- Identifying new methods for stream-lining regulatory processes (to keep up with the pace of change).
- Utilising advanced mathematical tools and data analytics to create new minerals industry knowledge.
- Contributing to optimisation of performance in the mining value chain and automation (particularly in the small to mid-cap operators and the SME service sectors).

The Board decided to defer finalising the review of the RPP until there was greater clarity of the consequences of the Minister assigning MRIWA a role in delivering to the Government’s election commitment regarding renewable technology manufacturing and work to develop battery technologies, and the transition to the new CEO was completed.

Agency Performance

Chair's Report

I had the pleasure to take over as Chair of this organisation in January 2018 and thank Peter Lilly for his outstanding leadership of the organisation as it transitioned from MERIWA to MRIWA under new legislation.

As we complete our fourth full financial year, our Institute is entering a time to reflect upon our performance and consider how to take the organisation to the next level. The two main triggers for this have been:

- the announcement in May of the additional funding of \$5.5 million to be managed via MRIWA for the potential Future Battery Industries Cooperative Research Centre (FBICRC) with the aim of securing its headquarters in Western Australia; and
- the legislated requirement for a review of the Institute, to be completed in early 2019.

While the final decision for Federal Funding of the FBICRC is not until March 2019, we consider WA to be the natural location for such a CRC. Western Australia has the capacity to supply many of the new energy materials required for the manufacture of batteries and other new energy technologies. We also have outstanding researchers in this state, who collaborate with other National and International Research organisations to ensure new IP can be leveraged to the benefit of WA. This initiative has the potential to create significant jobs growth in Western Australia. MRIWA's significant contribution to achieving this commitment is a testament to our ability to work with a range of key stakeholders, industry, research and government alike, for a mutually beneficial outcome.

The review of the MRIWA Act, which is being done in conjunction with a second assessment of the economic impact of MRIWA's investments in minerals research (the first was completed in 2015), will provide an opportunity to reflect on the performance of the organisation and the impact we have had on the State so far. The review and assessment will inform shaping opportunities to improve the operational model of the organisation and tune the way we work to ensure that the Government has the ongoing confidence in MRIWA to provide significant financial support for our core activities beyond the scope of the FBI CRC.

So, while we look to the future with optimism, the last year has been one with mixed messages. There have been early signs of the mining industry becoming more active in R&D as interest reignites for exploring and mining a range of commodities as well as in new technologies. However, this response is still patchy. Our key partners in R&D - the exploration, mining, mineral processing and mining equipment, technology and services (METS) companies - are balancing the needs of a strong focus on cash conservation with securing long-term competitiveness.

Our allocation for Grant funds in 2017/2018 has been fully subscribed. The Board of MRIWA has continued to invest in high-quality, strategically-relevant collaborative R&D projects that will continue to sustain the critically-important minerals sector in Western Australia well beyond the current cycle. During 2017/2018, the new MRIWA investment approved by the Board was \$3 million (excluding the \$5.5 million for the FBICRC) matched by sponsors' cash support of \$4.2 million. In addition, a further \$0.2 million of MRIWA funds were invested in new PhD research projects via scholarships. These figures bring our total R&D investment portfolio of active projects to \$37.3 million at the end of the financial year.

We also modified the conditions for MRIWA scholarships to contribute to developing the gender diversity of the research and operational mining workforce in the State, through the awarding of our first Scholarship specifically for women. We wish Kudzai Angeline Mchibwa and the other scholarship

winners, all the best in delivering some outstanding results and insights through their PhD research projects over the next few years.

The diversity of the research portfolio has been increased reflecting the new strong areas of interest. As a result, two new Theme Committees were formed to support the assessment of potential projects. These were a Productivity Committee, with a particular focus on digital, sensing and software solutions, and a New Materials and Markets Committee, which has a particular focus on mining commodities that are new to Western Australia. An example is the minerals that are likely to have increased demand to support the developing industries such as renewable energy supply and storage.

The Institute continues to be a highly proactive member of the national minerals innovation system. This includes identifying our stakeholder's needs and opportunities, identifying suppliers of resources and capabilities, and encouraging proposals from leading research organisations that align with our priorities. MRIWA was also active in promoting Western Australia as a prime location for major new programs in industry-driven R&D, such as the successful MinEx CRC proposal.

Our reach continues to develop at both a National and International level. Key active partnerships during the year have been with MinEx CRC, FBI CRC Bid, Digital Mining CRC Bid, Austmine, METS Ignited, ANSTO, Mining 3 and the South Australian Government mining industry agencies.

Since the Western Australian Government changed in March 2017, the Institute has developed a strong relationship with Minister Johnston (Minister for Mines and Petroleum) and the members of his office. The strength of this relationship has served the goal of increased inter-agency collaboration very well, as reflected in the positive outcomes already listed.

Unfortunately, much of the influential work that MRIWA might continue to do is under threat until the outcome of the review of the MRIWA Act is known. The review, and the economic impact assessment, will be included in the Institute's submission to the 2019 State Budget, which will seek new funding for the Institute to invest in 'business-as-usual' (BAU) minerals research for 2019/20 and beyond. (Business-as-usual is distinct from Budget allocations to specific initiatives such as the \$5.5 million for the FBI CRC.) The 2018 State Budget provides \$2 million to MRIWA for 2018/19 for BAU investments, and nothing beyond.

We are optimistic that the outcomes of the Economic Impact Assessment and Review of the Act will highlight the relevance and suitability of the MRIWA Act and the valuable contributions that MRIWA is making to a positive future for Western Australia.

The Board of MRIWA, and our partners in industry and the research community, continue to encourage the State Government to provide the quantum of funding needed to maintain MRIWA as a relevant, positive force in State, National and International R&D for the benefit of Western Australia. There is no doubt that MRIWA is a significant asset for the State.

As already noted, Dr Peter Lilly, our previous Chair, retired during the reporting period. As a consequence, we welcomed David Rose to the Board, whose executive operational leadership and technical skills will serve MRIWA well into the future.

I am most grateful to all my Board colleagues as they exercise their responsibilities with enthusiasm and commitment. The level of debate and commitment to building a positive outcome for Western Australia makes the task of Chair an easy one.

The members of the Advisory Committee and Theme Advisory Committees continue to provide indispensable advice to the Board on proposed research project investment and priorities. These

extraordinary people contribute generously of their time and intellect to the decision-making processes and I express my deep appreciation for their vital contribution.

Bryan Smith, one of the longest-standing members of the Advisory Committee retired during the year. All the Committee members have contributed their breadth of skills and experience to our deliberations and decision-making processes over a sustained period, and I thank them all for their selfless service. We welcomed several new members to our Theme Committees: Tamryn Barker, Charles Elliott, Ben Hammond, John Hearne, Melinda Hodkiewicz, Peter Oliver and Sabina Shugg.

I continue to express my sincere thanks to the CEO and his small but dedicated team for successfully managing MRIWA. Mark Woffenden, the current CEO, has announced his intentions to retire in the coming months. We have commenced a national search for a suitable replacement, and hope that we can find a new CEO who will have as much of a positive impact on the State and MRIWA as Mark has had.



Ms Denise Goldsworthy

Chair
Board of Directors

Date: 13 August, 2018

Operations Report

This is the third full-year Annual Report for the Minerals Research Institute of Western Australia. The Institute commenced on 1 February 2014, after the *Minerals Research Institute of Western Australia Bill 2013* received royal assent on 18 December 2013.

MRIWA Strategy

The MRIWA strategy is founded on a business model for the Institute (refer Figure 4), which focuses on the contribution that MRIWA makes to enabling the results of research projects to be used in the operating mining industry.

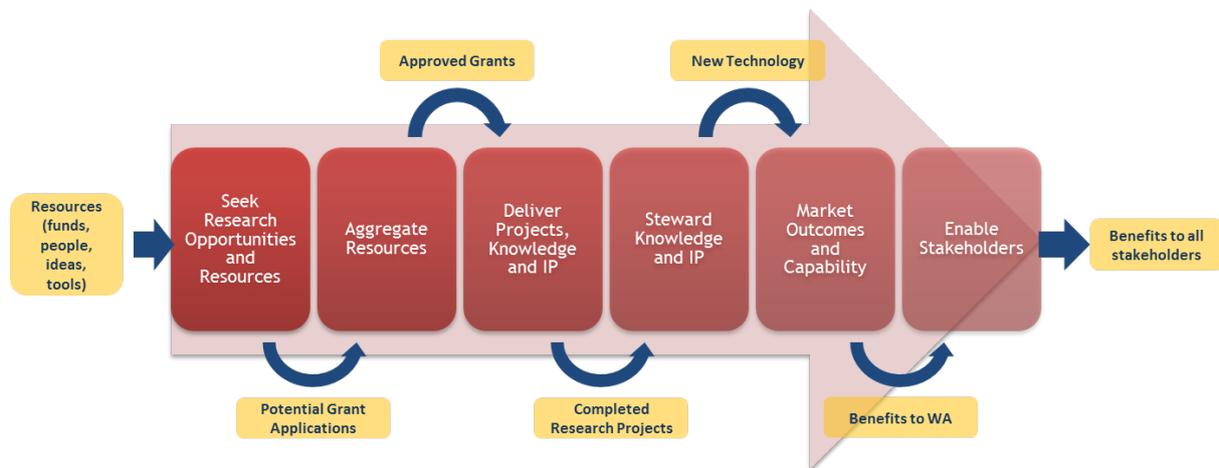


Figure 4. The MRIWA business model

To achieve its vision of promoting minerals research to optimise economic outcomes for Western Australia, MRIWA has identified and adopted several strategic goals. Two of particular note are:

- **Become an influential stakeholder in the national minerals innovation system**
The minerals research community is a complex 'ecosystem' involving many participants, including small private enterprises, international corporations, university institutions and government agencies (refer Figure 5).



Figure 5. Schematic of the community served by MRIWA

By understanding this community and building strong relationships with the members, MRIWA has positively influenced the focus and direction of research to the benefit of our minerals industry.

- **Extend from ‘enabling research’ to ‘enabling research and commercialisation’**
To contribute to innovation and industry success, research must progress from its origins in fundamental research to commercial implementation of new equipment or processes. As technology or concepts progress along this pathway, the financial investment required increases significantly, which can slow, or ultimately prevent, their implementation.

MRIWA assists this difficult transition from fundamental research to commercial application by judicious co-investment in research linked to operational testing, demonstrations, or by assisting with the commercialisation and marketing process.

The other elements of the MRIWA strategy are to:

- Diversify its financing strategy beyond current government funding;
- Balance the varying needs of both government and industry stakeholders; and
- Identify and strengthen MRIWA’s core competencies.

Achievements

Investment in Research and Education

The institute’s portfolio of research projects is appropriately diverse, aligned with the State’s needs and a sound mix of investments in fundamental and more application-ready projects.



Figure 6. Distribution of investments in the MRIWA portfolio or research projects by RPP Theme including the FBICRC

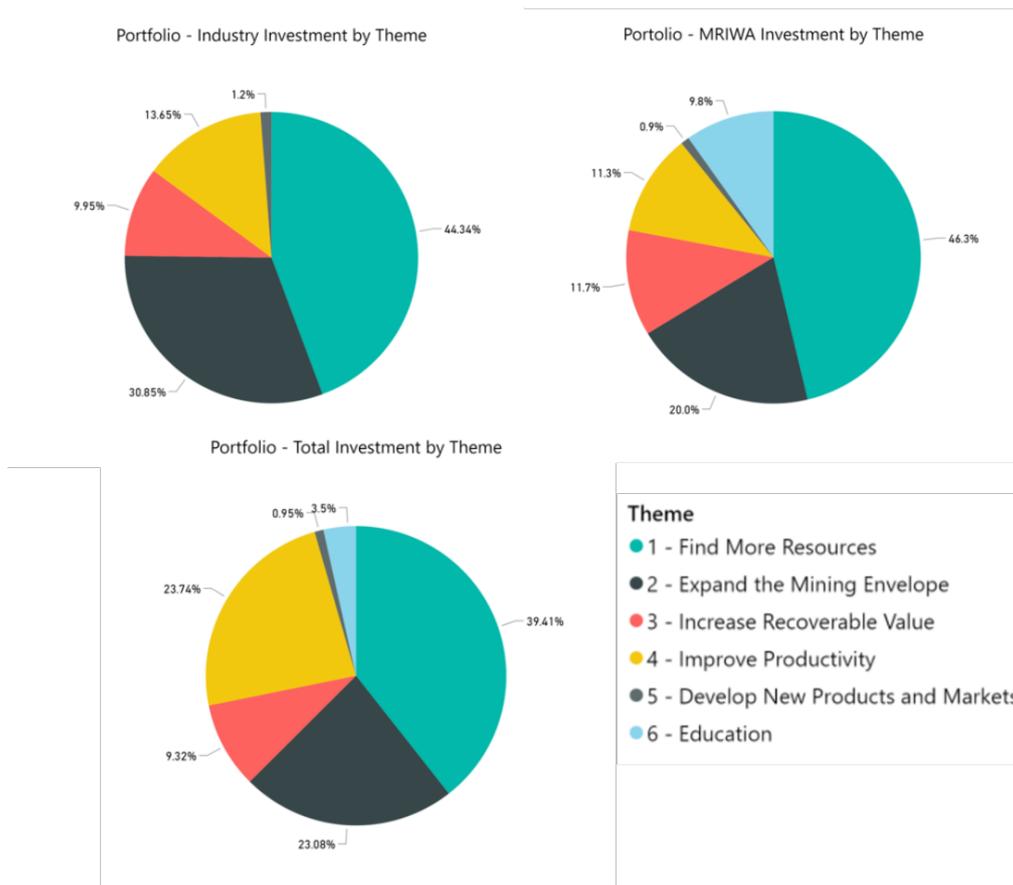


Figure 7. Distribution of investments in the MRIWA portfolio or research projects by RPP Theme, excluding the FBICRC

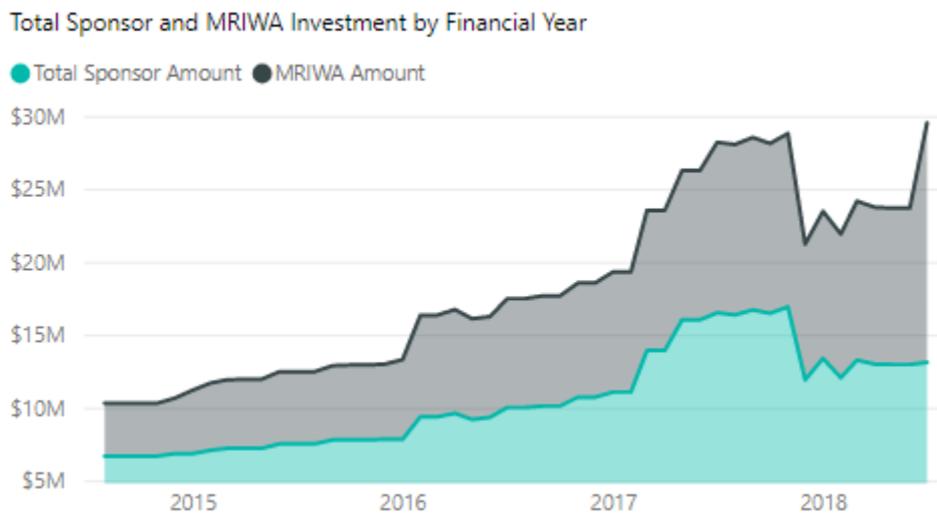


Figure 8. Total investment in research by MRIWA and project sponsors has increased steadily since the Institute commenced in February 2014

The value of the Institute’s portfolio of research projects has increased steadily over the last three years. The financial leverage (the value of investment by other Sponsors compared to the value of the MRIWA investment) has fluctuated as the fortunes of the minerals industry have changed.

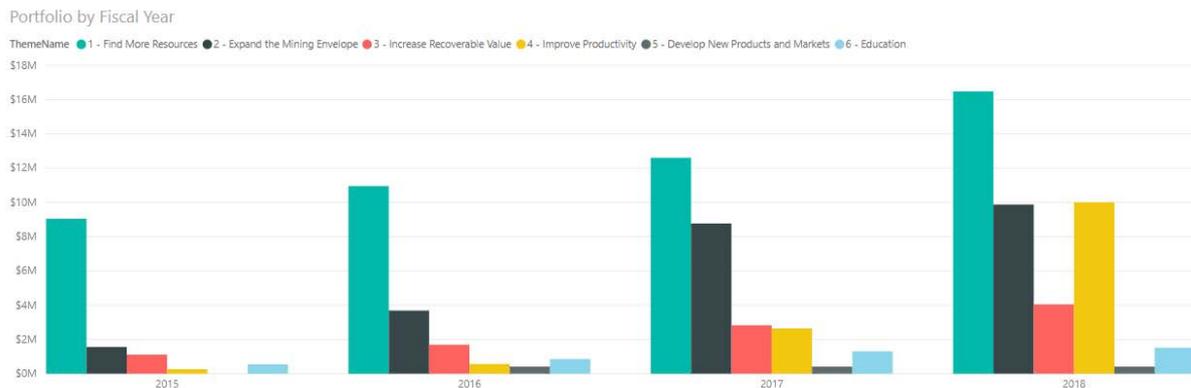


Figure 9. Investments in Themes 1, 2, 3 and 4 as well as the Scholarships Programme has increased steadily

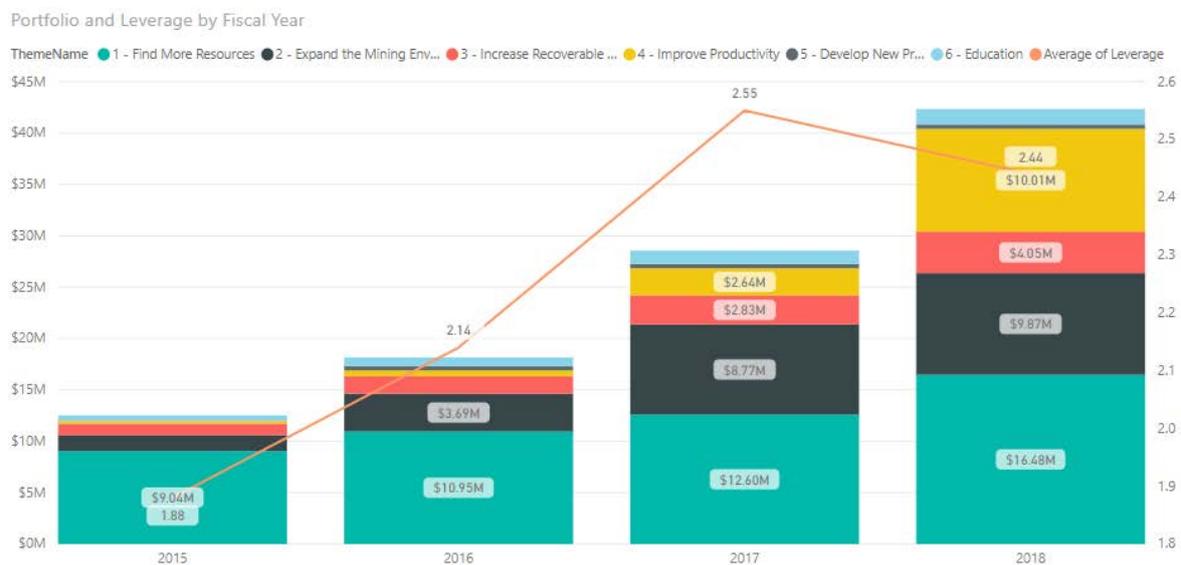


Figure 10. Distribution of investments in each of the Institute's research Themes (i.e. Exploration, Mining, Extractive Metallurgy, Productivity Improvement and New Markets and Materials), has changed as MRIWA has progressively implemented the business strategy since 2014

MRIWA has invested substantially with local universities and the CSIRO, with an increasing investment with inter-State research organisations. This work delivers to the intent of the MRIWA Act that MRIWA should attract the best available research capability to work on research required by the Western Australian minerals industry.

MRIWA is contributing to developing high-calibre talent for the long-term of the minerals industry in Western Australia (refer also page 47).

It is pleasing to report that the Federal Government has approved the Bid to the Australian Research Council for the ARC Training Centre for Transforming Maintenance through Data Science, in which MRIWA invested \$0.24 million in 2016/17 for two PhD scholars. Curtin University was awarded \$3.9 million in ARC funding for the establishment of the new Centre. The Centre aims to equip practising engineers and Australian graduates with the next generation of data science methods for the maintenance sector and to foster a new maintenance technology service sector for national and international markets. To this end, the Centre is partnering with the CORE Innovation Hub.



The vision for MinEx CRC is to create new opportunities for mineral discovery by delivering industry led, outcome focussed research.

The primary research objectives include:

- Developing more productive, safer and environmentally friendly drilling methods to discover and drill-out deposits, including Coiled Tubing technology.
- Developing new technologies for collecting data while drilling, bringing forward mine production.
- Implementation of a National Drilling Initiative (NDI) - a world-first collaboration of Geological Surveys, researchers and industry that will undertake drilling in under-explored areas of potential mineral wealth in Australia.

MinEx CRC is a \$215 million research centre with 34 industry and research participants. MRIWA has committed \$1 million of the \$41 million cash Participants have invested in the CRC. The Commonwealth Government Department of Industry, Innovation and Science CRC Program co-invested \$50 million.

“MinEx CRC will break new ground in the discovery and definition of mineral deposits by pioneering cheap, safe and environmentally-friendly coiled tubing drilling to build a 3D picture of the subsurface. New mineral discoveries are becoming rarer in Australia, but are critical for the long-term future of Australia’s mining industry. To address this challenge, cheaper, safer and more environmentally-friendly methods of mineral exploration under barren and deep cover rocks are needed. With the assistance of geological surveys, MinEx CRC will deploy and analyse the results of extensive, cost-effective coiled tubing drilling to map prospective rocks under cover in the context of the National Drilling Initiative. MinEx CRC will also further develop new greenfields coiled tubing drilling technologies in order that they are suitable for defining (drilling-out) mineral deposits. Enhanced depth, steering and sensing capabilities will permit and dramatically reduce the cost of resource definition. MinEx CRC will also work on techniques to optimise conventional drilling techniques such as diamond drilling”.

(Source: LinkedIn)

The Bid for the new MinEx Cooperative Research Centre reported last year, which included \$1 million of MRIWA funds, was approved by the Commonwealth Government’s CRC Program. The total value of the bid for the CRC is \$182 million, comprising cash investments by government agencies and industry of \$36 million, in-kind commitments of \$96 million and \$50 million requested from the CRC Programme. The CRC will be jointly headquartered in Perth and Adelaide.

MRIWA – beyond a funding agency

In the last three years MRIWA has proved its value for Western Australia beyond that of being a strategic funding agency.

- **Boundary-spanner.** The Institute has been instrumental in identifying the opportunity for, and bringing to life, research collaborations between scientists in disparate fields to achieve synergies that may not have otherwise eventuated. Examples include project M488 *Understanding rock-fluid interactions and lixiviant/oxidant behaviour for the in-situ recovery of metals from deep-ore bodies* and project M478 *Mine Pit Lakes – Their characterisation, assessment, management and value as potential lead indicators for in-situ metal recovery opportunities*.
- **Thought leader.** The Institute has been at the forefront in establishing national research collaborations in areas as diverse as the future battery industries for Australia, digital mining, automation and robotics in the resources sectors and in-situ recovery of metals.
- **Responder for Government.** MRIWA is unique in Australia as a government agency in its capacity to identify opportunities for government and to act in the interest of government’s election commitments and policies. The benefit to Western Australia in this regard has been amply evident in the process for assessing and responding to the opportunity for the FBICRC.

- **Model for other jurisdictions.** MRIWA made a submission to the Federal Government's Resources 2030 Taskforce that the MRIWA model should be considered for providing strategic focus, investment capability and industry assessment at the national level.
- **Comprehensive representative for Western Australia.** MRIWA has made a significant contribution to CRC ORE establishing the Kalgoorlie-Boulder Innovation Hub, to the headquarters for the new MinEx CRC being co-located in Perth and for the headquarters for the proposed FBICRC to be in Perth.

The 2017/18 year

The Australian mining industry has accelerated the focus on innovation noted in last year's report, in notable contrast to the focus only a couple of years ago on the narrower objective of improving productivity. Whilst commodity prices have generally increased during the reporting period¹, the broad challenges for the producers remain: higher energy costs, declining ore grades, and securing and retaining 'social licence to operate'.

Mineral producers and governments in Australia are increasingly recognising the potential of METS companies as vital contributors to delivering innovation in the Australian minerals sector. Companies such as these are not only often innovative by nature, but they have a potent capability to incorporate research into new or enhanced products or services that are required by the producing companies to achieve their improvement objectives. These companies have and can increase their role as 'channels to market' for inputs for innovation by the operating mining companies.

The minerals industry is increasingly exploiting advances in new sensors, vastly improved electronic communications and computing technologies, and capabilities to model and create visualisations of complex relationships from the macro- to the nano-scale. These are being integrated to deliver opportunities for business improvements barely imaginable a decade ago.

A notable new trend emerging during the year is the attention being given to ensuring 'social licence' is in place in conjunction with, if not in advance of, the application of new technologies or industrial processes. This contrasts with previous circumstance where social licence was often sought retrospectively.

The Institute has engaged with these developments by increasing engagement with a range of stakeholders: the growth of the relationship with METS companies as co-investors in research Grants is particularly pleasing.

¹ https://ycharts.com/indicators/metals_and_minerals_index_world_bank: 20 August 2018, Metals & Minerals Price Index is at a current level of 86.79, up from 86.45 last month and up from 72.24 one year ago. This is a change of 0.40% from last month and 20.14% from one year ago.

Project Sponsors by Organisation Type

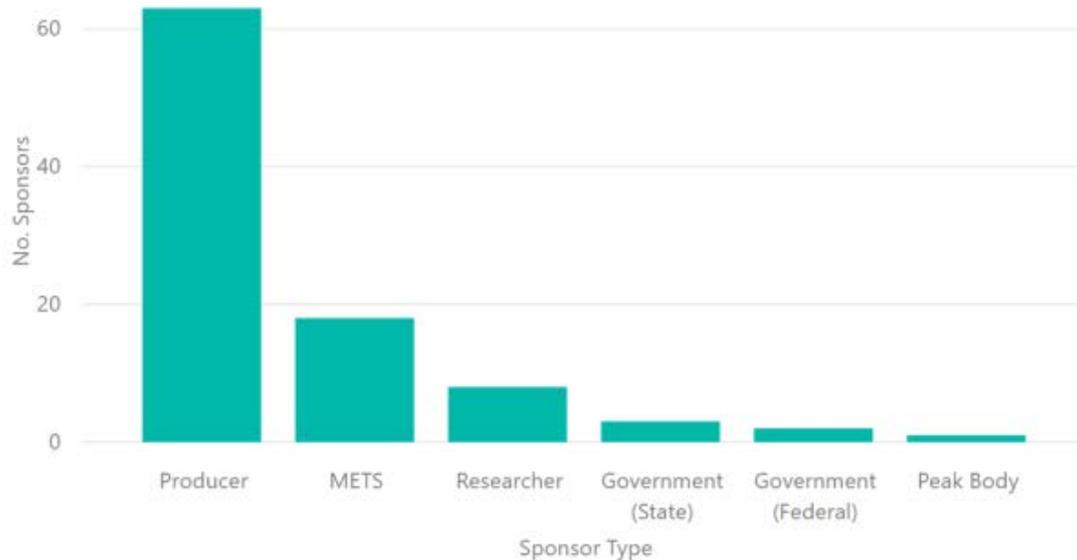


Figure 11. The majority of Sponsors for MRIWA projects are Producers, who comprise the traditional pool of parties requiring industry-specific research. The second largest group of Sponsors come from the METS sector. In recent years this group has shown the biggest growth in Sponsorship engagement in MRIWA projects. Universities, CSIRO and various CRCs comprise the Researcher cohort

Note: Sponsors are only shown once, regardless of the number of projects in which they invest.

In Western Australia, the State Government recognised the value of increasing its investment in innovation, or the commercialisation of new science and technology, for the minerals industry some six years ago, with the commitment to establishing and funding MRIWA.

The State Government's view is that without a central coordinating research body, minerals research in Western Australia has no focal point: there are both potential unidentified research gaps and likely overlaps in mineral research.

The Government's confidence in MRIWA is exemplified by the decision to authorise MRIWA to invest \$5.5 million (in conjunction with the Minister for Science's allocation of \$0.5 million) in the Future Battery Industries Cooperative Research Centre (FBICRC) Expression of Interest to the Australian Government, which was submitted on 3 July 2018.

The Institute is well-placed to contribute to the State Government's objectives to:

- Establish Western Australia as the 'go-to' place to find solutions to the difficult challenges facing the minerals industry.
- Achieve growth in regional areas of the State.
- Promote and develop engagement with selected economies in Asia.

The advancement, and application of, science for the minerals sector assist the State to grow and broaden the economy, create a new generation of jobs and expand relationships with the services sector of overseas economies, especially those in Asia.

The Institute's strategy aligns with the developments in the broader minerals industry: particularly to increase its engagement with the companies providing technologies and services to the industry producers and to invest in research in the "demonstration and commercialisation" element of the innovation value chain (sometimes referred to as the 'valley of death' for product development) whilst still continuing to invest in early-stage research. The expectation is that this broader investment will lead to increased market uptake of research outputs.

It is pleasing to report that MRIWA has achieved significant successes in 2017/18. In summary, the Institute has: further improved its external engagement; become a recognised voice in national minerals innovation; maintained its alignment with State goals; responded through its research investments to the industry cycle; and, further strengthened its governance.

Project M507 QA4UAV is a collaborative project between Frontier SI (formerly CRC SI), MRIWA and Department of Environment, Land, Water and Planning, Victoria.

With the increasingly widespread use of Unpiloted Aerial Vehicles (UAVs) in applications across many sectors, one of the key emerging areas of concern was the issue of low quality of the data provided, causing considerable frustration to users. This is because of the lack of a standard for data delivery or quality control process.

This project aimed to investigate how UAVs are being used to capture and acquire data and how that data is being used. After extensive surveys, 56 distinct applications of UAV data across 12 different sectors, including mining, were profiled. Data quality issues were identified as a major issue.

Based on these findings, more than 40 quality assurance checks have been highlighted that could help determine if UAV-acquired data is of high-quality and fit-for-purpose in a User Needs report.

The researchers will use the findings of this report to develop assisted workflow and quality assurance tools into a software package called QA4UAV which will address the needs of each sector.

These objectives have been achieved.



The FBICRC will contribute to the Government's election commitment to renewable technology manufacturing: work to develop battery technologies.

The State Government commitment ensured the bid would be hosted in WA by Curtin University, with the view to the headquarters for the FBICRC being in WA should the application be successful.

The FBICRC will enable Australian industry, governments and researchers to optimise the cost competitiveness and productivity of Australian energy storage metals, materials and systems to meet growth in markets, companies and exports. It will enable value creation, sustainability and global competitiveness through the battery value chain. The FBICRC will deliver Australian industry development for mineral processing, battery manufacture, deployment, reuse and recycling.

The FBICRC is requesting \$25 million from the CRC programme over a 5-year period, commencing 1 July 2019. Overall the 42 partners in the FBICRC are committing \$26.18 million in cash and \$13.15 million of in-kind contributions to the application. The estimated impact of the partner investment matched with \$25M Commonwealth investment is forecast to be \$1.23b over a 15-year period.

Three Research Programs, with multiple research activities will address the requirements of industry:

- Program 1: Battery Industry Development
- Program 2: Battery Resources, Processing and Recycling
- Program 3: Battery Materials, Components, Manufacturing, Testing and Deployment.

The Institute's plan for 2017/18 focused on:

- Maintaining a portfolio of research projects that aligns strongly with MRIWA's objectives, the Research Priority Plan and the business strategy. Essential to achieving this is establishing a strong 'pipeline' of opportunities for research grants and a flow of applications to the Board.
- Marketing the Institute in the Western Australian and national mining, equipment and technology services (METS) sector and securing research projects with co-investors from the sector.
- Maintaining the momentum of the tertiary scholarships program.
- Enhancing organisational capability to deliver to the requirements of the Act and the funds allocated to the new Institute.

Research Investments

It is especially pleasing to report that the Board has approved \$13.9 million of Grants for minerals research projects, comprising \$8.7 million of MRIWA funds including the \$5.5 million for the FBICRC and \$4.2 million of other investors' funds. (It is noted that these amounts refer to investments approved by the Board during the reporting period, not to investments for which legally binding contracts were completed during the reporting period, as is required for reporting in the Financial Statements. Also, the amounts include the commitment of \$5.5 million for the FBICRC, for which no co-investment is yet reportable.) The investments in research projects approved by the Board are summarised in Table 2, below.

Project Number	Project Title	RPP Theme	MRIWA (\$)	Co-investors (\$)	Total project (\$)
M468	Predicting grade distribution of comminuted particles to determine optimal grind size	3	\$65,000	\$81,000	\$146,000
M510	Safe, sustainable management of filtered tailings	3	142,000	\$365,250	\$482,500
M514	Novel seismic methodologies for exploration of mineral resources in a hypersaline environment	1	\$90,000	\$190,000	\$280,000
M515	Development of drilling fluid system for Coiled tube drill rig	4	\$150,000	\$250,000	\$400,000
M517	Geophysical Rock Mass Characterisation for mining and geometallurgy	2	\$150,000	\$250,000	\$400,000
M518	Real-time mining face grade determination using hyperspectral imaging techniques	2	\$250,000	\$600,850	\$850,850
M519	Broadening the opportunity for in-situ recovery of value from mineral deposits	3	\$240,000	\$660,000	\$900,000
M513	Extension to M432 - Validation and Standardisation of Sequential Leaching Tools to Better Predict the Impact of Iron Ore Mining on Ground and Surface Water Quality – Phase 2	4	\$216,000	\$309,000	\$525,000
M521	Lithospheric and crustal-scale controls on multi-stage basin evolution: Impacts on Mineralising Systems	1	\$733,737	\$760,000	\$1,493,737
M522	Physics Models for Ore Tracking in Surface Mines	4	\$380,000	\$380,000	\$760,000
M530	Yilgarn 2020	1	\$905,400	\$1,085,000	\$1,990,400

Project Number	Project Title	RPP Theme	MRIWA (\$)	Co-investors (\$)	Total project (\$)
M533	Future Battery Industries CRC	4	\$5,500,000	\$44,500,000	\$50,000,000
M534	CRC-ORE (M441) On-belt Gamma Activation Analysis (GAA) Sensing for Gold: Phase 3 - Preparation for Pilot Plant Campaign	3	\$62,000	\$174,000	\$236,000

Table 2. Summary of MRIWA research project investments in the reporting period

Communicating our projects sometimes requires less emphasis on the technical and more on the fun and catchy. Here we've had a go at retitling our projects for social media:

M529 Lixiviant access creation in impermeable hard rock mass for the in-situ underground leaching of metals from ore

"Freezing, cooking or zapping - can we crack underground rock using cryogenics, microwaves or high voltage pulses to enable extraction by leaching?"

M531 Social Licence to Operate (SLTO) and future In Situ Recovery (ISR) projects

"Better community understanding of in-situ leaching will lead to greater acceptance of this extraction technique"

M532 Geology, Mineralogy and Metallurgy of eMaterials Deposits in WA

"Future battery minerals in WA – what types of deposits does WA have, how good are they, and how do we extract them in the safest possible way?"

M533 Future Battery Industries CRC Bid (Stage 1)

"A cooperative research centre for future battery industries, headquartered in WA"

M534 CRC ORE GAA Phase 2

"Designing a smarter way to quickly determine gold content in ore on the conveyor belt"

M441e Magnetic Resonance Bench Analysis - Stage 1: Laboratory Feasibility

"Precise, autonomous ore grade measurement on each bench in an open cut mine"

M536 RC for Resource Sector Environmental Management

"Contribution to a cooperative research centre for resource sector environmental management"

An additional investment in research is provided by MRIWA through the PhD Scholarship Program. The new scholarships for 2017/18 are summarised in Table 2a.

Project Number	Project Title	RPP Theme	MRIWA (\$)	Co-investors (\$)	Total project (\$)
M523	Directors' Scholarship - Keith Giglia. <i>Monitoring and control of hydrocyclones by use of convolutional neural networks and deep reinforcement learning.</i>	6	\$106,050	\$0	\$106,050
M524	Women's Scholarship - Kudzai Angeline Mchibwa. <i>Innovative processes for leach liquor purification and production of battery grade LiOH from Li mineral resources</i>	6	\$105,000	\$0	\$105,000

Table 2a. Summary of MRIWA educational programme research project investments in the reporting period

It is also pleasing to report that the 'pipeline' of opportunities for future applications is strong and diverse.

Finances

MRIWA was in a sound position financially at the end of the reporting period. Results from the Financial Statements are provided in Table 3.

Improved and efficient **financial and project management** has resulted in a total admin cost of

3.3% of the total value of the portfolio of research projects

Item	\$ 000's
Accumulated funds opening balance at 1 July 2017	9,445
Plus income from State Government (Year ended 30 June 2018)	4,156
Less, net cost of services (Year ended 30 June 2018)	3,004
Accumulated funds as at 30 June 2018	10,597

Table 3. Summary of MRIWA's financial results for the reporting period for minerals research

The Institute's summary statistics for 2017/18 are provided in Table 4.

Factors	1 July 2017 to 30 June 2018
Projects	
Applications received ⁽¹⁾	16
Applications approved	13
Projects in progress ⁽²⁾	36
Projects completed ⁽³⁾	3
Technology Transfer	
Reports published	3
	(\$000s)
Funds Received (excluding Industry Sponsorship)	
Budget appropriation - Consolidated Revenue Fund	3,759
Budget appropriation - Exploration Incentive Scheme	350
Interest received	230
Total Funds Received	4,339
Less administration costs (excl. depreciation)	1,070
Funds available to support research	3,269
MRIWA Grants approved during period	
For research projects (includes \$5.5 million for FBICRC)	8,572
For scholarships	211
Total grants	8,783
Industry Sponsorship for approved new projects	4,513

Note 1: Defined as being given a project number.

Note 2: Projects in progress includes those approved by the Board (Conditions of Grant may not be finalised) to approval of the final report by the MRIWA Chair. Does not include projects in the education program.

Note 3: Projects completed to sign-off of the final report: release of the report may be delayed for up to 1 year by agreement with the Sponsor(s).

Table 4. Summary of MRIWA results for the reporting period

The full Financial Statements for MRIWA for the reporting period are provided at page 60.

The total financial commitments included in the Financial Statements in this Report 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 shown in the Financial Statements, refer Note 7.

MRIWA Outcome-Based Management Structure: Key Performance Indicators

The Outcome-Based Management Structure and Key Performance Indicators (KPI) for the Institute were approved by the Department of Treasury in March 2015, to apply from the 2014/15 annual reporting period.

The KPIs are:

Key Effectiveness Indicator: the ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects.

Key Efficiency Indicator: total administration cost for the year as a percentage of the total cash value of research projects and the education program under management during the year.

The full KPI report is provided at page 103.

Other Functions

In addition to the work to provide and manage research grants, MRIWA has progressed initiatives in its other functions during the reporting period. In summary:

Keep records about minerals research projects it undertakes, procures, manages or funds. The Institute makes copies of reports from all completed research projects available through a searchable facility on the Institute's website, which includes a facility that links report searches to the Geological Survey Map released by the Geological Survey of Western Australia. The support of the Department of Mines, Industry Regulation and Safety in establishing and maintaining these facilities is gratefully acknowledged.

Work with other people, authorities and institutions about minerals research. The Institute has adopted a strong 'outward-facing' approach to enhancing its networks and associations. Work has progressed with other WA government agencies, local and inter-State universities, CSIRO, industry peak bodies and associations, METS Ignited (the Federal Government's Industry Growth Centre for the resources sector) and local entities supporting early-stage innovation.

Maintain current knowledge of minerals research being undertaken. The Institute has enhanced its capacity to develop and maintain its knowledge base by forging closer links with: i) the Mining Equipment and Technology Services (METS) sector; ii) the consulting and the early-stage innovation sectors of the minerals industry; and, iii) 'communities of interest' working in initiatives such as the digital mine, minerals and the battery industry, in-situ recovery of metal and the application of spatial sciences in the minerals industry.

Promote public awareness and interest in minerals research. The Institute substantially enhanced its partnership activities during the reporting period. (Refer to MRIWA's Partnerships (page 50) for the full report.)

Foster academic activities related to minerals research. In addition to the strong investment in research projects, the Institute has invested a total in the last three years of \$1.4 million in its tertiary scholarships program. (Refer to MRIWA Scholarship Program (page 47) for full details.)

Advise the Minister about minerals research. The Institute has briefed the Minister as appropriate. MRIWA gratefully acknowledges the contribution of Minister Johnston to the Institute's activities during the reporting period.

Administration

The Institute undertook the scheduled annual review of policies during the report period.

The Institute extends thanks to Dr Peter Lilly, the inaugural Chair of the MRIWA Board, who completed his work with the MRIWA Board at the end of 2017, for his much-appreciated contributions to the Institute.

The Institute welcomed Ms Denise Goldsworthy as the new Chair of the Board and Mr David Rose as a new appointment to the Board.

The Institute extends thanks to Dr Bryan Smith who retired from the Advisory Committee during the year. Dr Smith's contributions to the Committee's deliberations were much appreciated.

The Institute welcomed Tamryn Barker, Charles Elliott, Ben Hammond, John Hearne, Melinda Hodkiewicz, Peter Oliver and Sabina Shugg as members of the Theme Advisory Committee. These appointments were associated with the Board's decision to create separate Theme Committees for Productivity and New Materials and Markets (previously combined), which reflects the growing demand for Grants in these areas.

Research

Advisory Committee Chair's Report

In last year's Annual Report, I made comment on the unprecedented number and remarkable variety of the Applications for research Grants submitted to the Advisory Committee. This year has seen the trend continue, with the Theme Committees and the Advisory Committee reviewing still more proposals. The projects approved are across all disciplines of minerals science, with a very diverse range of objectives, and involve an equally diverse range of proponents. This is evidence of the appetite that those working on innovation and research in the minerals industry have for MRIWA guidance, support and sponsorship.

Applications approved in the past year have included projects across the mining value chain from the earliest, most conceptual stages of exploration through many aspects involved in safe extraction of a number of minerals, to tailings deposition. The results of the research will contribute to improvements in the minerals industry's capacity to find and safely exploit the State's mineral wealth. The approaches taken include the application of well-established tools of conventional science as well as new techniques made available by ongoing advances in technology and computational science.

The researchers advancing the proposals have come from State and Federal government research entities, universities and commercial R&D companies. MRIWA has adopted an increasingly proactive role in stimulating research, and valuable links have been made across the minerals research community, including through sponsorship of projects run by groups such as METS Ignited, Austmine, Mining3 and several CRCs. These links continue to expand and strengthen, placing MRIWA in the midst of a dynamic minerals research community. The link with Mining3, for instance, has grown over 18 months to encompass four projects totalling \$3.1 million (of which MRIWA provides approximately 30%). Critically, and fundamentally to the MRIWA method, sponsorship and participation by industry remains an essential part of each project.

These entities bring their different perspectives to bear on the projects, which are then shepherded by MRIWA's staff and tested by MRIWA's committees, invariably resulting in projects that are better for having undergone the process.

The process is for MRIWA staff, having received an Application, to work with the proponents to ensure that it has the highest possible chance of both meeting MRIWA's guidelines and satisfying those reviewing it of its quality, its likelihood of success, and its potential to add value to the business of extracting minerals in WA. Assessments of the proposal and its researchers are sought from appropriately qualified experts who act as Assessors and Referees. The proposal then passes to the relevant Theme Committee.

The Theme Committees are constituted to align with MRIWA's objectives and are adapted to accommodate the expanding diversity and increasing technological complexity of the proposals being received. The Theme Committee structure has been modified in the past year and is currently as follows:

- Find More Resources, chaired by Jon Hronsky;
- Expand Mining Envelope, chaired by Gerard Danckert;
- Increase Recoverable Value, chaired by Chris Baker;
- Productivity, chaired by Rob Freeth; and
- New Materials and Markets, chaired by Alison Morley.

The Theme Committee will review the Application documents and have the proponents present their case. In some instances, more than one Theme Committee will combine to review a proposal. The proposal is then carried to the Advisory Committee, which is comprised of The Theme Committee chairs plus John Dell, Rob Hough and myself, as Chair.

The Advisory Committee reviews the documents, assisted by the Theme Committee's assessment. At each step along this chain of review questions may be asked of the proponents, and suggestions made for improvements. Projects are frequently revised or clarified as a result. The proposals then pass to the Board, along with a summary of the assessments, views and recommendations of the committees.

The Board, following its review, considers the merits of each proposal and gauges its fit within the MRIWA's project portfolio, and having regard for MRIWA's budget. The proposal will then be either rejected, approved, or approved with caveats. It is common for proposals rejected to be returned later, in an improved form, and approved.

The research community presents proposals to MRIWA that are of high scientific merit, and potentially great value to WA. Nevertheless, the constructive rigor of the MRIWA system frequently adds value to the proposals advanced, and researchers acknowledge its value. This is a credit to the MRIWA system itself, which is based on years of successful practice (as MRIWA and, before it, MERIWA) as well as a willingness to respond to the changing needs of minerals research. It is also, especially, a tribute to the quality of the people involved as MRIWA staff and as members of MRIWA's Board and committees.

The MRIWA committees are comprised of professionals in minerals science drawn from mining companies, academe and consulting groups. They are chosen for their experience, their expertise, and their willingness to dedicate a proportion of their valuable time to MRIWA. Their collective expertise is impressively deep and broad.

I would like to thank the members of the committees for their work, which is been invaluable to the minerals research community and, as a result, to WA's minerals industry. In particular, I would like to thank Bryan Smith, who retired from his roles on MRIWA's committees as one of the longest serving committee members, having commenced with the Minerals and Energy Research Institute of Western Australia (the precursor to MRIWA) in 2004/05. Bryan could always be relied upon for his conscientious, astute and insightful analysis of proposals related to exploration, and more broadly. His contribution will be missed.

I would also like to thank Mark Woffenden and his team for their energetic work in managing the complex and voluminous material presented to them, and for their painstaking efforts to make the committees' work easier. With Mark announcing his intention to retire I would also like to thank Mark for his progressive and professional leadership in building MRIWA's capacity and reputation, and its value to WA. I wish him well in retirement.



Mr Ian Suckling

Chair
MRIWA Advisory Committee

Date: 13 August, 2018

Research Project Investments

Investments in twelve research projects (excluding the FBICRC) were approved by the Board during the reporting period. The projects covered three exploration topics (finding more resources), one mining topic (expanding the mining envelope), four processing topics (increasing recoverable value) and four topics each looking at productivity and developing new products and markets.

Details of each of these investments are provided below.

M468 – Predicting grade distribution of comminuted particles to determine optimal grind size

The project will establish the distribution of mineral grains within the host rock by evaluating the underlying probability distributions through measurements on sections of the parent rock using image analysis techniques on a sound scientific basis.

The project provides benefit to the State by way of:

- The potential contribution to improving productivity in the mining industry.
- Investment by several operating mining companies.

M510 – Safe, sustainable management of filtered tailings

The project seeks to develop and verify a methodology for managing the deposition and compaction of filtered mine tailings to ensure long term geotechnical stability and sustainable closure of these storage facilities. It will evaluate various techniques for evaluating the state of the filtered mine tailings after compaction. It will couple these measurements with geotechnical modelling to predict future geotechnical stability.

The project provides benefit to the State by way of:

- Helping increase the safety and sustainability of the mining sector.
- Enhancing productivity by ensuring long-term stability of mine tailings, leading to better closure management.
- Bringing together large international mining companies and peak industry bodies.

M513 – Extension to M432 - Validation and Standardisation of Sequential Leaching Tools to Better Predict the Impact of Iron Ore Mining on Ground and Surface Water Quality – Phase 2

This project is an extension to the earlier MRIWA M432 validation study, which was based on a small number of test materials (seven waste rock samples) from one iron ore company. Both industry and government participants agreed that this study should be extended to validate the optimised sequential leaching tests against a larger number of samples more representative of the range of lithologies encountered by the iron ore industry.

To achieve this goal the optimised sequential leaching procedure will be validated and assessed against longer term kinetic leaching studies which will be data-mined or conducted in parallel using a range of representative rock types that will be supplied by the industry sponsors from their respective Iron Ore operations.

The project provides benefit to the State by way of:

- Addressing MRIWA's research priorities of increasing recoverable metal value and improving business productivity.
- Establishing for industry and regulators a mutually-recognised testing regime that will provide more certainty for both parties.

- Helping Western Australian regulatory bodies formulate better policy and guidelines.
- Bringing together large national and international mining companies and industry-focused researchers.

M514 – Novel seismic methodologies for exploration of mineral resources in a hypersaline environment

Significant gold deposits have been discovered under the hyper-saline Lake Carey, situated in a complex geological setting. Exploration is challenging as the lake surface comprises soft, fully saturated sediments. Many gold and base mineral deposits in WA occur in similar situations. Mapping deposits covered by a layer of water requires the development and application of different acquisition strategies.

The project aims to utilise recent advances in sensor technology and implement them for seismic data acquisition in a hypersaline environment. Investigations will include both surface and borehole measurements. Experimental surveys will utilise Distributed Acoustic Sensing Technology (DAS), which will require testing of different optical fibre types to optimise directional sensitivity and signal-to-noise ratio. DAS performance will be evaluated with non-conventional seismic sources (e.g. downhole power head and a sparker type of source). Passive seismic data will also be acquired and evaluated against active source recording.

Imaging of geological structures will include novel technologies (diffraction imaging, common reflection surface, and, data permitting, Full Waveform Inversion). Surface investigations will incorporate 2D and 3D acquisition geometries. The new methodology will be evaluated against current practices.

The project provides benefit to the State by way of:

- Addressing MRIWA's research priority to support find more mineral resources under geological cover.
- Bringing together researchers, producers and the METS sector.
- Having the potential to develop new exploration technology that can be commercialised.

M515 – Development of drilling fluid system for Coiled tube drill rig

This project aims at improving the technology related to the RoXplorer drilling fluid system, and in particular follows this track: (a) development of a concentrated liquefied *CTrol*, which can be readily added to streams of drilling fluid and incorporated in an automated drilling fluid management system, (b) development of engineering knowledge and algorithms validated under real field conditions to measure, maintain and modify *CTrol* properties autonomously, and (c) designing and optimising a solids removal units tailored for *CTrol* and the RoXplorer rig.

The project provides benefit to the State by way of:

- Contributing to MRIWA's research priority to find more mineral resources.
- The potential for the METS sector to provide better tools for exploration.
- Having collaboration between private companies and government research agencies.

M517 – Geophysical Rock Mass Characterisation for Mining and Geometallurgy

The aim of the project is to create a sensor string for boreholes with telemetry and data acquisition modes built into the string and collect seismic data over decades to inform "life of mine" planning for

engineers and metallurgists by providing them with rock mass characterisation for mining and geotechnical applications

The project provides benefit to the State by way of:

- Contributing to MRIWA's research priority to expanding the envelope for safe and economic mining.
- Bringing research and the METS industry together with the potential to develop a commercial product.
- Developing better knowledge of ore bodies, leading to more efficient mining.

M518 - Real-time mining face grade determination using hyperspectral imaging techniques

The objective of this project is to determine if hyperspectral imaging technology, fused with LiDAR information, can provide iron ore mining face grade information that is suitable for inclusion in mine process management, and lead the development of a system that could be fitted to a mining shovel in a commercial deployment.

The project provides benefit to the State by way of its potential to provide a 'platform' technology that can be built on for digital and automation initiatives across a range of activities in the minerals value chain, e.g. advanced operations scheduling, orebody reconciliation, automation of loading from a mine face.

M519 – Broadening the opportunity for in-situ recovery of value from mineral deposits

The development and testing of novel technologies for enhanced values recovery from in-situ ore bodies using more selective and environmentally acceptable lixiviant systems. Initially focussing on Cu and/or Au mineral systems, the 2 research modules will address the following main areas: characterisation of in-situ targets; development and testing of technologies for enhancing accessibility and liberation and therefore recovery of metals; containment of fluids and development of high-intensity/low-footprint processing options.

The project provides benefit to the State by way of:

- Contributing to MRIWA's research objective to increase recoverable metal value.
- Bringing together multiple mining and METS organisations to collaborate on the research.
- Enabling the development of leading technology to meet future needs of the industry.
- Enhancing the sustainability of the minerals sector in the State.
- Developing potential new commercial outcomes.

M521 – Lithospheric and crustal-scale controls on multi-stage basin evolution: Impacts on Mineralising Systems

This proposal seeks to apply an integrated basin study approach combining interpretation of multiple regional data sets (e.g. seismic, well, gravity, magnetics) with numerical modelling to investigate multi-scale (lithospheric and crustal), multi-stage deformation processes providing insight into the link between basement and basin evolution, and subsequent mineralisation processes within a series of key Western Australian basins. This will be the first systematic study of basement–basin–mineralisation development completed in WA, and possibly elsewhere. The results of this work may have significant impact on the understanding of similar systems around the world.

The project provides benefit to the State by way of:

- Addressing MRIWA's research priority to finding more mineral resources, under geological cover.
- Bringing together major mining and exploration companies in collaboration.
- Opening up new prospective areas for the State's mineral sector.

M522 – Physics Models for Ore Tracking in Surface Mines

This research project is a subset of a larger industry project being carried out by METS Ignited funding.

The main objective of the project is to develop the physics of material tracking in stages of the mining value chain where physical processes change the material shape and hence obscure the original grade distribution. The main areas of complex material movement and potential mixing include Blast movement, Digging, Dozer push, Truck loading, Truck dumping, Stockpile stacking and depletion, Surge piles and feeders. Existing tracking technologies require regular intervention, unsafe walking on loose material and only provide data when sensors pass loggers.

The underlying research hypothesis of the project is that by applying modern and accurate spatial data collection to track movement and data from mining equipment it is possible to use empirical and numerical techniques to define the mixing in a deterministic and probabilistic manner to meet the interoperability requirements of the ISO95 approach.

The project provides benefit to the State by way of:

- Contributing to MRIWA's research priority to improve industry productivity.
- Bringing together a collaboration between two large mining companies.
- Focusing on data analytics - a research area of developing interest to the minerals sector.
- Having the potential to help solve some of the key issues facing the mining industry in its drive towards digitisation.

M530 – Yilgarn 2020

Yilgarn 2020 is a 3-year research-intensive program that integrates priority research and technology activities with complementary data compilation and targeted data acquisition. The research project is articulated into three modules ranging from regional- to camp- and deposit-scale studies applied to both well-mineralised, and less well-endowed areas.

The combination of studies conducted on both mineralised and less mineralised areas is critical to evaluate and test the robustness of perceived mineralisation controls derived from the study of well-mineralised domains.

The project provides benefit to the State by way of:

- Addressing MRIWA's research priority to find more mineral resources.
- Bringing together major mining and exploration companies in collaboration.
- Increasing the prospectivity of a well-endowed and mature resource jurisdiction in Western Australia.

M533 – Future Battery Industries CRC

The Future Battery Industries Cooperative Research Centre (FBI CRC) will provide leadership for Australia to participate meaningfully in the future battery industries value chain. It will contribute

industry focussed research to the development of the whole value chain, transforming energy systems and sectors globally, and ensure economic return is maximised for Australia's new energy materials.

The project provides benefit to the State by way of:

- Being a major opportunity for MRIWA to deliver to the Government's election commitments in relation to the batter industry in Western Australia.
- Contributing to MRIWA's research priority to improve industry productivity.
- Bringing together a large consortium of METS sector companies, mining companies and government and research agencies to collaborate on research in a rapidly developing area of interest to the State and nationally and globally.

M534 – CRC-ORE (M441) On-belt Gamma Activation Analysis (GAA) Sensing for Gold: Phase 3 - Preparation for Pilot Plant Campaign

Work on Gamma Activation Analysis for gold sorting is reaching the transition from a project funded with research funding to one requiring industry support for pilot and full-scale implementation. The goal of this interim project is to provide everything that is still required for CRC Ore and CSIRO to develop an industry co-funding proposal to build and operate the pilot plant. The work to achieve this includes defining with potential partners the minimum viable product, pathways to implementation, and further minimisation of technical risk.

The project provides benefit to the State by way of:

- Contributing to MRIWA's research priority to increase recoverable metal value.
- Extending research to bring a developing technology closer to commercialisation.

Research Projects in Progress

The MRIWA portfolio of research projects where the Conditions of Grant have been executed by all parties at the end of the reporting period is summarised in Table 5 below.

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M424	Multiscale Dynamics of Hydrothermal Mineral Systems	Alison Ord Bruce Hobbs	UWA	3	1	210,000	630,000
M431	Ground Support Systems Optimisation	Yves Potvin	ACG	3.5	2	240,000	1,560,000
M432	Validation & Standardisation of Sequential Leaching Tests to Better Predict the Impact of Mining on Ground & Surface Water Quality	Neil Rothnie Silvia Black	ChemCentre	2	4	85,360	216,360
M436	Distal Footprints of Giant Ore Systems: Capricorn WA Case Study	Rob Hough	CSIRO	3	1	2,580,000	7,580,000

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M441	CRC ORE II	Steve Walters	CRC ORE	5	3	600,000	6,600,000
M446	4D Evolution of WA Ore Systems (WA4D): Re-Os Sulphide Geochemistry	Neal McNaughton	Curtin	3	1	175,000	341,650
M448	4D Evolution of WA Ore Systems (WA4D): Rutile - Pathfinder to Ores	Neal McNaughton	Curtin	3	1	263,113	489,763
M449	Drop Probe System – RC LWD (Reverse Circulation Log-While-Drilling)	Gordon Stewart	Globaltech Corporation Pty Ltd	0.75	4	150,000	300,000
M450	Feasibility of Electrokinetic In-Situ Leaching	Andy Fourie	UWA	3	4	50,000	50,000
M451	Establishing Leaching Environmental Impact Assessment Tools in The Development of A WA Framework for By-Product Re-Use and Classification	Silvia Black	ChemCentre	2	5	144,130	414,130
M458	A Novel Direct Leach Approach to Extract Platinum Group Metals (PGM) from the Panton Sill PGM Deposit in the Kimberley Region of WA	Jacques Eksteen	Curtin	3.5	3	200,000	510,860
M462	Multi-Scaled Near Surface Exploration Using Ultrafine Soils	Ryan Noble	CSIRO	2	1	149,500	387,000
M464	Rock properties to predict rockburst vulnerability in three dimensions	Phil Dight	ACG	4	2	1,100,000	1,980,000
M465	Deep Crustal-Scale Structure, Geological Evolution and Multi-Commodity Prospectivity Analysis in The Halls Creek Orogen, Kimberley Region, Western Australia	Sandra Occhipinti	CET	3	1	33,445	45,945

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M467	Mineralogical and Lithological Controls on REE Distribution in The Argyle Diamond Deposit	Louisa O'Connor	Curtin	2	1	30,000	60,000
M470	Mineral Systems on the Margin of Cratons: Albany-Fraser Orogen / Eucla Basement Case Study	Chris Kirkland	Curtin	3	1	250,288	765,288
M476	An Integrated Multi-Scale Study of Crustal Structure and Prospectivity of the Eastern Yilgarn Craton and Adjacent Albany-Fraser Orogen	Mike Dentith	CET	2.5	1	312,948	652,948
M477	Molten Salt Mineral Processing Technology	Frank Bruno	University of South Australia	2	3	246,000	580,000
M478	Mine Pit Lakes – Their Characterisation, Assessment, Management and Value as Potential Lead Indicators for In-Situ Metal Recovery Opportunities	Silvia Black	ChemCentre	2	4	220,000	550,000
M479	Solution purification and valuable by-products formation during the production of battery-grade lithium from micas	Aleks Nikoloski	Murdoch University	0.75	3	95,632	195,632
M482	Development and Evaluation of Fume Free Explosives for Underground Blasting Applications	Italo Onederra	Mining3	1	4	84,000	210,000

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M485	CRC-ORE (M441) GE.VIEW.WA - Developing New Tools and Resources for Benchmarking Grade Engineering Opportunity for the WA Gold Mining Industry	Paul Revell	CRC ORE	1	2	74,000	220,000
M487	Hard rock disc cutting technologies: Fundamentals of cutter/rock interaction and rock failure mechanism	Sevda Dekhoda	Mining3	3	2	200,000	550,000
M488	Understanding fluid- rock interactions and lixiviant/oxidant behaviour for the in- situ recovery of metals from deep ore bodies	Laura Kuhar	CSIRO	3	3	100,500	239,364
M489	Probabilistic Stope Design	Yves Potvin	ACG	2	2	85,000	430,000
M493	Don't Bury Western Australia's Geophysical Data: Uncovering Prospective Mineral Terrains with Regional Potential Field, Seismic and MT transects through cooperative inversion	Brett Harris	Curtin	1.5	1	125,300	257,900
M494	Mapping chemical architecture of gold camps	John Walshe	CSIRO	1.2	1	410,000	1,021,180
M495	A Study of Nano Diesel Particulate Matter (nDPM) Behaviour and Physico-chemical Changes in Underground Hard Rock Mines of Western Australia	Silvia Black	ChemCentre	1	4	166,120	516,120

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M497	Ground Support Systems Optimisation - Phase 2:Extension to M431	Yves Potvin	ACG	3	2	671,250	1,931,250
M498	Wearable Technologies for Safety	Mathew Hart	Soter Analytics	0.8	4	25,000	50,000
M499	Establishing the in-situ rock bolt behaviour underground in order to model and design improved rock bolt support systems	Sam Spearing	Mining3	3	2	400,000	1,270,000
M500	CRC-ORE (M441) On-belt Gamma Activation Analysis (GAA) Sensing for Gold: Phase 2 - Buildable Prototype Design and Laboratory Testing of Components	Paul Revell	CRC ORE	1	4	75,000	572,000
M503	CRC-ORE (M441) Integration of Enhanced Grade Engineering Grade by Size Gangue Liberation and More Energy Efficient Comminution.	Paul Revell	CRC ORE	2	2	75,000	976,748
M505	Glycine Heap Leaching	Ivor Bryan	Mining and Process Solutions Pty Ltd	2	3	265,000	700,000
M507	QA4UAV - A standard workflow to quality assure UAV products	Nathan Quadros	CRC SI	1	4	75,000	250,000
M514	Novel seismic methodologies for exploration of mineral resources in a hypersaline environment	Milovan Urosevic	Curtin	2	1	90,000	280,000
M515	Development of drilling fluid system for Coiled tube drill rig	Masood Mostofi	Curtin	1	4	150,000	400,000

No.	Project Title	Applicants	Institute	Term (yrs)	RPP Theme	MRIWA (\$)	Total (\$)
M518	Real-time mining face grade determination using hyperspectral imaging techniques	Andrew Job	University of Queensland	1	2	250,000	850,850

Table 5. MRIWA research project portfolio at 30 June 2018



Figure 12. GANTT chart showing Current Project Duration

Research Reports Finalised

A summary of each of the research project reports finalised and released during the reporting period is provided below.

M452 Pathways to high grade gold: 3D gradient mapping of mineral systems

Report No. 452

Grantee: CSIRO
Applicant: Dr John Walshe
Grant Amount: \$595,000
Duration: 1
Commenced: 1/12/15
Sponsors: Ramelius Resources Limited; Northern Star Ltd; Excelsior Gold Ltd;
Saracen Gold Mines Pty Ltd

The aim of this project was to use 3D mineral system mapping technologies to enhance brown-fields to green-fields exploration for high grade Au deposits in the Yilgarn craton.

The 3D mineral system models were developed for selected sponsors' sites through a series of modules within the overall program. The 3D mineral system models form the basis of evaluating gradient and targeting concepts and outcomes were workshopped with industry partners.

M459 & M484 - M459 Extension - Magmatic sulfide mineral potential in the East Kimberley

Report No. 459-484

Grantee: CSIRO
Applicant: Dr Margaux Levailant
Grant Amount: \$101,320 + \$75,140
Duration: 1 + 0.75yr
Commenced: 1/7/15 (1/8/16)
Sponsors: King River Copper; Panoramic Resources Ltd

The objective of the project was to investigate the prospectivity of mafic igneous intrusive rocks in the East Kimberley based on age, internal differentiation and geochemistry of parent magmas, and isotope fingerprinting of ore minerals. The centrepiece of the project was an investigation of the relationship between multiple small intrusions in the Savannah district, including the ore-hosting Savannah intrusion itself. It also investigated similar attributes of the neighbouring Hart Dolerite suite and its potential for PGE-enriched magmatic sulfides. The original M459 project was granted an extension of 9 months to complete the extended investigations into the neighbouring sills.

M492 Understanding uranium deposit behaviour to progress in-situ recovery implementation in Western Australia

Report No. 492

Grantee: CSIRO
Applicant: Laura Kuhar
Grant Amount: \$310,000

Duration: 0.25yr
Commenced: 16/1/17
Sponsors: Cauldron Energy

The objective of the project was to conduct appropriate field trials (pump tests, push-pull tests, recirculating load tests and uranium recovery tests) for uranium recovery from the sandstone-hosted Bennet Well deposit in Western Australia. As an essential and critical sub-component of the field leach trials, research was required to better understand:

- the deposit chemistry, mineralogy and leach behaviour at fine and coarse particle sizes to provide an indication of likely in situ uranium recoveries, rates of recovery and lixiviant consumption.
- gangue dissolution behaviour, impurity deportment and likely pregnant leach solution compositions for downstream processing.
- the accessibility of solution to valuable minerals and develop hydrogeological and reactive transport models to provide an understanding of behaviour

MRIWA Scholarship Programme

MRIWA has committed a total of \$1.46 million to tertiary student scholarships since commencement of the Institute on 1 February 2014.

The design principles for the MRIWA PhD Scholarships Programme focus on two criteria:

- i) to make a significant contribution to MRIWA's objectives; and,
- ii) to attract applicants with exceptional academic capability.

The Institute's commitment of \$1.46 million to the Scholarship Programme over 2014/18 has been allocated to:

- 4 Directors' PhD scholarships.
- 10 MRIWA PhD scholarships.
- 21 Odwyn Jones Honours Awards.
- 3 Best Thesis prizes, of \$3,000 each, for Odwyn Jones Awardees.
- 2 joint Best Thesis prizes, of \$1,500 each, for Odwyn Jones Awardees.

From 2014 – 2017 MRIWA operated two streams to the Scholarship Programme:

- i) stipends for PhD candidates for up to three and one-half years of their research studies and,
- ii) the Odwyn Jones Awards for undergraduate Honours and fourth year Engineering students.

The Board decided that, commencing with the 2018 PhD Scholarship awards, one of the MRIWA PhD scholarships will be reserved for a female candidate and that the scholarship will not be awarded if there is no suitable applicant or a female is not awarded the Directors' Scholarship.

In 2017 the Board decided to discontinue the Odwyn Jones Awards for undergraduate students.

The Institute gratefully acknowledges the generous donation by the Directors of their Board sitting fees to substantially fund four of the PhD scholarships – known as the Directors' PhD Scholarships. The Board wishes to direct these scholarships to research in the fields of minerals data analytics, in-situ leaching and/or the fundamentals of scale-up.

Evelien Martens, the 2015 Directors' scholar, and the first recipient, is researching the Feasibility of electrokinetics in-situ Leaching; Ahmad Saleem, the 2016 Directors' scholar, has chosen the topic

Quantifying the Role of Exploration Upside in Mineral Project Evaluations: The Missing Link in Project Value Determination?; Yihao Fu, the 2017 Directors' Scholar, is researching Characterisation of Ore and Bulk Solid Systems by use of Multivariate Image Analysis and Deep Learning Neural Networks; and Keith Giglia, the 2018 Directors' Scholar, is researching Monitoring and Control of Hydrocyclones by use of Convolutional Neural Networks and Deep Reinforcement Learning.

Eighteen complying applications were received for the 2018 PhD Scholarships Programme; 11 from Curtin University, 3 from Murdoch University and 3 from The University of Western Australia. An additional application, from Edith Cowan University, was withdrawn after the Applicant failed to secure a place in the University's PhD programme.

MRIWA is delighted to have awarded the 2018 PhD scholarships to the students shown in Table 6.

Scholar	Scholarship	Topic
Keith Giglia (Curtin University)	Directors' PhD	<i>Monitoring and Control of Hydrocyclones by Use of Convolutional Neural Networks and Deep Reinforcement Learning.</i>
Kudzai Angeline Mchibwa (Murdoch University)	MRIWA PhD Scholarship for Women	<i>Innovative Processes for Leach Liquor Purification and Production of Battery Grade Lithium Hydroxide from Lithium Mineral Resources.</i>

Table 6. Winners of the 2017 PhD Scholarships.



Figure 13. MRIWA PhD Scholars 2018

L to R: Helen Cook, Deputy Chair, MRIWA Board; Kudzai Angeline Mchibwa (Murdoch University); Hon Bill Johnston MLA, Minister for Mines and Petroleum; Keith Giglia (Curtin University); Kate Wright, Chair, Scholarships Panel; Mark Woffenden, MRIWA CEO

Although the Odwyn Jones Honours Awards were discontinued in 2017, the contributions of Professor Odwyn Jones, who maintained a career-long advocacy for strong mining education programmes and engagement of students with the mining industry, will continue to be recognised and honoured in the Odwyn Jones PhD Scholarship.

In 2018, MRIWA jointly awarded the Odwyn Jones Best Honours Thesis Prize (of \$1,500 each) to David Fox and Brandon Rego (both students of Curtin University). The Hon Bill Johnston, MLA, Minister for Mines and Petroleum presented certificates to all winners at MRIWA's Award Ceremony on 28th August 2018.



*Figure 14. Odwyn Jones Best Honours Thesis Prize
L to R: Brandon Rego (Curtin University); Helen Cook, Deputy Chair, MRIWA Board; Hon Bill Johnston
MLA, Minister for Mines and Petroleum; David Fox (Curtin University); Kate Wright, Chair,
Scholarships Panel; Mark Woffenden, MRIWA CEO*

Scholar	Topic
David Fox	<i>The Mineralogy and Geochemistry of Tumblagooda Sandstone Reduction Spheroids.</i>
Brandon Rego	<i>Tropicana Gold Mine's Raw Water Treatment using Nano-Filtration and Evaluation of the Impact thereof on Gold Ore Leaching Kinetics.</i>

Table 7. Winners of the 2017 Odwyn Jones Best Honours Thesis Prize.



**MRIWA inaugural
Scholarship for
Women winner:
Kudzai Angeline
Mchibwa**

Our new initiative, the MRIWA Postgraduate Research Scholarship for Women, was awarded for 2018 and the inaugural recipient is Kudzai Angeline Mchibwa. She took up her position at Murdoch University in May, pursuing the PhD topic

'Innovative processes for leach liquor purification and production of battery grade lithium hydroxide from lithium mineral resources'.

Angeline's research will play a key role in developing and testing novel hydrometallurgical processing techniques to support increasing the recovered value of Western Australia's lithium resources.

Angeline will be testing innovative processes to purify the lithium leach liquor, adapting conventional processes and exploring the use of other technologies such as solvent extraction, reverse osmosis and membrane technologies in a bid to produce LiOH of the required quality.

It's a lot to take on for a PhD project, but Angeline has more experience and a broader world-view than your average PhD candidate. Born in Botswana, the Zimbabwean national excelled in mathematics, chemistry and physics at school, following the bias set by her parents, particularly her maths-teaching mother. She then chose to study a chemical engineering degree at Zimbabwe's National University of Science and Technology.

"Being from Africa, mining is the main driver for most of the economy. And it shows in the mentality of the universities. Although my first degree is in chemical engineering, all of my experience lies in extractive metallurgy and mineral processing, as it's the natural application of chemical engineering

on that side of the world."

Angeline then worked at a nickel refinery in Zimbabwe for a year before becoming involved in a number of research consultancy projects back at her university. During the industry downturn in 2007, she broadened her horizons by undertaking a Masters degree at the University of the Witwatersrand in South Africa. She developed a process route to produce nanosized, monodispersed hematite particles after using microorganisms to leach pyrite ores.

The findings from her research can be used to curb the ubiquitous problem of acid mine drainage (AMD) pollution. In 2011 Angeline joined the Namibia University of Science and Technology, and became central to the development of the brand-new metallurgical engineering program in the Mining and Process Engineering Department, itself only created in 2009

"I decided the next step in my career development was to do a PhD. It had been almost seven years since my Masters, and I was ready for a new challenge. In terms of academic development, you're always better off charting unfamiliar frontiers, learning from other people engaged in cutting edge research, with international impact. In terms of mining and metallurgy, that's South Africa, Canada or Australia. So, I was very happy to come to Murdoch."

I was also inspired by Professor Eeva Leinonen, who is Murdoch's current and first female Vice-Chancellor", says Angeline. "She is recognised as being passionate about supporting students to reach their potential, and that resonates with me. And the fact that I can also live in Perth, one of the world's most liveable cities, while I'm studying doesn't hurt either!"

Angeline is already an established role model for women entering the mining sector, particularly from her time at the Namibia University of Science and Technology, developing an environment to train the next generation of metallurgical engineers. When asked who her role models were through her developing career, she responds: "My Mum first and foremost. She is an inspiration, a maths teacher, and encouraged me to go for it and do my best. There was always an emphasis on education, regardless of the field, and to try for excellence. She was always saying that if you're not progressing you're wasting yourself. So, look at your career and think of what you should achieve next."

MRIWA's Partnerships

Austmine

"Austmine is Australia's leading association of the Australian Mining, Equipment, Technology and Services sector (METS)". This sector comprises firms that provide specialist services to the mining and minerals industry.

MRIWA is a member of Austmine to allow the Institute to better connect with this vital sector the minerals industry, to promote opportunities for further collaborative research to benefit the Western Australian economy, and, to advance the Institute's strategic objective of contributing more to enabling the commercialisation of the outputs from research projects.

The Institute participated in Austmine's first Collaboration Laboratory (Co-Lab) in Perth in June 2016, on the topic of Next Generation Mineral Extraction. It is pleasing to report that two related projects have commenced from this collaboration: i) MRIWA project M522 *Physics Models for Ore Tracking in Surface Mines*; and, ii) a METS Ignited project, *Manufacturing Intelligence*.

Early-stage Innovation – CORE and Uearthed

MRIWA has established relationships with Perth-based organisation Uearthed and CORE that are actively contributing to the rapidly developing early-stage innovation community associated with the resources sector.

METS Ignited

As part of the Australian Government's Growth Centres Initiative, METS Ignited has developed, and is delivering to, a competitiveness plan for the Australian METS sector. MRIWA is collaborating with METS Ignited in areas of common interest, with a high priority on aligned investments to support research and its deployment to the minerals industry.

Co-operative Research Centres

The scale and reach of CRCs affords MRIWA an effective means to put Western Australia's minerals research interests in the national arena. Involvement with CRCs provides MRIWA with valuable access to stakeholder communities and provides the opportunity to attract greater research investment to Western Australia than might otherwise occur.

In addition to the formal relationship with CRC Optimisation of Resource Extraction II (CRCORE), MRIWA is working with CRC Spatial Information to promote research into the application of spatial information in the minerals industry.

MRIWA has invested \$1 million in the successful bid for the MinEx CRC, which secured a \$50 million Commonwealth grant that leverages a further \$165 million of cash and in-kind funding from CRC participants, bringing the total funding to \$215 million over a 10-year period. The CRC will be dual-headquartered in Western Australia and South Australia. A core part of MinEx CRC's focus will be to extend the capability of coiled tubing drilling pioneered by the Deep Exploration Technologies CRC—promising drilling at a fifth the cost of conventional diamond drilling.

MRIWA is a major contributor to, and investor in, the Bid for the Future Battery Industries CRC (refer page 24) and the emerging Bid for the Digital Mine CRC.

Working in conjunction with METS Ignited and other partners, MRIWA is well -positioned to continue to have a significant voice in developing future Bids for CRCs, or other arrangements for nationally significant research, for the minerals industry.

International Centre for Radio Astronomy Research

MRIWA has a long-standing relationship with ICRAR founded on a shared interest to promote research and industry development in Western Australia.

MRIWA Sponsorships

The Institute has an active sponsorship program designed to contribute to its functions (MRIWA Act S11) to promote public awareness of, and interest in, minerals research and to foster academic activities relevant to the Institute's functions.

Earth Sciences Western Australia

The MRIWA Board continues the three-year sponsorship, of \$10,000 per year, for the ESWA initiative for regional outreach in Kalgoorlie and surrounds. The Institute gratefully acknowledges the generous donation of their sitting fees by members of the MRIWA advisory committees, which has made this sponsorship possible.

TIGeR

MRIWA provided a sponsorship for The Institute for Geoscience Research (TIGeR) 2017 Conference on *Timescales of Geological Processes* at Curtin University. The Institute has committed to sponsor the 2018 Conference on *Coupling between Metamorphism and Deformation*.

International Lithium 2018 Conference, Perth

MRIWA sponsored the International Lithium 2018 Conference co-hosted by Murdoch University and AusIMM in Perth. The Conference was well attended and addressed themes of Exploration and Geology, Mineralogy (Hard Rocks vs Brines vs Other), Metallurgy and Processing, Risk and Economics, Lithium Applications (present and future), Recycling and Safety, and Environmental.

Tech Talks

To promote public awareness of, and interest in, matters relating to minerals research, MRIWA presents a Tech Talk series where experts in diverse fields are invited to speak about their specialisation to diverse audiences drawn from across MRIWA's community.

Six Tech Talks were presented during the reporting period:

Evolution of Project Development and Piloting for Technology Metals, presented by Adrian Manis, Rob Ring and Chris Ward from ANSTO.

Self-healing Bio-cement: From crack sealing to metal immobilisation, presented by Dr Navdeep Dhami from Curtin University.

More than a Lat/Long: a look into the spatial factors required for enabling the digital mine, presented by CRC Spatial Information's (CRC SI) Darren Mottolini.

Geosynthetics as Sensors: with smart material technology from Imagine Intelligent Materials, presented by Phil Aitchison from Imagine Intelligent Materials.

Mineral Systems Analysis in the Halls Creek orogen: Insights from geodynamic modelling, geophysical interpretation and isotopes, presented by Fariba Kohanpour (MRIWA PhD scholar), in conjunction with *Defining and navigating Au systems in the Eastern Goldfields, WA: "Are we there yet?"*, presented by John Walshe from CSIRO.

Predictive maintenance for humans, presented by Matthew Hart, in conjunction with *Big data making smart shovels a reality* presented by Andrew Job from Plotlogic.

MRIWA gratefully acknowledges the contributions of the speakers and the Department of Mines Industry Regulation and Safety for providing the venue.

Research Partners

The following organisations undertook research in the reporting period for MRIWA projects in progress:

ACG – Australian Centre for Geomechanics, University of Western Australia.	Curtin University (WA School of Mines).
Centre for Exploration Targeting (UWA)	Murdoch University
ChemCentre (WA)	University of Queensland
CMTE Development (Trading as Mining3)	University of South Australia
CSIRO Mineral Resources.	University of Western Australia
Curtin University	

Company Partners

The following companies and organisations provided financial sponsorship in the period for research projects in progress. The Board of Directors thanks these entities for their sponsorship and support.

ACG – Australian Centre for Geomechanics	GSM Mining Company Pty Ltd (Gold Fields Australia)
Agnew Gold Mining Company Pty Ltd (Gold Fields)	Hatch
Agnico Eagle Mines Limited	Heathgate Resources Pty Ltd
Alcoa World Alumina	Hecla Limited
Alumina Quality Workshop Inc	HiSeis Pty Ltd
AngloGold Ashanti Australia Limited	Iluka Resources
Antipa Minerals Ltd	Independence Group NL
Argyle Diamonds	Innovation Connections – Department of Industry
Atlas Copco Rock Drilling Tools Division	International Aluminium Institute
Barrick (Australia Pacific) Ltd	Jenmar Australia Pty Ltd
BASF Australia	Lithium Australia
BHP Billiton Group Operations Pty Ltd	LKAB Sweden
Boart Longyear	Matsa Gold Pty Ltd
Cadia Holdings Pty Ltd (Newcrest)	Mining and Process Solutions Pty Ltd
Central Chemical Consulting Pty Ltd	MMG Limited
Centre for Exploration Targeting (UWA)	Mount Isa Mines Ltd (Xstrata Zinc)
Centrex Metals Ltd	New Concept Mining
CMTE Development (Trading as Mining3)	Newcrest Mining Ltd
CODELCO – (Div Casa Matriz)	Newmont Mining Corporation
CRC CARE	Northern Star Kanowna Pty Ltd – NSR Ltd
Curtin University	Panoramic Resources Limited
Cytec Industries Inc	Peabody Energy Australia Pty Ltd
Department of Mines and Petroleum	Plotlogic Pty Ltd

DET CRC	Ponton Minerals Pty Ltd
Dywidag-Systems International Pty Ltd	Poseidon Nickel Ltd
Echo Resources	Ramelius Resources Limited
Encounter Resources Ltd	Rio Tinto Iron Ore
Environmental Copper Recovery Pty Ltd	Roy Hill
Ernest Henry Mining	Sandfire Resources
Evolution Mining Ltd	Sandvik Mining and Rock Technology
Fero Strata Systems Pty Ltd	Saracen Gold Mines Pty Limited
First Quantum Minerals (Australia) Pty Ltd	Savannah Nickel Mines Pty Ltd
Fortescue Metals Group	Science Industry Endorsement Fund (SIEF)
Freeport Minerals Corporation	Silver Lake Resources
Garock	South32
GeoBrugg AG Switzerland	St Ives Gold Mining Company Pty Ltd (Gold Fields)
Geological Survey of Western Australia	Sudbury Integrated Nickel Operations (Glencore)
Gindalbie Metals Ltd	Thermo Fisher Scientific
Glencore Mt Isa Mines	Tritton Resources Limited
Globaltech Corporation Pty Limited	University of South Australia
Gold Fields Australia	Venus Metals Corporation Pty Ltd
Gold Road Resources	Water Corporation WA
Golder Associates Pty Ltd	Yamarna South JV

Project Sponsors by Theme

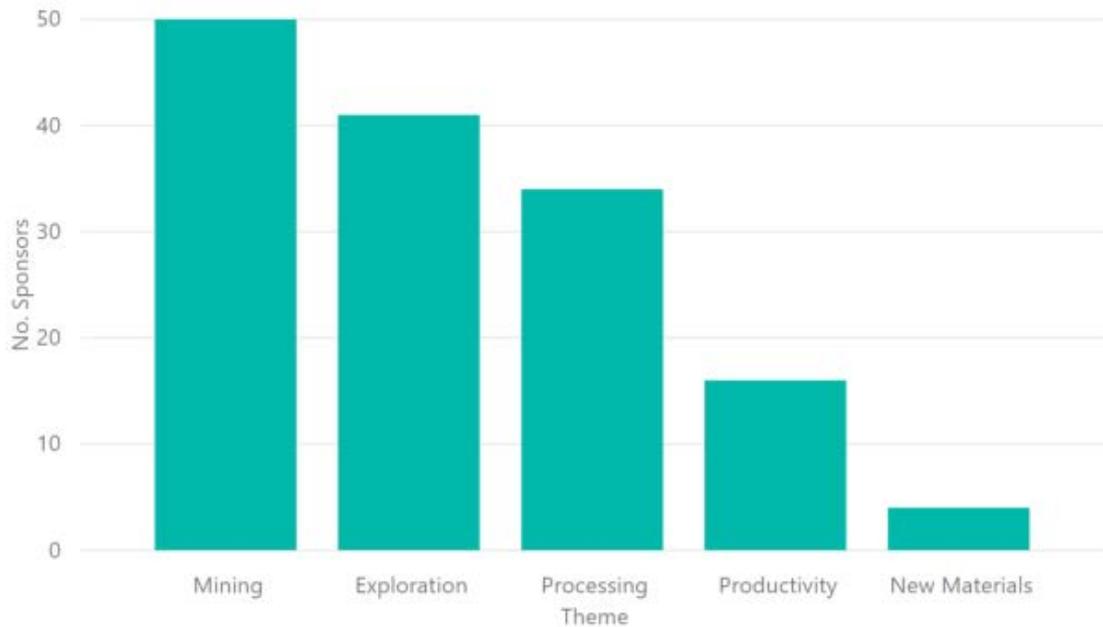


Figure 15. The majority of projects in the MRIWA portfolio fall under the themes of Exploration and Mining, followed by Processing. Producers are well represented across all Project Themes. The majority of investment by METS companies has been in projects in the themes of Mining and Processing.

Project Sponsors by Organisation Type

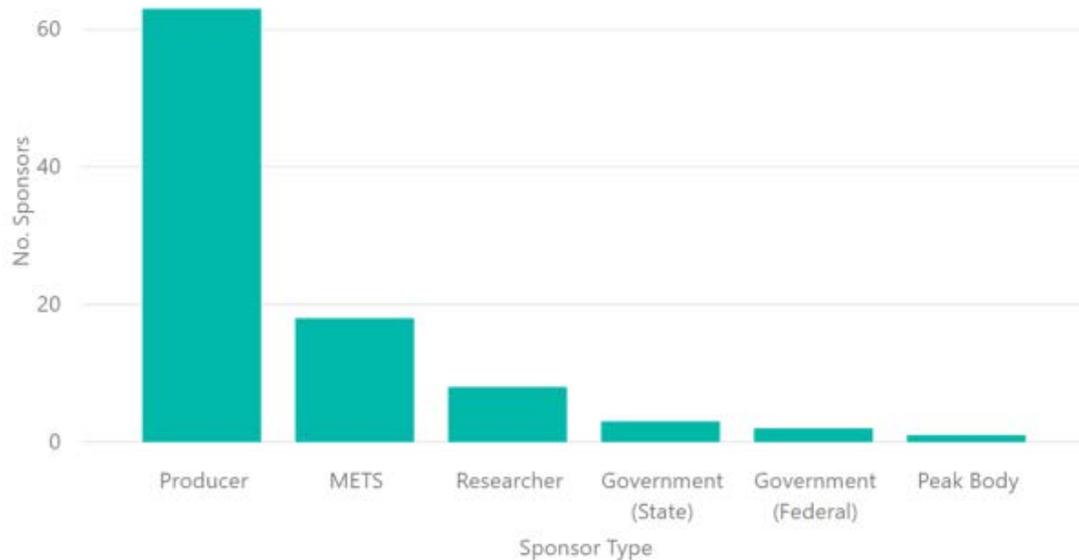


Figure 16. Most Sponsors are invested in a single MRIWA project. Producers are again well-represented and individual companies have invested in up to 5 separate current projects. METS companies invest in up two projects. While the total number of investors in 2 projects is smaller than the number of single investors, the proportion of METS companies investing in 2 projects is greater than those making a single investment. The Western Australian State Government has invested in 7 individual MRIWA projects through the Geological Survey of Western Australia. Curtin University is the single most frequent investor, with 9 separate projects currently approved or active with MRIWA.

Total Amount Invested per Individual Sponsor Across All Projects as at 30/6/18

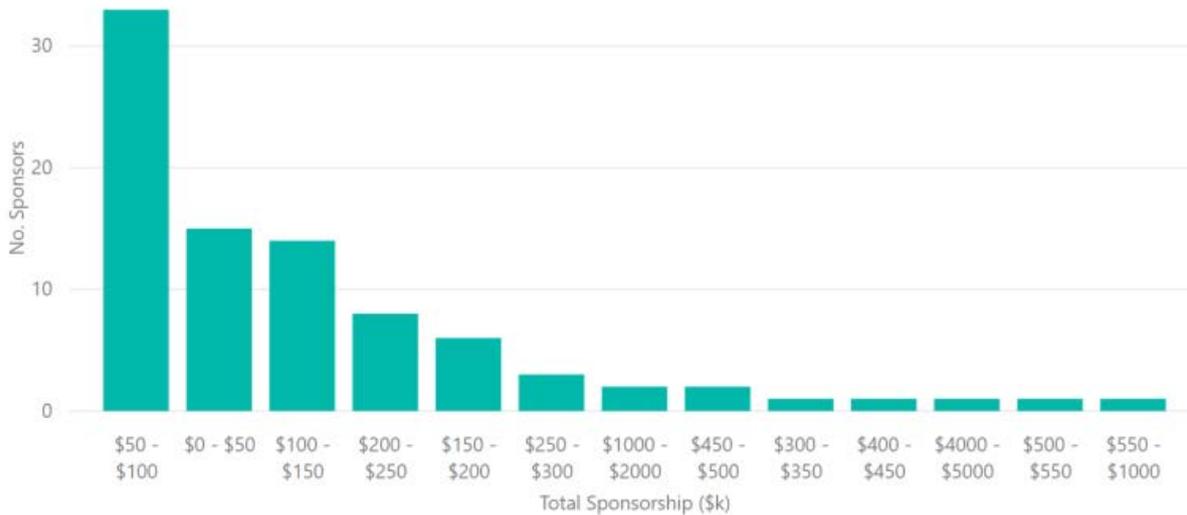


Figure 18. Most Sponsors have invested between \$50k – \$100k in MRIWA projects, generally as an investment in a single project rather than as a number of smaller investments in several projects. Repeat investments by METS companies and gold producers fall into to \$100k – \$150k range. Investments from \$150k and upwards are generally through multiple projects. The Geological Survey of Western Australia and Curtin University have each invested a total of between \$1M – \$2M across a number of MRIWA projects. The investment of \$5M came from MRIWA-leveraged investment of Federal Government (SIEF) funding to a single project.

Size of Sponsor Investment per Single Project

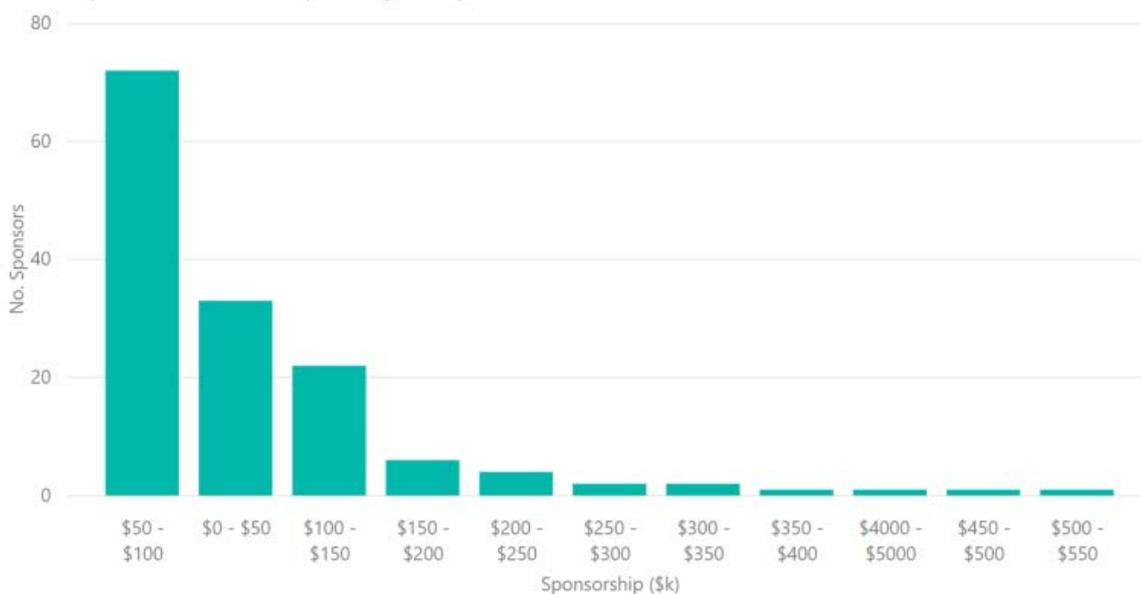


Figure 19. The majority of MRIWA Sponsors invest between \$50 – \$100k per project. Most METS sector investors fall into this investment range. Producers again comprise the largest number of Sponsors, up to an investment of \$250k. The largest individual investments were made by the Federal Government (SIEF, \$5M), State Government (GSWA), CSIRO (as Mining 3) and a METS company.

Significant Issues Impacting the Agency

The Institute faces three significant issues for 2018/19.

The most critical is the allocation of State Government funds for MRIWA to invest.

The Budget allocations and the generous contributions of DMIRS to MRIWA now comprise the following:

Revenue Source	2018/19 \$m	2019/20 \$m	2020/21 \$m	2020/21 \$m
MRIWA Allocation	2	-	-	-
MRIWA Continuing	0.78	0.8	0.8	0.8
DMP (EIS)	0.35	0	0	0
FBIIRC*	1	1.5	1.5	1.5
Total	4.13	2.3	2.3	2.3

* These funds are contingent on the success of the Bid for the FBIIRC and the headquarters being in Perth.

It is recognised that the State Government faced significant challenges in framing the 2018 Budget, which inevitably limited the capacity to invest in research. MRIWA is not immune to these circumstances.

The Institute has commissioned a new assessment of the economic impact of MRIWA's research investment to be available for the Budget submission.

Notwithstanding this initiative, it is essential to note that not committing additional funds in the 2019 Budget for the Institute for 2019/20 and beyond will have significant adverse consequences for the Institute. It will:

- Effectively halt investments in minerals research from 2019/20, except for that associated with the FBIIRC.
- Impose a hiatus on the Institute's capacity to negotiate for long lead-time research initiatives (for example, Cooperative Research Centres).
- Diminish MRIWA's reputation and standing as a significant research investor in the Australian minerals industry.

The second issue is attracting industry co-investments in minerals research, which was noted in last year's Annual Report as being a significant challenge for the foreseeable future. The co-investment achieved for 2017/18 is \$1.46 of other investors' money for every \$1 MRIWA committed (excluding the FBIIRC commitment), which is slightly less than the \$1.60 achieved for 2016/17. This is despite the Board's considered actions to increase co-investments and is below the target of \$2 for every \$1 MRIWA commits. It would be premature to anticipate that this will not continue to be a challenge for the Institute in 2018/19: the Board has to be vigilant to the balance between achieving financial leverage targets and failing to deliver the Institute's primary purpose of fostering and promoting investment in minerals research.

The third issue is to achieve an efficient transition to the new CEO. Mark Woffenden will retire from his role of CEO in the first half of 2018/19.

Audit and Risk Committee

Audit and Risk Committee Chair's Report

The Audit and Risk Committee continued to enhance the now well-established foundations for the governance and management of risk and financials for MRIWA during 2017/18.

In addition to our ongoing role in overseeing financial and performance reporting, risk management and systems for internal control, the Committee oversaw improvements to the Institute's risk management and controls, which are being revised as the organisation adapts to address the changing needs of industry and the State. Activities included:

- Considering, and making recommendations to the Board on, the options for the Institute's Effectiveness and Efficiency KPI targets for 2018/19 to allow for the highest level of transparency and accountability to government and other stakeholders.
- Overseeing the final stage of the re-design and installation of the revised version of the Institute's project management and reporting system, which allows for greater data usage and integrity, whilst retaining vital financial controls during the transition.
- Reviewing and updating the Institute's policies to ensure contemporary consideration of all required policies as part of the yearly process commenced in 2016.
- Overseeing the implementation of the Institute's digital and IT security strategy, including engagement with State Government's GovNext ICT program as the Institute looks to upgrade its fibre optic connection for fast internet access, Cloud storage and improved and cheaper telephony. The Institute responded appropriately to global issues experienced throughout the world in January 2018, which further highlighted the importance of our focus on robust IT systems. A new initiative for staff training commenced during the year.
- Commencing the review of the revised Australian Accounting Standards Board standards for treatment of revenue and leasing, and the implications of these new standards for MRIWA. In particular, to ensure the Institute has processes in place to appropriately capture all leases and review those contracts and service-use agreements currently in place, and also ensuring that the process for complying with the existing requirements for related-party transactions are in line with government requirements. This is work in progress.
- Reviewing the Institute's risk focus and risk register to ensure it aligned with the increasing engagement with Cooperative Research Centres.
- Reviewing changes to the indemnity provisions for new contracts for research projects.
- Leading the process for MRIWA to receive an exemption from the provisions of TI 824 as they relate to the employment status of the CFO. This was to ensure that there was a robust level of CFO skills available for the organisation, while recognising the practicalities of the limited capacity of the Institute to employ specialist staff.

I would like to again acknowledge the work of my Committee members Larry Lopez and Mark Bush and thank them for their continued valuable contribution. I also wish to acknowledge the work of Mark Woffenden, Anil Subramanya and Stephanie Ahlfeld from MRIWA and Kim Ong and Hannah



Bouffier from KPMG, who have supported the work of the Committee with diligence and focus. In particular, I note that this will be the last full year of working with Mark Woffenden and I would like to thank him for his outstanding services to MRIWA and this Committee.

A handwritten signature in black ink, appearing to read "Helen Cook".

Helen Cook
Chair
MRIWA Audit and Risk Committee

Date: 13 August, 2018

Disclosures and Legal Compliance

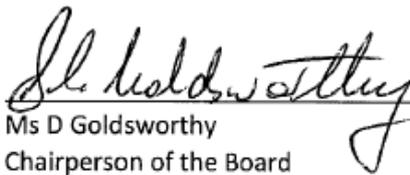
Financial Statements

Certification of Financial Statements

For the year ended 30 June 2018

The accompanying financial statements of the Minerals Research Institute of Western Australia ('MRIWA') have been prepared in compliance with the provisions of the *Financial Management Act 2006* from proper accounts and records to present fairly the financial transactions for the financial year ended 30 June 2018 and the financial position as at 30 June 2018.

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.



Ms D Goldsworthy
Chairperson of the Board

Date: 13 August 2018



Ms H Cook
Member of the Board

Date: 13 August 2018



Mr M Woffenden
Chief Finance Officer

Date: 13 August 2018

Opinion of the Auditor General



Auditor General

INDEPENDENT AUDITOR'S REPORT

To the Parliament of Western Australia

MINERALS RESEARCH INSTITUTE OF WESTERN AUSTRALIA

Report on the Financial Statements

Opinion

I have audited the financial statements of the Minerals Research Institute of Western Australia which comprise the Statement of Financial Position as at 30 June 2018 the Statement of Comprehensive Income, Statement of Changes in Equity, Statement of Cash Flows for the year then ended, and 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 2018 and the financial position at the end of that period. They are in accordance with Australian Accounting Standards, 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 am independent of the Institute in accordance with the *Auditor General Act 2006* and the relevant ethical requirements of the Accounting Professional and Ethical Standards Board's APES 110 *Code of Ethics for Professional Accountants* (the Code) that are relevant to my audit of the financial statements. I have also fulfilled my other ethical responsibilities in accordance with the Code. I believe that the audit evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

Responsibility of the Board for the Financial Statements

The Board is responsible for keeping proper accounts, and the preparation and fair presentation of the financial statements in accordance with Australian Accounting Standards, the *Financial Management Act 2006* and the Treasurer's Instructions, and for such internal control as the Board 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 agency's ability to continue as a going concern, disclosing, as applicable, matters related to going concern and 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 objectives of my audit are to obtain reasonable assurance about whether the financial statements as a whole are free from material misstatement, 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 decisions of users taken on the basis of the financial statements.

Opinion of the Auditor General

As part of an audit in accordance with Australian Auditing Standards, I exercise professional judgment and maintain professional scepticism throughout the audit. I also:

- Identify and assess the risks of material misstatement of the financial statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for my opinion. 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.
- Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances, but not for the purpose of expressing an opinion on the effectiveness of the agency's internal control.
- Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by the Board.
- Conclude on the appropriateness of the Board's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the agency's ability to continue as a going concern. If I conclude that a material uncertainty exists, I am required to draw attention in my auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify my opinion. My conclusions are based on the audit evidence obtained up to the date of my auditor's report.
- Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the financial statements represent the underlying transactions and events in a manner that achieves fair presentation.

I communicate with the Board regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that I identify during my audit.

Report on 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 Institute are those policies and procedures established by the Board 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 legislative provisions (the overall control objectives).

My opinion has been formed on the basis of the matters outlined in this report.

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 the incurring of liabilities have been in accordance with legislative provisions during the year ended 30 June 2018

The Board's Responsibilities

The Board is responsible for designing, implementing and maintaining controls to ensure that the receipt, expenditure and investment 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.

Opinion of the Auditor General

Auditor General's Responsibilities

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 Engagements 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 and 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 the controls, necessary to achieve the overall control objectives, were implemented as designed.

An assurance engagement to report on the design and implementation of controls involves performing procedures to obtain evidence about the suitability of the design of controls to achieve the overall control objectives and the implementation of those controls. The procedures selected depend on my judgement, including the 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 objectives.

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 the controls are in operation, the overall control objectives may not be achieved so that fraud, error, or noncompliance 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 conditions.

Report on 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 2018. The key performance indicators are the key effectiveness indicators and the 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 2018.

The Board's Responsibility 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 control 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 Instruction 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 agency'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*

Opinion of the Auditor General

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.

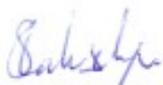
I believe that the evidence I have obtained is sufficient and appropriate to provide a basis for my opinion.

My Independence and Quality Control Relating to the Reports on 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 ASQC 1 *Quality Control for Firms that Perform Audits and Reviews of Financial Reports and Other Financial Information, and Other Assurance Engagements*, the Office of the Auditor General maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Matters Relating to the Electronic Publication of the Audited Financial Statements and Key Performance Indicators

This 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 2018 included 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 and key performance indicators described above. It does not provide an opinion on any other information which may have been hyperlinked to/from these financial statements or key performance indicators. 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 refer to the hard copy of the audited financial statements and key performance indicators to confirm the information contained in this website version of the financial statements and key performance indicators.



SANDRA LABUSCHAGNE
ACTING DEPUTY AUDITOR GENERAL
Delegate of the Auditor General for Western Australia
Perth, Western Australia
17 August 2018

Statement of Comprehensive Income

For the year ended 30 June 2018

	Notes	2018 \$	2017 \$
COST OF SERVICES			
Expenses			
Research grants		3,396,536	3,573,888
Scholarships		164,298	264,006
Employee benefits expense	3.1.1	542,640	530,639
Institute Contractor fees		127,551	100,808
Board and committee fees and costs	3.2	102,099	96,657
Supplies and services	3.3	224,229	201,317
Other expenses	3.3	25,274	19,186
Accommodation expense		47,250	47,250
Depreciation expense	5.1	3,617	4,522
Total cost of services		4,633,494	4,838,273
Income			
Revenue			
Interest revenue		230,163	205,654
Other revenue		46,009	53,309
Revenue from Industry Sponsorship		1,353,193	1,512,402
Total Revenue		1,629,365	1,771,365
Total income other than income from State Government		1,629,365	1,771,365
NET COST OF SERVICES		3,004,129	3,066,908
Income from State Government			
State Government Grant	4.1	4,109,000	4,134,772
Resources received free of charge		47,250	47,250
Total income from State Government		4,156,250	4,182,022
SURPLUS/(DEFICIT) FOR THE PERIOD		1,152,121	1,115,114
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD		1,152,121	1,115,114

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

Statement of Financial Position

As at 30 June 2018

	Notes	2018 \$	2017 \$
ASSETS			
Current Assets			
Cash and cash equivalents	7.1.1	6,766,981	4,984,944
Restricted cash and cash equivalents	7.1.2	6,063,798	5,961,490
Receivables and other assets	6.1	569,036	780,289
Other current assets	6.2	65,044	55,365
Total Current Assets		<u>13,464,859</u>	<u>11,782,088</u>
Non-Current Assets			
Office equipment	5.1	14,471	18,088
Total Non-Current Assets		<u>14,471</u>	<u>18,088</u>
TOTAL ASSETS		<u>13,479,330</u>	<u>11,800,176</u>
LIABILITIES			
Current Liabilities			
Payables	6.3	398,010	594,071
Employee benefit provisions	3.1.2	105,400	93,266
Deferred revenue	6.4	2,373,009	1,667,569
Total Current Liabilities		<u>2,876,419</u>	<u>2,354,906</u>
Non-Current Liabilities			
Employee benefit provisions	3.1.2	5,520	-
Total Non-Current Liabilities		<u>5,520</u>	<u>-</u>
TOTAL LIABILITIES		<u>2,881,939</u>	<u>2,354,906</u>
NET ASSETS		<u>10,597,391</u>	<u>9,445,270</u>
EQUITY			
Accumulated surplus	9.8	10,597,391	9,445,270
TOTAL EQUITY		<u>10,597,391</u>	<u>9,445,270</u>

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 2018

	Note	Accumulated surplus \$
Balance at 1 July 2016	9.8	8,330,156
Surplus for the period		1,115,114
Balance at 30 June 2017		<u><u>9,445,270</u></u>
Balance at 1 July 2017	9.8	9,445,270
Surplus for the period		1,152,121
Balance at 30 June 2018		<u><u>10,597,391</u></u>

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 2018

	Note	2018 \$	2017 \$
CASH FLOWS FROM STATE GOVERNMENT			
State Government Grant		<u>4,109,000</u>	<u>4,134,772</u>
Net cash provided by State Government		<u>4,109,000</u>	<u>4,134,772</u>
Utilised as follows:			
CASH FLOWS FROM OPERATING ACTIVITIES			
Payments			
Research Grant Payments		(3,794,470)	(3,335,311)
Employee benefits		(520,645)	(510,410)
Institute Contractor fees		(127,551)	(100,808)
Board and Advisory committee fees		(34,990)	(40,617)
Supplies and Services		(237,369)	(224,105)
GST payments on purchases		(267,068)	(394,821)
Receipts			
Receipts from Sponsors		2,305,020	1,331,402
Interest received		220,484	209,051
GST receipts on sales		134,885	128,528
GST receipts from taxation authority		<u>97,049</u>	<u>304,392</u>
Net cash used in operating activities	7.1.3	<u>(2,224,655)</u>	<u>(2,632,699)</u>
Net increase/(decrease) in cash and cash equivalents		1,884,345	1,502,073
Cash and cash equivalents at the beginning of the period		<u>10,946,434</u>	<u>9,444,361</u>
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD	7.1.1	<u>12,830,779</u>	<u>10,946,434</u>

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 2018

Note 1. Basis of preparation

MRIWA is a not-for-profit reporting entity that prepares general purpose financial statements in accordance with Australian Accounting Standards, the Framework, Statements of Accounting Concepts and other authoritative pronouncements of the AASB as applied by the Treasurer's Instructions. Several of these are modified by the Treasurer's Instructions to vary application, disclosure, format and wording.

Statement of compliance

MRIWA's financial statements for the year ended 30 June 2018 have been prepared in accordance with Australian Accounting Standards. The term 'Australian Accounting Standards' refers to Standards and Interpretations issued by the Australian Accounting Standards Board (AASB).

MRIWA has adopted any applicable new and revised Australian Accounting Standards from their operative dates.

The Financial Management Act 2006 and the Treasurer's Instructions impose legislative provisions that govern the preparation of financial statements and take precedence over Australian Accounting Standards, the Framework, Statements of Accounting Concepts and other authoritative pronouncements of the AASB.

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

This reporting entity comprises MRIWA and no other related bodies.

The financial statements have been prepared on the accrual basis of accounting using the historical cost convention.

The accounting policies adopted in the preparation of the financial statements have been consistently applied throughout all periods presented unless otherwise stated.

The financial statements are presented in Australian dollars and all values are rounded to the nearest dollar.

Comparative figures are, where appropriate, reclassified to be comparable with the figures presented in the current financial year.

Judgements and estimates

The preparation of financial statements requires management to make judgements about the application of accounting policies that have a significant effect on the amounts recognised in the financial statements. MRIWA evaluates these judgements regularly.

There have been no changes in accounting estimates.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 2. Institute outputs

How the Institute operates

This section includes information regarding the nature of funding the Institute receives and how this funding is utilised to achieve the Institute's objectives. This note also provides the distinction between controlled funding and administered funding:

	Notes
Institute objectives	2.1
Schedule of Income and Expenses by Service	2.2

2.1 Institute objectives

Mission

The Minerals Research Institute of Western Australia (MRIWA) is a statutory body established by the Western Australian Government under the Minerals Research Institute of Western Australia Act 2013 to stimulate minerals research to support investment in, and operation of, a globally competitive minerals industry in Western Australia. It is a granting agency for the purpose of fostering research to the benefit of the State's minerals endowment.

Services

MRIWA's primary function is to provide and administer funding grants to carry out minerals research. The Institute is able to collaborate with local, Australian and worldwide research and scientific institutions and is also able to undertake and procure minerals research itself.

2.2 Schedule of income and expenses by service

Treasurer's Instruction 1101(9) requires that statutory authorities provide segment information in the form of services.

MRIWA has one sole activity (or service) which is to finance and coordinate minerals research.

No schedule is prepared as this information is reported in the Statement of Comprehensive Income.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 3. 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	2018 \$	2017 \$
Research grants		3,396,536	3,573,888
Scholarships		164,298	264,006
Employee benefits expenses	3.1.1	542,640	530,639
Employee benefits provisions	3.1.2	110,920	93,266
Board and committee fees and costs	3.2	102,099	96,657
Other expenditure	3.3	249,503	220,503

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, normally on a quarterly basis.

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

3.1.1 Employee benefits expenses

	2018 \$	2017 \$
Wages and salaries	498,337	487,844
Superannuation - defined contribution plans	44,303	42,795
	542,640	530,639

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

Superannuation: is recognised in the profit or loss of the Statement of Comprehensive Income and comprises employer contributions paid to the GSS (concurrent contributions), the West State Superannuation (WSS) Scheme, the GESB Super Scheme (GESBS) and other superannuation funds.

The Government Employees Superannuation Board (GESB) and other fund providers administer public sector superannuation arrangements in Western Australia in accordance with legislative requirements. Eligibility criteria for membership in particular schemes for public sector employees vary according to commencement and implementation dates.

Eligible employees contribute to the Pension Scheme, a defined benefit pension scheme closed to new members since 1987, or the Gold State Superannuation Scheme (GSS), a defined benefit lump sum scheme closed to new members since 1995.

Employees commencing employment prior to 16 April 2007 who were not members of either the Pension Scheme or the GSS became non-contributory members of the West State Superannuation Scheme (WSS). Employees commencing employment on or after 16 April 2007 became members of the GESB Super Scheme (GESBS). From 30 March 2012, existing members of the WSS or GESBS and new employees have been able to choose their preferred superannuation fund provider. MRIWA makes contributions to GESB or other fund providers on behalf of employees in compliance with the Commonwealth Government's Superannuation Guarantee (Administration) Act 1992.

Notes to the Financial Statements

For the year ended 30 June 2018

Contributions to these accumulation schemes extinguish MRIWA's liability for superannuation charges in respect of employees who are not members of the Pension Scheme or GSS.

The GSS is a defined benefit scheme for the purposes of employees and whole-of-government reporting. However, it is a defined contribution plan for Institute purposes because the concurrent contributions (defined contributions) made by MRIWA to GESB extinguishes the Institute's obligations to the related superannuation liability.

MRIWA has no liabilities under the Pension Scheme or the GSS. The liabilities for the unfunded Pension Scheme and the unfunded GSS transfer benefits attributable to members who transferred from the Pension Scheme, are assumed by the Treasurer. All other GSS obligations are funded by concurrent contributions made by the MRIWA to the GESB.

The GESB makes all benefit payments in respect of the Pension Scheme and GSS, and is recouped from the Treasurer for the employer's share.

3.1.2 Employee related provisions

	2018	2017
	\$	\$
<u>Current</u>		
Employee benefits provision		
Annual leave ^(a)	24,618	17,061
Long service leave ^(b)	<u>80,782</u>	<u>76,205</u>
	<u>105,400</u>	<u>93,266</u>
<u>Non-Current</u>		
Employee benefits provision		
Long service leave ^(b)	<u>5,520</u>	-
	<u>5,520</u>	<u>-</u>

^(a) Annual leave liabilities have been classified as current as there is no unconditional right to defer settlement for at least 12 months after the reporting period. Assessments indicate that actual settlement of the liabilities will occur as follows:

	2018	2017
	\$	\$
Within 12 months of the end of the reporting period	24,618	17,061
More than 12 months after the end of the reporting period	<u>-</u>	<u>-</u>
	<u>24,618</u>	<u>17,061</u>

^(b) The liability for long service leave that is expected to be settled within 12 months after the end of the reporting period is recognised and measured at the undiscounted amounts expected to be paid when the liability is settled. A liability for long service leave is recognised based on remuneration rates current as at the end of the reporting period.

It is determined that the liability measured using the short-hand measurement technique was not materially different from the liability determined using the present value of expected future payments. This calculation is consistent with the MRIWA's experience of employee retention and leave taken.

Unconditional long service leave provisions are classified as current liabilities as MRIWA does not have an unconditional right to defer the settlement of the liability for at least 12 months after the end of the reporting period. Pre-conditional and conditional long service leave provisions are classified as non-current liabilities because MRIWA has an unconditional right to defer the settlement of the liability until the employee has completed the requisite years of service. Assessments indicate that actual settlement of the liabilities will occur as follows:

Notes to the Financial Statements

For the year ended 30 June 2018

	2018	2017
	\$	\$
Within 12 months of the end of the reporting period	-	-
More than 12 months after the end of the reporting period	<u>86,302</u>	<u>76,205</u>
	86,302	76,205

Provisions are liabilities of uncertain timing or amount and are recognised where there is a present legal or constructive obligation as a result of a past event and when the outflow of resources embodying economic benefits is probable and a reliable estimate can be made of the amount of the obligation. Provisions are reviewed at the end of each reporting period.

Employee on-costs: Employment on-costs, including workers' compensation insurance, are not employee benefits and are recognised separately as liabilities and expenses when the employment to which they relate has occurred. Employment on-costs are included as part of 'Other expenses' and are not included as part of MRIWA's 'Employee benefits expense'. The related liability is included in 'Employment on-costs provision'.

Key sources of estimation uncertainty – long service leave

MRIWA makes key estimates and assumptions concerning the future. These estimates and assumptions 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 estimations and assumptions used in calculating MRIWA's long service leave provision 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.

3.2 Board and committee fees and costs

	2018	2017
	\$	\$
Board of Directors' remuneration	79,716	78,215
Advisory Committee attendance fees	18,947	15,136
Board and Advisory Committee's expenses	<u>3,436</u>	<u>3,306</u>
	<u>102,099</u>	<u>96,657</u>

3.3 Other expenditure

	2018	2017
	\$	\$
Supplies and services		
Printing and stationery	1,671	1,253
Communications	46,901	33,028
Business travel	20,396	17,545
Accounting services	88,362	80,370
Consultants	13,636	3,843
Legal services	12,996	5,702
Insurance	12,253	15,706
Sponsorships	6,000	21,045
Other	<u>22,014</u>	<u>22,825</u>
Total supplies and services	<u>224,229</u>	<u>201,317</u>

Notes to the Financial Statements

For the year ended 30 June 2018

Other expenses

Audit fees	18,650,400	
Bad debts expense	24	-
Other expenses	<u>6,600</u>	<u>786</u>
	<u>25,274</u>	<u>19,186</u>
Total other expenditure	<u>249,503</u>	<u>220,503</u>

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.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 4. 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	2018 \$	2017 \$
Income from state government	4.1	4,156,250	4,182,022

4.1 Income from State Government

	2018 \$	2017 \$
State Government Grants	<u>4,109,000</u>	<u>4,134,772</u>
	<u>4,109,000</u>	<u>4,134,772</u>

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

Department of Mines, Industry Regulation and Safety	<u>47,250</u>	<u>47,250</u>
	<u>47,250</u>	<u>47,250</u>
	<u>4,156,250</u>	<u>4,182,022</u>

Revenue recognition

Revenue is recognised and measured at the fair value of consideration received or receivable. The following specific recognition criteria must also be met before revenue is recognised for the major business activities as follows:

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

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.

Rendering of services: Revenue is recognised by reference to the stage of completion of the transaction.

Sponsorship Revenue: Sponsorship from Industry is recognised as revenue by reference to the stage of completion of the transaction, i.e. when the Institute has fulfilled its obligations for research project grants.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 5. Key assets

Assets the Institute utilises for economic benefit or service potential

This section includes information regarding the key assets the Institute utilises to gain economic benefits or provide service potential. The section sets out both the key accounting policies and financial information about the performance of these assets:

	Notes	2018 \$	2017 \$
Office equipment	5.1	14,471	18,088

5.1 Office Equipment

	2018 \$	2017 \$
<u>Office equipment</u>		
At cost	33,480	33,480
Accumulated depreciation	<u>(19,009)</u>	<u>(15,392)</u>
	<u>14,471</u>	<u>18,088</u>
	<u>14,471</u>	<u>18,088</u>

<u>Office</u>	<u>equipment</u>		
Carrying amount at start of period		18,088	22,610
Additions		-	-
Disposals		-	-
Depreciation		<u>(3,617)</u>	<u>(4,522)</u>
Carrying amount at end of period		14,471	18,088

Capitalisation/expensing of assets

Items of plant and equipment costing \$5,000 or more are recognised as assets and the cost of utilising assets is expensed (depreciated) over their useful lives. Items of plant and equipment costing less than \$5,000 are immediately expensed direct to the Statement of Comprehensive Income (other than where they form part of a group of similar items which are significant in total).

Initial recognition and measurement

Plant and equipment are initially recognised at cost. For items of plant and equipment acquired at no cost or for nominal cost, the cost is their fair value at the date of acquisition.

Subsequent measurement

After recognition as an asset, the historical cost model is used for the measurement of plant and equipment and stated at cost less accumulated depreciation and accumulated impairment losses.

Depreciation

All non-current assets having a limited useful life are systematically depreciated over their estimated useful lives in a manner that reflects the consumption of their future economic benefits.

Depreciation is calculated using the straight-line method, using rates which are reviewed annually. The expected useful life for plant and equipment is 3 to 7 years.

Notes to the Financial Statements

For the year ended 30 June 2018

Impairment

There were no indications of impairment to office equipment at 30 June 2018. MRIWA held no goodwill or intangible assets with an indefinite useful life during the reporting period.

Plant and equipment are tested for any indication of impairment at the end of each reporting period. Where there is an indication of impairment, the recoverable amount is estimated. Where the recoverable amount is less than the carrying amount, the asset is considered impaired and is written down to the recoverable amount and an impairment loss is recognised. As MRIWA is a not for profit entity, unless an asset has been identified as a surplus asset, the recoverable amount is the higher of an asset's fair value less costs to sell and depreciated replacement cost.

The risk of impairment is generally limited to circumstances where an asset's depreciation is materially understated, where the replacement cost is falling or where there is a significant change in useful life. Each relevant class of assets is reviewed annually to verify that the accumulated depreciation reflects the level of consumption or expiration of the asset's future economic benefits and to evaluate any impairment risk from falling replacement costs.

The recoverable amount of assets identified as surplus assets is the higher of fair value less costs to sell and the present value of future cash flows expected to be derived from the asset. Surplus assets carried at fair value have no risk of material impairment where fair value is determined by reference to market-based evidence. Where fair value is determined by reference to depreciated replacement cost, surplus assets are at risk of impairment and the recoverable amount is measured. Surplus assets at cost are tested for indications of impairment at the end of each reporting period.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 6. 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	2018 \$	2017 \$
Receivables	6.1	569,036	780,289
Other current assets	6.2	65,044	55,365
Payables	6.3	398,010	594,071
Deferred revenue	6.4	2,373,009	1,667,569

6.1 Receivables

	2018 \$	2017 \$
<u>Current</u>		
Grant receivables - Sponsorship	449,042	728,145
GST receivable	<u>119,994</u>	<u>52,144</u>
	<u>569,036</u>	<u>780,289</u>

Receivables are recognised at original invoice amount less an allowance for any uncollectible amounts (i.e. impairment). The collectability of receivables is reviewed on an ongoing basis and any receivables identified as uncollectible are written off against the allowance account. The allowance for uncollectible amounts (doubtful debts) is raised when there is objective evidence that MRIWA will not be able to collect the debts. The carrying amount is equivalent to fair value as it is due for settlement within 30 days.

Reconciliation of changes in the allowance for impairment of receivables

Balance at start of period	-	-
Doubtful debts expense recognised during the period	-	-
Receivables written off during the period	<u>24</u>	<u>-</u>
Balance at end of period	<u>24</u>	<u>-</u>

The collectability of receivables is reviewed on an ongoing basis and any receivables identified as uncollectible are written-off against the allowance account. The allowance for uncollectible amounts (doubtful debts) is raised when there is objective evidence that the Institute will not be able to collect the debts.

6.2 Other current assets

	2018 \$	2017 \$
Accrued Interest	<u>65,044</u>	<u>55,365</u>
	<u>65,044</u>	<u>55,365</u>

Revenue is recognised when the interest accrues.

Notes to the Financial Statements

For the year ended 30 June 2018

6.3 Payables

	2018	2017
	\$	\$
<u>Current</u>		
Research grants payable	189,860	-
Scholarships payable	-	-
Payables	16,899	545
Accrued research grants	134,799	558,295
Accrued general expenses	54,440	33,340
Accrued salaries	<u>2,012</u>	<u>1,891</u>
	<u>398,010</u>	<u>594,071</u>

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. MRIWA considers the carrying amount of accrued salaries to be equivalent to its fair value.

Accrued research grants & 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

6.4 Deferred revenue

	2018	2017
	\$	\$
Deferred Revenue - Sponsorship	<u>2,373,009</u>	<u>1,667,569</u>
	<u>2,373,009</u>	<u>1,667,569</u>

Deferred Revenue 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.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 7. Financing

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

	Notes	2018 \$	2017 \$
Cash and cash equivalents	7.1.1	6,766,981	4,984,944
Restricted cash and cash equivalents	7.1.2	6,063,798	5,961,490
Commitments	7.2	4,278,458	5,196,938

7.1 Cash and cash equivalents

7.1.1 Reconciliation of cash

	2018 \$	2017 \$
Cash and cash equivalents	6,766,981	4,984,944
Restricted cash and cash equivalents - current	<u>6,063,798</u>	<u>5,961,490</u>
	<u>12,830,779</u>	<u>10,946,434</u>

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.

7.1.2 Restricted cash and cash equivalents

	2018 \$	2017 \$
Research grants	5,629,423	5,205,862
Director's Scholarship	<u>434,375</u>	<u>755,628</u>
	<u>6,063,798</u>	<u>5,961,490</u>

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

Notes to the Financial Statements

For the year ended 30 June 2018

7.1.3 Reconciliation of net cost of services to net cash flows provided by (used in) operating activities

	2018	2017
	\$	\$
Net cost of services	(3,004,129)	(3,066,908)
<u>Non-cash Items</u>		
Depreciation and amortisation expense	3,617	4,522
Resources received free of charge	47,250	47,250
<u>(Increase)/decrease in assets</u>		
Accrued Interest	(9,679)	3,397
Grants receivable - Sponsorship	279,103	(673,145)
Change in GST in receivables/payables ^(c)	(132,183)	(266,293)
Net GST receipts/(payments) ^(b)	97,049	304,392
<u>Increase/(decrease) in liabilities</u>		
Grants payable - Research and Scholarship ^(a)	(233,636)	502,583
Employee benefits	21,995	20,229
Deferred Revenue	672,724	492,145
Other Liabilities	33,234	(871)
Net cash used in operating activities	(2,224,655)	(2,632,699)

(a) Note that the Australian Taxation Office (ATO) receivable/payable in respect of GST and the receivable/payable in respect of the sale/purchase of non-current assets are not included in these items as they do not form part of the reconciling items.

(b) This is the net GST paid/received, i.e. cash transactions.

(c) This reverses out the GST in receivables and payables.

7.2 Commitments

	2018	2017
	\$	\$
Other expenditure commitments		
Within 1 year	2,664,453	3,069,551
Later than 1 year and not later than 5 years	1,614,005	2,127,387
Later than 5 years	-	-
	4,278,458	5,196,938

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.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 8. Risks and Contingencies

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

	Notes
Financial Instruments	8.1
Contingent Liabilities and Assets	8.2

8.1 Financial instrument

In addition to cash, MRIWA has two categories of financial instrument:

- Receivables; and
- Financial liabilities measured at amortised cost

Financial instruments have been disaggregated into the following classes:

- Financial Assets
 - Cash and cash equivalents
 - Restricted cash and cash equivalents
 - Receivables
- Financial Liabilities
 - Payables

Initial recognition and measurement of financial instruments is at fair value which normally equates to the transaction cost or the face value. Subsequent measurement is at amortised cost using the effective interest method.

The fair value of short-term receivables and payables is the transaction cost or the face value because there is no interest rate applicable and subsequent measurement is not required as the effect of discounting is not material.

(a) Financial risk management objectives and policies

Financial instruments held by MRIWA are cash and cash equivalents, restricted cash and cash equivalents, receivables, and payables. MRIWA has limited exposure to financial risks. MRIWA's overall risk management program focuses on managing the risks identified below.

Credit risk

Credit risk arises when there is the possibility of MRIWA's receivables defaulting on their contractual obligations resulting in financial loss to MRIWA.

The maximum exposure to credit risk at the end of the reporting period in relation to each class of recognised financial assets is the gross carrying amount of those assets inclusive of any allowance for impairment.

MRIWA trades only with recognised, creditworthy third parties. MRIWA has policies in place to ensure that sales of products and services are made to customers with an appropriate credit history. In addition, receivable balances are monitored on an ongoing basis with the result that MRIWA's exposure to bad debts is minimal. At the end of the reporting period there were no significant concentrations of credit risk.

Notes to the Financial Statements

For the year ended 30 June 2018

Liquidity risk

Liquidity risk arises when MRIWA is unable to meet its financial obligations as they fall due. MRIWA is exposed to liquidity risk through its trading in the normal course of business.

MRIWA has appropriate procedures to manage cash flows including drawdowns of appropriations by monitoring forecast cash flows to ensure that sufficient funds are available to meet its commitments.

Market Risk

Market risk is the risk that changes in market prices such as interest rates will affect MRIWA's income or the value of its holdings of financial instruments. MRIWA does not trade in foreign currency and is not materially exposed to other price risks. The Institute's exposure to market risk for changes in interest rates relates primarily to short-term investments comprised of term deposits and bank bills. The risk is managed by the Institute through diversification and variation in maturity dates.

(b) Categories of 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 as follows:

	2018	2017
	\$	\$
<u>Financial assets</u>		
Cash and cash equivalents	6,766,981	4,984,944
Restricted cash and cash equivalents	6,063,798	5,961,490
Receivables ^(a)	449,042	728,145
Other current assets	65,044	55,365
<u>Financial liabilities</u>		
Finance lease liabilities measured at amortised cost	398,010	594,071

^(a) The amount of receivables excludes GST recoverable from the ATO (statutory receivable).

Notes to the Financial Statements For the year ended 30 June 2018

8.1 Financial instrument (continued)

(a) Financial instrument disclosures

Credit risk

The following table discloses the MRIWA's maximum exposure to credit risk and the ageing analysis of financial assets. The MRIWA's maximum exposure to credit risk at the end of the reporting period is the carrying amount of financial assets as shown below.

The MRIWA does not hold any collateral as security or other credit enhancements relating to the financial assets it holds.

	Carrying Amount \$	Not past due and not Impaired \$	Past due but not impaired				Impaired financial assets \$
			Up to 1 Month \$	1-3 months \$	3 months to 1 year \$	1-5 years \$	
2018							
Cash and cash equivalents	6,766,981	6,766,981	-	-	-	-	-
Restricted cash and cash equivalents	6,063,798	6,063,798	-	-	-	-	-
Receivables ^(a)	449,042	-	83,292	247,500	118,250	-	-
Other current assets	65,044	65,044	-	-	-	-	-
	13,344,865	12,895,823	83,292	247,500	118,250	-	-
2017							
Cash and cash equivalents	4,984,944	4,984,944	-	-	-	-	-
Restricted cash and cash equivalents	5,961,490	5,961,490	-	-	-	-	-
Receivables ^(a)	728,145	-	524,645	154,000	49,500	-	-
Other current assets	55,365	55,365	-	-	-	-	-
	11,729,944	11,001,799	524,645	154,000	49,500	-	-

(a) The amount of receivables excludes GST recoverable from the Australian Taxation Office (statutory receivable)

Notes to the Financial Statements For the year ended 30 June 2018

8.1 Financial instrument (continued)

(c) Financial instrument disclosures (continued)

Liquidity risk

The following table details the contractual maturity analysis of financial assets and financial liabilities. The amounts disclosed in the table are the contractual undiscounted cash flows (interest and principal). Balances due within 12 months equal their carrying balances as the impact of discounting is not significant.

	Interest rate exposure		Maturity dates							
	Weighted average effective interest rate	Carrying amount	Variable interest rate	Non-interest bearing	Nominal amount	Up to 1 month	1-3 months	3 months to 1 year	1-5 years	More than 5 years
	%	\$	\$	\$	\$	\$	\$	\$	\$	\$
2018										
<u>Financial Assets</u>										
Cash and cash equivalents	2.118	6,766,981	6,766,981	-	6,766,981	-	-	-	-	-
Restricted cash and cash equivalents	2.118	6,063,798	6,063,798	-	6,063,798	-	-	-	-	-
Receivables ^(a)		449,042	-	449,042	449,042	-	-	-	-	-
Other current assets		65,044	-	65,044	65,044	65,044	-	-	-	-
		13,344,865	12,830,779	514,086	13,344,865	65,044	-	-	-	-
<u>Financial Liabilities</u>										
Payables		398,010	-	398,010	398,010	398,010	-	-	-	-
		398,010	-	398,010	398,010	398,010	-	-	-	-

(a) The amount of receivables excludes GST recoverable to the Australian Taxation Office (statutory receivable). Impaired receivables have also been excluded.

Notes to the Financial Statements For the year ended 30 June 2018

8.1 Financial instrument (continued)

(c) Financial instrument disclosures (continued)

Liquidity risk (continued)

	Weighted average effective interest rate	Interest rate exposure			Maturity dates					
		Carrying amount	Variable interest rate	Non- interest bearing	Nominal amount	Up to 1 month	1-3 months	3 months to 1 year	More than 5 years	
									%	\$
2017										
<u>Financial Assets</u>										
Cash and cash equivalents	1.982	4,984,944	4,984,944	-	4,984,944	-	-	-	-	-
Restricted cash and cash equivalents	1.982	5,961,490	5,961,490	-	5,961,490	-	-	-	-	-
Receivables ^(a)		728,145	-	728,145	728,145	-	-	-	-	-
Other current assets		55,365	-	55,365	55,365	55,365	-	-	-	-
		11,729,944	10,946,434	783,510	11,729,944	55,365	-	-	-	-
<u>Financial Liabilities</u>										
Payables		594,071	-	594,071	594,071	594,071	-	-	-	-
		594,071	-	594,071	594,071	594,071	-	-	-	-

(a) The amount of receivables excludes GST recoverable to the Australian Taxation Office (statutory receivable). Impaired receivables have also been excluded.

Notes to the Financial Statements For the year ended 30 June 2018

8.1 Financial instrument (continued)

(c) Financial instrument disclosures (continued)

Interest rate sensitivity analysis

The following table represents a summary of the interest rate sensitivity of MRIWA's financial assets and liabilities at the end of the reporting period on the surplus for the period and equity for a 1% change in interest rates. It is assumed that the change in interest rates is held constant throughout the reporting period.

	Carrying amount \$'000	-100 basis points		+100 basis points	
		Surplus \$'000	Equity \$'000	Surplus \$'000	Equity \$'000
2018					
Financial assets					
Cash and cash equivalents	6,766,981	(67,670)	(67,670)	67,670	67,670
Restricted Cash and cash equivalents					
	<u>6,063,798</u>	<u>(60,638)</u>	<u>(60,638)</u>	<u>60,638</u>	<u>60,638</u>
Total Increase/Decrease		(128,308)	(128,308)	128,308	128,308

	Carrying amount \$'000	-100 basis points		+100 basis points	
		Surplus \$'000	Equity \$'000	Surplus \$'000	Equity \$'000
2017					
Financial assets					
Cash and cash equivalents	4,984,944	(49,849)	(49,849)	49,849	49,849
Restricted Cash and cash equivalents					
	<u>5,961,490</u>	<u>(59,615)</u>	<u>(59,615)</u>	<u>59,615</u>	<u>59,615</u>
Total Increase/Decrease		(109,464)	(109,464)	109,464	109,464

Fair values

All financial assets and liabilities recognised in the Statement of Financial Position, whether they are carried at cost or fair value, are recognised at amounts that represent a reasonable approximation of fair value unless otherwise stated in the applicable notes.

8.2 Contingent assets and liabilities

MRIWA has no contingent liabilities or contingent assets.

Notes to the Financial Statements

For the year ended 30 June 2018

Note 9. 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	9.1
Future impact of Australian Accounting Standards not yet operative	9.2
Key Management Personnel	9.3
Related party transactions	9.4
Related bodies	9.5
Affiliated bodies	9.6
Remuneration of Auditors	9.7
Equity	9.8
Supplementary financial information	9.9
Explanatory statement	9.10

9.1 Events occurring after the end of the reporting period

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

9.2 Future impact of Australian standards issued not yet operative

MRIWA cannot early adopt an Australian Accounting Standard unless specifically permitted by TI 1101 *Application of Australian Accounting Standards and Other Pronouncements*. Consequently, MRIWA has not applied early any of the following Australian Accounting Standards that have been issued that may impact MRIWA. Where applicable, MRIWA plans to apply these Australian Accounting Standards from their application date.

	Operative for reporting periods beginning on/after
AASB 9 <i>Financial Instruments</i> <i>This Standard supersedes AASB 139 Financial Instruments: Recognition and Measurement, introducing a number of changes to accounting treatments. The Institute has not yet determined the application or the potential impact of the Standard.</i>	1 Jan 2018
AASB 15 <i>Revenue from Contracts with Customers</i> This Standard establishes the principles that the Institute shall apply to report useful information to users of financial statements about the nature, amount, timing and uncertainty of revenue and cash flows arising from a contract with a customer. The mandatory application date of this Standard is currently 1 January 2019 after being amended by AASB 2016-7. The Institute's income is principally derived from appropriations which will be measured under AASB 1058 Income of Not-for-Profit Entities and will be unaffected by this change. However, the Institute has not yet determined the potential impact of the Standard on 'User charges and fees' and 'Sales' revenues. In broad terms, it is anticipated that the terms and conditions attached to these revenues will defer revenue recognition until the Institute has discharged its performance obligations.	1 Jan 2019

Notes to the Financial Statements

For the year ended 30 June 2018

Operative for reporting periods beginning on/after

AASB 16	<p><i>Leases</i></p> <p>This Standard introduces a single lessee accounting model and requires a lessee to recognise assets and liabilities for all leases with a term of more than 12 months unless the underlying asset is of low value. The Institute has not yet determined the application or the potential impact of the Standard.</p> <p>Whilst the impact of AASB 16 has not yet been quantified, the Institute currently has no commitments of non- cancellable operating leases which will be brought onto the Statement of Financial Position.</p>	1 Jan 2019
AASB 1058	<p><i>Income of Not-for-Profit Entities</i></p> <p>This Standard clarifies and simplifies the income recognition requirements that apply to not-for-profit (NFP) entities, more closely reflecting the economic reality of NFP entity transactions that are not contracts with customers. Timing of income recognition is dependent on whether such a transaction gives rise to a liability or other performance obligation (a promise to transfer a good or service), or a contribution by owners, related to an asset (such as cash or another asset) received by an entity. The Institute anticipates that the application will not materially impact appropriation or untied grant revenues.</p>	1 Jan 2019
AASB 2010-7	<p><i>Amendments to Australian Accounting Standards arising from AASB 9 (December 2010) [AASB 1, 3, 4, 5, 7, 101, 102, 108, 112, 118, 120, 121, 127, 128, 131, 132, 136, 137, 139, 1023 and 1038 and Int 2, 5, 10, 12, 19 & 127]</i></p> <p>This Standard makes consequential amendments to other Australian Accounting Standards and Interpretations as a result of issuing AASB 9 in December 2010.</p> <p>The mandatory application date of this Standard has been amended by AASB 2012-6 and AASB 2014-1 to 1 January 2018. MRIWA has not yet determined the application or the potential impact of the Standard.</p>	1 Jan 2018
AASB 2014-1	<p><i>Amendments to Australian Accounting Standards</i></p> <p>Part E of this Standard makes amendments to AASB 9 and consequential amendments to other Standards. It has not yet been assessed by MRIWA to determine the application or potential impact of the Standard.</p>	1 Jan 2018
AASB 2014-5	<p><i>Amendments to Australian Accounting Standards arising from AASB 15</i></p> <p>This Standard gives effect to the consequential amendments to Australian Accounting Standards (including Interpretations) arising from the issuance of AASB 15. The mandatory application date of this Standard has been amended by AASB 2015-8 to 1 January 2018. MRIWA has not yet determined the application or the potential impact of the Standard.</p>	1 Jan 2018

Notes to the Financial Statements

For the year ended 30 June 2018

AASB 2014-7	<p><i>Amendments to Australian Accounting Standards arising from AASB 9 (December 2014)</i></p> <p>This Standard gives effect to the consequential amendments to Australian Accounting Standards (including Interpretations) arising from the issuance of AASB 9 (December 2014). MRIWA has not yet determined the application or the potential impact of the Standard.</p>	1 Jan 2018
AASB 2015-8	<p><i>Amendments to Australian Accounting Standards – Effective Date of AASB 15</i></p> <p>This Standard amends the mandatory application date of AASB 15 to 1 January 2018 (instead of 1 January 2017). It also defers the consequential amendments that were originally set out in AASB 2014-5. There is no financial impact arising from this Standard.</p>	1 Jan 2018
AASB 2016-3	<p><i>Amendments to Australian Accounting Standards – Clarifications to AASB 15</i></p> <p>This Standard clarifies identifying performance obligations, principal versus agent considerations, timing of recognising revenue from granting a licence, and, provides further transitional provisions to AASB 15. MRIWA has not yet determined the application or the potential impact.</p>	1 Jan 2018
AASB 2016-7	<p><i>Amendments to Australian Accounting Standards – Deferral of AASB 15 for Not-for-Profit Entities</i></p> <p>This Standard defers, for not-for-profit entities, the mandatory application date of AASB 15 to 1 January 2019, and the consequential amendments that were originally set out in AASB 2014-5. There is no financial impact arising from this standard.</p>	1 Jan 2018
AASB 2016-8	<p><i>Amendments to Australian Accounting Standards – Australian Implementation Guidance for Not-for-Profit Entities</i></p> <p>This Standard insert Australian requirements and authoritative implementation guidance for not-for-profit entities into AASB 9 and AASB 15. This guidance assists not-for-profit entities in applying those Standards to particular transactions and other events. There is no financial impact.</p>	1 Jan 2019

Notes to the Financial Statements

For the year ended 30 June 2018

9.3 Key management personnel

The Institute has determined that key management personnel include the responsible Minister, board members, and senior officers of the Authority. However, the Institute is not obligated to compensate Ministers and therefore disclosures in relation to Ministers' compensation may be found in the Annual Report on State Finances:

Compensation of members of the accountable authority

The number of Board members whose total fees, salaries, superannuation, non-monetary benefits and other benefits for the financial year fall within the following bands are:

	2018	2017
\$		
0 - 10,000	3	2
10,000 - 20,000	5	4
20,000 - 30,000	-	1

The total remuneration includes the superannuation expense incurred by MRIWA in respect of members of MRIWA. No members of MRIWA are members of the Pension Scheme.

Compensation of senior officers (other than senior officers reported as members of the accountable authority)

The number of senior officers whose total fees, salaries, superannuation, non-monetary benefits and other benefits for the financial year fall within the following bands are:

	2018	2017
\$		
280,000 – 290,000	1	-
290,000 - 300,000	-	1
310,000 - 320,000	-	-

	\$	\$
Short-term employee benefits	310,433	331,853
Post-employment benefits	27,842	27,533
Other long-term benefits	26,446	26,368
Termination benefits	-	-
Total compensation of all key management personnel	<u><u>364,721</u></u>	<u><u>385,754</u></u>

The total remuneration includes the superannuation expense incurred by MRIWA in respect of senior officers other than board members.

9.4 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 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;
- other departments and public sector entities, including related bodies included in the whole of government consolidated financial statements; and

Notes to the Financial Statements

For the year ended 30 June 2018

- 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 2018 include:

- Department of Mines, Industry Regulation and Safety
 - Appropriations (refer note 4.1)
 - Accommodation received free of charge (included in Accommodation Expense and Resources Received Free of Charge, refer note 4.1)
- ChemCentre
 - Sponsorship of a research project (included within Revenue from Industry Sponsorship, to the value of \$234,700)

9.5 Related bodies

The Institute has no related bodies.

9.6 Affiliated bodies

The Institute has no affiliated bodies.

9.7 Remuneration of auditors

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

	2018	2017
	\$	\$
Auditing the accounts, financial statements and key performance indicators	18,900	18,650

9.8 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.

	2018	2017
	\$	\$
Accumulated surplus		
Balance at start of period	9,445,270	8,330,156
Result for the period	<u>1,152,121</u>	<u>1,115,114</u>
Balance at end of period	<u>10,597,391</u>	<u>9,445,270</u>
Total Equity at end of period	<u><u>10,597,391</u></u>	<u><u>9,445,270</u></u>

Notes to the Financial Statements

For the year ended 30 June 2018

9.9 Supplementary financial information

(a) Write-offs

	2018	2017
	\$	\$
Public property written-off by the Authority during the period	-	-
	-	-
	<u>-</u>	<u>-</u>

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

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

Notes to the Financial Statements

For the year ended 30 June 2018

Explanatory statement

All variances between estimates (original budget) and actual results for 2018, and between the actual results for 2018 and 2017 are shown below. Narratives are provided for key variations selected from observed major variances, which are generally greater than:

- 5% and \$96,765 for the Statement of Comprehensive Income and the Statement of Cash Flows
- 5% and \$211,957 for the Statement of Financial Position

Statement of Comprehensive Income

	Variance note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
COST OF SERVICES						
Expenses						
Research grants	1, A	5,505,751	3,396,536	3,573,888	(2,109,215)	(177,352)
Scholarships	2, B	833,000	164,298	264,006	(668,702)	(99,708)
Employee benefits expense		504,194	542,640	530,639	38,446	12,001
Institute Contractor fees		103,680	127,551	100,808	23,871	26,743
Board and committee fees and costs		135,848	102,099	96,657	(33,749)	5,442
Supplies and services		254,945	224,229	201,317	(30,716)	22,912
Other expenses		18,400	25,274	19,186	6,874	6,088
Accommodation expense		47,250	47,250	47,250	-	-
Depreciation expense		6,000	3,617	4,522	(2,383)	(905)
Total cost of services		7,409,068	4,633,494	4,838,273	(2,775,574)	(204,779)

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Comprehensive Income (continued)

	Variance note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
Income						
Revenue						
Interest revenue		237,295	230,163	205,654	(7,132)	24,509
Other revenue		68,311	46,009	53,309	(22,302)	(7,300)
Revenue from Industry Sponsorship	3, A	<u>3,300,000</u>	<u>1,353,193</u>	<u>1,512,402</u>	<u>(1,946,807)</u>	<u>(159,209)</u>
Total Revenue		<u>3,605,606</u>	<u>1,629,365</u>	<u>1,771,365</u>	<u>(1,976,241)</u>	<u>(142,000)</u>
Total income other than income from State Government		<u>3,605,606</u>	<u>1,629,365</u>	<u>1,771,365</u>	<u>(1,976,241)</u>	<u>(142,000)</u>
NET COST OF SERVICES		<u>(3,803,462)</u>	<u>(3,004,129)</u>	<u>(3,066,908)</u>	<u>799,333</u>	<u>62,779</u>
Income from State Government						
State Government Grant	4	3,089,000	4,109,000	4,134,772	1,020,000	(25,772)
Resources received free of charge		<u>47,250</u>	<u>47,250</u>	<u>47,250</u>	-	-
Total income from State Government		<u>3,136,250</u>	<u>4,156,250</u>	<u>4,182,022</u>	<u>1,020,000</u>	<u>(25,772)</u>
SURPLUS/(DEFICIT) FOR THE PERIOD		<u>(667,212)</u>	<u>1,152,121</u>	<u>1,115,114</u>	<u>1,819,333</u>	<u>37,007</u>
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD		<u>(667,212)</u>	<u>1,152,121</u>	<u>1,115,114</u>	<u>1,819,333</u>	<u>37,007</u>

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Comprehensive Income (continued)

Major Estimate and Actual (2018) Variance Narratives

1. Research grants are below estimate as payments to researchers are a function of:
 - the number and financial scale of applications submitted to MRIWA,
 - the time required to negotiate the condition of grant for a project with the industry and research partners, and
 - progress by the researchers in executing the project.
2. Scholarships are below estimate as the number of scholarships declined were higher than expected.
3. Revenue from industry sponsorship is below estimate as it is difficult to forecast an accurate value of industry sponsorship revenue for research projects, it is also a function of the Condition of Grants and the progress by the researchers in executing the project.
4. The State government grant revenue is above estimate as a consequence of an additional \$1 million of grant monies being awarded in the 2018 budget.

Major Actual (2018) and Comparative (2017) Variance Narratives

- A. Research grants expenditure & Revenue from Industry sponsorship has returned a slight decrease in the previous year for which a contributing cause is the difficulties and the time required to complete the contracts for the project.
- B. 50% of the awardees for the PHD scholarships accepted the award and MRIWA had discontinued the undergraduate scholarship program.

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Financial Position

	Variance note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
ASSETS						
Current Assets						
Cash and cash equivalents	1, A	1,529,586	6,766,981	4,984,944	5,237,395	1,782,037
Restricted cash and cash equivalents	2	8,667,657	6,063,798	5,961,490	(2,603,859)	102,308
Receivables and other assets	3	330,000	569,036	780,289	239,036	(211,253)
Other current assets		<u>59,324</u>	<u>65,044</u>	<u>55,365</u>	<u>5,720</u>	<u>9,679</u>
Total Current Assets		<u>10,586,567</u>	<u>13,464,859</u>	<u>11,782,088</u>	<u>2,878,292</u>	<u>1,682,771</u>
Non-Current Assets						
Office equipment		<u>11,304</u>	<u>14,471</u>	<u>18,088</u>	<u>3,167</u>	<u>(3,617)</u>
Total Non-Current Assets		<u>11,304</u>	<u>14,471</u>	<u>18,088</u>	<u>3,167</u>	<u>(3,617)</u>
TOTAL ASSETS		<u>10,597,871</u>	<u>13,479,330</u>	<u>11,800,176</u>	<u>2,881,459</u>	<u>1,679,154</u>

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Financial Position (continued)

	Variance note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
LIABILITIES						
Current Liabilities						
Payables	4	147,116	398,010	594,071	250,894	(196,061)
Provisions		95,000	105,400	93,266	10,400	12,134
Deferred revenue	5, B	<u>1,450,000</u>	<u>2,373,009</u>	<u>1,667,569</u>	<u>923,009</u>	<u>705,440</u>
Total Current Liabilities		<u>1,692,116</u>	<u>2,876,419</u>	<u>2,354,906</u>	<u>1,184,303</u>	<u>521,513</u>
Non-current Liabilities						
Provisions		-	5,520	-	5,520	5,520
Total Non-Current Liabilities		-	5,520	-	5,520	5,520
TOTAL LIABILITIES		1,692,116	2,876,939	2,354,906	1,189,823	527,033
NET ASSETS						
		8,905,755	10,597,391	9,445,270	1,691,636	1,152,121
EQUITY						
Accumulated surplus		<u>8,905,755</u>	<u>10,597,391</u>	<u>9,445,270</u>	<u>1,697,156</u>	<u>1,152,121</u>
TOTAL EQUITY		8,905,755	10,597,391	9,445,270	1,691,636	1,152,121

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Financial Position (continued)

Major Estimate and Actual (2018) Variance Narratives

1. The variance for both cash and restricted cash is closely linked. The actual cash and cash equivalents is above estimate due to:
 - the number and financial scale of applications submitted to MRIWA;
 - the additional allocation of monies to MRIWA during the Budget and;
 - the slower than expected completion of the COG for approved projects.
2. Refer to comment in 1.
3. The receivables are above estimate as the invoicing schedule for a large number of approved projects called for invoices to be sent to sponsors late in the financial year. Receipts from sponsors for each project is determined at the time a Condition of Grant is negotiated and can vary based on the length of the project.
4. Payables are above estimate due to increased number of research projects requesting for payments in the month June 2018. The invoicing schedule for research payments is conditional on the progress of research made by researchers, often a factor that cannot be determined by MRIWA.
5. Deferred revenue is above estimate due to the inability to forecast an accurate value of deferred revenue as it is determined by the individual sponsorship value of each project and the timing of cash received, additionally it is affected by the delays in executing the Condition of Grants for projects.

Major Actual (2018) and Comparative (2017) Variance Narratives

- A. The cash and cash equivalents has increased from prior year due to projects approved by the Board that still have Conditions of Grants to be finalised being included in this cash balance.
- B. Deferred revenue has increased from prior years as projects that had Conditions of Grant to be finalised at the end of the last financial year commence in this financial year. The revenue received from sponsors have a direct relationship to the deferred revenue calculated.

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Cash Flows

	Variance note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
CASH FLOWS FROM STATE GOVERNMENT						
State Government Grant						
Net cash provided by State Government	1	<u>3,089,000</u>	<u>4,109,000</u>	<u>4,134,772</u>	<u>1,020,000</u>	<u>(25,772)</u>
		<u>3,089,000</u>	<u>4,109,000</u>	<u>4,134,772</u>	<u>1,020,000</u>	<u>(25,772)</u>
Utilised as follows:						
CASH FLOWS FROM OPERATING ACTIVITIES						
Payments						
Research Grant Payments	2, A	(6,369,333)	(3,794,470)	(3,335,311)	2,574,863	(459,159)
Employee benefits		(494,498)	(520,645)	(510,410)	(26,147)	(10,235)
Institute Contractor fees		(101,686)	(127,551)	(100,808)	(25,865)	(26,743)
Board and Advisory committee fees		(48,777)	(34,990)	(40,617)	13,787	5,627
Supplies and Services		(273,874)	(237,369)	(224,105)	36,505	(13,264)
GST payments on purchases	3, B	(674,489)	(267,068)	(394,821)	407,421	127,753

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Cash Flows (continued)

	Variance Note	Original budget 2018 \$	Actual 2018 \$	Actual 2017 \$	Variance between estimate and actual \$	Variance between actual results for 2018 and 2017 \$
Receipts						
Receipts from Sponsors	4, C	2,910,940	2,305,020	1,331,402	(605,920)	973,618
Interest received		235,471	220,484	209,051	(14,987)	11,433
GST receipts on sales	5	291,094	134,885	128,528	(156,209)	6,357
GST receipts from taxation authority	6, D	<u>383,395</u>	<u>97,049</u>	<u>304,392</u>	<u>(286,346)</u>	<u>(207,343)</u>
Net cash used in operating activities		<u>(4,141,757)</u>	<u>(2,224,655)</u>	<u>(2,632,699)</u>	<u>1,917,102</u>	<u>408,044</u>
Net increase/(decrease) in cash and cash equivalents		(1,052,757)	1,884,345	1,502,073	2,937,102	382,272
Cash and cash equivalents at the beginning of the period		<u>11,250,000</u>	<u>10,946,434</u>	<u>9,444,361</u>	<u>(303,566)</u>	<u>1,502,073</u>
CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD		<u>10,197,243</u>	<u>12,830,779</u>	<u>10,946,434</u>	<u>2,633,536</u>	<u>1,884,345</u>

Notes to the Financial Statements

For the year ended 30 June 2018

Statement of Cash Flows (continued)

Major Estimate and Actual (2018) Variance Narratives

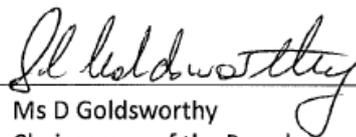
1. The State government grant revenue is above estimate as a consequence of an additional \$1million of grant monies being awarded in the 2018 budget.
2. Research grant payments is below estimate due to an inability to accurately forecast payments to researchers as this is dependent on the number of projects in progress, the actual progress of the project undertaken by the researcher and the value of the projects in progress.
3. The GST payments on purchases is below estimate as there is a direct relationship to the reduced payments to researchers.
4. Receipts from sponsors is below estimate due to an inability to accurately forecast receipts from sponsors as this is dependent on the number of projects in progress, the actual progress of the project undertaken by the researchers and the financial leverage, and the number of projects in the Portfolio.
5. The GST receipts on sales is below estimate as there is a direct relationship to the inability to forecast accurately sponsorship revenue anticipated for projects.
6. The GST receipts received is below estimate as there is a direct relationship to GST receipts on sales and GST payments on purchases.

Major Actual (2018) and Comparative (2017) Variance Narratives

- A. Research grant payments have increased as this is a function of the active number of projects in the Portfolio and the leverage secured by the Projects.
- B. The GST payments on purchases is below estimate as there was an increased amount of GST-free transactions made during the year.
- C. Receipts from Sponsors are driven by the terms set in the Condition of Grants at the commencement of every new research project and the number of active projects in the Institute's Portfolio.
- D. GST receipts from Australian Taxation Authority has a direct relationship to GST receipts on sales and GST payments on purchases. Please refer to comments above.

Certification of Key Performance Indicators For the year ended 30 June 2018

We hereby certify that 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 2018.



Ms D Goldsworthy
Chairperson of the Board
Date: 13 August 2018



Ms H Cook
Member of the Board
Date: 13 August 2018

Key Performance Indicators

For the year ended 30 June 2018

Outcomes Based Management

MRIWA commenced on 1 February 2014 after the *Minerals Research Institute of Western Australia Act 2013* (the Act) established the Minerals Research Institute of Western Australia as a statutory corporation to foster and promote minerals research for the benefit of Western Australia.

The Act repealed the *Minerals and Energy Research Act 1987* with the effect that MRIWA replaced the existing Minerals and Energy Research Institute of Western Australia (MERIWA).

The Key Performance Indicators reported here are designed to provide measurable outcomes relevant to MRIWA's objective and functions.

Desired Outcomes and Key Effectiveness Indicator

The calculation of the KPI bases the measure on:

- The decisions of the Board during the reporting period. The measure is useful to key stakeholders as it is closely coupled to the Board decisions and is not influenced by the lagging and highly variable process to complete the project contracts with the various parties involved, which can be up to six months.
- The end-of-month values during the reporting period, rather than just end-of-year. This refinement allows appropriate inclusion of projects commenced and completed during the reporting period.

It is recognised that it is appropriate for MRIWA to measure the effect of its research investments on minerals royalties accruing to Western Australia, and their economic impact more broadly. As acquiring the information for these measures is a significant undertaking, and because the results are difficult to audit, they are done only periodically, (roughly every 3 years), and are not incorporated in the OBM structure for routine use. It is noted that the State's minerals royalty's receipts vary significantly from year to year as a consequence of price and volume variations in the particular market. Deloitte Access Economics completed an Economic Impact Assessment for MRIWA in September 2015. ACIL Allen was commissioned in the fourth quarter FY 2018 to undertake a second assessment of the economic impact of the Institute's investments in minerals research and related activities.

Key Performance Indicators

For the year ended 30 June 2018

Services and Key Efficiency Indicator

MRIWA is a granting agency for the purpose of fostering research to the benefit of the State's minerals endowment.

The primary service provided by MRIWA is to seek research opportunities and resources, assist aggregate the resources to Grant applications and to manage completing approved projects. This is illustrated in the model of the MRIWA 'value chain':

The administration effort required of the Institute is appropriately measured as a function of the total financial scale of the portfolio of research projects.

The efficiency measure is the total administration cost for the year as a percentage of the total cash value of research projects and the education program under management during the year.

The efficiency indicator is in keeping with the intention of the MRIWA Act that the Board is accountable for a portfolio of projects, with discretion to manage the interlinking elements of the project value (financial scale), project financial leverage and project duration, to name some of the major considerations.

OUTCOME BASED MANAGEMENT STRUCTURE	
GOVERNMENT GOAL	
Sustainable Finances: Responsible financial management and better service delivery.	
AGENCY LEVEL GOVERNMENT DESIRED OUTCOME	
Fostering and promoting minerals research for the benefit of the State.	
KEY EFFECTIVENESS INDICATOR	
KPI 1	Ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects.
Notes:	
a)	Investment totals are for projects approved by the MRIWA Board in the reporting year.
b)	Measure reported as a multiple.
SERVICE	
Administer research grant applications and manage approved projects.	
KEY EFFICIENCY INDICATOR	
KPI 2	Total administration cost for the year as a percentage of the total cash value of research projects and the education program under management during the year.
Notes:	
a)	"Under management" being from the time of Board approval of the Grant to the time of the Chair approving the final report for the project.
b)	The "total value of research projects" to be calculated as the annual average of the end-of-month values.

KPI 1 - Effectiveness Indicator – Outcome	Target (multiple)	Actual (multiple)	
Ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects			
			Comments
2016/2017	3	2.55	
2017/2018	3	1.52	(a)
KPI 2 - Efficiency Indicator – Service	Target (%)	Actual (%)	
Total administration cost for the year as a percentage of the total cash value of research projects and the education program under management during the year.			
2016/2017	5	4.4	
2017/2018	4.5	3.3	(b)

(a) The below target actual result is primarily the consequence of the Board making an investment of \$5,500,000 in the Future Batteries Industries (FBI) CRC: the return on investment through financial leverage by co-investors will be included when the CRC Bid is approved and the Participants Agreement is executed, which is likely to be in mid- 2019.

Without including the investment in the FBI CRC, the Effectiveness Indicator is approximately 2.44. The Board has paid particular attention to encouraging co-investments in research projects by other parties: the Effectiveness Indicator is on a par with the result for the previous year.

(b) The better than target result has improved further on the 2017-year result as a consequence of the average value of the portfolio increasing by approximately \$12m, despite a small increase in administrative costs over 12 months.

Ministerial Directives

There have been no Ministerial directives to MRIWA during the reporting period.

Governance Disclosures

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 Board, the Advisory Committee and Theme Advisory Committees.

All members are aware of the matter of conflict of interest: the Board and the Committees apply standard practices for managing potential and actual matters of material personal interest.

Part 4 – Administration, Subdivision 3 of the *Minerals Research Institute Act 2013* sets out the provisions for disclosure of material personal interest.

Board and Committee Remuneration

Members of the Board of the Minerals Research Institute of Western Australia for 2017/18

Name	Position	Type of remuneration or fee	Section of MRIWA Act	Appointment Approved	Notes	Period of Member-ship	Gross remuneration (\$)
Ms Denise GOLDSWORTHY	Chair	Annual / \$22,691	Section 27 (1) (a)	19 October 2015	Chair from Dec 2017	3 years	17,048
Dr Peter LILLY	Chair	Annual / \$22,691	Section 27 (1) (b)	19 October 2015	Retired from Board Dec 2017	3 years	11,345*
Ms Helen COOK	Deputy Chair	Annual / \$13,614	Section 27 (1) (a)	28 January 2014	-	3 years	13,062
Prof Mark BUSH	Member	Annual / \$11,405	Section 27 (1) (d)	19 October 2015	-	3 years	11,405*
Ms Jane HAMMOND	Member	Annual / \$0	Section 27 (1) (c)	11 September 2017	-	3 years	0
Mr Larry LOPEZ	Member	Annual / \$11,405	Section 27 (1) (d)	19 October 2015	-	3 years	11,405*
Mr David ROSE	Member	Annual / \$11,405	Section 27 (1) (a)	1 June 2018	-	3 years	0
Ms Miriam STANBOROUGH	Member	Annual / \$11,405	Section 27 (1) (b)	11 September 2017	-	3 years	8,554*

Advisory Committee to the Minerals Research Institute of Western Australia at 30 June 2018

Name	Position	Type of remuneration or fee	Section of MRIWA Act	Appointment Approved	Period of Membership	Gross remuneration (\$)
Mr Ian SUCKLING	Chair	Attendance	Section 60 (1)	1 August 2018	31 December 2020	1,186*
Ms Alison MORLEY	Deputy Chair	Attendance	Section 60 (1)	1 February 2018	31 January 2020	1,361
Dr Christopher BAKER	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	1,679*
Mr Gerard DANCKERT	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	2,080*
Prof John DELL	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	882*
Mr Rob FREETH	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	1,977*
Dr Rob HOUGH	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	960*
Dr Jon HRONSKY	Member	Attendance	Section 60 (1)	1 February 2018	31 January 2020	1,618*
Dr Bryan SMITH	Member	Attendance	Section 60 (1)	30 September 2015	Retired 31 January 2018	928

Note (1) Gross remuneration includes payments for attendance at Advisory Committee and, where applicable, Scholarship Panel.

*Indicates contribution to advisory education fund.

Theme Committees

Name	Position (see Note 2)	Type of remuneration or fee	Section of MRIWA Act	Appointment Approved	Period of Membership	Gross remuneration (\$)
Dr Christopher BAKER	Chair Theme 3	Attendance	Section 60 (1)	1 February 2018	31 January 2020	See Advisory Committee
Ms Tamryn BARKER	Member Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	228*
Mr Peter BEWICK	Member Theme 1	Attendance	Section 60 (1)	1 February 2018	31 January 2020	684
Dr James CLEVERLEY	Member Theme 1	Attendance	Section 60 (1)	1 February 2018	31 January 2020	456
Dr Grant CAFFREY	Member Theme 3	Attendance	Section 60 (1)	1 February 2018	31 January 2020	570*
Mr Gerard DANCKERT	Chair Theme 2	Attendance	Section 60 (1)	1 February 2018	31 January 2020	See Advisory Committee

Prof John DELL	Chair Theme 4 & 5	Attendance	Section 60 (1)	2 October 2015	Retired 31 January 2018	See Advisory Committee
Mr Charles ELLIOT	Member Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	228*
Mr Rob FREETH	Chair Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	See Advisory Committee
Mr John HEARNE	Member Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	456*
Prof Melinda HODKIEWICZ	Member Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	114*
Dr Jon HRONSKY	Chair Theme 1	Attendance	Section 60 (1)	1 February 2018	31 January 2020	See Advisory Committee
Dr James KYLE	Member Theme 3	Attendance	Section 60 (1)	1 February 2018	31 January 2020	228
Ms Alison MORLEY	Chair Theme 5	Attendance	Section 60 (1)	1 February 2018	31 January 2020	See Advisory Committee
Mr Peter OLIVER	Member Theme 5	Attendance	Section 60 (1)	1 February 2018	31 January 2020	228*
Dr Ivor ROBERTS	Member Theme 1	Attendance	Section 60 (1)	1 February 2018	31 January 2020	228*
Mr David ROSE	Member Theme 2	Attendance	Section 60 (1)	1 February 2018	Resigned 31 May 2018	726
Dr Gamini SENANAYAKE	Member Theme 3	Attendance	Section 60 (1)	1 February 2018	31 January 2020	570
Ms Sabina SHUGG	Member Theme 4	Attendance	Section 60 (1)	1 February 2018	31 January 2020	114*
Dr Bryan SMITH	Chair Theme 1	Attendance	Section 60 (1)	30 September 2015	Retired 31 January 2018	See Advisory Committee
Mr William STAUNTON	Member Theme 3	Attendance	Section 60 (1)	1 February 2018	31 January 2020	342
Mr Richard STROUD	Member Theme 2	Attendance	Section 60 (1)	1 February 2018	31 January 2020	0
Mr John de VRIES	Member Theme 2	Attendance	Section 60 (1)	1 February 2018	31 January 2018	876*
Prof Kathleen WRIGHT	Member Theme 5	Attendance	Section 60 (1)	1 February 2018	31 January 2020	404*

Note (1) Gross remuneration includes payments for attendance at Theme Advisory Committee and, where applicable, Scholarship Panel.

Note (2). There are separate Theme Advisory Committees for Themes 1, 2 and 3 and a single Theme Advisory Committee for Themes 4 and 5. This structure is designed to match the expected work load and will be amended if necessary.

*Indicates contribution to education fund.

Other Legal Requirements

Expenditure on Advertising, Market Research, Polling and Direct Mail

In accordance with s175ZE of the *Electoral Act 1907*, the MRIWA incurred the following expenditure in advertising, market research, polling, direct mail and media advertising:

Total expenditure for the reporting period was \$0.

Expenditure was incurred in the following areas	Total	Expenditure	Amount
Advertising agencies	Nil		
Market research organisations	Nil		
Polling organisations	Nil		
Direct mail organisations	Nil		
Media advertising organisations	Nil		

Disability Access and Inclusion Plan Outcomes

The Institute is housed within the Department of Mines, Industry Regulation and Safety-owned building, Mineral House, 100 Plain Street, East Perth, which has a comprehensive and effective plan to ensure compliance with the *Disability Services Act, 1993*.

Compliance with Public Sector Standards and Ethical Codes

During the reporting period there were no known breaches of public sector standards, the *Code of Ethics* or the Institute's Code of Conduct and Ethics.

Recordkeeping Plans

The Institute's Recordkeeping Plan and the Retention and Disposal Plan are approved by the State Records Commissioner and are current.

Substantive Equality

Due to the small size of the Institute, matters concerning women, family and domestic violence, equal employment opportunities, language, cultural diversity and youth were addressed on an individual basis, as required.

Occupational Safety, Health and Injury Management

There were no fatalities or lost time injuries during the reporting period.

MRIWA has relevant OS&H policies and procedures. The Institute is housed within the Department of Mines, Industry Regulation and Safety-owned building, Mineral House, 100 Plain Street, East Perth. Where appropriate, MRIWA adhered to the OSH and Injury Management policies and practices of the Department of Mines, Industry Regulation and Safety.

Legislation Impacting on the Institute's Activities

Freedom of Information

There were no applications under the *Freedom of Information Act* during the year. A copy of the Information Statement is available by contacting the Chief Executive Officer on (08) 6180 4343 or by writing to the Minerals Research Institute of Western Australia, 100 Plain Street, East Perth 6004.

Disability Services Plan

The Institute is housed within the Department of Mines, Industry Regulation and Safety-owned building, Mineral House, 100 Plain Street, East Perth, which has a comprehensive and effective plan to ensure compliance with the *Disability Services Act, 1993*.

Customer Group Outcomes

Due to the small size of the Institute, matters concerning women, family and domestic violence, equal employment opportunities, language, cultural diversity and youth were addressed on an individual basis, as required.

Corruption Prevention

The Board of MRIWA was satisfied that the processes and procedures followed by the Institute, its staff and committees were robust and effective in the requirement to eliminate the possibility of corruption.

Annual Estimates 2017/18

Section 66 of the Minerals Research Institute of Western Australia Act 2013 applies the *Financial Management Act 2006* (FMA) in full and without exceptions. MRIWA has not been otherwise directed by the Treasurer.

The annual estimates for 2018/19, as approved by the Minister for Mines and Petroleum, are as follows:

STATEMENT OF COMPREHENSIVE INCOME

	ESTIMATE 2019 \$
COST OF SERVICES	
Expenses	
Research grants	9,066,667
Scholarships	350,000
Loss on disposal of assets	-
Employee benefits expense	532,600
Institute Contractor fees	234,000
Board and committee fees and costs	145,600
Supplies and services	448,700
Other expenses	19,000
Accommodation expenses	47,250
Depreciation expense	4,000
Total expenses	<u>10,847,817</u>
Income	
<i>Revenue</i>	
Interest revenue	220,000
Other revenue	68,311
Revenue from Industry Sponsorship	4,120,000
Total revenue	<u>4,408,311</u>
Total income other than income from State Government	<u>4,408,311</u>
NET COST OF SERVICES	<u>6,439,506</u>
Income from State Government	
State Government Grant	4,089,000
Resources received free of charge	47,250
Total income from State Government	<u>4,136,250</u>
Surplus for the period	<u>(2,303,256)</u>
TOTAL COMPREHENSIVE INCOME FOR THE PERIOD	<u>(2,303,256)</u>

STATEMENT OF FINANCIAL POSITION

	ESTIMATE
	2019
	\$
ASSETS	
Current Assets	
Cash and cash equivalents	2,320,055
Restricted cash and cash equivalents	9,280,220
Receivables and other assets	1,100,000
Other Current Assets	55,000
Total Current Assets	<u>12,755,275</u>
Non-Current Assets	
Property, plant and equipment	11,575
Total Non-Current assets	<u>11,575</u>
TOTAL ASSETS	<u>12,766,850</u>
LIABILITIES	
Current Liabilities	
Payables	650,000
Provisions	115,000
Deferred revenue	2,500,000
Total Current Liabilities	<u>3,265,000</u>
Non-Current Liabilities	
Provisions NCL	-
Total Non-Current Liabilities	<u>-</u>
Total Liabilities	<u>3,265,000</u>
Net Assets	<u>9,501,850</u>
EQUITY	
Accumulated surplus	9,501,850
Total Equity	<u>9,501,850</u>

STATEMENT OF CASH FLOWS

ESTIMATE
2019
\$

Cash flows from State Government

Cash receipts from Government	4,089,000
	4,089,000

Cash flows from operating activities

Payments

Research Grant Payments	(8,116,667)
Employee benefits	(522,358)
Institute Contractor Fees	(229,500)
Board and Advisory Committee Fees	(45,000)
Supplies and Services	(467,700)
GST Paid on Purchases	(881,387)

Other payments

Receipts from Sponsors	3,870,000
Interest received	222,500
GST received on sales	387,000
Net GST refunded from ATO (or paid)	494,387

Cash generated from operations **(5,288,725)**

Cash flows from investing activities

Purchase of non-current assets	-
Net cash from investing activities	-

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	(1,199,725)
Cash and cash equivalents 1 July 2018	12,800,000
Cash and Cash Equivalents at End of Year	11,600,275