



Minerals Research Institute of Western Australia

Annual Report 2015 / 2016

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Letter of Transmittal

Hon. Sean L'Estrange
Minister for Mines and Petroleum; Small Business
7th Floor
Dumas House
2 Havelock Street
WEST PERTH WA 6005

Dear Minister,

I am pleased to submit the Annual Report of the Minerals Research Institute of Western Australia (MRIWA) for the period 1 July 2015 to 30 June 2016, for your information and presentation to Parliament.

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, I acknowledge the valuable support given to the Institute during the reporting period by your office, by the Department of Mines and Petroleum and by the members of the MRIWA advisory committees.



Dr Peter Lilly
CHAIRMAN
BOARD OF DIRECTORS

Date: 1 September, 2016

Overview

Executive Summary

The Minerals Research Institute of Western Australia has now completed the second full year of operation since commencing on 1 February 2014, after the *Minerals Research Institute of Western Australia Bill 2013* received royal assent on 18 December 2013.

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.

Despite the down-turn in minerals commodity prices continuing, with a consequent reduction in the capacity of the minerals industry to invest in research, it is pleasing to report that MRIWA has achieved significant successes in 2015/16. In summary, MRIWA is now 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.

The Government announced in its 2016/17 Budget the commitment of a further \$6 million to continue the Institute's work over the next three years. The new MRIWA funding comprises \$3 million in 2016/17, \$2 million in 2017/18 and \$1 million in 2018/19.

More specifically:

- The Institute committed new investments in minerals research totalling \$2.8 million. This comprised \$2.5 million in eleven new collaborative research projects and \$0.3 million in scholarships for PhD studies. Notable in the new investments is \$1.1 million of MRIWA funds for a project with a total cash value of \$2 million for a research project on rock burst in underground mines with the Australian Centre for Geomechanics at the University of Western Australia.
- The total value of the Institute's portfolio of research projects (including scholarships for PhD students) at 30 June 2016 was \$20.0 million.
- Deloitte Access Economics completed the 'Minerals Research Institute of Western Australia, Economic Impact Assessment, August 2015' to measure the economic impact to Western Australia of MRIWA's investments in minerals research. The Assessment concluded that the estimated economic impacts represent a significant net return to Western Australia.
- 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 while also delivering to industry requirements.
- MRIWA has made significant progress in engaging with, and becoming a recognised voice in, the Australian minerals innovation system; being the agency that aligns the State's interests in minerals research with the State's science strategy and State goals; and, responding to the minerals industry cycle of investment in research - MRIWA is, judiciously, continuing to invest throughout the minerals industry cycle.
- The Institute completed further work to improve the administration systems, particularly financial and project management. The Institute reports an administration cost of 5.4% of the total value of the portfolio of research projects under management during the year.

Operational Structure

Functions

The Minerals Research Institute of Western Australia is accountable to the Minister for Mines and Petroleum.

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 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

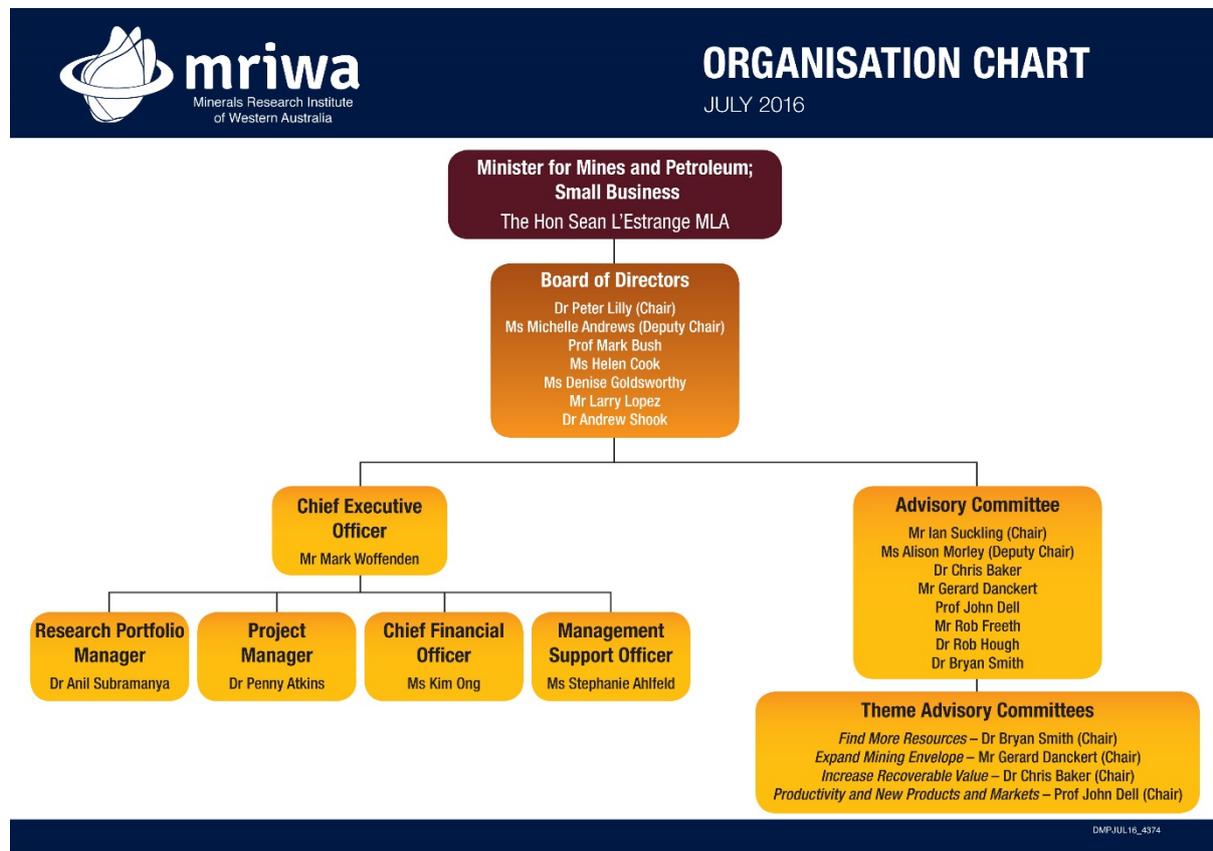


Figure 1. MRIWA Organisation Chart

Board

The Act provides for a seven-member Board for MRIWA. Details of the current members of the Board are provided below.

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|  | <p>Dr Peter Lilly became a professional director at the end of 2015 after 40 years' experience. Approximately half of this was in universities and industrial research organisations where he held management positions that included Head of Department, Head of School, Chief of Division, Director and Executive Director. The remaining half was in industry where he worked on mining and civil engineering projects in 15 countries and held a range of technical, management and executive roles up to and including Executive Director.</p> <p>Peter is currently Chairman of the Minerals Research Institute of Western Australia, a Non-Executive Director of METS Ignited Australia Ltd, a Director and Trustee of the Australasian Institute of Mining & Metallurgy Education Endowment Fund, a Director of the Industry Mentoring Network in STEM, a member of CSIRO's Mineral Resources Advisory Council, a Member of the Accreditation Council of the Australian Research Management Society, and Chairman of the Inductees Selection Committee for the Australian Prospectors & Miners Hall of Fame.</p> <p>He is a past President of the Australasian Institute of Mining and Metallurgy, and was elected to the Australian Academy of Technology and Engineering in 2007.</p> |
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|  | <p>Ms Michelle Andrews was appointed Deputy Director General Strategic Policy at the Department of Mines and Petroleum in July 2011.</p> <p>Michelle has over 20 years' experience in the State Government and has developed an extensive network of contacts with a track record of negotiating outcomes with industry and peak bodies, contributing to major project approvals, reforming approval processes, establishing the Office of the Environmental Protection Authority and providing policy advice to several Environment Ministers.</p> <p>In her role, Michelle is focused on ensuring Western Australia's resources sector continues to be an attractive destination for international investment. Michelle is also improving the way the department works with other government agencies, industry and community groups, and is leading fundamental changes in the department's policy development and stakeholder engagement activities.</p> |
|  | <p>Mr Mark Bush has 36 years of experience in research, research leadership, grant assessment and grant administration, while holding various academic and leadership positions with UWA.</p> <p>Professor Bush 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 Helen Cook has close to 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; Director, Cruthers Foundation. Helen is also a WA Councillor of the Australian Institute of Company Directors.</p> |
|  | <p>Ms Denise Goldsworthy Following 17 years at BHP Steel and 14 years in Mining (iron ore and minerals), including roles as Managing Director Dampier Salt, Managing Director Hlsmelt 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. 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, Arrium; 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 Trustee for the Navy Clearance Diver's Trust Council.</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>Dr Andrew Shook has held a wide variety of different positions in the mining and processing industries over the past 25 years, with experience in copper smelting, iron and steel, rare earths and titanium.</p> <p>Dr Shook also brings experience with technical and research development, plant production analysis and operational improvements. Formerly Chief Technology and Information Management Officer with BHP Billiton Uranium, he is currently General Manager, Future Business Technology at Rio Tinto Iron Ore.</p> |

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 four 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.

Performance Management Framework

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.

Key Performance Indicators

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 economic 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 Key Performance Indicators for the Institute are:

- Key Effectiveness Indicator: The ratio of total cash invested in research projects to total approved MRIWA cash investments in those projects.
- Key Efficiency Indicator: 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.

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.

In April 2015, the WA Office of Science released *A Science Statement for Western Australia* that identified five areas in which the advancement and application of science can help WA broaden the economy and create a new generation of jobs. These areas are: mining and energy, medicine and health, agriculture and food, biodiversity and marine science and radio astronomy.

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.

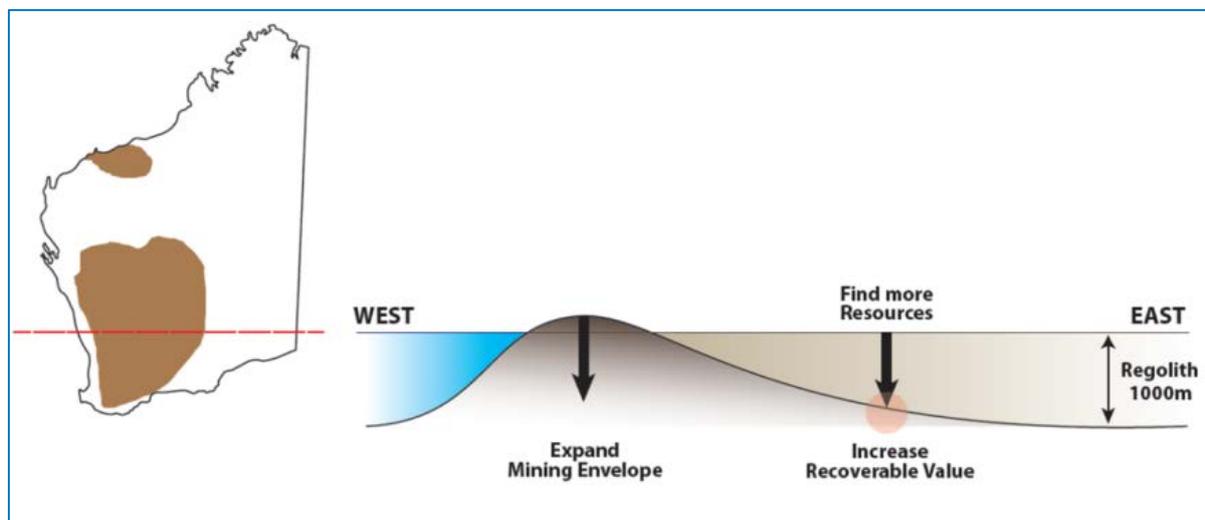


Figure 3. Schematic of the relationship between MRIWA's Research Themes and the WA geology

Agency Performance

Chair's Report

At the end of its second full financial year, our Institute exists in a far more challenging environment than it did in 2012 when I joined the Board of what was then the Minerals and Energy Research Institute of Western Australia (MERIWA).

Our key partners in Research and Development, the companies in the minerals sector, currently have a strong focus on cash conservation and R&D is often one of the first casualties of such times of depressed commodity prices given that the benefits that genuine R&D usually brings tend to be realised beyond current planning and survival horizons.

Those companies with producing operations have largely had a strong focus on productivity improvement, the first phases of which usually require little attention to scientific and engineering research and much more attention to decreasing operating costs and capital intensity while sustaining or increasing production levels.

Notwithstanding the challenging industry environment over the past year, the Board of MRIWA has continued to invest in high-quality, strategically-relevant R&D projects that will sustain the minerals sector well beyond the current cycle. During 2015-2016, the total of new MRIWA investments approved by the Board was \$2.5 million. This was matched by sponsors' investments of \$2.9 million. Additionally, MRIWA committed a further \$0.3 million to PhD research projects. The total cash commitment to minerals research through MRIWA projects was \$5.7 million.

The MRIWA Board also continues to support the development of early stage researchers through its PhD scholarships and Awards program, where we currently have \$0.85 million invested in 9 PhD projects. Reviewing, approving and witnessing the granting of these awards to outstanding students is one of the great pleasures of being involved with MRIWA, and we look forward to seeing the benefit the program brings to the community when these students complete their work, when companies apply the outcomes, and when the individuals themselves embark on their careers in industry, government or academia.

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. Examples of such initiatives include CRC ORE, UNCOVER and a possible new CRC in in-situ recovery of metals from hard rock.

We actively engage with the mining technology, equipment and services sector as part of our strategy, albeit at a time when those same METS companies are, in general, also reacting to significant reductions in their cash flows. However, it is often these companies that will take R&D outcomes and turn them into innovations that the exploration and mining companies will use to improve sustainability and shareholder value. This is a key part of MRIWA strategy which will remain a focus for the foreseeable future, including engagement with METS Ignited Australia Ltd, the industry growth centre in this space.

As part of our stakeholder engagement strategy, we have instituted regular "Tech Talks" on topics of interest to the minerals community, some of which bring new ideas from other sectors of science and engineering into the minerals domain. These talks are well attended and the Institute thanks the contributors and attendees for their time and interest.

As foreshadowed in last year's report, the 2015-16 financial year was the final one in the total new funding of \$7.5 million for MRIWA over 3 years announced in 2012. In the lead-up to the State budget, in which MRIWA sought a further term of funding, MRIWA commissioned Deloitte Access Economics to estimate the value added to the State by MERIWA and MRIWA's work. This was shown to be

relatively significant based on a handful of projects independently assessed, with far greater returns to the State than the investments made.

The Board and management of MRIWA were fully cognisant of the challenges facing the State budget in recent months and are appreciative of the \$6 million over three years that has been earmarked for MRIWA to date.

During the past financial year, three members of the Board retired: Mr Phil Lockyer, Mr Stedman Ellis and Mr James McClements. All provided their prodigious skills and experience to our deliberations and decision-making processes over a sustained period, and I thank them for their selfless service. As a consequence of this change, we welcomed three new members: Ms Denise Goldsworthy, Mr Larry Lopez and Emeritus Professor Mark Bush. All three bring to the Board a range of strategic and technical skills that will serve MRIWA well into the future. I am most grateful to all my past and current Board colleagues as they exercise their responsibilities with enthusiasm and commitment. Such a talented group of professionals makes the role of Chair a relatively uncomplicated one.

I express my sincere thanks to the CEO and his small but dedicated team for successfully managing MRIWA through these challenging times. The staff continue to transform for the better the way the Institute engages with its three key stakeholder groups: State Government, Industry and the Research Community.

The members of the Advisory Committee and associated Theme Committees continue to provide indispensable advice to the Board on matters of research project investment and priority. These wonderful people contribute generously of their time and intellect to the decision-making processes and I express my deep appreciation for their vital contribution.

The management and staff of the Department of Mines and Petroleum have always been and continue to be a great source of support and, in particular I take this opportunity to thank Mr Richard Sellers, Director General of the Department, for his enthusiasm and wise counsel.

Finally, I wish to thank our Minister for most of 2015-2016, The Honourable Bill Marmion MLA, for his wholehearted interest in the Institute. I look forward to working with our new Minister, The Honourable Sean L'Estrange MLA.



Dr Peter Lilly

Chair
Board of Directors

Date: 5 August, 2016

Operations Report

This is the second 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.

The external context in which the Institute operates has changed significantly since May 2012, when the then Minister for Mines and Petroleum announced that MRIWA would be established with \$7.5 million of new money allocated over three years from the 2012/13 State Budget. Of particular note are lower commodity prices and completion of the cycle of major capital investments in the minerals industry.

The Australian mining industry is now focused on increasing productivity, with innovation at the heart of much of the thinking. The industry faces the ‘headline’ challenge of servicing the capital cost of the construction boom whilst responding to generally lower commodity prices and higher input costs for each metal unit – primarily the consequence of a broad decline in ore grades.

Governments in Australia are increasingly recognising the potential of the small to medium enterprises (SMEs) and the mining equipment, technology and services (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 operating 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 federal government has acknowledged this role in its program of Industry Growth Centres (IGC), which has the objective to enable national action on key issues such as deregulation, skills, collaboration and commercialisation. The IGC for the METS sector, known as METS Ignited, is now established.

Advances in enabling technology platforms for the minerals industry are converging at an ever increasing rate to provide synergies that are already turbo-charging innovation. 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 are all being integrated to deliver technologies barely imaginable a decade ago.

And, there is mounting evidence of a cultural change in the Australian mining industry. One example is that the potential of scientific research, of collaborating with other industry companies in research, of new technologies and of the ‘open innovation’ process to contribute to achieving necessary productivity improvements is being increasingly recognised by corporations in the minerals industry: and acted on. Another example is the developing appreciation that, despite the inherent natural variation in an ore body, the emerging technologies previously mentioned provide the very real potential for mining to emulate the manufacturing industry; with the consequential opportunities for efficiencies, in a way that was previously beyond contemplation.

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 five years ago with the commitment to establishing and funding MRIWA. This commitment has been re-enforced with the allocation in the 2016/17 State Budget of \$6 million of new funds to the Institute for the period 2016/17 to 2018/19.

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 Institute’s strategy aligns with the developments in the broader industry: particularly to increase its engagement with the companies providing technologies and services to the industry operators 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 2015/16. In summary, the Institute has: further improved its external engagement; become a recognised voice in national minerals innovation; ensured it is aligned with State goals; responded through its research investments to the industry cycle; and, further strengthened its governance.

The Institute’s plan for 2015/16 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.
- Fully establishing the new, greatly expanded, tertiary scholarship program.
- Marketing the Institute in the Western Australian and national mining, equipment and technology services (METS) sector.
- Enhancing organisational capability to deliver to the requirements of the Act and the increased funds allocated to the new Institute.

These objectives have been achieved.

Research investments

It is especially pleasing to report in this context that the Board has approved \$2.5 million of MRIWA funds for minerals research projects (it is noted that this refers 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). The investments approved by the Board are summarised in Table 2, below.

| Project Number | Project Title | RPP Theme | MRIWA | Co-investors | Total project |
|----------------|--|-----------|-------------|--------------|---------------|
| M449 | Drop Probe System – RC LWD (Reverse Circulation Log-While-Drilling) | 4 | \$150,000 | \$150,000 | \$300,000 |
| M451 | Establishing Leaching Environmental Impact Assessment Tools in The Development of A WA Framework for By-Product Re-Use and Classification | 5 | \$144,130 | \$209,800 | \$353,930 |
| M462 | Multi-Scaled Near Surface Exploration Using Ultrafine Soils | 1 | \$149,500 | \$237,500 | \$387,000 |
| M464 | Rock Properties to Predict Rockburst Vulnerability in Three Dimensions | 2 | \$1,100,000 | \$880,000 | \$1,980,000 |
| M465 | Deep Crustal-Scale Structure, Geological Evolution and Multi-Commodity Prospectivity Analysis in The Halls Creek Orogen, Kimberley Region, Western Australia | 1 | \$33,445 | \$12,500 | \$45,945 |
| M467 | Mineralogical and Lithological Controls On REE Distribution in The Argyle Diamond Deposit | 1 | \$30,000 | \$30,000 | \$60,000 |
| M470 | Mineral Systems On the Margin of Cratons: Albany-Fraser Orogen / Eucla Basement Case Study | 1 | \$250,288 | \$515,000 | \$765,288 |

| Project Number | Project Title | RPP Theme | MRIWA | Co-investors | Total project |
|----------------|--|-----------|-----------|--------------|---------------|
| M476 | An Integrated Multi-Scale Study of Crustal Structure and Prospectivity of the Eastern Yilgarn Craton and Adjacent Albany-Fraser Orogen | 1 | \$312,948 | \$340,000 | \$652,948 |
| M477 | Molten Salt Mineral Processing Technology | 3 | \$246,000 | \$334,000 | \$580,000 |
| M484 | M459 Extension- Magmatic Sulphide Mineral Potential in The East Kimberley | 1 | \$45,140 | \$30,000 | \$75,140 |
| M485 | 'Ge.View.WA' – Developing New Tools and Resources for Benchmarking Grade | 2 | \$74,000 | \$146,000 | \$220,000 |

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

| Project Number | Project Title | RPP Theme | MRIWA (\$) | Co-investors (\$) | Total project (\$) |
|----------------|---------------------------------------|-----------|------------|-------------------|--------------------|
| M471 | Director's Scholarship - Ahmad Saleem | 6 | \$104,006 | \$0 | \$104,006 |
| M472 | MRIWA Scholarship - Harry Watts | 6 | \$69,006 | \$0 | \$69,006 |
| M474 | MRIWA Scholarship - Rashid Vaneghi | 6 | \$69,006 | \$0 | \$69,006 |
| M475 | MRIWA Scholarship - Eun Joo Choi | 6 | \$69,006 | \$0 | \$69,006 |

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 is notable for the spread across the Research Priority Plan themes, the growing interstate participation and the larger scale of projects - both financially and with regard to the collaborations of researchers and end-users.

MRIWA Strategy

The Board approved the MRIWA strategy in September 2014. The strategy is founded on a revised business model for the Institute (refer Figure 4), which illustrates the new focus on the contribution that MRIWA looks to make to moving the results of research projects into use in the operating mining industry.

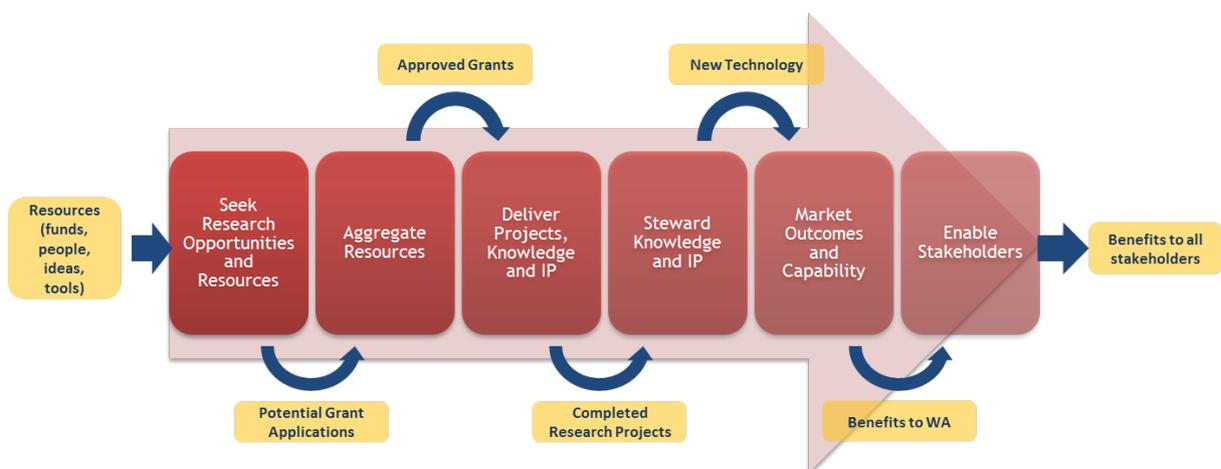


Figure 4. The MRIWA business model

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 from small private enterprises, international corporations, university institutions and government agencies (refer Figure 5).

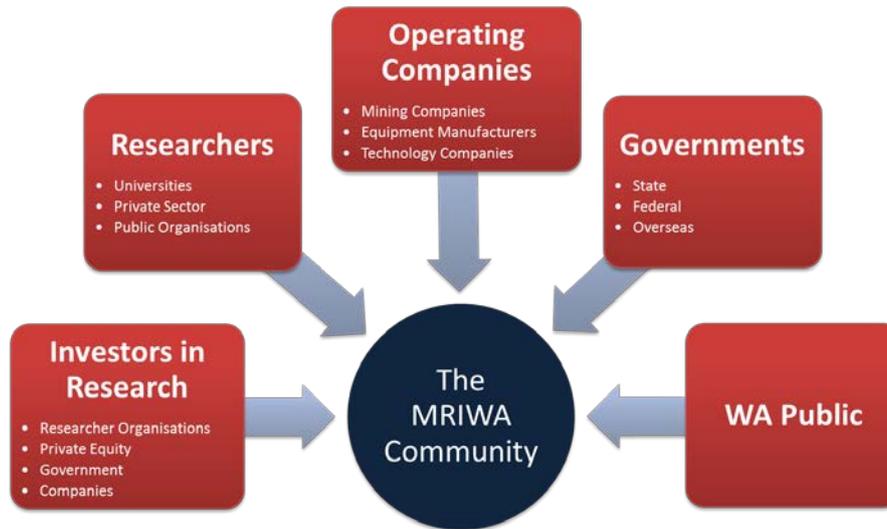


Figure 5. Schematic of the community served by MRIWA

By understanding this community and building strong relationships with the members, MRIWA aims to be an influential body, positively impacting the focus and direction of research to the benefit of our minerals industry.

- **Extend from ‘enabling research’ to ‘enabling research and commercialisation’**

To have a real impact on industry success, research must progress from its origins in fundamental research to the commercialisation and implementation of new equipment or processes. As technology or concepts progress along this pathway, the financial investment required increases significantly, which can slow down or ultimately prevent their implementation.

MRIWA can assist 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.

Finances

MRIWA was in a sound position financially at the end of the reporting period. Refer Table 3.

| Item | \$ 000’s |
|---|----------|
| Accumulated funds opening balance at 1 July 2015 | 9,810 |
| Plus income from State Government (Year ended 30 June 2016) | 1,870 |
| Less, net cost of services (Year ended 30 June 2016) | 3,350 |
| Accumulated funds as at 30 June 2016 | 8,330 |

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

The Institute’s summary statistics for 2015/16 are provided in Table 4.

| Factors | 1 July 2015 to 30 June 2016 |
|--|--------------------------------|
| Projects | |
| Applications received ⁽¹⁾ | 16 |
| Applications approved | 11 |
| Projects in progress ⁽²⁾ | 24 |
| Projects completed ⁽³⁾ | 5 |
| | |
| Technology Transfer | |
| Reports published | 6 |
| | |
| | (\$000's) |
| Funds Received (excluding Industry Sponsorship) | |
| Budget appropriation - Consolidated Revenue Fund | 1,473 |
| Budget appropriation - Exploration Incentive Scheme | 350 |
| Interest received | 238 |
| | |
| Total Funds Received | 2,061 |
| Less administration costs (excl. depreciation) | 984 |
| | |
| Funds available to support research | 1,077 |
| | |
| MRIWA Grants approved during period | |
| For research projects | 2535 |
| For scholarships | 311 |
| Total grants | 2,846 |
| | |
| Industry Sponsorship for approved new projects | 2,885 |

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 2 years 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 39.

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 22.

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, revised from those applying for 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 Effectiveness 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 75.

Grant Audit

MRIWA was included in an audit by the Office of the Auditor General (OAG) during the reporting period of Grant Administration. The OAG assessed, "...whether 8 State government agencies had controls and procedures in place to ensure compliance with requirements at the various stages of the grant process, including awarding and approval of grants, monitoring of grant milestones and acquittal of grants", using the lines of inquiry shown in Table 5. (Refer, *Western Australian Auditor General's Report, Grant Administration, Report 16, 2016.*)

| Agency | Adequate grant management policies and procedures | Transparent and equitable assessing and approving of grant applications | Adequate monitoring and acquitting of grants | Management assessment of overall effectiveness of programs |
|--------|---|---|--|--|
| MRIWA | Good | Good | Good | Good |

Ratings applied by the Office of the Auditor General: Poor, Fair, Good.

Table 5. Results for MRIWA of AOG audit of Grants Administration

Economic Impact Assessment

During the reporting period MRIWA commissioned the first-ever assessment of the economic impact of investments in minerals research projects by MRIWA and its predecessor the Minerals and Energy Research Institute of Western Australia, to the State of Western Australia.

Deloitte Access Economics completed the 'Minerals Research Institute of Western Australia, Economic Impact Assessment, August 2015'.

The Assessment concluded that the estimated economic impacts represent a significant net return to Western Australia.

Four scenarios were modelled based on varying two key assumptions: (1) Industry benefits extrapolation, and, (2) MRIWA inducement factor.

| | Inducement | | |
|---------------------------|------------|------------|------------|
| | \$ | None | 50% |
| Extrapolation of benefits | Yes | Scenario 1 | Scenario 2 |
| | No | Scenario 3 | Scenario 4 |

Figure 6. Scenarios modelled in the Economic Impact Assessment. Scenario 4 is the baseline.

The baseline Scenario 4 showed that, "The aggregated benefit (\$90.4 million in NPV terms) significantly outweighs not only the funding cost of the five selected [research] projects, but also the entire funding across all MRIWA /MERIWA projects since 1990 of \$25.7 million in NPV terms across all projects [excluding the small operational funding provided to MRIWA]."

The modelling outcomes suggest MRIWA has generated a significant return to the State

- Includes direct and indirect economic impacts
- The total economic impacts represents a significant net return to the WA economy
- Estimated employment generation and government revenues are commensurate with the size of additional GSP generated

| Economic indicator | Scenario 1 | Scenario 2 | Scenario 3 | Scenario 4 |
|---|------------|------------|------------|------------|
| GSP increase, NPV (2014-15 \$m, cumulative) | 59.5 | 120.8 | 48.0 | 90.4 |
| Employment (average FTEs) | 2.7 | 7.8 | 2.1 | 6.2 |
| WA Government revenue, NPV (2014-15 \$m, cumulative) | 4.9 | 10.5 | 3.9 | 7.8 |
| Cost of all projects funded by MRIWA / MERIWA since 1990, NPV | 25.7 | | | |

Figure 7. Economics Impact Modelling Outcomes (Courtesy Deloitte Access Economics)

Whilst world-class minerals deposits are the source of the majority of the State’s minerals royalties, these deposits have low orebody risk and the operating companies are in a position to ensure low technology risk. Hence, there is less likelihood that MRIWA funds for research will be sought. The greater need, with substantial opportunity for benefit for Western Australia, is for MRIWA’s co-investments in research to assist: bringing on stream higher-risk orebodies; making new technologies accessible to mid- and lower-tier companies; and to exploiting new commodities, such as the rare earth elements, uranium, lithium and/or potassium. The net benefit of these investments to the State is to expand existing mining activity and/or to allow economic development of otherwise under-exploited or stranded mineral deposits.

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. Work is well-progressed to enhance this facility by linking the search to the new Geological Survey Map released by the Geological Survey of Western Australia during the year. The support of the Department of Mines and Petroleum 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, the resources Industry Growth Centre and local entities supporting early-stage innovation.
- *Maintain current knowledge of minerals research being undertaken.* This has been enhanced through wider networks, both with institutions and also with greater variety of academic disciplines.
- *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 34) 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 two years of \$0.8 million in its tertiary scholarships program. (Refer to MRIWA Scholarship Program (page 31) for full details.)

- *Advise the Minister about minerals research.* The Institute has briefed the Minister as appropriate. MRIWA gratefully acknowledges the contributions of both Minister Marmion and Minister L'Estrange to the Institute's activities during the reporting period.

Administration

The Institute completed a comprehensive review of policies for occupational health and safety, information technology and for funding and administration of grants during the reporting period.

The Institute extends thanks to Dr Tony Bagshaw and Ms Lisa Hannigan, who both completed their work with MRIWA during the reporting period, for their enthusiasm and contributions to the Institute. The Institute was pleased to welcome Dr Anil Subramanya and Ms Stephanie Ahlfeld to the staff.

Research

Advisory Committee Chair's Report

The role of the Advisory Committee is to review applications for research funding presented to MRIWA. This follows the passage of these applications through the hands of the MRIWA CEO and his dedicated Project Managers, then one of the four Theme Committees. The members of the Theme Committees have been chosen for the value of their particular expertise and experience, which provides a substantial breadth and depth of industry and academic acumen for each committee. The Chair of each Theme Committee is a member of the Advisory Committee: this provides for effective communication between the committees. The Chair of the Advisory Committee attends meetings of the MRIWA Board in order to facilitate the Board's discussion of the research proposals brought to them from the Advisory Committee, and to provide continuity to the decision making.

Past applicants have made comment regarding the benefits to their projects of the processes that the MRIWA staff and committees put the applications through. These processes are aimed at ensuring that the applications are aligned with MRIWA's objectives and that they are given the best chance of successfully obtaining MRIWA funding. Other benefits frequently accrue to proposals as a consequence of the rigorous processes and expert review of the MRIWA staff, the committees and the external, independent assessors MRIWA enlists to provide additional outward perspective. These benefits include the refining of project scopes; better definition of objectives; greater clarity of drafting, with potentially more appeal to other prospective sponsors; improved discipline in project administration; and the establishment of connections made with other relevant parties.

The task undertaken by MRIWA of assessing the projects and assigning priorities for funding is complex. The MRIWA guidelines require that each proposal must satisfy the Board of its novelty and scientific merit. There is also an emphasis on balancing the research portfolio across the themes of the Institute's Research Priority Plan, with this being manifest in the wide variety of research fields tackled by MRIWA projects. Other important factors considered include a project's potential to provide benefit to the Western Australian economy and the nature and timing of that benefit; and the level of industry support provided. The latter is considered important both as an indication of industry endorsement of the practical value of the research and as a means of extending further the limited funds available for distribution by MRIWA.

I assumed the role of Chair of the Advisory Committee following the appointment of Professor Mark Bush to the MRIWA Board of Directors. I would like to thank Professor Bush for his energetic and astute contributions while Chair, and also to thank the other committee members whose generous commitments of their time and efforts have served MRIWA very well in the past year. This service has thereby been of great value to Western Australia's mining industry. I'd also like to thank Mark Woffenden and his staff for their tireless and professional management and administration of the applications for presentation to the committees, particularly as the number of these applications continues to climb. I see this increase as a positive sign of the health of minerals research, and an indication of the growing recognition of the value of the role MRIWA plays in minerals research in Western Australia and beyond, and I expect this trend to continue.



Mr Ian Suckling

Chair
MRIWA Advisory Committee
Date: 20 August, 2016

Research Project Investments

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

Details of each of these investments are provided below.

M449 - Drop Probe System – RC LWD (Reverse Circulation Log-While-Drilling)

RC drilling is very important and applicable to the iron ore industry and is widely used in WA, due to the benefits of high speed and reduced cost when compared with the alternative, diamond coring. Enabling holes to be logged as part of the drilling process would result in an even more productive and cost effective system, thereby providing a competitive advantage to the user.

The core to this technology will be to devise a means of controlling the free fall speed of the survey equipment within the RC pipe such that equipment is not damaged when it impacts the bottom stop within the string. It will also be necessary that this be able to be used in holes that are wet and dry as is commonly the case, particularly in the Pilbara. The rate of deceleration will also be critical at the end of the downward trip.

Trials have been conducted that have demonstrated that the survey probes under development by Globaltech and associates are capable of producing the required results, however due to peculiarities associated with the RC technique these cannot be used effectively without the development of a means of dropping an electronic probe down the completed drill hole (within the RC string inner pipe).

The key advantage of these would be the key efficiency gain of not having to stop drilling for downhole surveys to take place, saving rig downtime.

The applicant is a commercial supplier of technology for the minerals Exploration industry and the research is to be done in conjunction with BHPB Iron Ore and the selected BHPB drilling contractor.

Gordon Stewart will lead the research at Globaltech. Sponsorship for this study has been committed by two companies (\$150,000), with MRIWA contributing \$150,000 for a total project cash value of \$300,000 for this 9-month project.

The project contributes to MRIWA's strategic positioning by virtue of:

- The potential contribution to improving productivity in the minerals exploration industry.
- Having a major mining service provider company as partner.
- Being a good example of MRIWA working with the WA METS sector in research for new technology.

M451 – Establishing Leaching Environmental Impact Assessment Tools in the Development of a WA Framework for By-product Re-use and Classification

The rapid development and urbanisation of the Swan Coastal Plain in Western Australia, the existing shortage of basic raw materials for construction and fill and the poor quality of sandy soils are issues of significant environmental, economic and social importance to the State Government. The use of by-products to address these issues, have the potential benefits of reducing environmental degradation and assisting the sustainability of many land uses.

There are currently no specific regulatory frameworks or standards in Australia to enable the routine utilisation of industrial by-products in commercial infrastructure and development projects. In

contrast, countries with high re-use rates of these materials such as USA, New Zealand and parts of Europe have well established regulatory frameworks.

As a first step toward developing such a framework for Western Australia, it is proposed that rigorous assessment and validation be performed on existing tools that have been used overseas for the assessment of by-products following the EU and US EPA adopted methodologies known as LEAF (Leaching Environmental Assessment Framework). As industry and regulators' confidence in the applicability of the methodology grows, a regulatory framework similar to that in the EU could be developed.

This project addresses the urgent needs of industry and the WA Government regulatory agencies to enable the beneficial re-use of by-products (waste derived materials). The use of by-products would address issues arising from: i) rapid development and urbanisation of the Swan Coastal Plain in Western Australia; ii) the potential shortage of quality basic raw materials for construction and fill; and iii) the poor quality of sandy soils that have limited capacity to retain fertilisers and to attenuate the leaching of contaminants. In addition, the Swan Coastal Plain region is underlain by extensive groundwater resources that are extremely vulnerable to contamination from poor soil management practices. All this has significant environmental, economic and social importance to the community of Western Australia.

Sponsorship for this study has been committed by three companies (\$245,550), with MRIWA contributing \$144,130 for a total project cash value of \$389,80 for this 2-year project.

The project contributes to MRIWA's strategic positioning by virtue of:

- Enhancing MRIWA's investment in Theme 5 which is presently a minor component of its portfolio.
- Having two Alumina producers as partners.
- Opening a potential market in WA for mining waste products.
- Partnering with WA regulatory agencies to help establish regulatory frameworks and standards to enable routine utilisation of industrial by-products in commercial development.

M462 - Multi-Scaled Near Surface Exploration Using Ultrafine Soils

The project aims to greatly refine analytical methods and enhance surface exploration success with sampling and analysing micro- and nano-particulate metals and fine particle size fractions in local site orientation surveys as well as broad regional sample sets in Australia. Samples from previous orientation surveys from CSIRO, industry and previous or current regional soil surveys (GSWA, GSSA, NTGS) will be subject to a variety of size separation analyses and assessed in relation to other physical (e.g. texture), mineralogical (e.g., Fe oxides, kaolinite), biological (e.g. organic carbon) and chemical (e.g. pH, EC) properties of the samples.

Dr Ryan Noble leads the research team at CSIRO undertaking this study. Sponsorship has been committed by five companies and GSWA (\$237,500 directly to CSIRO), with MRIWA contributing \$149,500 for a total project cash value of \$387,000 for this 2-year project.

The project contributes to MRIWA's strategic positioning by virtue of:

- Enhanced exploration capability to identify new minerals targets through cover.
- Presenting an opportunity to the commercial laboratories in WA to provide new methods and services to the exploration industry.
- Having a commercial laboratory as a partner

M464 - Rock Properties to Predict Rockburst Vulnerability in Three Dimensions

Rockbursts underground are increasing the cost of mining safely (i.e. ground support, seismic monitoring, restriction in production and sequencing, delays in re-entry) and sometimes leading to premature closure of mines (e.g. Bounty Mine 2001, Big Bell 2003, Tasmania Mine 2012 and BHP Billiton Perseverance Mine in 2014). In the context of Western Australia, the problem of rockburst is a major threat to the future exploitation of deep mining resources.

The pervasiveness of the rockburst issue in many mining operations suggests that it is still one of the major ground control issues waiting to be resolved and one which could affect all operations. Despite decades of research, factors affecting the occurrences of rockburst damage are still not yet well understood (Heal, 2010). Hence there is a demand for an alternative approach to understanding their occurrence and how to better manage the risks associated with this problem.

The benefit of the project to the mining industry will lead to fewer mines closing due to rockburst, and help identify approaches to reduce the consequences of rockbursts, in particular, by designing more appropriate support systems. This will contribute to making deep mines safer and more sustainable in the future.

The UWA-based research team, led by Professor Phil Dight, is partnering with nine industry sponsors in this endeavour. The total value of the project is \$1,980,000 with MRIWA contributing \$1,100,000 for the 3-year term.

The project contributes to MRIWA's strategic positioning by virtue of:

- The research being critical to safely conduct operations in increasingly deeper underground mines.
- The outcomes contributing to increased productivity through efficient life-of-mine planning.
- Contributing to safer and more sustainable mines through the design of more appropriate support systems.

M465 - Deep Crustal-Scale Structure, Geological Evolution and Multi-Commodity Prospectivity Analysis in the Halls Creek Orogen, Kimberley Region, Western Australia

Increasingly, a mineral systems approach to mineral exploration is seen as a holistic way to assess mineralisation on a regional to camp scale.

The focus of this project is to carry out a detailed analysis of the East Kimberley using the mineral systems approach. The analysis will include structural geophysical interpretation, traditional field mapping, geochronology and geodynamic modelling. The project will identify critical geological elements that contribute to mineralisation and preservation of ore deposits, expanding on the recently completed regional study by the CET Mineral Systems Analysis project team.

The benefit for mineral explorers is the development and test of a multi-scalar and multi-dimensional approach to mineral exploration. The design of a practical targeting model for Au and Ni mineralisation in the Halls Creek Orogen will examine regions at the regional to camp and deposit scales. The model will be tested using techniques and procedures appropriate to the scale under study. The research program will provide additional data (geology, geochronology, geophysics and geodynamics) to assist industry.

The UWA-based research team, led by Dr Sandra Occhipinti, is partnering with one industry sponsor in this endeavour. The total cash value of the project is \$45,945 with MRIWA contributing \$33,445 for the 3-year term.

The project contributes to MRIWA's strategic positioning by virtue of:

- The research addressing hydrothermal ore systems – particularly gold and base metals in the Kimberley region. Both are significant in the WA minerals endowment.
- The research being conducted by a highly acclaimed research centre. The Perth community of geoscientists in which the Centre resides is similarly recognised as of world standing.
- The outputs making a practical contribution to enhanced exploration success in WA.

M467 - Mineralogical and Lithological Controls on REE Distribution in the Argyle Diamond Deposit

There has been a resurgence of exploration interest in REEs, including assessment of novel REE sources underpinned by demand from the communications and electronics industries.

Mantle-derived alkaline and silica-undersaturated rocks such as kimberlites, lamproites and carbonatites naturally contain high REE-contents, compared to most other common rock types. Very little is known about the REE-minerals in such rocks in WA.

This project covers a PhD project to make a preliminary assessment of the Argyle diamond deposit to host REE. It will study the distribution of REE within the lamproite-hosted diamond deposit.

The research team, led by Professor Louisa O'Connor (Curtin University) is partnering with one industry sponsor. The total cash value of the project is \$60,000 with MRIWA contributing \$30,000 over 2 years.

The project contributes to MRIWA's strategic positioning by virtue of:

- The research having the potential to make an important contribution to identifying a new source of REE, particularly, in this instance, within an existing mine.
- Potential to establish a new resource industry in WA.
- Development of new protocols for assessing REE resources

M470 - Mineral Systems on the Margin of Cratons: Albany-Fraser Orogen / Eucla Basement Case Study

Modern exploration requires a new integrated approach, utilising a broad range of techniques, which can collectively enhance the geological knowledge of a region's mineral endowment. Craton margins host significant lithospheric discontinuities that focus fluids and heat and which, under favourable circumstances, may become mineralised corridors.

Additionally, high-grade terrains are frequently viewed as less prospective for some mineralisation (e.g. gold) than lower-grade regions. However, recent discoveries in the Albany-Fraser Orogen highlight that many common models for mineral endowment are lacking and their resolution through cover limited.

This program of research will focus on the partially covered terrain of the Albany-Fraser Orogen and the covered Eucla Basement of Western Australia. The project will utilise a lithosphere-scale mineral systems approach to establish the fundamentals (timing, scale, material) of mass transfer processes within the crust. The project will utilise a broad range of geochronology techniques to enhance GSWA's regional U-Pb zircon coverage and will apply crustal evolution studies via novel analytical equipment to rapidly delimit domains of enhanced mantle input.

Professor Chris Kirkland leads the research team at Curtin University. Sponsorship for this study includes partnership with GSWA and one industry sponsor, with MRIWA contributing \$250,288 for a total project cash value of \$765,288 for this 3-year project.

The project contributes to MRIWA's strategic positioning by virtue of:

- Enhancing brown-fields and green-fields exploration for high-grade gold deposits in craton margins.
- Contributing to new holistic exploration approaches which could be entering the market within the mid-term i.e. less than 5 years.

M476 - An Integrated Multi-Scale Study of Crustal Structure and Prospectivity of the Eastern Yilgarn Craton and Adjacent Albany-Fraser Orogen

The proposed project uses a highly prospective terrain in Western Australia as a natural laboratory to trial newly developed methods for processing, modelling and interpreting geophysical datasets to (i) characterise an orogenic gold mineral system in 3D and (ii) derive geological information for assessing regional-scale prospectivity near cratonic margins. The study area is the southern Yamarna Terrane in the eastern Yilgarn Craton and adjacent parts of the Albany-Fraser Orogen. In addition to the integrated geological characterisation of a highly prospective but underexplored terrain the results of the research will be generally applicable to exploration under cover in Western Australia.

The area is host to what are arguably the two most important gold discoveries in WA in the last 20 years: Tropicana and Gruyere gold deposits.

Professor Mike Dentith from the Centre for Exploration Targeting, UWA, leads the research team. Sponsorship for this study has been committed by one company and GSWA (\$340,000 combined), with MRIWA contributing \$312,948 for a total project cash value of \$652,948 for this 2.5-year project.

The project contributes to MRIWA's strategic positioning by virtue of:

- Providing the exploration industry with a self-consistent dataset for the study area.
- Recommended interpretation workflows applicable to the study area as well as any comparable geological terrain in WA.
- Definition of new prospectivity criteria.
- Developing the prospectivity of a significant new area for exploration.

M477 - Molten Salt Mineral Processing Technology

There has been some interest in recent times to explore the potential for developing projects to mine and produce potash for the fertiliser industry in WA from rock or brine projects.

Centrex Potash Pty Ltd is developing the Oxley Potash project in WA with a key focus on high temperature molten chloride salt roast of potassium feldspar, followed by cooling before separation and recycling of unreacted salt and production of KCl. If the separation processes could be undertaken while still molten, the energy, salt, and water savings for the process would provide a step change in performance.

This project covers the first two of a three-stage project, the final stage being a scale-up to pilot plant before commercialisation.

Dr Frank Bruno from University of South Australia will lead the research team. Sponsorship for this study has been committed by one company, the University of South Australia and the Department of State Development SA (\$334,000 total), with MRIWA contributing \$246,000, for a total project cash value of \$580,000 for this three-year project.

The project contributes to MRIWA's strategic positioning by virtue of:

- Providing opportunity for MRIWA to invest in cutting-edge molten salt research that may lead to WA's (and Australia's) first fully integrated potassium fertiliser mining operation.

- The technological development may be levered into the state's solar energy industry.
- The technology could be leveraged into other commodities (e.g. lithium, titanium, zircon, REEs).
- Providing WA entities access to novel IP in the area of application of molten salts to metal recovery.

M484 - M459 Extension- Magmatic Sulfide Mineral Potential in the East Kimberley

Igneous intrusions of broadly basaltic composition are the hosts for some of the world's most valuable ore deposits of Ni, Cu and PGE, and indeed some of the most valuable ore deposits of any type on the planet. Exploration for this style of deposit in Proterozoic mobile belts has recently received a major boost in Australia following the discovery of the Nova deposit in greenfields-terranes in Western Australia, and also with exciting new discoveries and deposit extensions in the Musgrave province also in WA. However, detailed camp-scale targeting and exploration for these deposits remains extremely challenging and new approaches are required.

This project extends on the findings of MRIWA project M459 investigating 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 this extension will be an investigation of the relationship between multiple small intrusions in the Savannah district, including the ore-hosting Savannah intrusion itself.

Dr Margaux Le Vaillant from CSIRO, along with Dr Stephen Barnes will lead the research team. Sponsorship for this project has been committed by two companies with MRIWA contributing \$45,140 for a total project cash value of \$75,140.

The project contributes to MRIWA's strategic positioning by virtue of:

- Providing opportunity for MRIWA to invest in high calibre science with the potential to enhance exploration in WA for Ni, Cu and platinum group elements.
- Studying mafic igneous intrusive rocks in the East Kimberley which may be extended to produce targeting models for other craton margins in orogenic settings such as the Musgraves and the Albany Fraser Region.
- Including two resources companies with interests in the region.

M485 - 'GE.VIEW.WA' – Developing New Tools and Resources for Benchmarking Grade

Grade Engineering is being developed and implemented by a consortium of over 30 mining companies, equipment suppliers (METS) and research organisations within CRC ORE. Emerging results from collaborative site activities mainly outside of Australia to-date demonstrate potential for generating significant value which can reverse the trend of declining productivity due to feed grade depletion.

The main aim of Grade Engineering is to improve productivity in the minerals sector by using coarse separation. The key driver for this is the concept of grade heterogeneity – variability of grade below conventional minimum mining unit but within coarse separation scale.

The project will make use of data from the GSWA's GeoVIEW.WA public-domain GIS-based portal – a unique data resource compared to other States and Territories within Australia and indeed the world.

This project will focus on filtering of high priority opportunities for the WA gold mining industry.

Dr Steve Walters from CRC ORE will lead the research team. Sponsorship for this project has been committed by CRC ORE, with MRIWA contributing \$74,000 via a draw-down from its membership fee to CRC ORE. The total project cash value is \$220,000.

The project contributes to MRIWA's strategic positioning by virtue of:

- Increasing the productivity of the gold industry by extending the life of existing Au mining operations in WA, re-invigorating operations on care and maintenance and unlocking stalled feasibility projects through lowering of effective cut-off grades using Grade Engineering.
- Participating in innovative research that uses the GeoVIEW.WA portal to return value and profile to a world-class Western Australian Department of Mines and Petroleum initiative.
- Engaging, via CRC ORE, with a consortium of over 30 mining companies, equipment suppliers (METS) and research organisations.

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 | Prof A Ord Prof B Hobbs | UWA | 3 | 1 | 210,000 | 630,000 |
| M431 | Ground Support Systems Optimisation | Prof Y 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 | Dr N Rothnie Dr S Black | ChemCentre | 2 | 4 | 85,360 | 216,360 |
| M434 | Selective Bio-Mining of Rare Earth Phosphate Ores and Minerals | Prof J Eksteen | Curtin | 1.5 | 3 | 111,770 | 191,770 |
| M436 | Distal Footprints of Giant Ore Systems: Capricorn WA Case Study | Dr R Hough | CSIRO | 3 | 1 | 2,580,000 | 7,580,000 |
| M437 | Bayer Precipitation & Alumina Quality | Dr I Livk | CSIRO | 2.5 | 3 | 150,000 | 600,000 |
| M441 | CRC ORE II | Dr S Walters | CRC ORE | 5 | 3 | 600,000 | 6,600,000 |
| M446 | 4D Evolution of WA Ore Systems (WA4D): Re-Os Sulphide Geochemistry | Prof N McNaughton | Curtin | 3 | 1 | 175,000 | 341,650 |
| M448 | 4D Evolution of WA Ore Systems (WA4D): Rutile - Pathfinder to Ores | Prof N McNaughton | Curtin | 3 | 1 | 263,113 | 489,763 |
| M449 | Drop Probe System – RC LWD (Reverse Circulation Log-While-Drilling) | Mr G Stewart | Globaltech Corporation Pty Ltd | 0.75 | 4 | 150,000 | 300,000 |
| M450 | Feasibility of Electrokinetic In-Situ Leaching | Prof A 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 | Dr S Black | ChemCentre | 2 | 5 | 144,130 | 414,130 |

| No. | Project Title | Applicants | Institute | Term (yrs) | RPP Theme | MRIWA (\$) | Total (\$) |
|------|--|-----------------|-----------|------------|-----------|------------|------------|
| M452 | Pathways to High Grade Gold: 3D Gradient Mapping of Mineral Systems | Dr J Walshe | CSIRO | 1 | 1 | 395,000 | 595,000 |
| M458 | A Novel Direct Leach Approach to Extract Platinum Group Metals (PGM) From The Panton Sill PGM Deposit in The Kimberley Region of WA | Prof J Eksteen | Curtin | 3.5 | 3 | 200,000 | 510,860 |
| M462 | Multi-Scaled Near Surface Exploration Using Ultrafine Soils | Dr R Noble | CSIRO | 2 | 1 | 149,500 | 387,000 |
| M465 | Deep Crustal-Scale Structure, Geological Evolution and Multi-Commodity Prospectivity Analysis in The Halls Creek Orogen, Kimberley Region, Western Australia | Dr S Occhipinti | CET | 3 | 1 | 33,445 | 45,945 |
| M467 | Mineralogical and Lithological Controls On REE Distribution in The Argyle Diamond Deposit | Dr L O'Connor | Curtin | 2 | 1 | 30,000 | 60,000 |
| M470 | Mineral Systems On the Margin of Cratons: Albany-Fraser Orogen / Eucla Basement Case Study | Dr C 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 | Dr M Dentith | CET | 2.5 | 1 | 312,948 | 652,948 |
| M484 | M459 Extension- Magmatic Sulphide Mineral Potential in The East Kimberley | Dr M Levallant | CSIRO | 0.75 | 1 | 45,140 | 75,140 |

Table 6. MRIWA research project portfolio at 30 June 2016

Research Reports Finalised

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

M417 Dynamic Testing of Surface Support Systems Report No. 312

Grantee: WA School of Mines, Curtin University
Applicant: Dr Ernesto Villaescusa
Grant Amount: \$1,259,960
Duration: 4 years
Commenced: July 2011
Sponsors: Seven industry sponsors

The aim of this project was to establish criteria for selection of ground support schemes based on rock mass characteristics and expected energies associated with seismic loadings. The report describes the third phase of a three phase programme (extending on M349 and M349A), including results of

modifying equipment/tests on combined surface support and reinforcement schemes as currently used, or could potentially be used.

**M419 Advancing Rockburst Risk Mitigation Techniques in Mines
Report No. 314**

Grantee: ACG, UWA
Applicant: Prof Yves Potvin
Grant Amount: \$1,573,415
Duration: 2 years
Commenced: January 2011
Sponsors: Sixteen industry sponsors

The objective of the project was to research seismic hazard assessment, the analysis of mining-induced seismic responses, investigation into cave tracking and support performance under dynamic loading. In addition, the mXrap software was further developed as a tool for technology transfer and this was successfully demonstrated.

**M426 Exploration Targeting for BIF-hosted Fe Deposits in the Pilbara Craton WA
Report No. 311**

Grantee: UWA
Applicant: Prof Paul Duuring
Grant Amount: \$474,000
Duration: 2 years
Commenced: February 2012
Sponsors: One industry sponsor

This study documents the geological framework, deformation histories, controls on iron ore formation, multi-stage hypogene and supergene fluid alteration events affecting BIF and the geochemical signatures of their respective high-grade iron ore bodies – a mineral systems model for the genesis of the BIF-hosted iron ore bodies is presented for the Pilbara Craton with implications for iron ore exploration.

**M430 Tailings Storage Facilities Characterisation - Quantifying Seepage Losses
Report No. 215**

Grantee: UWA
Applicant: Dr Andy Fourie
Grant Amount: \$351,000
Duration: 2 years
Commenced: January 2014
Sponsors: Nine industry sponsors through AMIRA

This project aims to quantify seepage from Tailings Storage Facilities which can be a potential source of contamination. It describes an experimental study using a geotechnical centrifuge at the UWA to produce high-quality experimental data of seepage through various TFS configurations and provide a benchmark against which commercially available seepage modelling packages can be evaluated; the study also provides results on heterogeneous material profiles.

**M433 Targeting Channel Iron Deposits Formation in the Pilbara using a forward landscape evolution & clastic sedimentation approach.
Report No. 310**

Grantee: CSIRO
Applicant: Dr Erick Ramanaidou
Grant Amount: \$144,000

Duration: 1 year
Commenced: February 2014
Sponsors: Two industry sponsors

The objective of the study was to apply the CSIRO developed LECODE numerical model for understanding and potential targeting of CID both outcropping and buried within current BC Iron's tenements. The model was used to assess and validate the model against known CID deposits and then apply that to other areas. The results of the study show that such accumulation in the Craton is limited and more prominent in the Hamersley Basin.

The final report was subject to a one-year publication moratorium by the industry sponsors.

***M435 Bayesian Inversion of AEM Data for a Multidimensional World
Report No. 313***

Grantee: CSIRO
Applicant: Dr David Annetts
Grant Amount: \$217,000
Duration: 0.75 year
Commenced: December 2014
Sponsors: Four industry sponsors

This pilot project is designed to establish the feasibility of a Bayesian approach to the interpretation and synthesis of multiple geo-data sets to aid exploration. This was carried out by the development of strategies to establish confidence in 2.5D lithological models derived from airborne electromagnetic (AEM) data. The results presented in this report can serve as a benchmark to establish if more efficient approaches provide sufficient exploration information.

MRIWA Scholarship Program

MRIWA has committed a total of \$835,000 to tertiary student scholarships since commencement of the Institute on 1 February 2014.

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

The design principles for the MRIWA PhD scholarships 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 \$835,000 for the Scholarship Program over 2014-2016 has been allocated to:

- 2 Directors' PhD scholarships.
- 7 MRIWA PhD scholarships.
- 24 Odwyn Jones Honours Awards
- 2 Best Thesis prizes, of \$3,000 each, for Odwyn Jones awardees.

The Institute gratefully acknowledges the generous donation by Directors of their Board sitting fees to substantially fund two of the PhD scholarships – known as the Directors' PhD Scholarships. The first Directors' PhD scholarship was awarded in 2015 and the second was awarded in 2016. The Board wished to direct these scholarships to research in the fields of minerals data analytics, *in-situ* leaching and/or the fundamentals of scale-up. The 2015 Directors' scholar is researching the feasibility of electrokinetic *in-situ* leaching and the 2016 Directors' scholar's topic is in data analytics applied to exploration data.

Twenty-five eligible applications for the PhD scholarships were received in 2015 for the 2016 scholarships, 2 from Edith Cowan University, 6 from Curtin University, 10 from Murdoch University and 4 from The University of Western Australia.

MRIWA is delighted to have awarded the 2016 PhD scholarships to the students shown in Table 7.

| Scholar | Scholarship | Topic |
|--|----------------|--|
| Ahmad Saleem (The University of Western Australia) | Directors' PhD | Quantifying the Role of Exploration Upside in Mineral Project Evaluations: The Missing Link in Project Value Determination? |
| Eun Joo Choi (The University of Western Australia) | MRIWA PhD | Alkaline Magmatism as a Probe into the Architecture of the Archean Lithospheric Mantle, Yilgarn Craton, Western Australia |
| Harry Watts (The University of Western Australia) | MRIWA PhD | Developing a More Benign Way to Extract Rare Earths from Monazite Ore Using a Sequence of Weak Organic Acids at a Moderate pH and Room Temperature and Ore Recirculation |
| Rashid Geranmayeh Vaneghi (Curtin University) | MRIWA PhD | Progressive Damage Mechanisms of Rocks Subjected to Cyclic Loading |

Table 7. Winners of the 2016 PhD Scholarships.



The Minister for Mines and Petroleum, the Honourable Sean L'Estrange MLA and 2016 Directors' PhD Scholar, Ahmad Saleem

The Honours' Award was named to recognise Professor Odwyn Jones who maintained a career-long advocacy for strong mining education programs and engagement of students with the mining industry. Professor Jones also chaired MERIWA's Advisory Committee from 1999 -2013.

In 2016, MRIWA awarded four Odwyn Jones Awards of \$5,000 each to students from Curtin and Murdoch and UWA: the three that were accepted are shown in Table 8.

| Scholar | Topic |
|---|---|
| Wei Han (Curtin University) | Haulage Simulation for Autonomous Haulage Trucks |
| Kaarina Recklies (Murdoch University) | The Effects of Clays, Dispersants and Collectors on the Flotation of Au-Cu Ores |
| Thomas Pilote (The University of Western Australia) | Geochemical and Petrological Controls on Rare Earth Element Mineralisation, and Phase Mobility in the Mukinbudin Granitic Pegmatites and their Associated Regolith Profiles |

Table 8. Winners of the 2016 Odwyn Jones Awards.



L-R: Richard Sellers, Director General, Department of Mines and Petroleum; Peter Lilly, Chairman, MRIWA; with Thomas Pilote and Kaarina Recklies, Odwyn Jones Award 2016; Minister for Mines and Petroleum, the Honourable Sean L'Estrange MLA and 2016 Directors' PhD Scholar, Ahmad Saleem; Eun Joo Choi and Harry Watts, MRIWA PhD Scholars 2016; Mark Woffenden, CEO, MRIWA

The author of the best thesis of the 2015 Odwyn Jones cohort was Christopher Gilbertson, who was awarded a prize of \$3,000.

In June 2016, Evelien Martens and Stefano Caruso, PhD scholarship winners in 2015, were honoured by being asked to give a short presentation of their research work to the 2016 AMEC Convention in Perth.

Consequent to the Government's decision in the 2017 Budget to commit a further \$6 million to MRIWA, the Board decided in May 2016 to allocate an additional \$450,000 to the research scholarship program. This provides for 5 PhD scholarships and 6 Odwyn Jones Awards in 2017.



L-R: Peter Lilly, Chairman, MRIWA; Minister for Mines and Petroleum, the Honourable Sean L'Estrange MLA; and Richard Sellers, Director General, Department of Mines and Petroleum

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 and it has avoided some of the cyclical peaks and troughs associated with the broader industry. It has done this by being customer-focussed and offering highly innovative solutions through ongoing investment in R&D, while collaborating widely with other suppliers on this R&D. (Source: “Australia’s New Driver for Growth”, Austmine, 2015).

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. The Institute is a lead contributor to the Co-Lab Working Group: Real-time Orebody Modelling, which was established at the initial Co-Lab.

Innovation

MRIWA has established active relationships with organisations in Perth contributing to the rapidly developing early-stage innovation community associated with the resources sector.

MRIWA has working relationships with Unearthed (“Accelerating innovation in the resources sector”), Spacecubed (“Co-working for Entrepreneurs, Innovators and Changemakers”) and CORE (“Brings together the key players in the resources innovation ecosystem together in one space – to connect, collaborate and solve problems”). (Sources: websites accessed 26/08/2016.)

METS Ignited

As part of the Australian Government's Growth Centres Initiative, METS Ignited is tasked with developing a competitiveness plan for the Australian METS sector. MRIWA contributed to METS Ignited’s Sector Competitiveness Plan for METS: both parties are committed to close collaboration in areas of common interest.

Tech Talks

To promote public awareness of, and interest in, matters relating to minerals research, MRIWA initiated a Tech Talk series in 2016 where experts in diverse fields were invited to speak about their specialisation.



In-situ recovery: The ultimate in smart mining – only extract the values

Five Tech Talks were presented during the reporting period:

- “The geological map of Western Australia - past, present and future”, Mr David Martin, GSWA.
- “Innovation in the Minerals Industry - What makes a successful research and innovation collaboration between science and industry?” Professor Cam McCuaig, Centre for Exploration Targeting.
- “Making Earth Science rock for teachers and students alike - The Earth Science WA (ESWA) Story”, Ms Jo Watkins, ESWA.
- “The Earth and the Sky - How astronomy can support innovation in the WA minerals and energy industry”, Professor Peter Quinn, International Centre for Radio Astronomy Research.
- “In-situ recovery: The ultimate in smart mining – only extract the values!”, Dr David Robinson, CSIRO.

MRIWA gratefully acknowledges the contributions of the speakers and the Department of Mines and Petroleum for providing the venue.

Earth Sciences Western Australia

In February 2016, the MRIWA Board approved sponsorship of \$10,000 per year for the next three years to 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.



ESWA initiative – Kalgoorlie and surrounds

Sponsorship of conferences

At the March 2016 Board meeting, the Directors approved sponsorship of \$1,000 for the Institute of Geoscience Research (Curtin University), 2016 Conference, “Rock Alteration in the Upper Crust: Element Mobility and Concentration”.

In June 2016 the Board approved sponsorship of \$5,000 for the 13th International Nickel-Copper-PGE Symposium, Perth, 2016.

Co-operative Research Centres

The scale and reach of CRCs affords MRIWA an effective means to put WA’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, MRIWA is working with CRC Spatial Information to promote research into the application of spatial information

in the minerals industry. In the latter part of the reporting period, MRIWA established active engagements with parties interested in preparing bids for several new CRCs for the minerals industry.

International Centre for Radio Astronomy Research

During this reporting period, MRIWA progressed a common interest in data analytics with the International Centre for Radio Astronomy research (ICRAR) to further the State's Science strategy. The focus of the work has been on opportunities for collaborative research into the application of data analytics to data bases used by the minerals industry.

Research Partners

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

Australian Centre for Geomechanics, University of Western Australia.

ChemCentre (WA).

CSIRO.

Curtin University.

Curtin University (WA School of Mines).

University of WA (Centre for Exploration Targeting).

Globaltech Pty Ltd.

Company Partners

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

| | |
|--|--|
| Alcoa World Alumina | Glencore Xstrata Copper (Kidd Mine) Canada |
| Argyle Diamonds | Globaltech Corporation Pty Ltd |
| Atlas Copco | Iluka Resources |
| BHP Billiton Iron Ore | Independence Group NL |
| Boart Longyear | Lynas Corporation |
| CODELCO - (Div Casa Matriz) | MMG Ltd |
| CSIRO | Northern Star Resources Ltd |
| Curtin University of Technology | Panoramic Resources |
| Dywidag Systems International Pty Ltd | Panton Sill Pty Ltd |
| Evolution Mining | Ponton Resources |
| Excelsior Gold Ltd | Ramelius Resources Limited |
| FERO Strata Pty Ltd | Saracen Gold Mines Pty Ltd |
| GeoBrugg AG Switzerland | Thermo Fisher Scientific |
| Geological Survey of Western Australia | Water Corporation WA |
| | Xstrata Zinc Mount Isa Mines Ltd |

Significant Issues Impacting the Agency

1. Securing an appropriate level of co-investment in the Institute's minerals research projects by other parties.

Attracting co-investments in minerals research, at the level achieved historically by the Institute, was noted in last year's Annual Report as being a significant challenge for the foreseeable future. This challenge remains.

There is no doubt that the prevailing difficult financial circumstances of the minerals industry are adversely affecting corporations investing in collaborative research. This challenge is magnified by the fact that MRIWA's role to support research with longer-term outcomes is potentially at odds with industry's interest in funding research with near-term benefits.

2. Securing continuation of State Government monies beyond the allocation in the 2016 Budget of \$3 million in 2016-17, \$2 million in 2017-18 and \$1 million in 2018-19.

The budget constraints faced by both the State and Federal governments inevitably limit their capacity to invest in research. MRIWA is not immune to these circumstances.

The Institute appreciates the State Government's decision in the 2016 Budget to continue funding for a further three years. The Institute notes that the reducing funding in the out-years poses challenges to manage the perception by stakeholders that MRIWA does not have the financial resources to be a significant investor in either long-term, large-scale national minerals research initiatives, or, in the later years, in a research program of the current scale.

3. Engaging successfully with the diverse community of operating, service and technology providers and research entities that comprise the WA minerals industry.

Despite the current challenges of securing industry co-investment, there is some evidence that industry companies are starting to look to research to improve the productivity of their investments in capital infrastructure.

There are encouraging signs of a resurgence of interest in collaborative research from the private sector to co-invest in research in the early stages of the development of new products and services.

MRIWA will seek to work and invest with its stakeholders to amplify these opportunities for WA.

Audit and Risk Committee

The Audit and Risk Committee had a busy year and continued to build on the strong foundations established for the governance and management of risk and financials for MRIWA.

In addition to the important 'business-as-usual' role of oversight of the financial statements, audit process and governance of risk management of the organisation, the Committee also undertook the following projects aimed at continuing improvement and driving best practice in our risk management processes.

- Finalisation of the statement of appetite for risk of the Board which was commenced in the previous year.
- Detailed review of the Conditions of Grant contract and recommendations to the Board for amendments to best support the objectives of the organisation and best practice.
- Oversight of disaster recovery testing and agreement on regular testing.
- Detailed policy review and gap analysis to ensure MRIWA has up to date policies covering major areas such as Grants processes, Health and Safety and IT.
- Attention to emerging matters such as IT security, exposure to cloud computing and confidentiality issues associated with awarding grants.
- Finalisation of the Financial Management Manual which was commenced in the previous year.
- Oversight of financial and project management systems being re-designed to meet new forms of MRIWA investments (such as projects within CRC ORE and other extension projects) and to deliver management efficiencies whilst ensuring necessary controls are not compromised.

I would like to thank my Committee members and acknowledge two members of the Committee who completed their terms this year, Stedman Ellis and James McClements. I welcome the input of new Committee members Larry Lopez and Mark Bush and thank them for their continued contribution. I also wish to acknowledge the excellent work of Mark Woffenden and Kim Ong from KPMG who have supported the work of the Committee with great dedication and focus this year.



Helen Cook
Chair
MRIWA Audit and Risk Committee

Date: 17 August, 2016

Disclosures and Legal Compliance

Financial Statements

Certification of Financial Statements

For the year ended 30 June 2016

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 2016 and the financial position as at 30 June 2016.

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.



Dr P Lilly
Chairman of the Board
Date:



Ms K Ong
Chief Finance Officer
Date:



Ms H Cook
Member of the Board
Date:

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

I have audited the accounts and financial statements of the Minerals Research Institute of Western Australia.

The financial statements comprise the Statement of Financial Position as at 30 June 2016, the Statement of Comprehensive Income, Statement of Changes in Equity, Statement of Cash Flows, and Notes comprising a summary of significant accounting policies and other explanatory information.

Opinion

In my opinion, the financial statements are based on proper accounts and present fairly, in all material respects, the financial position of the Minerals Research Institute of Western Australia at 30 June 2016 and its financial performance and cash flows for the year then ended. They are in accordance with Australian Accounting Standards and the Treasurer's Instructions.

Board's Responsibility 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 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.

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 based on my audit. The audit was conducted in accordance with Australian Auditing Standards. Those Standards require compliance with relevant ethical requirements relating to audit engagements and that the audit be planned and performed to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Institute's preparation and fair presentation of the financial statements in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of the accounting policies used and the reasonableness of accounting estimates made by the Board, as well as evaluating the overall presentation of the financial statements.

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

Opinion of the Auditor General

Report on Controls

I have audited the controls exercised by the Minerals Research Institute of Western Australia during the year ended 30 June 2016.

Controls exercised by the Minerals Research Institute of Western Australia 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.

Opinion

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 2016.

Board's Responsibility for Controls

The Board is responsible for maintaining an adequate system of internal control to ensure that the receipt, expenditure and investment of money, the acquisition and disposal of public and other property, and the incurring of liabilities are in accordance with the Financial Management Act 2006 and the Treasurer's Instructions, and other relevant written law.

Auditor's Responsibility for the Audit of Controls

As required by the Auditor General Act 2006, my responsibility is to express an opinion on the controls exercised by the Minerals Research Institute of Western Australia based on my audit conducted in accordance with Australian Auditing and Assurance Standards.

An audit involves performing procedures to obtain audit evidence about the adequacy of controls to ensure that the Institute complies with the legislative provisions. The procedures selected depend on the auditor's judgement and include an evaluation of the design and implementation of relevant controls.

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

Report on the Key Performance Indicators

I have audited the key performance indicators of the Minerals Research Institute of Western Australia for the year ended 30 June 2016.

The key performance indicators are the key effectiveness indicators and the key efficiency indicators that provide information on outcome achievement and service provision.

Opinion

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 2016.

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 controls as the Board determines necessary to ensure that the key performance indicators fairly represent indicated performance.

Opinion of the Auditor General

Auditor's Responsibility for the Audit of Key Performance Indicators

As required by the Auditor General Act 2006, my responsibility is to express an opinion on the key performance indicators based on my audit conducted in accordance with Australian Auditing and Assurance Standards.

An audit involves performing procedures to obtain audit evidence about the key performance indicators. The procedures selected depend on the auditor's judgement, including the assessment of the risks of material misstatement of the key performance indicators. In making these risk assessments the auditor considers internal control relevant to the Board's preparation and fair presentation of the key performance indicators in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the relevance and appropriateness of the key performance indicators for measuring the extent of outcome achievement and service provision.

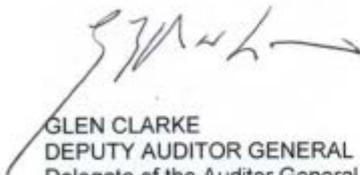
I believe that the audit evidence obtained is sufficient and appropriate to provide a basis for my audit opinion.

Independence

In conducting the above audits, I have complied with the independence requirements of the Auditor General Act 2006 and Australian Auditing and Assurance Standards, and other relevant ethical 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 2016 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.



GLEN CLARKE
DEPUTY AUDITOR GENERAL
Delegate of the Auditor General for Western Australia
Perth, Western Australia
9 August 2016

Statement of Comprehensive Income For the year ended 30 June 2016

| | Note | 2016 \$ | 2015 \$ |
|---|------|--------------------|------------------|
| COST OF SERVICES | | | |
| Expenses | | | |
| Research grants | | 3,218,990 | 2,167,065 |
| Scholarships | | 201,574 | 111,000 |
| Loss on disposal of assets | 11 | - | 1,918 |
| Employee benefits expense | 6 | 471,398 | 422,521 |
| Institute Contractor fees | | 153,602 | 140,336 |
| Board and committee fees and costs | 7 | 110,027 | 101,649 |
| Supplies and services | 8 | 234,196 | 290,380 |
| Other expenses | 9 | 18,010 | 16,065 |
| Accommodation expenses | | 47,250 | 47,250 |
| Depreciation expense | 15 | 5,652 | 5,374 |
| Total cost of services | | 4,460,699 | 3,303,558 |
| Income | | | |
| Revenue | | | |
| Interest revenue | | 237,878 | 207,908 |
| Other revenue | | 72,574 | 77,798 |
| Revenue from Industry Sponsorship | | 799,300 | 1,756,223 |
| Total revenue | | 1,109,752 | 2,041,929 |
| Total income other than income from State Government | | 1,109,752 | 2,041,929 |
| NET COST OF SERVICES | | 3,350,947 | 1,261,629 |
| Income from State Government | 10 | | |
| State Government Grant | | 1,823,000 | 6,023,113 |
| Resources received free of charge | | 47,250 | 47,250 |
| Total income from State Government | | 1,870,250 | 6,070,363 |
| SURPLUS/(DEFICIT) FOR THE PERIOD | | (1,480,697) | 4,808,734 |
| TOTAL COMPREHENSIVE INCOME FOR THE PERIOD | | (1,480,697) | 4,808,734 |

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

Statement of Financial Position As at 30 June 2016

| | Note | 2016 \$ | 2015 \$ |
|--------------------------------------|------|------------------|-------------------|
| ASSETS | | | |
| Current Assets | | | |
| Cash and cash equivalents | 21 | 4,263,210 | 5,703,540 |
| Restricted cash and cash equivalents | 12 | 5,181,151 | 4,831,056 |
| Receivables and other assets | 13 | 207,787 | 140,063 |
| Other current assets | 14 | 58,762 | 67,740 |
| Total Current Assets | | 9,710,910 | 10,742,399 |
| Non-Current Assets | | | |
| Office equipment | 15 | 22,610 | 28,262 |
| Total Non-Current assets | | 22,610 | 28,262 |
| TOTAL ASSETS | | 9,733,520 | 10,770,661 |
| LIABILITIES | | | |
| Current Liabilities | | | |
| Payables | 17 | 93,616 | 197,499 |
| Provisions | 18 | 71,780 | 65,209 |
| Deferred revenue | 19 | 1,237,968 | 693,131 |
| Total Current Liabilities | | 1,403,364 | 955,839 |
| Non-Current Liabilities | | | |
| Provisions | 18 | - | 3,969 |
| Total Non-Current Liabilities | | - | 3,969 |
| TOTAL LIABILITIES | | 1,403,364 | 959,808 |
| NET ASSETS | | 8,330,156 | 9,810,853 |
| EQUITY | | | |
| Accumulated surplus | 20 | 8,330,156 | 9,810,853 |
| TOTAL EQUITY | | 8,330,156 | 9,810,853 |

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 2016

| | Note | Accumulated Surplus \$ |
|--------------------------------|------|------------------------------|
| Balance at 1 July 2014 | 20 | 5,002,119 |
| Surplus for the period | | 4,808,734 |
| Balance at 30 June 2015 | | <u>9,810,853</u> |
| Balance at 1 July 2015 | | 9,810,853 |
| Deficit for the period | | (1,480,697) |
| Balance at 30 June 2016 | | <u>8,330,156</u> |

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

Statement of Cash Flow For the year ended 30 June 2016

| | 2016 | 2015 |
|---|-----------------------|--------------------|
| Note | \$ | \$ |
| CASH FLOWS FROM STATE GOVERNMENT | | |
| State Government Grant | 1,823,000 | 6,023,113 |
| Net cash provided by State Government | 1,823,000 | 6,023,113 |
| Utilised as follows: | | |
| CASH FLOWS FROM OPERATING ACTIVITIES | | |
| Payments | | |
| Research Grant Payments | (3,499,474) | (2,301,700) |
| Employee benefits | (508,121) | (401,730) |
| Institute Contractor fees | (166,981) | (146,929) |
| Board and Advisory committee fees | (34,205) | (22,525) |
| Supplies and Services | (247,994) | (289,702) |
| GST payments on purchases | (327,084) | (283,500) |
| Receipts | | |
| Receipts from Sponsors | 1,340,617 | 944,804 |
| Interest received | 236,603 | 191,097 |
| GST receipts on sales | 101,221 | 99,500 |
| GST receipts from taxation authority | 192,182 | 194,848 |
| Net cash used in operating activities | 21 (2,913,235) | (2,015,837) |
| CASH FLOW FROM INVESTING ACTIVITIES | | |
| Purchase of non-current assets | - | (33,480) |
| Net cash used in investing activities | - | (33,480) |
| Net increase in cash and cash equivalents | (1,090,235) | 3,973,796 |
| Cash and cash equivalents at the beginning of the period | 10,534,596 | 6,560,800 |
| CASH AND CASH EQUIVALENTS AT THE END OF THE PERIOD | 21 9,444,361 | 10,534,596 |

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

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 1. Australian Accounting Standards General

MRIWA's financial statements for the year ended 30 June 2016 have been prepared in accordance with Australian Accounting Standards. The term 'Australian Accounting Standards' includes Standards and Interpretations issued by the Australian Accounting Standard Board (AASB).

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

Early adoption of standards

MRIWA cannot early adopt an Australian Accounting Standard unless specifically permitted by TI 1101 *Application of Australian Accounting Standards and Other Pronouncements*. Partial exemption permitting early adoption of AASB 2015-7 *Amendments to Australian Accounting Standards – Fair Value Disclosures of Not-For-Profit Public Sector Entities* has been granted. Aside from AASB 2015-7, there has been no early adoption of any other Australian Accounting Standards that have been issued or amended (but not operative) by the Department for the annual reporting period ended 30 June 2016.

Note 2. Summary of significant accounting policies

(a) General statement

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.

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.

(b) Basis of preparation

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.

Note 3 'Judgements made by management in applying accounting policies' discloses judgements that have been made in the process of applying the Institute's accounting policies resulting in the most significant effect on amounts recognised in the financial statements.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 4 'Key sources of estimation uncertainty' discloses key assumptions made concerning the future, and other key sources of estimation uncertainty at the end of the reporting period, that have a significant risk of causing a material adjustment to the carrying amounts of assets and liabilities within the next financial year.

(c) Reporting entity

The reporting entity comprises of MRIWA and has no related bodies.

(d) Income

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:

Rendering of services

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

Interest

Revenue is recognised as the interest accrues.

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.

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.

State Government Grant

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

(e) Plant and equipment

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.

f) Impairment of Assets

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.

See also note 2(j) and note 13 'Receivables and other assets' for impairment of receivables.

(g) Financial instruments

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; and
 - Receivables.
- Financial Liabilities
 - Payables.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

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.

(h) Cash and cash equivalents

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.

(i) Accrued salaries

Accrued salaries (see Note 17 'Payables') 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.

(j) Receivables

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. See also note 2(g) 'Financial Instruments' and note 13 'Receivables and other assets'.

(k) Payables and Accrued Expenses

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. See also note 2(g) 'Financial instruments' and note 17 'Payables'.

(l) Research Grants

Grants expense is recognized 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.

(m) Scholarships

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

(n) Provision for leave

All annual leave and long service leave provisions are in respect of employees' service up to the end of the reporting period.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Annual leave

The provision for annual leave is classified as a current liability as MRIWA does not have an unconditional right to defer settlement of the liability for at least 12 months after the end of the reporting period.

Long service leave

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.

Superannuation

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*. 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 agency purposes because the concurrent contributions (defined contributions) made by MRIWA to GESB extinguishes the agency's obligations to the related superannuation liability.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

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.

(o) Provisions – other

Employment 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'.

(p) Superannuation expense

Superannuation expense is recognized 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 employer contribution paid to the GESB in respect of the GSS is paid back into the Consolidated Account by the GESB.

(q) Resources received free of charge

Resources received free of charge or for nominal cost that MRIWA would otherwise purchase if not donated, and can be reliably measured are recognised as income at fair value. Where the resource received represents a service that MRIWA would otherwise pay for, a corresponding expense is recognised. 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.

(r) Comparative figures

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

Note 3. Judgements made by management in applying accounting policies

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.

Note 4. Key sources of estimation uncertainty

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.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Long Service Leave

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.

Note 5. Disclosure of changes in accounting policy and estimates

Initial application of an Australian Accounting Standard

MRIWA has applied the following Australian Accounting Standards effective for annual reporting periods beginning on or after 1 July 2015 that impacted on MRIWA:

AASB 2013-9 Amendments to Australian Accounting Standards – Conceptual Framework, Materiality and Financial Instruments.

Part C of this Standard defers the application of AASB 9 to 1 January 2017. The application of AASB 9 was subsequently deferred to 1 January 2018 by AASB 2014-1. MRIWA has not yet determined the application or the potential impact of AASB 9.

AASB 2014-8 Amendments to Australian Accounting Standards arising from AASB 9 (December 2014) – Application of AASB 9 (December 2009) and AASB 9 (December 2010) [AASB 9 (2009 & 2010)]

This Standard makes amendments to AASB 9 Financial Instruments (December 2009) and AASB 9 Financial Instruments (December 2010), arising from the issuance of AASB 9 Financial Instruments in December 2014. MRIWA has not yet determined the application or the potential impact of AASB 9.

AASB 2015-3 Amendments to Australian Accounting Standards arising from the Withdrawal of AASB 1031 Materiality

This Standard completes the withdrawal of references to AASB 1031 in all Australian Accounting Standards and Interpretations, allowing that Standard to effectively be withdrawn. There is no financial impact.

AASB 2015-7 Amendments to Australian Accounting Standards - Fair Value Disclosures of Not-for-Profit Public Sector Entities [AASB 13]

This Standard relieves not-for-profit public sector entities from the reporting burden associated with various disclosures required by AASB 13 for assets within the scope of AASB 116 that are held primarily for their current service potential rather than to generate future net cash inflows. It has no financial impact.

Voluntary changes in Accounting Policy

There have been no voluntary changes in accounting policy.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Future impact of Australian Accounting Standards 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.

AASB 9 Financial Instruments

1 Jan 2018

This Standard supersedes AASB 139 Financial Instruments: Recognition and Measurement, introducing a number of changes to accounting treatments.

The mandatory application date of this Standard was amended to 1 January 2018 by AASB 2012-6, AASB 2013-9 and AASB 2014-1 Amendments to Australian Accounting Standards. MRIWA has not yet determined the application or the potential impact of the Standard.

AASB 2010-7

1 Jan 2018

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 & 1038 and Int 2, 5, 10, 12, 19 & 127]

This Standard makes consequential amendments to other Australian Accounting Standards and Interpretations as a result of issuing AASB 9 in December 2010.

AASB 2012-6 and AASB 2014-1 amended the mandatory application date of this Standard to 1 January 2018. MRIWA has not yet determined the application or the potential impact of the Standard.

AASB 2014-1 Amendments to Australian Accounting Standards

1 Jan 2018

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.

AASB 1057 Application of Australian Accounting Standards

1 Jan 2016

This Standard lists the application paragraphs for each other Standard (and Interpretation), grouped where they are the same. There is no financial impact on application of the Standard.

AASB 2014-4 Amendments to Australian Accounting Standards – Clarification of Acceptable Methods of Depreciation and Amortisation [AASB 116 & 138]

1 Jan 2016

The adoption of this Standard has no financial impact for MRIWA as depreciation and amortisation is not determined by reference to revenue generation, but by reference to consumption of future economic benefits.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

AASB 2014-5 Amendments to Australian Accounting Standards arising from AASB 15

1 Jan 2018

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.

AASB 2014-7 Amendments to Australian Accounting Standards arising from AASB 9 (December 2014)

1 Jan 2018

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.

AASB 2015-1 Amendments to Australian Accounting Standards – Annual Improvements to Australian Accounting Standards 2012–2014 Cycle [AASB 1, 2, 3, 5, 7, 11, 110, 119, 121, 133, 134, 137 & 140]

1 Jan 2016

These amendments arise from the issuance of International Financial Reporting Standard *Annual Improvements to IFRSs 2012–2014 Cycle* in September 2014, and editorial corrections. There is no financial impact.

AASB 2015-2 Amendments to Australian Accounting Standards – Disclosure Initiative: Amendments to AASB 101 [AASB 7, 101, 134 & 1049]

1 Jan 2016

This Standard amends AASB 101 to provide clarification regarding the disclosure requirements in AASB 101. Specifically, the Standard proposes narrow-focus amendments to address some of the concerns expressed about existing presentation and disclosure requirements and to ensure entities are able to use judgement when applying a Standard in determining what information to disclose in their financial statements. There is no financial impact.

AASB 2015-6 Amendments to Australian Accounting Standards – Extending Related Party Disclosures to Not-for-Profit Public Sector Entities [AASB 10, 124 & 1049]

1 Jul 2016

The amendments extend the scope of AASB 124 to include application by not-for-profit public sector entities. Implementation guidance is included to assist application of the Standard by not-for-profit public sector entities. There is no financial impact.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

*AASB 2016-2 Amendments to Australian Accounting Standards – Disclosure Initiative:
Amendments to AASB 107*

1 Jan 2017

This Standard amends AASB 107 *Statement of Cash Flows* (August 2015) to require disclosures that enable users of financial statements to evaluate changes in liabilities arising from financing activities, including both changes arising from cash flows and non-cash changes. There is no financial impact.

Changes in accounting estimates

There have been no changes in accounting estimates.

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 | 2015 |
|--|------------------|------------------|
| | \$ | \$ |
| Note 6. Employee benefits expense | | |
| Wages and salaries | 433,526 | 379,107 |
| Superannuation - defined contribution plans | 37,872 | 43,414 |
| | <u>471,398</u> | <u>422,521</u> |
| Note 7. Board and committee fees and costs | | |
| Board of Directors' remuneration | 91,121 | 85,071 |
| Advisory Committee attendance fees | 15,927 | 16,578 |
| Board and Advisory Committee's expenses | 2,979 | - |
| | <u>110,027</u> | <u>101,649</u> |
| Note 8. Supplies and services | | |
| Printing and stationery | 2,434 | 2,232 |
| Advertising | 5,009 | 6,426 |
| Communications | 32,971 | 22,587 |
| Business travel | 6,461 | 782 |
| Accounting services | 101,515 | 135,890 |
| Consultants | 48,063 | 31,373 |
| Legal services | 8,230 | 19,532 |
| Insurance | 9,321 | 7,120 |
| Sponsorships | 2,000 | 25,000 |
| Other | 18,192 | 39,438 |
| | <u>234,196</u> | <u>290,380</u> |
| Note 9. Other expenses | | |
| Audit fees | 18,000 | 16,055 |
| Bad debts expense | 10 | 10 |
| | <u>18,010</u> | <u>16,065</u> |
| Note 10. Income from State Government | | |
| State Government Grants | 1,823,000 | 6,023,113 |
| | <u>1,823,000</u> | <u>6,023,113</u> |
| Services received free of charge from other State Government agencies during the period: | | |
| Department of Mines and Petroleum | 47,250 | 47,250 |
| | <u>47,250</u> | <u>47,250</u> |
| | <u>1,870,250</u> | <u>6,070,363</u> |

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 \$ | 2015 \$ |
|---|------------|----------------|
| Note 11. Net gain/(loss) on disposal of non-current assets | | |
| <u>Proceeds from disposal of non-current assets</u> | | |
| Office equipment | - | - |
| <u>Costs of disposal of non-current assets</u> | | |
| Office equipment | - | (1,918) |
| Net gain/(loss) | - | (1,918) |

Note 12. Restricted cash and cash equivalents

| | | |
|------------------------|------------------|------------------|
| Research grants | 4,458,422 | 4,247,493 |
| Director's Scholarship | 722,729 | 583,563 |
| | <u>5,181,151</u> | <u>4,831,056</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.

Note 13. Receivables and Other Assets

Current

| | | |
|---------------------------------|----------------|----------------|
| Grants receivable - Sponsorship | 55,000 | 51,480 |
| GST receivable | 152,787 | 88,583 |
| | <u>207,787</u> | <u>140,063</u> |

There are no receivables individually determined as impaired at the end of the reporting period.

See also note 2(j) 'Receivables', 2(d) 'Sponsorship Revenue', and note 26 'Financial Instruments'.

Reconciliation of changes in the allowance for impairment of receivables

| | | |
|---------------------------------------|----------|----------|
| <u>Balance at the start of period</u> | - | - |
| Doubtful doubt expense | 10 | 10 |
| Amounts written off during the period | (10) | (10) |
| Balance at the end of period | - | - |

Note 14. Other Current Assets

| | | |
|------------------|---------------|---------------|
| Prepayments | - | 10,253 |
| Accrued Interest | 58,762 | 57,487 |
| | <u>58,762</u> | <u>67,740</u> |

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 \$ | 2015 \$ |
|----------------------------------|------------|------------|
| Note 15. Office Equipment | | |
| <u>Office Equipment</u> | | |
| At cost | 33,480 | 33,480 |
| Accumulated depreciation | (10,870) | (5,218) |
| | 22,610 | 28,262 |
| Total Office Equipment | 22,610 | 28,262 |

| Office Equipment | | |
|---|---------|---------|
| Carrying amount at start of period | 28,262 | 2,074 |
| Additions | - | 33,480 |
| Disposals | - | (1,918) |
| Depreciation | (5,652) | (5,374) |
| Carrying amount at end of period | 22,610 | 28,262 |

Note 16. Impairment of assets

There were no indications of impairment to office equipment at 30 June 2016. MRIWA held no goodwill or intangible assets with an indefinite useful life during the reporting period.

Note 17. Payables

Current

| | | |
|--------------------------|--------|---------|
| Research grants payable | 38,712 | 134,622 |
| Scholarships payable | 17,000 | - |
| Payables | 11,666 | 7,905 |
| Accrued research grants | - | - |
| Accrued general expenses | 26,238 | 43,022 |
| Accrued salaries | - | 11,950 |
| | 93,616 | 197,499 |

See also note 2(k) 'Payables', 2(l) 'Research Grants' and note 26 'Financial Instruments'.

Note 18. Provisions

Current

| | | |
|-----------------------------|--------|--------|
| Employee benefits provision | | |
| Annual leave ^(a) | 8,049 | 16,705 |
| Long service leave | 63,731 | 48,504 |
| | 71,780 | 65,209 |

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 \$ | 2015 \$ |
|---|------------|------------|
| Note 18. Provisions - continued | | |
| <u>Non - Current</u> | | |
| Employee benefits provision | | |
| Long service leave ^(b) | - | 3,969 |
| | - | 3,969 |
| (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 is expected to occur as follows: | | |
| Within 12 months of the end of the reporting period | 8,049 | 16,705 |
| More than 12 months after the end of the reporting period | - | - |
| | 8,049 | 16,705 |
| (b) Long service leave liabilities have been classified as current where there is no unconditional right to defer settlement for at least 12 months after the end of the reporting period. Assessments indicate that actual settlement of the liabilities is expected to occur as follows: | | |
| Within 12 months of the end of the reporting period | - | - |
| More than 12 months after the end of the reporting period | 63,731 | 52,473 |
| | 63,731 | 52,473 |
| Note 19. Deferred revenue | | |
| Deferred Revenue - Sponsorship | 1,237,968 | 693,131 |
| | 1,237,968 | 693,131 |

Note 20. 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.

Accumulated surplus

| | | |
|--------------------------------------|-------------|-----------|
| Balance at start of period | 9,810,853 | 5,002,119 |
| Result for the period | (1,480,697) | 4,808,734 |
| Balance at end of period | 8,330,156 | 9,810,853 |
| Total Equity at end of period | 8,330,156 | 9,810,853 |

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

| | 2016 \$ | 2015 \$ |
|--|--------------------|--------------------|
| Note 21. Notes to the Statement of Cash Flows | | |
| Cash and cash equivalents | 4,263,210 | 5,703,540 |
| Restricted cash and cash equivalents (Note 12 'Restricted cash and cash equivalents') | 5,181,151 | 4,831,056 |
| | 9,444,361 | 10,534,596 |
| Reconciliation of net cost of services to net cash flows provided by/(used in) operating activities | | |
| Net cost of services | (3,350,947) | (1,261,629) |
| <u>Non-cash items:</u> | | |
| Depreciation and amortisation expense (note 15 'Office Equipment') | 5,652 | 5,374 |
| Loss on disposal of non-current asset | - | 1,918 |
| Resources received free of charge (note 10 'Income from State Government') | 47,250 | 47,250 |
| Finance income | - | - |
| <u>(Increase)/decrease in assets:</u> | | |
| Accrued Interest | (1,275) | (16,811) |
| Grants Receivable - Sponsorship | 6,733 | 9,371 |
| Change in GST in receivables/payables ^(c) | (225,863) | (184,000) |
| Net GST receipts /(payments) ^(b) | 192,182 | 194,848 |
| <u>Increase/(decrease) in liabilities</u> | | |
| Grants Payable - Research and Scholarship ^(a) | (78,910) | (23,635) |
| Employee Benefits | (36,723) | 20,791 |
| Deferred Revenue | 544,837 | (823,923) |
| Other liabilities | (16,171) | 14,609 |
| Net cash provided by/(used in) operating activities | (2,913,235) | (2,015,837) |

(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.

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 | 2015 |
|--|------------------|------------------|
| | \$ | \$ |
| Note 22. Commitments | | |
| Other expenditure commitments | | |
| Within 1 year | 2,202,138 | 2,322,036 |
| Later than 1 year and not later than 5 years | 1,983,302 | 2,002,305 |
| Later than 5 years | 110,000 | - |
| | <u>4,295,440</u> | <u>4,324,341</u> |

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

Note 23. Contingent liabilities and contingent assets

MRIWA has no contingent liabilities or contingent assets.

Note 24. Events occurring after the end of the reporting period

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

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 25. Explanatory statement

All variances between estimates (original budget) and actual results for 2016, and between the actual results for 2016 and 2015 are shown below. Narratives are provided for key variations selected from observed major variances, which are generally greater than:

- 5% and \$66,071.

| | Variance notes | Estimate 2016 \$ | Actual 2016 \$ | Actual 2015 \$ | Variance between estimate and actual \$ | Variance between actual results for 2016 and 2015 \$ |
|------------------------------------|-------------------|------------------------|----------------------|----------------------|---|---|
| COSTS OF SERVICES | | | | | | |
| Expenses | | | | | | |
| Research grants | A | 3,150,000 | 3,218,990 | 2,167,065 | 68,990 | 1,051,925 |
| Scholarships | 1, B | 273,000 | 201,574 | 111,000 | (71,426) | 90,574 |
| Loss on disposal of assets | | - | - | 1,918 | - | (1,918) |
| Employee benefits expense | 2 | 402,297 | 471,398 | 422,521 | 69,101 | 48,877 |
| Institute contractor fees | 3 | 242,687 | 153,602 | 140,336 | (89,085) | 13,266 |
| Board and committee fees and costs | | 126,516 | 110,027 | 101,649 | (16,489) | 8,378 |
| Supplies and services | | 207,490 | 234,196 | 290,380 | 26,706 | (56,184) |
| Other expenses | | 18,000 | 18,010 | 16,065 | 10 | 1,945 |
| Depreciation expense | | 6,000 | 5,652 | 5,374 | - | - |
| Accommodation expenses | | 47,250 | 47,250 | 47,250 | (348) | 278 |
| Total cost of services | | 4,473,240 | 4,460,699 | 3,303,558 | (12,541) | (951,038) |

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

Note 25. Explanatory statement (cont.)

| | Variance notes | Estimate 2016 \$ | Actual 2016 \$ | Actual 2015 \$ | Variance between estimate and actual \$ | Variance between actual results for 2016 and 2015 \$ |
|---|-------------------|------------------------|----------------------|----------------------|---|---|
| Revenue | | | | | | |
| Interest revenue | | 200,000 | 237,878 | 207,908 | 37,878 | 29,970 |
| Other revenue | | 68,311 | 72,574 | 77,798 | 4,263 | (5,224) |
| Revenue from Industry Sponsorship | 4, C | 2,350,000 | 799,300 | 1,756,223 | (1,550,700) | (956,923) |
| Total revenue | | 2,618,311 | 1,109,752 | 2,041,929 | (1,508,559) | (932,177) |
| Total income other than income from State Government | | 2,618,311 | 1,109,752 | 2,041,929 | (1,508,559) | (932,177) |
| NET COST OF SERVICES | | 1,854,929 | 3,350,947 | 1,261,629 | 1,496,018 | 2,089,318 |
| Income from State Government | | | | | | |
| State Government Grant | 5, D | 1,611,000 | 1,823,000 | 6,023,113 | 212,000 | (4,200,113) |
| Resources received free of charge | | 47,250 | 47,250 | 47,250 | - | - |
| Total income from State Government | | 1,658,250 | 1,870,250 | 6,070,363 | 212,000 | (4,200,113) |
| SURPLUS FOR THE PERIOD | | (196,679) | (1,480,697) | 4,808,734 | (1,284,018) | (6,289,431) |
| TOTAL COMPREHENSIVE INCOME FOR THE PERIOD | | (196,679) | (1,480,697) | 4,808,734 | (1,284,018) | (6,289,431) |

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Major Estimate and Actual (2016) Variance Narratives

1. Scholarships became a structured program from 2015. 5 PhD scholarships to the value of \$560,000 over 3.5 years were approved by the Board in 2016, of which MRIWA only awarded 4 PhD scholarships in 2016. The under spend is the result of one less scholarship being awarded than approved.
2. MRIWA employed a full time project manager from November 2015.
3. A part time project manager on contract completed his service with MRIWA in November 2015. MRIWA employed a full time project manager from November 2015.
4. Inability to forecast an accurate value of industry sponsorship revenue for research projects. The financial difficulties experienced by the minerals industry resulted from the downturn in the global mineral commodity prices in recent years has adversely affected the reduced co-contribution into research projects by sponsors.
5. The increase is attributed to additional funding provided by Department of Mines & Petroleum.

Major Actual (2016) and Comparative (2015) Variance Narratives

- A. Payment schedules commenced for some projects approved in previous financial year and there were 8 new projects that commenced in 2016. These factors directly impact on the amount of research grants paid.
- B. 5 PhD scholarships were awarded in 2015 by the MRIWA Board. The Board awarded a further 4 PhD scholarships in 2016, bringing the total number of scholars in the MRIWA PhD program to 9. These factors account for the higher scholarship expenditure.
- C. This variance is due to the reduced financial leverage in industry co-investment on new projects commenced during the financial year, which consequently has a direct impact on amount of unearned revenue recognised.
- D. A proportion of the 2016 appropriation for MRIWA was paid by the Departments of Mines & Petroleum to MRIWA in advance in the period ending 30 June 2015.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 26. Financial instruments

(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 as shown in the table at note 26(c) 'Financial instrument disclosures' and note 13 'Receivables and other assets'.

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.

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.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 26. Financial instruments - continued

(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:

| | 2016 | 2015 |
|--|-------------|-------------|
| | \$ | \$ |
| <u>Financial Assets</u> | | |
| Cash and cash equivalents | 4,263,210 | 5,703,540 |
| Restricted cash and cash equivalents | 5,181,151 | 4,831,056 |
| Receivables ^(a) | 55,000 | 51,480 |
| Other current assets | 58,762 | 57,487 |
| <u>Financial Liabilities</u> | | |
| Financial liabilities measured at amortised cost | 93,616 | 197,499 |

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

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

(c) Financial instrument disclosures

Credit risk

The following table discloses MRIWA's maximum exposure to credit risk and the ageing analysis of financial assets. 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 table discloses the ageing of financial assets that are past due but not impaired and impaired financial assets. The table is based on information provided to senior management of MRIWA.

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 \$ | 1-2 years \$ | More than 5 years \$ | |
| 2016 | | | | | | | | |
| Cash and cash equivalents | 4,263,210 | 4,263,210 | - | - | - | - | - | - |
| Restricted cash and cash equivalents | 5,181,151 | 5,181,151 | - | - | - | - | - | - |
| Receivables ^(a) | 55,000 | - | 38,500 | 16,500 | - | - | - | - |
| Other current assets | 58,762 | 58,762 | - | - | - | - | - | - |
| | 9,558,123 | 9,503,123 | 38,500 | 16,500 | - | - | - | - |
| 2015 | | | | | | | | |
| Cash and cash equivalents | 5,703,540 | 5,703,540 | - | - | - | - | - | - |
| Restricted cash and cash equivalents | 4,831,056 | 4,831,056 | - | - | - | - | - | - |
| Receivables ^(a) | 51,480 | - | 51,480 | - | - | - | - | - |
| Other current assets | 57,487 | 57,487 | - | - | - | - | - | - |
| | 10,643,563 | 10,592,083 | 51,480 | - | - | - | - | - |

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

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Liquidity Risk and interest rate exposure

The following table details MRIWA's interest rate exposure and the contractual maturity analysis of financial assets and financial liabilities. The maturity analysis section includes interest and principal cash flows. The interest rate exposure section analyses only the carrying amounts of each item.

| | 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 month \$ | 3 months to 1 year \$ | 1-5 years \$ | More than 5 years \$ |
| 2016 | | | | | | | | | | |
| <u>Financial Assets</u> | | | | | | | | | | |
| Cash and cash equivalents | 2.394 | 4,263,210 | 4,263,210 | - | 4,263,210 | - | - | - | - | - |
| Restricted cash and cash equivalents | 2.394 | 5,181,151 | 5,181,151 | - | 5,181,151 | - | - | - | - | - |
| Receivables ^(a) | 2.394 | 55,000 | - | 55,000 | 55,000 | - | - | - | - | - |
| Other current assets | | 58,762 | | 58,762 | 58,762 | 58,762 | - | - | - | - |
| | | 9,558,123 | 9,444,361 | 113,762 | 9,558,123 | 58,762 | - | - | - | - |
| <u>Financial Liabilities</u> | | | | | | | | | | |
| Payables | | 93,616 | - | 93,616 | 93,616 | 93,616 | - | - | - | - |
| | | 93,616 | - | 93,616 | 93,616 | 93,616 | - | - | - | - |

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 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 \$ | 1-5 years \$ | More than 5 years \$ |
| 2015 | | | | | | | | | | |
| <u>Financial Assets</u> | | | | | | | | | | |
| Cash and cash equivalents | 2.442 | 5,703,540 | 5,703,540 | - | 5,703,540 | - | - | - | - | - |
| Restricted cash and cash equivalents | 2.442 | 4,831,056 | 4,831,056 | - | 4,831,056 | - | - | - | - | - |
| Receivables ^(a) | | 51,480 | - | 51,480 | 51,480 | - | - | - | - | - |
| Other current assets | | 57,487 | - | 57,487 | 57,487 | 57,487 | - | - | - | - |
| | | 10,643,563 | 10,534,596 | 108,967 | 10,643,563 | 57,487 | - | - | - | - |
| <u>Financial Liabilities</u> | | | | | | | | | | |
| Payables | | 197,499 | - | 197,499 | 197,499 | 197,499 | - | - | - | - |
| | | 197,499 | - | 197,499 | 197,499 | 197,499 | - | - | - | - |

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

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

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.

| 2016 | Carrying amount \$ | -100 basis points | | +100 basis points | |
|--------------------------------------|--------------------------|-------------------|-----------------|-------------------|---------------|
| | | Surplus \$ | Equity \$ | Surplus \$ | Equity \$ |
| Financial assets | | | | | |
| Cash and cash equivalents | 4,263,210 | (42,632) | (42,632) | 42,632 | 42,632 |
| Restricted Cash and cash equivalents | 5,181,151 | (51,812) | (51,812) | 51,812 | 51,812 |
| Total Increase/Decrease | | (94,444) | (94,444) | 94,444 | 94,444 |

| 2015 | Carrying amount \$ | -100 basis points | | +100 basis points | |
|--------------------------------------|--------------------------|-------------------|------------------|-------------------|----------------|
| | | Surplus \$ | Equity \$ | Surplus \$ | Equity \$ |
| Financial assets | | | | | |
| Cash and cash equivalents | 5,703,540 | (57,035) | (57,035) | 57,035 | 57,035 |
| Restricted Cash and cash equivalents | 4,831,056 | (48,311) | (48,311) | 48,311 | 48,311 |
| Total Increase/Decrease | | (105,346) | (105,346) | 105,346 | 105,346 |

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.

Notes to and forming part of the Financial Statements For the year ended 30 June 2016

Note 27. Remuneration of board members and senior officers

Remuneration of board members

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

| | 2016 | 2015 |
|--|---------------|---------------|
| \$ | | |
| 0 - 10,000 | 6 | 6 |
| 10,000 - 20,000 | 4 | 1 |
| | \$ | \$ |
| Base remuneration and superannuation | 91,121 | 92,204 |
| The total remuneration of board members are: | <u>91,121</u> | <u>92,204</u> |

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.

Remuneration of senior officers

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

| | 2016 | 2015 |
|---|----------------|----------------|
| \$ | | |
| 100,001 - 110,000 | - | - |
| 250,000 – 350,000 | 1 | 1 |
| | \$ | \$ |
| Base remuneration and superannuation | 292,942 | 282,245 |
| Annual leave and long service leave accruals | (1,847) | 27,830 |
| Other benefits | 23,446 | 23,272 |
| The total remuneration of senior officers is: | <u>314,541</u> | <u>333,347</u> |

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

**Notes to and forming part of the Financial Statements
For the year ended 30 June 2016**

| | 2016 \$ | 2015 \$ |
|---|------------|------------|
| Note 28. Remuneration of auditor | | |
| Remuneration payable to the Auditor General in respect to the audit for the current financial year is as follows: | | |
| Auditing the accounts, financial statements and performance indicators | 18,400 | 18,000 |
| | 18,400 | 18,000 |
| | 18,400 | 18,000 |

Note 29. 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 and energy research.

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

Note 30. Supplementary financial information

(a) Write-offs

Public property written-off by the Authority during the period

| | |
|----|-----|
| 10 | 444 |
| 10 | 444 |
| 10 | 444 |

The Institute has no related or affiliated bodies.

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

No gifts of public property were provided by the Institute.

Certification of Key Performance Indicators For the Year Ended 30 June 2016

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 2016.



Dr P Lilly
Chairman of the Board
Date:



Ms H Cook
Member of the Board
Date:

Key Performance Indicators for the year ended 30 June 2016

Outcomes Based Management

The primary function of the Minerals Research Institute of Western Australia (MRIWA) is to provide and administer funding grants to carry out minerals research.

MRIWA's overarching objective is to stimulate minerals research to support investment in, and operation of, a globally competitive minerals industry in Western Australia to optimise economic and social benefits to the State into the future.

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 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.

As well as directly supporting minerals research projects, MRIWA is also able to undertake and procure minerals research itself and to collaborate with local, Australian and worldwide research and scientific institutions. MRIWA funds are available for projects, programmes and events that promote public awareness of and interest in minerals research, and to support relevant academic activities. The expertise of MRIWA is available to the Minister and the WA Government.

Reason for new OBM for MRIWA

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 intention of the revised Key Performance Indicators reported here is 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 will be useful to key stakeholders as it is closely coupled to the Board decisions and is not be 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 will allow appropriate inclusion of projects commenced and completed during the reporting period.

It is recognised that it will be appropriate for MRIWA to measure the effect of its research investments on WA State minerals royalties, and their economic impact more broadly. It is recommended that as acquiring the information for these measures is a significant undertaking, and the results are difficult to audit, they are done only periodically, say 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.

Key Performance Indicators for the year ended 30 June 2016

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 | Financial and Economic Responsibility: Responsibly managing the State's finances through the efficient and effective delivery of services, encouraging economic activity and reducing regulatory burdens on the private sector. |
| AGENCY LEVEL GOVERNMENT DESIRED OUTCOME | Fostering and promoting minerals research for the benefit of the State. |
| KEY EFFECTIVENESS INDICATOR | <p>KPI 1 Ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects.</p> <p>Notes:</p> <p>a) Investment totals are for projects approved by the MRIWA Board in the reporting year.</p> <p>b) Measure reported as a multiple.</p> |
| SERVICE | Administer research grant applications and manage approved projects. |
| KEY EFFICIENCY INDICATOR | <p>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.</p> <p>Notes:</p> <p>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.</p> <p>b) The "total value of research projects" to be calculated as the annual average of the end-of-month values.</p> |

Key Performance Indicators for the year ended 30 June 2016

| KPI 1 - Effectiveness Indicator – Outcome | Target | Actual | |
|---|-------------------|-------------------|-----------------|
| Ratio of total cash investments in research projects to total approved MRIWA cash investment in those research projects | (multiple) | (multiple) | Comments |
| 2014/2015 | 3 | 1.9 | |
| 2015/2016 | 3 | 2.14 | (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. | (%) | (%) | |
| 2014/2015 | 4.5 | 6.4 | |
| 2015/2016 | 4.5 | 5.7 | (b) |

- (a) The below-target actual result is the consequence of the financial difficulties experienced by the minerals industry resulting from the downturn in global mineral commodity prices in recent years. Industry companies have less cash available to invest in research. It has been more difficult to attract industry investment into research applications to MRIWA.
- (b) The above-target result is primarily the consequence of the lower financial leverage of applications approved during the year ended 30 June 2016. The Board has taken steps to increase the financial leverage of the portfolio of research projects. This has included declining applications with low financial leverage and approving applications conditional on the applicant securing additional other party investments for the project.

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 2015/16

| Name | Position | Type of remuneration or fee | Section of MRIWA Act | Appointment Approved | Notes | Period of Member-ship | Gross remuneration (\$) |
|-----------------------------|--------------|-----------------------------|----------------------|----------------------|---------------------------|-----------------------|-------------------------|
| Ms Michelle Jane ANDREWS | Deputy Chair | Annual / \$0 | Section 27 (1) (c) | 28 January 2014 | - | 3 years | 0 |
| Prof Mark BUSH | Member | Annual / \$11,405 | Section 27 (1) (d) | 19 October 2015 | | 3 years | 5,702 |
| Ms Helen COOK | Member | Annual / \$11,405 | Section 27 (1) (a) | 28 January 2014 | - | 3 years | 11,405 |
| Mr Stedman David ELLIS | Member | Annual / \$11,405 | Section 27 (1) (d) | 28 January 2014 | Term completed 31 Jan '16 | 2 years | 5,702 |
| Ms Denise GOLDSWORTHY | Member | Annual / \$11,405 | Section 27 (1) (a) | 19 October 2015 | - | 3 years | 5,702 |
| Dr Peter Arthur LILLY | Chair | Annual / \$22,691 | Section 27 (1) (b) | 19 October 2015 | Re-appointed | 3 years | 22,691 |
| Mr Clive Phillip LOCKYER | Member | Annual / \$11,405 | Section 27 (1) (a) | 28 January 2014 | Term completed 31 Jan '16 | 2 years | 5,702 |
| Mr Larry LOPEZ | Member | Annual / \$11,405 | Section 27 (1) (d) | 19 October 2015 | - | 3 years | 5,702 |
| Mr James Timothy MCCLEMENTS | Member | Annual / \$11,405 | Section 27 (1) (d) | 28 January 2014 | Resigned 31 Dec '15 | 3 years | 5,702 |
| Mr Andrew Arthur SHOOK | Member | Annual / \$11,405 | Section 27 (1) (b) | 28 January 2014 | - | 3 years | 11,405 |

Advisory Committee to the Minerals Research Institute of Western Australia at 30 June 2016

| 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) | 30 September 2015 | 31 July 2018 | 1,082* |
| Dr Christopher BAKER | Member | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | 2,063* |
| Mr Gerard DANCKERT | Member | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | 735* |
| Prof John DELL | Member | Attendance | Section 60 (1) | 2 October 2015 | 31 January 2018 | 576* |
| Mr Rob FREETH | Member | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | 192 |
| Dr Rob HOUGH | Member | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | 192* |
| Dr Bryan SMITH | Member | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | 2,735 |

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) | 30 September 2015 | 31 January 2018 | See Advisory Committee |
| Mr Peter BEWICK | Member Theme 1 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 990 |
| Dr James CLEVERLEY | Member Theme 1 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 684 |
| Mr Grant CAFFREY | Member Theme 3 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 114* |
| Mr Gerard DANCKERT | Chair Theme 2 | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | See Advisory Committee |
| Prof John DELL | Chair Theme 4 & 5 | Attendance | Section 60 (1) | 2 October 2015 | 31 January 2018 | See Advisory Committee |
| Mr Jon HRONSKY | Member Theme 1 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 114* |
| Dr James KYLE | Member Theme 3 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 420 |

| Name | Position (see Note 2) | Type of remuneration or fee | Section of MRIWA Act | Appointment Approved | Period of Membership | Gross remuneration (\$) |
|----------------------|--------------------------|-----------------------------|----------------------|----------------------|----------------------|-------------------------|
| Dr Ivor ROBERTS | Member Theme 1 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 570* |
| Mr David ROSE | Member Theme 2 | Attendance | Section 60 (1) | 2 October 2015 | 31 January 2018 | 384 |
| Dr Gamini SENANAYAKE | Member Theme 3 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 534 ⁽¹⁾ |
| Dr Bryan SMITH | Chair Theme 1 | Attendance | Section 60 (1) | 30 September 2015 | 31 January 2018 | See Advisory Committee |
| Mr William STAUNTON | Member Theme 3 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 596 |
| Mr Richard STROUD | Member Theme 2 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 420 |
| Mr John de VRIES | Member Theme 2 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 228* |
| Dr Chris WARD | Member Theme 4 & 5 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 114* |
| Prof Kathleen WRIGHT | Member Theme 4 & 5 | Attendance | Section 60 (1) | 1 October 2015 | 31 January 2018 | 602* ⁽¹⁾ |

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 \$7,209.

| Expenditure was incurred in the following areas | Total | Expenditure | Amount |
|---|---------|---|--|
| Advertising agencies | \$7,209 | PK Print DMP Communications Telstra Directories Listings West Australian Advertising | \$477 \$1,690 \$2,616 \$2,426 |
| 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 and Petroleum 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 and Petroleum 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 and Petroleum.

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 and Petroleum 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 2016/17

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 2015/16, as approved by the Minister for Mines and Petroleum; and Small Business, are as follows:

STATEMENT OF COMPREHENSIVE INCOME

| | ESTIMATE 2017 \$ |
|---|---------------------------------|
| COST OF SERVICES | |
| Expenses | |
| Research grants | 4,252,525 |
| Scholarships | 252,432 |
| Loss on disposal of assets | - |
| Employee benefits expense | 571,240 |
| Institute Contractor fees | 86,400 |
| Board and committee fees and costs | 139,817 |
| Supplies and services | 208,682 |
| Other expenses | 18,000 |
| Accommodation expenses | 47,250 |
| Depreciation expense | 6,000 |
| Total expenses | <u>5,582,346</u> |
| Income | |
| <i>Revenue</i> | |
| Interest revenue | 230,000 |
| Other revenue | 68,311 |
| Revenue from Industry Sponsorship | 1,939,403 |
| Donations | - |
| Total revenue | <u>2,237,714</u> |
| Total income other than income from State Government | <u>2,237,714</u> |
| NET COST OF SERVICES | <u>3,344,632</u> |
| Income from State Government | |
| State Government Grant | 4,073,000 |
| Resources received free of charge | 47,250 |
| Total income from State Government | <u>4,120,250</u> |
| Surplus for the period | <u>775,618</u> |
| TOTAL COMPREHENSIVE INCOME FOR THE PERIOD | <u>775,618</u> |