The Western Australian Biodiversity Science Institute

Committee Secretary
Senate Standing Committees on Environment and Communications
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Sir/Madam,

RE: WABSI submission for the Senate Inquiry into "Rehabilitation of mining and resources projects as it relates to Commonwealth responsibilities"

Key Points:

- WABSI, a joint venture of the leading research organisations and mining regulatory bodies in WA, is ideally positioned to facilitate the delivery of science to address key issues in the rehabilitation of mining and resources projects.
- WA's unique environment and the youth of restoration science means research and implementation must be tightly coupled to ensure continuous improvement in mining restoration outcomes – WABSI provides a key mechanism for this.
- Significant research capacity and effort is being invested in mining rehabilitation – WABSI can support collaboration to reduce duplication and address major knowledge gaps.
- Research must address the needs of industry and government to ensure improved mining rehabilitation outcomes for the State – WABSI prioritises biodiversity research that reflects WA's Industry and government needs.
- Improved outcomes can be achieved by enhancing knowledge sharing – WABSI provides a key mechanism for delivering translational science and fostering knowledge sharing between sectors and across disciplines.

About WABSI

The Western Australian Biodiversity Science Institute (WABSI), established in October 2015, is a joint venture between ten leading organisations in Western Australia – The University of Western Australia, Murdoch University, Curtin University, Edith Cowan University, CSIRO, Department of Premier and Cabinet, Department of Parks and Wildlife, Department of Mines and Petroleum, Botanic Gardens and Parks Authority and the Western Australian Museum.

Our Vision:

High quality, relevant biodiversity knowledge that is readily accessible to industry, government and the broader community to better manage the State's biodiversity.

Our Purpose:

Through a broad consultative process, identify strategic priorities, for acquiring, managing and communicating Western Australian terrestrial biodiversity knowledge.

- Enable and support high quality end user driven research to address critical knowledge gaps.
- Deliver excellence and efficiencies in research by fostering constructive collaboration across sectors and between researchers.
- Ensure information is available in a form that is relevant and accessible to government policy makers, industry, land managers and other stakeholders.

Collaborative Science

Western Australia has a strong track record in collaborative research to address mine site rehabilitation research. This has been built from partnerships between industry, government and researchers that has developed world leading rehabilitation technologies for many regions of the State, most notably from the Alumina Industry in the Darling Ranges. Large scale projects such as the Restoration Seedbank Initiative and ARC Industrial Transformation Training Centre for Mine Site Restoration (CMSR), together with numerous other industry supported research projects, are currently underway to help develop the science, knowledge, and technical skills required to improve the delivery of proven, cost-effective, and scalable restoration of biodiverse native vegetation communities in the resource rich regions of Western Australia.

However, despite the scale of these individual activities, we know that these are only incrementally improving our ability to successfully rehabilitate and restore Western Australian mining landscapes. WABSI represents a natural progression, to build on and improve the successful activities being implemented by our partners to ensure improved outcomes for mining rehabilitation in Western Australia. WABSI provides a mechanism to foster collaboration across these major and minor research initiatives and ensure they are contributing to the long term goals and priorities for Western Australian biodiversity science that will address the key needs for our state. This will also ensure greater efficiencies in funding investment decision, reducing duplication and empowering the significant research capacity held in the State.

Collaboration across the broader research community and between industry groups is also fundamental to ensure the knowledge gained from mining rehabilitation science and management are extended across WA's land use systems and ecological communities. This is particularly important in ensuring that rehabilitation at all current and legacy mine sites across WA are informed by the latest science and achieving the best biodiversity outcomes for the State

WABSI Research Priorities for Mining Rehabilitation

Mining is a major contributor to the Western Australian economy, accounting for 23% of Western Australia's GSP and 55% of Australia's mining gross value added in 2015-16 (State Development, 2017). The growth of the mining sector has also led to a large increase across the State in the area requiring rehabilitation before a mine site can be closed and relinquished. For example, in the EPA's 2012/13 annual report, this was estimated to be an area of over 120,000ha in the Pilbara alone. Given the unique biodiversity and variety of environments in which mining occurs across WA, this places significant pressure on the sector to successfully rehabilitate mine sites and to be able to identify and assess when agreed completion criteria have been met.

One of the four priority nodes in the WABSI research framework is focused on restoration and ex-situ conservation, and aims to:

Develop and facilitate the adoption of cost effective and scalable strategies and tools for the restoration and reconstruction of Western Australian ecosystems and the reintroduction of threatened plants and animals.

This node seeks to progressively build upon Western Australia's capacity to restore and rehabilitate key disturbed ecosystems, establish new populations of threatened species through translocations and protect species through ex-situ collections. Successful reconciliation of the ongoing development of the State, with the objective of biodiversity conservation, requires a proven capability to understand and restore species and ecological communities.

A key goal of the process of ecological restoration is recovering historic ecological continuity that was interrupted by ecosystem impairment. Historic continuity is not necessarily the recovery of what occurred in the past but rather the continuity or persistence of an intact ecosystem in response to an ever-changing environment, which can lead to new expressions of that ecosystem in the future. This research node seeks to address the significant task of progressively building the capacity of land managers across the State to understand and develop successful strategies for the restoration of ecological communities and the reintroduction of species.

Challenges include:

- Limits to our understanding of how to undertake restoration or reintroduce key animal and plant species across the vast majority of Western Australian ecosystems.
- The need to establish criteria for success in different environments to inform decision making.
- Building capacity to set standards for, and undertake restoration of, ecosystems when key environmental attributes such as climate, soil chemistry or groundwater levels have changed.
- Developing an understanding of the relative costs and benefits of restoration, including determining at what standard efforts of restoration should take place and in what timeframe.

When considered in the context of mining rehabilitation, these challenges manifest differently across the regions of the State. For example:

- Many ecological communities in the biodiverse South West of the State are localised and are often found in association with specific habitats and substrates. Multiple development pressures, including mining, and a drying climate have placed significant stress on key ecosystems, such as the jarrah forests and coastal heath lands that are suffering widespread Phytophthora dieback caused by disease, drought and changed fire regimes. Research is required to identify how strategies, such as selection of seed from drought resilient stock or maximising genetic diversity, may be required to ensure these ecosystems persist into the future.
- Mining developments throughout the State require realistic and achievable mine closure standards, including consideration of the potential to maximise conservation outcomes across site and landscape scales.

- Whilst researchers, industry and government agencies in Western Australia have delivered some notable advances in restoration science and practice, limited analysis and documentation of past restoration practices has made it difficult to define existing methodologies and continuously improve restoration practice.

An opportunity exists for WABSI to harness and leverage existing knowledge and expertise for wider application throughout the State.

WABSI Current Activity

Whilst WABSI is still in its foundational stage, we have begun the process of better linking Research, government and industry to continuously improve rehabilitation outcomes in Western Australia. Some key initiatives that we have received initial support for include:

The Pilbara Rehabilitation Initiative

WABSI has recently been endorsed by the Pilbara Rehabilitation Group, a collective of 13 mining companies working together to better facilitate knowledge sharing in Pilbara Mining Rehabilitation, to lead the development of the Pilbara Rehabilitation Initiative (PRI). The PRI identifies key knowledge gaps in physical and biological aspects of mining rehabilitation in the Pilbara, and provides a strategic framework for investing in mining restoration research. As a planning tool that will be informed by industry, government and the Research community, it is anticipated that this will become a key platform that can inform both public and private sector funding decision making to ensure investment is addressing the mining rehabilitation and biodiversity outcomes in the region.

State Framework for Completion Criteria and Monitoring

WABSI is currently developing a program of work that will bring Western Australia's leading scientists together to review research relevant to the completion criteria development and rehabilitation monitoring in Western Australia. The project has been endorsed by the Chamber of Minerals and Energy in WA, will work closely with industry and government to develop an independent, science based framework that can support the development of standards for mine closure and relinquishment in the State. This has been recognised as a key stone project by WABSI following extensive consultation and provides an opportunity for Western Australia to develop world leading practice in assessing post mining rehabilitation success that is underpinned by the latest research and scientific understanding.

Yilgarn Banded Iron Formation Research Synthesis

WABSI has recently brought together researchers from a number of its partner organisations, including Curtin University, Botanic Gardens and Parks Authority, University of Western Australia and Department of Parks and Wildlife to deliver a workshop in partnership with the newly formed ARC ITTC Centre for Mine Site Restoration that will result in the publication of research describing conservation and restoration challenges and learnings from the significant research effort that has been directed towards understanding and managing the potential impact of mining within these systems. This activity highlights the value of collaboration and leading science in informing mine site restoration.

Research Plan Review and Stakeholder Engagement

WABSI is currently engaging with a large number of stakeholders to ensure that WABSI facilitated research is addressing the key priorities for the State. We have begun the process of mapping out and engaging with all key end users of biodiversity information to support sustainable development within the State. WABSI is continuing the implementation of a state wide stakeholder engagement strategy to ensure that we can best reflect the diverse needs of those responsible for land management decision making. As a joint venture representing the major research providers in Western Australia, we are also building a unique database and understanding of the biodiversity research being undertaken within WA. This provides valuable insights that can reduce duplication of research effort and enhance knowledge sharing across funding programs to improve research quality and impact.

For further information, please contact:

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