



13 JUSTIFICATION AND CONCLUSION

13.1 Justification

The Proposal is considered justified because it:

- Provides diversity in the mining sector.
- Responds to a recognised need and is consistent with WA and national waste management strategies in addition to regional economic strategies and plans.
- Provides a number of community and economic benefits including opportunities for the long-term, storage, treatment and recovery of valuable materials or the permanent isolation of hazardous, intractable and LLW in addition to long-term full-time employment.
- Would not result in significant effects on the environment.
- Is consistent with the principles of sustainability and environmental protection.

Proceeding with the Proposal would result in significant social and economic benefits, including:

- Providing a unique dual revenue business that commercialises an industrial bulk commodity (kaolin) and provides safe management solutions for difficult to manage hazardous waste resources.
- Future potential recovery of valuable materials.
- Long-term jobs and major investment and business opportunities in remote regional Australia.
- Diversification of the economy by an environmental infrastructure business with strong social, environmental and economic values.
- Royalties, taxes and levies over the 25 year term could support other parts of the economy.
- Employment and business opportunities that can support local and regional communities.
- Long Proposal life of 26 years. The site can be expanded for generations (1 year build, 25 year operation).
- Creation of approximately 90 jobs during the build phase, and approximately 23 direct and 46 indirect (2x multiplier) during the operation phase.
- Benefits would apply to local Indigenous communities where opportunities for training, employment and business opportunities during construction and operations exist.
- When operating, the Facility would also provide a reliable long-term utility service to other industries that produce waste materials within Australia.
- The Facility could attract new kaolin and waste recycling and recovery industries to WA, and support industrial development in WA, bringing attendant economic benefits.



13.1.1 Environmental effects

Detailed scientific desktop and field investigations were undertaken to assess key environmental factors and to discuss their potential environmental impacts, positive or negative, during both construction and operation of the Proposal. These included specialist studies of biodiversity, soils, cultural heritage, surface, groundwater and radiology.

Potential environmental impacts of the Proposal are documented in this PER. Mitigation and management measures have been documented to avoid and/or reduce potential impacts identified during various risk assessments. Based on the environmental impact and risk assessment, the Proposal would result in the following (direct) environmental impacts:

- **Flora and vegetation:** up to approximately 276.05 ha of native vegetation would be removed during the construction of the Facility. Direct clearing of each vegetation association present within the proposed development envelope represents clearing less than 1% of their current remaining extent in the region. There would be no impacts on Threatened or Priority Ecological Communities (listed under the WC Act) or Threatened or Endangered Ecological Communities (listed under the EPBC Act). In addition, there would be no impacts on flora species listed as having conservation significance under the WC Act or the EPBC Act. These species would be avoided during construction and operation of the Proposal.
- **Terrestrial fauna:** the removal of up to approximately 276.05 ha of native vegetation would result in the loss of foraging, breeding, roosting, sheltering and/or dispersal habitat for some fauna species. Most fauna species are not confined to a specific habitat type, and given the presence of large areas of suitable adjoining habitat, the proposed clearing would not have a significant impact on fauna habitats. Clearing of vegetation would not likely have a significant impact on fauna species listed as having conservation significance under the WC Act or the EPBC Act. All fauna species would readily move to adjacent undisturbed vegetation once vegetation clearing commences.

Mitigation measures that would be implemented during both construction and operation have been proposed to avoid (eliminate) or ensure potential impacts are short-term and easily managed. The environmental performance of the Proposal would be managed through the implementation of construction and operational environmental management plans and monitoring programs. This would also help to ensure compliance with relevant legislation and any conditions of approval.

Based on the above, construction and operation of the Facility would not result in a significant environmental impact, provided the mitigation and management measures outlined in this document are implemented. The Proposal would meet the environmental objectives described in the EPA's Environmental Assessment Guideline No. 8 (2015a).

13.1.2 Consideration of the principles of sustainability and environmental protection

The principles of sustainability and environmental protection include:



- **Precautionary principle.** Where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.
- **Inter-generational equity.** The present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.
- **Conservation of biological diversity and ecological integrity.** The conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making.
- **Improved valuation, pricing and incentive mechanisms.** This includes recognition of the principles that the costs of environmental externalities should be internalised and that the polluter should bear the costs associated with environmental pollution.
- **Waste minimisation.** All reasonable and practicable measures should be taken to minimise the generation of waste and its discharge into the environment.
- **Best practice.** When designing proposals, and implementing environmental mitigation and management actions, the contemporary best practice measures available at the time of implementation should be applied.
- **Continuous improvement.** The implementation of environmental practices should aim for continuous improvement in environmental performance.

An assessment of the Proposal against these principles is provided below.

Precautionary principle

A number of environmental investigations have been undertaken to ensure that the potential impacts of the Proposal are understood with a high degree of certainty. Where a higher degree of risk was identified, this included specialist studies. The assessment of potential impacts of the Proposal is considered to be consistent with the precautionary principle. The assessments undertaken are consistent with accepted scientific methodologies, and have taken into account relevant statutory and government agency requirements.

The Proposal has evolved to avoid environmental effects where possible and to reflect the findings of the studies undertaken. For example, the location of cells could be located to avoid plant species that have potential conservation significance. Safeguards have also been proposed to minimise the potential environmental impacts. These safeguards would be implemented during construction and operation of the Facility. A CEMP and OEMP would be prepared prior to construction or operation of the Facility.

Inter-generational equity

Construction and operation of the Facility has the potential to lead to some environmental and social disturbance. These disturbances include potential temporary elevated levels of traffic, noise and dust generation during construction. There would also be an increased potential for hazards and



risks (spills, etc.) during operation. However, strict implementation of the CEMP and OEMP would ensure there would be no significant impact that would diminish the health, diversity or productivity of the environment for present or future generations.

Conservation of biological diversity and ecological integrity

Surveys of flora and vegetation and a fauna assessment has been undertaken to identify potential adverse impacts on biodiversity. These studies demonstrate that the Proposal would not have significant impact on any local populations of native biota including threatened and endangered species, populations or ecological communities.

Improved valuation, pricing and incentive mechanisms

The environmental impact assessment has identified the environmental and other consequences of the Proposal and identified mitigation measures where appropriate to manage potential adverse effects. If approved, the construction and operation of the Proposal would be in accordance with relevant legislation, the conditions of approval and the CEMP and OEMP. These requirements would result in an economic cost to the proponent. The implementation of mitigation measures would increase both the capital and operating costs of the Proposal. This indicates that environmental resources have been given appropriate valuation in the development of the Proposal.

Waste minimisation

It is estimated that about 3.2 million tonnes of legacy wastes are temporarily stored in over 200 locations across Australia, awaiting an appropriate long-term storage option. The Proposal would minimise waste that is currently stored in temporary and often inappropriate storage locations, by providing a suitable near surface geological repository for permanent isolation of hazardous and intractable wastes.

Best practice

Best practice has been implemented in the design of the Proposal by reviewing practices at international LLW isolation facilities and adhering to international and national codes for isolation of LLW. It is considered best practice to prepare a Safety Case for a LLW near surface geological repository. At this stage of the Proposal, the proponent has prepared an outline Safety Case which is provided in Appendix A.15.

Recommendations for environmental mitigation and management measures specified by technical experts have been included in this PER to eliminate or reduce the potential environmental impacts associated with the Proposal.

Continuous improvement

Continuous improvement and corrective actions are of paramount importance, and are a fundamental part of the EMS. An environmental monitoring program enables auditing of mitigation measures to ensure they achieve their objectives and to facilitate modification, where necessary. An



environmental monitoring program would be established for both the construction and operational phase of the Proposal. Monitoring requirements would be listed within the CEMP and OEMP.

13.2 Conclusion

13.2.1 Conclusion

Sandy Ridge is located 240 km north-west by road from Kalgoorlie and 75 km north-east of Koolyanobbing in WA. Sandy Ridge is a very remote site. It is located within a semi-arid environment where annual average evaporation rates are approximately eight times higher than annual average rainfall. The site has been geologically stable and arid for millions of years and is highly likely to remain so.

The proponent proposes to develop a dual revenue business comprising a kaolin open cut mine. The mine would produce up to 290,000 tpa of ore, and up to 40,000 tpa of mostly ceramics for the Asian export market from an onsite kaolin processing plant. By using the voids resulting from mining for the secure storage, recovery of valuable materials may one day be possible. The Proposal would see the permanent isolation of up to 100,000 tpa of hazardous and intractable waste using a best practice safety case over a 25 year operating life.

This Public Environmental Review has been prepared to support the approval of the Proposal under Part IV of the *WA Environmental Protection Act 1986* and, under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth). The Public Environmental Review has been prepared to address the requirements set out in the final ESD for the Proposal issued by the WA OEPA on 27 May, 2016. The Public Environmental Review has also been prepared to address the requirements set out in Schedule 4 of the *Environment Protection Biodiversity Conservation Regulations*.

Mining kaolin clay would diversify the WA mining sector and help strengthen the circular economy. The Sandy Ridge Proposal would provide long-term training and job opportunities at a local and regional level.

There is a need and obligation to provide for the safe and secure storage of hazardous, intractable and low level radioactive wastes that continue to be generated across a wide spectrum of business and research organisations within Australia. Currently, such wastes are stored in hundreds of locations across Australia, often in unsecured and inappropriate locations. The current management of such waste types can lead to significant and potentially long-term adverse impacts on human populations and our environment.

The kaolin ore would be temporarily stored at the Sandy Ridge site before being transported by road to Fremantle Port. From there, it would be loaded onto ships and exported to Asia for production in dinnerware products.



Before arriving at Sandy Ridge, waste products would be temporarily stored at strategic warehouse locations that are appropriately rated and licensed. The bulk of waste products would be transported by rail to Kalgoorlie.

The Sandy Ridge Proposal has been developed and designed in accordance with similar facilities currently operating best practice techniques in France and Spain. The Proposal offers the waste industry and government regulators an opportunity to provide an economically and practically accessible end point solution for hazardous and intractable waste storage and isolation in Australia.

Environmental investigations were undertaken to assess the potential impacts from the construction and operation of the Proposal in accordance with relevant environmental legislation and relevant guidelines and procedures established by regulatory agencies. Based on the findings of the environmental investigations, the Proposal would result in some short-term adverse effects on the environment. These effects would be easily managed and mitigated by implementing the various environmental mitigation measures outlined in this PER. They would also be managed by adhering to relevant legislation, regulations, policies and guidelines.

If approved, the environmental performance of the Proposal would be managed through the implementation of a construction environmental management plan and an operational environmental management plan. Both plans would be underpinned by site specific and detailed environmental management plans. The preparation and implementation of such plans would ensure compliance with relevant legislation, regulation and any conditions of approval.

It is considered that the Proposal is justified on the basis that it meets the standards required for a near surface geological repository, and is environmentally acceptable because it has been assessed to meet necessary Commonwealth and WA regulations and guidelines. In addition, the Proposal has been assessed within this PER as being in accordance with the principles of sustainability and environmental protection.

Based on this PER, it is considered that the long-term operational benefits of the Proposal would outweigh the short term, minor adverse effects identified in the risk assessment.

13.2.2 Recommendations

It is recommended that the Proposal be approved for the following reasons:

- The Public Environmental Review has addressed the requirements of work set out in the Environmental Scoping Document. It has also addressed all necessary environmental guidelines as required by the Office of the Environmental Protection Authority and the Commonwealth Department of the Environment.
- The assessment of key environmental factors has involved detailed quantitative scientific assessment and consultation with key government and non-government stakeholders. The assessment has concluded the Proposal can be constructed and operated without resulting in significant risks on either the environment or human populations.



- Where the risk assessment has identified potential issues, the environmental assessment has proven, by way of modelling and consultation, those issues can be easily managed through tailored environmental management measures that meet relevant government and best practice guidelines.
- The site is located on vacant Crown reserve which is not constrained by any matters of national environmental significance under the *Environment Protection Biodiversity Act 1999*. The site has been extensively surveyed for potential rare, threatened or endangered plants and/or animals. There would be no impacts on Threatened or Priority Ecological Communities (listed under the WC Act). Field survey results confirm the site is not constrained by sensitive plants or animals and it lacks the necessary habitat for such species to occur.
- The potential environmental, social and economic benefits of the Proposal outweigh any potential negative issues. If approved, the Proposal would address what is a serious legacy intractable waste issue in Australia. It would result in long-term, inter-generational jobs at both the regional and local employment level. The Proposal would encourage regional investment, training, business opportunities, growth in infrastructure, royalties and taxes for Western Australia.
- In a period when the Australian mining sector is experiencing a significant downturn, the Proposal promotes diversification by introducing kaolin mining. The kaolin resource can be mined for 25 plus years thus ensuring long-term stability in the WA mining sector.
- If approved, the Proposal would positively contribute to several initiatives put forward by government authorities such as the Australian Government *National Waste Policy* and the WA Government *Western Australian Waste Strategy*. It would also be consistent with the aims and objectives of numerous strategic plans prepared for the Goldfields-Esperance Region.
- By storing like with like wastes, the Proposal can provide for future waste recovery and re-use projects. This in turn creates opportunities for current and future research opportunities.
- The 'do nothing' option would not realise the potential benefits that have been identified in this PER.