

## Chapter 22

# Conclusion and Recommendations



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## 22 CONCLUSION AND RECOMMENDATIONS

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### 22.1 Conclusion

Tellus propose to construct and operate an underground rock salt mine and a complementary storage, recovery and permanent isolation facility (herein referred to as the ‘Chandler Facility’). A rail siding and temporary storage and transfer facility that would be located adjacent to the Central Australian Railway (herein referred to as ‘the Apirnta Facility’) is also proposed. A private haul road linking the two facilities (herein referred to as the ‘Chandler Haul Road’) would be constructed. A private access road (herein referred to as ‘Henbury Access Road’) would be constructed to link the Apirnta Facility with the Stuart Highway. Collectively, the two proposed facilities and the haul and access roads are referred to as “the Proposal”.

If approved, the Chandler Facility and Chandler Haul Road would be located within the Maryvale Station (NT Portion 810), approximately 120 kilometres south of Alice Springs and about 25 kilometres by road from the community of Titjikala. The Apirnta Facility, Henbury Access Road and a portion of the Chandler Haul Road would be located within Henbury Station (NT Portion 657), approximately 30 kilometres to the west of the Chandler Facility. This EIS has been prepared by the proponent to support the key approvals under both the EA Act and the EPBC Act for the construction and operation of the Proposal. This EIS has been prepared to address the requirements set out in the Terms of Reference issued by the NT EPA on 23 September, 2016 under the EA Act.

#### 22.1.1 Salt business

According to the 2014 Salt Market Report by Roskill, salt has greater than 14,000 commercial applications globally. Approximately 80 % of salt is consumed across four main markets. These include Chloralkali production, synthetic soda ash production and road de-icing.

##### *Challenges and opportunities in the salt market*

Through desktop research, industry consultation, and domestic and international site visits, dry and wet salt pilot projects and marketing direct to buyers the proponent has developed a high level of understanding of both the international and domestic salt demand and supply forecasts. A summary of the current salt market situation, the challenges and opportunities in the salt market and how these challenges and opportunities relate to the Proposal is provided in Table 22-1.

Given the specification and quality of the proponent’s salt within the Chandler Formation, the chloralkali industry in China, Japan and Indonesia are considered to present the greatest opportunity for the export of salt from the Proposal.



**Table 22-1 Challenges and opportunities in the salt market**

Current situation	Challenges and opportunities	Competitive advantage of the Proposal
<ul style="list-style-type: none"><li>Asia consumes about 42 % of the global supply of salt.</li><li>Demand for salt is growing at 3-5 % per annum in Asia.</li><li>Australia is the largest external supplier of salt to Asia (about 60% of salt imported to Asia comes from Australia). However, Australia is near production capacity.</li><li>Australia produces approximately 13.2 million tonnes of salt per annum (M tpa) predominantly via solar evaporative salt facilities in Western Australia.</li><li>In Australia and Asia, salt is produced predominantly via solar evaporative salt facilities – heavy rain and cyclones can disrupt salt production in solar evaporative facilities for months at a time.</li><li>This process is also quite inefficient (about 65 tonnes of sea water is needed to produce one tonne of salt) and time intensive (the process can take between 12-18 months).</li></ul>	<p><b>Challenges</b></p> <ul style="list-style-type: none"><li>There is growing concern by Asian salt buyers about reliable supply, quality and price pressure.</li><li>There is an approximate six million tonne shortfall of salt expected in the Asian market by 2018.</li><li>To meet this shortfall, up to 47,000 hectares of new solar evaporative salt facilities would be required along environmentally sensitive coastal areas.</li><li>It is becoming increasingly difficult to secure approvals for new solar evaporative salt projects in Australia due to their environmental impact. (three recent failed applications 2.5 M tpa, 3- 4 M tpa and approximately 1 M tpa).</li></ul> <p><b>Opportunities</b></p> <ul style="list-style-type: none"><li>There are new markets in Asia and growing demand from existing markets, but growing supply pressures.</li><li>An opportunity exists to meet the growing demand for salt in Asia. This opportunity is mining of rock salt in the Chandler Formation in the NT. Currently, no deep rock salt mining exists in Australia.</li></ul>	<ul style="list-style-type: none"><li>Unlike solar evaporative salt facilities which are located in environmentally sensitive coastal areas and, are becoming increasingly difficult to obtain planning approval for, the Proposal will have a relatively small surface footprint and is located in semi-arid zone not affected by cyclones, in a geographically and tectonically stable area.</li><li>Extensive investigations have proven that billions of tons of salt are contained within the Chandler Formation.</li><li>Mining this salt could easily be scaled up to meet demand.</li><li>Core testing shows high grade salt is available.</li><li>Existing logistics infrastructure is in place and has spare capacity.</li><li>The Adelaide/Darwin Railway Line is located adjacent to the proposed Apirnta Facility and would be used to transport salt from the proposed Chandler Facility to port facilities in Adelaide.</li><li>Australia is a gateway to Asia. We are closer than India and Chile who also supply salt to Asia.</li></ul>

## 22.1.2 Storage business

There is a need and regulatory obligation to provide for the safe and secure storage, recovery of valuable materials and the permanent isolation of hazardous waste. The solution put forward involves the storage (retrievable) and recovery of valuable materials and the permanent isolation of such wastes in a deep underground geological repository that safeguards human health and the environment from harm over geological time. This can be achieved by applying proven scientific and environmentally sound management principles.



A geological repository is an underground storage or disposal facility of hazardous waste that relies on both a natural geological barrier (e.g. a salt bed) and man-made engineered barriers that both form part of a multi barrier system as part of an overall safety case that is globally recognised for its permanent isolation capabilities. The natural geological barrier isolates waste from the biosphere safely and permanently. Once the repository is closed, it requires very little ongoing monitoring as the geological barrier is passively safe. The lifespan of containment is in the hundreds of thousands to millions of years. As a result, geological repositories that can permanently isolate materials are globally considered ‘best practice’ for hazardous waste.

### Waste hierarchy

There is a clear difference between what is considered best practice for hazardous and non-hazardous wastes. The ‘waste hierarchy’ methodology suggests the primary focus of waste management should be on reusing, recycling and recovering materials. This methodology is a broadly accepted policy for general (non-hazardous) wastes (refer to Figure ES-3).

A different framework is appropriate for hazardous wastes, which present a danger to health or the environment and, as such, should generally not be re-integrated into manufacturing processes for re-use. With these kinds of wastes, international best practice as reflected in conventions such as *the Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal* (‘The Basel Convention’) adopt environmentally sound management principles, which focus on the permanent removal of such wastes from the biosphere, and in so doing protect the environment and human health.

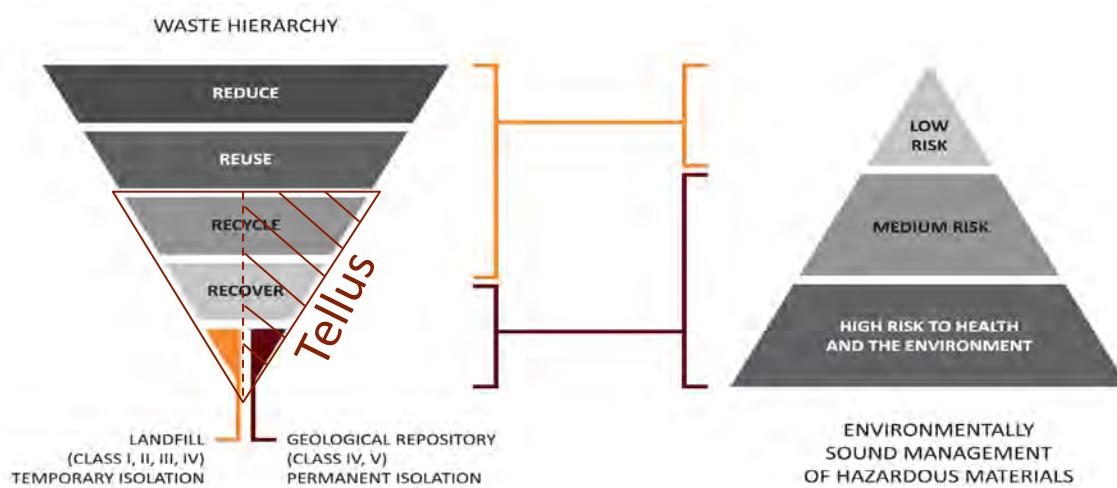
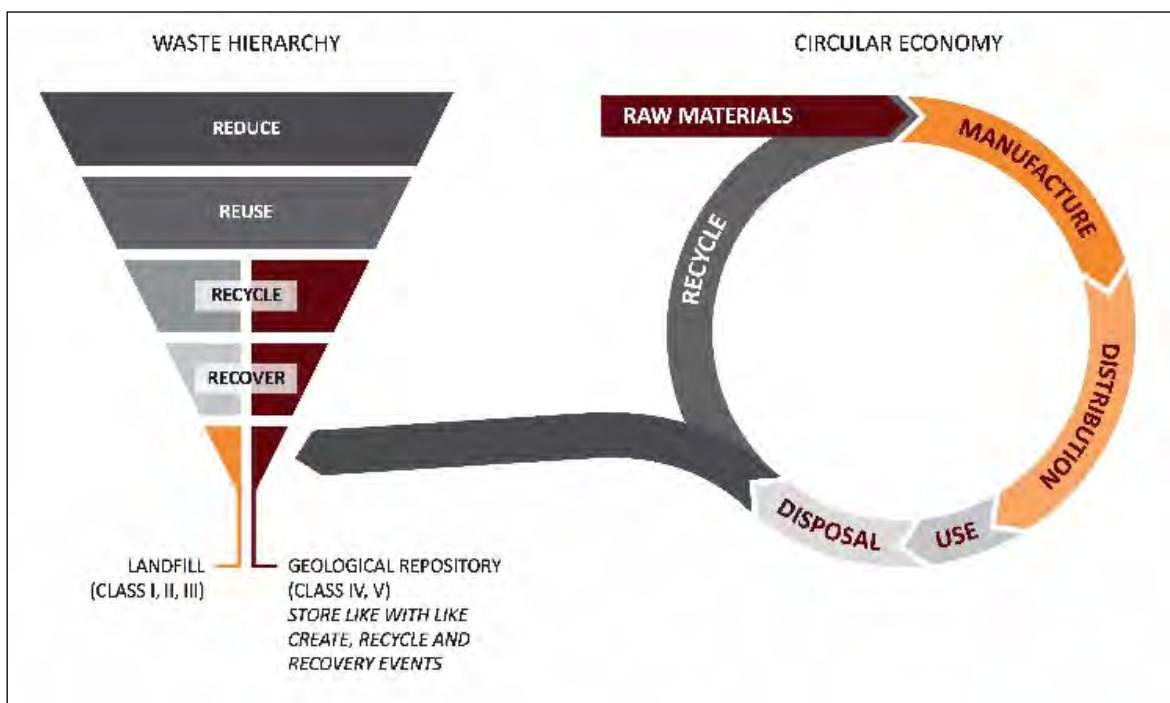


Plate 22-1 The waste hierarchy and the proponent’s service offering

### Circular economy

One of the advantages of geological repositories is that one can also support the circular economy using long term storage by placing ‘like-with-like’ materials for operational safety reasons and to create opportunities for the future recovery of valuable materials. The proponent’s business model mirrors international solutions operating in the United Kingdom, Europe and North America.



**Plate 22-1 The proponent's business model supports the circular economy**

#### *Challenges and opportunities in the waste market*

Through desktop research, industry consultation, and domestic and international site visits, salt pilot projects and marketing direct to buyers the proponent has developed a high level of understanding of both the design, construction, build and closure experience of mostly the European and North American facilities, plus domestic waste demand and supply forecasts. A summary of the current waste market situation, the challenges and opportunities in this market and how these challenges and opportunities relate to the Proposal is provided in Table 22-2.

**Table 22-2 Challenges and opportunities in the waste market**

Current situation	Challenges and opportunities	Competitive advantage of the Proposal
<ul style="list-style-type: none"> <li>Australians are the second highest emitters of hazardous waste per capita</li> <li>Resources and energy boom translates to a waste boom.</li> <li>Manufacturing decline generates a contaminated soil waste boom.</li> <li>Market size: 6 M tpa and growing at 3% per year.</li> <li>Large legacy waste pool (900 M t) due to lack of</li> </ul>	<p><b>Challenges</b></p> <ul style="list-style-type: none"> <li>Waste production in Australia has grown at six times population growth.</li> <li>Australian and international accounting standards are now exposing the size of waste problem.</li> <li>Complex technical solutions, long lead times for viable solutions and costly alternatives are frustrating producers.</li> <li>Legislation increasingly banning surface landfills.</li> </ul>	<ul style="list-style-type: none"> <li>World's best practice</li> <li>Tellus stores like with like</li> <li>Tellus supports the circular economy = "Take, Make, Recover this Generation or Store Safely for next Generation or Dispose Safely".</li> <li>Permanent isolation of hazardous materials using sound environmental management principals.</li> <li>Cost advantage</li> </ul>



Current situation	Challenges and opportunities	Competitive advantage of the Proposal
<p><b>affordable supply and growing.</b></p> <ul style="list-style-type: none"><li><b>Increased regulation and environmental legislation.</b></li><li><b>Directors assume personal liabilities and this regime is now being extended further to certain employees.</b></li><li><b>Landfill liner useful life before isolation properties are compromised is 10-30 years, yet &gt;50% still accept hazardous waste.</b></li><li><b>Traditional re-processing, incineration, treatment before landfilling, storage/disposal into man-made engineered landfill are temporary solutions.</b></li><li><b>There are limited cost effective solutions available</b></li></ul>	<ul style="list-style-type: none"><li>Lack of transparency in pricing from existing players.</li><li>Transportation costs.</li><li>Complex regulatory issues.</li><li>Final disposal of mixed wastes types supports the linear economy “Take, Make and Dispose”.</li></ul> <p><b>Opportunities</b></p> <ul style="list-style-type: none"><li>Waste market is a \$14.5 billion industry that hires over 50,000 people and is growing.</li><li>No salt geological repository businesses exist in Australia.</li></ul>	<ul style="list-style-type: none"><li>Model removes company, Director and employee liability</li><li>Simplicity and flexibility</li><li>One of the few tools that can solve the large legacy waste problems</li><li>Tellus’ solutions could be key tools for governments in emergency situations (man made and natural disasters)</li><li></li></ul>

### *Benefits*

Proceeding with the Proposal would result in significant social and economic benefits in the NT and within Australia. The Proposal would:

- Provide an innovative unique dual revenue business in remote Central Australia.
- Diversify the economy.
- Major investment in regional Australia Boost the economy over the 29-year project life.
- Royalties, taxes and levies.
- Create training and long term job opportunities.
- Provide local business support and new business opportunities.
- Fulfil the government’s own environmental and waste policy obligations under the following four main regulatory regimes.
- Support the circular economy.

### *Environmental impact*

Environmental investigations were undertaken to assess the potential effects 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 minor adverse impacts on the environment.
- These impacts would be managed and mitigated by implementing the various mitigation measures outlined in this EIS and by adhering to relevant legislation, regulations, policies and guidelines.
- The environmental performance of the Proposal would be managed through the implementation of the construction, operational, and closure and rehabilitation environmental management plans. This would also help to ensure compliance with relevant legislation, regulation and any conditions of approval.

It is considered that the Proposal is justified on the basis of environmental acceptability and is in accordance with the principles of ecologically sustainable development.

Based on this environmental impact assessment, it is considered that the long term operational benefits of the Proposal would outweigh the minor adverse effects of the Proposal.

## 22.2 Recommendations

It is recommended that the Proposal be approved under Part 3 Sections 18, 18A, 20 and 20A of the *Environment Protection Biodiversity Conservation Act 1999*, and under the *NT Environmental Assessment Act* for the following reasons:

- It would not result in significant adverse environmental impacts on matters of National Environmental Significance under the EPBC Act and associated Regulations.
- It would not result in adverse impacts on human health.
- Appropriate engineering design and strict environmental on-site management (through both a construction and operational environmental management plan) would be followed to avoid the potential environmental impacts and adverse human health effects identified in this EIS.
- It would provide an innovative unique dual revenue business in remote Central Australia that should result in significant long term environmental, social and economic and benefits:
  - Environmental benefits include the safe and secure storage, recovery and permanent isolation of hazardous waste, support for the circular economy through the recovery of valuable materials and the fulfilment of the government's own environmental and waste policy obligations.
  - Social benefits include local and indigenous long term employment and training opportunities.
  - Economic benefits include a long term boost to the local economy, the creation of material local business prospects, royalties, taxes and levies.