ASSESSMENT REPORT

for the

CENTRAL EYRE IRON PROJECT

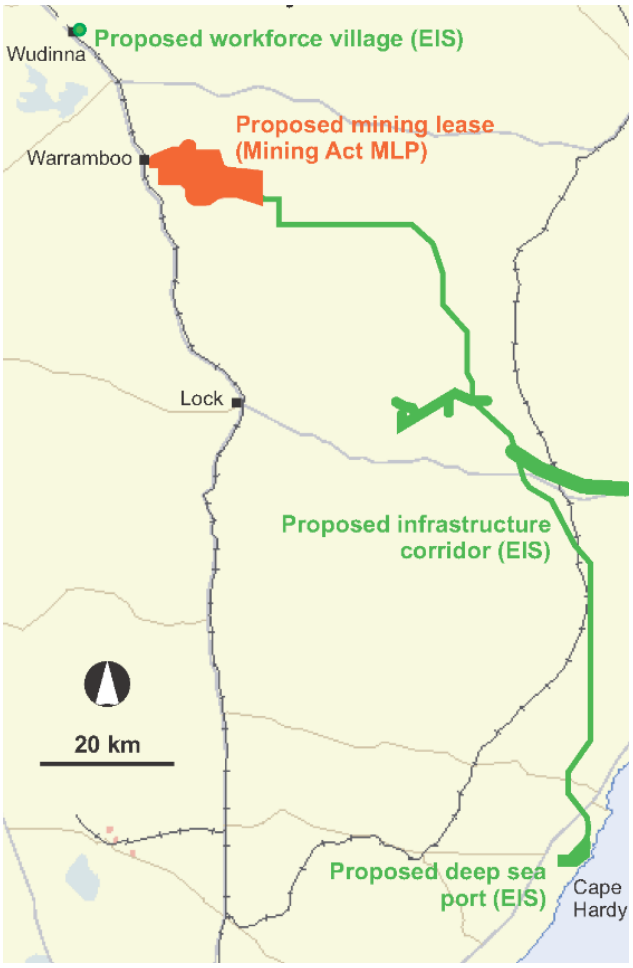
Environmental Impact Statement

Land use components - Sea Port at Cape Hardy, Infrastructure Corridors and

Wudinna long-term employee village

Iron Road Ltd

March 2017



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Government of South Australia
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1 INTRODUCTION

Iron Road Limited is proposing to mine a large magnetite resource adjacent Warramboo, and construct significant infrastructure designed to enable its transport and subsequent export from Australia.

Consideration of this proposal has required formal assessment, in a coordinated fashion noting the whole of project concept, under both the *Development Act 1993* and the *Mining Act 1971.* As a result of this approach the requirements for public consultation and assessment have been 'mirrored' as the assessment of the Mine and the mine infrastructure development have progressed under the *Mining Act 1971 and the Development Act 1993* (respectively).

This Assessment Report (AR) therefore identifies and assesses, in accordance with sections 46 & 48 of the *Development Act 1993*, the potential economic, environmental and social impacts of those land use components proposed by Iron Road Limited as part of its Central Eyre Iron Ore Project (CEIP). These components include the proposed Port at Cape Hardy, Infrastructure Corridors (containing rail, water, electricity and haul road) and the Wudinna long-term employee village.

Whilst this AR is intended to be a 'stand-alone' document, the detailed information on which it is based is contained within the 'Central Eyre Iron Project Environmental Impact Statement' released for public consultation on 19 November 2015 until 2 February 2016; submissions received from the general public, the Councils for Tumby Bay, Cleve, Kimba and Wudinna, and State Government agencies on the EIS, along with the proponent's responses to these comments in the Response Document (RD) dated October 2016. It also relies on further specific additional information, comments and advice provided by the proponent and relevant South Australian Government Agencies. Discussions with the Australian Government Department of the Environment and Energy have also been held on matters related to the *Environment Protection and Biodiversity Conservation (EPBC) Act 1999.*

The Environmental Impact Statement, public submissions and the Response Document to the Environmental Impact Statement are available on the CEIP website http://www.ceipconsultation.sa.gov.au for information.

2 ENVIRONMENTAL IMPACT ASSESSMENT

Environmental Impact Assessment (EIA) is the process of identifying the potential economic, environmental and social impacts of a proposal and appropriate measures that may be taken to minimise those impacts. The main purpose of EIA in the *Development Act 1993* (the Act) context is to inform decision makers of the likely impacts of a proposal, before decisions are taken. The process also allows community to make submissions on the proposal, based on the documents presented for assessment.

The following outlines the key procedural steps in the assessment process:

2.1 Major Development Declaration and Guidelines

An initial declaration under Section 46 of the Act was made for this proposal on 22 August 2013 and then re- issued on 29 May 2014 to take into account amendments to the affected land of the proposal. A Development Application for the development of the port and associated developments was made on 16 June 2014. On 29 June 2014 a referral was made by Iron Road Limited (the Proponent) pursuant to the *EPBC Act 1999* to ascertain if the proposal constituted a 'controlled action' by the Commonwealth Minister for the Environment.

The Minister for the Environment duly declared the action to be a 'controlled action' pursuant to the relevant legislation on 26 August 2014, mainly due to potential impacts on marine mammals and Southern Right Whales in particular. This action then triggered the Bilateral Agreement between the Commonwealth & the State of South Australia for environmental assessment under s45 of the *EPBC Act 1999.* This required a series of collaborative actions to be undertaken including consultation with the Commonwealth on the proposed contents of the Guidelines (required to be issued by the Development Assessment Commission (DAC)) to ensure that issues in relation to the 'controlled action' were formally taken into account by the proponent throughout the assessment process.

DAC subsequently considered the matter and determined that an Environmental Impact Statement (EIS) level of assessment was appropriate for this development. Guidelines were released to the proponent and the public (via advertisement) on 30 October 2014.

The main topics included for investigation are:

- Planning and environmental legislation and policies
- Need for the proposal
- Environmental Issues
    a) Coastal and Marine
    b) Native Vegetation (Terrestrial and Marine)
    c) Native Fauna (Terrestrial and Marine)
    d) Geology and Soils
    e) Water Supply
    f) Climate Change and sustainability
    g) Air Quality and Noise
    h) Management and Monitoring
- Built Form and Design
- Transport and Access
- Economic Development
- Risk/Hazard Management
- Effects on Communities

- Aboriginal Heritage
- Native Title
- European or other Heritage
- Effects on Infrastructure requirements
- Construction and Operational Effects

2.2 Environmental Impact Statement exhibition

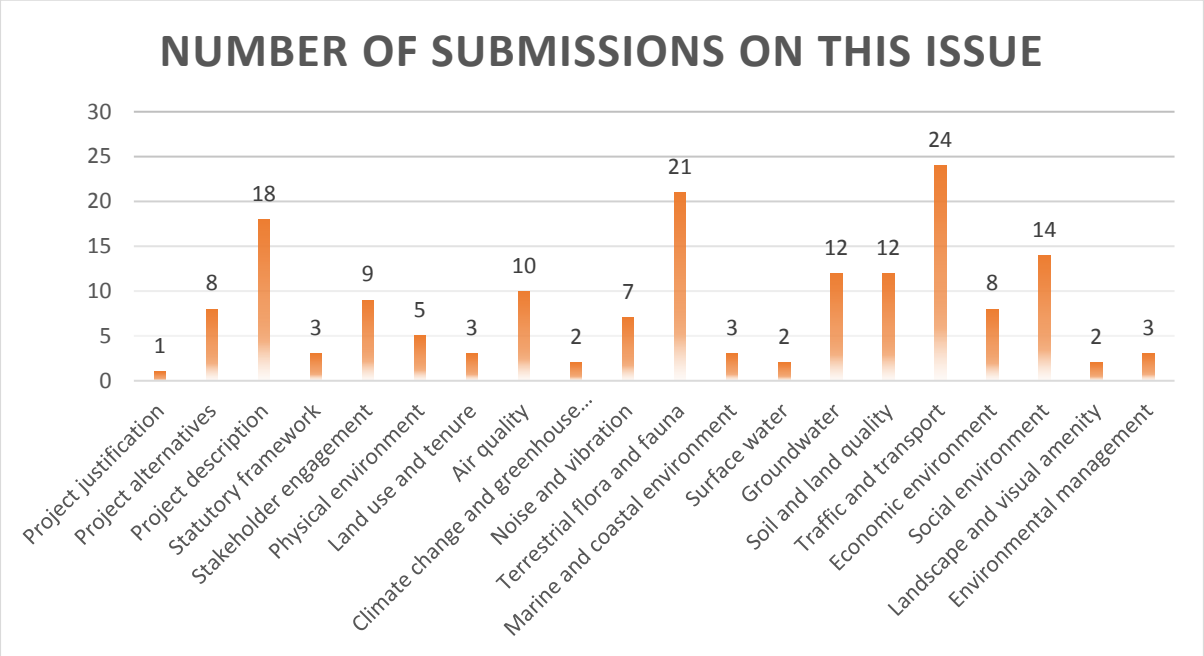
The proponent prepared an EIS in response to the Guidelines which was subsequently released on 19 November 2015 and concluded on 2 February 2016. During the public consultation period a series of public meetings were held in Pt Neill, Cleve and Wudinna, (sponsored by the Minister for Planning and also attended by representatives from the Department of State Development [for the mine] and the proponent) on 8-10 December 2015. Approximately 80-100 people attended over the 3 afternoon/evening meetings.

Along with State Government comments, 105 written submissions were received during the public consultation period some of which were of considerable size (100 pages plus). Approximately half of the submissions could be considered supportive of the proposal and the other half opposed. There were no additional Commonwealth Government comments in relation to the EIS.

2.3 Response Document

The proponent was then provided with Government comments and applicable public submissions to formally consider and to determine how to respond to the issues raised. A Response Document was then lodged on 29 September 2016 and publicly released on 13 October 2016.

The proponent considered that 53 public submissions were generally supportive of the proposal, employment opportunities, and diversification of employment industries and to reverse the general employment decline on the Eyre Peninsula.



Of the submissions, 21 raised issues concerning the EIS/EPBC and 19 raised issues in relation to the EIS/ Mining Lease Proposal (MLP). Issues related to the Mine and the Mine Lease Proposal are being dealt with solely by the associated MLP assessment report, which will be released publicly.

In the Response Document (Section 3.1) the proponent also identified a number of issues raised which it considered to be 'Out of scope' including:

- Alternative routes for the rail infrastructure to transact Hambidge Wilderness Protection Area which does not currently permit development
- Opposition to mining in general and its effects on agricultural lands
- Perceived land de-valuation
- Timing of public consultation
- Cost of obtaining hard copies of the EIS.

It is noted that Section 3.1 of the Response Document to the EIS does seek to address these questions but does indicate they are 'Out of Scope'.

The remainder of the proposed responses to the issues and questions raised are in tabular form and identify the issues raised with cross referencing where appropriate.

2.4 Final Environmental Impact Statement

The Response Document, along with the associated EIS, now forms the finalised EIS for the proposal. This is the case also for the purposes of the EPBC Act. The Commonwealth Government has been kept fully involved in the process and assessment of this development as is required by the Bilateral Agreement. Commonwealth requirements have been included in this Assessment Report.

2.5 Assessment Report

Whilst two separate Assessment Reports have been prepared, one for the EIS/EPBC, the other for the *Mining Act 1971*, the State agencies and Commonwealth have worked collaboratively to achieve alignment of the documents and conditions, having regard to jurisdictional responsibilities.

This Assessment Report has been structured so as to deal separately with each land use component. In accordance with section 46(9) of the *Development Act 1993* this AR also outlines, amongst other matters, the envisaged environmental, social and economic impacts, considers the safeguards or commitments proposed by Iron Road to mitigate potential impacts, and proposes appropriate conditions if the CEIP development is approved.

2.6 Decision

In summary three key initial decisions need to be made with regards to the proposal. These include:

- *Development Act 1993 (*EIS components): Decision made by the Governor on advice from Executive Council
- *EPBC Act 1999* (Controlled Action items only): Decision made by the Commonwealth Minister for the Environment
- *Mining Act 1971* (Mining Lease Proposal): Decision made by the Minister for Mineral Resources and Energy

In making a decision under section 48 of the Development Act 1993 the Governor must have regard to the following requirements:

- Provisions of the relevant Development Plans and Legislation
- The Building Rules
- The Planning Strategy

- The objects, general environmental duty and relevant environmental protection policies under the *Environment Protection Act 1993*
- The prohibitions and restrictions applying under a marine park under the *Marine Parks Act 2007*, and the general duty of care under that Act, if it appears that the development may have an impact on any aspect of a marine park
- The EIS
- The Response Document
- May take into account any other matters considered relevant

The Governor may refuse or authorise the development, and if authorising, may reserve a decision on a specified matter until further assessment is undertaken, or in any event, attach conditions that must be complied with in the future.

It is noted that this AR does not include a specific assessment of the proposal against the provisions of the Building Rules under the *Development Act 1993.* If the Governor grants a development authorisation pursuant to Section 48 of the Act, the proposal would require certification against the Building Rules.

2.7 Subsequent Decisions *Environment Protection Act 1993* (EP Act)

The EP Act provides for the management and protection of the environment, including site contamination, air and water quality, noise and waste management. Key objectives of the Act are to ensure that all reasonable and practical measures are taken to protect, restore and enhance the quality of the environment in line with the principles of ecologically sustainable development.

As the proposed Cape Hardy Sea Port development involves activities of environmental significance as prescribed in Schedule 1 of the EP Act it would require ongoing licensing of these activities from the South Australian Environment Protection Authority (EPA). Activities likely to require a license include:

- Chemical storage and warehousing facilities
- Concrete batching
- Metallurgical works
- Mineral works
- Waste or recycling depots
- Bulk storage and shipping facilities
- Crushing, grinding or milling
- Sewage treatment
- Rail operations

With activities of major environmental significance the Governor must have regard to the objectives of the EP Act, the general environmental duty and relevant Environment Protection Policies. The following policies were considered in the Assessment:

- Environment Protection (Waste Management) Policy, 2007
- Environment Protection (Waste to Resources) Policy, 2010
- Environment Protection (Air Quality) Policy, 2016
- Environment Protection (Water Quality) Policy, 2015
- Environment Protection (Noise) Policy, 2007

3. CAPE HARDY SEA PORT

3.1 General

A port facility is required for the export of the iron ore (magnetite concentrate) from the inland mine site, with a need for a site on the coast as close as practicable. The port would also be used for the importation of mine related infrastructure modules (and other construction materials). The EIS (Section 3.1) investigated a number of export options on Eyre Peninsula, including existing ports, ports proposed at different locations by other companies and potential new sites for the proponent to develop. The various options were evaluated based on criteria related to design, environmental, social/cultural and economic aspects. The Cape Hardy site was selected as the most appropriate location. Strategically, a port facility at the Cape Hardy site would provide a viable export alternative for the central Eyre Peninsula region, with sufficient capacity to accommodate third party exports (such as other iron ore exporters or for the export of other minerals or grain).

3.1.1 Site and locality

The proposed port site (see Figure 1) is located on the eastern coastline of Eyre Peninsula, approximately 80 kilometres north of Port Lincoln. The site comprises approximately 1,100 hectares (ha) of land, although the port facilities (i.e. stockpiling, materials handling and loading components) would only require 461 ha of land next to the coast. The marine infrastructure (i.e. jetty and wharf) would require approximately 147 ha of marine waters for a port operating zone. The port facility would occupy land between North Coast Road and the coastline, with the main entrance point provided via Brayfield Road (approximately five kilometres south of the Port Neill Township).

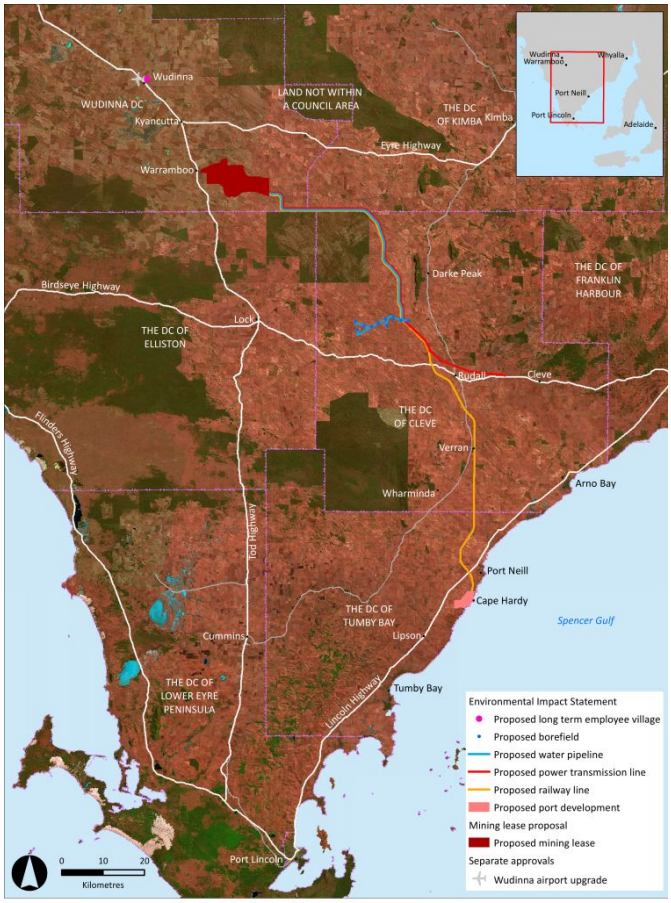


Figure 1 - Overview of proposed major development (image supplied by proponent)

3.1.2 Existing environment

The majority of the site has been modified for agricultural use, with remnant vegetation restricted to coastal dunes on the headlands. These isolated communities are in relatively poor condition, being degraded by high levels of weed infestation, grazing impacts (sheep and rabbits) and edge effects. The site is characterised by a thin to moderate layer of soil (i.e. between 1 m and 9 m thick) overlying a weathered bedrock zone of sandy gravel (nominally 2 m thick), above strong gabbro and gneiss metamorphic rock (to a maximum depth of 30 m). The soils consist predominantly of alluvial deposits of clayey to gravelly sand with sandy clay encountered in the deeper areas located in the centre of the site.

The coastal environment is characterised by a series of small rocky headlands, separated by short stretches of sandy beach. The marine environment surrounding the port site is considered to be a relatively sheltered system with low to moderate wave energy, primarily driven by tidal currents. Tides are predominantly semi-diurnal with two high and low tides each day. The site is exposed to both ocean swell and wind generated sea waves. Swell wave energy typically approaches the port site from a SSE direction. Wind generated waves usually occur during south-easterly storm events. (see below for example of port environment)

Figure 2 - Port environment - supplied image - 14.2 Iron Road EIS Chapter 14 page 14-5

The seabed substrate along the jetty alignment comprises a sub-tidal reef around the headland, sandy bottom supporting seagrass meadows along most of the alignment, with a silty bottom supporting sparse, mixed small algae where deeper water is encountered at the loading wharf end. Seabed habitat follows depth and substrate contours, with a higher density of benthic flora coverage at shallower depths.

The land based portion of the port site is located within the broader Eyre Yorke Block (IBRA) Bioregion, but more specifically the Eyre Hills (Southern Uplands) sub-region. The marine portion is within the lower Spencer Gulf, part of the Lower Spencer Gulf and Eyre (IMBRA) Bioregions and the Dutton Biounit.

3.2 Project description – key elements

The port facility has been designed to cater for Panamax and Capesize vessels, with an export capacity of up to 70 million tonnes per annum (Mtpa). However, the proposed operation is for the export of approximately 21.5 Mtpa of magnetite concentrate (although the storage/loading facilities have been designed for up to 30 Mtpa). Thus, there is potential for an increase in magnetite export and for additional port users to be accommodated.

Figure 3 - Port Infrastructure Layout - supplied image - 14.19 Iron Road EIS Chapter 4 page 4-31

Facilities proposed as part of the port development include:

- Railway Line Loop.
- Materials Handling Facilities: Rail unloading facility, conveyor systems, concentrate stockpile and ship loader.
- Marine Infrastructure: 900 m long jetty structure (incorporating 350 m of causeway that would also be used for the modules/materials offloading facility and tug boat berth) and a 400 m long wharf at the end of the jetty (with two ship berths).

- Supporting Infrastructure: Ancillary port administration (including customs and stevedoring facilities); plant and equipment workshop and facilities; fuel storage; module laydown area; 33 kV power line and substation; car parking and internal access roads; road upgrades and realignments; stormwater management; water supply and wastewater treatment facilities; emergency services facility; and communications tower.
- Temporary Construction Camp.

The full jetty structure would extend 1300 metres from the shore line to reach a water depth of approximately -21.3 metres AHD. The first 350 metres would comprise reclaimed seabed (i.e. built up with fill and lined with rock armour protection) to create a causeway and a module offloading facility wharf deck. A right angle extension of the wharf would provide a berth for vessels for the unloading of modules/materials (i.e. via a roll on/roll off ramp and a lift on/lift off wharf). A berth for tug boats, comprising a jetty with a steel-piled concrete deck (approximately 36 m long and 8 m wide), would connect with the causeway and be protected by the wharf extension. The last 400 metres of the jetty would comprise a ship loading wharf.

Figure 4 - jetty infrastructure layout - supplied image - 14.26 Iron Road EIS Chapter 4 page 14-39

A detailed description of the port components and operation is provided in the EIS (Sections 4.3 and 4.6.4).

Ore would be delivered to the port facility via a railway line loop and unloading facility. Rail wagons would enter an enclosed unloading shed and bottom dump ore into hoppers and onto a fully covered conveyor. The conveyor would transfer ore to the stockpile, via a fully enclosed transfer station. Ore would be deposited onto an open stockpile, via an enclosed conveyor and boom stacker. The stockpile would be 660 metres long and 44 metres wide, with ore stockpiled to a height of 20 metres (i.e. to enable the storage of approximately 660,000 tonnes of concentrate, which equates to approximately three to four shiploads). A mobile water cart with spray cannons will apply a biodegradable veneering

agent to the stockpile to seal the surface and reduce dust generation. A low height bucket-wheel reclaimer would then transfer ore from the stockpile to a conveyor connected to the shiploader. A mobile shiploader on the wharf would deposit ore into export vessels, via a telescopic chute.

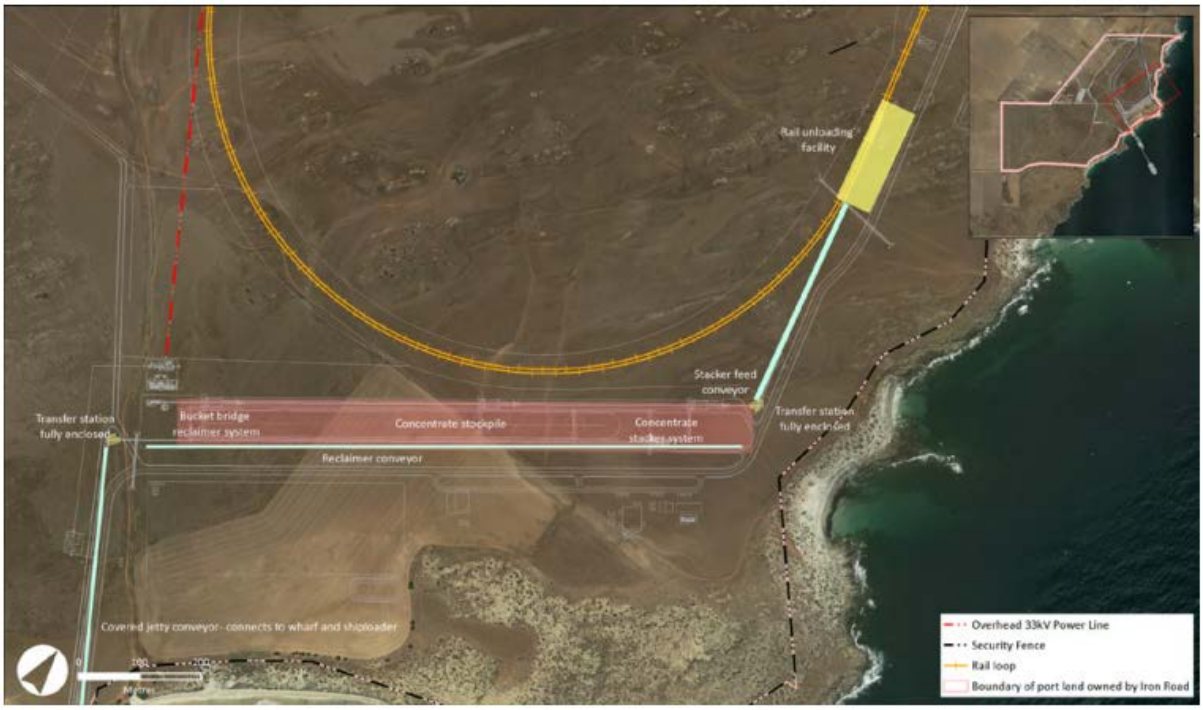


Figure 5 - Port site materials handling facilities - supplied image - 4.20 Iron Road EIS Chapter 4 page 14-33

The port would receive approximately 145 vessels per year, which on average will be three vessels per week. Ships will enter Spencer Gulf and then proceed directly to the port, approaching and departing from the port via a nominated approach route (fairway) from the main Spencer Gulf shipping channel. The fairway is of sufficient natural depth so as not to require dredging. A vessel anchorage area, within the Port access zone, is proposed to be established 3 km off-shore from the site.

Figure 6 - port operating limits and anchorages - supplied image - 4.44 Iron Road EIS Chapter 4 page 4-69

3.3 Summary of submissions

3.3.1 Public submissions

Numerous public submissions raised concerns with the port component, including:

- Is the port suitable for bulk grains and is segregation required especially to avoid cross contamination with iron ore. It should be noted grain export is not part of the proposal, but could be accommodated in the future by a third party (and be contingent upon handling/storage systems being approved as a separate application).
- Port should have import/export facilities for joint use by other parties.
- Easy linkage to the national rail network should be established (or grain allowed to be transported via the infrastructure corridor to the port).
- Coastal and marine environment could potentially be impacted by disturbance, propeller wash, pollutants/contaminants (including fuel, oil and litter), noise, light spill, greenhouse gas emissions, dust and ore spillage. Plus effects on visual amenity.
- Potential effects on fauna, especially protected species such as the White-bellied Sea-eagle, plovers, whales and Leafy Sea-dragon.
- Water sensitive urban design principles should be adopted for enhancing the quality of water run-off from the site and into the marine environment.
- Biosecurity and quarantine management.
- Construction camp issues, such as water requirements, power requirements and noise.
- Water requirements for the concrete batching plant.
- Rail impacts, especially dust and ore spillage during transport and unloading (including cleaning before returning to the mine).
- Management of shipping to avoid passage through the Sir Joseph Banks Marine Park.
- Greenhouse gas emissions from shipping.
- Responsibilities for compliance and enforcement regimes (primarily for shipping activities).
- Effect on the community (especially Port Neill) from increased traffic (i.e. accident risk), noise, pollution etc.

3.3.2 Government submissions

The main issues raised in government submission include:

- Whilst the proponent has undertaken adequate marine surveys, a considerable amount of benthic habitat would be lost/disturbed, which would need to be further quantified as part of any future Significant Environmental Benefit offset analysis. In particular, turbidity from propeller wash may effect a wider area than predicted.
- Further information on the construction methodology and impacts of the Module Offloading Facility would need to be provided in the CEMP.
- Whilst there is very little likelihood of ecological impacts from iron dust, there may be aesthetic effects. The proposed dust mitigation measures are of a high standard to manage such impacts.
- Invasive marine species should be monitored in accordance with BiosecuritySA or federal programs.
- Further assessment of existing site contamination would be needed (and management measures consequently reviewed).
- Moisture monitoring of concentrate stockpiles would need to be included in the CEMP and OEMP.
- The CEMP would need to include turbidity monitoring.

3.4 Key Environmental, social and economic issues

An industrial type of development such as a port facility has the potential to have a number of impacts on the surrounding environment, including:

- Industrialisation of part of the coast, especially increased levels of human activity and potential disturbance of the coastal and marine environment.
- The establishment of a prominent visual feature on the landscape, especially the jetty/wharf structure on the coast (and extending offshore) and to a lesser degree the ore stockpile.
- Effects from construction activities, especially land disturbance from earthworks (vegetation clearance, soil erosion, dust and altered drainage); destruction and disturbance of terrestrial, coastal and marine habitat and fauna species; noise; and increased traffic (especially heavy vehicles).
- Effects during operation, especially from rail and shipping activities.
- Risk of pollution (especially fuel/oil spills from vessels).
- The introduction and/or spread of pest or nuisance plants and animals (particularly marine pest species).
- Disruption to local communities during construction and operation (primarily residents and visitors to the coast).
- Reduced amenity and recreational/tourism values of the coast.

The establishment of an export port within Spencer Gulf would also increase the current volume of shipping traffic moving into/out of the Spencer Gulf, using the existing shipping channel accessing the open sea. Shipping traffic would also increase along the export route from the Gulf to Asian ports, including passing west through the Great Australian Bight Commonwealth Marine Reserve.

The stretch of the coast in this locality is relatively natural and is generally free from human disturbance (apart from farming activities). There is generally low accessibility for the public, due to most of the coast being private land used for agriculture and a lack of public roads that lead to the coast. The area is generally quiet, apart from farming activities.

The proposed site is located on part of the coastline that is not within a marine park, aquaculture zone, commercial fishing ground or other important conservation or economic area. The Sir Joseph Banks Marine Park lies 12km south of the site. Whilst the Port Neill Aquaculture Zone (where there are currently no leases) lies approximately two kilometres off-shore from the site, the waters between the zone and the coast are within an Aquaculture Exclusion Zone.

This part of Spencer Gulf has reasonable conservation and coastal landscape values. The coastal environment is characterised by small rocky headlands separated by small sandy beaches. The intertidal and coastal habitats are considered typical of those found along eastern Eyre Peninsula. The coastal strip has been highly modified by farming and remnant vegetation is predominantly restricted to the narrow coastal reserve. The site has a low level of public usage or recreational fishing pressure, except for locals and visitors to the publicly accessible Cowley Beach, approximately seven kilometres south-west of the jetty site. The beach is used for recreation (including semi-formal camping) and tourism.

The EIS (Chapter 9) used an environmental impact assessment methodology based on a *source, pathway and receptor* approach in considering actual and potential effects. A Risk Assessment was undertaken for potential adverse effects that could occur as a result of unplanned or unexpected events. This approach utilised aspects of both Federal and State legislation and guidelines.

3.4.1 Site selection and consideration of alternative sites

The EIS (Section 3.1) investigated a number of export options, including existing ports (Thevenard, Port Bonython, Port Lincoln and Whyalla), ports proposed by other companies (Port Spencer and Lucky Bay) and potential new sites to develop (Elliston, Drummond Point, Coles Point, Arno Bay, Gibbon Point and Cape Hardy). The various options were evaluated based on criteria related to design, environmental, social/cultural and economic aspects.

The Cape Hardy site was selected as the most appropriate location. In particular, the site is not in close proximity to a marine park or a conservation reserve and the land has been predominantly cleared of vegetation for farming. Deep water is located relatively close to shore (approximately 1.3 kilometres from the coast), and the site is afforded some natural protection from ocean swells and waves (i.e. no breakwater required). In addition, it is not located in close proximity to a township.

3.4.2 Air Quality

The existing air quality at the port site is expected to be very good or good (as defined by the EPA in the SA Air Quality Index), due to the rural location with low levels of road traffic and limited industrial activity. Existing air pollution sources are likely to be airborne particulate matter such as wind-blown aerosols and dust, vehicle/machinery generated dust from unsealed roads and ground disturbance in paddocks from agricultural activities. The sensitive receivers closest to the proposed development are individual dwellings on rural properties located intermittently around the proposed site. The closest dwelling is located on coastal land approximately 70 m from the southern boundary of the port site, with the other closest dwellings more than 1200 m from the boundary.

Air emissions may result from construction activities, rail transport of the iron concentrate and operations at the port. The sources of emissions and emission estimates for significant sources are summarised in the EIS (Section 10.5). During construction, dust from exposed surfaces, earthworks and vehicles movements could cause elevated levels of particulates that have the potential to impact on human health and larger particles can impact on amenity, primarily through deposition on surfaces (such as dwellings and vehicles). During port operation, dust (including particulate matter PM^{10} and $PM^{2.5}$ and deposited dust) could be generated by activities associated with the transport, storage and handling of the iron concentrate. Gaseous emissions from the locomotives and shipping could release pollutants such as volatile organic compounds (VOC's), oxides of nitrogen (NOx), carbon monoxide (CO), sulphur dioxide (SO_2) and particulates (PM^{10} and $PM^{2.5}$).

The design of the proposed port includes a range of measures to minimise potential air quality impacts, which are detailed in the EIS (Section 10.4). In general, infrastructure would either be enclosed or fully covered to assist with maintaining the moisture content of the iron concentrate (approximately 10%) and/or fitted with a dust control systems (including dust suppression sprays). The concentrate stockpile would have a relatively high moisture content (approximately 10%) which would reduce the potential for dust generation, with the application of water onto the stockpile by spray cannons mounted on water trucks undertaken to maintain the moisture content of the stockpile. An organic veneering agent would be added to the water spray to bind and stiffen the surface of the stockpile to create a cohesive layer over the surface of the concentrate and reduce the emission of wind generated dust. Dust emissions from construction earthworks would be controlled using conventional mitigation measures, such as water carts and water sprays. The separation distance between the actual footprint of the construction activity and sensitive receivers is over 1 km and the construction works are also short-term in nature.

The EIS (Section 10.5.4) included air quality modelling of dust emissions and qualitative assessment of gaseous emissions associated with the proposed port operation (e.g. emissions from diesel engine powered equipment). Air emissions from construction works were also assessed. The modelling

demonstrated that all relevant air quality criteria (including PM^{10} and $PM^{2.5}$) would be met at sensitive receiver locations surrounding the proposed port site. Thus, the impact of emissions at sensitive receivers was considered to be low.

The EIS (Section 10.6) detailed a range of appropriate controls and strategies that would be implemented to manage air emissions, especially the adoption of a suitable Environmental Management Framework. In addition, the adoption of an air quality monitoring programme would involve active management of dust emissions through implementation of a hierarchy of controls. This would prioritise control at the emission source (e.g. concentrate stockpile or ship loader), followed by control of the dispersion pathway, then control at the receiver. The controls at the source may include application of additional water sprays or reduced operations. Controls of the dispersion pathway may include windbreak systems, in the form of either vegetation or engineered structures.

The EIS (Section 10.8) concluded the most significant source of emissions would be dust from materials handling at the port site. However, modelling of dust emissions demonstrated that all relevant air quality criteria would be met and the potential impact was categorised as low. Mitigation measures would be implemented to reduce the potential for dust impacts and risks at the nearest sensitive receivers. Operational air quality monitoring would be undertaken to assess ongoing compliance with the relevant air quality criteria and to facilitate any adjustment of operations and/or management practices.

The EPA considered the dust management strategies to be of a high standard and acceptable. Control measures for the ore stockpile, primarily the implementation of a water spray system and the use of veneering agents (based on moisture monitoring), would need to be detailed in the Construction and Operational Environmental Management Plans (EMP's). A dust monitoring program (including reactive mitigation strategies) would also need to be detailed in the EMP's.

3.4.3 Noise and Vibration

The port site has a quiet rural character dominated by natural noise sources, such as birds, wind and wave noise, with intermittent human-induced noise from road traffic and agricultural machinery. The rural nature results in the location of sensitive receivers being sparse and isolated, enjoying a high level of amenity due to minimal human-induced noise. The closest dwelling is located on coastal land approximately 70 m from the southern boundary of the port site, with the other closest dwellings more than 1200 m from the site boundary.

The port related infrastructure would introduce new noise and vibration sources to the area, including train movements, materials handling and ship-loading activities. Construction activities (including the blasting of rock over a 5-6 month period) would introduce short-term noise and vibration sources, whilst shipping activity would introduce an ongoing new noise source on the local marine environment. The EIS (Section 12.5.1) details the types of noise and vibration that could occur.

The design of the port includes the following measures to minimise potential noise and vibration impacts:

- Rail unloading facility enclosed to protect equipment, control dust and to minimise noise from the unloading operation.
- Unloading of iron concentrate from the bottom of train wagons allows continuous and slow movement of the train, which would eliminate engine braking and shunting noise of wagons.
- Transfer stations and conveyor systems fully covered to minimise dust and noise.

Noise modelling was undertaken, based on actual noise level measurements from coal and iron ore trains in the Pilbara, to determine a representative noise level. Each component of the port (including

train noise associated with the unloading operation) was incorporated as noise sources in the modelling. Ship and tug boat noise was not included as the noise level was considered to be low (i.e. approximately 60 dB overall on the adjacent jetty, as measured at the port at Dampier, WA) compared with the ship loader (i.e. approximately 129 dB), so such noise would be masked by general background noise and other operational noise.

The EIS (Section 12.8) concluded that noise control and management strategies during the construction would be required to manage impacts to within acceptable levels. Once the port is operational, the predicted noise impacts are expected to be well within relevant noise criteria. The measures proposed in the EMP's (including noise monitoring) would enable detection of any exceedances of noise criteria and the implementation of adaptive management strategies to manage noise levels.

It is considered that the EIS has satisfactorily demonstrated that all noise sources would be minimised and controlled to avoid adverse impacts on the community and the environment. Marine (underwater) noise is addressed in Section 3.4.4 of the AR.

3.4.3 Terrestrial Environment

The majority of the port site has been highly modified for agricultural use, with extensive vegetation clearance and remnant patches mainly restricted to coastal dunes on the headlands. These fragmented communities are in relatively poor condition, being degraded by high levels of weed infestation, grazing impacts (sheep and rabbits) and edge effects. The EIS (Section13.2.2) provided a detailed baseline study of the terrestrial flora, fauna and ecological communities based on a desktop review and field survey.

Native Vegetation Communities

Remnant communities predominantly comprise patches of coastal shrublands on cliff-top dunes or sub-coastal and coastal low Mallee and woodland further inland. The EIS (Section 13.3.3) determined the condition of the patches to be poor-moderate (especially due to the high level of weeds present).

The EIS (Section 13.5.2) calculated that total vegetation clearance would amount to 17 ha and predominantly vegetation that is in poor to very poor condition. The rail loop would require most of this clearance, primarily degraded tussock grassland near the north-eastern site boundary. Thus, vegetation clearance for the construction and operation of the port was considered to have a low impact. Revegetation as part of a Significant Environmental Benefit (SEB) offset requirement under the *Native Vegetation Act 1991*, would help compensate for any small loss of habitat.

Native Fauna Communities

The EIS (Section 13.3.3) identified native fauna diversity as low, due to the highly degraded nature of the site and lack of available habitat. However, a variety of common species continue to use remaining habitats, including mammals, reptiles and birds. For example, Nankeen Kestrels (*Falco cenchroides*) continue to hunt for prey among pasture and several other bird species utilise degraded habitats, including Stubble Quail (*Coturnix pectoralis*), Willie Wagtail (*Rhipidura leucophrys*), Richard's Pipit (*Anthus novaeseelandiae*) and Spotted Pardalote (*Pardalotus punctatus*). Native mammals that utilise the degraded habitat included the Euro (*Macropus robustus*) and the White-striped Freetail Bat (*Tadarida australis*). Thirteen common reptile species were also recorded, including the Sand Goanna (*Varanus gouldii*) and Painted Dragon (*Ctenophorus pictus*).

The coastal habitats found around the site support a much greater diversity of avifauna species, including the Hooded Plover, Common Sandpiper, Caspian Tern, Nankeen Night Heron, Rock Parrot and White-bellied Sea-eagle. The area is not considered to support significant shorebird habitat and

these species are unlikely to breed in the immediate vicinity of the port, but could regularly move through the site (especially to forage for food). The exception is the Hooded Plover that is known to nest along nearby beaches.

The proposal has been designed to largely avoid remnant habitat on the site, such as the locally significant patches of coastal dune and Mallee communities. The EIS (Section 13.5.5) identified the following impacts on fauna that may occur during construction and operation:

- Direct mortality through strike with vehicles or machinery or barriers to movement (e.g. trenches)
- Habitat clearance, habitat degradation or weed introduction.
- Increase in predators (e.g. fox /cat) through poor waste management practices.
- Impacts to breeding regimes as a result of increased disturbance, changes in noise levels and changes in light levels. Some species are particularly prone to disturbance (e.g. White-bellied Sea-eagle, Osprey and Little Penguin).

Such impacts were predicted to be low-negligible, as existing habitat is highly degraded and effects are likely to be short term (i.e. during the construction phase, as fauna move away from the area and return when disturbance has reduced or offset habitat has been established).

The proposed vegetation clearance is not likely to result in significant habitat fragmentation or isolation of habitat, nor cause a significant barrier to fauna movement. The rail corridor, whilst not fenced, could present an impediment for the movement of small mammals and reptiles.

Introduced Plants and Animals

The EIS (Section 13.3.3) identified a high number of introduced species that occur on the site, most of which are minor weed species. Weeds of National Significance include Bridal Creeper (*Asparagus asparagoides f. asparagoides*), Boneseed (*Chrysanthemoides monilifera* ssp. *monilifera*) and African Boxthorn (*Lycium ferocissimum*). Highly invasive 'declared weed' species recorded at the site include Bridal Creeper, Boxthorn, Horehound and False Caper. Onion Weed (a 'declared weed' in some parts of the State) was also prevalent throughout. Other weeds that were particularly common in the understorey included Cat's Ear, Wild Turnip, Sow-thistle, Coastal Galenia, Perennial Veldt Grass and other exotic grasses.

Eight introduced animal species were recorded for the site, including the Common Blackbird (*Turdus merula*), Common Starling (*Sturnus vulgaris*), European Goldfinch (*Carduelis carduelis*), House Sparrow (*Passer domesticus*), Rock Pigeon (*Columbia livia*), Skylark (*Alauda arvensis*), Spotted Turtle Dove (*Stigmatopelia / Streptopelia chinensis*), Cat (*Felis catus*), European Fox (*Vulpes vulpes*), House Mouse (*Mus musculus*) and Rabbit (*Oryctolagus cuniculus*).

Construction activities would need to be managed to ensure weed species are not spread further around the site or to other sites. In particular, disturbed soils and stockpiles would be the most prone to weed infestation. Increased human habitation of the site could potentially encourage pest species that would be attracted to food sources or shelter provided by the facility. In particular, Silver Gull numbers could increase due to the proposal, especially if attracted to waste or stormwater retention basins/ponds.

Mitigation measures for the spread or introduction of weeds are detailed in the Construction Environmental Management Plan. The monitoring and control of feral animals is addressed in the Operational Environmental Management Plan. The residual impact of pest plants and animals was rated as a low risk.

Surface Water and Groundwater

The site has no substantial watercourses (i.e. defined creeks or rivers), with surface waters limited to ephemeral drainage lines that discharge to the coast during significant rainfall events. The EIS (Section 14.5.9) identifies a range of potential impacts on marine water quality from run-off, including nutrient loading (especially algal growth), turbidity, reduced salinity (i.e. from freshwater discharges during storms) and the discharge of contaminants.

The proposed materials handling infrastructure and rail loop extend across an unnamed creek and several minor drainage lines. Culverts will be installed at creek crossing locations to allow runoff to pass underneath the constructed infrastructure during rainfall events of up to 1 in 20 year flows. Rock armour will be installed downstream of the culverts to minimise erosion. Various open channel water slowing points will be employed.

Figure 7 - proposed stormwater management - supplied image - 4.34 Iron Road EIS Chapter 4 page 4-50

Run-off from the stockpile, module laydown areas and hardstand at the rail unloading facility will be directed to sedimentation basins to enable any mobilised concentrate and suspended solids to settle and water to evaporate rather than being discharged to the environment. Sediment will be periodically removed from sedimentation ponds to maintain performance and will be disposed of

appropriately in accordance with EPA requirements. Road runoff will be directed to roadside swales, which will be top-dressed with topsoil to encourage vegetation growth. In the immediate vicinity of inlet structures and locations of high velocity, swales will be rock-lined to slow flows and minimise soil erosion. These swales have been shown to capture and retain suspended solids, which are considered likely to constitute the majority of any contaminants from this run-off.

Areas which pose a contamination risk to stormwater (such as light vehicle re-fuelling) will be bunded, with disposal of waste by a licensed contractor. Natural flows within existing drainage lines will be diverted around or through port infrastructure into the creeks or natural drainage areas, with appropriate sedimentation structures prior to discharge. Vehicle wash-down areas will be established and managed in accordance with the EPA information sheet *Stormwater Management for Wash Bays* (2004)

The port would include a range of impermeable infrastructure, including roadways, hardstands and buildings. The runoff from this infrastructure will be captured with guttering and directed into evaporation/infiltration ponds that have capacity to capture up to a 90th percentile of run-off events with any over flow from greater events discharged into vegetated swales away from the marine environment. This will prevent high sediment loads, pollutants or high velocity flows from entering the marine environment, causing erosion or impacting coastal, intertidal and sub tidal areas.

In regard to groundwater implications, the rail unloading facility is proposed to be constructed 24 metres below the ground surface, which would extend 16 metres below the local groundwater level. Groundwater salinity at its location is similar to seawater (i.e. 35,000 mg/L TDS). The EIS (Section 16.4) states that permanent drainage will be provided at the base and perimeter of the excavation required to accommodate the facility. Groundwater will be collected in trench drains positioned around the perimeter of the excavation and collected in sumps for disposal to the transfer pump station header tank.

The EIS used a groundwater inflow rate to the excavation is 3.5 m3 /d which will result in drawdown extending approximately 500 m from the train unloading facility after 25 years. The assessment is conservative as it assumes no recharge to the groundwater system over the calculation period. The zone of influence is within the proposed port facility footprint and does not interact with any of the identified receptors. As the drawdown associated with groundwater management was not predicted to affect any environmental values or affect any existing groundwater users, the impact was deemed to be negligible.

In regard to potential groundwater contamination, hydrocarbon and chemical storage facilities will be designed in accordance with Australian Standards, relevant legislation and best practice guidelines. · Fuel and lubricant storage and dispensing facilities will be designed and installed in accordance with Australian Standards (i.e. AS 1940-2004: The storage and handling of flammable and combustible liquids and AS 1692-2006: Steel tanks for flammable and combustible liquids), relevant South Australian legislation and best practice guidelines

In conclusion, the proponent has adequately investigated the surface water characteristics of the site and potential impacts related to how the modifications to the site would affect the natural hydrology and discharges to the marine environment. The proposed stormwater management strategy provides adequate measures to mitigate impacts (especially flooding and erosion risks), to maintain a natural water balance and to use stormwater as a resource. The groundwater characteristics of the site have also been adequately investigated. The predicted zone of influence (i.e. groundwater drawdown) is not expected to affect any groundwater users beyond the site, due to its limited radial extent. In

addition, there is only a low risk of contamination by seepage of chemical or hydrocarbon spills/leaks through the soil, which can be suitably managed.

3.4.4 Coastal and Marine Environment

The coastal zone would become highly modified by the establishment of a large port facility and associated rail corridor. Large areas of the terrestrial part of the site would be the subject of substantial earthworks, primarily to construct the rail and ore storage/handling infrastructure, which could affect the coastal and marine environment (especially through high levels of disturbance). In particular, storm events could result in significant amounts of soil erosion and turbid run-off, which could drain to the coast and enter the marine environment. Natural surface drainage at the port site would be modified and managed, including the use of vegetated swales and basins capture and treat run-off (including any contaminants). Thus, drainage from the site would be prevented from entering the coastal and marine environment (except for natural flows).

The low rocky headland and intertidal zone would be affected during construction of the jetty/wharf, due to earthworks (especially for the causeway and modules/materials offloading facility) and piling works. The jetty causeway (i.e. cut/filled base, with rock armouring) would extend approximately 300 metres across the rocky shore and intertidal zone, covering a 140m wide footprint along its length. The jetty and wharf would extend a further 1100 metres into Spencer Gulf. The causeway structure would substantially extend the protrusion of the headland offshore and would modify coastal processes to some degree (especially local water circulation patterns and sand movement), whilst the jetty/wharf structure would cause shading of the seabed (and, to a lesser degree, affect circulation patterns). During construction the marine environment could be affected by physical disturbance of the seabed, loss of benthic habitat, turbidity, noise and vibration.

The EIS (Chapter 14) investigations covered a study area stretching six kilometres along the coast and extending three kilometres offshore (29 km^2) to represent a potential zone of impact. A range of parameters were investigated, including bathymetry, hydrodynamic processes, seabed characteristics, water quality, benthic habitats, marine flora/fauna and noise/vibration modelling.

Coastal Processes

The proposal's coastal location, being within the relatively sheltered embayment of the Spencer Gulf, is subject to moderate wave energy. The dominant currents are tidal driven and most waves are generated by winds from the south-east (with waves up to 2.6 metres in height recorded, but typically less than 1.5 metres). The seabed drops away to deep water within a short distance from the shoreline. The site is not subject to any substantial longshore drift of sand that could be affected by the establishment of a jetty (and causeway) structure. Thus, local beaches would not be detrimentally affected by any changes to natural sand loss or accretion rates. The wave and current characteristics provide regular flushing of the site (especially after dodge tide periods), which would assist in mitigating the effects of any localised turbidity or minor spills (such as ore or hydrocarbons).

In regard to seabed characteristics, particle size of the substrate increases closer to shore compared to that further from shore, where there is a greater portion of fine sediments. In shallow waters, the substrate is dominated by sparse to moderate density seagrass, with deeper waters dominated by mixed small algae over sand. The causeway would be constructed over a patchy rocky reef substrate. The jetty alignment traverses a sandy seabed, whilst the loading wharf extends across a silt substrate.

The EIS (Section14.5.3) acknowledges the causeway section of the jetty (i.e. which forms the module offloading facility and tug harbour) would permanently alter local bathymetry and hydrological processes, as they will be physical structures in the environment (deemed a medium impact). Modelling predicted there would not be any significant changes in broader coastal processes such as

erosion or sediment dynamics (i.e. low level reduction in the rates of sediment transport and bed shear, with increased sedimentation around the causeway of less than 1%) Whilst the impacts would be minor, they would be long-term. Noting the gradual nature of any change alterations to the hydrodynamic conditions at the port site are not envisaged to significantly affect habitat, density or diversity of benthic fauna or intertidal habitats

The rocky headland and the seabed would be affected during construction of the causeway due to earthworks and reclamation works. The piles for the jetty and loading wharf would be driven into the substrate. Jetty construction could result some disturbance of marine sediment and turbidity (low impact), which would be controlled by the use of silt curtains. During operation, the relatively open structure of the jetty would result in minor, localised changes to water circulation patterns that would not affect the profile of local beaches.

Water Quality

The existing marine environment in this part of Spencer Gulf has water quality that is relatively natural, except for elevated nutrient levels from aquaculture (primarily based around Port Lincoln and Arno Bay). For the port site, the EIS (Section 14.3.4) found that concentrations of nutrients in surface and bottom waters are typical of the southern Spencer Gulf, with little difference between the two, suggesting that the water column is well mixed and homogeneous in nutrient composition. The concentration of chlorophyll-a was low, which is characteristic of waters in Spencer Gulf. Concentrations of dissolved metals are within the expected range of sediments in the southern Spencer Gulf.

The main risks to marine water quality are expected to occur during the construction period, such as localised turbidity from causeway construction, jetty/wharf pile installation and uncontrolled run-off from land based sites. Large scale earthworks have the potential to discharge sediment to the marine environment, via run-off and dust. In addition, the establishment of large areas of hard surfaces (including buildings) and fuel/chemical storages has the potential to substantially increase the amount of run-off and contaminants discharged to the marine environment during operation, which could affect water quality if not appropriately managed. Chemical or fuel leaks and spills could find their way into the bay, especially via the local drainage system. The rail corridor could also be a source of contaminated discharges to the marine environment, primarily from trains (i.e. oil/diesel leaks), corridor maintenance activities (i.e. herbicide use for weed control) and run-off (i.e. sediment). During operation, increased turbidity from vessel movements, primarily from propeller turbulence during manoeuvring at the wharf, could potentially have long-term effects on the marine environment. This could be addressed by avoiding manoeuvring during low tides, but this may affect operational flexibility. This would need to be addressed by monitoring and strategies in the OEMP.

Marine Turbidity, Sedimentation and Erosion

The EIS (Section 14.5.3) states that the proposed construction methodology avoids the need for dredging works and spoil disposal. Jetty/wharf construction could result in minor disturbance of marine sediment and turbidity, especially during piling activities. Hollow piles will be utilised for construction of the jetty. The driving of hollow piles into the seabed results in significantly less sedimentation in comparison to solid piles. The construction of the causeway could also result in short-term elevated turbidity, especially during the placement of fill and armour rock.

The EIS (Section 14.5.4) acknowledges that propeller wash and disturbance to the seabed from vessels would increase turbidity and suspended solids (especially for the silty marine environment in the deeper water areas). Hydrodynamic modelling indicated that water movements, tides and wave action may disperse sedimentation and marine biota is unlikely to be exposed to prolonged periods of elevated turbidity. However, modelling also demonstrated there would be areas that would

potentially be affected, especially given the predicted frequency of ship movements. Increased sedimentation associated with propeller wash was predicted to be minimal, due to the shallow draught of vessels (especially from tug boats during the manoeuvring of large vessels). Effects would be of short duration and localised, being deemed a low impact. However, the hull of fully laden export vessels may at times (especially low tide) be very close to the seabed and pose a greater risk of impacts from propeller wash. In addition, there could be a cumulative effect between ship movements (especially during dodge tide conditions) which can be managed operationally.

Ship scour can also result in the erosion of the seabed and increased turbidity. Whilst the use of tug vessels would minimise propeller wash, repeated manoeuvring of vessels would cause some ship scour, which would result in short-term turbidity. Approximately one cargo ship movement per day would result in localised impacts to intertidal and sub tidal flora (especially sediment suspension) on a daily basis, representing a medium impact (i.e. long term but localised).

Marine Ecosystems

The local marine environment includes sub-tidal and benthic communities, comprising habitat and species typically found along eastern Eyre Peninsula and the Spencer Gulf. These communities are considered typical of the region, being slightly to moderately disturbed with no marine pest species recorded. Only low levels of boating and fishing activities occur (both recreational and commercial), especially given there are no aquaculture operations nearby and the closest boat ramp is at Port Neil. Within the immediate vicinity of the site there are no areas high conservation value, such as biodiversity 'hotspots', seabird/migratory wader habitat or marine mammal breeding or haul out sites. Whilst there have been conservation listed species recorded for or near the site, these species are generally transitory (i.e. using the area as part of a wider foraging/feeding territory, as passage through to other key habitats in the region or along a migratory pathway).

The EIS (Section 14.3.5) benthic habitat survey (i.e. video towed transects) identified the primary habitat types on site as comprising:

- Shallow Benthos (< 16 m depth): seagrass meadow predominantly *Posidonia* spp., with some *Amphibolis antarctica* patches restricted to shallower waters (< 12 m depth).
- Mid Benthos (< 18 m depth): mainly bare fine sand and silty sediment with very sparse mixed small algae, *Posidonia* sp. and occasional scattered invertebrates.
- Deep Benthos (> 20 m depth): bare silt dominated by clumps of mixed invertebrates (sponges, ascidians, molluscs and both motile and immotile shellfish). Very sparse, mixed small algae also present, along with some evidence of cyanobacterial matting. No dense seagrass beds observed beyond 19 m of depth and macroalgae became uncommon after 21 m depth.
- Rocky Reefs: discrete patches in shallow water close to the shoreline.

A benthic infauna survey indicated that the shallow near-shore areas (i.e. with areas of seagrass habitat) had the greatest diversity, with the highest number of organisms per sample and greatest number of taxa (and good overall health of habitat). Areas of decreasing diversity aligned with areas of no seagrass coverage, anoxic sediments and elevated levels of some metals.

The EIS (Section 14.3.7) used desktop studies (i.e. database and literature reviews) to identify protected megafauna species that have the potential to occur in waters around the Spencer Gulf region. Species were classed as common, uncommon, rare or vagrant based on the frequency which they are seen in the region. The Common Dolphin (*Delphinus delphis*), Bottlenose Dolphin (*Tursiops aduncus*), Southern Right Whale (*Eubalaena australis*), Humpback Whale (*Megaptera novaeangliae*), Long-nosed (formerly New Zealand) Fur Seal (*Arctocephalus forsteri*) and Australian Sea Lion (*Neophoca cinerea*) were the species most commonly identified.

During construction and operation, a substantial increase in human activity and disturbance may cause modifications to fauna behaviour (primarily, avoidance of the area). Some species/individuals may adapt to the changed environment or benefit from it (such as 'artificial' reef communities colonising the jetty structure). It is considered that marine species may be affected by pile driving activities (i.e. noise, vibration and sonic waves) up to 500 m from the source.

The EIS (Section 14.5.1) estimates that approximately 2.65 ha of seagrass is proposed to be cleared, with an additional 14.7 ha susceptible to periodic disturbance. As such, 17.35 ha of seagrass will likely experience some form of disturbance during construction and operation. The area to be disturbed is classified as sparse to moderate. Approximately 2.61 ha of the rocky reef and macroalgal habitat is proposed to be cleared. An additional 259 ha of macroalgal habitat could also be potentially susceptible to periodic disturbance from erosion, sedimentation or turbidity. The rocky surface of the jetty causeway and the pylons will provide some habitat for a number of species that would naturally associate with reef areas, but has the potential to be colonised by invasive species (which would need to be monitored). It is considered that additional minor loss of macroalgae and seagrass may also occur due to scouring (or 'blow-outs') around the pilings and causeway. Turbulence could also increase turbidity. Such minor levels of clearance would not have a significant effect on marine ecosystems. The clearance of marine vegetation (primarily seagrass and macroalgae) would need to be offset via the SEB framework under the *Native Vegetation Management Act 1991*. Such compensation would need to address vegetation directly cleared for construction and long-term vegetation loss that would occur during operation.

During operation, the jetty and berthed vessels could lead to a minor loss of habitat (or loss of condition) from shading, propeller wash scouring of the seabed (i.e. during vessel manoeuvring activities), increased sedimentation/turbidity from turbulence, altered hydrodynamic conditions and noise. Regular use of the area by large vessels would also present a potential risk of a substantial fuel/oil spill. The introduction of regular shipping activities by vessels from foreign ports will present a risk of marine pest species becoming established and potentially spreading, which could have a detrimental effect on local and regional ecosystems if not adequately monitored and controlled.

The EIS (Section 14.5.2) identified piling/drilling activities and engine noise from marine vessel movements as being the primary sources of noise from construction activities. Through the implementation of soft start procedures, safety observation zones to monitor movement of marine fauna, and shut down procedures where marine mammals are identified within 500 m of piling activities it is not anticipated that any marine biota will be significantly affected by underwater noise emissions. Construction noise will result in a short-term alteration to existing behavioural patterns of marine fauna within the study area, which was determined to be a low impact.

During operation, the main noise sources are engine noise from vessel movements and operation noise associated with materials handling. The predicted underwater noise at the port resulting from vessel movements will be dominated by low frequencies, as vessel speeds will be restricted in the port with ships being manoeuvred into position by tug boats. As such, noise from vessel movement is considered to result in negligible impact to the behaviour and physical wellbeing of marine fauna with predicted noise levels indicating an insignificant increase in background noise levels within the study area. Whilst increasing vessel numbers in Spencer Gulf would increase the ambient noise levels in the marine environment (i.e. as low-frequency sound can travel great distances in the open water environment), the impacts of an additional of one ship movement per day would be negligible.

During construction and operation, a substantial increase in human activity and disturbance may cause modifications to fauna behaviour (primarily, avoidance of the area). The impacts during the construction period are anticipated to last for approximately 30 months (i.e. for the maritime

installation of jetty/wharf infrastructure). It is considered that marine species may be affected by pile driving activities (i.e. noise, vibration and sonic waves) up to 500 metres from the site. Most species/individuals are likely to adapt to the changed environment or benefit from it. 'Artificial' reef communities are predicted to colonise the jetty structure. However, research indicates that the new structure may increase fish aggregation, but is unlikely to increase biodiversity. In addition, the structure may encourage colonisation by marine pest species that will compete with native species.

A vessel anchorage zone is proposed to be established approximately 5 km off-shore from the site, for vessels waiting to access the port. Vessels entering/leaving the anchorage zone would travel directly to the existing shipping lane in the middle of Spencer Gulf. Vessels would avoid travelling through any Marine Park, Aquaculture Zone or commercial fishing ground.

The main issues associated with the anchorage zone and shipping lane are the risks of a fuel/oil spill and collision with marine mammals. The species considered most at risk from vessel strike, due to their likelihood of regular occurrence, are the Southern Right Whale, Bottlenose Dolphin and Common Dolphin. Collisions between cetaceans and all vessels have the potential to occur wherever there is an overlap between cetacean and boating activities. According to the International Whaling Commission (IWC), there have only been two records of ship strike in South Australia between 1953 and 2009. One involved a Southern Right Whale near Cape Jervis (in 2001) and the other a Pygmy Right Whale near the Lincoln National Park (in 2008). Thus, the risk of vessel strike is expected to be low.

The EIS (Section 14.4) appropriately describes a range of design measures to protect environmental values of the site (and Spencer Gulf). In particular, the EIS (Section 14.6) details management measures that would be adopted to avoid or mitigate impacts and risks to the marine and coastal environment from underwater noise during construction and operation, including:

- Safety Zone: A safety zone surrounding piling activity will be established to monitor the movement of marine mammals in waters impacted by construction noise. The safety zone is separated into the following two areas:
    1. Observation Zone – piling activities will be placed on standby should a mammal be sighted within the observation zone.
    2. Shutdown Zone – all piling activities will cease should a mammal be sighted within the shutdown zone.

    The area of a suitable safety zone can vary depending on the noise exposure threshold of marine mammals in the region. An observation zone distance of 1.5 km and a shutdown zone distance of 500 m in accordance with the South Australian Underwater Piling Noise Guidelines (DPTI 2012) will be implemented during the construction of the port. The shutdown zone required by the guidelines is sufficient to mitigate the range of underwater noise impacts on marine mammals.

- Operational Procedures: The following standard procedures would be implemented prior to the commencement of daily construction activity (or following a break of more than 30 minutes) during piling/drilling activities.
    1. Pre-start – The observation zone will be monitored for the presence of marine mammals for at least 30 minutes prior to the commencement of construction. Monitoring will be focused on the safety zones from an appropriate vantage point.
    2. Soft start – Piling impact will be gradually increased over a 30 minute period to alert marine mammals to construction activities and provide opportunity for animals to retreat to a safe distance. Monitoring of the safety zones for the presence of marine mammals will continue during the soft start process.

3. Normal operation – If no marine mammals are observed during the pre-start and soft start processes, piling will commence. Monitoring of the safety zones for the presence of marine mammals will continue during normal operation.
4. Standby operation – If a marine mammal is sighted within the observation during soft start or normal operation, the piling rig will be placed on standby to observe the mammal(s) and to confirm it has not entered the shutdown zone.
5. Shutdown – If a marine mammal is sighted within the shutdown zone all piling activity will stop immediately. Where no marine mammals have been sighted for more than 30 minutes, piling activities will recommence following standard procedures.

The EIS (Section 14.6.2 and Table 14-8) also appropriately describes and identifies a range of management strategies for the coastal and marine environment that would be addressed in the EMP's, such as marine fauna management, waste management, traffic/vessel management, water quality, oil spills/leaks, light spill and marine pests. These measures are considered as appropriate by the Assessment Report.

Listed/Significant species and commercial species (including marine mammals)
The proposed site and surrounding area does not provide critical or significant habitat for any threatened species. However, some species are likely to be transient and may pass through the site as part of a wider foraging territory or migration path. Species of conservation significance that are occasional visitors to the Spencer Gulf and may pass in the vicinity of the site (and through the anchorage area and shipping channels), and may be affected in a minor way, include:

- Southern Right Whale (listed as Endangered Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*).
- Humpback Whale (listed as Vulnerable).
- Australian Sea-lion (Vulnerable species) – colony on islands of the nearby Sir Joseph Island Banks Group near Port Lincoln and Long-nosed (New Zealand) Fur Seal (listed as Marine).
- Common Dolphin and Bottlenose Dolphin (both listed as Cetacean).
- Great White Shark (listed as Vulnerable).

Impacts on marine fauna are predicted to be low, as there is no essential habitat and whales and possibly seals would move away from the noise source (which would also reduce the ship-strike risk). Although behavioural changes (avoidance) are expected, these are not considered to have significant long-term impacts since the Spencer Gulf does not lie on a whale migration route. Shipping noise was predicted to have negligible impact on marine mammal populations. The EIS (Section 14.7.1) deemed the risk of ship strike to marine mammals, both as a result of the proposal and cumulatively if other proposed ports were developed, to be low.

It should be noted the potential effect on the Southern Right Whale was a key reason for the proposal being deemed a 'controlled action under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

Southern Right Whale *(Eubalaena australis)*
Southern Right Whales have been recorded as an occasional visitor to the Spencer Gulf during their annual migration (i.e. between May – November) and generally follow the coastline as far up as Port Augusta. The whales (often mothers with calves) may venture into the sheltered waters of the Gulf and use it as a resting area on their way to their breeding and calving grounds around the Head of the Bight on the Far West Coast. Whilst Spencer Gulf does not contain any recognised aggregation areas, the Conservation Values Atlas identifies the near shore areas of Spencer Gulf as a Biologically Important Area used by whales as a seasonal calving habitat. Whilst overall whale numbers are steadily re-building, there is limited evidence of an increase in the south-eastern population.

Anecdotal evidence suggest whales appear to be gradually increasing their use of the Spencer Gulf. The EIS (Appendix T) includes records that identify whales being present in Spencer Gulf on 40 occasions from 1997 – 2015. The sightings generally comprise 1-2 whales per year, often a mother with calf. Whales are usually sighted around Port Lincoln, Lipson Cove and Port Neil.

The *Conservation Management Plan for the Southern Right Whale 2011-2021* (SEWPaC 2012) identifies the risk from vessel disturbance as a known threat to the species. Vessel disturbance can occur in the form of collisions or by disrupting the behaviour of animals. Southern right whales appear to be the primary whale species involved in vessel collisions in the southern hemisphere (i.e. 50% of whale mortalities).

Chronic disturbance, leading to increased energetic costs or disruption of critical social behaviours as individual animals try to avoid vessels, can also occur. Loud noises (such as from piling or blasting) or long exposure (such as from vessel noise) may lead to avoidance of important habitat areas, interruption to communication and, in some situations, physical damage, including permanent or temporary hearing loss. Habitat modification through the development of infrastructure (such as ports) could lead to the physical displacement of whales from their preferred habitats or disruption to normal behaviour. Given the low population numbers, it is critical that any impacts do not result in significant behavioural changes, especially for whales that may be calving/nursing.

It should be noted the Australian Government is currently working with State Government agencies and relevant stakeholders (including the Australian Maritime Safety Authority) to develop a ship strike mitigation strategy. Thus, a substantial increase in shipping activity and vessel movements (without appropriate management strategies in place) could potentially increase the risk of whale strike or avoidance of noise sources. The cumulative impact of increased shipping activities without appropriate management strategies in place within the Upper Spencer Gulf (including potential future increased shipping from existing port operations, including Lucky Bay Common User Export Facility, if established) could also lead to increased interactions or create a barrier to whale migration up Spencer Gulf. This could pose some degree of threat to the recovery of the species and the re-establishment (or establishment) of migration routes.

The existing shipping channels are aligned towards the centre of Spencer Gulf in deeper water, away from the shallow inshore waters preferred by whales, and whales are likely to avoid the channels. Outside Spencer Gulf, the western shipping lane is located 200 nautical miles from whale aggregation areas at the Head of the Bight and Fowlers Bay, but whales will need to cross the lane during their migration. The proposal would increase ship movements (especially if most ships travel west from Spencer Gulf).

The low numbers of whales observed in Spencer Gulf, along with the relatively low incidence of reported ship strike, suggests that the risk to whales is low (even in the context of increasing ship movements). Although, it should be recognised that most vessel strikes are likely to go un-noticed or un-reported. However, the population trends for whales using these waters indicate low numbers and little evidence of recovery. Consequently, any loss or disturbance (especially reproductive females) could have significant consequences for the south-eastern population. Thus, whilst the likelihood is low, the effect could be major and pose a relatively high risk.

The whale management procedures in the EIS (especially the establishment of an Observation Zone) suitably address this risk. During construction careful management would minimise any impacts during the 'whale season' from May to November (especially from noise during piling or blasting

activities). The EIS (Section 14.6.2) states that whale management procedures would be developed and incorporated into the construction and operational Environmental Management Plans.

The whale management procedures will include:

- A description of all threats to the megafauna species expected in the area resulting from the proposed port.
- A monitoring plan for megafauna habitat use and behaviour, using appropriate survey techniques for mapping of potential threats to the expected whale species arising from the port construction and operations.
- Identification and indication of noise sources and strategies to manage/mitigate noise impacts (e.g. piling procedures). Construction would aim to avoid the use of blasting in the marine environment and piling (and possibly blasting) activities would generally only occur during daylight hours.

In addition, a Marine Mammal Notice to Mariners would be developed and implemented, incorporating:

- An overview of when marine mammals are expected to be present within the study area and key shipping routes.
- Mandated reductions of speed in shipping lanes during periods of peak marine mammal movements (e.g. whale season from May to November).
- Mandatory reporting of marine mammals sightings to the appropriate authorities.
- Encouragement for appropriate caution in ship movements around marine mammals.
- Response procedures to be implemented should an entangled marine mammal be sighted, or a collision occur.

The Australian Government Department of the Environment and Energy noted that the EIS proposal is consistent with the *Marine Bioregional Plan for the South-west Marine Region* (Department of Sustainability, Environment, Water, Population and Communities, Public Affairs 2012). The same Department noted the EIS states how the proposal is not inconsistent with the Conservation Management Plan for the Southern Right Whale; however, the Department also expressed concerns about the likely impacts on the species, especially during the calving period. The approval requirements imposed on the Port Spencer (Sheep Hill) Deep Water Port Facility (by Centrex Metals) were considered relevant to the assessment of the proposal.

Thus, it is considered that **a Southern Right Whale Management and Monitoring Plan should be prepared and implemented** (if the proposal is approved) that includes:

- A description of all threats to the Southern Right Whale arising from port construction and operation activities (including appropriate mapping).
- A plan to monitor whale habitat use and behaviour, using appropriate survey techniques for mapping potential threats to whales arising from Port construction and operation activities.
- Mitigation measures to manage the impact of Port construction and operation (including shipping), especially underwater noise caused by the Port and vessels and the risk of vessel strike.
- Consideration and management of cumulative impacts arising from Port construction and operational activities.
- Management of noise impacts, such that underwater noise does not exceed 183 dB re 1µPa2.s. The Plan should identify all sources of underwater noise that would be produced measures to minimise these.

During construction, marine piling (and possibly blasting) activities should minimise the risk of physical impacts, including temporary threshold shift to whales (i.e. reversible hearing loss). These must include:

Pre-start up visual observations

- Visual observations for whales undertaken to the extent of the marine piling observation zone (i.e. up to 1,250 metres) by a suitably trained crew member for at least 30 minutes before the commencement of marine piling.

Operating procedures

- Visual observations of the piling observation zone.
- Exclusion zones must be implemented so as to ensure that whales are not exposed to Sound Exposure Levels (SEL) of greater than or equal to 183 dB re 1µPa2.s and be no less than a 1250 metre horizontal radius for whales, unless a lesser exclusion zone has been determined from noise monitoring of piling and has a SEL equal to or below 183 dB re 1µPa2.s.
- If whales are sighted within the relevant exclusion zone, action to cease all piling within the relevant exclusion zone should be taken within two minutes of the sighting or as soon as possible if it is unsafe to cease piling within two minutes.
- Piling activities must not recommence until whales are observed to move outside the exclusion zone or 30 minutes have passed since the last sighting.
- Soft start procedures: Piling activities must be initiated at the soft start level and then build up to full operating impact force. The soft start procedures should only commence if no whales have been sighted in the exclusion zone during pre-start-up visual observations.
- No marine piling operations should occur between the hours of sunset and sunrise during the peak southern migration of mother and calf whale pods (defined as April to November in any year).
- Marine piling commenced prior to sunset or prior to a period of low visibility (i.e. inability to see for a distance of 500 metres or more due to fog, rain, sea spray or smoke) can continue between the hours of sunset and sunrise, unless marine pile driving is suspended for more than 15 minutes.

The preparation and implementation of the Plan should be undertaken in co-ordination with the Spencer Gulf Ecosystem and Development Initiative (SGEDI). The SGEDI is a major initiative led by the Environment Institute, with research partners SARDI and Flinders University, and funded by investment from industry. It aims to develop independent and credible science (especially to address knowledge gaps through research) to enable evidence-based assessment of development options within the Spencer Gulf. The Plan should outline appropriate methodology to monitor both whale habitat use and behaviour using appropriate survey techniques during construction and operation of the Port, as well as how it proposes to dovetail in with any other specific research to be undertaken by SGEDI on the species utilisation of the Spencer Gulf area. The Plan would need to be incorporated into the Environmental Management Plans for construction and operation.

To complement the Plan, an Oil Spill Contingency Plan should also be prepared and implemented (if the proposal is approved) that addresses strategies to address any potential impacts on whales. On balance and with correct management measures the AR considers the risks to whales as manageable through and the implementation of an Environmental Management Plan framework, including the preparation of a Southern Right Whale Management and Monitoring Plan.

Commercial Species

The EIS (Section 14.3.12) recognised that fishing and aquaculture have a significant commercial role in the Spencer Gulf region, with Port Lincoln and Arno Bay representing focal points for the industry.

The closest aquaculture leases to the proposed port site are approximately 33 km north (Arno Bay), and 30 km south (Cape Euler). The Port Neill Aquaculture Zone is approximately 2 km from the closest point of the proposed jetty, and is located within the marine study area. A number of commercial fisheries also operate within the Spencer Gulf. However, the study area represents only a small proportion of habitats used by these industries.

The EIS (Section 14.5.6) identified that construction and operation of the proposed port would restrict commercial fisheries from operating within some areas close to the site (particularly within the port operating limit zone). The majority of the area would remain available for fisheries and recreational fishing. The local area does not contain any habitat identified as critical for commercially fished species and there are no aquaculture leases located within 30 km's. Construction of the jetty will also restrict the potential future development of the aquaculture leases at the site, but the inshore waters in this locality are designated as an area excluded from aquaculture development. Thus, restricting commercial fisheries and aquaculture from operating within such a small area will not significantly impact commercial operations and was deemed a negligible impact.

Marine Pests

The EIS (Section 14.3.9) states that no Invasive Marine Species (IMS) were identified within the marine study area during field surveys. Species considered to pose the greatest risk to the marine environment include:

- *Alexandrium minutum* (toxic dinoflagellate, estuarine dinoflagellate).
- *Carcinus maenas* (European or green shoe crab).
- *Caulerpa taxifolia* (aquarium caulerpa, killer alga).
- *Codium fragile ssp. tomentosoides* (dead man's fingers, green sea-fingers, oyster thief, sea staghorn).
- Charybdis japonica (Asian paddle crab, lady crab, Asian swimming crab, Japanese swimming crab, Japanese rock crab, shore swimming crab).
- *Musculista senhousia* (Asian date mussel, bag mussel, Senhouse's mussel, Asian mussel, Japanese mussel, green mussel, east Asian bag mussel, date mussel, cuckoo mussel).
- *Polysiphonia brodiei* (red macroalga).
- *Sabella spallanzanii* (European fan worm, sabellid fan worm, Mediterranean fan worm, giant fan worm, tremuligione amaro).
- *Watersipora* spp. (lace coral).

The EIS (Section 14.7.6) acknowledged that mitigating the introduction and spread of marine pests into the local marine environment is a key issue in the construction and operation of the proposed port. IMS could be transported to the study area as biofouling on vessel hulls, jack-up barge legs, anchors, anchor chains, mooring lines, internal boat compartments, sediment transported in or on vessels, or in any seawater onboard vessels/barges, including ballast water, in bilge, inside pipes or pumps. The two most likely mechanisms for the spread of marine pests are via ballast water and biofouling. IMS can exist in low numbers or persist as cysts in an area and can rapidly increase in density after a disturbance to the environment or removal of competitive indigenous species. Construction activities have the potential to either release cysts or propagules, as well as provide cleared surfaces for IMS to colonise. Due to the opportunistic traits of IMS the hard surfaces of the Module Offloading Facility (MOF), tug harbour and jetty will create suitable areas for colonisation.

A new port facility would need to be managed to control the spread of marine pests already in Australian waters and prevent the introduction of new ones. The EIS (Section 14.6.2) states that all vessels utilising the port will be required to comply with the national guidelines relevant to biofouling and ballast water [Australian Quarantine and Inspection Service *Australian Ballast Water*

Management Requirements (DAFF 2011) and the *Quarantine Act 1908*[1]] to mitigate the risk of introducing pest species to the marine environment. This is consistent with the International Maritime Organisation's (IMO) International Convention, as it establishes standards and procedures for the management and control of ships ballast water and sediments. Thus, there would be no dumping or exchange of ballast water or waste disposal at the Port. Biofouling was identified as a major risk of pest species transfer. The IMO's codes and guidelines for the management of biofouling would be adopted for the Port. In addition, the port would be part of Australia's National System for the Prevention and Management of Marine Pest Incursions (the National System). Monitoring would be undertaken for the detection of pest marine species, allowing for an early response (if required).

Accidental Spills/Leaks

The establishment of an ore loading jetty for large vessels introduces a risk to the marine environment from accidental spillage of iron concentrate or a spill of hydrocarbons that could affect water quality and marine ecosystems. This could range from a long term impact from regular small spills to a catastrophic event where a major fuel/oil spill occurs. A long term accumulation of pollutants could also result from small leaks from vessels or the leaching of anti-foulants (such as copper).

The EIS (Section 14.5.7) clarifies that the iron concentrate intended for shipment is magnetite-based and known to be insoluble in seawater, so it cannot cause a measurable elevation in dissolved iron concentrations in either the water column or surrounding surface sediments in the event of dust or accidental release to the marine environment. Thus, the accidental release of iron concentrate into seawater would not result in increased phytoplankton growth (i.e. algal blooms). In particular, the Spencer Gulf environment is not iron-limited, so there would be no iron 'fertilisation' effect on phytoplankton or algae (and background concentrations of iron in the water are relatively high compared to oceanic waters).

Whilst spillage of concentrate or dust could affect local marine habitats by covering the benthos (i.e. change sediment characteristics), smothering benthic organisms and potentially altering habitat structures, suitable design controls would be implemented to minimise spillage and dust emissions during material handling and storage. As such any impacts were predicted to be negligible.

Whilst the EIS also considered the potential for a substantial fuel/oil spill to be low, it is a risk nonetheless that could have a significant impact on the marine environment. Although the Spencer Gulf is a sheltered embayment, there is a probability that a spill could occur due to weather conditions and/or human error/mechanical failure.

As a result it is proposed that, along with the licence framework employed by the EPA, that a stringent monitoring and management framework be mandated as part of any approval issued to ensure ongoing vigilance and maintain a low risk profile for any spill event, along with appropriate response measures (should these be required). With such measures in place, the AR considers the potential risk to be manageable.

3.4.5 Hazard and Risk

The EIS (Section 9.2; Tables 9-4 and 9-5) included a risk assessment that identified five levels of risk (i.e. Insignificant, Minor, Moderate, Major and Catastrophic) for the following impact aspects:

- Injury and/or Fatality.
- Air Quality and Noise.
- Cultural.

[1] NB: The *Quarantine Act 1908* was repealed in June 2016 and replaced by the *Biosecurity (Consequential Amendments and Transitional Provisions) Act 2015*.

- Social.
- Contamination.
- Recharge.
- Effect on Behaviour of Listed Fauna.
- Effect on Viability of Listed Flora and Fauna Species.
- Effect on Behaviour and Viability of Fauna (Non-listed).
- Effect on Flora Community.
- Ground, Surface and Marine Water Quality.

The risk assessment approach was applied for each environmental impact assessment chapter of the EIS (i.e. 10 – 23) and risk control options summarised in the Environmental Management Framework (i.e. Chapter 24). This was considered a suitable approach. Hazards and risks are addressed for each issue in the AR.

3.4.6 Light Spill

The EIS (Section 13.5.6) identified that light from construction and operation of the port could impact upon behaviour of local native fauna during nightly construction activities, port operation and lighting on the train. The introduction of artificial lighting to an area can affect foraging behaviour, predator / prey interactions, reproduction, migration and social interactions. Species that may be particularly susceptible to lighting are nocturnal birds, coastal birds, nocturnal reptiles and common microbat species. Based on the limited range of species within the port area, it was considered that short-term impacts to common and conservation significant fauna would be low. Whilst two Hooded Plovers are known to occur along the beach at the port site, they are expected to move to other suitable beach sites adjacent the port site during construction, and if they return they are unlikely to be impacted by the operation of the port.

During operation, artificial lighting will be required for safe navigation, security purposes and for lighting areas to support the 24 hour operation of the port. The EIS (Section 14.5.5) states that light spill into the marine environment will be avoided through the use of directional lighting as much as practicable. Whilst the introduction of artificial light sources may result in localised changes to the behaviour of fish and predator species, the overall impact is likely to be negligible.

3.4.7 Visual Amenity and Landscape Character

Figure 8 - 3D representation of wharf and jetty - supplied image - 4.29 Iron Road EIS Chapter 4 page 4-42

The relatively remote coastal landscape, with gently undulating hills, rocky headlands and sandy beaches is natural in appearance. There are no other industrial type developments situated along this particular stretch of coastline from Port Lincoln to Whyalla. The proposed development will establish a prominent visual feature along a natural (almost pristine) coastline. The *Coastal Viewscapes of South Australia* (Dr Andrew Lothian, 2005) report identified the site as being within an area that has a 'moderate-high' scenic quality rating.

Whilst this part of the coast is generally privately owned farmland and not readily accessible to the public, the nearby Cowley Beach is used by the public for recreation and tourist pursuits (including informal camping). Therefore, the visual amenity from this location would be the most affected. There are several farming residences within a 5 km radius of the site whose visual amenity would be affected to some degree, whether within direct view or when working or travelling around the area. Natural topography and existing vegetation around properties and along roadsides provide some screening.

The existing rural and coastal views would be altered by the concentrate stockpiles, conveyors, ship loader, jetty, vessels and other facilities (all large structures, making them more evident in a rural landscape). The jetty will be the most prominent feature when viewed from the coast. The Cape Class and Panamax vessels will have the greatest impact on the visual amenity when they are berthed at the jetty. At close range, vessels would accentuate the visual impact of the jetty. Vessels waiting in the Anchorage Area would add to the visual impact.

The EIS (Section 23.2) undertook a landscape and visual impact assessment to determine the likely effect of the port, taking into consideration the sensitivity of the landscape to change, the presence of publically accessible locations (including vantage points and key tourist areas) and proposed mitigation measures. The assessment determined that views of the port would be most prominent from the closest point along North Coast Road and from Cowley Beach. These locations were identified to have a potentially 'high' level impact on visual amenity, due to the proximity of port site infrastructure, the sensitivity of the surrounding landscape and the utilisation of the area for scenic and recreation purposes. Visual impacts would be mitigated by establishing native vegetation to the east of North Coast Road adjacent to the port site to provide visual screening of the port site and other design and control measures. Given the distance to residential properties and landscape mitigations proposed, no impacts are expected on local land as a result of changes to the seascape surrounding Cape Hardy.

In review it is clear that visual effects of the proposed port on the environment are considered to be one of the most significant impacts on the locality. An industrial development would be established in a rural area, along a part of the coastline that is devoid of development and relatively natural/pristine. Whilst the land based components of the proposal would be suitably screened using the natural topography and vegetation plantings, the jetty structure and associated shipping activities would result in some loss of landscape quality. This impact would be greatest from North Coast Road and from Cowley Beach, the latter which would have reduced amenity value (and potentially tourism and recreational values). The jetty would also be very noticeable at night, due to lighting of the facility and from vessels. However, on balance the site when compared to other coastal locations is expected to perform appropriately and have a manageable impact upon the surrounding area.

To further explore opportunity to minimise impact a detailed landscaping plan and maintenance schedule should be required as part of any approval issued. The AR concludes the proposal to be appropriate in this regard.

3.4.8 Waste Management

The EIS (Section 4.5.10) states that, during the construction phase, a waste management plan will be implemented (i.e. as part of the CEMMP). Specific measures to be incorporated in the waste management plan will include:

- A procurement policy to encourage purchase and use of materials with recycled content, minimal packaging and materials that can be recycled/re-used.
- Waste separated into different streams to facilitate recycling and removed from the site by a licensed contractor.
- Liquid waste (including hydrocarbons, paints and solvents) stored in sealed drums or containers in a bunded area before removal from the site by an EPA-licensed contractor for recycling or disposal to a licensed facility.
- Temporary ablution facilities serviced by pump-out tanker trucks, used with off-site disposal by a licensed contractor.

The EIS (Section 4.6.5) states that, during operation, all recyclable waste will be separated into different streams to facilitate recycling and removed by a licensed contractor. Iron Road will liaise with the Wudinna and Tumby Bay Councils to develop or upgrade transfer facilities for recyclable waste that can be shared with the community. A composting facility will be established for putrescible waste for the construction camp. Other inert waste will be disposed of in the Wudinna and Tumby Bay landfills with the facilities upgraded if necessary, in consultation with the Council. E-waste, including electrical and electronic equipment will be containerised and provided to an appropriate facility in Adelaide for recycling. Overall the approach is considered to be an appropriate and measurable response to waste management.

3.4.9 Heritage Impacts

The EIS (Section 19.3.1) states that an Aboriginal heritage survey over the port site did not identify any archaeological or other sites of cultural significance within the infrastructure footprint and surrounds. In addition, no registered sites are recorded on the government Central Archive – Register of Aboriginal Sites and Objects. (see photo below - Aboriginal Heritage Survey team examines the port site).

Plate 19-1 Members of the Survey Team inspecting the proposed port site, January 2015

Figure 9 - Supplied image 14.2 Iron Road EIS Chapter 19 page 19-5

The EIS (Chapter 20) states that a search of Commonwealth, State and local non-Aboriginal heritage registers, lists and databases did not identify any heritage sites of objects. In addition, no shipwrecks were identified within 5km of the port site.

Should an approval be issued the applicant will retain the obligation to advise if any other sites of significance to Aboriginal people are found during construction and to cease works in the area until the matter can be appropriately resolved.

3.4.10 Climate Change/Greenhouse Gas/Sustainability

The EIS (Chapter 11) included a risk assessment of predicted climate change and the implications for the operation of the Port.

The EIS (Section 11.3.5) states that sea levels on Eyre Peninsula are anticipated to rise by 0.2 m by 2030, 0.7 m by 2070 and 1.1 m by 2100 in a high emissions scenario (Department of Climate Change 2009). The Coast Protection Board Policy Document requires new coastal development to account for a sea level rise of 0.3 m by 2050 and 1 m by 2100. The effects of sea level rise may be exacerbated during storm events. During storm events, an elevated sea level may result in damage to coastal and marine infrastructure. It is anticipated that any damage would be reparable in the short term, and the consequences of such an event are considered to be moderate. Design of the proposed port facility has incorporated an allowance for projected sea level rise to support ongoing safe operations for the life of the project. Due to the site's elevation (Figure 11-1) it is considered rare that coastal or marine infrastructure will be inundated and damaged during the operable life of the CEIP Infrastructure. As such, the overall risk is considered to be low.

In addition, climate change predictions indicate that bushfire events will increase in frequency and intensity in the Eyre Peninsula region. Bushfire events may result in damage or destruction of Port infrastructure, as well as threaten the safety of employees. Power supply may be lost in the event of extreme heat or a fire event resulting in outages in transmission or distribution infrastructure external to Port infrastructure. Backup generation will be in place for all critical elements required for construction or the safe operation of the Port. An increase in extreme rainfall events may result in surface water flows exceeding the capacity of drainage and retention / detention infrastructure. Wind speeds on the Eyre Peninsula may increase by 3.5% by 2030 and 7.5% by 2070 in a high emissions scenario and are likely to be amplified during storm events (also predicted to increase in frequency and intensity).

The following design and control measures have been incorporated to appropriately minimise risks to the Port infrastructure as a result of the predicted changes to climatic conditions:

- Marine and coastal infrastructure (causeway (including module off-loading facility), wharf and jetty) are designed with allowance for sea level rise to prevent the inundation or damage to infrastructure (refer to Chapter 4, Project Description, for an explanation of the marine infrastructure design)
- The port site is located within a natural 'amphitheatre' with on-shore infrastructure located behind the fore-dune on higher land, avoiding potential future inundation from high tides, extreme storm events, or sea level rise (refer to Figure 11-1).
- Run-off water sedimentation basins are proposed at the port site to catch stormwater running off the concentrate stockpile, module laydown area and hardstand at the rail unloading facility from extreme weather events (refer to Figure 11-1 for locations). Detailed design shall further consider the latest climate change predictions to adopt appropriate rainfall design scenarios (due to altered rainfall patterns) to inform detailed design of the stormwater management approach and sedimentation ponds to accommodate at least 1 in 100 year storm events.

Allowance on site for detailed design of the stormwater management infrastructure is available to include extending/deepening of the proposed sedimentation basins if required.

- Utilisation of native and drought-tolerant vegetation for landscaping purposes to improve resilience to climate change and minimise water requirements.

In addition, the Operations Environmental Management Plan (OEMP) would include a series of control and management strategies to address future climate change implications, such as:

- Bushfire management and emergency response procedures will be developed to consider the amplified risk of bushfire and extreme weather events as a result of climate change. Bushfire management measures recommended by the CFS will be incorporated.
- Inspection of stormwater management infrastructure following extreme storm events, to determine the integrity of dam walls, to monitor available capacity and to determine whether the design capacity remains current.
- Monitoring the marine environment for build-up of invasive marine species which may be favoured by an increase in sea temperatures and could influence the functionality of the port and the local marine environment.
- Development of extreme heat procedures to minimise occurrence of heat stress amongst the workforce.

The EIS (Chapter 11) included an assessment of greenhouse gas (GHG) impacts of the Port in accordance with national standards and guidelines, with the methodology used to calculate the impact assessment reflecting recognised national reporting requirements. Emissions calculations were undertaken in accordance with the methodologies detailed within the National Greenhouse and Energy Reporting System Measurement: Technical Guidelines for the Estimation of Greenhouse Gas Emissions by Facilities in Australia (Department of the Environment 2014d) and included:

- Carbon dioxide (CO2).
- Methane (CH4).
- Nitrous oxide (N20).
- Hydrofluorocarbons (HFCs).
- Perfluorocarbons (PFCs).
- Sulphur hexafluoride (SF6).

In order to compare the relative effects of different gases, all non-carbon dioxide gases were converted to carbon dioxide equivalent using the Global Warming Potential index (GWPs).

Impacts are activity specific and referred to as direct and indirect emissions or:

- Scope 1 (Direct GHG emissions) – These emissions occur from sources that are directly owned or operated by the proponent.
- Scope 2 (Electricity indirect GHG emissions) – The indirect emissions occur from the generation of electricity used by the proponent across the extent of its construction and operations. They are generated at power generation sites, but attributed to the end user.
- Scope 3 (Other indirect GHG emissions) – These emissions occur as a consequence of activities associated with the proposal, but occur from sources not owned or controlled by the proponent. Reporting of scope 3 emissions is optional under all of the standards and guidelines relevant to this assessment.

The EIS (Section 11.4.1) advises that the proposal will result in the release of GHG emissions primarily as a result of the use of diesel fuel for the transport of iron concentrate by train to the port facility and the use of purchased electricity for materials handling at the port site. The design of the port has incorporated a number of measures to minimise GHG emissions as low as reasonably possible, including the use of a Module Offloading Facility (i.e. for direct transport of pre-constructed modules),

optimising blasting techniques, efficient railway line and measures to reduce energy demand (especially energy efficient designs).

The EIS (Section 11.5) concluded that the total volume of GHG emissions generated by the entire proposal (i.e. including mining operations) was estimated to be approximately 1,316,891 t of CO2-e during construction, and 1,765,538 of CO2-e per annum during operations. It should be noted the operational figure is a peak level estimate and it is anticipated that in most years emissions levels will be considerably lower. Given the estimated volume of annual GHG emissions, the proposal would trigger the threshold for the reporting and management of GHG emissions under the *National Greenhouse and Energy Reporting Act 2007*.

The emission of greenhouse gases as a result of the proposal was considered to represent a small percentage of national and global emissions. Regionally, emissions from the proposal may represent up to 5.9% of South Australia's contribution to global GHG emissions. Mitigation actions will be taken to ensure GHG emissions are ALARP. This includes design modifications to protect environmental values including: modifications to operational design features; minimisation and optimisation of fuel consumption and minimisation of land clearance.

In order to minimise GHG emissions during the construction and operation of the Port, management strategies would focus on: minimising fuel consumption (for example through optimisation of water balance); optimising efficiency of plant and equipment; using renewable energy where possible; sourcing recycled material and material that has minimal impact on environmental values; sourcing local materials wherever practicable; generation of offsets to compensate for residual impacts; stockpiling of topsoil to be used in rehabilitation activities; minimising land clearance; and comprehensive monitoring and energy audits to monitor emissions levels. Iron Road is committed to working with the South Australian Government, through such mechanisms as the Regional Adaptation Plan for the Eyre Peninsula and establishment of a Climate Change Sector Agreement, to achieve South Australia GHG emissions targets.

3.4.11 Management Strategies during Construction and Operation

During the anticipated 30 month construction period, extensive earthworks would be required during construction for the rail loop, rail unloading facility, building pads and jetty causeway. Blasting would also be undertaken over a 5-6 month period during construction of the rail loop (i.e. for cuttings to achieve a relatively flat gradient) and for the underground rail unloading infrastructure. Clean fill from earthworks would be used in the causeway construction, with large boulders (i.e. ~1m^3 in size) sourced from blasting used for rock armour protection. Cut and fill will occur in stages to minimise the amount of soil exposed at any given time, and rehabilitation of exposed sites will occur as soon as practicable. In order to enable re-use of the excavated materials, a dedicated materials crushing and screening plant would be established. A concrete batch plant, with a capacity of 90m^2/hr of concrete, would also be established in close proximity to the construction activities. Saline groundwater from the water supply bores would be piped to the site for use during construction (especially dust suppression). Diesel generators would be used for power supply.

During construction, ground disturbance footprints will be minimised and vegetation will be retained wherever possible. Progressive rehabilitation of disturbed ground will be undertaken as soon as practicable. Rehabilitation strategies will include use of locally indigenous plant species, use of existing seedbank from stockpiled material where practicable, and align with regional NRM objectives where possible.

There are a range of standard impacts associated with such a large infrastructure proposal that are likely to occur, including:

- Earthworks that remove vegetation cover, disturb soils and change the topography of the land (and natural drainage), which would require the control of wind and water erosion.
- Generation of air emissions, which would require the control of dust, noise and pollutants.
- Use of fuels and chemicals that would require suitable storage and handling practices (including contingencies for leaks and spills).
- Generation of various waste streams that need to be minimised, managed and disposed of (including litter and sewage).
- Increased traffic (particularly heavy vehicles), which can have an impact on road safety and cause disruption to local traffic movements (especially during peak farming periods, such as harvesting).
- Disturbance to the coastal and marine environment.
- Disturbance to the amenity of the area, especially for locals and tourists.

The port would operate 24 hours per day for 365 days per year and would require management of an operational workforce (approximately 100 employees), automated rail operations, a water/power supply, waste management and Port operations (including a fairway and anchorage area). The most significant impacts during operation of such an export facility are likely to be:

- Regular rail movements to/from the Port (noise and traffic impacts).
- Noise from the operation of the Port (including underwater noise).
- Increased shipping traffic around the Port and within the Spencer Gulf.
- Visual impact of the prominent storage stockpile, materials handling infrastructure, jetty/wharf structure and shipping traffic on the coast.
- Potential risk of a fuel/oil spill.
- Stormwater management.
- Pest plant and animal control.

Impacts on the community and the environment would be adequately managed through the avoidance and mitigation measures proposed in the construction and operational Environmental Management Plans.

Decommissioning

The port will service the proposed mine which has an estimated production life of 25 years. The EIS (Section 4.7) states that, during the later stages of mining, liaison will occur with all relevant stakeholders (including user groups) to determine future management or decommissioning of the infrastructure. It is expected that the railway line and loop and port infrastructure will be retained, based on negotiation with the State Government and potential private investors for future use. Decommissioning and removal of site infrastructure (if required) would involve site assessment and remediation planning, including removal of fuel and chemical storage and wastewater treatment facilities in accordance with the relevant legislation and standards.

A requirement mandating the preparation of an overarching plan dealing with decommissioning has been included as a suggested condition of approval should it be granted.

The key risks for the development of the port would be management of the proposed stock pile of iron ore at the port, noise impacts of the rail operations and any air quality issues in relation to the movement of the iron ore onto the ships. The risks of there being adverse outcomes in relation to the operation of the port are considered low with appropriate management regimes being implemented.

The AR considers that the environmental, social and economic impacts from the sea port at Cape Hardy can be adequately addressed in the required management plans which form part of the conditions if this proposal is approved.

4 PRINCIPAL INFRASTRUCTURE CORRIDOR (Rail, Water & Electricity Supply)

4.1 General

There are essentially three corridors for rail, water and electricity supply for the CEIP development. The three corridors are discussed below in this chapter. It should be noted that the water and electricity corridors merge into the rail corridor close to the mine boundary, or in the northern part of the rail corridor.

Figure 10 - supplied image 4-5 Iron Road EIS Chapter 4 page 4-11

4.1.1 Site and locality

The proposed corridors will be located across four council areas on Eyre Peninsula: Wudinna District Council, District Council of Kimba, District Council of Cleve and the District Council of Tumby Bay, connecting the proposed mine site to the proposed port site at Cape Hardy.

The main rail corridor will originate in a south-easterly direction from the mine near the intersection of Kimba Road and Lock Road. The corridor will then follow the northern boundary of the Hambidge Wilderness Protection Area, before turning in a south-easterly direction, passing approximately 7 km west of Darke Peak, 1.5 km southwest of Rudall and 3 km west of Port Neill at its intersection with the Lincoln Highway. The corridor will then continue south to the proposed port facility located approximately 7 km south of Port Neill at Cape Hardy.

4.1.2 Existing environment

The area required for the corridor is primarily located within agricultural land typically used for cropping (95.3%) and grazing (1.4%). Portions of the corridor are currently used for transport purposes (3.1%).

The infrastructure corridor will pass through catchment areas and cross the Driver River, the Dutton River and the Byres Bay Creek and several ephemeral drainage lines.

Part of the corridor will run parallel to the northern boundary of the Hambidge Wilderness Protection Area (WPA). The Hambidge WPA is a significant patch of remnant indigenous vegetation dominated by mallee vegetation communities. It is located to the southeast of the proposed mine site. A separation distance of 50m will be maintained along this section of the corridor.

Aside from Hambidge, the landscape adjacent to the corridor consists predominantly of agricultural land, supporting only highly fragmented and degraded small patches of remnant vegetation which are generally restricted to dune crests.

4.1.3 Project Description – key elements

Infrastructure corridors are proposed between the proposed port site at Cape Hardy and the proposed mine site. The corridors will include:

- a railway line
- a bore field and water pipeline
- a power transmission line connecting the mine site to existing electricity network

The total area of the infrastructure corridor, power transmission line and borefield corridors is approximately 828 ha:

- railway line, rail maintenance track, water pipeline and construction buffer 743 ha
- power poles 43 ha
- borefield 42 ha

The proposed railway will be a standard gauge, heavy haulage rail system with a single track designed using Australian Rail Track Corporation engineering standards. It will accommodate two locomotives to move iron ore concentrate from the mine site to the port on six loaded and six unloaded (return) train trips per day. Two-way passage of trains will be provided through the use of two passing sidings located along the infrastructure corridor.

The railway line will be approximately 148 km long, which includes the port site loop (approximately 5 km) and the mine site loop (approximately 13 km).

A 10m wide unsealed road will be constructed immediately adjacent to the proposed railway line. This road will be used for servicing both the mine and port site during construction, track maintenance and inspection purposes.

The proposed railway line and unsealed road/maintenance track will extend along the entire length of the infrastructure corridor, while the water pipeline and power transmission line will join the corridor north of the Birdseye Highway

The corridor will range in width from approximately 60 m in the south to approximately 110 m in the north depending on which infrastructure components are present. Additional width will be required in some locations to provide for two rail sidings, a pump station and for earthwork embankments with a maximum width of approximately 150 m.

4.2 Summary of Submissions

4.2.2 Public submissions

Key issues raised in the public submissions in relation to the corridor include:

- traffic interruptions on the Lincoln Highway
- types of crossings
- need to upgrade Birdseye Highway crossing
- safety of crossings
- farmer operational issues related to crossing the corridor and railway (in particular during cropping/harvest periods)
- train scheduling and changes to scheduling
- disruption to services (electricity, phone, water, internet) during corridor construction
- relocation of services (electricity, phone, water, internet)
- economic viability of unused portions of land not acquired by the proponent for the corridor
- livestock (accidently) accessing the corridor/railway (e.g. gates left open)
- control of weeds along corridor
- bushfire risks
- railway noise

In response the applicant updated details with respect to the following items:

- further commitment to the development and implementation of controlled traffic management strategies
- further discussions with DPTI, the District Councils and local farmers (where necessary) in relation to rail crossings and other traffic related impacts to deliver a safe and efficient network
- commitment to provide regular and timely information on any changes to the train schedule (currently proposed to be every 2 hours) to assist in reducing disruptions to road users
- acknowledgement of temporary disruptions to services during the construction phase of the project, however anticipated improvements to services in the long term due to upgraded infrastructure into the region
- commitment to provide regular and timely information to local residents and communities about planned works during the construction phase to help reduce disruptions
- commitment to relocate and reinstate any services in an efficient manner at the expense of the proponent
- further exploring options with effected land holders for the use of excess parts of land (including being used towards the required significant environmental benefit, for culverts and/or being sold or leased to another party for farming purposes)
- development and implementation of best practice weed management and control strategies
- development and implementation of best practice bushfire management strategies
- commitment to fully fence the entire rail corridor and develop a policy with the rail operator in relation to a variety of factors including protocols around reporting of incidents and

compensation (where Iron Road is at fault – e.g. an employee leaving a gate open and stock die as a result)

- commitment to maintain noise at levels that are below those that are regulated for harm or nuisance, in line with applicable legislation and standards and the noise policies developed by the SA EPA.

The AR recognises that in some instances, more discussions are required between the proponent and the relevant Government agencies or landholders to determine the detail to resolve the issue.

Accordingly, the development and implementation of traffic management and control strategies in the Construction Environmental Management Plan and Operation Environmental Management Plan, to the satisfaction of DPTI, will be a condition of approval.

Should the development be approved, a further four conditions are proposed including:

- **development and implementation of weed management and control strategies in the Construction Environmental Management Plan and Operation Environmental Management Plan, to the satisfaction of DEWNR.**
- **development and implementation of bushfire management strategies in the Construction Environmental Management Plan and Operation Environmental Management Plan, to the satisfaction of DEWNR and the CFS.**
- **fencing of the entire length of the corridor, to be maintained by Iron Road Limited, to the satisfaction of DPTI.**
- **ensuring noise emissions are below regulated levels, and undertaking ongoing noise assessment and monitoring, to the satisfaction of the EPA, to ascertain the effectiveness of noise control measures.**

4.2.3 Government submissions

Key comments provided by Government Agencies in relation to the railway corridor include:

- potential for habitat loss/impacts
- air quality and noise management
- identification of areas of site contamination and potential remediation
- investigation of a railway crossing at Birdseye Highway (i.e. DPTI's *Railway Crossing Policy* September 2015)
- the need for impacts to all affected habitats to be discussed with the Department of Environment , Water and Natural Resources and included in the significant environmental benefit calculation and that minimisation strategies will be included in the Construction Environmental Management Plan and Operation Environmental Management Plan
- air quality and noise management strategies to be included in both the Construction Environmental Management Plan and Operation Environmental Management Plan
- engagement of an expert contamination expert to gather site contamination data (including acid sulphate soil); and that a Remediation Action Plan, if required, will be developed.

The AR recognises that in some instances, more discussions are required between the proponent and the relevant Government agencies to determine the detail to resolve the issue. Accordingly, should the major development be approved, the following conditions are recommended:

- **a significant environmental benefit, as determined by the Native Vegetation Council (DEWNR) will be a condition of approval.**
- **the development and implementation of air quality and noise management strategies in the Construction Environmental Management Plan and Operation Environmental Management Plan, to the satisfaction of EPA.**
- **undertaking a Preliminary Site Investigation (PSI) in accordance with the National Environment Protection (Assessment of Site Contamination) Measure 1999 prior to the commencement of any construction activities within areas that were identified in the EIS as having some potential for contamination and for the sites of the short term workers accommodation at Cape Hardy and long term workers village at Wudinna to identify potential sources of contamination within these sites. The PSI is to be completed prior to the CEMP and the PSI results used to inform the CEMP development.**
- **undertaking a review of railway crossings, and preparing and formalising Interface Agreements with the appropriate parties prior to construction, to the satisfaction of DPTI.**
- **the development of an Infrastructure Agreement regarding the provision of roads and rail upgrades, between the Proponent and DPTI.**

4.3 Key environmental, social and economic issues

4.3.1 Rail alignment selection and consideration of alternatives

The proponent considered a range of transport options for the movement of the iron concentrate from the proposed mine to the port site, and determined that rail transport is the most appropriate.

A slurry pipeline was considered but deemed unsuitable due to the iron concentrate particle size, coupled with the fact that the pipeline could not be shared for third party use and would require a larger volume of water than the preferred option of railing the concentrate.

Shared use of the existing Cummins Buckleboo Railway was considered and ruled out as an option due to social and economic reasons. This line is only suitable for trains travelling at low operating speeds and would not be able to carry the extra tonnage that the CEIP mine will produce.

A number of alternative rail corridors were also evaluated to select the preferred corridor for a new railway line:

A. Following Cummins Buckleboo Railway – deemed unsuitable due to social and environmental reasons - a greater number of individuals would be impacted; it will have a greater impact on remnant native vegetation (due to the extent of remnant vegetation within the existing rail easement) and does not allow for a 2 km horizontal curve radius as preferred by ARTC track design standards.
B. Similar to the proposed railway line, with the exception of the corridor between the Lincoln Highway and the Cummins Buckleboo Railway – deemed unsuitable due to the potential impact to Centrex Metal's Carrow prospect, which is located in this area. Carrow is a potential magnetite deposit that may be developed in the future.

The final alignment of the iron concentrate transport route has been driven by environment, social, cultural, design and economic criteria. It avoids the Hambidge WPA and other conservation parks and reserves in the region. It also avoids intact areas of remnant vegetation that other options would not. The railway line is located away from the townships of Rudall, Darke Peak and Port Neill, and property impacts will be minimised by locating the railway line close to existing property boundaries rather than cutting across paddocks.

The AR concludes that the criteria utilised to determine the proposed railway alignment was robust and provides adequate justification that the alignment represents an economically, socially and environmentally viable option.

4.3.2 Land Tenure

Existing land tenure for the proposed infrastructure corridor is a combination of land tenures including freehold, Crown Reserves and Crown Leases held by various parties.

The proponent does not currently have ownership or the right to access all the property within the proposed infrastructure corridor and must negotiate suitable arrangements for the land required with each affected landowner.

The proponent has held meetings with directly affected landowners throughout the stages of the project to discuss the level of impact the corridor will have on their properties, design alternatives and options, management issues, continuity of farming and compensation.

The proponent has committed to developing Impact Management Plans (IMP) in conjunction with each affected landowner. These plans will identify what infrastructure will be required to assist farmers continue with their business (including fencing, gates, stock crossings and culverts).

The proponent has also indicated that further discussions are required around portions of land that will not be required for the infrastructure corridor but can no longer be effectively used by the landowner for farming purposes. The proponent intends to include details on the management of these portions of lands in the individual IMP's and has indicated that options may include:

- purchase of the land to be used for SEB purposes
- selling or leasing the land to another party for farming purposes
- using the land for culverts
- using the land as access points

At the time of this AR, individual IMPs have not yet been developed, and agreed to, for all affected landowners. This must be resolved before construction of the corridor can commence.

There are six small land parcels that contain Crown land. These parcels may be subject to native title rights and interests. As such, the proponent has included each of these land parcels in the Indigenous Land Use Agreement that has been negotiated with the Barngarla Aboriginal Corporation on behalf of the Barngarla people.

The AR acknowledges that land ownership or right to access arrangements for all property within the proposed infrastructure corridor are still being negotiated.

The AR acknowledges that Impact Management Plans (IMP) are being prepared and must be finalised with all affected landowners before construction of that portion of the railway can commence.

The AR acknowledges that an Indigenous Land Use Agreement has been negotiated with the Barngarla Aboriginal Corporation on behalf of the Barngarla people.

4.3.3 Impact on Road network/treatment for road/rail crossings

The traffic and transport issues in relation to this development are outlined in Chapter 18 of the EIS and Appendix W. In it the proponent has taken into account current industry standards and guidelines including:

- Austroads Guide to Traffic Management
- Highway Capacity Manual (HCM) vol2, Ch15 methods for analysis of two lane Highways (TRB 2010)
- Australian Standard AS1742 Manual of uniform traffic control devices, Pt 7 Railway crossings

The EIS summarizes the potential impacts/risks for the rail line crossing numerous local roads and also four major roads in the Eyre Region, these are the Lincoln, Tod, Birdseye and Eyre Highways. Section 18.4 of the EIS outlines the design response to protect the integrity of the road network on Eyre Peninsula in relation to both construction and operation of the CEIP development. These include:

- The use of modularised construction methods to reduce the overall construction traffic
- A proposed rail maintenance track along the infrastructure corridor to provide access for project vehicles
- A combination of road realignments, level crossings and grade separated crossings are proposed along the infrastructure corridor to maintain the connectivity of the road network following construction of the proposed railway line. This includes a road bridge at the intersection of the proposed railway line and the Lincoln Highway so vehicles travelling on the highway do not need to stop for trains, and road diversions of part of Phelps Road and Wudinna- Darke Peak Road to avoid the need for level crossings in these locations
- During detailed design each of the level crossings will be designed in accordance with AS1742.7, which defines the sighting required for level crossings in order to provide clear visibility warning signage for an approaching motorist as well as between a road vehicle and an oncoming train
- During construction of the proposed Lincoln Highway road bridge, a parallel temporary road detour will be installed around the construction area in consultation with DPTI to maintain traffic flows.
- The proposed rail line will be constructed as grade separated over existing Cummins-Buckleboo rail line, to allow the existing railway line to maintain functionality

- Construction of a new road bridge over the proposed railway line to maintain the connectivity of North Coast Road at the north-western port site boundary.
- Upgrade of Brayfield Road between North Coast Road and Lincoln Highway intersection.
- Minor realignment, slight lengthening and improvement of the physical standard of sections of the existing Brayfield Road as the primary access point to the port site
- Upgrade of the Lincoln Highway/Port Neill Access Road intersection.

Within Section 18.5 the proponents have provided detail on the level crossing detailed design commitments (Table 18.5)

DPTI provided comments on the EIS in relation to Transport issues related to this proposal. The Department's comments referred to a Railway Crossing Policy released in September 2015 (see references).

4.3.4 Transport safety and emergency response

Impacts to the operation of the local School buses have been discussed in Section 18.5.5 of the EIS. It is proposed that construction traffic will be timed to avoid the school bus services wherever possible. The proponent has assessed that delays to school buses as a result of construction or ongoing traffic is negligible however there will be some delays during construction of the rail line at a number of locations. Iron Road will liaise with local schools about alternative routes where required, consideration of new or upgraded level crossings are proposed by the proponent which would enable bus routes to continue to operate during rail operations. However, this will be dealt with in more detail when 'crossings' plan is undertaken by Iron Road and DPTI as required by the proposed conditions.

A summary of risks to transport as a result of the construction and operation of the CEIP Rail corridor have been provided in Table 18-13 of the EIS and the outcome is that all traffic impacts related to the development are within the design capacity of the existing transport network, that any delays on the network as a result of the construction or operation are minor and are not expected to increase traffic accidents or level of risk for traffic on public roads.

Iron Road has committed to a traffic management and road maintenance plan for public roads as part of the CEMP and OEMP. It is proposed that this be a condition of approval, and that it is to be developed in consultation with each relevant Council and the DPTI.

4.3.5 Moving over – dimensional (OD) loads

The proponent has discussed the impact assessment of large loads in Appendix W (Traffic Impact Assessment by Jacobs). The majority of large module sized transport is outlined in Table 5-1 of Appendix W, also Fig 5-1 shows the proposed module delivery and diversion routes that Iron Road would use for these loads. Timing of the delivery of such loads would attempt to reduce the impacts on existing road users including travel at night, however if motorists do encounter these module loads there may be delays of up to 10 minutes per vehicle. The average delay times are given in Table 5-3 of App W.

There are also going to be impacts to the power line crossings along the module routes. A total of 36 line crossings would either need to be raised or buried underground to avoid affecting the delivery of modules, likewise some culvert widths might need to be widened to allow for a module width of 12m. An assessment of the level of service of the affected roads in Table 5-5 indicates that traffic flows would still mostly be uncongested and free flowing, a few road segments were slightly more affected (uncongested and reasonably free flowing), these are Eyre Highway (Lincoln Hwy intersection – Port Augusta Bridge (eastbound and westbound) and Lincoln Hwy (Cowell – Ash Road (eastbound).

Pursuant to the *Road Traffic Act 1961*, the proponent will need to seek approval from DPTI as delegated by the Minister for Transport, for authority to access the construction site with vehicles that do not fall within the definition of 'General Access Vehicle'. This might include such things as construction equipment and vehicles carrying large indivisible construction materials. The proponent will also need to give consideration to application for access to enable Restricted Access Vehicles to have regular access to a network of roads to facilitate the Port's business. This might include access for Road Trains or B-Doubles to transport commodities to and from the Port. If the road network required is not already Gazetted as an approved route for the type of vehicle required, then an application must be made to DPTI to amend the Gazetted route.

An important initial step, as outlined in the Heavy Vehicle Access Framework, is to have an assessment of the route undertaken by an Authorised Route Assessor, at the applicant's cost. This process will identify any upgrades required to make the route safe and suitable for the type of vehicle access requested. As part of the approval/s, the proponent will be required to prepare a list of final transport infrastructure improvement needs upon completion of a full route assessment. If this is necessary, the list should identify the scope, timing and estimated cost of the required improvements. Based on the list, the proponent will be required to enter a Deed of Agreement with DPTI regarding delivery of the infrastructure identified in the list of improvement needs. DPTI will require the assessment of proposed routes any road improvements that are required to cater for the movement of heavy vehicles associated with the mine and Port to be funded by the proponent.

4.3.6 Air Quality

The existing air quality in the whole of the project area is considered 'very good' or 'good' (as defined by the EPA in the SA Air Quality Index) due to its rural location, low levels of road traffic and limited industrial activity. The existing air pollution is mostly comprised of airborne particulate matter including wind-blown aerosols and dust, vehicle/machinery generated dust from un-paved roads and ground disturbance in paddocks, other agricultural activities and fires.

It is expected that new air emissions will occur as a result of the construction of the corridor and the transport of iron concentrate along the railway.

Air quality indicators and ambient air quality criteria are specified in the EPA guidance document, *EPA 386/06, Air quality impact assessment using design ground level pollutant concentrations (DGLCs)*, updated January 2006 (EPA 2006). This document does not provide air quality criteria for particulate matter, however there is a requirement to source appropriate alternatives. To accommodate this requirement, the National Environment Protection (Ambient Air Quality) Measure (NEPM) standards and guidelines for particulate matter 10 µm or less in diameter (PM10) and for particulate matter 2.5 µm or less in diameter (PM2.5) were adopted by the proponent (NEPC 2003) for the assessment of gaseous emissions from the locomotives proposed to be used as part of the railway operation. In addition, the NSW Department of Environment and Conservation (DEC) standards and guidelines for Total Suspended Particulates (TSP) and deposited dust were adopted for the project by the EPA for the protection of amenity from nuisance dust (DEC 2005).

Air quality assessments were undertaken for the corridor (railway) component including:

- air quality modelling of locomotive combustion emissions at a single indicative location along the proposed corridor and qualitative assessment of dust emissions from the proposed corridor
- qualitative assessment of the potential air emissions from construction works

Approximately 30 dwellings, the Driver River Uniting Church (Verran) and the Taragoro grain storage and handling facility are identified as being located within 1 km of the proposed infrastructure components along the corridor (including the borefield wells, water pipeline, railway line and power transmission line).

Potential sources of air emissions during construction have been identified to include:

- wind-borne dust from exposed surfaces, such as cleared areas, temporary stockpiles and excavations
- materials handling activities associated with earthworks requirements (e.g. cut and fill for railway line)
- blasting for cut and fill works along the proposed corridor
- general construction works associated with the construction of various buildings and storage facilities along the proposed corridor
- wheel-generated dust from heavy and light vehicle movements on unsealed surfaces
- diesel exhaust emissions from the use of construction machinery, vehicles and generators.

Construction activities are not expected to generate significant quantities of dust, based on the relatively low levels of ground disturbance and short-term duration of construction along the corridor. The proponent has committed to prepare and implement a Construction Environmental Management Plan (CEMP) for the corridor to minimise dust emissions during the construction period. Analysis undertaken by the proponent indicates that the impact of construction dust emissions on surrounding sensitive receivers is considered to be low based on the transient nature of construction along the corridor, limited scale of planned earthworks at any particular site, the separation distance between construction activity and sensitive receivers, the short-term nature of construction works and implementation of standard construction dust control measures.

Diesel exhaust emissions would arise from the use of any construction machinery operating on site, and vehicular movements in and around the site. Analysis undertaken by the proponent indicates that the effects of these gaseous emissions are expected to be insignificant and localised around the emission sources only; and therefore the proponent assesses that the impact of these emissions on surrounding sensitive receivers is considered to be negligible

Potential sources of air emissions associated with the operation of the proposed corridor have been identified to include:

- wheel-generated dust from light vehicles travelling along the rail maintenance track
- residual dust from the empty rail wagons and from the external walls of the train
- gaseous emissions from the locomotives.

It is expected that dust generation from corridor operations will be minimal, as the rail wagons containing the iron concentrate will be covered during railway operation and the rail maintenance track will typically be used by only one vehicle at a time. Analysis undertaken by the proponent indicates that the impact to air quality from dust associated with the operation of the railway line (and other corridor components) is considered to be negligible.

Locomotives will emit gaseous emissions due to the combustion of diesel. The proponent has committed to using new locomotives which will meet the Australian Standards for railway rolling stock and emit less diesel fumes than older locomotives. Analysis undertaken by the proponent indicates that the impact associated with locomotive emissions is expected to be low.

The EPA accepts the proponent's assessment of air quality and proposed mitigation measures to be undertaken during the construction and operational phases of the corridor. The EPA considers that an

air quality management strategy should be included in the Construction Environmental Management Plan and the Operational Environmental Management Plan.

The AR concludes that adequate air quality assessment has been undertaken for both the construction and operation of the corridor and that avoidance and mitigating measures proposed are appropriate.

The AR concludes that air quality management issues can be satisfactorily dealt with in the Construction Environmental Management Plan and the Operational Environmental Management Plan that will be prepared by the proponent. The air quality management strategies in these plans will need to be to the satisfaction of the EPA and will be a condition of approval.

4.3.7 Noise and vibration

The project area is a quiet rural area with limited human-induced noise and vibration from intermittent road traffic, existing rail operations and agricultural machinery. The construction and operational use of the proposed infrastructure corridor will introduce new noise and vibration sources to the project area, in particular from train movements along the proposed railway. It is also expected that ground vibration from blasting will occur during the construction phase.

Day-time construction, seven days a week (including on Sundays and public holidays) is planned with night-time construction works only occurring in exceptional circumstances.

For construction of the projects infrastructure, other than the proposed railway line, Clause 23 of the *Environment Protection (Noise) Policy 2007* (Noise Policy) is applicable. The guidelines presented in the Department of Planning, Transport and Infrastructure's *Management of Noise and Vibration: Construction and Maintenance activities, Operational Instruction 21.7* (DPTI 2014) are relevant to road and railway construction. These guidelines include noise criteria for varying construction timeframes and periods of the day.

Australian Standard AS 2187.2 – 2006 (*Explosives – Storage and use Part 2: Use of explosives*) specifies requirements for the safe use of explosives and provides guidelines for measurement and criteria for peak levels of ground vibration and airblast. In addition, the NSW Department of Environment and Conservation (DEC) guideline *Assessing Vibration: a technical guideline* (DEC 2006) presents preferred and maximum vibration values for use in assessing human responses to vibration, (derived from a *British Standard, BS 6472-1992, Evaluation of human exposure to vibration in buildings (1–80 Hz*)).

In relation to the operational use of the railway, the *Guidelines for the assessment of noise from rail infrastructure* (EPA 2013) (the Rail Noise Guidelines) apply.

The proponent undertook extensive noise and vibration assessments for the components of the corridor including:

- noise modelling of construction scenarios at a number of locations along the proposed infrastructure corridor, including construction of the borefield wells, power transmission line pylons, rail cuttings and bridges
- prediction calculations for ground vibration and airblast due to blasting during construction at the proposed railway line/Lincoln Highway intersection
- noise modelling of the operation of the proposed railway line

The proponent incorporated the following into the assessment:

- identification of potential noise and vibration sources from the proposed infrastructure construction and operation

- determination of relevant noise standards and criteria including review of national and state legislative requirements
- identification of sensitive receivers that may be affected by construction and operation of the infrastructure
- review of metrological conditions in the project area
- establishment of existing noise and vibration conditions in the project area
- prediction of noise levels at sensitive receiver locations due to construction and operation of the infrastructure
- prediction of ground vibration and airblast due to construction blasting

Due to the agricultural use of the proposed infrastructure corridor, sensitive receivers are sparse (determined by desktop assessment of aerial imagery). The sensitive receivers closest to the proposed infrastructure corridor are:

- individual dwellings on agricultural properties (located at least 170m away from the corridor) with 15 identified sensitive receivers located within 500m of the proposed railway line
- two grain storage and handling facilities.

The closest identified sensitive receiver to the proposed railway line is the Driver River Uniting Church at Verran (140 m from the proposed railway line).

The proposed railway operation comprises three trains, each consisting of two locomotives and 138 wagons, running two return trips each per day. This amounts to 12 train pass-bys per day for sensitive receivers along the proposed railway line. The train pass-bys would generate very short periods of noise intermittently during the day and night, separated by long periods of quiet.

The proponents propose the following measures to minimise potential noise and vibration impacts:

- the rail alignment will be located as far as feasible away from houses and townships
- the railway line will be a continuously welded rail which avoids the noise of the wheels impacting on the rail joints which occurs for existing jointed railway lines
- the gradient of the railway line has been minimised to maximise fuel efficiency, reduced engine strain, braking and brake noise.
- the railway line has been designed with wide bends and loops to minimise wheel squeal
- passing sidings have been located away from sensitive receivers to avoid the impact of idling noise
- new locomotives will be used which will meet the Australian Standards for railway rolling stock and emit less noise than older locomotives.

The construction noise prediction modelling undertaken by the proponent or the railway line, borefield and power transmission indicates that impacts of construction noise for the infrastructure corridor are expected to be low.

The noise level prediction modelling undertaken by the proponent has determined that the noise levels due to the railway line operation would be below the noise criteria presented in the Rail Noise Guidelines for both the day-time and night-time periods and that the predicted noise levels at sensitive receivers along the proposed infrastructure will be low.

The proponent will develop and implement blasting procedures in accordance with AS 2187.2 – 2006, therefore it is considered that the impact of ground vibration and airblast due to blasting will be low.

As the separation distance between construction works and sensitive receivers is over 100m and that attenuation of vibration from construction equipment occurs over short distances, it is deemed that

construction vibration levels will be below the preferred day-time human response. As vibration from construction equipment is expected to meet the applicable criteria and be of a short-term nature, the proponent assesses that impacts from construction equipment vibration are considered to be low.

The EPA accepts the proponent's assessment of noise and vibration and proposed measures to reduce the impacts during the construction and operation phases of the corridor. The EPA considers that a noise management strategy should be included in the Construction Environmental Management Plan and the Operational Environmental Management Plan.

The Commonwealth Department of the Environment and Energy considers that the effects of noise emissions and vibrations on EPBC Act listed species has been adequately addressed, and that mitigation measures for noise emissions and vibrations should be a component of approval conditions.

The AR concludes that adequate noise and vibration assessment has been undertaken for both the construction and operation of the corridor and that avoidance and mitigating measures proposed are appropriate.

The AR concludes that noise management issues can be satisfactorily dealt with in the Construction Environmental Management Plan and the Operational Environmental Management Plan that will be prepared by the proponent. The noise management strategies in these plans will need to be to the satisfaction of the EPA and DPTI and will be a condition of approval.

4.3.8 Light spill/nuisance

Light from construction and operation of the infrastructure corridor may impact upon the behaviour of native fauna during nightly construction activities and lighting on the train (running every two hours during the night). Indirect impacts to flora that rely on nocturnal pollinators are also possible. An increase in insects attracted to the lights may occur and this may in turn result in an increase in predators (including geckos, spiders and micro bats) nocturnal aerial fauna may be disorientated by the lights resulting in collision with structures.

There are no regulatory limits for lighting impacts to fauna, however the proponent proposes to use design and operational measures to reduce potential impacts from lighting as much as practicable.

The proponent has assessed the impact from the construction and operation of the infrastructure corridor to be low as the impacts will be short-term and intermittent.

For the section of the railway that passes near the northern boundary of the Hambidge WPA, the proponent also assesses this impact to be low as lighting impacts during rail operation would be momentary as the train passes and during the construction phase fauna have the ability to move deeper into the WPA.

The Commonwealth Department of the Environment and Energy considers that the effects of light pollution on EPBC Act listed species has been adequately addressed and that and that mitigation measures for light pollution should be a component of approval conditions.

The AR concludes that adequate light impact assessment has been undertaken for both the construction and operation of the corridor and that avoidance and mitigating measures proposed are appropriate.

The AR concludes that light pollution issues can be satisfactorily dealt within the Construction Environmental Management Plan and the Operational Environmental Management Plan that will

be prepared by the proponent. The light spill strategies in these plans, to be prepared to the satisfaction of the EPA, will be a condition of approval.

4.3.9 Hambidge Wilderness Protection Area (WPA)

The Hambidge Wilderness Protection Area (WPA) is a protected area on the Eyre Peninsula. It lies approximately 140 kilometres north of Port Lincoln and 15 kilometres north east of Lock. The area was proclaimed under the *Wilderness Protection Act 1992* on 30 September 2004.

Total area of the WPA is 353,460 ha, of which 99,967 ha is remnant native vegetation.

The area comprises an extensive system of parallel dunes with ridges (6 to 12 metres in height) running north west to south east. Clay pans are scattered throughout the inter-dunal area. Vegetation comprises a low mallee scrub association dominated by *Eucalyptus dumosa, E socialis, E oleosa, E incrassata, E calycogona, Melaleuca uncinata, M lanceolata* with an understory comprising *Santalum acuminatum, Triodia, Hibbertia, Baeckia, Boronia* and *Dodonaea* species. The area is home to a wide variety of mallee birds, including the endangered malleefowl (*Liepoa ocellata*), and vulnerable species such as blue-breasted wren (*Malurus pulcherrimus*), blue-winged parrot (*Neophema chrysostoma*), chestnut quail-thrush (*Cinclosoma castanotum*), yellow-plumed honeyeater (*Lichenostomos ornatus*) and yellow-tailed pardalote (*Pardalotus xanthopygus*).

DEWNR advises that a large area of the Hambidge WPA was burnt in fires that occurred during 2000. This resulted in the majority of the Major Vegetation Sub-groups (MVS) being below the Threshold of Potential Concern 1 (as described in DEWNR Fire Management Guidelines for Native Vegetation in SA). This indicates that if another major fire, or smaller fires at regular intervals, was to occur within this area, long term negative impacts are highly likely. Species that require longer to flower and set seed are especially at risk of disappearing from the community.

The route of the proposed infrastructure corridor has been designed to primarily avoid key biodiversity planning areas including the Hambidge WPA, Hincks WPA and Hincks Conservation Park.

There are two areas of the infrastructure corridor that will come within 1 km of the conservation areas, including a section that runs through agricultural land adjacent the northern boundary of the Hambidge WPA (see Figure 13-1 EIS).

The existing boundary of the Hambidge WPA is buffered from the agricultural land by a 20m fire break and access track. The proposed infrastructure corridor will include a 10m maintenance track that will serve as a buffer (for weed and fire risk) between the WPA and the railway, water and power transmission lines. In addition, the location of a transmission line in a section of infrastructure corridor north of the Hambidge WPA will provide an extra minimum buffer of 35m from the northern boundary fence of the WPA (to rail track) to reduce bushfire risk.

DEWNR's supports the proposed 35m buffer (power transmission line) and inclusion of a 10m wide maintenance track. DEWNR acknowledges that the exact final location of the railway line and power transmission line will not be available until the design phase of the project, and requests to work with the Proponent during this phase. DEWNR requests to work with the Proponent to implement effective fire management planning to minimise fire risk to the Hambidge WPA as a result of railway operations.

The AR concludes that adequate assessment of the impacts on the Hambidge WPA has been undertaken for both the construction and operation of the corridor and that avoidance and mitigating measures proposed are appropriate.

The development of a Fire Management Plan, including the Hambidge WPA, to the satisfaction of the CFS and DEWNR, will be required and is proposed as a condition of approval.

4.3.10 Fire Management

As described in 4.3.9 Hambidge WPA above, the existing boundary of the WPA is buffered from the agricultural land by a 20m fire break and access track, and the proposed infrastructure corridor will include an additional 10m maintenance track that will serve as a buffer for weed and fire risk between the WPA and the railway. In addition, the location of a transmission line in a section of infrastructure corridor north of the Hambidge WPA will provide an extra minimum buffer of 35m from the northern boundary fence of the WPA (to rail track) to reduce bushfire risk.

The proponent intends to use dampers and spreaders as part of the design of the power transmission line will be designed to reduce fire risk.

Several public submissions raised concern about use of the railway line sparking a fire on high risk fire days and management of the line during a fire. The design, and operation of, the rail and train are required to meet legislative obligations in relation to safety pursuant to the *Railways (Operations and Access) Act, 1997* (SA) and the *Rail Safety National Law (South Australia) Act, 2012* (SA).

The proponent has advised that all train operations would be suspended if a hazard, including fire, is detected on the line, however the train operations will continue on high fire risk days, as is common practice, subject to additional pre-departure checks focusing on exhausts and braking systems.

Fire management and risk strategies outlined in the Operation Environmental Management Plan include:

- the development of bushfire management and emergency response procedures (including the consideration of amplified risk of bushfire and extreme weather events as a result of climate change)
- regular best practice inspection and maintenance of transmission line and rail
- consideration of the fire danger season and total fire ban days as declared by the CFS will be given when planning hot works and other high risk activities
- safety audits to review implementation of fire reduction measures

DEWNR supports the proposed 35m buffer (power transmission line) and inclusion of a 10m wide maintenance track. DEWNR requests to work with the Proponent to implement effective fire management planning to minimise fire risk to the Hambidge WPA as a result of railway operations.

The CFS has advised that a Bushfire Management Plan will need to be developed as the project progresses.

The AR concludes that adequate assessment of the fire risks has been undertaken for both the construction and operation of the corridor and that management and risk strategies are appropriate.

The AR acknowledges that fire management and risk reduction strategies will be incorporated in the Construction Environmental Management Plan and the Operational Environmental Management Plan that will be prepared by the proponent.

The development of a Fire Management Plan, to the satisfaction of the CFS and DEWNR, will be a condition of approval.

4.3.11 Terrestrial impacts (flora and fauna)

The proponent has identified the following impacts that may result from construction activities and rail transport of the iron concentrate:

- vegetation clearance
- habitat fragmentation
- disturbance (direct & indirect)
- fauna mortality (direct & indirect)
- light & noise disturbance
- dust (flora)
- spread of weeds & introduction of new weeds
- bushfire

The proponent has undertaken an assessment of these impacts, and determined that in most cases the impacts will be negligible or low. The impact of vegetation clearance has been determined to be medium, however will be subject to an offset pursuant to the *Native Vegetation Act 1991* requirements. The proponent expects that the offset activities will have overall lasting benefits.
Noise impacts to fauna have been determined to be medium during the construction phase and low during the operational phase. Both are considered to be localised and short-term impacts.

Flora

Native vegetation is scattered throughout the broader region primarily within conservation areas and vegetation Heritage Agreement areas, but is also contained within discrete and isolated patches on cleared private land, and linear strips along roadsides and in rail reserves.

The conservation areas are managed to protect species and generally contain larger numbers of protected flora and fauna than smaller isolated patches that occur within the agricultural landscape.

The proponent recognises that over 500 flora species have been recorded in the vicinity of the proposed infrastructure corridor, borefield and transmission line from Yadnarie, including 89 exotic species (BDBSA 2013), of which over 100 of the flora species were recorded in field assessments for the EIS study.

In general, the native vegetation located within the proposed infrastructure corridor is comprised of various densities and composition of Mallee associations (often on dune crests) surrounded by agricultural paddocks. There are also a few patches of vegetation that are comprised of Samphire or Chenopod shrublands.

The design of the proposed railway line includes the following measures to minimise impacts to environmental values:

- Route selected to generally avoid known areas of high ecological value such as conservation parks, reserves, vegetation heritage agreement areas and other areas known to contain higher likelihood of occurrence of threatened species (e.g., Jumping-Jack Wattle [*Acacia enterocarpa*] and Darke Peak Mallee [*Eucalyptus cretata*] respectively).
- One section of the infrastructure corridor is directly adjacent the northern boundary of Hambidge WPA, which is an area of high ecological value. This section of the corridor passes through agricultural land, but does not utilise an existing road. A 10m maintenance track will serve as a buffer (weeds and fire) between the rail component of the infrastructure corridor and the boundary fence of the WPA.

- Proposed infrastructure corridor width minimised where possible (whilst enabling the safe development of required infrastructure) to minimise disturbance footprint.
- Infrastructure components co-located within a single corridor to minimise overall project footprint wherever practicable.
- Utilising existing road corridors or other land devoid of native vegetation wherever possible.
- Establishment of designated maintenance tracks, light vehicle roads and vehicle lay down areas in locations which minimise vegetation clearance, to restrict vegetation impacts to designated areas and minimise ongoing disturbance.
- Dust design measures to minimise impacts to flora habitat via dust impacts to vegetation.
- Location of transmission line in Section of Infrastructure Corridor north of Hambidge WPA to provide a minimum buffer of 35 m from northern boundary fence of Hambidge WPA (to rail track) to reduce bushfire risk (noting that there is also an existing fire break of 20 m within Hambidge WPA).
- Determination of offset requirements to compensate for ecological impacts from the proposed project.
- Design of rail crossing and access points for emergency vehicles.

Clearance of native vegetation will be required for various components of the proposed infrastructure corridor.

Clearance of vegetation will be minimised wherever practicable, primarily through placement of project components in areas already devoid of native vegetation such as cleared paddocks. Total vegetation clearance required for the proposed infrastructure corridor (including the borefield and transmission line from Yadnarie) is 81.4 ha, assuming all native vegetation beneath the project footprint is cleared. Whilst some clearance of native vegetation within the Hambidge WPA is required, no vegetation clearance is proposed in the conservation reserves or Heritage Agreement areas.

Clearance of native vegetation will require approval from the Native Vegetation Council and will be subject to a significant environmental benefit (SEB) offset pursuant to the *Native Vegetation Act 1991*.

The proponent undertook field assessment of approximately 50% of the vegetation that is within or will intersect the proposed corridor. The field surveys were undertaken to establish the environmental values present, such as vegetation type and condition, threatened communities, threatened or listed species or suitable habitat to support such species.

The remaining areas of vegetation were not assessed in the field as they were inaccessible at the time of the assessment, or were incorporated into the corridor footprint post assessment. These patches of vegetation were assessed via a desktop review using aerial imagery, size and contiguity of the patch, surrounding land use and DEWNR vegetation layer data.

As a result of this assessment, the proponent determined that vegetation within the corridor was mostly of a moderate or poor condition (as derived from criteria outlined by DWLBC (2005)). This is due to the fact that the majority of the patches are small, isolated, oblong and narrow in shape, subjected to large edge effects, and subject to ongoing disturbance factors such as grazing and trampling by livestock, agricultural weed invasion, pest mammal invasion and direct human disturbance. The habitats encountered were determined to be largely disturbed remnants with the absence of one or more structural dominants, a lack of age and structural diversity, and poor species diversity.

It is acknowledged that better quality patches do occur in the region, however, the majority of these have been avoided due to corridor route selection.

The proponent has assessed that clearance of vegetation within the infrastructure corridor is likely to have a long-term, medium-level impact on environmental values within the corridor,

Recent records (i.e. within the last 20 years) indicate that over 70 exotic floral species have previously been recorded within 5 km of the project area, mainly comprising minor weed species through to Declared and aggressive species. Bridal creeper is considered very aggressive and has also been flagged as a 'red alert weed' along with African Boxthorn and Horehound (DEWNR 2013). Field assessments in 2012 and 2011 recorded over 20 exotic species throughout vegetation patches along the proposed infrastructure corridor

DEWNR agrees in principle with the proponent's assessment, however recommends that once access can be obtained further verification of the condition of the vegetation (that was not field assessed) occur and that the presence of rare or threatened species be undertaken, to ensure that the final SEB requirements are determined to be accurate and appropriate.

Fauna

The fragmented nature of the landscape provides limited habitat for a number of common birds, mammals and reptiles. Higher quality habitat that occurs within the conservation parks and vegetation Heritage Agreement areas are avoided by the infrastructure corridor.

The EIS outlines that within the broader Eyre Peninsula region:

- The most commonly recorded native mammal species on the Eyre Peninsula is the Western Grey Kangaroo (*Macropus fulginosus*).
- The Western Pygmy-possum (*Cercartetus concinnus*) (a small ground dwelling mammal) is also frequently recorded in surveys, particularly in low mallee habitat.
- Eight species of micro bat were recorded during the recent EP biological survey and that it is likely that five of these bat species are the most common native mammals in the area, aside from the kangaroos.
- The majority of reptiles with conservation ratings on the Eyre Peninsula have restricted distributions and isolated populations with mallee sites were found to support significantly higher numbers of reptile species than low shrubland sites
- Bird species include Grey Shrikethrush (*Colluricincla harmonica*), Inland Thornbill (*Acanthiza apicalis*), Weebill (*Smicrornis brevirostris*), Grey Butcherbird (*Cracticus torquatus*) and Red Wattle Bird (*Anthochaera carunculata*).

The proponent has not undertaken any on site fauna surveys within the proposed infrastructure corridor footprint. Within 5 km of the corridor footprint, records exist for 171 fauna species, including 14 mammal, 31 reptile and 126 birds. Of these 171 records, 23 were for threatened species (four with EPBC / NPW ratings and 19 with only NPW ratings) and eight were exotic species.

The proponent undertook a desktop study that highlighted 36 EPBC listed fauna species as potentially occurring along the proposed infrastructure corridor. Of the 36 EPBC listed fauna identified as having the potential to occur within the project area, the proponent has assessed that 13 are considered possibly present or likely to occur and 23 are considered unlikely to occur. The 13 EPBC fauna that are possibly present or likely to occur include: Australian Fairy Tern (*Sternula nereis*), Cattle Egret (*Bubulcus ibis*), Common Sandpiper(*Actitis hypoleucos*) , Osprey (*Pandion haliaetus*) , Fork-tailed Swif(*Apus sp*), Malleefowl (*Leipoa ocellata*) , Pacific Golden Plover (*Pluvialis fulva*) , Rainbow Bee-eater (*Merops ornatus*), Red-lored Whistler(*Pachycephala rufogularis*), Sandhill Dunnart (*Smithopsis psammaphila*), Whitebellied Sea-eagle(*Haliaeetus leucogaster*) and two Listed Marine species (Rock Parrot[*Neophema petrophila*] and Cape Barren Goose[*Cereopsis novaehollandiae*]).

The desktop assessment also considered 11 fauna species of state conservation significance that have potential to occur in the area. Ten of these fauna species, including nine birds, and one reptile have previous records within 5 km of the project area. The proponent has determined that one species is present in the project area (White-wing Chough[*Corcorax melanorhamphos*]) one is considered 'likely' to occur (Gilbert's Whistler [*Pachycephala inornata*]), five possibly may occur and four are considered unlikely to occur.

The desktop study also identified 12 introduced fauna that may be present through the proposed infrastructure corridor area, including five mammals and seven birds. Observations of a number of rabbits and foxes (including pups) were made along the proposed infrastructure corridor during vegetation field assessments.

The Commonwealth Department of the Environment and Energy considers that the EIS:

- adequately demonstrates that the proposed action avoids or is likely to have a negligible impacts on terrestrial EPBC Act listed threatened species
- adequately quantifies and details the extent, condition and significance of potential native fauna habitat loss or disturbance during construction and operation, and the ability of EPBC ACT listed species and communities to recover
- adequately addresses buffer distances between threatened, endangered and threated species (TEPS) and native vegetation within conservation areas.

The AR concludes that the proponent has undertaken adequate measures to minimise vegetation disturbance, and that any vegetation that is to be cleared will be subject to a significant environmental benefit (SEB) offset, as determined by the Native Vegetation Council. This will be a condition of approval.

The AR concludes that adequate assessment of the impacts on the flora and fauna has been undertaken for both the construction and operation of the corridor and that avoidance and mitigating measures proposed are appropriate.

The AR concludes that buffer distances of 50 metres from the centreline of the infrastructure corridor (as detailed in the EIS) between threatened, endangered and protected species (TEPS) and native vegetation within conservation areas are adequate.

4.3.14 Visual impacts/landscape quality

Acknowledging that the construction and operation of the CEIP project has the potential to impact the existing rural character of the area the proponent undertook a landscape and visual impact assessment (LVIA) for the entire project to identify locations that may be sensitive to visual change. In addition specific locations were assessed based upon feedback during stakeholder engagement sessions.

Four key landscape types were identified as being prevalent with in the project area, of which three are relevant to the infrastructure corridor – undulating farmland; parks/conservation areas and townships.

The undulating farmland is the most prevalent landscape type within the vicinity of the infrastructure corridor. This landscape consists of broad-acre agricultural land, primarily used for grazing and cropping. It includes some existing residential dwellings and associated supporting agricultural infrastructure. This landscape has been mostly cleared of vegetation and has undergone continual change since European settlement.

The Hambidge WPA is the key conservation area within the vicinity of the infrastructure corridor. It is located adjacent to the northern boundary of the corridor. Its main purpose is for conservation rather than tourism and recreation, however Prominent Hill is located within the WPA and its peak can be accessed via track and provides views over the WPA.

Darke Peak Range has been identified as a key topological feature within the visual vicinity of the infrastructure corridor. It is located 4.4km east of the closest point of the corridor. The Darke Range Conservation Park is located at the southern end of the Range and is used for recreational purposes. The CP also contains lookout (Federation Lookout) however it is not highly frequented and access is via a steep rocky track that is not suited to all vehicles.

There are 4 townships within 5 km of the infrastructure corridor (Port Neill, Rudall, Verran, Kielpa). The small township of Rudall is located approx. 1.5km east of the infrastructure corridor. The Cummins-Buckleboo Railway passes through the town and grain silos are its dominant features.

The route selected for the proposed infrastructure corridor has been designed to avoid known areas of landscape or scenic significance and residential areas and townships.

It is acknowledged that construction of the infrastructure corridor will result in a visual impact. This will be short term and temporary. Overall, the infrastructure corridor is generally not located within areas commonly regarded as being of significant scenic or aesthetic value and as such the impact is considered low. The proponent has committed to undertake landscaping, where required, utilising native species, to minimise visual impacts. In addition, the proponent has committed to liaising, as necessary, with individual landowners, during each phase of the project to ensure individual visual impacts are minimised and managed appropriately.

The impacts associated with the construction and use of the corridor will be managed via minimisation strategies within the Construction Environmental Management Plan and Operational Environmental Management Plan.

The AR concludes that adequate assessment of the visual/landscape quality impacts has been undertaken for both the construction and operation of the corridor.

The AR concludes that visual/landscape quality impacts can be satisfactorily dealt within the Construction Environmental Management Plan and the Operational Environmental Management Plan that will be prepared by the proponent.

4.3.15 Agricultural practice impacts

Agriculture is the primary land use in the project area. As identified previously (4.1.2) the area required for the corridor is primarily located within agricultural land typically used for cropping (95.3%) and grazing (1.4%).

A majority of the proposed infrastructure corridor will be located on private freehold land (affecting 56 land owners). During construction of the corridor, the proponent recognises that a lot of the affected land will be unavailable to farming due to security and safety reasons. However, post construction, areas of the corridor will be rehabilitated and, where practical, can be reverted back to agricultural use.

The key impacts on agricultural practices, as identified by the proponent and during the engagement process have been identified as:

- farming operational issues related to crossing the corridor and railway (in particular during cropping/harvest periods)

- stock access (in particular livestock accidently accessing the corridor/railway)

The proponent has committed to developing Impact Management Plans (IMP) in conjunction with each affected landowner. These plans will identify what infrastructure will be required to assist farmers continue with their business (including fencing, gates, stock crossings and culverts). At the time of this AR, IMPs have not yet been developed, and agreed to, for all affected landowners. This must be resolved before construction of the corridor can commence.

The proposed infrastructure corridor has been located, as far as reasonable practical, on property or paddock boundaries, however in some instances the corridor will divide agricultural land. This will result in some temporary and permanent changes to property access and farming practices. It will also impact upon the ability to cross (stock & machinery) some locations. To minimise this impact, and provide connectivity between pastures, crossing points will be created along the length of the corridor. The location of these crossing points will be determined in consultation with affected land owners. In addition, the proponent has advised that in some locations, it will be possible for landowners to utilise the rail maintenance track to move between paddocks.

The proponent has committed to fully fence the entire rail corridor (with the maintenance track located outside the fenced area) to ensure sheep and other animals do not enter. They will also develop a policy with the rail operator in relation to a variety of factors including opening and closing of access gates. The proponent has also committed that in the event that losing livestock in the infrastructure corridor has occurred due to the fault of the Company (e.g. rail staff leave a gate open) then appropriate compensation discussions will be held with the relevant farmer.

The proponent has indicated that overall they will be responsible for maintaining the fence and gates, however if it is determined that other parties have cause damage, the proponent will not be financially responsible for those repairs.

Due to the short term nature of construction and the placement of crossing points following construction, the proponent has assessed the impact of loss of connectivity as low.

The proponent has committed to continuing discussions and meetings with impacted landowners throughout both the construction and operational phases of the project.

The AR concludes that adequate assessment of the agricultural practice impacts has been undertaken for both the construction and operation of the corridor.

Stock fencing of the entire length of the corridor, including its maintenance will be a condition of approval.

The AR acknowledges that Impact Management Plans are being prepared and must be finalised with all affected landowners.

The AR acknowledges that the proponent will be responsible for maintaining and repairing the fence (except damage caused by others) and compensating loss of livestock that is caused by an employee/contractor of the company. This will be a condition of approval, and should be included in the individual IMP's as necessary.

4.3.16 Surface Water

The proponent undertook a desktop review of the region's existing rainfall patterns, surface water characteristics and identified existing drainage and water courses along the proposed infrastructure corridor.

The proponent acknowledges that earthworks and establishment of the infrastructure within the corridor has the potential to alter the hydrology of an area, in particular the flow regimes. To minimise the impact on, and potential risks to surface water during construction and operation, strategies and management approaches will be incorporated into the Construction Environmental Management Plan and Operations Environmental Management Plan.

The proponent identified that:

- there are a small number of salt lakes to the northeast of the proposed infrastructure corridor, however as they are more than 5 km outside of the construction footprint of infrastructure corridor they will not be impacted by changes to hydrology associated with the construction and operation of the corridor; and
- there is no current capture or retention of surface water for potable, agricultural or industrial purposes within catchments crossed by the infrastructure corridor
- the proposed infrastructure corridor will cross the Driver River, Dutton River, the Byres Bay Creek and several small ephemeral drainage lines.
- the proposed transmission line will cross at least two creek catchments and drainage lines (Yadnarie Creek and Sheoak Creek)

At locations where the infrastructure corridor will cross existing drainage and water courses, culverts will be installed to allow water to pass and maintain natural flows during stormwater events. Over the length of the entire infrastructure corridor, approximately 400 culverts will be installed.

At flow locations the culverts will have the capacity to accommodate a minimum of 1 in 20 year rainfall flows and rock armour will be installed immediately downstream of culverts to reduce erosion.

Due to the provision of culverts, the flow regime of existing creek and drainage lines running through the infrastructure corridor will not be altered in rainfall of up to 1 in 20 year flow events, however during higher flow events, the culverts will restrict flow, reducing the downstream peak flow rate and extending the length of time during which the creek would flow. This will result in temporary localised pooling of surface water immediately upstream of the culverts. This water will eventually pass through the culvert and reach the coast. As the pooling of surface water will be in isolated locations adjacent to the railway line, limited in occurrence and is only temporary the proponent has assessed this impact to be low. The Driver River (not Dutton River or Byres Bay Creek) has been assessed[2] and was found to be in poor condition – current information is inadequate to assign a condition rating to the Dutton River and Byres Bay Creek .

The potential for erosion, particularly during heavy rainfall events, will increase during the construction of the infrastructure corridor due to significant earthmoving activity. To manage this, the proponent will utilise industry standard practices in relation to sediment and erosion management. In addition, disturbed areas will be revegetated as soon as practicable to support erosion control.

The AR concludes that adequate assessment of the surface water systems and impacts have been undertaken for both the construction and operation of the corridor.

The AR concludes that surface water impacts can be satisfactorily dealt within the Construction Environmental Management Plan and the Operational Environmental Management Plan that will

[2] EPA 2015 http://www.epa.sa.gov.au/reports_water/c0204-ecosystem-2015

be prepared by the proponent. The development of control strategies and management approaches in these plans, to the satisfaction of DEWNR, will be a condition of approval

4.3.17 Groundwater

The groundwater interaction associated with the infrastructure corridor will be short-term extraction from two saline groundwater wells located along the infrastructure corridor (within the saline groundwater borefield near Kielpa and near the Driver River). These wells will operate for two years to supply groundwater during construction. These wells will require well construction permits pursuant to the *Natural Resources Management Act 2004.*

Groundwater impacts associated with the operation of the proposed railway line are not expected.

The infrastructure corridor is not located within a prescribed wells area under the *Natural Resources Management Act 2004* or a water protection area prescribed under the *Environment Protection Act 1993*.

No existing wells have been identified within the zones of influence of the infrastructure corridor construction water supply production wells.

The infrastructure corridor production well (IC5) will be located approximately 2.5 km from the Driver River. Modelling predicts groundwater levels in the vicinity of the Driver River would decrease by approximately 3m after two years of continuous well operation. Drawdown can impact a river system, depending on the degree of connection the river has with groundwater. The Driver River has been assessed to currently be in in poor ecological condition due to human disturbance (including high salinity and acidity). In addition, the EPA (2010) has identified saline groundwater inflow as a threat to the Driver River which has the potential to reduce the ecological integrity of the system. Based upon these factors, any drawdown of groundwater level beneath the Driver River is not expected to adversely impact ecosystems supported by the Driver River. As such, the proponent has assessed the predicted impact of the operation of well IC5 to be negligible.

No environmental values have been identified within the zone of influence of the well within the borefield near Kielpa (IC4), and as such, the proponent has assessed the predicted impact of the operation of this well to be negligible.

DEWNR agrees with the proponent's assessment. In addition, DEWNR has interpreted the data provided in the EIS and determined that the risk to groundwater dependant ecosystems identified near the construction water supply wells from short-term pumping (2 years) is considered low.

To minimise the impact on, and potential risks to groundwater during construction a series of control strategies and management approaches will be incorporated into the Construction Environmental Management Plan.

The AR concludes that adequate assessment (based on the existing available information, of the groundwater systems and impacts have been undertaken for the construction of the corridor and that negligible impacts are expected during the 2-year construction phase.

The AR concludes that any groundwater impacts can be satisfactorily dealt within the Construction Environmental Management Plan that will be prepared by the proponent. The development of control strategies and management approaches in these plans, to the satisfaction of DEWNR, will be a condition of approval.

The potential effect on ephemeral watercourses (Driver River) resulting from operation of well number IC5 may also need to be monitored to verify the modelling predictions (and be addressed in the Construction EMP).

The AR concludes that no impacts are expected to groundwater with the operation and use of the proposed railway line and corridor.

The AR acknowledges that two well construction permits *(Natural Resources Management Act 2004)* will be required for the construction of the two saline water construction supply wells.

4.3.18 Greenhouse gas/sustainability

Construction of the infrastructure to be contained within the corridor will generate greenhouse gas (GHG) emissions primarily via construction fleet diesel consumption and electricity consumption. In addition, changes in the carbon stocks of land will occur as a result of land clearance, as well as embodied energy emissions associated with the use of concrete and steel.

Use of the corridor will result in the release of greenhouse gas (GHG) emissions primarily as a result of the use of diesel fuel for the mobile fleet and transport of iron concentrate by train from the mine site to the port facility.

Maintaining low GHG emission levels is important as it is expected that regions' agricultural landscape, and associated economy, will be impacted by changed climatic conditions (reduced rainfall, higher evaporation and higher temperatures).

The proponent has incorporated a number of measures to minimise GHG emissions, including:

- avoiding areas of significant native vegetation
- co-locating infrastructure requirements, maintenance tracks and vehicle laydown areas within a single corridor to minimise the project footprint
- utilising land where vegetation is already cleared and/or degraded
- reducing the size of the haul truck fleet and minimising vehicle fleet speed
- reducing fuel requirements through the transportation of pre-constructed modules directly to the mine rather than truck delivery of all construction material
- minimising the gradient of the railway line to maximise fuel efficiency
- maximising the number of tonnes transported per unit of fuel
- sourcing products locally wherever practicable

The proponent will establish a Climate Change Sector agreement to reduce emissions, improve energy efficiency, reduce energy consumption, identify opportunities to adapt to climate change, and promote the use of renewable energy.

The AR concludes that the measures undertaken by the proponent to minimise GHG emissions, improve energy efficiencies and reduce energy consumption are satisfactory. The AR recognises that a Climate Change Sector agreement, which the proponent will report against, will be established.

In general, it is considered that the environmental risks associated with the rail corridor can be managed through the required CEMP and OEMP, if this proposal is approved. The areas of additional investigations include surface and groundwater investigations as identified in the sections above.

Identified social impacts from the rail corridor in terms of traffic and transport as well as road crossing points and school bus route impacts will be dealt with in additional management plans as part of the CEMP or OEMP.

4.4 ELECTRICITY INFRASTRUCTURE CORRIDOR (Yadnarie Spur)

4.4.1 General

4.4.1.1 Site and Locality

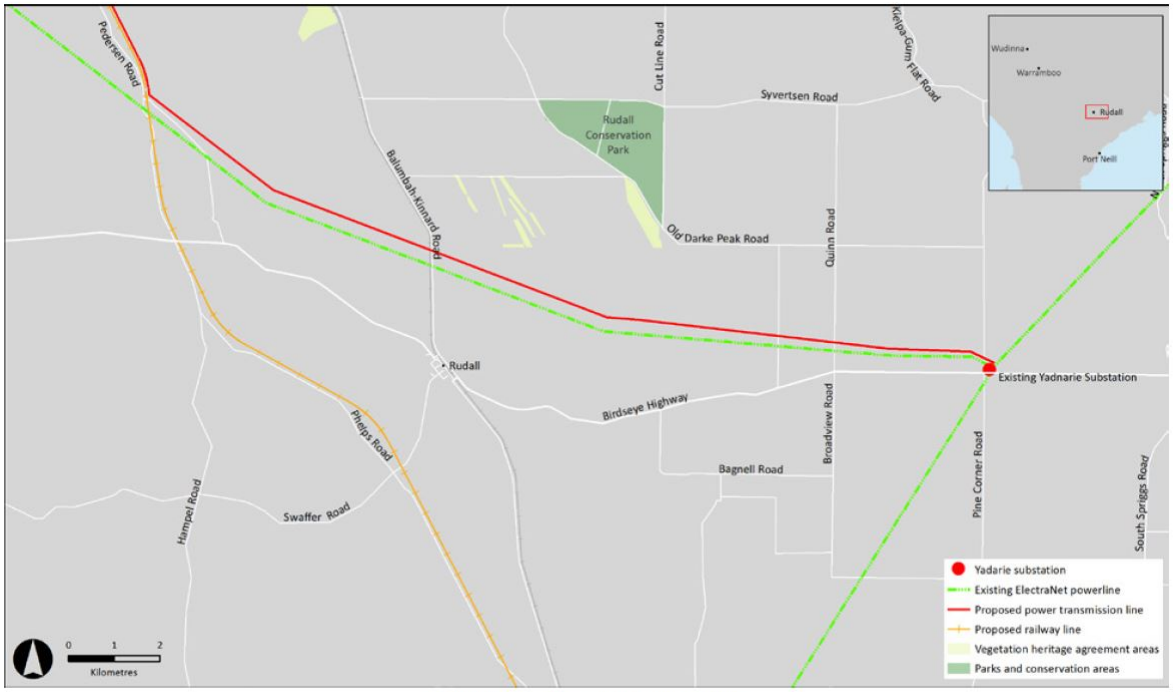


Figure 4-17 Power Transmission Line Overview

Figure 11- supplied image 4-17 Iron Road EIS Chapter 4 page 4-11

The proposed alignment of power transmission line generally follows the infrastructure corridor with the exception of the spur line connecting from the existing Yadnarie Substation.

The spur line follows an existing ElectraNet Powerline and diverges at Pederson Road to the north, above Rudall and connects with the infrastructure corridor to the north of the Birdseye Highway.

The subject site spreads across several allotments which are described below.

4.4.1.2 Existing environment

The general environment consists of cropping and grazing land uses with 96.7% of the infrastructure corridor being described in this manner. Throughout the rural landscape sparse vegetation is evident given the grazing and cropping land uses.

The spur line spans approximately 13kms in a westerly direction, with the last third deviating to the north west of Rudall.

4.4.2 Project Description – key elements

4.4.2.1 General

The proposal seeks to construct a connection to the ElectraNet infrastructure using 275kv line steel monopoles and towers with concrete foundation pads.

A 50m wide easement will be required within the infrastructure corridor. A 450m span between towers is proposed and the finished height will vary depending on topography. Approximately 200 steel mono poles will be required for the length of the power transmission line.

Installation will require local roads to be closed for a short term to install the wires and conductors.

Figure 12 - supplied in EIS - 4.2.3 - example of steel monopole Chapter 4, page 27

4.4.3 Key environmental, social and economic issues

4.4.3.1 Connection to the existing grid

As outlined in Section 3.4 of the EIS power is currently supplied from the SA Electricity Grid and the National Electricity Market via ElectraNet's high voltage transmission network. The 275kv network extends as far as Cultana near Whyalla and then splits at Yadnarie into two 132kv lines, one to Wudinna and one to Port Lincoln. The CEIP will require approximately 280MW or power and the current supply of 100mW is currently close to capacity. The Yadnarie spur will connect to the main network connection at Cultana.

Approval for the upgrading of the network capacity will be required to be undertaken by ElectraNet. SA Power Networks provide technical standards documents for the design and construction of overhead distribution lines. Approval processes, to have a regulated electricity line, are subject to the requirements of the National Electricity Market and are not provided through this development decision.

4.4.3.2 Site selection and alternatives

Within the EIS Project Alternatives chapter, the proponent has considered 3 other options, 1 of which considers a private transmission line to the proposed mine from the Yadnarie substation.

It was considered that alignment with the existing network is more appropriate given the distance and capital required to construct connections from Cultana or Port Augusta is inefficient and cost prohibitive.

4.4.3.3 Hazard and Risk

The applicant has considered risks posed in terms of historical fires within Eyre Peninsula from early records of 1933 to January 2014.

Storm events and drought have also been considered in the physical environment section of the EIS, with an acceptable level of risk being identified from these potential hazards.

The proponent has also provided risk and impact definition for the proposal which is discussed in other sections of this Assessment Report.

It is expected that the proponent will liaise with land holders to gain access to land for construction, operation and maintenance.

ElectraNet as the developer for the electricity infrastructure will need to gain all the necessary approvals for the development of this infrastructure as a subsequent requirement to this development authorisation if it is approved.

4.5 WATER SUPPLY (Borefield) Corridor

The EIS (Section 3.3) states that the processing of iron ore can be undertaken using saline water and estimated that approximately 15 GL of water per year would be required. During the design process water saving strategies were incorporated (including tailings dewatering allowing recycling of process water) that resulted in a 70% reduced demand for raw water and associated reduction in water pumping energy demands. There is insufficient capacity in the existing regional water supply to accommodate the proposal, so an alternative sustainable supply is needed. A number of options were evaluated and deemed to be unsuitable, including a desalination plant at Elliston and a seawater intake at the Port site.

It is proposed to establish a borefield near Kielpa, approximately 60 km southeast of the proposed mine, to supply water for the processing of iron concentrate. Water would be pumped from an aquifer located 150-300 m below ground level. All production and monitoring wells associated with the borefield will require well construction permits pursuant to the *Natural Resources Management Act 2004.*

In addition, the EPA's *Environment Protection (Water Quality) Policy 2015* applies to all underground waters in South Australia and seeks to achieve water quality objectives that will protect or enhance defined environmental values (i.e. beneficial uses of groundwater requiring protection against pollution). The policy applies across the State, except where the salinity is greater than 13,000 mg/L, for which only parts of the policy are applicable. For water with lower salinities, the environmental value of the water for stock use would need to be protected.

4.5.1 General

4.5.1.1 Site and Locality

The proposed borefield and pipeline are located 7.5km west of Kielpa, a small rural township north of Rudall. The borefield would be spread across an area extending approximately 12km from the infrastructure corridor. The site is on the plains approximately 5 kilometres south of the Darke Range,

where the land has largely been cleared for dryland agriculture. Remnant vegetation is generally restricted to the peaks of parallel dunes.

4.5.2.1 Existing Environment

The EIS (Section 16.3.2) identifies the borefield as being located within the Kielpa Geological Domain, which hosts the Polda Trough, a Permian aged structural depression infilled with up to 400 m of Permian, Jurassic, Tertiary and Quaternary Sediments. Groundwater salinity in the targeted aquifer (Tertiary sediment aquifer) ranges from 25,000 to 40,000 mg/L, which is comparable to seawater (i.e. suitable for industrial use only with treatment). There are no current users of the aquifer. There are unlikely to be any Groundwater Dependent Ecosystems (i.e. dependent on sub-surface presence or surface expression of groundwater) that could be affected by abstraction. However, some ephemeral watercourses (Dutton River, Driver River Gum Creek, Sheoak Creek, Yadnarie Creek and Mangalo Creek) and salt lakes (White Lagoon and Red Lagoon) may be reliant on the surface expression of groundwater.

The site is not located within a Prescribed Wells Area under the *Natural Resources Management Act 2004* or a water protection area prescribed under the *Environment Protection Act 1993*.

4.5.2 Project Description – key elements

The proposed borefield and water pipeline would supply approximately 15 GL per year of saline water to the mine site. The borefield will incorporate 10 bores, each installed to approximately 300 m depth and spaced approximately 2,000 m apart within existing road reserves. Each bore would abstract 4000 m^3/day for the life of the mine (25 years). The pipeline would run along Dog Fence Road and Kilroo-Kielpa Road to join with the corridor. Extracted groundwater would be piped to a tank and pump-station, located adjacent the corridor, then piped to a storage dam at the mine site. The EIS (Section 4.2.2 and Table 4-3) provides a more detailed description.

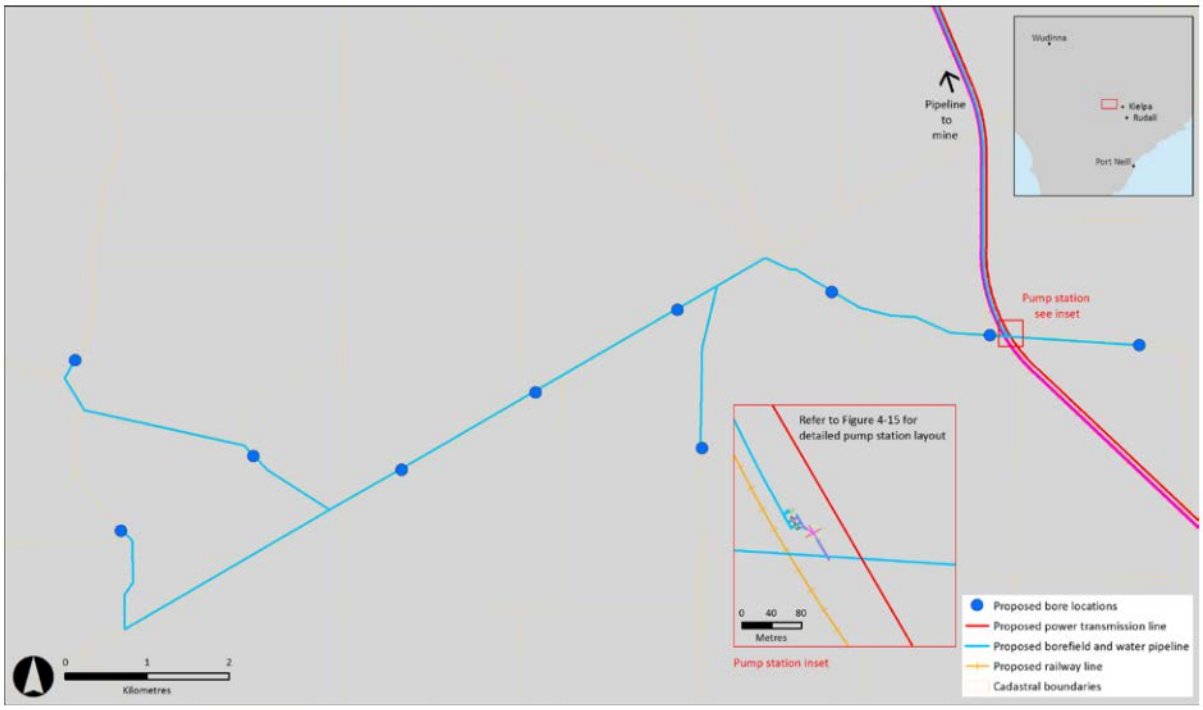


Figure 13- Borefield Layout

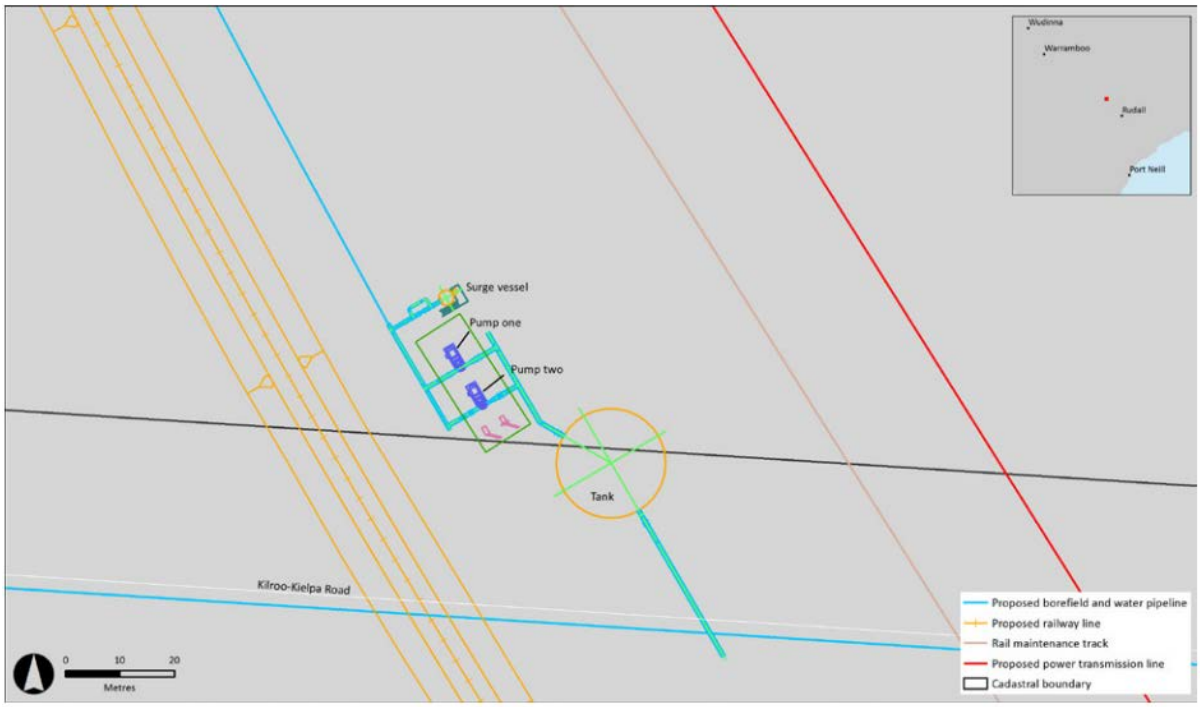


Figure 14- pump station layout

4.6 Summary of Submissions

4.6.1 Public Submissions

A small number of public submissions raised a limited number of concerns about the borefield component, including:

- Level of knowledge about the interaction of aquifers and the impact of taking substantial amounts of groundwater, primarily the drawdown effect (especially risks to Kielpa aquifer and the Polda Basin resource).
- Potential for saline bores to leak and contaminate adjoining land.

4.6.2 Government Submissions

The main issues raised in government submission include:

- Groundwater monitoring would need to be included in the CEMP and OEMP to validate the predicted impacts.

4.7 Key Environmental, Economic and Social Issues

The EIS (Appendix U) identified four categories of potential direct impacts on groundwater:

- Groundwater quantity - changes to groundwater levels / pressures and flux.
- Groundwater quality - salinity and concentrations of other important water quality constituents.
- Groundwater / Surface water interaction - changes to the level of interaction between groundwater and surface water systems.
- Physical disruption of aquifers - whether or not there will be permanent disruption of a groundwater system from the proposed activities, and to what extent.

Potential impacts could affect 'receptors' within the predicted zone of influence (i.e. environmental, social, cultural and economic users of groundwater resources). The EIS (Appendices U and V) includes a Groundwater Impact Assessment (GIA) that was undertaken in accordance with the National Water

Commission (NWC) *Framework for assessing cumulative potential impacts of mining operations on groundwater systems* (NWC 2010). This provided a risk-based approach to managing local and cumulative effects of mining and associated infrastructure on groundwater and connected systems. This is similar to the traditional 'source, pathway, receptor' model, whereby the assessment of risk posed to a potential receptor is determined by the level of receptor exposure to a threatening process and adverse effect arising from that exposure.

The EIS (Table 16-2) identified groundwater drawdown from the 10 bores operating for the life of the mine (25 years) as a Water Affecting Activity.

4.7.1 Construction and operation

The installation of bores would require a small disturbance footprint. In addition, the pipeline would not require trenching, as it would be constructed above-ground. Bores would be constructed by a licensed driller in accordance with well permits obtained from DEWNR and the *Minimum Construction Requirements for Water Bores in Australia, 3rd Edition* (National Uniform Drillers Licensing Committee, February 2012). The EIS (section 13.4.1) states that, during construction, bore locations within road reserves would avoid native vegetation (where practicable). Standard land management issues (such as soil erosion and weed invasion) would be addressed by the Construction EMP.

The EIS (Section 16.5.2) modelling predicted that a zone of influence (i.e. a one metre drawdown contour) could extend 20 km for a scenario of high aquifer transmissivity and low storage and 7 km for a scenario of low aquifer transmissivity and high storage. Within close proximity of the borefield (i.e. up to 8 km from the bores under a worst-case scenario), the groundwater level would generally be lowered by 10 metres. The EIS (Appendix U) estimated that drawdown for individual production bores could range from 70 to 115 metres.

The modelling also considered a range of recharge rates (1, 7 and 15 mm per year) to predict credible timeframes for groundwater level recovery following cessation of groundwater pumping. The predicted time required for complete recovery of groundwater levels ranged from approximately 350 years for the 1 mm scenario (conservative) to approximately 75 years for the 15 mm scenario.

The potential for drawdown effects to be greater than predicted has been accounted for through a sensitivity analysis and inclusion of a buffer zone. Based on this conservative approach, it was considered a low risk that additional impacts due to drawdown would occur.

4.7.2 Impact on other uses/users

The EIS assessment of impacts to receptors was based on an area extending approximately 20 km from the borefield - the zone of influence predicted by the modelling. The Musgrave PWA is outside the predicted groundwater cone of depression and there are no active bores (i.e. users) in use within the zone. Thus, the impact was deemed to be negligible (especially given there would be no change to any identified environmental values).

Impacts on groundwater levels and water volumes/quality are not considered to be significant, given the poor quality of the resource, an absence of users and no groundwater dependent ecosystems. However, the borefield is relatively large in scale and would abstract a substantial volume of water over a considerable time period. Thus, the borefield would need to be carefully managed and monitored, primarily via the Operational EMP.

The AR concludes that adequate assessment of the groundwater systems and impacts have been undertaken for the construction and operation of the proposed borefield. No detrimental impacts are expected to affect the groundwater resource associated with the operation and use of the

proposed borefield. The use of groundwater from the Kielpa aquifer for the water mine supply is considered to be appropriate and the preferred option. Groundwater monitoring at designated locations would be undertaken to assess whether groundwater drawdown is consistent with the model predictions throughout the operation of the borefield (including further investigation where differences are observed). Any groundwater impacts can be satisfactorily addressed within the Construction and Operational Environmental Management Plans that will be prepared by the proponent. The development of control strategies and management approaches in these plans, to the satisfaction of DEWNR, will be a condition of approval.

The AR acknowledges that well construction permits *(*under the *Natural Resources Management Act 2004)* will be required for the construction and operation of the borefield supply and monitoring wells.

5 WUDINNA LONG-TERM EMPLOYEE VILLAGE

5.1 General

It should be noted that the Social Impact Assessment in relation to the establishment of the Wudinna Long-Term Employee Village (and all the other components) will also be addressed in Chapter six of this Assessment Report.

5.1.1 Site and locality

Section 4.4 of the EIS document outlines in detail the expected locality for the long term employee village at Wudinna. It is proposed to be located on the northwest boundary of the Wudinna Township in the central Eyre Peninsula and require approximately 5 hectares of land (see Figure 4-37 of the EIS for the location of the proposed site). The area is within the Rural Living and recreation zones of the Wudinna Development Plan. (see below for indicative diagram of long term employee village)

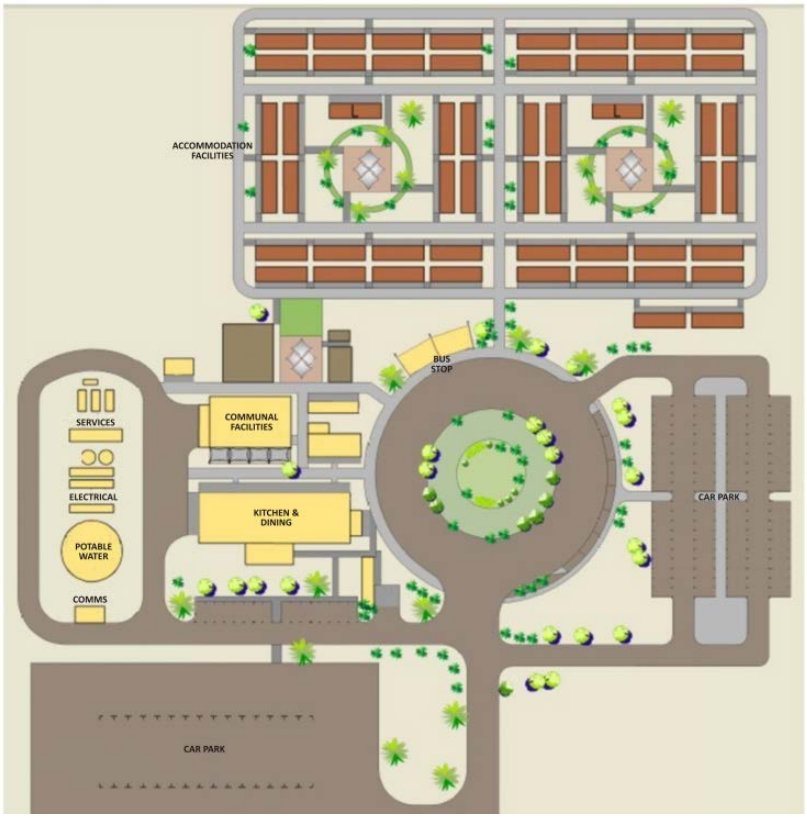


Figure 15 - Supplied image – 4-38 Iron Road EIS Chapter 4 page 4-58

5.1.2 Existing Environment

The site of the proposed employee village is located on cleared primary production land (cropping) to the immediate northwest of the township., A larger 'investigation' area has been identified but the actual village will only require approximately 5 hectares, or about the same area as the existing Wudinna oval for comparison. The proponent does not own or have control of the land in that area currently and its purchase/lease would need to be negotiated with the landholder. The locality does not have any existing infrastructure, which would be needed to be provided to support the village including water supply/sewer provision/ electricity etc.

5.2 Project description – key elements

5.2.1 General

The proposed long term employee village is expected to include accommodation for approximately 300 people who will be working either at the mine site or along the railway line. The workers are expected to be either drive in/drive out (DIDO) or fly in fly out (FIFO). An upgrade of the Wudinna airport is proposed but this is not part of the current Major Development assessment. It is the intention of Iron Road and the DC of Wudinna that the long-term employee village would complement the existing township and that occupants of the village would be welcomed into the social fabric of the town. More discussion on the social impacts are provided in Chapter six of this AR.

5.3 Summary of Submissions

5.3.1 Public Submissions

Of the 105 public submissions on this proposal (as a whole) approximately five of those raised issues related to the development of the Wudinna long-term employee village. The main issue identified was the impact of FIFO employees on the existing town (referencing a TV program on Mt Newman). The Response Document from Iron Road outlined the expectation that most of the FIFO workforce will be related to the construction phase of the mine (approximately 3 years) and that the majority of the ongoing workforce will be encouraged to be part of local communities on an ongoing basis considering that the lifetime of the mine is expected to be about 25 years. This is also part of the strategy for co-location with the township or the village so that employees will be encouraged to live in the township with its existing amenities. Also raised was the potential financial impost on the DC of Wudinna to provide infrastructure and services to the long-term employee village. In their RD the company have indicated that provision of such services would be through a commercial arrangement with the council and that there would be no financial implications for the council.

The Wudinna Community Club is keen to partner with the proponent to provide an adequate level of service to the additional people in the township, and Iron Road has embraced this possibility.

A comment was made on the justification of the estimate from Iron Road that an additional $300,000 income to councils (there are 4 in the project area) would occur as a result of the development. The RD indicated that this was the estimate for rate increases provided by their economic consultant but also does not include additional jobs/businesses and population growth.

One submitter asked what the proposed daily and annual water usage estimates for the approximately 300 people resident in the long-term employee village would be. The RD responded by advising the design allowances for the potable water supply per site personnel have been based on the individual fixture allowances specified in Table 5-2 of 'Onsite Wastewater System Code', SA Health (April 2013) which indicates that the Daily Flow will equate to 119 L/person/day. The proponent does not expect usage required for the long term employee village to have any negative impact on existing town supplies.

Another submitter indicated that the workers would be better off being fully integrated into the town in pockets of flats or apartments. The RD response was that Wudinna doesn't have the capacity to integrate a substantial increase in population, nor does the existing development plan encourage the building of flats/apartments. These issues will be dealt with in the proposed Structure Plan investigations, the company will ultimately be encouraging workers to live in the town but the initial requirements of the company would be best served.

5.3.2 Government Submissions

A couple of the government submissions referred to the long-term employee village particularly with regards to wastewater and stormwater management, both of which would be dealt with under a CEMP and OEMP by Iron Road.

Regions SA in relation to the Long Distance Commute (LDC or FIFO/DIDO workforce) indicated that the messaging through the chapter (21 and 22 of the EIS) is based on the premise that a residential workforce is preferable to a LDC workforce for many reasons and Iron Road will do what it can to encourage development of a residential workforce. However many actions proposed to be undertaken by Iron Road do not appear in their current form to accord with this messaging and will in fact facilitate the establishment, and long term encroachment, of a LDC workforce. The CEIP includes a proposed long term accommodation village consisting of single person's accommodation (single room with ensuite bathroom), share living and dining facilities. The Chapter makes the point that there are only 24 dwellings unoccupied in Wudinna, and it will be important to make land available for essential development. Iron Road does not indicate that it will itself undertake this type of residential development in the town.

Region SA's view is that if Iron Road is to encourage development of a residential workforce that will integrate with, and contribute to the well- being of the existing community (including paying rates for services) then it could consider providing some (at least short-term) family friendly accommodation in the village. This would allow time for families to relocate, purchase land and build a home in the area.

Iron Road responded in its RD that it will explore the possibility of providing some short term, family-friendly accommodation in the proposed village in consultation with the DC Wudinna.

Renewal SA raised concerns about accommodation provision at Wudinna and considers that until the new residential workforce accommodation is built (estimated at Q2 in Yr2) there will be a period when, at the front end, of the project there will be a high demand for housing in Wudinna. Existing lower and middle cost housing will be snapped up by mine workers on higher incomes, leaving a gap in the housing market for lower incomes households. The gap is likely to lead to an increase in overall rental and house price costs as supply is not meeting demand.

The State Government has an Affordable Housing policy that is managed through the state planning system to help build local government, developers and the residential development industry to ensure a diverse range of housing is built to accommodate a spectrum of households and household incomes. The *Eyre and Western Regional Plan 2012* identifies affordable housing and cost of living objectives and Principles for Development. The principles include:

- Principle 13.7 – Provide at least 15 per cent affordable housing, including five per cent for high needs housing, in all new significant housing developments.
- Principle 13.8 – Encourage affordable housing through innovative products, funding arrangements and joint ventures between the not-for-profit and private sectors.

The Wudinna Development Plan also includes principles of development control in relation to affordable housing. The proponent should identify a methodology to benchmark and track affordable housing in Wudinna using existing affordable housing metrics to ensure that the current and future residents are not disadvantaged by broad-scale housing cost increases. A process for further work with Wudinna council to ensure the existing planning framework for addressing affordable housing through the development plan and the 15% affordable housing policy is applied should also be considered but does not form part of the conditions attached to this decision.

5.4 Key environmental, social and economic issues

5.4.1 Site Location

The precise location of the long term employee village is not known currently, although it is likely to be on the North West corner of the township of Wudinna. The exact location will be subject to discussions between the Wudinna Council/ the proponent and landholders.

5.4.2 Construction/ Design and operation

Figure 4-38 of the EIS provides an example layout of the long term employee village. It is likely that the construction of the village would be contracted from Iron Road to a company (unidentified at the present time) experienced in this task to construct the village.

It is expected that information on the layout, design and operation of the long-term employee village will be forthcoming at a future time and consideration of design could be considered by the Wudinna DC.

The proposed village is expected to include an administration building, dining and kitchen building, car parking areas and landscaping, a summary is provided in Table 4-5 of the EIS. The village would be expected to meet the needs of a DIDO or FIFO workforce including garden and landscaping requirements. The proposed model of operation has not yet been determined but it is more likely that a worker would have their own allocated accommodation 'module' rather than having a 'motel' model where a worker might be allocated any 'module' that is available.

The final design and layout of the long-term employee village should be to the satisfaction of the Wudinna DC.

5.4.3 Infrastructure provision

There is currently no provision of infrastructure to the possible site for the long-term employee village. It will be necessary for Iron Road or their contractors to negotiate with providers such as SA Water/for water with sewer expected to be provided by incorporation with the town community wastewater management scheme. Power to service the long-term employee village will also be required.

It is outlined in section 4.4 of the EIS that open space irrigation from stormwater runoff is proposed as part of the town community wastewater management Scheme.

Provision of all infrastructure for the long-term employee village must occur before construction of the village be to the approval of the Wudinna DC including consideration of waste water provision.

5.4.4 Integration/ relationship with Wudinna Township

The location of the village will be determined in consultation with the DC of Wudinna who will undertake a structure planning process which could lead to a Development Plan amendment to facilitate and control development within that zone.

It is expected that the long-term employee village will perform on a stand-alone basis even though it is connected to the township and workers may also make use of the existing commercial, recreational and health facilities in Wudinna. Iron Road will provide a medical facility at the mine site for illness and accidents, however, there may be some reliance on the health facilities in Wudinna. Iron Road has stated that it will be flexible about the design of the long-term employee village and will work closely with the council to come to a final design. It is also possible that construction of the workers' village would be contracted out to a company who are well versed in providing such a facility. Contractors to Iron Road are still bound by the conditions of approval (if this proposal is approved) which are provided to Iron Road.

Commitments which could be conditioned or agreed by Iron Road to assist with integration with Wudinna include:

- developing a code of behaviour for long-term employee village residents
- developing an agreement with SAPOL to prevent and respond to any anti-social behaviour
- implementation of a fitness – for work program in conjunction with the mine, including responses to drug and alcohol issues.
- participating in the development of a plan to address social services and infrastructure.
- establish a complaints register to enable reporting of unacceptable behaviour

The long-term employee village will utilise town water (SA Water) supplies, with sewage incorporated into the town Community Wastewater Management Scheme. It is expected that the principles of water sensitive urban design (WSUD) would be incorporated into the design and landscaping will also be provided for shade and screening.

5.4.5 Air Quality

There are not expected to be detrimental air quality impacts on the long-term employee village from the activities of the mine site as the village is up wind of the prevailing south westerly winds and also at least 25 kilometres to the North West of the mine. The operation of the village (apart from construction which would require water trucks to wet down the site as part of the CEMP) should not cause any air quality impacts on the town of Wudinna or vice versa.

5.4.6 Terrestrial Impacts

The site of the proposed long-term employee village is on existing cropping land where no vegetation clearance would be required and it would be likely that impact on existing fauna would be minimal to non-existent.

It is possible that pest weeds and animals may become more prevalent on the site and consideration of a pest management plan may offset this possibility.

5.4.7 Surface Water

The hard surface area of the proposed long-term employee village is not large and it is not expected that the proposal would have any significant effect on catchments and stormwater flows. This detail should be included in how stormwater runoff would be dealt with under the agreed CEMP and OEMP for the long-term employee village. These management plans would need to be approved before construction of the long-term employee village occurs and should also be to the satisfaction of the DC of Wudinna

5.4.8 Noise and vibration

There are not expected to be any noise or vibration issues for the long-term employee village from the operation of the mine or the rail line as it is too remote from the site. It is also unlikely that the

residents of the village would experience any noise from the airport expansion but the expansion has not yet occurred.

5.4.9 Waste Management

The disposal of solid waste from the long-term employee village to the land fill at Wudinna has not been addressed in the EIS but would be part of a waste management plan including recycling and the EPA policy *South Australian Environment Protection (Waste to Resources) Policy 2010.* The company would need to engage with the DC Wudinna to ensure landfill space was available and/or expansion of the landfill is possible.

A waste management plan will be required for both the CEMP and OEMP.

5.4.10 Traffic and access

It is expected that many workers especially for the mine and in construction would be either 'fly in fly out' (FIFO) or 'drive in drive out' (DIDO). The proposed layout of the long-term employee village includes a 'layby' area for bus transfer for workers from the upgraded Wudinna airport and for transfer to the mine site. Appropriate parking would need to be provided for DIDO workers and areas for parking are indicated on the example layout in figure 4-38 of the EIS.

A traffic, access and parking plan should be part of the detailed design of the village and subject to the approval of the DC of Wudinna.

5.4.11 Greenhouse gases and sustainability

Climate change and Greenhouse Gas issues are discussed in detail in Chapter 11 of the EIS.

Iron Road should seek to incorporate renewable energy options in the project, including installing solar panels at the village.

5.4.12 Visual amenity and landscape character impacts

The proposed long-term employee village is expected to be single level and single occupation units with associated kitchen/recreational/ laundry and services buildings with landscaping and garden areas. The village will not directly relate to the main street of Wudinna and its facilities nor is it an immediate neighbour to other dwellings in Wudinna. The visual amenity of the site should not impact in a deleterious way with the township but neither does it add landscape character to the township. The village will obviously look different to the rest of Wudinna as it is predominantly single occupation units instead of generally detached dwellings in large gardens with 3/4 bedrooms. It is proposed that landscaping and screening both external to the village (along the road frontages) and within the village (between accommodation units and services for example). Section 23.5.2 of the EIS has stated that no viewpoint analysis of the proposed village was undertaken due to the fact that the final layout and location of the village has not yet been determined. Seven dot point objectives for the development of the village have been identified by Iron Road which includes:

- Maximise the economic benefit to goods and services providers within Wudinna through the establishment of linkages between the proposed village and the existing township.
- Promote the use and integration of shared facilities and services
- Incorporate landscaping at all road frontages and amongst the various structures within the village to soften the overall visual impact.
- Utilise stormwater runoff and improved infrastructure within the village to support the ongoing operation of existing infrastructure within Wudinna

- Develop the village as a logical extension to the Wudinna Township utilising consistent colours, materials, landscaping and street layout within a compact urban form.
- Undertake the establishment of the village in accordance with the objectives and principles of development control for temporary/transient populations (e.g. tourist accommodation) as outlined in the Wudinna DC Development Plan.

The above dot points should be considered in the review of the Development Plan for Wudinna and address issues of design/colour/materials/landscaping and open space provision in the Wudinna long-term employee village.

5.4.13 Rehabilitation and decommissioning

There is no current plan for the rehabilitation or decommissioning uses for the long-term employee village in Wudinna. There may be a number of potential uses for the long-term employee village when the mine has ceased operation, these could include tourist accommodation, school groups or other group travel accommodation.

The seven dot point plan mentioned above also includes:

- Maximising opportunities for the adaptive, beneficial reuse of infrastructure within the village following closure of the mine.

A rehabilitation or decommissioning plan will need to be negotiated with the DC Wudinna as a condition of approval.

In summary, the AR concludes that the potential impacts from the development of the Wudinna long-term employee village are manageable and acceptable, subject to compliance with commitments made in the EIS, legislative requirements and the recommended conditions outlined in this chapter.

6 ECONOMIC AND SOCIAL ASSESSMENT

6.1 Economic Impact

6.1.1 What is proposed?

The proposed integrated logistics chain comprised of a port, rail, power and water infrastructure corridor will support the transfer and connection of goods from the mine site to the purchaser.

The proposed works have been categorised within project phases as construction and operation, both phases having separate timing, duration, capital expenditure and workforce requirements.

The applicant has ascertained a baseline in each council area through consideration of ABS data and Regional Development Australia reports, state government plans and other economic reports available for the area.

The analysis below summarises expected annual average economic impacts as derived from economic modelling conducted for the project, with the construction of the infrastructure phase of the project expected to take 4 years, with the remaining operational phase (to follow) continuing for a further 25 years.

Table ES-1 Local and regional economic impact of the CEIP, construction and operation phases

	Wudinna	Kimba	Cleve	Tumby Bay	Elliston	Rest of Eyre & Western	Total Eyre & Western
Construction (avg/an, yrs 1-4)							
Gross Regional Product ($m)							
Direct	29	0	12	16	0	0	57
Flow-on	12	1	4	6	0	33	55
Total	**41**	**1**	**15**	**22**	**0**	**33**	**112**
Employment (fte)							
Direct	551	0	164	273	0	0	988
Flow-on	135	7	37	57	1	233	470
Total	**686**	**7**	**201**	**330**	**1**	**233**	**1,458**
Operation (avg/an, yrs 5-29)							
Gross Regional Product ($m)							
Direct	2,376	0	1	2	0	0	2,379
Flow-on	26	2	3	2	1	19	52
Total	**2,401**	**2**	**4**	**4**	**1**	**19**	**2,431**
Employment (fte)							
Direct	654	0	26	25	0	0	705
Flow-on	195	11	20	13	7	88	335
Total	**849**	**11**	**46**	**38**	**7**	**88**	**1,040**

In summary, table ES-1 shows the regional employment analysis (direct and flow-on) from the construction and operational phases and the regional impact (sourced from Appendix X to EIS – Economic Impact Assessment).

Table ES-2 Regional, state and national economic impact of the CEIP, construction and operation phases

	Eyre & Western	Rest of South Australia	**Total South Australia**	Rest of Australia	**Total Australia**
Construction (Avg/an, yrs 1-4)					
Gross State Product ($m)	112	406	**518**	653	**1,171**
Employment (fte)	1,458	1,569	**3,027**	2,451	**5,478**
Operation (Avg/an, yrs 5-29)					
Gross State Product ($m)	2,431	294	**2,725**	98	**2,823**
Employment (fte)	1,040	945	**1,985**	244	**2,228**

Table ES-2 includes the State and regional economic impacts from the construction and operational phases (sourced from Appendix X to EIS – Economic Impact Assessment).

6.1.2 Jobs and economy - Construction

The proponent identifies total expected expenditures of $4.8 billion (including at a regional, State, inter-State and overseas level) of which $2.7 b (56%) is expected to occur within South Australia.

The average expenditure of $673m within SA during the construction phase is expected to create an average of just under 1500 jobs within the Eyre and Western region specifically, and just over 3000 jobs for South Australia as a whole. At the SA regional level, construction phase employment is

expected to be transitory, but will have local spinoffs as local demand for housing and other consumption is expected to increase in line with employment.

6.1.3 Jobs and economy - Operation

On average the proponent expects that the proposal will generate a Gross Operating Surplus (GOS) of $2.3 billion per year during operation.

It is also expected that an average of $1.1 billion will be spent on the mine, rail, port and general supply chain during the 25 years of operations.

As a result of these expenditures, the proponent has suggested that 1985 FTE's are expected to be created during the operational phase:

- At a SA regional level, the Wudinna LGA is expected to be the largest beneficiary with 849 FTE direct and flow on employees. Further, both Cleve (46 FTE) and Tumby Bay (38 FTE's per annum on average) are likely to have strong regional employment growth.[3]

6.1.4 Logistics

The port at Cape Hardy is expected to be a multi user facility from initial operation; providing an access point for grain and other resources as appropriate. This allows for more than one export from a deep sea access point within SA waters.

6.1.5 Land Tenure

The proponent has indicated that most of the allotments required for infrastructure are private freehold land with a minority consisting of road reserves and crown land and that meetings with landholders are ongoing differing in stages of negotiation. Logistical issues such as stock and machinery access/movement, shearing and cropping impacts are part of the discussions to ensure each party maintains fair and reasonable access.

Finer details for each privately owned allotment will be negotiated and agreed through an impact management plan; through the construction and operation phases the proponent will undertake regular liaison with those impacted.

When development occurs, the proponent has proposed to rehabilitate as soon as practicable with the acknowledgement that for logistics and foot print reasons some farm land may be inaccessible during construction.

The applicant has sought technical advice from Econsearch (see Appendix X to EIS) which details the contribution of each stage of the project to the relevant local government areas and South Australia overall.

6.1.6 Local area and region

The existing economic environment is characterised by jobs in agriculture (66% of SA's wheat and barley produced in the local area), fishing (80% of the SA's commercial seafood industry), mining (Eucla Basin, Gawler Craton) and manufacturing (Whyalla Steelworks).

The technical analysis is based on a methodology devised by the consultant to the proponent which focuses on the input-output (also known as the Regional Industry Structure & Employment) model.

[3] Assumptions have been made based on potential operations such as 40% local workers, 60% long distance commute workers (fly in fly out).

Economic activity indicators such as:

- jobs
- full time equivalent (FTE) roles
- the value of the output from the mine site,
- the measure of the contribution to the regional, state and domestic product (including household income) as a result of the development (known as GRP/GSP/GDP).

The technical advice indicates that employment as a direct result of the development would generally consist of construction, planning and engineering services and material supply firms. Roles may consist of services related to energy, raw materials, logistics, business support services and other roles as required.

These assumptions are based on the value of output to avoid duplication of impacts.

Due to the relatively short phase of construction and specialised nature of the work required, in comparison, the consultant has assumed that all of the roles will be undertaken by specialists which fly in/out or drive in/out rather than local workers.

A summary of the employment expected from the proposal is outlined below (sourced from Chapter 21 – Economic Environment of the EIS).

Table 21-9 Predicted Employment Resulting from CEIP in the Local Study Area (Number and %)

Employment[1] (Number and %[2])	Year 1	Year 2	Year 3	Year 4
Eyre Peninsula (excluding local study area)	• 7 FTE jobs • Less than 1%	• 163 FTE jobs • 1%	• 448 FTE jobs • 2%	• 315 FTE jobs • 1%
Wudinna DC	• 13 FTE jobs • 2% of total FTE jobs in area	• 478 FTE jobs • 72% of total FTE jobs in area	• 1356 FTE jobs • 203% of total FTE jobs in area	• 898 FTE jobs • 134% of total FTE jobs in area
DC of Kimba	• 1 FTE jobs • Less than 1% of total FTE jobs in area	• 6 FTE jobs • 1% of total FTE jobs in area	• 14 FTE jobs • 3% of total FTE jobs in area	• 8 FTE jobs • 2% of total FTE jobs in area
DC of Cleve	• 4 FTE jobs • 1% of total FTE jobs in area	• 140 FTE jobs • 16% of total FTE jobs in area	• 397 FTE jobs • 45% of total FTE jobs in area	• 263 FTE jobs • 30% of total FTE jobs in area
DC of Tumby Bay	• 6 FTE jobs • 1% of total FTE jobs in area	• 228 FTE jobs • 24% of total FTE jobs in area	• 651 FTE jobs • 68% of total FTE jobs in area	• 433 FTE jobs • 46% of total FTE jobs in area

[1]Direct and Flow-on
[2]Compared with 2012/2013 employment figures

The technical advice indicates a contribution of approximately $2.7 billion to the state's gross product each year for 25 years of operation.

The proponent has considered the tension between the proposed development and the loss of agricultural land, the improvement of training opportunities in the regional areas, improved opportunities for local businesses and other mining businesses, and the demand for skilled workers in the form of labour competition for existing industries.

While approximately 7000 hectares of primary production land will be lost (.25% of productive land in the Eyre Peninsula Natural Resource Management region as a result of the CEIP footprint (mine and infrastructure); some of the port land and mine land may be made available for cropping/grazing as

appropriate. The trade-off between the development use versus cropping use is seen to be beneficial over the life of the mine by approximately $1.6 million per year in revenue.

It is expected that the average contribution of the proposal will have the most economic impact in the Wudinna District Council, with approximately $59 million to be value added per year.

A substantial increase in demand for services and products is expected in the local area; with local, regional and state-wide businesses to benefit from the flow on effects of the proposal.

Demand for services and products would range from:

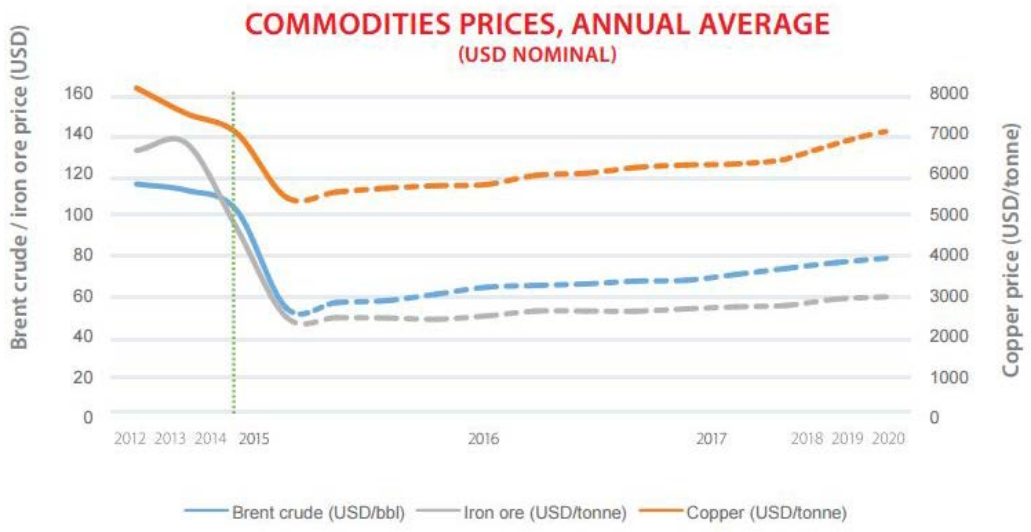
- fuel
- communications
- transport and logistics (especially for the workforce)
- engineering, light earthworks
- catering, training and the like

It is expected that the demand for workforce may impact the existing primary production and commercial fishing industries for the region; the impact is expected to be over 3 years.

6.1.7 State level

While having significant impact at the local and regional level, the proposal is expected to generate significant revenue in the context of South Australia's economic outlook.

Generally, commodity prices have fallen over the last few years with a view to gradual improvement to 2020.



Source: Consensus Economics Energy & Metals Consensus Forecasts, YCharts

The analysis (above) at the regional level and the projected commodity prices can be considered at the strategic level with South Australia's economic forecast and economic priorities. The state's resources have been identified as an opportunity for jobs and economic growth.

Objectives identified for 2017 include creating an additional 3000 jobs and increasing production of mineral resources by $1.5 billion; the attraction of 5 to 10 mining services to SA and three resource company head offices to Adelaide are seen as objectives for the State.

While the proposed land use, construction works and the assessment report are limited in their scope – an investment of this size in the state would have significant positive impacts through the creation of jobs and potentially be a catalyst for further investment in the State.

The multiplier effect from an investment of this size is also expected to be significant as the support for a major mine site and associated infrastructure would be relative in investment.

Infrastructure Australia has assessed the CEIP through their multi-criteria analysis in July 2016 and rated the proposal as a Priority Project. This conclusion was based on the potential to contribute to the Australian economy an estimated $933 million via royalty and company tax income. There is also the potential for the South Australian economy to garner $0.9 million from royalties.

The 2015/2016 State Budget Mid-Year Review demonstrates the expected income and expenditure for the State with the Gross State Product (GSP) expected to increase to 2.5% in 2016-17 and up to 3% in 2017-18.

Key Economic Indicators – Australia and South Australia Real Growth Rates (Per Cent Per Annum)

	2014–15 ACTUAL	2015–16 ESTIMATED	2016–17 FORECAST	2017–18 PROJECTION	2018–19 PROJECTION	2019–20 PROJECTION
Australia [(a)]						
Gross Domestic Product (GDP)	2.2	2½	2½	3	3	3
South Australia						
Gross State Product (GSP)	1.6	1½	2	2¼	2¼	2¼
State Final Demand (SFD)	1.3	1½	2	2¼	2¼	2¼
Employment	0.5	½	¾	1	1	1
Adelaide Consumer Price Index (CPI)	1.6	¾	1¾	2¼	2½	2½

(a) Australian forecasts from Pre-Election Economic and Fiscal Outlook, 2016.

The Treasury Department expects that a transition from reliance on manufacturing and mining will have impacts on the state budget as will the closure of Holden and car manufacturing in 2017 (as per Key Economic Indicators table above sourced from the Budget 2016-17 Overview, page 16.).

The forecasted increase in the GSP is based on the recalibration of revenue generating activity in the state. Industries such as food, health, tourism, the shipbuilding program and investment by State Government in capital works throughout the state are expected to soften the impact of the potential downturn in revenue.

It is generally considered that the proposed mine site, infrastructure corridor and port will have a significant economic benefit to the local and regional area.

The proposed land tenure/access and use arrangements are reasonable; with negotiations ongoing and liaison at different stages of the development proposed to occur as appropriate.

The isolated nature of the proposal to generate a fly in/out workforce as well as provide for opportunities for local businesses to support the main operation.

The potential economic impacts for the State are expected to be positive; with subsequent investment in associated supporting industries expected as well as attraction of other mining opportunities.

The AR concludes the applicant has robustly considered the economic impacts of the proposed works through the technical report provided by Econsearch.

6.2 Social Impact

6.2.1 Regional community impacts

There is the potential, if this proposal is approved, for the CEIP development to have a number of positive and potentially negative impacts. It is possible that some of the negative impacts could be mitigated through negotiation with landholders and other interested parties in the longer run. It is intended that there will be a number of conditions in relation to this issue if the Governor's Authorisation is forthcoming.

6.2.1.1 General

This section of the AR addresses the Social Impact Assessment (SIA) for the infrastructure corridors, the Port site at Cape Hardy as well as impacts on surrounding communities. SIA is relation to the Wudinna long-term employee village is also considered in Chapter 5 of this AR. Chapter 22 of the EIS and Appendix Y of the EIS 'Social Impact Assessment' cover the proponent's view of the social profile and potential impacts of this development. The work undertaken within these documents adequately describe the social environment within which this development is proposed. Impacts on the township of Warramboo and the communities affected directly by the mine are considered in the Assessment of the Mining Lease Proposal and also attached to this 'consolidated' Report.

6.2.1.2 Site and Locality

The CEIP development would have direct effects on the land owners in the corridors and also on the development of the port site and to a lesser extent Port Neill, Tumby Bay and other small towns on the Eyre Peninsula.

6.2.1.3 Existing Environment

'Existing Environment' descriptions for the proposal are provided in the EIS in Appendix Y.

Section 3.1 of Appendix Y provides a snap shot of the affected communities in relation to this development.

Wudinna

This township with a population of approximately 560 people is an important service centre for much of the surrounding agricultural district and offers a range of valuable retail, recreation, and social services to the central Eyre Peninsula. The population is generally older than the South Australian average and there are more women than men, with more single person households. There are relatively few unoccupied dwellings and the rents are higher compared to the rest of the district. There is a strong community spirit in Wudinna and high participation in sports and community events. This 'volunteering' spirit is common across the Eyre Peninsula as indicated in ABS information. The proposed long-term employee village would be located immediately adjacent to the township of Wudinna, which is approximately 25km to the north west of the mining lease boundary.

Tumby Bay

Tumby Bay is located on the coast 30km to the south of the proposed Cape Hardy port site and is also a service centre for the surrounding district. It has a resident population of approximately 1,470 with a large retired population, the majority being female.

Port Neill
This small township (population 136 people) is approximately 5km north of the Cape Hardy port site boundary and offers a small range of retail and other services. The population is characterised by being in the older age group and also with a majority of females. Housing costs here are also relatively high and the population grows significantly during holiday periods. Port Neill has an attractive coastal environment with a town jetty.

District Councils of Kimba and Cleve
The proposed rail corridor and infrastructure supply corridors are located within these district council areas. These are predominantly agricultural communities with, predictably, over 40% of workers employed in the agriculture/forestry/fishing sector. These areas are characterised by an older, more male age profile than is the average for South Australia. There is also a high employment participation rate. The CEIP infrastructure corridor would intersect a number of agricultural land holdings and also be constructed in proximity to the townships of Rudall and Verran.

District Council of Elliston
The CEIP infrastructure corridor does not traverse this district council area but is in closer proximity to the mine site.

Eyre Region – Major Towns
The cities of Port Lincoln, Port Augusta and Whyalla are within a 200-250km radius of the mine site and the corridor/port and along with Ceduna to the west may provide a local source of labour for the mine and the corridor/port. These centres may also provide a source of goods and services for the CEIP development.

6.2.1.4 Project Description

In terms of impacts to regional communities from the proposed project components the EIS indicated the following peak workforce and accommodation requirements:

- Construction worker numbers are estimated at 500 people for the construction of the infrastructure corridor and 400 for the proposed port development (a further 1050 for the mine construction and 560 ongoing positions at the mine). Workers would be accommodated at the Wudinna long-term employee village or at the port construction camp.
- An additional 450 people would be employed in the Adelaide office during construction and an ongoing workforce of 60 people utilising existing Adelaide accommodation.

6.2.1.5 Summary of submissions

Issues raised by public submissions (summarised) included:

- Traffic and Transport issues in relation to operation of the rail line including farm operation, farm machinery and stock movements, grain truck traffic, school bus safety at rail/road crossings (numerous submissions)
- Fire safety issues in relation to the rail operation including fire truck and emergency vehicle access
- Relocate rail line through Hambidge and Hincks Reserves
- Use of the 'left over' corners of paddocks after rail line installed
- Land compensation
- Vibration and noise
- Third party access to port
- Loss of agricultural workers to mine operation
- Impact of long-term employee village on Wudinna/liability for Wudinna DC

- Housing supply in a number of centres (Wudinna, Tumby Bay, Cleve, Port Neill)
- Community friendly rosters
- Government and private services resourcing (SAPOL, medical, dental, emergency services)
- Social licence to operate

6.2.1.6 Assessment of regional community impacts

The CEIP proposal would have direct impacts on Wudinna, land holders and communities along the infrastructure corridor(s) particularly the rail corridor and at Port Neill as the closest community to the port site. Likely impacts relating to population growth and the associated demand for services and facilities would include:

- Wudinna would attract workers, initially resident in the long-term employee village and potentially longer term in the township itself
- Construction workers would be accommodated in the long-term employee village or at the port construction camp at Cape Hardy
- Land holders and community members in close proximity to (or part of) the rail corridor from Cape Hardy to the mine site near Warramboo
- The entire Eyre region in terms of employment opportunities and demand for goods and services

The expected assessment of the potential impacts to Wudinna, Port Neill (and surrounding towns) and owners in the infrastructure corridor(s) is provided below.

Wudinna

This section should be read in conjunction with Chapter 4 of this AR which also considers some of the impacts of the development on the town of Wudinna.

Chapter 22 of the EIS indicates that the workforce characteristics for the CEIP has been determined to be:

- A high proportion of men to women, particularly in the LDC workforce
- A relatively young population
- A high proportion of people employed as machinery operators and drivers, technicians and trades workers and professionals
- People on relatively high income levels
- People with relatively high levels of schooling

Wudinna may be affected by the development of the mine and corridor in a number of ways. The most significant being the development of the long-term employee village on the edge of the town. Most of the workers employed for the development of the mine are expected to be LDC workers, although longer term residency in the existing town will be encouraged by Iron Road.

Accommodation of up to 300-350 workers would occur at Wudinna with the intention that all the day to day needs of an LDC workforce would be provided on-site including recreation, meals/dining, medical facilities (in conjunction with medical resources to be provided at the mine site), laundry as well as bedroom/ensuite accommodation.

It is likely that this accommodation provision would be outsourced to a mining camp developer as there are specialist developers in this realm. The proponent has committed to working with the DC of Wudinna by supporting the development of a new Structure Plan for the town which will take into account the proposed long-term employee village, its location and its linkages with the township.

The LDC workforce at the long-term employee village would be expected to be fairly 'self-contained' and not need to rely upon services and facilities of the township. The working rosters have been identified in Chapter 22 of the EIS where over half of the employees would work five days on and two days off, whereas the majority of contractors and those engaged at the mine would work two weeks on and one week off, while the majority of the maintenance workers would work of rosters of seven days on, seven days off or seven nights on and seven nights off. This would be standard for the industry.

While Iron Road has stated that it has a preference to employ suitably qualified local and regional workers this may not be possible and whomever is employed will also decide themselves what living and lifestyle arrangements suit them as individuals. There will also be additional employment as a result of the need for goods and services which is likely to support workers in other industries living locally in the region.

Wudinna and Tumby Bay do have existing hospitals which provide 24 hour emergency services, the Port Lincoln hospital is also within 2 hours of the mine and 1 hour of the port site. The hospital provides a range of medical and emergency services and has recently undergone an expansion and upgrade. The Royal flying doctor service also has access to the local airstrips at Wudinna and Tumby Bay for critical cases.

With the development of the village at Wudinna it is not expected that there will be any extra demand on education/child care or other family services as most of the occupants are likely to be single people or if FIFO have left their families in situ. Longer term settlement of families in Wudinna will change that equation and the issue of more family/child care and kindergarten places/policing will become more of an issue as permanent residents for ongoing operations become part of the town community, but this if likely to be 5 years post construction commencement.

There may be some potential impact on police resources at Wudinna as a result of an influx of single workers (this is a common issue across mine sites world-wide) however this should be mitigated by the shift arrangements for construction workers plus a zero tolerance of alcohol and drugs on the mine site. Regular testing of workers is likely to be a feature for those in construction and in the operational phase of the mine. This should result in fewer workers vs town occupant issues from the construction workforce.

Ongoing workforce

Iron Road have deemed in the EIS that the demand for government and community services in any nearby townships relative to CEIP activities will be negligible, however if more ongoing workers are located within townships this could change. The question is whether existing social need monitoring through ABS information will be 'nimble' enough to deal with any additional requirements resulting from the CEIP development or should additional reporting by the company be suitable in the longer term to deal with the population increases resulting from the mine project during the 5 year 'gap' in ABS survey data being available.

A ' partnership' between council, mining company and government could assist in monitoring and adjusting development of housing for people working in all sectors in the towns and could also be used as a vehicle to address other issues of mutual concern including cultural, indigenous development plans, employment and training gaps etc.

The number of people who identify as being of Aboriginal descent in the town of Wudinna is quite low but the number of indigenous people who live on Eyre Peninsula is higher than the State average. The company has negotiated an Indigenous Land Use Agreement with the Barngarla Aboriginal

Corporation on behalf of the Barngarla people, which includes components related to Indigenous engagement and employment as part of the projects operations. Implementation of this agreement will provide opportunities for employment and training (including apprenticeships) for the indigenous community.

Port Neill (and surrounding towns)
A short term construction camp accommodating 650 people is proposed on the Cape Hardy site for the development of the Port facilities. Construction would occur over a three year time scale. Due to the construction skill sets required it is likely that the majority of workers in this phase of the development would be FIFO or DIDO workers.

There will be an ongoing workforce of approximately 100 personnel during the operational phase of the development. A number of towns are within a reasonable drive by car to the port site and would be a catchment area for ongoing employees. It would be expected that ongoing port workers would reside in the vicinity of the port, however workers with the appropriate skill sets may not be available within the existing population requiring recruitment from further afield. Recruited workers would still be encouraged to reside locally to the port. This may result in some impact upon services in the surrounding district including health, dental and education (for accompanying family members). Iron Road have estimated that an increase in population of 120 residents (including family) would potentially reside locally and this would represent an increase of 4.5% in the population of the DC of Tumby Bay. The proponent has relied upon the research undertaken by Burge (2004) which states that if the population increase is less than 5% the impacts are not likely to require active management. Iron Road believe that there would be a negligible impact on the demand for services as a result of the operational workforce at the port site.

Detailed social impact assessment of the increases in population both in the construction and ongoing phase have not been undertaken (See Section 22.5.2 of the EIS) because provision of government and non-government services is outside the control of Iron Road.

However, it is expected that some monitoring of the impact of the proposal on government services (in particular) will be required as part of ongoing management of the CEIP. These could include:

1. providing population (both Long Distance Commute and ongoing) numbers over time to SA Health, DECD, SAPOL, Renewal SA and Regions SA
2. providing population increase information to the councils
3. monitoring the level of available and affordable housing in the townships targeted for increased population over time.
4 liaising with other non-government organisations on the West Coast
5. community participation partnerships (Franks, 2012) may also provide a framework in organising resources and coordination of activities. The company have already commenced Memorandum of Understanding (MOU) processes with the local affected councils.

Many public submissions concerning the main corridor route (Rail) raised issues in relation to disruption of farm operations/ machinery movements/stock movements and also safety for the school bus in crossing this corridor. Concerns were also raised about the land 'left over' by the dissection of the land by the rail corridor and whether this will be useful in an agricultural sense when returned to the farmer.

At the time of this assessment the proponents do not own any of land in the rail corridor nor does it have any options to purchase this land. It is acknowledged in Section 22.5.6 of the EIS that there will be both temporary and permanent changes to property access and farm management practices. It

could also affect crossing points for agricultural and pastoral purposes in some locations due to it being a crossing point for rail or water pipes. The CEIP EIS outlines that at the time the EIS was written there were 89 parcels of land held by 56 landowners that would be affected by the rail alignment and the land between Yadnarie and the rail corridor for the electricity connection. The proponent has assessed this to be of low impact and will be negotiated through individual agreements with landowners.

Changes to local access due to the corridor have been deemed by the proponent to be of 'medium impact' as this will be a long term change in the study area.

This assessment concludes that a plan should be developed as the basis of agreement on school bus safety and this plan should include consultation with the local councils and schools as appropriate.

In reference to the purchase of land in the corridor, the proponent has committed 'to negotiating consistently and sensitively with directly affected landowners to achieve agreements with all parties'.

The fate of any 'left over' land parcels as a result of the rail alignment has not yet been determined and should be considered before operation of the rail line occurs. The rail corridor is expected to be fenced but farmers/land owners need to be confident that these 'left over' parcels can either be operated as ongoing farming land or that appropriate compensation is provided or some other process can be adopted to make sure these parcels are useful in land use sense.

This assessment concludes that a plan be developed to address the ongoing use and purpose for any 'left over' land parcels, so that the land is practically usable and legally accessible.

6.2.1.6 Conclusion

The AR concludes that managing the growth of regional communities is primarily the responsibility of State and local governments, through the provision of appropriately located and serviced land. Therefore, no commitments have been made in the AR regarding the delivery of services, however, it is expected that the company will contribute to the monitoring and management of growth in relation to the impacts of this development.

It is expected that a Social Management Plan will be prepared and should outline:

- all strategies, initiatives and commitments described in Chapter 22 of the EIS
- monitoring or rentals rates, rental availability and housing stress in Wudinna and Port Neil/Tumby Bay
- opportunities for local industry participation and employment
- opportunities for indigenous employment and involvement
- means by which ongoing feedback to and from the community is to be maintained and enhanced
- a process for reviewing and updating the SMP on a regular basis: and
- anything that the Minister for Planning directs in writing
- the implementation and maintaining of the SMP must be audited by a suitably qualified independent expert on an annual basis, or at a frequency as the Minister for Planning may specify in writing
- the expert must prepare a report of the findings of the audit and this report must be made publicly available within one month of completion of the audit.

Communications Protocol

The proponent must develop (to the satisfaction of the Minister for Planning) a communication and operating protocol between itself and owners of adjacent land to and on the land prior to the

commencement of operations of the rail/water/electricity corridor/port/Wudinna long-term employee village that includes the following matters:

- Interaction with landholder operations;
- Emergency procedures
- Communications and issue management processes
- Land management
- Dispute resolution
- Ongoing communication about the proponent's operations
- Receiving and considering feedback
- Safety procedures
- Access protocols; and
- Any matters identified by the Minister for Planning

The proponent must maintain and adhere to the protocol to the satisfaction of the Minister for Planning for the term of the development life.

Complaints Register

- The proponent must operate a 24 hour per day, 7 day per week, telephone complaints line for the purpose of receiving complaints from members of the public in relation to operation of the rail line and port (in particular)
- The proponent must take reasonable measures to notify the public of the complaints line telephone number and the fact that it is a complaints line
- The proponent must establish and maintain a public complaints register. The public complaints register must, as a minimum, record the following detail in relation to each complaint received in which it is alleged that environmental harm (including an environmental nuisance) has been caused by operation under the development authorisation for this proposal.
    - The date and time at which the complaint was received
    - All personal details of the complainant which were provided by the complainant or, if no such details were provided, a note to that effect
    - The subject matter of the complaint
    - The action taken by the proponent in relation to the complaint, including any follow up contact with the complainant; and
    - If no action was taken by the proponent, the reasons why no action was taken
- All records in respect of the public complaints must be maintained for a period of at least 7 years
- The proponent must make the public complaints register available except for the name and contact details of each complainant.

6.2.2 Indigenous issues

6.2.2.1 General

This section of the AR applies to the development as a whole and considers the issues the project raises in relation to indigenous people. Aboriginal cultural heritage and native title are dealt with in Chapter 4 of this AR. The MLP assessment also considers indigenous issues in relation to the Mine development.

This section provides a summary of the legislative environment and mechanisms for managing indigenous issues.

6.2.2.2 Legislative environment

Chapter 19 of the EIS satisfactorily outlines any issues and risks for Aboriginal Heritage in relation to the CEIP development. It also provides details of the relevant legislation pertaining to Aboriginal Heritage this includes:

- The *Aboriginal Heritage Act 1988* applies to all activities within the development area. If Iron Road needs to 'damage, disturb or interfere with' any Aboriginal sites or objects or remove or disturb any remains, the company must seek authorisation from the Minister of Aboriginal Affairs and Reconciliation, pursuant to section 23 of the *Aboriginal Heritage Act 1988.* Iron Road is also obliged to make reports under section 20 of the *Aboriginal Heritage Act 1988* if any sites, objects or remains are discovered.
- The Native Title Act 1993 (Cwth) has a number of functions, including setting up processes through which native title can be recognised and providing protection for native title rights and interests by prescribing procedures which must be complied with by prescribing procedures which must be complied with by Commonwealth, State and Territory governments. The Act also regulates Indigenous Land Use Agreements (ILUAs), which are voluntary agreements made with native title parties about the use and management of land and waters.

The proponent has developed a strong relationship with the recognised native title holders to the land (the Barngarla people). An ILUA was agreed by all the relevant parties including the Barngarla people in 2015 and was registered by the National Native Title Tribunal on 1 December 2016. The ILUA will manage all native title and Aboriginal heritage matters going forward. There is only a small amount of land within the footprint of the development area that is subject to the ILUA because the majority of land is not considered subject to Native Title due to the fact it was alienated from the crown estate for many years.

6.2.2.3 Aboriginal Cultural Heritage

Section 19.3.1 of the EIS provides information about existing information on Aboriginal Heritage. A review of the Central Archive including the Register of Aboriginal Sites and Objects administered by DSD – AAR, showed no registered sites in the immediate development area but showed five archaeological sites and two burial sites recorded in the greater CEIP area, the closest of which is 5km away from the CEIP infrastructure. The Barngarla people had (and still have) a strong attachment to their large territorial lands.

Surveys were undertaken with Aboriginal representatives and Dr Scott Cane (the Barngarla heritage advisor). The survey findings are discussed in section 19.3.4 of the EIS. In relation to the infrastructure corridor and Wudinna long-term employee village the survey team did not report any sites, objects or remains of significance, however Iron Road acknowledges that sites/objects/remains may be identified during construction, operation or closure and management and control strategies will be implemented as required under the *Aboriginal Heritage Act 1988.*

The Port site survey reported the presence of a number of sites mostly scattered artefacts, no sites including fish traps were discovered in the location of the jetty, there is also quite a bit of post settlement disturbance which would reduce the likelihood of finding undisturbed Aboriginal heritage and cultural material.

The proponent has provided a thorough assessment of the proposal in terms of impacts on Aboriginal Heritage items/materials/remains and have provided a response to issues of concern requested by the Barngarla (Table 19-1) and control and management strategies (Table 19-3).

The DSD – AAR had no additional concerns in the Response Document and the commitments provided in the EIS are acceptable. All commitments in the EIS are reflected in any conditions of approval if this proposal gains development authorisation.

A culturally important Aboriginal Heritage site was identified by the Barngarla Aboriginal Corporation and DEWNR which is a 'spring fed creek' to the south of the port site and avoiding any impacts on this site should be incorporated into the CEMP and OEMP.

6.2.2.4 Non – Aboriginal Heritage

A summary of the Non-Aboriginal Heritage impacts of the proposed development are provided in Chapter 20 of the EIS and a list of places of heritage significance (for the corridor) is provided in Table 20-1 and Table 20-2 (for the Wudinna employee village).

No listed non- aboriginal heritage items were located within the footprint of the CEIP infrastructure, although 17 were identified within 5km. Due to this fact the risks associated with non-aboriginal heritage are considered by the proponent (and supported by this assessment) to be low and therefore acceptable.

The proponent will need to comply with the requirements of the relevant legislation outlined in Section 20.1 of the EIS.

There are no listed Shipwrecks on the DEWNR data base for the area near Port Neill, however if any wrecks are found during construction it must be reported under the *Historic Shipwrecks Act 1981.*

7 Other Major Development assessment matters

7.1 The Governor as the relevant authority

Section 48(5) of the *Development Act 1993* requires that before the Governor considers a proposal that has been declared a Major Development, the Governor must have regard to (amongst other things) the provisions of the appropriate Development Plan and the Development Regulations, the Building Rules, the Planning Strategy, the Environment Protection Act 1993, and any other matters considered relevant.

In respect of applications being assessed as Major Developments under the Act, the appropriate Development Plan and Planning Strategy are those current at the time of the decision, as Section 53 of the Act does not apply to the Major Development provisions of the Act.

7.2 South Australian Strategic Plan

When making a decision, the Governor has regard to any other matters considered relevant to the proposal. In this regard, the assessment has also been carried out with reference to the State Strategic Plan. The State Strategic Plan (Government of South Australia 2011) seeks to widen opportunities for all South Australians through the pursuit of seven strategic priorities:

- Premium Food and Wine from our Clean Environment.
- Growing Advanced Manufacturing
- Realising the Benefits of the Mining Boom
- Creating a Vibrant City
- Safe Communities, Healthy Neighbourhoods
- Every Chance for Every Child
- An Affordable Place to Live

The relevant goals and targets include:

Goal – South Australia has a resilient, innovative economy.

Target 35 – Economic growth: exceed the national economic growth rate over the period to 2020.

Target 37 –Total exports: Increase the value of South Australia's export income to $25 billion by 2020

Target 41 – Minerals exploration: Exploration expenditure in South Australia to be maintained in excess of $200 million per annum until 2015

Target 42 – Minerals production and processing: Increase the value of minerals production and processing to $10 billion by 2020

Target 46 – Regional population levels: Increase regional populations, outside of Greater Adelaide, by 20 000 to 320 000 or more by 2020

Target 47 – Jobs: Increase employment by 2% each year from 2010 to 2016

Goal – South Australia's transport network enables efficient movement by industry and the community

Target 56 – Strategic infrastructure - Ensure that the provision of key economic and social infrastructure accommodates population growth

7.3 Planning Strategy

The Eyre and Western Region Plan (2012, a volume of the South Australian Planning Strategy) outlines the land use and development directions for the development area.

The Plan details the environmental assets in addition to the land use history and current land use arrangements.

A workshop with the local community and Council's for the region to considered strengths, weaknesses and opportunities. This resulted in four key themes to be which were used as the basis and structure for the Plan which are listed as follows:

- Environment and sustainability
    - Native vegetation and habitat management, protection of coastal waters, water security, renewable energy, adapting to climate change.
- Economic development
    - Diversification and protection of primary production land uses, support of new mining and energy developments, attracting and retaining a skilled workforce
- Population, settlements and culture
    - Support a diverse range of accommodation options, retaining and attracting young people and skilled personnel, encouraging a sense of place and cultural values, building employment services in key growth centres that can also serve rural and remote residents and businesses
- Infrastructure and services provision.
    - Maximising the use and adaptability of infrastructure, protecting land corridors for the expansion or augmentation of infrastructure, providing infrastructure to support development of mining

Generally, the proposal is appropriate when considering the Eyre and Western Region Plan – with a balance between the conserving and maintaining the natural environment, economic considerations such as job creation and provision of infrastructure.

The proposal responds to the policy through several design aspects – with the alignment of the infrastructure corridor respecting the existing conservation park while delivering services to the development. Creation of the corridor also provides separation from passenger vehicles and creates a controlled work site environment.

The proposal seeks to draw skilled workers to the area and subsequent local level spending for incidentals will support local retail and hospitality roles.

7.4 Development Plan Policy

The nature, scale and impacts of the proposed works are not able to be considered by the relevant Development Plans as they in their cumulative nature form a significant Major Project for the proponent. The guidelines that have been used in the assessment of these elements are the most appropriate method to evaluate, investigate and assess the proposal. This section of the Assessment Report considers the relevant Development Plans and whether the application satisfies the fine grain detail at the local level. The Governor is required to have regard for these policies as they have been formed on public consultation and the Development Plan Amendment process over time to reflect local views and land uses. Several Development Plans that span the Eyre Peninsula of South Australia and are relevant in the assessment of land use proposals for each Council area. These Development Plans, the relevant objectives (OBJ) and principals of development control (PDC) are outlined below.

Wudinna DC Development Plan - Primary Production Zone

The subject development involves the proposed mine site, long term employee village and part of the infrastructure corridor.

An employee village is an expected land use in the general policy area of the Development Plan when in relation to primary production (PDC 7); whereas the mine site and infrastructure corridor are not. The desired character of the Primary Production Zone focuses on farming activities and associated community activities. The proposed works do not have a direct relationship with primary production (PDC 4). The intention of the general section is to support fulfilment of the Primary Production Zone with temporary workforces as required.

Transport corridors are also mentioned in the general section (PDC 1) to support the efficient provision of sustainable transport networks and encourage their use. PDC 3 states that corridors should be sited and designed in a manner that does not unreasonably interfere with the health and amenity of adjacent sensitive land uses. PDC 4 further indicates that roads should be sited and designed to blend with the landscape and have sympathy for the terrain.

The proposed haulage road fulfils PDCs 11 and 12, in separating heavy vehicles from passenger from passenger vehicle car parking areas and keeping the local roads free.

Kimba DC Development Plan - Primary Production Zone

Part of the infrastructure corridor is considered within the Kimba Development Plan with Hambidge Conservation Park forming a large parcel of land within the North West corner of the Development Plan – the alignment of the corridor has regard for this natural feature.

Again, the desired character for the Primary Production Zone states that protection of primary production from fragmentation of land and incompatible development is important to the area.

Orderly and Sustainable development is encouraged by the Development Plan through the General Section. Development should address undue effects on adjacent land (PDC7).

The proposal would expand the economic base of the region from primary production through orderly and economic development (PDC 3).

In considering the infrastructure corridor -Transport and Access in the General Section of the Development plan states that:

- Movement Systems (PDC 3) should be sited and designed so as to not reasonably interfere with the health and amenity of adjacent sensitive land uses.
- Roads should be sited and designed to blend with the landscape and be in sympathy with the terrain (PDC 4).
- Development at intersections, pedestrian and cycle crossings, and crossovers to allotments should maintain or enhance sightlines for motorists, cyclists and pedestrians to ensure safety for all road users and pedestrians (PDC 9).
- Hazards such as bushfire and flood should be considered with development located and designed to minimise threats to property and person (PDC 4, 5).

Cleve DC Development Plan - Primary Production Zone

The proposed infrastructure corridor and the Yadnarie Transmission Spur Line are sited within the Cleve Development Plan and the Primary Production Zone. The Zone states that primary production is considered the main land use of the area. The General Section – Hazards (PDC 3) states that development should be located to minimise threat to life and property by bushfires.

The Industrial Section of the council wide policies considers development should minimise the adverse impacts on adjacent uses.

The most relevant policy in this Development Plan relates to the Infrastructure Section of the council wide policies.

- *PDC 2 Development should only occur only where it provides, or has access to, relevant easements for the supply of infrastructure.*
- *PDC 8 Electricity infrastructure should be designed and located to minimise its visual and environmental impacts.*
- *PC 10 Utilities and services, including access roads and tracks, should be sited on areas already cleared of native vegetation. If this is not possible, their siting should cause minimal interference or disturbance to existing native vegetation and biodiversity.*

The orderly and sustainable development section of the council wide policies encourages orderly and compact development that doesn't interfere with adjacent land uses (OBJ 2, 3) which should also demonstrate how an undue effect would be addressed (PDC 7).

Access to the transmission line will be as close as possible to the existing Electranet infrastructure to avoid access restrictions to private property. The majority of the proposed infrastructure is to the West of Cleve and North of Rudall.

Tumby Bay Development Plan - Primary Production Zone, Coastal Conservation Zone

The infrastructure corridor and the Cape Hardy Port are situated within the Primary Production and Coastal Conservation Zones respectively.

Primary production is considered the main land use of the area although diversification is encouraged to support the local economy.

The proposal skirts to the west of Port Neill and continues south closer to the coastline and Cape Hardy as the end point. Both the Coastal Zone and council wide policy relating to coastal areas seek to retain features such as mangroves, wetlands and the like. Environmental Protection is prominent with PDCs 2-8 (council wide) outlining the approach to the interface of land and coastal waters.

The Zone encourages low-intensity recreational uses and development that contributes to the desired character.

Land Use in the Coastal Conservation Zone focuses on tourism which should be linked to essential public facilities such as minor public works.

Public access to the foreshore in the locality is encouraged by the Development Plan.

Hazards for the proposed locality are identified as general bushfire risk.

Land not within a council area coastal waters development plan - Coastal Waters

The proposed deep sea water port is located seven kilometres south of Port Neill to load capesize vessels within the Coastal Waters section of the Development Plan and map LNWCA(CW)/B.

The development plan spans the whole of South Australia's coastline. The Coastal Waters Zone encourages the conservation of the marine environment so that there are no negative impacts from development.

Generally, the objectives seek to encourage orderly and economic development through the safe and efficient movement of people and goods. This should be balanced with maintaining amenity of land and sea scapes, flora and fauna. Preservation of coastal areas is also encouraged with activities and uses to be appropriately sited in a Zone for that purpose. (Objectives 1, 4, 8, 13, 16, 20).

Objectives 21-26, 28, 30 detail the manner in which development and change of land use should occur on the interface between land, coast and sea. Pollution, erosion and damage or depletion of natural coastal processes are to be avoided with preservation of the high landscape and amenity value to allow for urban and tourist developments.

A tension remains between public access and private development of the coastal area within the Zone. Public access will not be available along the foreshore of the port area for security reasons; public access to Cowley's Beach will continue. (see photo below of Cowley's Beach)

Figure 16 - Supplied image 23.10 Iron Road EIS Chapter 23 page 23-16

Crown Lease Arrangements

Permission from Minister for Transport is required to negotiate a Crown Lease for use of the sea floor. A permit to undertake works is also required prior to that.

Ancillary issues

At some stage there will need to be an amendment to the redevelopment plans to accommodate and control ongoing development related to this proposal.

7.5 Environment Protection Act 1993

Based on the information provided, activities of environmental significance, as defined in Schedule 1 of the *Environment Protection Act 1993* (EP Act) have been identified, as detailed below.

- Bulk shipping Facilities: the conduct of facilities for bulk handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals to and from any wharf or wharf side facility (including sea-port grain terminals), being facilities handling or capable of handling these materials into or from vessels at a rate exceeding 100 tonnes per day.
- Rail Operations: the conduct of any of the following activities associated with a railway:
  (a) the construction or operation of railway infrastructure; and
  (b) the operation of rolling stock on a railway; and
  (c) other activities conducted on railway land.

- Concrete Batching Works: the conduct of works for the production of concrete or concrete products with a total capacity for production exceeding 0.5 cubic metres per production cycle (if required during construction).

The following activities may also require authorisation under the EP Act:

- Petroleum Production, Storage or Processing Works or Facilities: The conduct of works or facilities at which petroleum products are stored in tanks with a total storage capacity exceeding 2,000 cubic metres (if diesel is stored on-site).
- Chemical Storage and Warehousing Facilities: the storage or warehousing of chemicals or chemical products that are, or are to be, stored or kept in bulk or in containers having a capacity exceeding 200 litres at facilities with a total storage capacity exceeding 1,000 cubic metres (if chemicals are stored on site)

The Governor, before making a decision on the proposed development, should have regard to the objects of the Act, the general environmental duty and any relevant environment protection policies.

The objects of the Act are:

- *To promote the principles of ecologically sustainable development.*
- *To ensure that all reasonable and practicable measures are taken to protect, restore and enhance the quality of the environment having regard to the principles of ecologically sustainable development, and to prevent, reduce, minimise and, where practicable, eliminate harm to the environment.*

In addition, proper weight should be given to both long and short term economic, environmental, social and equity considerations in deciding all matters relating to environmental protection, restoration and enhancement. The Environment Protection Authority (EPA) is required to apply a precautionary approach to the assessment of risk of environmental harm and ensure that all aspects of environmental quality affected by pollution and waste are considered in decisions relating to the environment.
The following Environment Protection Policies are applicable:

- *Environment Protection (Water Quality) Policy 2015.*
- *Environment Protection (Air Quality) Policy 2016.*
- *Environment Protection (Noise) Policy 2007.*
- *Environment Protection (Waste to Resources) Policy 2010.*

7.6 Building Rules Consent

This AR does not include an assessment of the proposal against the provisions of the Building Rules under the *Development Act 1993*. If the Governor grants a development authorisation, further assessment of the proposed development against the Building Rules will be required. The proponent may choose to seek building rules consent from a private building rules certifier.

The Governor would require building rules to be approved as a condition rather than a reserve matter attached to the decision notification. This would occur *after* a private certifier has assessed and certified that any 'building work' under the Act, complies with the Building Rules (and has supplied this information to the Minister, as required by Regulation 64 of the *Development Regulations 2008*). The Building Rules certification must of course be consistent with the development authorisation.

The following structures (as examples) would need Building Rules Consent (and Certificate of Occupancy) to be obtained, prior to the commencement of operations on the site.

- Jetty/wharf structure (including ship berthing, tug berth and ship loader)
- Conveyors and associated structures

- Workers accommodation(s)
- Port buildings
- Infrastructure buildings
- Any other structures

In addition, several components of the development (including signage, stormwater management, monitoring programs and operational protocols) would be required to meet the relevant Australian Standards, EPA Guidelines/Codes and other relevant engineering standards.

7.7 Harbors and Navigation Act

The *Harbors and Navigation Act 1993* applies to coastal and inland waters of the State and has relevance for the proposal in regard to the provision of marine facilities and the management of shipping activities (especially navigation, safety and pollution control). The government agency responsible for administering the Act, DPTI has considerable experience in the design matters for port facilities and shipping activities and would be responsible for auditing certification processes for such structures on behalf of the Governor (or his delegate).

In addition, prior to the use of the Port Neill facility for shipping purposes, the Port would need to be defined under the *Harbors and Navigation Act 1993* as a harbor and port, and the proponent would be required to enter into a port operating agreement with the Minister for Transport and Infrastructure. The port may be a compulsory pilotage area.

The proponent would need to ensure satisfactory oil spill and firefighting facilities and contingencies are in place prior to operation of the port, having regard to the South Australian Marine Spill contingency Action Plan and the *Pollution of Waters by Oil and Noxious Substances Act 1987*. In addition, the proponent would need to comply with the MARPOL (Convention for the prevention of Pollution from Ships) requirements. Consultation with the EPA would need to be undertaken to address pollution and waste management requirements.

As foreign vessels would use the facility, then compliance would be required with the Australian Quarantine Inspection Service (AQIS) and Australian Customs Service.

The general design of the Port is considered to be consistent with these requirements, further consultation with the DPTI would need to be undertaken to address these aspects at the detailed design stage.

7.8 Native Vegetation Act

Under the Native Vegetation Regulations 2003 of the *Native Vegetation Act 1991* the proponent is exempt from the requirement to obtain approval for vegetation clearance if the proposal has been the subject of an EIS and the comments of the Native Vegetation Council (NVC) on the EIS are included in the relevant Assessment Report. The NVC has been formally consulted and its comments have been considered in the preparation of this report. No statutory approval for such clearance is required from the NVC, although suitable offset provisions for such clearance needs to be to the satisfaction of the NVC.

Under Regulation 5(1)(c) of the Native Vegetation Regulations, native vegetation may, subject to any other Act or law to the contrary, be cleared if –

(i) *the clearance is incidental to a proposed development to which Section 48 of the Development Act 1993 (the Major Development Process) applies; and*

(ii) an environmental impact Statement, public environmental report or development report; and an assessment report, relating to the development have been prepared under that Act; and

(iii) the Minister responsible for the administration of the Development Act 1993 referred the environmental impact statement, public environmental report or development report to the NVC for comment and report and-

(a) the Council provided comments which were included (wholly or substantially) in the relevant Assessment Report

(b) the Council failed to provide comments within 8 weeks after receiving the Minister's invitation for comment and report; and

(iv) the Governor has granted his or her consent to the proposed development under Section 48 of the Development Act 1993; and

(vi) the clearance is undertaken in accordance with a management plan that has been approved by the Council that results in a significant environmental benefit on the property where the development is being undertaken, or the owner of the land(or a person acting on his or her behalf) has, an application to the Council to proceed with clearing the vegetation in accordance with this provision, made a payment into the Fund of an account considered by the Council to be sufficient to achieve a significant environmental benefit in the manner contemplated by section 21 (6) of the Act.

The Act also includes within the definition of native vegetation, native plants growing 'in or under waters of the sea' includes 'any water that is subject to the ebb and flow of tide'.

Accordingly, if the Governor approves the development, the proponent will need to negotiate with the NVC a suitable form of compensation in the form of a Significant Environmental Benefit (SEB), prior to the clearance or modification of native vegetation in the development area. The proponent will need to seek direction from the NVC on how to achieve the required SEB.

7.9 Aboriginal Heritage Act 1988

The Aboriginal Affairs and Reconciliation (AAR) section of the Department of State Development which administers the *Aboriginal Heritage Act 1988*, require that in the event archaeological items are uncovered during earthmoving, it be contacted immediately. The proponent would need to ensure construction contractors are aware of this requirement.

The proponent would need to consult with appropriate representatives of any relevant Aboriginal Groups in regard to any known sites of significance in the area and any Native Title Claims over the sea bed and subjacent lands.

7.10 Natural Resources Management Act 2004

The *Natural Resources Management (NRM) Act 2004* seeks the sustainable and integrated management of the State's natural resources and makes provision for the protection of the State's natural resources.

The NRM act has a remit to facilitate integrated and sustainable natural resource management. The proponent would need to consult with the Eyre Peninsula NRM Board over arrangements to manage water and the land, which would need to be incorporated into the proposed construction and operational Environmental Management Plans.

7.11 Environment Protection and Biodiversity Conservation Act 1999

Iron Road referred the actions to be undertaken for the mining and infrastructure components of the CEIP to the Commonwealth Department of the Environment under the EPBC Act.

These referrals were published and public comment was invited ahead of the decision on whether the proposed actions would impact Matters of National Environmental Significance under the EPBC Act and be controlled or not.

The Commonwealth determined that the infrastructure referral was a 'controlled action' as a result of potential impacts on the Southern Right Whale and required assessment.

The bilateral agreement allows the South Australian Government to undertake the assessment of the actions controlled under the EPBC Act. The Commonwealth Minister for Environment or his delegate can then rely on this assessment in making his decision on whether to approve the action or not.

8 RESOURCES

http://economic.priorities.sa.gov.au/priorities/unlocking_our_resources,_energy_and_renewables#

South Australia's economic priority to unlock resources, energy and renewables provides several targets which the proposed works would contribute to achieving.

These targets include:

- Increase the value of our mineral and energy resources production from $7 billion (2013 baseline) to $10 billion per annum (by 2017), creating an additional 5,000 jobs.
- Increase private investment in mineral and energy resources exploration expenditure from $648 million in 2013/14 to $1 billion per annum in 2017.
- Attract a further 10 service companies with a significant presence in South Australia.
- Ensure $150 million of contracts are awarded through Industry Capability Network SA (ICNSA) to local suppliers for the minerals and energy sector over the next three years.

9 CONCLUSION

The proposal has addressed a number of issues pertaining to infrastructure, sea port development and accommodation requirements for the proposed short term and long term employees.

The assessment concludes that:

- the proposal aligns with State Strategic Directions and Economic Priorities
- the proposal supports the development of a new, large Iron Ore mine at Warramboo on the Eyre Peninsula
- the social, environmental and economic impacts of the proposal have been considered and are appropriate, pending the additional work which will form the requirements for the Construction Environment Management Plan and the Ongoing Environment Management Plan, both of which are subject to the satisfaction of the Minister for Planning
- the proposal creates significant employment for construction (3,000 jobs for mine and infrastructure, and 1985 ongoing positions).

The key risks for the development of the port would be management of the proposed stock pile or iron ore at the port, noise impacts of the rail operations and any air quality issues in relation to the movement of the ore onto the ships. The risks of there being adverse outcomes in relation to the operation of the port are considered low with the appropriate management regimes being implemented. The AR considers that the environmental, social and economic impacts from the sea port can be adequately addressed in the required management plans forming part of the conditions.

In relation to the infrastructure corridors it is clear that more discussions are required between the proponent and the relevant government agencies or landholders to determine the details to resolve the issues. Accordingly, the development and implementation of traffic management and control strategies in the Construction Environmental Management Plan and Operation Environmental Management Plan, to the satisfaction of DPTI, will be a condition of approval.

The AR concludes that the criteria utilised to determine the proposed railway alignment was robust and provides adequate justification that the alignment represents an economically, socially and environmentally viable option.

The AR also acknowledges that land ownership or right to access arrangements for all property within the proposed infrastructure corridor are still being negotiated.

The AR acknowledges that impact management plans (IMP's) are being prepared and must be finalised with affected landowners before construction of that portion of the railway can commence.

The AR recognises that an Indigenous Land Use Agreement has been negotiated with the Barngarla Aboriginal Corporation on behalf of the Barngarla people.

The development of a Fire management plan, including for the Hambidge WPA , to the satisfaction of the CFS and DEWNR, will be required as a condition of approval, if the development is approved.

The AR concludes that Iron Road Ltd has undertaken adequate measures to minimise vegetation disturbance, and any vegetation that is to be cleared will be subject to a significant environmental benefit (SEB) offset, as determined by the Native Vegetation Council. This will be a condition of approval.

The AR concludes that the potential impacts of the development of the Wudinna long term employee village are manageable and acceptable, subject to compliance with commitments made in the EIS, legislative requirements and recommended conditions.

The potential economic impacts for the State are expected to be positive; with subsequent investment in associated supporting industries expected as well as attraction of other mining opportunities.

The Assessment Report concludes that the proposal is worthy of the Governor's Authorisation subject to condition and set out in the next part of this Assessment Report. Consistent with approvals for other Major Developments, with two years to commence and a maximum five year period for material completion of the development.

10 RECOMMENDATIONS & CONDITIONS

Should the Governor grant a development authorisation, the approval should be based on the following requirements:

CONDITIONS OF DEVELOPMENT AUTHORISATION

General

1. Except where minor amendments may be required by other legislation or by conditions imposed herein (for the avoidance of doubt in the event of any consistency between the plans and documents and the conditions of approval, the conditions shall prevail), and subject to paragraph 2 of these conditions, the proposed major development shall be undertaken in accordance with the plans and documents identified in the table below.

Plan Description	ID	Date	Author
CEIP Environmental Impact Statement 2015 (Main Report Volumes 1 and 2 and Appendices)		5 November 2015	Iron Road Limited
CEIP EIS Response Document (Supplementary EIS)		October 2016	Iron Road Limited

2. In the event of any inconsistency between the documents referred to in condition 1, the most recent document shall prevail to the extent of the inconsistency subject to any amendments required by the conditions of this approval.

3. For the purposes of section 48 (11)(b) of the *Development Act 1993*, the proponent shall commence the development by substantial work on the port facility, substantial work shall be taken to mean the completion of the land forming for the jetty and tug harbour as well as completion of the jetty deck within 2 years of the date of this authorisation, failing which the authorisation may be cancelled.

4. The proponent shall have materially completed the development within 5 years of the date of this authorisation, failing which an extension might be sought from the Minister or the authorisation may be cancelled.

5. That except where minor amendments may be required by other relevant Acts, or by conditions imposed by this authorisation, the proposed Major Development for the Central Eyre Iron Project (CEIP) must be carried out in accordance with the plans and details submitted as part of the Major Development Application, and where provided, in accordance with the conditions imposed by this authorisation and the details and plans submitted in accordance with those conditions.

Prior to the Commencement of Construction Works

6. Construction of building works requiring Building Rules Consent shall not commence until a copy of the Building Rules consent is provided to the Minister for Planning. Compliance with the Building rules in relation to all aspects of the proposed Major Development relating to the building Rules [SEE NOTES 1 & 2 in the ADVISORY NOTES BELOW].

7. Final design details (including site plans, floor plans, elevations, cross-sections, perspectives, details of cut and fill, finishes and colours, any on–site landscaping and car parking configuration) shall be prepared to the reasonable satisfaction of the Minister for Planning for the following items:
   (a) Railway line;
   (b) The jetty structure and associated loading facilities;
   (c) Permanent warehouse facility;
   (d) Permanent fuel and chemical storage tanks;
   (e) Long-term employee village at Wudinna and construction camp at Cape Hardy(refer Notes to Proponent);
   (f) All administrative and other buildings.

8. A Social Management Plan (SMP) shall be prepared at the proponent's cost in consultation with relevant Councils and Government agencies and a copy of the final plan provided to the Minister for Planning prior to the commencement of construction works. The Social Management Plan shall outline proposed measures in relation to (at a minimum) the following matters:

   (a) monitoring or rentals rates, rental availability and housing stress in Wudinna and Port Neil/Tumby Bay
   (b) opportunities for local industry participation and employment
   (c) opportunities for indigenous employment and involvement
   (d) incorporation of all strategies, initiatives and commitments described in Chapter 22 of the Environmental Impact Statement.
   (e) means by which ongoing feedback to and from the community is to be maintained and enhanced.
   (f) a process for reviewing and updating the Social Management Plan on a regular basis.

9. The Social Management Plan shall remain in operation throughout all stages of the project, including construction and operation.

10. A suitably qualified independent expert shall undertake an improvement review of the SMP annually and make their findings publically available.

11. Detailed engineering designs for the jetty, associated structures and all other structures sought to be constructed on or over land owned by the crown shall be prepared and independently certified by a registered engineer, to the satisfaction of the Department for Planning Transport and Infrastructure (DPTI). A certificate as to the structural soundness of each proposed structure shall be submitted to DPTI prior to the commencement of construction of the relevant structure.

12. A Southern Right Whale Management and Monitoring Plan, prepared in consultation with the Spencer Gulf Ecosystem and Development Initiative (SGEDI). The Plan should outline appropriate methodology to monitor both whale habitat use and behaviour using appropriate survey techniques during construction, operation and decommissioning of the Port (refer to Advisory Note 5 below).

13. A Construction Environmental Management Plan (CEMP), prepared in consultation with the Environment Protection Authority, the Country Fire Service, Department of Environment, Water and Natural Resources (as required) and relevant Councils, and in accordance with the EPA guideline 'Construction environmental management plans' 2016 (see http://www.epa.sa.gov.au/business_and_industry/environmental_planning/position-statements-and-guidelines).

14. Preliminary site investigation (PSI), in accordance with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* for the sites of the short term workers accommodation at Cape Hardy and long term employee village at Wudinna to identify potential sources of contamination within these sites. The PSI is to be completed prior to the Construction Environment Management Plan and the PSI results used to inform the Construction Environment Management Plan development.

15. The CEMP shall cover the pre-construction and construction phases of the proposed Major Development and incorporate measures to manage and monitor (at a minimum) the following matters:
    a. traffic management, (including for construction materials), road maintenance and rail crossing management strategies
    b. in respect of the rail corridor, a plan which identifies the proposed impact on school bus routes including a demonstration of consultation with the appropriate schools and relevant councils
    c. air quality, dust and sediment control
    d. surface and groundwater management
    e. stormwater management strategy
    f. the assessment and remediation of known or suspected site contamination – in accordance with the National Environment Protection Measure
    g. waste management (for all waste streams) and overall site clean-up (including litter)
    h. use of and storage of chemicals, oil, construction-related hazardous substances and other materials that have the potential to contaminate stormwater, groundwater or the marine environment (including emergency responses).
    i. vibration management and noise emissions (including ongoing noise monitoring to ascertain the effectiveness of noise control measures) and periods and hours of construction and operation which demonstrates compliance with the requirements of the *Environment Protection (Noise) Policy 2007*
    j. Aboriginal heritage requirements in accordance with the *Aboriginal Heritage Act 1988*
    k. vegetation clearance (including SEB offset and a Native Vegetation Management Plan developed in consultation with the Native Vegetation Council)
    l. introduced plants and animals (including weeds and pests) management and control strategies
    m. impacts on the marine environment (especially noise and turbidity)
    n. climate change impacts
    o. visual impacts (including lighting)
    p. effect on existing infrastructure
    q. emergency management, including fire

r. impacts on marine mammals, in particular the Southern Right Whale, to the satisfaction of the Commonwealth Minister for the Environment and Energy, (refer to Notes to the proponent)

s. community complaints regarding the above matters by way of a community complaints register (refer to Notes to Proponent below).

16. The Construction Environment Management Plan shall be actively monitored to ensure compliance with predicted impacts and shall be formally reviewed annually by the proponent and a copy of that review provided to the Minister for Planning until the construction phase is complete.

17. The final design and layout of the long-term employee village, including the provision for all required infrastructure, shall be to the satisfaction of the Wudinna District Council and shall in the selection of the design/colour/materials/landscaping and open space provision in the long-term employee village at Wudinna address the following:

    a) incorporate landscaping at all road frontages and amongst the various structures within the village to soften the overall visual impact
    b) develop the village as a logical extension to the Wudinna Township utilising consistent colours, materials, landscaping and street layout within a compact urban form.
    c) Undertake the establishment of the village in accordance with the objectives and principles of development control for temporary/transient populations (e.g tourist accommodation) as outlined in the Wudinna District Council Development Plan.

18. A plan for the infrastructure corridors, shall be prepared and provided to the Minister for Planning which:

    a) identifies the final surveyed alignment for the infrastructure corridor(s), and
    b) ensures legal access is provided to all land parcels (as required under the *Real Property Act 1886)*

19. Prior to the commencement of construction works for the road and rail components of the development the proponent shall:

    a) undertake a review of all proposed rail crossings to determine the appropriate treatment in accordance with the requirements of the *South Australian Government Railways Crossing Policy 2015* for each crossing along the proposed rail infrastructure corridor (whether existing or newly created by this development), and designs for the proposed treatment of rail crossing identified in the review as requiring treatment shall be prepared in consultation with and to the reasonable satisfaction of the Minister for Transport and Infrastructure;
    b) prepare Interface Agreements for execution with [Iron Road Limited or their agents and the Minister for Transport and Infrastructure];

c) fund the upgrade of any road or rail upgrade works, including but not limited to railway crossings, that are required as a direct consequence of this proposed major development;
d) provide to the Minister for Planning a copy of each Infrastructure Agreement, including Deeds of Agreement, entered into under the Highways Act 1926 for the provision of road and rail upgrades.

During Construction Works and Prior to Operation of the Development

20. All works shall be undertaken at the proponent's cost in accordance with the approved plans, drawings, specifications and other documentation provided in accordance with conditions 1-19 listed above.

21. All landscaping shown on the approved plans in respect of each component shall be substantially established prior to the operation of that component of the development and shall be maintained in good health and condition at all times.

22. Vegetation screening and landscaping of the long-term employee village and the Cape Hardy port facilities, where appropriate, shall be planted and established prior to operation commencing at each of those sites respectively and, when established, must be maintained in good health and condition at all times.

23. The entire length of the infrastructure corridor is to be fenced (refer to Note to Proponent).

24. All external lighting, including car parking areas and buildings, shall be designed and constructed to conform with Australian Standards and must be located, directed and shielded and of such limited intensity that no unreasonable nuisance or loss of amenity is caused to any person beyond the boundary of the site.

25. Council, utility or state-agency maintained infrastructure (i.e. roads, kerbs, drains, crossovers, footpaths etc.) that is demolished, altered, removed or damaged during the construction of the development shall be reinstated to Council, utility or state agency specifications as applicable. All costs associated with these works shall be met by the proponent.

26. All vehicle car parks, driveways and vehicle entry and manoeuvring areas shall be designed and constructed in accordance with the relevant Australian Standards and be constructed, drained and paved with bitumen, concrete or paving bricks (or other such material as agreed to by the Minister for Planning), in accordance with sound engineering practice and appropriately line marked.

27. All loading and unloading, parking and manoeuvring areas shall be designed and constructed to ensure that all vehicles can safely traffic the site and enter and exit the subject land in a forward direction.

28. All stormwater design and construction shall be in accordance with Australian Standards and recognised engineering best practice to ensure that stormwater does not adversely affect any adjoining property or public road.

29. All liquids or chemical substances that have the ability to cause environmental harm if discharged into the environment shall be stored within a bunded compound that has a capacity

of at least 120% of the volume of the largest container, in accordance with the EPA 'Bunding and Spill Management Guidelines' (2007).

30. The proponent shall provide satisfactory oil spill and firefighting facilities and ensure that contingencies are in place prior to operation of the port, having regard to the South Australian Marine spill contingency action Plan and the Pollution of Waters by Oil and Noxious Substances Act 1987.

31. In consultation with and to the satisfaction of the Environment Protection Authority, the Country Fire Service, Aboriginal Affairs and Reconciliation (within the Department of Premier and Cabinet) and relevant Councils an Operational Environmental Management (OEMP) shall be prepared by the proponent. The OEMP must incorporate measures to manage and monitor (at a minimum) the following matters:
    a) vibration and operational noise management (such as from machinery noise), to ensure compliance with the Environment Protection (Noise) Policy 2007
    b) air quality management dust and sediment control
    c) site contamination
    d) surface, stormwater and groundwater management, including ongoing validation of model predictions and Water Sensitive Urban Design (where appropriate).
    e) waste management (for all waste streams) and overall site clean-up (including litter)
    f) fire and emergency management
    g) Aboriginal Heritage requirements in accordance with the *Aboriginal Heritage Act 1988*
    h) chemical, oil, hazardous substances and fuel use and storage (including management/emergency response plans)
    i) safe shipping activities and navigation
    j) impacts on the terrestrial, coastal and marine environment, including sand accretion and deposition, coastal hazards, pest plants and animal species, impacts on sea grass and marine flora
    k) climate change impacts
    l) Southern Right Whale and other marine mammal management and monitoring (including monitoring of whale strike).
    m) visual impacts (including lighting)
    n) revegetation and landscaping (including environmental rehabilitation)
    o) traffic management/road maintenance and rail operations, including access (by way of traffic management/road maintenance and rail operations strategies)
    p) In respect of the rail corridor a plan which identifies the proposed impact on school bus routes including a demonstration of consultation with the appropriate schools and relevant councils
    q) public safety
    r) impacts on adjacent land users
    s) community complaints regarding the above matters by way of a community complaints register (refer to Notes to Proponent below)

32. The Operational Environmental Management Plan shall be actively monitored by the relevant authorities (as listed in condition 31 above) to ensure compliance with predicted impacts and be reviewed at regular intervals, and updated as necessary, in particular when a significant change in project scope or performance is detected.

33. Each of the relevant councils shall be given seven days' notice, prior to the commencement of works within their council area, and be provided with the name and contact details for the person responsible for coordinating site works within their council area that are covered by this

approval.

34. Unless otherwise permitted, all over-dimensional vehicles operating between Cape Hardy and the mine site shall utilise the haul road contained within the infrastructure corridor, not public roads.

During Operation of the Development

35. Operations on the sites shall be undertaken in accordance with all plans and details submitted as part of the Major Development Application, and where provided (and endorsed by the Minister for Planning where required) in accordance with conditions 20-34 as listed above.

36. The development and the sites shall be maintained in a serviceable condition and operated in an orderly and tidy manner at all times.

37. The proponent will be responsible for the maintenance and repair of the fence along the infrastructure corridor, unless otherwise agreed to in Individual Management Plans as negotiated with individual landowners.

38. A rehabilitation or decommissioning plan shall be developed to the satisfaction of the Minister for Planning, in consultation with the relevant councils, stakeholders and Government Agencies. The Plan should be prepared at, or before, the 20 year anniversary of operation or at any time should operations cease, and include information related to:
    a) identifying assets to be rehabilitated, remediated, decommissioned and/or removed, along with those that are proposed to be retained and the proposed tenure and management arrangements;
    b) confirming responsibility for costs associated with rehabilitating, remediating, decommissioning and/or removing and retaining assets;
    c) handover arrangements for useable assets;
    d) responsibility for future management and maintenance of useable assets.
    e) Measures, if required, to remove fuel and chemical storage and wastewater treatment facilities in accordance with relevant legislation and standards.
39. Unless otherwise specifically provided for in these conditions or otherwise agreed in writing, all costs necessary for compliance with these conditions shall be met by the proponent.

Advisory Notes

1. Pursuant to Development Regulation 64, the proponent is advised that the Wudinna DC or the DC of Tumby Bay or private certifier conducting a Building Rules assessment must-
    (a) provide to the Minister a certification in the form set out in Schedule 12A of the Development Regulations 2008 in relation to the building works in question; and
    (b) to the extent that may be relevant and appropriate-
        (i) issue a Schedule of Essential Safety Provisions under Division 4 of Part 12; and
        (ii) assign a classification of the building under these regulations; and
        (iii) ensure that the appropriate levy has been paid under the *Construction Industry Training Fund 1993*.

Regulation 64 of the Development Regulations 2008 provides further information about the type and quantity of all Building Rules certification documentation for Major Developments required for referral to the Minister for Planning.

2. Construction of each component of the development may commence only after a Building Rules

assessment and certification has been undertaken in relation to that component and issued by the relevant Council or private certifier, in accordance with the provisions of the *Development Act 1993*, and the Minister for Planning has received a copy of the relevant certification documentation, as outlined in Regulation 64 of the *Development Regulations 2008* (see condition 6 of this approval).

3. The proponent's Construction Environment Management Plan and Operational Environmental Management Plan should be prepared taking into consideration, and with explicit reference to;

a) Relevant *Environment Protection Act 1993* policies and guidance documents, including, but not limited to: the *Environment Protection (Air Quality) Policy 2016*, the *Environment Protection (Noise) Policy 2007* the *Environment Protection (Water Quality) Policy 2015,* the Environment Protection Authority *Code of Practice for Materials Handling on Wharves 2007,* Environment Protection Authority *Bunding and Spill Management Guidelines 2012,* Environment Protection Authority Handbooks for Pollution Avoidance and the Environment Protection Authority Stormwater Pollution Prevention Codes of Practice, in addition other legislative requirements and Guidelines/ Australian Standards requiring compliance.

b) Address the impacts on the Southern Right Whale through the implementation of a Southern Right Whale Management and Monitoring Plan, prepared in consultation with the Australian Government Department of the Environment and Energy.

c) Inclusion of a Fire and Emergency Management Strategy that outlines the proposed fire and emergency management procedures, prepared in consultation with the Country Fire Service.

4. The following activities in relation to the components of the development herby approved and/or requiring future approval will require licences under the *Environment Protection Act 1993.*

a) bulk shipping facility: the conduct of facilities for bulk handling of agricultural crop products, rock, ores, minerals, petroleum products or chemicals to and from any any wharf or wharf side facility (including sea-port grain terminals) being facilities handling or capable of handling these materials into or from vessels at a rate exceeding 100 tonnes per day (triggers 7(1) of Schedule 1, *Environment Protection Act 1993)*

b) petroleum Production, Storage or Processing Works or Facilities: The conduct of works or facilities at which petroleum products are stored in tanks with a total storage capacity exceeding 2,000 cubic metres (triggers 1(5)(a) Petroleum Storage of Schedule 1, *Environment Protection Act 1993*)

c) concrete batching exceeding .5 cubic metres per production cycle. (triggers 2(5) of Schedule 1, Environment Protection Act 1993)

d) railway construction activity (triggers 7(2) of Schedule 1, *Environment Protection Act 1993.*

e) fuel burning (if Power generation triggers 5MW)(triggers 8(2)(a) of Schedule 1, *Environment Protection Act 1993*)

f) chemical storage and warehousing facilities (triggers 1(1) of Schedule 1, *Environment Protection Act 1993).*

5. The Commonwealth Department of Environment and Energy has advised that it will require a Southern Right Whale Management and Monitoring Plan shall include the following:

a) A description of all threats to the Southern Right Whale arising from port construction, operation and decommissioning activities (including appropriate mapping).

b) A plan to monitor whale habitat use and behaviour, using appropriate survey techniques for mapping potential threats to whales arising from Port construction and operation activities.

c) Mitigation measures to manage the impact of Port construction and operation (including shipping), especially underwater noise caused by the Port and vessels and the risk of vessel strike.
d) Consideration and management of cumulative impacts arising from Port construction and operational activities.
e) Management of noise impacts, such that underwater noise does not exceed 183 dB re 1µPa2.s. The Plan should identify all sources of underwater noise that would be produced and measures to minimise these.
f) During construction, marine piling and blasting activities should minimise the risk of physical impacts, including temporary threshold shift to whales (i.e. reversible hearing loss). These must include:
   Pre-start up visual observations

   - Visual observations for whales undertaken to the extent of the marine piling/blasting observation zone (i.e. up to 1,500 metres) by a suitably trained crew member for at least 30 minutes before the commencement of marine piling/blasting.

   Operating procedures

   - Visual observations of the observation zone.
   - Exclusion zones must be implemented so as to ensure that whales are not exposed to Sound Exposure Levels (SEL) of greater than or equal to 183 dB re 1µPa2.s and be no less than a 1250 metre horizontal radius for whales, unless a lesser exclusion zone has been determined from noise monitoring of piling or blasting and has a SEL equal to or below 183 dB re 1µPa2.s.
   - If whales are sighted within the relevant exclusion zone, action to cease all piling/blasting within the relevant exclusion zone should be taken within two minutes of the sighting or as soon as possible if it is unsafe to cease piling/blasting within two minutes. If piling/blasting does not cease within two minutes the person undertaking the action must report the incident to the Commonwealth Minister for the Environment and Energy in writing within one business day.
   - Piling/blasting activities must not recommence until any whales that were observed in the exclusion zone are observed to move outside the exclusion zone or 30 minutes have passed since the last sighting.
   - Soft start procedures: Piling activities must be initiated at the soft start level and then build up to full operating impact force. The soft start procedures should only commence if no whales have been sighted in the exclusion zone during pre-start-up visual observations.
   - No marine piling operations should occur between the hours of sunset and sunrise during the peak southern migration of mother and calf whale pods (defined as April to November in any year).
   - Marine piling commenced prior to sunset or prior to a period of low visibility (i.e. inability to see for a distance of 500 metres or more due to fog, rain, sea spray or smoke) can continue between the hours of sunset and sunrise, unless marine pile driving is suspended for more than 15 minutes.
   - Post blast inspection procedures for any injured whales, including management of injured whales.

- Reporting within one business day to the Federal Minister for the Environment and Energy when injury, or mortality of, a whale occurs.
- Contingency measures should blasting result in injury to, or mortality of, fauna.
- Measures that prohibit night time blasting during the peak migration of Southern Right Whales.

Monitoring shall be undertaken by a suitably qualified Marine Fauna Observer who is trained in the identification of key marine species/fauna behaviour and communication procedures

6. To complement the plan, an oil spill Contingency Plan shall also be prepared and implemented that addresses the strategies to address any potential impacts on whales.

7. All works and activities must be undertaken in accordance with the General Environmental Duty as defined in Part 4, section 25(1) of the Environment Protection Act 1993 (which requires that a person must not undertake any activity, which pollutes, or may pollute the environment; without taking all reasonable and practical measures to prevent or minimise harm to the environment), relevant Environment Protection Policies made under Part 5 of the Environment Protection Act 1993, the Australian and New Zealand Environment Conservation Council (ANZECC) Best Practice Guidelines for Waste Reception Facilities at Ports, Marinas and Boat Harbours in Australia and New Zealand and other relevant publications and guidelines.
8. Well construction permits will be required for all wells installed as a part of the project pursuant to the *Natural Resources Management Act 2004*.
9. Pursuant to the *Harbors and Navigation Act 1993,* the proponent will need to enter into a licnce agreement with the Minister for Transport and Infrastructure over adjacent land on terms acceptable to the Minister prior to the commencement of construction. Such agreement will require completion of works to the satisfaction of the Minister, at which time the responsibility and control of the area will be transferred so as to minimise the Minister's ongoing responsibilities. Under the *Harbors and Navigation Act 1993*, the proponent would also need to apply to the Minister for Transport and Infrastructure to have the harbor defined (and gazetted) as a 'Port' including a Port Operating Agreement being negotiated between the port operator and the Minister. It is likely that the proponent will be subject to the *Maritime Services (Access) Act 2000* allowing for third party access.
10. Prior to the use of the facility for shipping purposes, the Port will be required to be defined under the *Harbors and Navigation Act 1993* as a harbor and port, and that the proponent (or port operator) will be required to enter into a port operating agreement with the Minister for Transport and Infrastructure, prior to commencement of operations at the new terminal (as a requirement for quarantine procedures by the Department of Primary Industries and Regions South Australia).
11. The proponent is advised that appropriate navigational aids will be required to be erected in appropriate locations, or existing navigation marks may need to be re-located, in consultation with the Department of Planning, Transport and Infrastructure, prior to commencement of operations at the new terminal (as required under the *Harbors and Navigation Act 1993*).
12. The proponent is advised that in order to ensure the safe navigation and efficient traffic management between ships calling at the port of Cape Hardy and the new bulk terminal, an approved Vessel Tracking System (VTS) will be required to be put in place by the proponent prior to commencement of operations at the new terminal (as a requirement for quarantine procedures by the Department of Primary Industries and Regions South Australia.
13. In accordance with the *National Heavy Vehicle Law (South Australia) Act 2013,* the proponent will need to apply to the National Heavy Vehicle regulator for the use of Restricted Access Vehicles on public roads, where access for such vehicles is currently not available. This might include such

things as construction equipment and vehicles carrying large indivisible construction materials. This might also include access for vehicles such as Road Trains or Performance Based Standards (PBS) vehicles to transport commodities to and from the Port as part of regular operations.

14. An important initial step, as outlined in the Heavy Vehicle Access Framework, is to have an assessment of the route undertaken by an Authorised Route Assessor, at the proponent's cost. This process will identify any upgrades required to make the route safe and suitable for the type of vehicle access requested. As part of the approval/s, the proponent will be required to prepare a list of final transport infrastructure improvement needs upon completion of a full route assessment. If this is necessary, the list should identify the scope, timing and estimated cost of the required improvements.
15. The proponent is reminded of its obligation under the *Aboriginal Heritage Act 1988* whereby any 'clearance' work, which may require permission to disturb, damage or destroy Aboriginal Sites, must be undertaken with the full authorisation of the Minister for Aboriginal Affairs and Reconciliation, according to section 23 of the *Aboriginal Heritage Act 1988.*
16. The proponent, and all agents, employees and contractors, such as construction crews, is reminded of the need to be conversant with the provisions of the *Aboriginal Heritage Act 1988,* particularly the requirement to immediately contact the Department of Aboriginal Affairs and Reconciliation in the event that archaeological items (particularly skeletal material) are uncovered during earthmoving.
17. The proponent is reminded of its obligations under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*, not to undertake any activity that could have a significant effect on any matter of National Environmental Significance without the approval of the Federal Minister for Environment and Energy.
18. As foreign vessels are allowed into port the proponent will need to consult with the Department of Planning, Transport and Infrastructure (Marine Operations) to address any requirements of the Australian Quarantine Inspection Service (AQIS) and Australian Customs Service.
19. The wastewater treatment system shall be designed by the proponent to ensure that the general obligations of the *Environment Protection (Water Quality) Policy 2016* are met, and to ensure that effluent does not overflow or escape from drains, pipes, sumps, tanks, storage treatment and disposal system, except where the effluent complies with criteria in the above policy.
20. Approval for upgrading the electricity network capacity will be undertaken separately by ElectraNet. This is expected to include liaison with land holders to gain access to land for construction, operation and maintenance of the Yadnarie to Rail corridor.
21. The proponent is advised that it will be required to establish a Community complaints register under the *Mining Act 1971* and this should include appropriate contacts for the proponent and a record of complaints which can be retained and audited.
22. The rail line will be subject to the *Railways (Operation and Access) Act 1997.*
23. The following information will be required to be submitted for assessment and approval by the Minister for Transport and Infrastructure, prior to the commencement of construction works for each relevant component.
24, Should the proponent wish to vary the Major Development or any of the components of the Major Development, an application to the Minister for Planning must be submitted, provided that the development application variation remains within the ambit of the Environmental Impact Statement and Assessment Report referred to in this development authorisation. If an application variation involves substantial changes to the proposal, pursuant to section 47 of the *Development Act 1993,* the proponent may be required to prepare an amended Environmental Impact Statement for public inspection and purchase. An amended Assessment Report may also be required to assess any new issues not covered by the original Assessment Report and a decision made by the Governor pursuant to section 48 of the *Development Act 1993.*
25. The Minister has a specific power to require testing, monitoring and auditing under section 48C of the *Development Act 1993.*

10 Acronyms and glossary

The Act	*Development Act 1993* and Regulations 2008
ABS	Australian Bureau of Statistics
AHD	Australian Height Datum
AR	Assessment Report
CEMMP	Construction Environment Management and Monitoring Plan
CEMP	Construction Environmental Management Plan
DAC	Development Assessment Commission
DEWNR	Department of Water, Environment & Natural Resources
DIDO	Drive in Drive out
DPTI	Department of Planning, Transport & Infrastructure
DR	Development Report
DSD	Department of State Development
EMP	Environmental Management Plan
EPA	Environment Protection Authority
EPBC Act	Environment Protection and Biodiversity Conservation Act 1999
EPP	Environment Protection authority
FIFO	Fly in Fly out
LDC	Long Distance Commute
MOF	Module Offloading Facility
PDC	Principle of Development Control
Sensitive receivers	include locations where people live or work that may be affected by noise due to the proposed development. This includes dwellings, schools, hospitals, business premises or public recreational areas. Sensitive receivers may include derelict or uninhabitable dwellings or buildings as the site may have existing user rights which would allow redevelopment
TEPS	Threatened, endangered or protected species.

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Appendix A

Provided by Iron Road Limited

HIGH LEVEL COMMITMENTS – ENVIRONMENTAL IMPACT STATEMENT

CHAPTER/RESPONSE DOCUMENT REF.	COMMITMENT
Response Document – Attachment B, DPTI Issues #2, #4 and #5.	• Work with DPTI in a constructive and efficient manner to determine the appropriate treatment for each and every crossing to be impacted by the CEIP, acknowledging the principles and intent of the Government's *Railway Crossing Policy* dated September 2015 is to minimise risk to all road and rail users. • The outcome of the review of the crossings may include grade-separated crossings, at-grade crossings that meet Australian Standards or at-grade crossings that have been further enhanced including boom gates. This review will lead to formalised Interface Agreements with the appropriate parties prior to construction. • Fund the upgrade of any crossings that are required as a direct result of Iron Road's activities and which have been formalised in the Interface Agreements.
Response Document – Attachment B, DPTI Issue #9 and #11.	• Iron Road to establish relevant agreements with DPTI relating to a proposed change in the Modular Access Route (MAR), away from public roads and along the infrastructure corridor via an upgraded service road in order to alleviate upgrades to numerous intersections across the Eyre Peninsula.
Chapter 4.6.2 – Project Description Response Document	• Rail wagons will be covered.
Chapter 6 – Stakeholder Consultation and Engagement Executive Summary Response Document	• Continue to work with communities and stakeholders throughout every phase of the CEIP and building on Iron Road's extensive network of relationships gained over many years of consultation • Engage independent professionals to undertake regular reviews of the company's effectiveness in consulting and communicating with stakeholders to ensure continual improvement.
Chapter 10 - Air Quality (Table 10-15) Response Document	• Ensure compliance with air quality criteria by: o the regular use of water sprays or suitable chemical wetting agents on susceptible earthen material loads, active earthen stockpiles; unpaved roads or other exposed areas; o locating earthen stockpiles as far from sensitive receivers as practicable; o implementing a dust monitoring programme. • Should visible air quality impacts be clearly observed, reduce or cease relevant work activities to stop the impacts and implement alternative work methods prior to recommencing activities. • Maintain the complaints and ideas hotline (as referred to in Chapter 22). • Maintain, inspect and verify requirements for dust control equipment and technology.

	• Maintain vehicles and rail wagons.
Chapter 11 – Climate Change and Greenhouse Gas (Table 11-3)	• Incorporate energy efficient design elements within the accommodation, administration and workshop facilities to reduce electricity demands (including the use of energy-efficient fixtures, fittings and appliances, and the use of passive solar design elements within the plant and accommodation facilities). • Consider small scale renewable options, where practicable, such as solar powered monitoring stations and solar power for site administration, accommodation and workshop facilities. • Investigate opportunities for the application of greenhouse emission offset programs under the Emissions Reduction Fund and associated Carbon Farming Initiative.
Chapter 12 – Noise and Vibration (Table 12-19) Executive Summary Response Document	• Railway line will be continuously welded so as to avoid the noise of the wheels impacting on rail joints. • No construction activities with noise impacts on amenity will occur on Sundays or public holidays without prior approval. • The rail loading and unloading facilities will be enclosed to protect equipment, control dust and minimise noise. • Noise impacts will be minimised by: o the use of modern locomotives which meet the Australian Standards for railway rolling stock and emit less noise than older locomotives; o shutting off or throttling down equipment when not in actual use; o fitting noise reduction devises on equipment such as mufflers; o regularly servicing equipment, vehicles, locomotives and rail wagons; o locating noisy equipment or processes in strategic areas to minimise their impact on nearby sensitive receivers. • Train schedules and potential noise impacts will be communicated widely to the local and regional community. • A monitoring programme will be developed in accordance with statutory requirements.
Chapter 13 – Terrestrial Flora and Fauna (Table 13-23)	• No clearance of native vegetation will commence until approval has been obtained from the Native Vegetation Council. • Native vegetation clearance will be offset via implementation of an appropriate Significant Environmental Benefit. • Vegetation will be retained on site wherever practicable and progressive rehabilitation of vegetation will occur as soon as practicable. • Periodic monitoring of the occurrence and extent of weed species, particularly following trigger events (e.g. seasonally after winter rains or following fire) and within areas adjacent or in close proximity to high value vegetation (e.g. Hambidge WPA). • Education regarding conservation significant flora and fauna to be given to all staff, their families and contractors.
Chapter 14 – Marine and Coastal Environment (Table 14-8) Executive Summary	• No dredging. • Covered conveyor system and telescopic ship-loader for concentrate transport from land to ship. • Develop and implement piling management procedures.

	• Develop and implement whale management procedures incorporating a description of all threats, a monitoring plan, and the identification and indication of noise sources in order to manage/mitigate noise impacts. • Develop and implement a Marine Mammal Notice to Mariners incorporating mandatory reporting of marine mammal sightings, mandated reductions of speed in shipping lanes during periods of peak marine mammal movements and response procedures should an entangled marine mammal be sighted, or a collision occur. • Develop and implement waste management measures to identify, separate and provide adequate waste disposal for all waste streams. • Shutdown and observation zone for marine mammals during jetty construction. • Restriction of vessel speed within the port by using tugs for manoeuvring the large ships. • Record sightings of protected marine species.
Chapter 15 – Surface Water (Table 15-2)	• Water sensitive urban design principles will be incorporated into the port and long-term employee village sites, including the collection of roof run-off in rainwater tanks for use on site.
Chapter 17 – Soil and Land Quality (Table 17-5)	• Develop an ASS management plan with respect to the infrastructure corridor on the principles of avoidance, minimisation of disturbance and treatment using a risk-based approach. • Develop and implement dune management procedures. • Develop and implement soil management procedures to manage soil compaction and loss of soil quantity.
Chapter 18 – Traffic and Transport (Table 18-12) Response Document	• Proposed road closures and alignments to be reviewed and confirmed in consultation with relevant District Councils. • Enter into appropriate management agreements with each relevant District Council relating to the upgrade of roads, including Iron Road's commitment to fund such upgrades. • Iron Road will be responsible for financial implications relating to any upgrade of DC roads and will enter into appropriate management agreements with each impacted DC in due course. • Liaise with local schools to discuss any impacts to bus routes due to road closures or traffic movements. • Develop a pavement monitoring, management and rehabilitation plan in consultation with DPTI. • Schedule slow moving heavy equipment outside of peak traffic periods and avoid potential conflict times identified during harvest. • Implement an incident reporting system for the management and implementation of traffic improvement measures.
Chapter 19 – Aboriginal Heritage and Native Title (Table 19-3) Executive Summary	• Develop and implement an Aboriginal heritage management protocol in accordance with the ILUA, including procedures to be followed in the event that Aboriginal heritage sites are uncovered during any phase of the CEIP. • Continue to develop a relationship with the Barngarla people and ensure that all operations are compliant with the terms and conditions of the ILUA, the Heritage Protocol and the heritage survey report.
Chapter 21 – Economic Environment (Table 21-14)	• Develop and implement a local employment policy to provide local and regional workers with priority access to employment opportunities through the CEIP.

Executive Summary Response Document	• Maximise employment and economic opportunities for local, regional, South Australian and Australian people and businesses by: o developing an Australian Industry Participation Plan; o working collaboratively with government, education and training providers and other relevant organisations to train and up skill local and regional people and to enhance business capacity among local and regional suppliers; o implementing a trainee and apprenticeship program; o working with business groups to identify and provide information on CEIP business opportunities including tendering and procurement processes and standards to facilitate the pre-qualification of local and regional businesses. • Prior to project completion, work with stakeholders, including future land users, to have a coordinated approach for parties to be able to access the infrastructure upon project completion.
Chapter 22 – Social Environment (Table 22-23) Executive Summary Response Document	• Encourage Iron Road's operational workforce to reside locally rather than on a long distance commute basis by developing policies and/or offering incentives. • Develop induction procedures and information for our workforce so that they understand the values and expectations of the local community. • Support the preparation of a Structure Plan at Wudinna, to be undertaken by the Wudinna DC, to integrate the long-term employee village within the existing township. • Work with the Wudinna DC and community members to develop strategies to strengthen social cohesion and social interactions between non-residents, incoming residents and existing residents. • Participate in local and State Government planning to provide for social services and facilities for the benefit of both existing and incoming residents and workers. • Work closely with Renewal SA, Wudinna DC and other district councils to monitor housing demand in order to manage prices. • Collaborate with key government agencies to plan for and support appropriate and sustainable services and amenities that benefit existing and incoming residents. • Develop flexible work practices to accommodate farm work as best as practicable, including peak agricultural periods such as harvesting, and other seasonal business activities. • Provide a family friendly work environment. • Provide a regular bus service to transport employees to work at the mine. • Operate a zero tolerance policy with regular drug and alcohol testing of all workers to ensure workplace safety. • Provide regular and timely information to local residents and communities about the CEIP and planned works to assist in reducing disruptions and the number of complaints. • Continue to operate a toll free phone hotline and a complaints register. • Work with impacted landowners openly and with consistency and respect. • Locate a temporary construction camp at the port site to minimise disruption to local communities.