STATE PLANNING COMMISSION

Assessment Requirements

ENVIRONMENTAL IMPACT STATEMENT

Northern Water Project
Cape Hardy, Eastern Eyre Peninsula, Upper Spencer Gulf and Far North of South Australia

Office of Northern Water Delivery

September 2024

NORTHERN WATER

Government of South Australia
Department for Housing and Urban Development

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1 Objective of the EIS

To assess the social, economic and environmental impacts for projects declared as impact assessed development (not being restricted development) requires the preparation of an Environmental Impact Statement (EIS).

The EIS process is the highest level of assessment under the *Planning, Development and Infrastructure Act 2016* (PDI Act) and enables the holistic consideration of projects that are considered to be of economic, social or environmental importance to South Australia.

The EIS process provides a comprehensive assessment of a development or project proposal and the expected effects on the receiving environment and within the broader context of its setting, which could relate to a local area, region, state or nation.

2 Description of Development

On 7 December 2023 Infrastructure SA, as an agency of the Crown, lodged a development application under Section 131 of the *Planning, Development and Infrastructure Act 2016* (the PDI Act) for the Northern Water Supply Project (Crown DA 23034957).

On 17 January 2024, pursuant to Section 131(25) of the PDI Act the Minister directed that the development becomes subject to the procedures under the PDI Act with respect to the preparation and consideration of an EIS. The direction notice appeared in the SA Government Gazette on 25 January 2024. The scope of the development is as defined in Crown DA 23034957.

On 8 March 2024 Infrastructure SA lodged a scoping application under Section 111(2)(d) of the PDI Act in accordance with the requirements of Practice Direction 17 – Impact Assessment Development (State Planning Commission).

On 1 July 2024 responsibility for the Northern Water Project was transferred from Infrastructure SA to the Office of Northern Water Delivery, attached to the Department for Infrastructure and Transport.

The Northern Water Project is a water supply infrastructure project which seeks to provide a new, sustainable source of water to the eastern Eyre Peninsula, Upper Spencer Gulf and Far North of South Australia. The project will support current and future growth in the region, and may reduce reliance on the River Murray, Great Artesian Basin and local groundwater sources.

The proposed development comprises a 260 megalitres per day (ML/day) desalination plant on eastern Eyre Peninsula at Cape Hardy, and more than 600km of water delivery pipeline extending north from the desalination plant to Olympic Dam passing Whyalla, Port Augusta, Woomera and Roxby Downs. Potential consumers of the water supply include hydrogen and mining projects, SA Water, Department of Defence, the manufacturing sector and the pastoral, agricultural and horticulture sectors.

A detailed description of the project, based on the engineering reference design, is provided below including construction and operational methodologies and estimated native vegetation clearance.

It is noted that adjustments to the project design are expected, subject to the outcomes of ongoing design and engineering, stakeholder engagement, technical studies and further assessment.

2.1 Engineering Reference Design

Desalination Plant Facility

- A seawater reverse osmosis desalination plant on the western shore of Spencer Gulf at Cape Hardy, approximately 30km north-east of Tumby Bay and 170km south-west of Whyalla.
- The desalination plant is a scalable facility with ultimate capacity of 260 ML/day comprising:
  - Water intake pipeline extending approx. 17m depth into the Spencer Gulf with associated intake pumps and screened intake heads (length of 1.1km; 650m of which is offshore).
  - Pre-treatment system, reverse osmosis plant, post-treatment system, water storage tanks and pumping to distribution network.
  - An outfall pipeline leading to three concentrated seawater diffusers at approximately 18m depth into the Spencer Gulf (length 1.4km; 930m of which is offshore).
- High voltage switchyard.
- Stormwater detention and bio retention basins.
- Administration buildings, workshops, parking, fencing, entry points, access roads, and security.

Water Pipelines

- A water supply pipeline network, with a main trunk of approximately 540km long connecting the desalination plant at Cape Hardy with the Olympic Dam mine site at Roxby Downs.
- Proposed offtake connections:
  - Approx. 58km lateral offtake to the Carrapateena mine (north of Port Augusta).
  - Approx. 13.1km lateral offtake to SA Water's Whyalla (north) water storage site.
  - SA Water storage at Lincoln Gap.
  - Hydrogen Jobs Plan Project at Whyalla.
  - Woomera.
  - Other pastoralists, renewable energy projects, mining and industrial users along the route.
- The majority of the main trunk pipeline would be trenched (underground) except where geotechnical conditions or other sensitivities require an alternative design response.

Pump Stations and Storage Tanks

- A series of six (6) new pump stations and associated water storage facilities are proposed along the pipeline alignment. Pump stations will comprise a pump room, electrical equipment, control room, storeroom, crib room and amenities.

- Water storage tanks will be located at the desalination plant site and at key points along the main trunk pipeline, which are a combination of new and existing facilities. New storage tanks are proposed to be concrete construction, ranging in size from 2ML to 8ML capacity.

Proposed Pump Stations and Water Storage Tanks	New or Existing
Cape Hardy pump station and storage	New
Cowell pump station and storage	New
Midgee storage tank	New
Nonowie pump station and storage	New
Whyalla North offtake storage tank	New
Whyalla North SA Water tank	Existing
Lincoln Gap pump station and storage	New
Lincoln Gap SA Water earthern storage tanks	Existing
Lincoln Gap storage tank	New
Kootaberra pump station and storage	New
Oakden Hills pump station and storage	New
Pimba storage tank	New
Carrapateena high point storage tank	New
Woomera Department of Defence water storage tanks	Existing
Olympic Dam BHP existing storage	Existing
Olympic Dam interface tank	New

Electricity Transmission Infrastructure

- The project requires new electricity transmission lines and network connection points, including new transformers and substations to provide power to the desalination plant and pump stations.
- A new 132kV transmission line will be constructed by ElectraNet through a 132kV feeder terminating at a new ElectraNet substation located adjacent the plant (Port Neill Substation).
- New transmission lines will provide power to the new pump stations from either ElectraNet transmission system, or from the SA Power Networks (SAPN) distribution system depending on the location and capacity of the network.
- A number of new substations will be required comprising:
    - Three (3) new substations and three (3) upgraded substations will be network substations that are designed, build, owned and maintained by an energy network provider (SA Power Networks or ElectraNet). These substations are located external to the Northern Water infrastructure, with capacity for future expansion.
    - A series of small substations will be constructed by Northern Water which are dedicated to the new pump stations and located within the pump station sites.
- Small solar farms (5MW) may be constructed at selected pump stations to provide supplementary power and/or where no low voltage power distribution is available.
- Contracts will be established with ElectraNet (for 275kV and 132kV infrastructure) and with SA Power Networks (for 33kV and 66kV infrastructure) to build, own and maintain

the 3 new and 3 existing (upgraded) network substations and new transmission lines associated with the project. All contracted parties will be required to comply with Northern Water management systems, contract conditions, conditions of approval, government legislation, policies and guidelines, as well as their own management systems and project plans.

Proposed Electricity Transmission Infrastructure	Voltage
New transmission lines	
Cape Hardy (23km)	132kV
Franklin Harbour (36km)	66kV
Mount Young (6.7km)	132kV
Pandurra (1.1km)	275kV
Bookaloo (3.6km)	275kV
Oakden Hills (15.5km)	33kV
New network substations	
Port Neill substation (serves 132kV line and desalination plant and pumping station)	132kV
Nonowie substation	132kV
Kootaberra substation	275kV
Upgraded existing network substation	
Cleve substation (SAPN)	66kV
Coraberra Hill substation (ElectraNet)	275kV
Mount Gunson substation (SAPN)	275kV
New pumping infrastructure substation	
Cape Hardy facility substation	33kV
Franklin Harbour facility substation (within Cowell pumping station footprint)	33kV
Mount Young facility substation (within Nonowie pumping footprint)	33kV
Pandurra facility substation (within Lincoln Gap pumping footprint)	33kV
Bookaloo facility substation (within Kootaberra pumping footprint)	33kV
Oakden Hills facility substation (within Oakden Hills pumping footprint)	33kV

Ancillary and Enabling Works

- Communication towers of approximately 30-40m in height, and associated equipment, are proposed for the desalination plant site, pump stations, and storage tank sites. The towers will provide point-to-point radio link connectivity and data communication between sites.
- Enabling infrastructure works include the creation of vehicle access tracks, road infrastructure upgrades, services relocation, and alterations to existing landholder infrastructure.

2.2 Construction Methodologies

Construction of the desalination plant is expected to be staged. The first stage will deliver 130ML/day, with most infrastructure (notably the marine works and distribution pipeline) built to accommodate the ultimate 260m ML/day capacity.

Construction is expected to commence in 2026, with first water to key off-takers in 2028. The timing for subsequent stages of capacity (up to maximum 260ML/day) will be demand driven.

Desalination Plant

- The desalination plant will require bulk earthworks using a cut and fill method. The reference design has considered the topography of the site and set the desalination plant over three levels (with 10m vertical separation between each level).
- A high-level overview of the construction process for the desalination plant:
    - Survey
    - Mobilisation and site establishment
    - Vegetation clearance and grading
    - Construction water supply
    - Earthworks
    - Excavation and Foundation installation
    - Building Construction
    - Mechanical / Electrical Fit Out
    - Rehabilitation
- The preferred method of construction for the intake and outfall tunnels is via tunnel boring machine which would be launched from the desalination plant site. The launch shafts would be approximately 30m deep and will likely require rock blasting to reach sufficient depth.
- It is anticipated that the offshore intake and diffuser structures will be constructed from a jack up barge (JUB). A pile top drill rig would be utilised to excavate the intake and diffuser shafts into the seabed. After the drilling is complete, the riser would be lowered from the JUB. The connection between the tunnel and the intake and diffuser risers are individual horizontal adits and will be excavated from the intake/outfall tunnel towards each riser.

Water Delivery Pipeline

- The construction corridor width will vary along the alignment based on local conditions. A nominal corridor width of up to 50m in previously disturbed areas has been allowed for trenching, pipeline installation, stockpiling, vehicle access and pipe laydown. In areas of ecological sensitivity (or in response to other local conditions), disturbance corridors will be constrained.
- Below ground installation, via trench and cover fill, is the preferred construction method for most of the alignment. Trenchless installation may be used for rail line crossings, major road crossings and some waterway / waterbody crossings. Some sections of the pipeline may require above ground installation, for example steep terrain, creek crossings, and environments / soils that are sensitive to excavation (eg ephemeral lakes, highly aggressive soils).

- A high-level overview of the construction process for the pipeline is provided below:
  - Survey
  - Construction mobilisation
  - Vegetation clearance and grading
  - Pipe deliveries and pipe stringing
  - Trenching
  - Pipe Installation
  - Backfill
  - Rehabilitation
- Following construction, the permanent disturbance width for the pipeline corridor is nominal 7m, comprising 5m width access road and an allowance of 2m for pipeline fixtures including air valves, scour values and isolator valves.
- Rehabilitation directly above the pipeline (15m width) will be restricted to shallow rooted species to avoid future impacts to the pipeline and engineered fill.

Electricity Transmission Infrastructure

- Disturbance footprints are determined by the type of infrastructure and may include:
  - 275kV: 50m x 50m structure pads (15m x 15m permanent disturbance)
  - 132kV: 40m x 40m structure pads (15m x 15m permanent disturbance)
  - 66kV and 33kV: 10m x 10m permanent structure pads (no rehabilitation)
  - Stringing tracks and pads: 50 m x 50 m (temporary, to be rehabilitated)
  - Access tracks and passing lanes (permanent)
  - New substations, noting that facility substations are included within the pump station disturbance footprint.
- Construction is likely to proceed on several concurrent work fronts. A high-level overview of the construction process for the transmission lines is provided below:
  - Access preparation
  - Vegetation clearance and grading including temporary stockpiling
  - Foundations
  - Tower assembly and installation
  - Stringing

Temporary Development & Other Construction Requirements

- Temporary development for the construction phase including laydowns, yards, site offices, and amenities. Estimated footprint 100m x 100mm per area, with several required along the project route.

- A combination of existing commercial premises and transportable construction camps may be used for workforce accommodation.
- Construction camps would include temporary accommodation and office buildings, sewage treatment systems and possibly a mobile reverse osmosis plant for water treatment. Estimated footprint of 10ha per camp, located every 100km along the project route.
- Concrete batching plants will be required for foundations, footings and tanks. Mobile batching trucks may be utilised.
- Potable and non-potable water will be required for various activities including the construction workforce, concrete batching, hydrotesting, dust suppression and backfill conditions. Potential sources include trucking of potable water from SA Water standpipes, the existing Dept of Defence pipeline to Woomera, the BHP network at Roxby Downs, and/or containerised temporary reverse osmosis units for more remote locations.
- Electricity supply from mobile (diesel powered) generators or temporary connections into the existing network, until such time as the new and/or upgraded electricity transmission infrastructure is constructed.

2.3 Operational Requirements

Desalination Plant

- The desalination plant will operate and be staffed on a 24/7 basis with most maintenance activities undertaken during daylight hours.

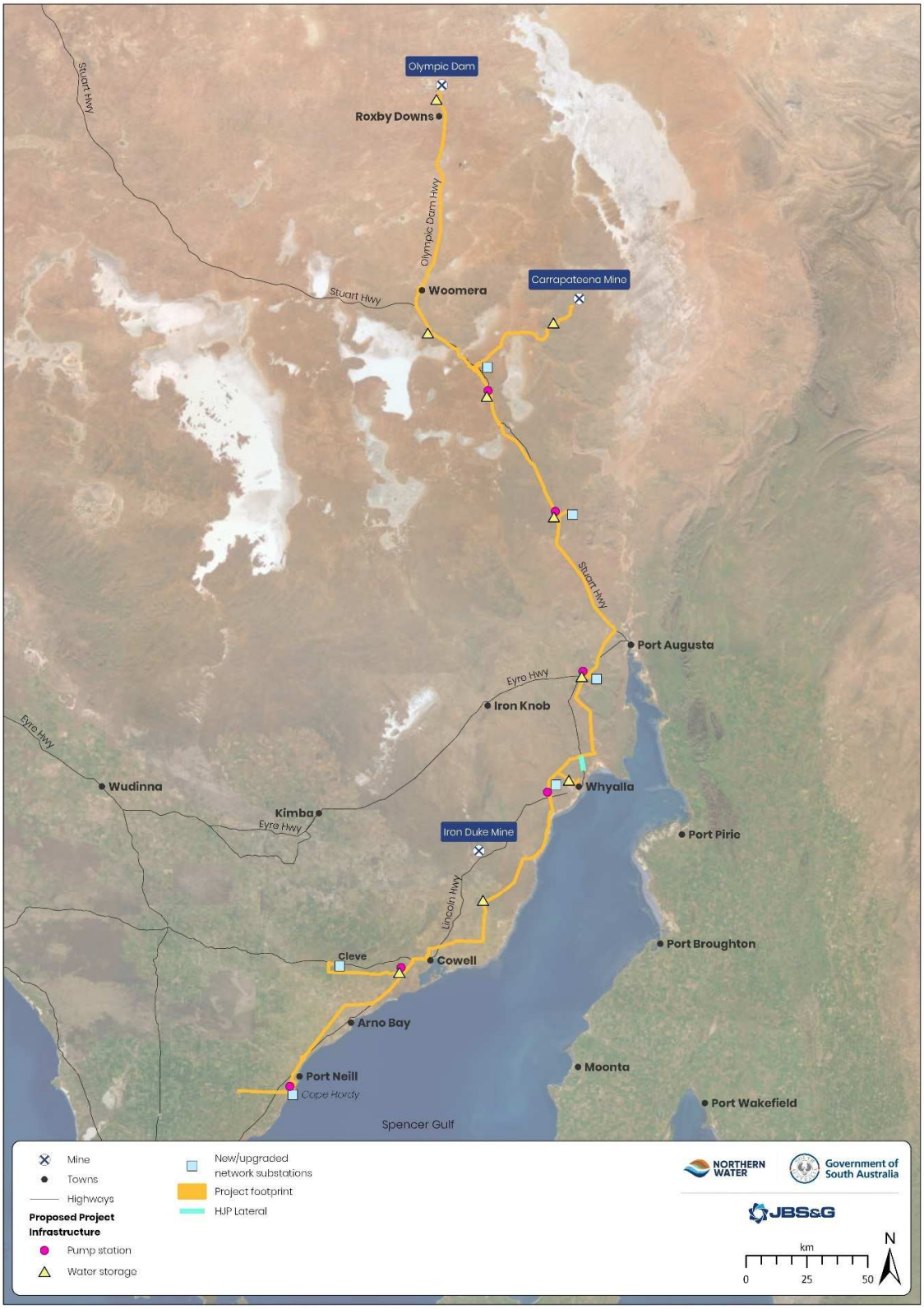
Water Delivery Pipeline

- Ongoing maintenance requirements are expected to be minimal. Regular inspections will be undertaken by either light vehicle or helicopter. Vegetation trimming may be required periodically.

2.4 Project Disturbance Footprints

An estimated summary of project disturbance footprints for the various project elements and associated native vegetation impacts (temporary and permanent) are summarised below.

Project Element	Initial disturbance footprint (ha)	Native vegetation disturbance (ha)		
		Temporary	Permanent	% Rehabilitated
Desalination plant (including offshore components)	118.2	0	0	NA
Water transfer infrastructure	2489.9	1532.9	358.2	81.1%
Power infrastructure	97.8	30.7	20.5	60%
Ancillary infrastructure including accommodation camps	60	30	0	100%
TOTAL	**2765.9**	**1593.6**	**378.7**	**80.8**



Spatial Reference: GDA2020 MGA Zone 53; **Author:** rtandon; **Date:** 26/07/2024

Figure 1: Subject Site / Site Plan

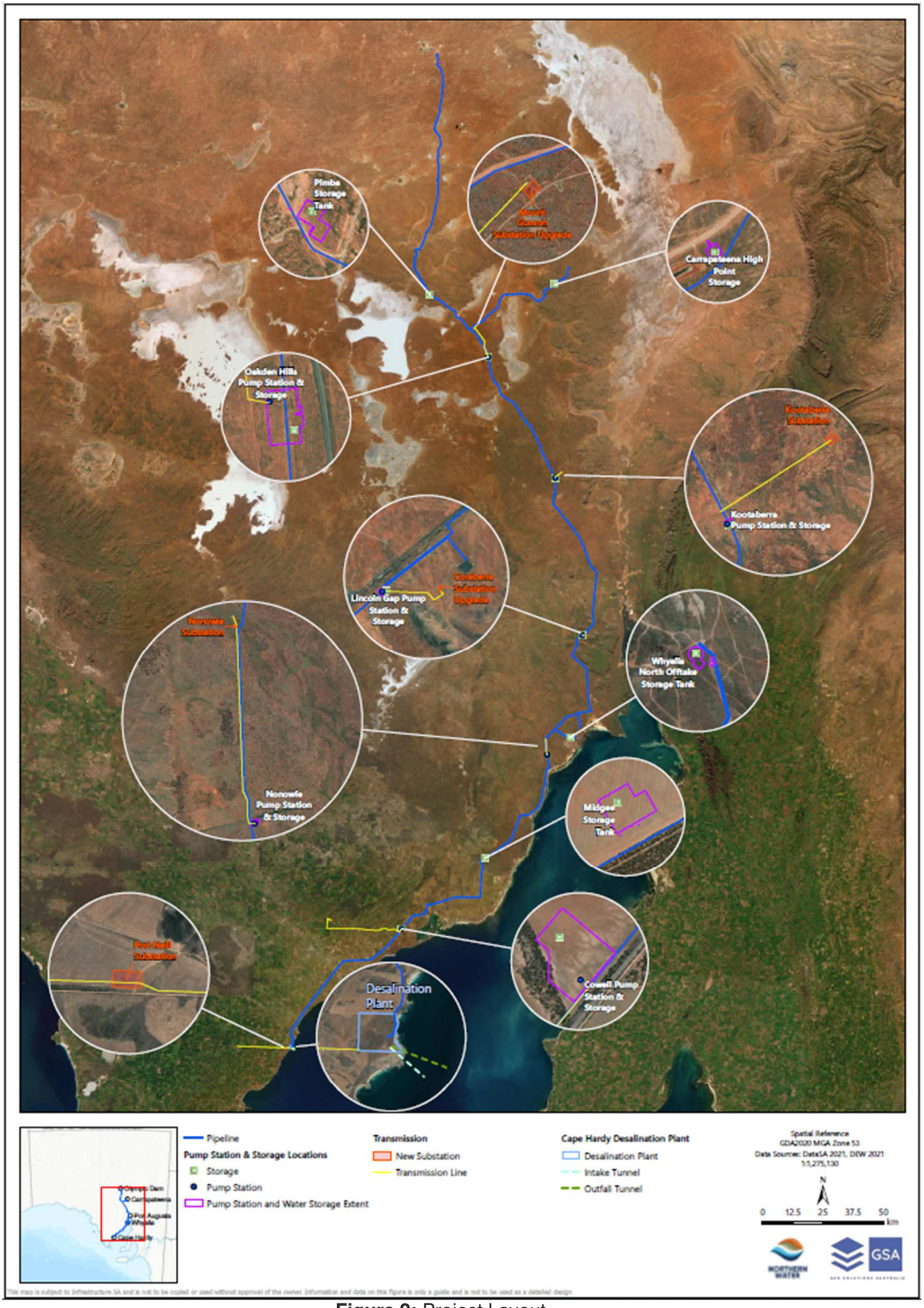


Figure 2: Project Layout

3 Related Development Authorisations

The proposed site for Northern Water Project desalination plant at Cape Hardy is on land owned by IRD Port Assets Pty Ltd and subject of an approved Major Development initially issued to Iron Road Ltd under the *Development Act 1993* (repealed).

Iron Road's current approval is for a deep-sea port associated with the Iron Road Central Eyre Iron Project and would be capable of loading various bulk sized carriers. Supporting infrastructure includes a 150km infrastructure corridor (transmission line, sea water supply pipeline and rail line), and an accommodation village at the township of Wudinna.

This development was approved on 3 May 2017 by the Governor of South Australia. Iron Road Ltd has until 3 May 2027 to commence construction. Further information on the project is available on the PlanSA website (Cape Hardy - Deep-Sea Port | PlanSA).

Developer Amp Energy aspires to develop a 5GW green hydrogen production facility at the Cape Hardy site; however this is not part of the existing Iron Road Development approval and is not considered a related development authorisation.

The Office of Northern Water Delivery is in discussions with Iron Road Ltd to master plan the Cape Hardy site to enable co-location of the approved deep-sea port, the proposed green hydrogen plant, and the Northern Water project. Iron Road is aware that amendments may be required to its existing development approval to enable the complementary project footprints at the Cape Hardy site.

4 Background to these Assessment Requirements

This document contains the Assessment Requirements to guide the preparation of an EIS by the project proponent.

The Assessment Requirements set out the matters relating to the environment that are to be addressed in an EIS for this project. The EIS must also address all requirements set out in Section 113 of the PDI Act, Practice Direction 17 and Schedule 4 of the *Environment Protection and Biodiversity Conservation Regulations 2000* (EPBC Regulations) (Appendix A).

Every attempt has been made to ensure these Assessment Requirements address all the major issues associated with the proposed development, however they are not necessarily exhaustive. The Assessment Requirements should not be interpreted as excluding from consideration matters deemed to be significant but not incorporated in them or matters that emerge as important or significant from environmental studies or otherwise during the course of the preparation of the EIS.

The EIS must therefore address other matters not covered in these Assessment Requirements in the following circumstances:

- Studies reveal a matter that had not been foreseen when the Assessment Requirements were finalised.
- Stakeholder engagement and consultation with the community identifies an issue of widespread concern to the public, which had not previously been considered contentious. This may include a public perception of significant environmental harm that may not be borne out by technical studies, which may also be attracting extensive media coverage.
- New or amended legislation or policies come into effect after the Assessment Requirements have been finalised, which may or may not have been referred to in the Assessment Requirements. Transitional arrangements or exemptions may apply, but it is considered best practice and of net benefit to a project to consider emergent

legislation or policies even if not specifically required. This serves to 'future-proof' the EIS.

- The proponent makes amendments to the proposed project that would result in a change in the nature, scale, timing or location of any impacts.

5 The Impact Assessment Process

5.1 EIS process

Section 131 of the PDI Act provides if a State Agency proposes to undertake development or supports development for the purposes of "Essential Infrastructure", then the State Agency must lodge a Crown Development Application.

There is, however, specific provision available via Section 131(25) of the PDI Act which enables the Minister for Planning to formally direct that an EIS be prepared by the applicant, at which time the Impact Assessed pathway would apply. This direction was made by the Minister on 17 January 2024.

The scoping application lodged by Infrastructure SA on 8 March 2024 includes a preliminary assessment of the key social, environmental and economic issues and impacts associated with the development. The Commission has used the information provided in this application to develop Assessment Requirements to inform preparation of the EIS.

The EIS must be prepared by the proponent in accordance with the Assessment Requirements for each environmental attribute in line with the level of detail specified. The level of detail is determined by the Commission based on the Practice Direction, the views of the relevant government agencies and the local council(s). The proponent is also given an opportunity to provide feedback on the level of detail required.

Assessment Requirements are intended to be outcome-focused and, supported by relevant guidance documents and legislation, are generally accompanied by a method of investigating the highlighted impacts and measures to assess these impacts. The methods provided are not necessarily exhaustive and a wide range of methods may be available to consider and respond to a particular issue.

If additional matters requiring detailed assessment become apparent after the final Assessment Requirements are issued, the EIS must also address these new matters in a comprehensive manner and identify means by which the effects can be managed.

The matters that must be included in an EIS are set out in Section 113 of the PDI Act and in the sections below. These requirements include detail of expected environmental, social, economic and climate effects of the development, consistency with state and regional planning documents, consideration of the provisions of the *Environment Protection Act 1993* and commitments by the proponent to avoid, mitigate or satisfactorily manage and control any potentially adverse effects of the development on the environment.

The EIS process is illustrated in Figure 3.

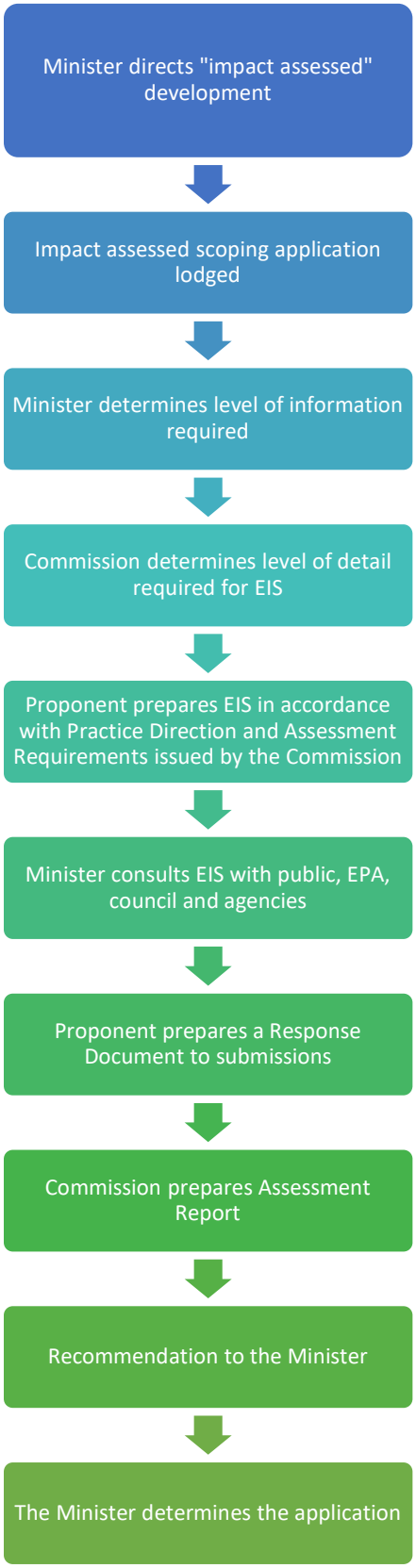


Figure 3: Steps in impact assessed development process

5.2 Assessment under accredited assessment process

The proposal was referred under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). The delegate of the Australian Government Minister for the Environment and Water decided under section 75 of the EPBC Act that the proposed action is a controlled action and, as such, requires assessment and an approval decision due to the potential for a significant impact on matters of national environmental significance (MNES) protected under Part 3 of the EPBC Act.

The proposal is being assessed under an accredited assessment process in accordance with section 87(4) of the EPBC Act and section 131(25) of the PDI Act. These Assessment Requirements have been prepared to meet the requirements of both government jurisdictions.

The proponent EIS must address matters outlined in Schedule 4 of the EPBC Regulations.

5.3 Consultation Process

After the completed EIS is submitted to the Minister for public release, it is referred to council(s) and relevant government agencies for comment. The public is also provided with an opportunity to comment when released for public exhibition.

Public consultation is a valuable resource to the EIS preparation process and a well-considered engagement strategy can play a pivotal role in the assessment of a project. The PDI Act sets out the principles of the Community Engagement Charter which guide public participation in the planning process and ensure that people and communities have a greater opportunity to engage in the planning process. The Minister will consider the Charter in determining the consultation program for an impact assessed development.

The process for consultation with First Nations people must be undertaken consistent with the requirements of the *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the Environment Protection and Biodiversity Conservation Act 1999* and or any First Nations engagement standard (if one is in force).

Public exhibition is undertaken for a minimum of 30 business days.

An advertisement will be placed in The Advertiser and local newspapers inviting submissions. The public consultation process will cater for those with special needs or those not able to access documentation electronically.

[Before releasing the EIS, the Minister must also consider the Community Engagement Charter and the consultation program. The PDI Act does not set any requirements for public notification except to say that the EIS must be placed on public notification however PD 17 details a minimum of 30 business days. PD 17 should outline details (aligning with the reading of the Community Engagement Charter) where additional or tailored consultation should be undertaken by the Minister and the proponent.

The Charter should be considered the minimum requirements for public consultation and emphasise the importance of early and open engagement as soon as practicable to avoid or minimise situations as early as possible where Stakeholder engagement and consultation with the community identifies an issue of widespread concern to the public, which had not previously been considered contentious.]

5.4 Responding to submissions

Copies of submissions from the public, council(s) and other relevant agencies are then provided to the proponent who then prepares a Response Document to address matters raised during the public exhibition period.

Following the receipt of the Response Document, the Commission will prepare an Assessment Report. The Assessment Report must set out:

- The Minister's assessment of the development
- Any comments by the Minister relating to:
  - the EIS
  - submissions received through the public consultation process
  - the proponent's responses to submissions received and matters raised by the Minister
- Comments provided by the Environment Protection Authority, another Minister, a council or other authority or body
- Any other comments or matters as the Minister or the Commission thinks fit.

The Assessment Report and the Response Document will be available for inspection and purchase by members of the public at a place and for a period of time determined by the Commission.

Availability of each of these documents (primarily on the PlanSA Portal website) will be notified by advertisements in The Advertiser and local newspapers and in writing to persons who made a written submission. A copy of the EIS, Response Document and the Assessment Report will be provided to the relevant council(s). Requirements for public availability and notification of an EIS, Response Document and Assessment Report are laid out in Section 113 (10) - (12) of the PDI Act.

The Minister will make a final decision subject to Section 115 of the PDI Act.

In deciding whether the proposal will be approved and any conditions that will apply, the Minister must have regard to:

- The State Planning Policies
- Regional Plans, including the 30-Year Plan for Greater Adelaide (where relevant)
- Provisions of the Planning Rules and the regulations
- If relevant, the Building Code of Australia
- Where development involves or is for the purposes of a prescribed activity of environmental significance, the *Environment Protection Act 1993* including the objects, General Environmental Duty and relevant environment protection policies
- Where relevant, the view of the Minister who is responsible for the administration of an area of the State subject to a special legislative scheme
- The EIS, Response Document and the Commission's Assessment Report
- Where relevant, any other government policy and/or legislation.

Pursuant to Section 115(2)(a) of the PDI Act the Minister can at any time indicate that the development will not be granted a development authorisation. This may occur if the

development is inappropriate or cannot be demonstrated to be properly managed. This is commonly referred to as an “early no.”

5.5 Development of the Assessment Requirements

Assessment Requirements set out the environmental attributes relevant to the development which are to be assessed (e.g. soil, water, heritage, threatened species, etc). The key environmental, social and economic impacts to these environmental attributes are to be addressed in the EIS. The level of assessment required is determined by the Commission based on consideration of key factors to determine whether a standard level of assessment will be sufficient or whether more detailed assessment is required.

5.5.1 Key factors to consider in determining level of assessment detail

The PDI Act defines an EIS as “a document that includes a detailed description and analysis of a wide range of issues relevant to the proposed development or project, incorporating significant information to assist in an assessment of environmental, social or economic effects associated with the development or project and the means by which those effects can be managed”.

In setting the Assessment Requirements, the Commission considers the scale, nature and sensitivity of the receiving environment associated with the proposal and refers to relevant legislation, policy, guidance documents, government agencies and subject matter experts to determine whether a standard or a detailed level of assessment is appropriate.

The Commission is required to classify the issues relevant to the proper assessment of the development or project according to categories of importance so as to indicate the levels of attention that should be given to those issues in the preparation of an EIS.

The following key factors have been considered in identifying the issues requiring assessment in the EIS and whether the Assessment Requirements are ‘detailed’ or ‘standard’:

- Scale of the impact taking into account intensity, geographical extent and duration
- Nature of the impact which should consider direct, indirect, cumulative and perceived impacts
- Sensitivity of the receiving environment
- Ability to avoid, minimise and/or offset the impacts of the project, to the extent known at the application stage
- Complexity of technical assessments and investigations required to identify and assess mitigation measures.

Description and examples of the key factors is provided in Table 1.

Table 1: Description and examples of key factors to consider during scoping

Key factor	Components of factor	Description of example
Scale of the Impact	Severity	The scale or degree of the impact relative to the current situation or adopted standards or performance measures. The intensity may be measured quantitatively and compared to reference values (e.g. area of vegetation cleared, air and water quality, noise levels, change or disruption to ecological community function) or qualitatively.
	Geographical extent	The geographical reach of the impacts of the development or the range within which the impacts are observable

	Duration	The timeframe over which the impact occurs (e.g. for a short period, during construction only; during operations permanently). It may also refer to the period/s in which the impacts are observable and the regularity of the impacts (e.g. irregular, intermittent, regularly during operations.)
Nature of the Impact	Direct impacts	Impacts caused directly by the development. They usually occur at the same time as the development and within the vicinity of the site (e.g. vegetation clearing, air emissions).
	Indirect impacts	Impacts that occur as a consequence of the development or its direct impacts. Impacts may be delayed and happen further away from the site (e.g. project changes water table, changes affect wetland and causes an impact on groundwater dependent ecosystems). Impacts may also occur due to growth or land use changes facilitated by the project (e.g. a new transmission line may open up new areas for renewable energy generation).
	Cumulative impacts	The combined impacts of the project on a matter combined with other relevant existing and future projects (e.g. marine impacts from multiple port developments).
	Perceived impacts	There are a range of perceptions of the same impacts by people or groups
Sensitivity of the Receiving Environment	Existing regulations and guidance	The degree of sensitivity expressed in legislation or relative to adopted standards and performance measures (e.g. *Environment Protection (Commercial and Industrial Noise) Policy 2023*)
	Value to society	Environmental value: e.g. water quality, natural habitat). Social value: e.g. community value, landscape, recreation, lifestyle disturbance, water quality, cultural heritage, amenity. Economic value: e.g. water supply, critical transport routes
	Vulnerability / resilience to change	The degree of vulnerability of the environment to the impacts of the project or resilience to cope with change. Regard should be had to the likely scale and nature of the impacts of the development and the sensitivity and adaptive capacity of the environment.

5.5.2 Assessment Level Characteristics

The characteristics of 'detailed' and 'standard' levels of assessment are provided in Table 2. A detailed level of assessment is required if the impact of the development has one or more the characteristics set out in Table 2.

Table 2: Characteristics of detailed and standard assessment

Level of Assessment	Characteristic of the impact of the development
Standard	▪ The project is unlikely to result in significant impacts on the environmental attribute if managed through conventional management and mitigation measures, including cumulative impacts. ▪ While the assessment of the impacts of the development on the environmental attribute will involve technical specialists, these impacts are likely to be: ○ well understood by regulators and stakeholders

	○ relatively easy to predict using standard methods ○ capable of being mitigated to comply with relevant standards or performance measures. ▪ The assessments will be supported by quantitative assessment methods, although the focus and coverage may be on specific project components or project locations. ▪ The assessment is unlikely to involve any significant uncertainties or require any detailed cumulative impact assessment.
Detailed	▪ The development has a high / medium probability of causing significant environmental impact on the environmental attribute, including cumulative impacts. ▪ There is a high / medium probability of impacts on the development from external environmental factors such as those associated with climate change (sea-level rise, increased frequency of bushfire, floods etc) ▪ It is considered important by the Commission, and/or there is a public perception that an activity has the potential to cause significant impacts on the environmental attribute (even though this may be mistaken), or the activity has been the subject of extensive media coverage. ▪ Potential impacts to a Matter of National Environmental Significance (MNES) are likely to require referral and approval under the *Environment Protection Biodiversity and Conservation Act 1999*). ▪ The development raises requirements under other legislation applicable for the development (e.g. prescribed activities of environmental significance under the *Environment Protection Act 1993).* ▪ Assessment of the impacts of the development on the environmental attribute will require detailed studies and investigations to be carried out by technical specialists. During this assessment, these specialists may need to: ○ work closely with specialists assessing the impacts of the project on other environmental attributes to determine the likely indirect impacts of the project. ○ undertake a detailed cumulative impact assessment for the project. ▪ Assessment is likely to involve several uncertainties in relation to one or more of the following and specific strategies may be required to address these uncertainties (e.g. further monitoring, review, technical investigations and adaptive management): ○ data collection (e.g. baseline information, availability of data for cumulative impacts assessment) ○ identifying the specific mitigation measures or suitable offsets for the project ○ the methods available for predicting the impacts of the project, including the indirect and cumulative impacts ○ criteria for evaluating the acceptability of the impacts of the project ○ specific strategies may be required to address these uncertainties (e.g. further monitoring, review, technical investigations and adaptive management).

5.5.3 Environmental Attributes to be considered in the EIS

Issues relevant to the proposal are addressed by each Assessment category within which a range of environmental attributes are identified. Specific Assessment Requirements are then determined for each environmental attribute relevant to the proposal with the level of detail tailored for that element or issue.

Table 3: Assessment categories and environmental attributes

Assessment category	Environmental attribute and typical issues
Amenity and Environmental Quality	Air quality Ground level concentrations (include background levels, construction / traffic), dust, odour, stack emissions, receptors (location and sensitivity). Noise / Vibration

	Noise / vibration type (include traffic noise), underwater noise, noise level, sensitive receptors and location. Sensitive receptors may include terrestrial and marine fauna. Transport and Traffic Traffic disruptions- commuter and local, public transport, pedestrians / cyclists, changes to traffic flow and volumes - temporary / ongoing, road / maritime safety, car parking, presence of heavy vehicles, impacts to road pavement, marine traffic / shipping. Visual amenity Interface with adjoining land, landscape changes, built form, light spill.
Biological Environment	Biosecurity Weeds, pest species (including marine pests), diseases and pathogens. Matters of National Environmental Significance Nationally threatened species and communities, migratory species, wetlands of national importance (Ramsar), Commonwealth lands Marine Flora and Fauna Marine protected areas, threatened species, communities/ ecosystems, seagrass clearance, biodiversity loss Terrestrial and Aquatic Flora and Fauna Protected areas, threatened species and communities, native vegetation clearance, habitat loss through clearing fire or fragmentation, habitat degradation, biodiversity loss
Climate Change and Resource Use Efficiency	Climate change adaptation Climate change risk assessment Greenhouse gas emissions Greenhouse gas emissions including emissions reduction targets, NGER reporting, cumulative impacts on state and national GHG inventories and targets. Sustainable use of resources Sustainable procurement, products / materials, energy efficiency Waste Management Waste hierarchy; waste recycling / disposal
Economic Environment	Local, regional and state economies Economic impact assessment which addresses workforce / employment, existing economic land and marine uses (primary production, tourism, ports, fisheries), infrastructure - utilities (energy, water), telecommunications, ports, rail), displacement, competition, opportunities, temporary and ongoing for existing businesses / industries, property and land values
Hazards and Risks	Bushfire, Floods, Site Contamination Hazard risk management, bushfire, flooding, contamination and dangerous goods
Land Tenure, Protected Areas and Land Use	Land Tenure, Protected Areas and Land Use Land tenure (freehold, pastoral lease, mining, oil and gas, native title, crown land), generalised land use, population centres, major infrastructure and utilities (including marine infrastructure), P&D Overlays and Zones, reserved areas (including marine parks), changes / displacement of land uses.
Physical Environment	Coastal and Marine Coastal land systems (dunes, estuaries, beaches, island), and marine water quality. Soils, Landform and Geology Erosion and sedimentation, soil compaction and inversion, contamination (spills), land subsidence and acid sulfate soils. Surface Water and Groundwater Surface water quality (sedimentation, wastewater, spills, use of surface water) and groundwater use and quality.
Design	Urban Quality

	Supporting design excellence to create desirable and socially inclusive places.
Social and Community	Aboriginal cultural heritage Known and unknown Aboriginal sites, objects and remains. Community wellbeing Social impact assessment which addresses impacts to specific groups, impacts to services, impacts / displacement of residential areas, public safety (including perceptions), recreation and public space amenity. Heritage Places and Areas Listed national, state and local heritage sites.

6 Content Requirements for the EIS

Section 113 of the PDI Act and Schedule 4 of the EPBC Regulations (Appendix A) set out the legislative requirements for the content of an EIS.

6.1 Statutory Requirements

The EIS must Include the following (subject to any Practice Direction):

1. A statement of the expected, predicted or potential environmental, social and economic effects of the development, whether positive, neutral or negative. The assessment of effects should include all issues identified in the Assessment Requirements and be cross referenced to supporting technical studies.
2. A statement of the expected impact of the development on the climate and any proposed measures designed to mitigate or address those effects.
3. A statement of the extent to which the expected, predicted or potential effects of the development are consistent or at variance with the provisions of—
   a. Any relevant State Planning Policy
   b. Any relevant Regional Plan(s), including the 30-Year Plan for Greater Adelaide (if applicable)
   c. The Planning and Design Code
   d. Any matters prescribed by the Regulations.
4. If the development involves, or is for the purposes of, a prescribed activity of environmental significance as defined by the *Environment Protection Act 1993*, a statement of the extent to which the expected, predicted or potential effects of the development are consistent or at variance with—
   a. The objects of the *Environment Protection Act 1993*
   b. The general environmental duty under that Act
   c. Relevant environment protection policies under that Act.
5. If the development will, or is likely to, significantly impact one or more Matters of National Environmental Significant (MNES) under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), a statement of:
   a. The expected, predicted or potential effects of the development on each identified MNES

b. The extent to which the expected, predicted or potential effects of the development are consistent or at variance with the provisions of any relevant Commonwealth of Australia conventions, agreements or obligations under international agreements or treaties as they relate to MNES aspects

c. The extent to which the expected, predicted or potential effects of the development are consistent or at variance with any relevant Commonwealth plans (such as threat abatement plant and recovery plans), conservation or management principles.

6. If the development is to be undertaken within an area of the State that is specifically subject to a special legislative scheme—a statement of the extent to which the expected, predicted or potential effects of the development are consistent or at variance with the State Planning Policy that specifically relates to that special legislative scheme.
7. A statement of the proponent's commitments to avoid, mitigate and satisfactorily manage and/or control any potential or likely adverse impacts of the development on the environment (including any proposed offsets to reduce residual significant impacts) or any matter that may be directly relevant to a special legislative scheme.
8. Any other particulars in relation to the development required by the Regulations, relevant Practice Direction or by the Minister.

The proponent's commitment to meet conditions proposed to avoid, mitigate and satisfactorily manage and/or control any potential or likely adverse impacts of the development on the physical, social or economic environment, must be clearly articulated in the EIS.

The design and construction of the proposed development should be flexible enough to incorporate changes to minimise any impacts highlighted by this evaluation.

6.2 Summary of the EIS

The EIS should include a summary of the matters set out in the Practice Direction prepared pursuant to Section 109 of the PDI Act and include mention of all environmental attributes set out in the Assessment Requirements. The reader should be able to obtain a quick but thorough understanding of the proposal and associated environmental impacts. The summary should convey the most important aspects and environmental management commitments relating to the proposed project in accessible, easily understood language.

The summary should aim to construct a narrative around what is being proposed in the EIS, alternatives that were considered, what the broad environmental implications are of the proposal and how they will be managed to provide a net benefit. The summary should be logical and easy to read and need not reflect the precise order of chapters within the EIS itself. Images and graphics are suggested as a means of assisting to succinctly communicate the contents of the summary.

Content should be summarised accurately and objectively. It should report all the EIS's key conclusions and be consistent with the rest of the EIS. Specific issues and impacts should be addressed at an appropriate level of detail proportionate to their potential for significant impact and depth of study undertaken.

6.3 Introduction to the EIS

The introduction to the EIS should set the context for detailed assessment of the project in subsequent sections of the EIS, and include:

- Title, background to, and clear objectives of, the proposed project
- Proponent details, including;
  - Contact information for the proponent or representatives of a proponent organisation for the project, including full name, street and postal address, Australian Business Number, telephone, fax, email and other details as appropriate
  - Identify the legal entities that would develop, manage and operate the project
  - Provide a description of corporate structure including joint ventures, corporate policies and objectives relating to the project, in particular environmental policies
  - Specify mechanisms used to ensure that corporate policies will be implemented and adhered to for the project in addition to requirements for Environmental Management Plans
  - Identify key personnel, contractors, and/or subcontractors responsible for preparing the EIS
- Staging and timing of the proposal, including expected dates for construction and operation
- Relevant legislative requirements and approval processes
- Purpose and description of the EIS process

6.4 Need for the Proposal

The EIS should provide a statement of the objectives and justification for the proposal including:

- the specific objectives that the proposal is intended to meet, including market requirements
- expected local, regional and State benefits and costs, including those that cannot be adequately described in monetary or physical terms (e.g. effects on aesthetic amenity)
- a summary of environmental economic and social arguments to support the proposal including the consequences of not proceeding with the proposal.

6.5 Description of the Proposal

The EIS should provide a comprehensive and consolidated description of the proposal for which the proponent is seeking approval, using suitable maps, plans, figures and tables.

The proposal description sets out what the proponent is presenting for assessment and provides the basis for the Commission's evaluation against the Assessment Requirements. As the proposal may have undergone changes since the initial scoping stage (e.g. in response to stakeholder engagement, risk analysis or planning, technical or compliance grounds), it is important that the EIS provides an up to date and comprehensive description of the proposal.

The description of the proposal should address all aspects of the proposed project that are assessed by the EIS, and address the following information:

- Nature of the proposal and location
- Scale and intensity of the project
- Key elements of the receiving environment

- A project plan to outline objectives, constraints, key activity schedule and quality assurance
- Site layout plans (including indicative land division plan if relevant)
- Construction and commissioning timeframes (including staging)
- Description of working hours
- Description of the existing environment (including the immediate and broader location, identifying sensitive receptors and adjacent land uses which may lead to cumulative impacts)
- Description of the current commercial activities occurring in the area
- Details of all buildings and structures associated with the proposal
- Details of any other infrastructure requirements and availability
- Details on the operation of the proposal, including operating hours
- Relevant Zones and Overlays defined by the Planning and Design Code
- Management arrangements for the construction and operational phases (including Environmental Management and Monitoring Plans)
- A contingency plan for delays in construction
- All requirements detailed in Schedule 4 of the EPBC Regulations (Appendix A)

6.6 Project Alternatives

Feasible alternatives considered for the proposed project should be presented in the EIS described and evaluated the comparative environmental, social, and economic impacts (including the option of not proceeding).

Each alternative and its potential impacts should be discussed in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action while rejecting others. This may be used to inform a justification of why the proposed project and preferred options should proceed.

6.7 Summary of Preceding Actions

The EIS should provide a summary of actions and activities that have been undertaken prior to or as part of the preparation of the EIS. These could include prior engagement with the Commission, government agencies, local councils and other stakeholders, engagement with the local community, the process of project development, pre-feasibility studies and any technical reports which may have bearing on the level of detail required by a relevant Assessment Requirement.

6.8 Matters of National Environmental Significance

The EPBC Act ensures that ‘nationally significant’ animals, plants, habitats and places are identified and any potential significant impacts on them are carefully considered before changes in land use or new developments are approved.

There are nine MNES under the EPBC Act:

- Listed threatened species and communities
- Listed migratory species

- Ramsar wetlands of international importance
- Commonwealth marine environment
- World heritage properties
- National heritage places
- The Great Barrier Marine Park
- Nuclear actions
- A water resource, in relation to unconventional gas development and large coal mining development.

On 27 November 2023 a referral under the EPBC Act to the Australian Government Minister for the Environment and Water was received from Infrastructure SA.

On 8 April 2024 the Delegate of the Minister determined that the Northern Water Project has the potential to have a significant impact on the environment and requires assessment and approval under the EPBC Act before it can proceed.

The action has the potential to have a significant impact on the following MNES that are protected under Part 3 of the EPBC Act:

- Listed threatened species and communities (sections 18 & 18A):
    - *Leipoa ocellata* (Malleefowl) – Vulnerable
    - *Swainsona pyrophila* (Yellow Swainson-pea) – Vulnerable
    - *Eucalyptus petiolaris* (Eyre Peninsula Blue Gum) – Endangered
    - *Pseudomys australis* (Plains Mouse) – Vulnerable
    - *Amytornis textilils myall* (Western Grasswren) – Vulnerable
    - *Amytornis modestus* (Thick-billed Grasswren) – Vulnerable
    - *Falco hypoleucos* (Grey Falcon) – Vulnerable
    - *Neophema chrysostoma* (Blue-winged Parrot) – Vulnerable
    - *Sternula nereis nereis* (Australian Fairy Tern) – Vulnerable
    - *Aphelocephala leucopsis* (Southern Whiteface) – Vulnerable
    - *Stagonopleura guttata* (Diamond Firetail) – Vulnerable
    - *Notomys fuscus* (Dusky Hopping-mouse) – Vulnerable
    - *Neophoca cinerea* (Australian Sea-lion) – Endangered
    - *Eubalaena australis* (Southern Right Whale) – Endangered and Migratory
    - *Acacia enterocarpa* (Jumping Jack Wattle) - Endangered
    - *Pterostylis xerophila* (Desert Greenhood) – Vulnerable
    - *Acacia rhetinocarpa* (Neat wattle) – Vulnerable
    - *Frankenia Plicata* – Endangered
    - *Dasyurus geoffroii* (Western Quoll) – Vulnerable
    - *Smithopsis psammophila* (Sandhill Dunnart) - Endangered

- Listed migratory species (sections 20 and 20A):
    - *Limosa lapponica* (Bar-tailed Godwit) – Migratory
    - *Tringa nebularia* (Common Greenshank) – Endangered and Migratory
    - *Actitis hypoleucos* (Common Sandpiper) – Migratory
    - *Calidris ferruginea* (Curlew Sandpiper) – Critically Endangered and Migratory
    - *Numenius madagascariensis* (Eastern Curlew) – Critically Endangered and Migratory
    - *Calidris tenuirostris* (Great Knot) – Vulnerable and Migratory
    - *Charadrius leschenaultia* (Greater Sand Plover) – Vulnerable and Migratory
    - *Tringa stagnatilis* (Marsh Sandpiper) – Migratory
    - *Pandion haliaetus* (Osprey) – Migratory
    - *Calidris melanotos* (Pectoral Sandpiper) – Migratory
    - *Gallinago stenura* (Pin-tailed Snipe) – Migratory
    - *Calidris canutus* (Red Knot) – Vulnerable and Migratory
    - *Calidris ruficollis* (Red-necked Stint) – Migratory
    - *Arenaria interpres* (Ruddy turnstone) – Vulnerable and Migratory
    - *Philomachus pugnax* (Ruff, Reeve) – Migratory
    - *Calidris alba* (Sanderling) – Migratory
    - *Calidris acuminata* (Sharp-tailed sandpiper) – Vulnerable and Migratory
    - *Eubalaena australis* (Southern Right Whale) – Endangered and Migratory
- Commonwealth land (sections 26 and 27A):
    - Cultana Training Area
    - Australian National Railway Commission (ANRC) lands
    - Woomera Defence Centre and Woomera Air Weapons Range

Listed controlling provisions relevant to the assessment are those that were listed at the time that the controlled action decision was made, on 8 April 2024. The EIS must address all relevant MNES (refer to MNES1, 2 and 3 in Table 7 below), and explain how they have adequately regarded the Conservation Advices (and Recovery Plans where applicable) of each EPBC Act listed species that are known or likely to be impacted, and Australia's obligations under international conventions and agreements. Moreover, the EIS must explain how the proposal is not inconsistent with any Threat Abatement Plans, Bioregional Plans or Recovery Plans.

Various policy statements and other publications that may be relevant to the assessment can be found at Appendix B.

6.8.1 Other considerations under the EPBC Act

a) Ecologically sustainable development

The EIS must include a discussion of how the proposal meets the principles of ecologically sustainable development, as defined under section 3A of the EPBC Act.

b) Environmental record of person(s) proposing to take the action

The EIS must include details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

i. The person proposing to take the action.

ii. For an action for which a person has applied for a permit, the person making the application.

iii. If the person proposing to take the action is a corporation, details of the corporation's environmental policy and planning framework must also be included.

c) Environmental outcomes

In the event that the Commonwealth Minister decides to approve the action and attach conditions, should you wish to implement or pursue an outcomes-based approach to mitigating and/or offsetting impacts on protected matters, the EIS must provide information on the outcomes that will be achieved for the relevant protected matters.

Outcomes need to be specific, measurable and achievable, and should be based on robust baseline data and new and relevant scientific data. Outcomes must be developed in consideration of the *Outcomes-based Conditions Policy 2016* and *Outcomes-based Conditions guidance 2016*, with suitable justification for considerations identified in the policy and guidance.

To allow application of outcomes-based conditions, the EIS should include the specific environmental outcomes to be achieved. It should also include the reasoning for these, including reference to any recovery plan, conservation advice or threat abatement plan that may be relevant to the protected matters.

For each proposed outcome, the information must include:

i. The risks associated with achieving the outcome.

ii. The measurability of the outcome, including all suitable performance measures.

iii. Appropriate baseline data upon which the outcome has been defined and justified.

iv. The likely impacts that the proposed outcome will address.

v. Demonstrated willingness and capacity of achieving the outcome.

vi. The level of knowledge about the protected matter or its surrogate, upon which outcomes were based.

vii. Discussion of the appropriateness of any surrogates for protected matter outcomes.

viii. Commitments to independent and periodic audits of performance towards achieving outcomes.

ix. Assessment of the likely level of control that the proponent will have in achieving the outcome.

x. Details of proposed management to achieve the outcome, including, but not limited to performance indicators, periodic milestones, proposed monitoring and adaptive management, and record keeping, publication and reporting processes.

The proposed action will be assessed by a single EIS, to be prepared under a project specific administrative arrangement between the Commonwealth and Government of South Australia and meeting the requirements of both the EPBC Act (Commonwealth) and the PDI Act (State).

6.9 Sources of Information

All sources of information (e.g. reference documents, literature services, research projects, authorities consulted) should be fully referenced, and reference should be made to any uncertainties in knowledge, how recent the information is and how the reliability of the information was tested. Where judgements are made, or opinions given, these need to be clearly identified as such, and the basis on which these judgements or opinions are made need to be justified. The expertise of those making the judgements including the qualifications of consultants and authorities should also be provided.

Any technical and additional information relevant to the EIS that is not included in the text should be included in appendices.

6.10 Consultation process

The EIS must include an appropriate public consultation program, outlined within a Community Engagement Plan, and must be undertaken consistent with the requirements of the Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act 1999 (Interim Engaging with First Nations People EPBC Guidelines) and or any First Nations engagement standard (if one is in force).

The Community Engagement Plan must detail:

- All legislated notification requirements to be undertaken by the Minister pursuant to the PDI Act and Practice Direction.
- The Proponent's overall engagement and collaboration strategy including scope and guiding principles.
- Engagement undertaken to date on the proposed project.
- Engagement activities proposed throughout the EIS process including performance outcomes, level of public participation, techniques, indicative timeframes, responsibilities and measures for measuring performance.
- A list of affected stakeholders, interest groups and other relevant parties.

The extent to which a proponent consults with relevant persons and organisations is to be proportional to the public interest and significance of the proposed project's potential environmental, social and economic impacts. Early and sustained consultation with all relevant stakeholders is recommended.

Prior to the public release of the EIS, the Community Engagement Plan will be reviewed by the Minister with regard to the principles of the State Planning Commission's Community Engagement Charter. The Minister may require alterations to the Community Engagement Plan to ensure consistency with the Charter and Interim Engaging with First Nations People EPBC Guidelines (Appendix B) and an appropriate level of public participation in the EIS process.

6.11 Required Plans and Forms

- Current Certificate(s) of Title
- Context and locality plans should illustrate and analyse the existing environment and site conditions and the relationship of the proposal to surrounding land and buildings. Plans should be drawn to a large scale and be readily legible, according to standard mapping conventions. Plans should include:
    - Any neighbouring buildings, infrastructure or facilities, including identification of all nearby sensitive receptors and the likely use of existing or proposed neighbouring buildings (e.g. dwelling, farm outbuildings, shop, office)
    - Locations of any watercourses, surface water bodies (including dams), underground water sources, and any other sensitive environmental receptors/areas in the locality
    - Locations of any State heritage places in relation to the site
    - Existing native vegetation, regulated or significant trees
    - Known sites for State or Nationally listed protected or threatened species (including migratory species) or ecological communities on the site, adjoining land and marine environments
    - Existing roads (public and private)
    - Potential areas of habitat for native fauna, including relevant vegetation communities
    - Any other information that would help to set the context for the locality
- Site plans clearly indicating all proposed buildings, structures and works, and demonstrating that key parts of the development will be contained within relevant allotment boundaries
- Elevations showing all sides of buildings, structures and works with levels and height dimensions relative to ground level.
- Bulk earthworks plan (or similar) for the desalination plant site detailing the extent of engineered cut and fill across the site.
- A description of construction materials, finishes and colours
- Location and dimensions of any external advertising displays, including information as to whether signs are to be illuminated or contain a moving display.

7 Key Issues and Project Specific Assessment Requirements

The Commission has undertaken a preliminary review of the proposed development, based on the proponent's development application, and identified the following as key issues associated with the development:

- Effects on marine flora and fauna, ecological processes, and marine based industry including recreational and commercial fisheries and aquaculture.
- Effects on terrestrial flora and fauna.
- Effects on Matters of National Environmental Significance under the EPBC Act including listed threatened species and communities, listed migratory species, and Commonwealth lands.

- Effects on Aboriginal cultural heritage.
- Economic and social effects for local and regional communities, and the State.
- Effects of providing an alternative, climate independent water resources for community, industry and mining use.

A scoping analysis of the environmental attributes associated with these key issues has been undertaken in accordance with the methodology detailed in Section 5.5.1. Refer Appendix C.

This scoping exercise has informed the level of assessment for each relevant environmental attribute (standard or detailed) and guided the preparation of the project specific Assessment Requirements presented in Sections 9 and 10.

The Project Specific Assessment Requirements are reflective of the Assessment Requirements Library available online at PlanSA. The Library is a planning practitioner's resource that provides draft standard and detailed Assessment Requirements, from which the initial project specific requirements are based. The Library also provides descriptions of each attribute and reference material to assist proponents in preparing an EIS.

The 'Detailed' Project Specific Assessment Requirements reflect the key issues identified above and should be given the greatest level of attention and detail in the EIS.

8 Post Decision Requirements

If the development is approved, final detailed design drawings / plans and project specific management plans will be required through reserved matters or conditions pursuant to section 115(6) and 115(7) of the PDI Act, to the satisfaction of the Minister for Planning.

Final detailed drawings / plans may include the following, drawn at an appropriate scale:

- Site plans clearly indicating all proposed buildings, structures and works, and demonstrating that key parts of the development will be contained within relevant allotment boundaries.
- Elevations showing all sides of buildings, structures and works with levels and height dimensions provided relative to ground level.
- Cross sections of the buildings, structures and works, including stockpile and storage facilities showing ground levels, floor levels, ceiling heights and maximum heights in Australian Height Datum
- Floor plans for each building or structure demonstrating what is proposed at each floor, with internal layouts.
- Final schedule of external materials, finishes and colours for the desalination plant.

A suite of management plans will capture all measures identified in the Applicant's EIS and Response Document, and the Commission's Assessment Report to avoid, mitigate, manage, offset and/or monitor environmental impacts during construction and operation of the development. Preparation of the plans will require consultation with DCCEEW, State Agencies, local Councils, Traditional Owners and others, as relevant. The suite of plans is expected to address both PDI Act and EPBC Act requirements and may include:

- Construction Environmental Management Plan (CEMP)
- Traffic Management Plan (TMP)

- Coastal and Marine Management Plan
- Hazard and Emergency Management Plan(s)
- Flora and Fauna Management Plan(s)
- Native Vegetation Clearance Data Report (final) including a Significant Environmental Benefit (SEB) Management Plan
- Threatened Species Management Plan
- Offset Strategy and Offset Management Plans for MNES
- Cultural Heritage Management Plan (CHMP)
- Greenhouse Gas Emissions Mitigation Plan
- Operational Environmental Management Plan (OEMP)
- Decommissioning and Rehabilitation Plan (DRP)

9 Summary of Project Specific Assessment Requirements – Commonwealth

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
Commonwealth Matters of National Environmental Significance (MNES)				
MNES1	Listed Threatened Species and Communities (Sections 18 and 18A – EPBC Act) controlling provision	To ensure the proposed action does not have unacceptable adverse impacts to the survival of the species.	An analysis is required for each listed threatened species and ecological communities that are known or likely to occur within the proposal site according to PMST (using a buffer of 5 km), which may include, but is not limited to, those identified in section 6.8 above, and is based on the likelihood of significant impacts and should follow the below structure. Description ▪ Describe each listed threatened species and ecological communities including EPBC Act listing status, abundance, distribution, ecology, and habitat preferences in both a regional and local context. These descriptions are to align with the information in the SPRAT database and relevant Commonwealth documents (Appendix B). Desktop analysis ▪ Describe the desktop assessment methodology used to inform the field surveys within and adjacent to, the site of the proposed action. ▪ Identify and describe historical records of listed threatened species and ecological communities in the broader region supported by an appropriate source (i.e. Commonwealth and State databases, published research, publicly available survey reports, etc.) (See Appendix B), including the year of the record and a brief habitat description. ▪ Where desktop analysis is the limit of the information being analysed justify this position. Survey efforts ▪ Detail methods, data and scientific literature used to assess the environmental values in the proposed action area and surroundings, including survey data and historical records for the relevant listed species with reference to DCCEEW documents (e.g. approved conservation advice, recovery plans, draft referral guidelines and listing advice, and the SPRAT Database), including published research and any other relevant sources. ▪ Justify any divergence from relevant Commonwealth and State guidelines or best practice survey guidelines at the time of the surveys with input from species experts and available scientific literature. ▪ Ensure surveys adhere to suitable standard for scope, timing and spatial and temporal replication, to maximise species detection. ▪ Include maps demonstrating survey effort and species distribution. ▪ Provide additional surveys to fill information gaps, from Cape Hardy to Mullaquana, SA. ▪ Provide lidar surveys of Malleefowl mounds in all potential and suitable habitats, and ground truth data identifying any nests within 500 m of the proposed action corridor. ▪ Consider camera trapping as suitable methodology for targeting Plains Mouse and other small mammal species, where required, in areas with potential suitable habitat. ▪ Consider Southern Whiteface population in a regional context, bringing it back to relevant IBRA region/s.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			Survey outcomes ▪ State the total number of records (individuals and evidence of presence) of listed threatened species and ecological communities within and adjacent to the proposed action. All records are to include the year of the record and a brief description of the habitat in which the record was identified. This data may be used by DCCEEW to update the relevant species distribution models that underpin the publicly available PMST. Habitat assessment ▪ Conduct a comprehensive habitat assessment focusing on quality, importance, and ecological function (e.g. for foraging, breeding, roosting or dispersal) for listed threatened species and communities within the proposed action area and surrounding areas. ▪ Base habitat assessments on field surveys and vegetation assessments, the SPRAT Database, relevant DCCEEW documents (e.g. approved conservation advice, recovery plans, listing advice, draft referral guidelines, etc.), published research and expert input, where necessary (See Appendix B). ▪ Map habitat type/s for relevant listed threatened species and ecological communities within and adjacent to the proposed action site, detailing the disturbance footprint (in ha) with an overlay of any EPBC habitats and known records of individuals from desktop analysis and/or field surveys. ▪ Note that the National Conservation Values Atlas Mapping System indicates important foraging habitat for the Australian Sea Lion and important migratory habitat for the Southern Right Whale, within the marine environment off Cape Hardy, SA. Impact assessment ▪ Describe and assess the likely short-term and long-term impacts (direct, indirect, facilitated, and cumulative) to listed threatened species and ecological communities within a 5 km buffer area of the proposed action according to PMST. ▪ Evaluate all relevant impacts with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database (Appendix B), including habitat clearance, fragmentation, degradation, injuries, disturbances (e.g., dust, light, vibration, noise), behavioural changes, pest/weed introduction, hydrological changes, water quality (including ecotoxicology assessment of concentrated seawater discharge), barriers to fauna movement. ▪ Identify action components and stages of the action and/or consequential actions that are of relevance to each listed threatened species and communities. ▪ Impacts discussion on these protected matters should address uncertainty (where applicable) and in the absence of information about impacts a precautionary approach or principle should be applied and the maximum potential impact assumed. ▪ The assessment of the impact to threatened ecological communities must include any relevant buffers that directly surround the patch. ▪ Provide maps which identifies the total amount of habitat (in ha) for each listed threatened species and communities in the disturbance footprint and the interaction or overlap between impacted habitat (where the	

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			disturbance footprint occurs) and retained habitat (areas that are not directly impacted by the disturbance), with tables of coordinates appended. ▪ Provide a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible. ▪ Assess how the action impacts the outcomes, objectives and targets of relevant reports and documents. Significant impact assessment ▪ Analyse the significance of the relevant impacts considering the species ecology and environment, potential threats, and using the DCCEEW's Significant impact guidelines 1.1 (2013) outline which significant impact criteria applies. ▪ Provide an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures have been applied. If residual significant impacts to protected matters are likely, please provide proposed offsets (described below). Avoidance, mitigation and management ▪ Describe all relevant species-specific measures to avoid, mitigate and manage potential impacts on listed threatened species and communities, aligning with key life-cycle events (e.g. key breeding periods) and assess expected effectiveness. ▪ Detail sedimentation and erosion mitigation measures particularly in relation to important habitats that relate to shorebirds and marine species. ▪ Describe measures to prevent oxidation of acid sulphate soils, treat and neutralise acid if formed and manage excavated material, where identified, and if relevant to a potential impact to MNES. ▪ Detail measures that aim to protect the soil seedbank of Yellow Swainson-pea, where habitat is present. ▪ Describe application of the mitigation hierarchy (avoid, mitigate and offset) as it relates to key activities and impacts to MNES. ▪ Ensure that avoidance, mitigation and management measures are aligned with the requirements of all EPBC Act relevant policy and guidance (Appendix B). ▪ Use committed language ('will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) for proposed measures, referencing relevant guidance or best practice. ▪ Present specific measures for impacted protected matters including the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue as stated in DCCEW's Environmental Management Plan Guidelines (Appendix B). Proposed offsets ▪ Should there be any residual significant impacts on MNES after the avoidance, mitigation and management measures have been applied then provide details of an offset package (this may be in the form of an offset strategy and offset management plan) proposed to be implemented to compensate for the residual impacts of the project. Provision of a complete offset strategy and its management plan can be considered as condition/s of approval. However, a preliminary strategy at a minimum, should be provided as part of the assessment to	

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			demonstrate a reasonable level of feasibility under Part 7 of the EPBC Act Environmental Offsets Policy (Appendix B).	
MNES2	Listed Migratory Species (Sections 20 and 20A – EPBC Act) controlling provision	To ensure the proposed action does not have unacceptable adverse impacts to the survival of the species	An analysis is required for each listed migratory species that are known or likely to occur within the proposal site according to PMST (using a buffer of 5km), which may include, but is not limited to, those identified in section 6.8 above, and is based on the likelihood of significant impacts and should follow the below structure. Description ▪ Describe each listed migratory species including EPBC Act listing status (if applicable), abundance, distribution, ecology, and habitat preferences in both a regional and local context. These descriptions are to align with the information in the SPRAT database and relevant Commonwealth documents (Appendix B). Desktop analysis ▪ Describe the desktop assessment methodology used to inform the field surveys within and adjacent to, the site of the proposed action. ▪ Identify and describe historical records of listed migratory species in the broader region supported by an appropriate source (i.e. Commonwealth and State databases, published research, publicly available survey reports, etc.), including the year of the record and a brief habitat description. Survey efforts ▪ Detail methods, data and scientific literature used to assess the environmental values in the proposed action area and surroundings, including survey data and historical records for the relevant listed species with reference to DCCEEW documents (e.g. approved conservation advice, recovery plans, draft referral guidelines and listing advice, and the SPRAT Database), including published research and any other relevant sources. ▪ Justify any divergence from relevant Commonwealth and State guidelines or best practice survey guidelines at the time of the surveys with input from species experts and available scientific literature. ▪ Ensure surveys adhere to suitable standard for scope, timing and spatial and temporal replication, to maximise species detection. ▪ Include maps demonstrating survey effort and species distribution. ▪ Provide additional surveys to fill information gaps, from Cape Hardy to Mullaquana, SA. ▪ Conduct targeted fauna surveys of listed migratory species likely to be significantly impacted including migratory shorebird species and the southern right whale, where potential and important habitats are identified. Refer to DCCEEW's Significant impact guidelines 1.1 (2013), Industry guidelines for avoiding, assessing and mitigating impacts of EPBC Act listed migratory shorebird species, the online National Conservation Values Atlas Mapping System, other relevant DCCEEW documents, i.e. from the SPRAT Database), including published research and other relevant sources (Appendix B). Survey outcomes ▪ State the total number of records (individuals and evidence of presence) of listed migratory species within and adjacent to the proposed action. All records are to include the year of the record and a brief description of the	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			ecological behaviour and habitat in which the record was identified. This data may be used by DCCEEW to update the relevant species distribution models that underpin the publicly available PMST. Habitat assessment ▪ Conduct a comprehensive habitat assessment focusing on quality, importance, and ecological function (e.g. for foraging, breeding, roosting or dispersal) for listed threatened species and communities within the proposed action area and surrounding areas. ▪ Base habitat assessments on field surveys and vegetation assessments, the SPRAT Database, relevant DCCEEW documents (e.g. approved conservation advice, recovery plans, listing advice, draft referral guidelines, etc.), published research and expert input, where necessary. (See Appendix B.) ▪ Map habitat type/s for relevant listed threatened species and ecological communities within and adjacent to the proposed action site, detailing the disturbance footprint (in ha) with an overlay of any EPBC habitats and known records of individuals from desktop analysis and/or field surveys. ▪ Map listed threatened ecological community, subtropical and temperate coastal saltmarsh (vulnerable) and any other beach habitats within or adjacent to the proposed action area that could be important habitat to any migratory shorebirds likely to be impacted. ▪ Note that the National Conservation Values Atlas Mapping System indicates important migratory habitat for the Southern Right Whale, within the marine environment off Cape Hardy, SA. Impact assessment ▪ Describe and assess the likely short-term and long-term impacts (direct, indirect, facilitated, and cumulative) to listed threatened species and ecological communities within a 5km buffer area of the proposed action according to PMST. ▪ Evaluate all relevant impacts with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database (Appendix B), including habitat clearance, fragmentation, degradation, injuries, disturbances (e.g., dust, light, vibration, noise), behavioural changes, pest/weed introduction, hydrological changes, water quality (including ecotoxicology assessment of concentrated seawater discharge), barriers to fauna movement. ▪ Identify action components and stages of the action and/or consequential actions that are of relevance to each listed migratory species. ▪ Impacts discussion on these protected matters should address uncertainty (where applicable) and in the absence of information about impacts a precautionary approach or principle should be applied and the maximum potential impact assumed. ▪ Provide maps which identifies the total amount of habitat (in ha) for each listed migratory species in the disturbance footprint and the interaction or overlap between impacted habitat (where the disturbance footprint occurs) and retained habitat (areas that are not directly impacted by the disturbance), with tables of coordinates appended. ▪ Provide a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible. ▪ Assess how the action impacts the outcomes, objectives and targets of relevant reports and documents.	

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			Significant impact assessment ▪ Analyse the significance of the relevant impacts considering the species ecology and environment, potential threats, and using the DCCEEW's Industry guidelines for avoiding, assessing and mitigating impacts on EPBC Act listed migratory shorebird species and Significant impact guidelines 1.1 (2013) (see Appendix B), outline which significant impact criteria applies. ▪ Provide an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures have been applied. If residual significant impacts to protected matters are likely, please provide proposed offsets (described below). Avoidance, mitigation, and management ▪ Describe all relevant species-specific measures to avoid, mitigate and manage potential impacts on listed migratory species, aligning with key life-cycle events (e.g. key breeding periods) and assess expected effectiveness. ▪ Detail sedimentation and erosion mitigation measures particularly in relation to important habitats that relate to migratory shorebirds and marine species. ▪ Describe measures to prevent oxidation of acid sulphate soils, treat and neutralise acid if formed and manage excavated material, where identified, and if relevant to a potential impact to MNES. ▪ Describe application of the mitigation hierarchy (avoid, mitigate and offset) as it relates to key activities and impacts to MNES. ▪ Ensure that avoidance, mitigation and management measures are aligned with the requirements of all EPBC Act relevant policy and guidance (Appendix B). ▪ Use committed language ('will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) for proposed measures, referencing relevant guidance or best practice. ▪ Present specific measures for impacted protected matters including the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility, and timing for each environmental issue as stated in DCCEW's Environmental Management Plan Guidelines (Appendix B). <u>Proposed offsets</u> ▪ Should there be any residual significant impacts on MNES after the avoidance, mitigation and management measures have been applied then provide details of an offset package (this may be in the form of an offset strategy and offset management plan) proposed to be implemented to compensate for the residual impacts of the project. Provision of a complete offset strategy and its management plan can be considered as condition/s of approval. However, a preliminary strategy at a minimum, should be provided as part of the assessment to demonstrate a reasonable level of feasibility under Part 7 of the EPBC Act Environmental Offsets Policy (Appendix B).	
MNES3	Commonwealth land (sections 26 and 27A)	To ensure the proposed action does not have	A Whole of Environment Assessment is required for Commonwealth Land, which may include, but is not limited to, those identified in section 6.8 above, and is based on the likelihood of significant impacts.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
	controlling provision	unacceptable adverse impacts on the whole environment relating to Commonwealth Land.	Environmental context ▪ Identify the areas, components or features of the environment that may be vulnerable to all impacts or especially vulnerable to certain kinds of impacts. Examples of environmental components which are likely to be vulnerable to all impacts include environmental components which have very specific environmental requirements, for example, some animal species, such as the Malleefowl, which have unique nesting requirements or environmental components which are non-renewable like certain plant species which are slow growing or slow to regenerate. Potential impacts ▪ Identify potential adverse impacts including both onsite and offsite, direct and indirect, and assess severity based on scale, intensity, duration, and frequency of the action (i.e., severe, moderate, minor). Significant impact assessment ▪ Describe the overall adverse impact of the action to Commonwealth Land within the proposed action area and nominated 5 km buffer in the context of the whole environment, particularly those elements of the environment which are sensitive or valuable. ▪ Analyse the significance of the relevant impacts (including direct, indirect, facilitated and cumulative) considering the whole of the environment, potential threats, and using the DCCEEW's Significant impact guidelines 1.1 (2013) and DCCEEW's Significant impact guidelines on Commonwealth land 1.2 (Appendix B), and outline which significant impact criteria applies. ▪ Should there be found to be no significant impacts on any of the identified Commonwealth Land, address where impacts do not exist and provide suitable justification to support this conclusion. ▪ Aassess from a 'whole of environment' context on impacts on landscapes and soils, coastal landscapes and process, ocean forms and life, water resources, pollutants, plants and animals, people and communities and heritage. ▪ Provide information on surplus soil management post pipeline installation. ▪ Identify components of the environment with special value and address any potential impacts on those components. This may include state-listed flora and fauna species, state heritage places, important landforms or geological features, and water bodies. ▪ Recommend targeted surveys for Malleefowl, Western Grasswren and Plains Mouse. Consider a longer-duration surveys for Plains Mouse with 'An introduction to camera trapping for wildlife surveys in Australia' (2012) and Paull et al. (2011) suggesting 'that a minimum deployment time for camera trapping studies on Australian small- and medium-sized mammals is 14 nights.', lidar surveys for potential Malleefowl mound nest locations and to fill information gaps for the Western Grasswren, within Cultana Training Area, north/north-west of the Whyalla Conservation Park. ▪ Where required, include emergency management plans. ▪ Describe potential impacts from supporting a temporary workforce, construction activities and disruptions to community services.	

Library Ref	Environmental Attribute	Objective	Method of Investigation	**Level of Assessment**
			▪ Survey for cultural heritage sites, assess potential impacts, and outline avoidance measures, where significant impact is identified. Avoidance, mitigation and management ▪ Detail measures to avoid, mitigate and manage impacts on the whole environment of Commonwealth Land. These measures are to be based on best available practices, appropriate standards, and supported by scientific evidence (e.g. outcomes of successful field trials, research papers, etc). ▪ Include proposed measures to avoid and mitigate the relevant impacts of the action on listed threatened species with identified critical habitat and cultural heritage sites on Commonwealth Land. ▪ Assess the predicted effectiveness of the proposed measures. ▪ Develop an engagement plan with the Australian National Railway Commission outlining avoidance and mitigation measures for active train tracks interacting with the main trunk water pipeline construction, where they intersect. In the absence of an engagement plan with ANRC, it will need to be clearly demonstrated how the horizontal bore drilling along active tracks and related construction activities will not significantly impact ANRC operations. ▪ Describe application of the mitigation hierarchy (avoid, mitigate and offset) as it relates to key activities and impacts to MNES. ▪ Ensure that avoidance, mitigation and management measures are aligned with the requirements of all EPBC Act relevant policy and guidance (Appendix B). ▪ Use committed language ('will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) for proposed measures, referencing relevant guidance or best practice. ▪ Present specific measures for impacted protected matters including the environmental objectives, performance criteria, monitoring, reporting, corrective action, responsibility and timing for each environmental issue as stated in DCCEW's Environmental Management Plan Guidelines (Appendix B). Proposed offsets ▪ Should there be any residual significant impacts on MNES after the avoidance, mitigation and management measures have been applied then provide details of an offset package (this may be in the form of an offset strategy and offset management plan) proposed to be implemented to compensate for the residual impacts of the project. Provision of a complete offset strategy and its management plan can be considered as condition/s of approval. However, a preliminary strategy at a minimum, should be provided as part of the assessment to demonstrate a reasonable level of feasibility under Part 7 of the EPBC Act Environmental Offsets Policy (Appendix B).	

10 Summary of Project Specific Assessment Requirements – State

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
Amenity and Environmental Quality (AEQ)				
AA1	NA	To ensure the selection of the site and concept design considered mitigation of impacts and risks to the surrounding environment.	▪ Describe location and design options considered for all project elements (including the desalination plant facility, water delivery pipeline, pump stations and storage sites, and electricity transmission infrastructure), reasons for selection and how the proposed location and /or design avoids and / or mitigates potential impacts and risks to the surrounding environment. ▪ Outline and justify any trade-offs in the design or operation of the development.	STANDARD
AEQ1	Air Quality	To ensure the development does not have unacceptable adverse air quality impacts on the surrounding receiving environment, in particular sensitive receivers in proximity to polluting development.	▪ Describe the existing air environment at the proposed development site and the surrounding area and airshed, including local and regional meteorology, existing sources of contaminants and background / ambient levels of air contaminants. ▪ Describe and illustrate the location of any sensitive receivers. All types of sensitive receivers should be identified, noting that some pollutants can affect health or amenity over shorter time periods than others, and for these pollutants a broader range of locations (e.g. commercial and industrial) should be considered as sensitive receivers. In addition, describe any other environmental values that could be impacted by emissions to air. ▪ Provide an emissions inventory and description of the characteristics of contaminants or materials that would be released from point and diffuse sources and fugitive emissions when carrying out the development activity. This should address construction, commissioning, operation, upset conditions, and closure of the proposed development. ▪ Provide an assessment of predicted impacts of emissions on sensitive receivers / environmental values of the receiving environment, that includes consideration of background levels of pollutants, in accordance with the Environment Protection (Air Quality) Policy 2016 (Air Quality EPP). Assessment should consider the sensitivity and assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts. ▪ Provide an assessment of the compatibility of the development's air emissions with existing or potential land uses in surrounding areas and the cumulative impact of emissions with other known releases of contaminants, materials or wastes associated with existing development and approved development (i.e. as described by approved plans and existing project approvals). ▪ Describe the proposed mitigation measures to protect the environmental values for air quality, how the relevant standards and indicators may be achieved. If required, revisit project design and construction methodologies to reduce air quality impacts to demonstrate that the Air Quality EPP and/or the general environmental duty under the *Environment Protection Act 1993* (EP Act) will be met.	STANDARD
AEQ2	Noise / Vibration	To ensure the development does not have unacceptable adverse noise or vibration impacts on the surrounding environment, in particular sensitive	<u>General</u> ▪ Describe and illustrate the locations of any noise and vibration sensitive receivers both proposed or existing (including marine and terrestrial fauna). Also describe any other environmental values that could be impacted by noise emitted from or to the development. ▪ Describe current background noise and vibration levels at sensitive receivers, including their location, who they are, and how have they been defined. Note – the analysis must clearly identify all types of sensitive receivers, noting that these could include commercial/industrial land uses, and for the protection of the workers at those sites.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
		receivers in proximity to noise sources.	▪ Describe sources and characteristics of noise and vibration that would be emitted during the construction, commissioning, operation, upset conditions, and closure of the development. ▪ If MNES have been identified, undertake an assessment of potential noise impacts to MNES. ▪ Provide an assessment of the compatibility of the development's noise emissions with existing or potential land uses in surrounding areas and the cumulative impact of emissions with other known noise / vibration emissions associated with existing development and approved development (i.e. as described by approved plans and existing project approvals). ▪ Describe noise emission and vibration impacts on fauna, including nocturnal species, and how these impacts will be managed. ▪ Describe and design strategies to mitigate noise and vibration impacts during construction, commissioning, operation, upset conditions and closure of the development, to demonstrate compliance with relevant legislation, guidelines and standards including, but not limited to: – *Environment Protection (Commercial & Industrial Noise) Policy 2023*. – *Environmental Protection Act 1993* (environmental duty and relevant environmental authorisations). – *Local Nuisance and Litter Control Act 2016*. – Guideline for the Management of Noise and Vibration: Construction and Maintenance Activities, DIT, October 2021. – AS 2436 Guide to Noise and Vibration Control on Construction, Demolition and Maintenance Sites. <u>Underwater noise</u> ▪ Undertake an underwater noise assessment covering both construction and operation of the desalination plant facility. The assessment should include / consider: – Noise from the development including piling, dredging, drilling, shipping movements, onshore blasting and operation of the desalination plant. – Impacts to marine flora and fauna including cetaceans. – Examine the base case and future case scenarios including the approved Iron Road port. – Consider the potential short-term and long-term impacts. ▪ Demonstrate how the development will meet the General Environmental Duty under the EP Act with respect to underwater noise. ▪ Describe and design environmental management strategies to mitigate noise and vibration impacts of underwater noise on marine flora and fauna.	
AEQ3	Transport and Traffic	To ensure impacts to the safety and efficiency of transport modes and the broader transport and traffic system and infrastructure are avoided or mitigated.	<u>Road operations</u> ▪ A Transport and Access Impact Assessment should be prepared by a suitably qualified traffic engineer, evaluating current and proposed access arrangements and development related transport impacts including the effect on the arterial road network, and vehicle interface with the local road network. Any assessment must address implications for the entire supply chain and the transport, traffic and access impact for the construction, operation, maintenance and decommissioning phases. ▪ The assessment should determine the transport system asset improvements, asset management / maintenance requirements, and operational management requirements to accommodate the increase in movements and/or vehicle sizes/mass for affected transport assets and services across all modes for the proposal's construction / implementation and operational phases. The assessment should provide where relevant:	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– A summary of the transport task for the development (including workforce and end-to-end supply chain (input and output)) during construction, operations and decommissioning phases of the development. This should address predicted traffic volumes, proposed vehicle types, number/frequencies, hours of activity and traffic peaks, any requirements that are outside of the current gazetted heavy vehicle networks, and any measures required to ensure compliance with the 'Heavy Vehicle National Law'. – A description of the existing transport and traffic environment (using traffic data, accident statistics) and include (where relevant) public transport networks, car parking, school bus routes, and public pedestrian, cycle pathways or trails. – Any operational management measures to minimise delays and ensure safety and/or accommodate (where relevant) for other transport users (e.g. temporary road closures/detours, impact on school bus routes, alternative or new facilities), including transport of plant and equipment to/from the site. – Requirements for temporary or permanent upgrades and modifications to roads or rail infrastructure (including rail crossings and bridges), upgrades to road pavements and surfaces, access on arterial and / or local roads and car parking as a result of the development including any increase (temporary or ongoing) in maintenance requirements of transport assets. – Any management measures for transport of hazardous materials. – Identify any laydown areas or accommodation areas that will generate traffic movements and interfaces with public road and rail networks. – Describe potential impacts of the development on Public Access Routes (PARs) through pastoral leases. Consider access and/or closure requirements during construction and operation, and potential damage, maintenance and repair arrangements. – Describe how identified impacts to transport and access will be mitigated. Mitigation strategies may include upgrade or traffic management works, contributions or other strategies that can be documented in a traffic management plan. Strategies must be prepared in close consultation with relevant transport authorities, including local government. <u>Maritime operations</u> ▪ Identify any marine or port infrastructure (new or amendments) required to facilitate the development (eg module offloading facilities if required), and their interface with transport routes and networks. ▪ Describe expected marine traffic volumes to and from port / wharves and the desalination plant development site, including expected boat/ship movements, timing and patterns. ▪ Describe marine traffic impacts associated with these movements (e.g. interaction with other vessels, impacts to navigation aids) including to existing operators (e.g. commercial fisheries, tourist operators, recreational users). ▪ Describe the impacts of any marine structures on maritime operations and management of these impacts. ▪ Discuss the measures that will be undertaken to mitigate these impacts and any safety measures that will be implemented to ensure public safety and that enable compliance with relevant marine, navigation and ports legislation and operational arrangements. <u>Rail operations</u> ▪ Assess the potential impacts of any temporary or permanent disruption of existing freight and passenger rail services.	

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			▪ Discuss the measures that will be undertaken to mitigate these impacts and enable compliance with rail legislation and operational arrangements. <u>Air operations</u> ▪ Describe any features of the project that could impact on air transport, including registered aerodromes and private airfields. ▪ Discuss the measures that will be undertaken to mitigate these impacts.	
AEQ4	Visual Amenity	To ensure adverse effects on visual amenity, landscape and open space values, including Aboriginal cultural values, are avoided or minimised and opportunities to enhance these values are maximised.	<u>Desalination Plant</u> ▪ Provide a description of the landscape character, features and values of the development area and its environs, including Aboriginal cultural values. ▪ Describe the effects of the development on visual amenity and landscape quality for residents and visitors for both near and distant views, from important viewing points, including from the land and sea. Describe the effects of the development on culturally significant sightlines. This should include construction, operations and closure / rehabilitation aspects of the proposal. ▪ Provide a visual analysis of the constructed desalination plant facility using photomontages which includes: – A depiction of proposed built form / structures and site levels, set within the local topography. – The photomontages should depict the development from key viewpoints including public roads, sensitive receptors, and important viewing points (including from the land and sea). – The photomontages should depict the main elements of the approved Iron Road major development (as far as practically possible) to consider cumulative impact on visual amenity and landscape quality. – A 3D representation of the desalination plant facility either in model or video form. ▪ Describe the potential for visual amenity impacts from night lighting at the desalination plant site and measures to mitigate visual impact. ▪ Describe the rationale for the major design elements of the proposed development and measures to mitigate their visual impact. If required, revisit project design and siting and/or consider other mitigation strategies developed in consultation with Traditional Owners to maintain culturally significant sightlines to the extent possible. ▪ Describe how the design and construction of all buildings and structures will be controlled to ensure cohesive visual amenity, including details of construction materials, colours and landscaping for all buildings and structures. ▪ Describe the use of screening / amenity / landscape plantings, and any broad scale revegetation of the disturbance footprint, including opportunities for the use of locally endemic species. <u>Ancillary Water and Electricity Transmission Infrastructure</u> ▪ Provide a description of the landscape character, features and values of the development area and its environs, including Aboriginal cultural values. ▪ Where there is potential to impact on sensitive receptors, culturally significant sightlines, and/or major public roads, provide a visual analysis of the electricity transmission infrastructure. The analysis should include photomontages or perspectives (or similar) showing the proposed development from near and distant views (as relevant). ▪ If required, revisit project design and siting and/or consider other mitigation strategies developed in consultation with Traditional Owners to maintain culturally significant sightlines to the extent possible. ▪ Describe the proposed revegetation of disturbance footprints, including opportunities for the use of locally endemic species.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
Biological Environment (BE)				
BE1	Biosecurity	To ensure that construction and operation of the development avoids the introduction or spread of biosecurity threats including pest or nuisance animal and plant species (including marine pests), diseases and pathogens.	<u>Terrestrial / Aquatic</u> ▪ Describe the extent and significance of existing exotic, pest or nuisance plant and animal species, diseases and pathogens in the development's terrestrial and aquatic environs. ▪ Describe the existing uses and environmental values of the development's terrestrial and aquatic environs and any sensitive places and receivers which may be impacted by introduced biosecurity threats. ▪ Identify the potential for the introduction or dispersal of new exotic, pest or nuisance plant and animal species, diseases and pathogens, and the associated implications for native species, habitat, agricultural land and other environmental values. ▪ Identify the potential for increased distribution and abundance of existing exotic, pest or nuisance plant and animal species, disease and pathogens, and the associated implications for native species, habitat, agricultural land and other environmental values. ▪ Propose measures to remove, control and limit the introduction or spread of exotic, pest or nuisance plants and animals, diseases and pathogens on the development site and any areas under the proponent's control (e.g. decontamination of vehicles, mobile plant, equipment and materials), having regard to the effectiveness of such mitigation measures in the past. This includes declared plants and animals under relevant State and Commonwealth legislation. <u>Marine</u> ▪ Describe the extent and significance of existing exotic, pest or nuisance plant and animal species, diseases and pathogens in the development's marine environs. ▪ Describe the existing uses and environmental values of the development's marine environs and any sensitive places and receivers which may be impacted by introduced biosecurity threats. ▪ For the construction phase, provide a biosecurity risk analysis that outlines the potential risk of introduction of exotic marine organisms and disease (e.g. operation of vessels or barges supporting construction activities) and measures proposed to eliminate this risk, including strategies to prevent their introduction to marine waters surrounding Cape Hardy. ▪ Detail the response procedure that will be followed in the event of a new exotic organism being detected and describe the system of surveillance monitoring.	STANDARD
BE2	Marine Flora and Fauna	To ensure that the nature and scale of the development avoids or minimises adverse effects on biodiversity, threatened and protected marine flora and fauna species, their ecological communities and habitat	▪ Provide an assessment undertaken by an appropriately qualified specialist of the direct, indirect and cumulative effects of the development on marine flora and fauna, ecological communities and populations, that may occur over the life of the development: – Describe the distribution, abundance, condition and significance of flora and fauna species, and populations, and marine habitats at Cape Hardy. The assessment should consider and/or include a) benthic habitat and plankton surveys; b) ecologically important species; c) economically important species, particularly for the commercial and recreational fisheries and aquaculture industries (both existing and potential future sites in the region) including spat survival / collection; and d) species that are totemic and/or of significance to the cultural traditions of Traditional Owners.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– Describe the ability of communities, populations or individual species to recover, regenerate or be rehabilitated during construction and operation including maintenance. – Describe the measures that will be taken to address displaced flora and fauna (if any). – Incorporate the outputs of the underwater noise (AEQ2), physical coastal and marine (PE1), and biosecurity (BE1) assessments, and incorporate suitable avoidance and mitigation measures in line with those and other relevant assessments. – Detail any residual impacts that cannot be avoided and propose measures to offset the residual loss. – Mitigation and offset strategies for totemic and/or culturally significant species should be developed in consultation with Traditional Owners.	
BE3	Terrestrial Flora and Fauna	To ensure that the nature and scale of the development avoids or minimises adverse effects on biodiversity, threatened and protected terrestrial and aquatic flora and fauna species, their ecological communities and habitat.	▪ Prepare a draft Native Vegetation Clearance Data Report prepared by an Accredited Consultant approved by the Native Vegetation Council. The assessment should undertake a survey of the vegetation (including EPBC Act Listed threatened species and communities), detail compliance with the impact mitigation hierarchy and describe how the significant environmental benefit would be achieved (and attaching a copy of a draft Significant Environmental Benefit Management Plan if developed). ▪ Provide an assessment undertaken by an appropriately qualified specialist of the direct, indirect and cumulative effects of the development on terrestrial flora and fauna, ecological communities and populations, that may occur over the life of the development: – Describe the location, extent, condition and significance of flora and fauna species and populations that may be affected during construction and operation. Consider ecologically important species, economically important species, and species that are totemic and/or of significance to the cultural traditions of Traditional Owners. – Identify significant wildlife habitat and characterise wildlife movement within the broader development area that could be directly or indirectly impacted by the development including alteration of habitat conditions (e.g. habitat fragmentation, severance of wildlife corridors or habitat linkages) that may occur over the life of the development. Assess the potential impacts on habitat connectivity of listed or other protected fauna species including but not limited to migratory species. – Include alteration of conditions that may directly or indirectly impact wetland, riparian and in-stream environments and undertake an assessment of the impacts of the development on aquatic ecology (where relevant). – Detail any changes in biological diversity that may result at the interface between the development and existing native vegetation (i.e. the ‘edge effect’) during construction and over the life of the development. – Describe the ability of communities, populations or individual species to recover, regenerate or be rehabilitated during construction and operation including maintenance. – Assess the ability of habitat to recover, especially for resident or migratory shore birds and listed threatened or significant species. – Assess the effects of artificial light from the desalination plant on fauna species for which artificial light has been demonstrated to affect behaviour, survivorship or reproduction (if any). Consider impact in accordance with the *National Light Pollution Guidelines for Wildlife*. – Describe the measures that will be taken to address displaced native fauna (if any). – Detail suitable avoidance and mitigation measures to minimise impact to flora and fauna.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– Detail any residual impacts that cannot be avoided and propose measures to offset the residual loss. – Mitigation and offset strategies for totemic and/or culturally significant species should be developed in consultation with Traditional Owners.	
Climate Change and Resource Efficiency (CCRE)				
CCRE1	Climate Change Adaptation	To ensure that development and design are climate resilient and risks from climate change are reduced.	▪ Undertake a climate risk assessment of the relevant potential impacts on the development of projected climate change over the lifetime of the development (e.g. increasing temperatures, extreme heat and heat waves, decline in rainfall, increased drought, extreme rainfall events, harsher fire weather, sea level rise, salinity of marine waters). Include proposed adaptive management strategies. Indicate how the site selection has incorporated climate change adaptation considerations. ▪ For developments with a lifetime to 2050 or before, the risk assessment should be based on climate projections from the RCP 8.5 scenario (high greenhouse gas emissions scenario). For developments with a lifetime beyond 2050, the risk assessment should be based on climate projections under both the RCP 8.5 and RCP 4.5 scenario (moderate greenhouse gas emissions scenario). ▪ Examine the potential cumulative effects of climate change from a risk management perspective (including adaptive management strategies). ▪ Outline the potential effects of, and identify strategies to protect against, extreme weather events, including a 1% AEP storm event and sea level rise as per Coast Protection Board policy and allowances from a risk management perspective, including adaptive management strategies. Include mitigation strategies should the structure not withstand such an event.	STANDARD
CCRE2	Greenhouse Gas Emissions	To ensure the development minimises greenhouse gas emissions through the design of the desalination plant and associated with its construction and operation so as to meet South Australia's goal to reduce greenhouse gas emissions by more than 50% below 2005 levels by 2030 and achieve net zero emissions by 2050.	▪ Describe the electricity consumption requirements for the development and identify the proposed energy sources. ▪ Undertake a greenhouse gas assessment that: – identifies all sources GHG emissions that would be generated – provides the estimated annual GHG emissions from each source – provides an estimate of yearly net GHG emissions and emissions intensity, including an uncertainty assessment – provide an inventory of projected annual Scope 1 and Scope 2 emissions for each GHG over the life of the development. Provide an estimate of annual Scope 3 GHG emissions for the life of the development. ▪ Describe GHG mitigations including: – A description of how the project will contribute to meeting South Australia's emissions targets i.e. 100% renewable energy target by 2030, 50% emissions reduction below 2005 level by 2030 and zero net emissions by 2050. – A description of measures that have been incorporated in the design to minimise, reduce and ameliorate greenhouse gas emissions, particularly the use of alternative or renewable energy sources and off-sets, energy efficiency and energy conservation measures, and if it incorporates integrated passive design principles and climate-responsive techniques and features and identify barriers to implementation.	STANDARD
CCRE3	Sustainable Use of Resources	To ensure opportunities to procure and use resources efficiently and sustainably are maximised, supporting	▪ Describe the sustainability objectives of the development and the approach and methodology used to achieve these objectives. ▪ Describe design guidelines for aspects of the development (including transport options) that would be adopted to ensure sustainability. ▪ Describe how sustainability of the development will be audited.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
		South Australia's transition to the circular economy	▪ Identify ways in which power use can be minimised or supplemented, especially using alternative energy sources, energy efficient measures and energy conservation. ▪ Describe the proposed approach to matters such as design, construction methods, materials and equipment to reduce energy use (including vehicle emissions), disposal of waste, water use efficiency during construction and operation over the life of the project. ▪ Describe the capacity for ancillary infrastructure at the desalination plant site (including electricity transmission infrastructure, roads, stormwater management) to be augmented and/or upgraded to cater for future development in the precinct. ▪ Describe how the development may impact reliance on existing climate-dependent water resources in the region (River Murray, Great Artesian Basin and local groundwater sources).	
CCRE4	Waste Management	To ensure that waste generated, transported or received as part of the development is managed in accordance with the waste hierarchy and in a manner that protects all environmental values.	▪ Identify, quantify and classify all the expected waste streams to be generated from the proposed project activities during the construction, operation, rehabilitation and decommissioning phases of the development. ▪ Assess and describe the proposed management measures against the waste management hierarchy, namely: avoid and reduce waste generation, recycle, reuse, recover, treatment and disposal. This includes the generation, storage and transport of waste.	STANDARD
Land, Regional and State Economies (LRSE)				
LRSE1	Local, regional and state economies	To ensure adverse economic impacts arising from construction and operation of the development are avoided or mitigated, and net economic benefits to the region and state are created	▪ Provide a full economic analysis of the development including the long-term economic viability and efficiency of the operational aspects of the development, incorporating a regional impact analysis (RIA) and cost-benefit (risk return) analysis (CBA). ▪ The RIA should focus on the direct impact of the project on the local, regional and state economies. The identification of economic impacts should include the prediction of spending on goods, services, taxes etc. during construction and operation of the project and the distribution of income generated by the project. ▪ The CBA should assess the impact of the project on the economic welfare of the economies of interest by estimating a dollar value for as many economic, social and environmental benefits and costs as can reasonably be predicted. ▪ Consideration of regional economic impacts should include: – An outline of the skill level requirements of any new workforce, the component of the workforce that is expected to be hired locally, and the type of employment this would entail (e.g. full time, permanent, sub-contractors, casual, skilled labour, truck drivers etc) and identify if this employment would be continuous/year-round. – An assessment of potential impacts on existing, future (ie approved), and envisaged (ie zoned) significant economic activities and facilities in the region including industrial, commercial, tourism (including aquaculture tourism), and primary industries (mining, agriculture, horticulture, viticulture, aquaculture, fisheries). – Describe the full potential aquaculture activity within nearby designated aquaculture zones (ie based on the 'prescribed criteria' within the relevant aquaculture zone policy, pursuant to the *Aquaculture Act 2001*), including the Port Neill Aquaculture Zone, and assess potential impacts of the development on future aquaculture investment and activity (including investment attraction).	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– Identification of the impacts of the development will have on existing users of distribution networks for gas, electricity, waste, potable water, sewerage, and communication systems. ▪ Describe any potential economic effects locally and regionally and the potential to attract value add development and commercial ventures including: – employment opportunities and the expected impacts on the local work force during construction and operational stages and flow-on impacts on local business. – information on local and indigenous employment and training opportunities associated with the proposal. – the economic effect of the construction and on-going workforce regionally. Include consideration of impact of development on existing industries and local businesses if workers change employment e.g. mining taking skilled workers from trades and primary industries due to higher wages. – effects on accommodation supply and demand. – an analysis of existing supply chain and prospective suppliers, as well as any gaps in the supply chain – secondary economic effects, including property and land values, potential to attract new industries and commercial ventures. Describe the positive and negative effects on existing businesses / industries (e.g. displacement, competition or opportunities). – the proposal's anticipated effect on State and local investment, research and development, educational effects, employment generation and flow-on impacts on business. – the proposal's anticipated effect on State and local investment and the region as a whole, identifying employment and investment opportunities, including the 'multiplier effect' for the local area, the broader regional economy and community and South Australia. – any economic implications for the State and the region if the development does not proceed, including reliance on existing climate-dependent water resources and resultant limits on growth.	
Hazards and Risks (HR)				
HR0	General	To ensure the risk of, and adverse impacts from natural and man-made hazards from the development are avoided, minimised or mitigated to protect people, property and the environment.	▪ Undertake a hazard and risk assessment in accordance with *AS/NZS ISO 31000:2018 Risk management guidelines* and with *HB203:2006 Environmental risk management principles and processes* which describes the potential risks to people, property and the environment during all stages of development. The assessment shall address the specific requirements listed in HR 2, 3, 4 below.	STANDARD
HR1	Bushfire / Fire	As above	▪ Evaluate and identify any bushfire risks, in particular how risks from bushfire will be minimised with regards to the potential for uncontrolled bushfire events, high levels and exposure to ember attack, impact from burning debris, radiant heat, likelihood and direct exposure to flames from a fire front. ▪ Explain how buildings and structures will be designed, configured, sited and the use of materials in order to reduce the impact of bushfire. ▪ Evaluate the risk of fire originating from the development and any potential impacts to people, property and the environment. ▪ Describe measures that would be taken to avoid and minimise the risks of these events during all stages of development.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
HR2	Flooding	As above	▪ Undertake a quantitative flood assessment for the desalination plant site (Cape Hardy) including: – Describe the history of flooding onsite and in proximity to the development site. – Describe current flood risk for a range of annual exceedance probabilities up to the probable maximum flood for the development site. – Undertake flood modelling, using MUSIC and DRAINS tools, to assess how the desalination plant may potentially change flooding and run-off characteristics on-site and both upstream and downstream of the site. – Identify the potential impacts on people, property, infrastructure, and the environment from potential flood risk. – Describe measures that would be taken to avoid and minimise the risks of these events during all stages of development. ▪ Undertake a qualitative flood assessment for all substation, pump station, and water storage sites including: – Describe the history of flooding onsite and in proximity to the development site. – Describe current flood risk for the development site. – Where applicable, describe how the development may potentially change flooding and run-off characteristics on-site and both upstream and downstream of the site. – Where applicable, identify the potential impacts on people, property, infrastructure, and the environment from potential flood risk. – Where applicable, describe measures that would be taken to avoid and minimise the risks of these events during all stages of development.	STANDARD
HR3	Site and Groundwater Contamination	As above	▪ Describe the historical land use and potential for contamination of soils and sediments and describe any known or suspected soil contamination that could be re-suspended, released or otherwise disturbed as a result of the development. ▪ Detail any known or potential sources of contaminated of groundwater that could be impacted by the development. ▪ Detail procedures to be adopted to confirm whether site contamination exists (such as site history, site audit, and site contamination reporting) and any remedial measures proposed. ▪ Demonstrate compliance with the assessment methodology and site acceptability requirements for the intended use(s) of the development sought by Practice Direction 14 Site Contamination Assessment 2021. ▪ Site and groundwater contamination assessment undertaken in accordance with the National Environment Protection (Assessment of Site Contamination) Measure (ASC NEPM), the EPA Guidelines for the assessment and remediation of site contamination and any other relevant guidance issued by the EPA. ▪ Describe measures that would be taken to avoid and minimise the risks of these events during all stages of development.	STANDARD
HR4	Dangerous Substances including marine spill management	As above	▪ Identify all dangerous and hazardous substances and any explosives to be used, transported, stored, processed or produced and the rate of usage. ▪ Describe the use, handling and disposal of these materials during construction and operation, with reference to storage (including any associated fire protection facilities). ▪ Describe how hazardous contaminants and waste substances produced by the development will be treated or contained until their disposal at an approved facility. ▪ Evaluate the potential effects of any accidents involving dangerous substances on the environment and public health.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			▪ Describe measures that would be taken to avoid and minimise the risks of these events during all stages of development.	
Land Use and Site Conditions (LUSC)				
LUSC1	Land tenure, protected areas and land use	To ensure that the impacts of development on environmental, social and economic values of adjoining land uses, land tenures and protected areas are avoided or minimised.	▪ Provide details of the existing land uses, land tenures and protected areas at, overlapping or adjoining the development site (including with the use of maps) which may be impacted by the development including: – relevant Planning Code Overlays and Zones. – existing or potential native title rights, claims and interests (including with the use of maps) including: a) land or waters where native title has been determined to exist by the Federal Court b) land or waters that are covered by a native title determination application c) land or waters that are covered by a registered Indigenous Land Use Agreement. – Crown land, pastoral leases, petroleum and mining tenements, Native Vegetation Heritage Agreements or any other relevant land tenures (including leases and licences). – areas protected under legislation or Special Legislative Schemes. – designated aquaculture zones in the Spencer Gulf, including the Port Neill Aquaculture Zone. – Iron Road's existing development approval under the *Development Act 1993* (repealed) for a deep-sea port and associated infrastructure at Cape Hardy. ▪ Provide details of the development (activities or structures) with the potential to impact on the existing land uses, approved developments, land tenures and protected areas listed above, during all stages of the development (construction, operation (including maintenance) and decommissioning). ▪ Describe any measures to mitigate these impacts.	STANDARD
Physical Environment (PE)				
PE1	Coastal and Marine	To ensure the natural features and processes of coastal systems are protected so that the environmental, economic and cultural values of the coast are maintained. To ensure the quality and productivity of marine waters, sediment and biota are protected so that environmental values are maintained and impacts to commercial industries (eg fisheries and aquaculture) which rely on them are minimised.	<u>Desalination Plant – General</u> ▪ Describe coastal engineering requirements for the location, orientation and type of infrastructure. ▪ Undertake a qualitative assessment of the potential impact of the proposed coastal works on the local sediment transport regime. ▪ Describe materials that will be used to construct the infrastructure, including any treatment that the materials may have been subject to, prior to immersion in water. ▪ Describe the impacts of infrastructure construction on foreshore, intertidal, seabed, benthic and pelagic environments (especially any nursery/spawning areas). Describe measures that will be undertaken to mitigate these impacts. ▪ Describe, and provide baseline information on, the existing seabed profile, bathymetry, sedimentary profiles (including particle sizes), sand movement, water flow and tidal movement patterns through and around the proposed infrastructure. ▪ Identify any possible changes to the seabed, bathymetry, sedimentary profiles (including particle sizes), and sand movement water flow and tidal movement patterns as a result of the development during both the construction and operational phases. Identify the impacts this may have on sensitive marine flora and fauna, aquaculture activities (existing and potential future), commercial and recreational fishing in the region, and outline mitigation strategies. ▪ Describe the contaminants and toxicants that may accumulate on the site and the risks during stormwater events (where not managed) to the adjacent aquatic environments and commercial industries (e.g. fisheries and aquaculture) that rely on those environments.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			▪ Identify the risks from the exposure of fine sediments or clays that would impact adversely on water quality (turbidity and light penetration) and contribute to the production of sediment plumes in the region during both construction and operation phases. Outline the impacts this may have on commercial aquaculture activities in the region. Discuss the presence and risks of any chemicals in sediments potentially disturbed during construction or operation. ▪ Detail measures to protect foreshore areas during and after construction, including potential marine and terrestrial protection areas and associated buffers. <u>Desalination Plant – Operational Marine Discharge</u> ▪ Undertake detailed investigations relating to operational marine discharge of the desalination plant to provide adequate understanding of existing values, physical and ecological processes, sensitivities to predicted project effects and the potential impacts of such effects. Investigations should include: – Marine sediments and water quality: establish baseline water quality within the vicinity of the intake and outfall infrastructure. – Plume dispersion: use hydrodynamic modelling of multiple plant flow regimes and receiving environment conditions (eg capture low currents and quiescent weather conditions, as well as impacts of staged delivery of the desalination plant) to determine the dilution and dispersion of the concentrated seawater in the local environment and determine impacts of the desalination plant on the hydrodynamics of Spencer Gulf. Investigate the potential for long term effects of salinity in Spencer Gulf (in combination with climate change). – Use nearfield plume modelling to demonstrate the plume does not break the surface directly after discharge and the degree of dilution at impact with the seabed. – Use midfield modelling to outline benthic and pelagic flora and fauna communities potentially exposed to desalination plant discharge (including recreational and commercial fisheries and aquaculture species) and evaluate risk. – Describe the likely constituents and toxicity of any chemical treatments, additives, or any other chemicals (including brine) that may be discharged to the marine environment (single chemical toxicity). Outline the degree of dilution required to ensure that “95% protection level” of representative local species are protected from any chronic impacts from the discharge (whole effluent toxicity). – Modelling of seawater intake to consider larval entrainment, and assess the impacts on the marine environment, including recreational and commercial fisheries and aquaculture species. ▪ Describe management and mitigation measures that could be implemented to reduce environmental risk from operational marine discharge.	
PE2	Soils, Landform and Geology	To ensure development is undertaken in a manner that protects the productivity and quality land including, soil, subsoil and landform and avoids impact to other environmental values.	▪ Provide a detailed description of the soils, landform and geology in the area of the development including the potential for water and wind erosion, soil salinity, acid sulfate soils and soil contamination. The description should: – Characterise soil types and structures in the development area and identify the potential location and disturbance of dispersive, acid sulfate, saline or potentially contaminated soils, or soils of other special characteristics that could affect or be affected by the development. – Identify hydrological, geomorphic or meteorological conditions that may contribute to susceptibility to erosion (e.g., channels, steep slopes, wind).	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– Identify any areas of ground instability and any ground conditions that may be susceptible to subsidence from development activities (e.g. tunnelling, deep excavation, dewatering) and direct and indirect changes to vegetative cover. Identify properties, structures and infrastructure that may be susceptible to subsidence. ▪ Describe the development activities with potential to impact on soils and ground stability. ▪ Address the implications of seismicity in the area in relation to both the construction and operation of the development. ▪ Identify the risks of contamination of land from spills of fuel (or other toxic substances). Describe measures for the prevention and containment of spills, describe the contingency plans to be implemented in the event of spills, and comment on their expected effectiveness. ▪ If acid sulfate soils would be disturbed or unexpectedly encountered during construction, describe measures to avoid oxidation of the sulfides, treat and neutralise the acid if it forms and manage any excavated material. ▪ Ensure that appropriate soil contamination investigations have been undertaken and that soil generated from earthworks is managed in accordance with EPA guidelines, including for re-use on site or removal of material off-site for re-use, treatment or disposal.	
PE3	Surface Water and Groundwater	To ensure the quality of groundwater and surface water is protected so that environmental values including ecological health, cultural heritage values, land uses and the welfare and amenity of people are maintained.	<u>Surface Water</u> ▪ Describe existing surface water environmental conditions upstream and downstream of the development area (including seasonal variations and variations with flow) of waterbodies, watercourses, drainage channels, wetlands and floodplains. Water quality, including any existing site contamination and potential sources of surface water pollution should be addressed. ▪ Describe present and potential users and uses of water in areas which may be affected by the development, including residential, municipal, agricultural, industrial, recreational and environmental uses of water. Describe surface water / groundwaters that are (or may be) of cultural significance to Traditional Owners. ▪ If MNES have been identified, undertake an assessment of potential impacts to surface and groundwater relevant to the MNES. ▪ Describe the legislative, regulatory and planning contexts for surface water that apply to the development. ▪ Describe the potential for pollution (e.g. sediment plumes, spills to land and water, discharge of stormwater and wastewater, dewatering) of water bodies, watercourses, drainage channels, wetlands and floodplains during construction and operation. Identify locations where discharge to surface waters or land may occur during construction, operation or decommissioning of the development. ▪ Describe how erosion and capture of sediment will be minimised and managed during construction of the pipeline network and the electricity transmission lines. ▪ Describe potential alteration to surface water flows as a result of the development (including to water bodies, watercourses, wetlands, floodplains, beds and banks) and include details of the nature of the works. Discuss the implications of these changes for downstream water uses, and impacts on environmental and cultural heritage values, and describe how these impacts will be minimised. ▪ Describe how drainage and flow of watercourses will be maintained in the operational phase of the proposed pipeline network. ▪ Describe the options for supplying water to the development including potable water (if relevant) and temporary demands during the construction period. Describe on-site storage and treatment requirements for wastewater from accommodation and/or offices and workshops.	STANDARD

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			▪ Identify the risks of contamination of land from spills of fuel (or other toxic substances). Describe measures for the prevention and containment of spills, describe the contingency plans to be implemented in the event of spills, and comment on their expected effectiveness. ▪ Describe the proposed mitigation measures to protect environmental and cultural heritage values for surface water quality during construction and operation. Provide details of proposed wastewater and stormwater management, as well as any water sensitive design features as part of the development. If required, revisit project design and construction methodologies to reduce impacts surface water quality to demonstrate that the Environmental Protection (Water Quality) Policy 2015 (Water Quality EPP) will be met. – Describe wastewater capture, management and treatment for: a) Any process wastewater if applicable (other than the marine discharge from the desalination plant). b) Staff facilities wastewater. – Stormwater management should clearly describe: c) All methods of proposed drainage on site, the sizing of all elements including the direction of any drainage leaving the site and how frequently runoff will leave the site. d) How clean runoff (e.g. from the roof) will be separated from contaminated runoff. e) How all contaminated runoff will be captured, retained and treated. f) All proposed stormwater treatment measures on site including the sizing of all elements. g) How any upstream stormwater is managed/ diverted around the site. h) All bunding details. ▪ Describe measures to manage construction impacts including stockpile management and storage to minimise potential adverse effects on local hydrology and water quality, restoring soil profiles, drainage and productivity, as well as landscape rehabilitation in the context of decommissioning of earth structures. Describe how erosion will be minimised and sediment capture controls where required (e.g. temporary berms, controlling water movement into and around the site, stockpile management and stabilisation of non-paved operational areas. ▪ Describe the indirect environmental benefits to existing surface water resources in the region (ie River Murray) of proceeding (or not proceeding) with the development. <u>Groundwater</u> ▪ Describe the known groundwater related environmental conditions including quality and significance of groundwater in the area of the development and any surrounding area potentially affected by the proposed development's activities. For the desalination plant include: – describe the nature, type, geology / stratigraphy and depth to and thickness of the aquifers, hydraulic properties and value as water supply sources – any existing site contamination, and any identified potential sources of groundwater pollution – characterise the quality and volume of the groundwater including seasonal variations of groundwater levels – describe existing groundwater supply infrastructure (e.g. bores, wells, or excavations). ▪ Describe the legislative, regulatory and planning contexts for groundwater that apply to the development. ▪ Describe present and potential users and uses of groundwater water in areas potentially affected by the development, including residential, municipal, agricultural, industrial, recreational and environmental uses of water including groundwater dependent ecosystems (GDE).	

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			▪ Describe the potential changes to hydrology (including water quality), as a result of the proposal, and the implications of these changes. Water quality impacts should consider any parameters (e.g. metals, non-metal inorganics) considered important for existing groundwater users / uses in the vicinity of the projected area of impact. ▪ Where groundwater would be taken by the development, quantify the volume of water that would be taken, the timeframe over which the take would occur and the potential impact on groundwater users. ▪ Describe stormwater and wastewater management and the potential impact on ground water resources in particular with regard to fuel and chemicals used in construction and / or operation of the development. Describe measures proposed for management of stormwater and wastewater during construction and operation to avoid impacts to groundwater. ▪ Describe the indirect environmental benefits to existing groundwater resources in the region (ie Great Artesian Basin and local groundwater sources) of proceeding (or not proceeding) with the development.	
Design (DQ)				
DQ1	Urban Design and Place-Making	To ensure development promotes the value and quality of good design across South Australia's built environments, and that contributes to healthy neighbourhoods, supports innovation and the integration of smart and sustainable technologies.	<u>Desalination Plant</u> ▪ Provide a contextual analysis and identify site-specific issues including: – existing site conditions – existing transportation networks and movement patterns, including public access to the coast and crown reserve and the facility. – local environmental conditions. ▪ Describe the design principles that have informed the position and layout of the plant, including the requirement for the provision of appropriate site levels (and associated excavation and filling of land). ▪ Provision of landscaping (for both screening and amenity purposes). ▪ Provide a description of external materials, finishes and colours (consistent with development in a coastal environment). ▪ Provide details of any proposed reception/visitor amenities facilities.	STANDARD
Social and Community (SC)				
SC1	Aboriginal Cultural Heritage	Avoid adverse effects on Aboriginal cultural heritage values and maximise opportunities to appropriately complement and preserve these values.	▪ Describe how the proposed location and / or design avoids and / or mitigates potential impacts and risks to known and unknown Aboriginal heritage. Where impacts to Aboriginal heritage cannot be avoided, provide detailed justification for this and acknowledgment that impacts must be authorised or otherwise approved by the Minister for Aboriginal Affairs under the *Aboriginal Heritage Act 1988* (SA). ▪ Undertake on-ground cultural heritage survey(s) by qualified heritage experts (ideally an anthropologist and an archaeologist) in consultation with the relevant Recognised Aboriginal Representative Bodies (RARB)/Traditional Owner representatives. Where practical, survey(s) should cover the entirety of the project area. ▪ The subsequent Aboriginal heritage report should: – be prepared by a suitably qualified heritage expert. – be agreed by the RARB/Traditional Owner representatives. – clearly outline the results of the heritage survey, including the location of Aboriginal heritage within the project area, as well as any areas where unrecorded sub-surface Aboriginal heritage is likely to occur. – consider the project's potential impacts to known and unknown Aboriginal heritage.	DETAILED

Library Ref	Environmental Attribute	Objective	Method of Investigation	Level of Assessment
			– consider the results of a central archives search, as well as any other searches of local archives, other relevant databases and review of any relevant historical survey reports. – incorporate the views of the RARB representing all Traditional Owners of the relevant Aboriginal heritage, or where no RARB is appointed, Traditional Owner representatives, including any recommendations to relocate project elements to avoid Aboriginal heritage. Note that any sensitive or restricted information relating to Aboriginal heritage must remain confidential, and should not be publicly disclosed. – consider both the archaeological and anthropological/ethnographic values of the area, based on relevant literature, previous heritage assessments and the views of the RARB or Traditional Owner representatives. – provide recommendations for the protection and management of Aboriginal heritage before construction, during project works, and post construction (ie operation and maintenance activities) in light of the above.	
SC2	Community Wellbeing / Social Impact Assessment	To ensure adverse effects on the community near the development are avoided or minimised including with regard to community cohesion, access to services and facilities and health impacts and capitalise on opportunities to enhance benefits for communities.	▪ Provide a social impact assessment (SIA) of the development which addresses: – the existing social environment of communities potentially impacted by the project. – the potential social impacts (both positive and negative) of the project, and how they will be managed and monitored. ▪ The SIA should include social baseline information which includes but is not limited to: – a demographic profile of potentially affected communities. – an analysis of community characteristics (e.g. community history and culture, land / property ownership). – an overview of land use, key industries in the region, and relevant local and state government plans. – an overview of the capacity and accessibility of infrastructure, facilities and services, including education, health and emergency services. – an analysis of the existing housing and accommodation market, including availability, capacity and affordability. – a profile of the local and regional labour market, including likely availability of personnel with skills relevant to the project. – details of other resource, infrastructure and major projects in the area (existing, approved and potential). ▪ Key matters to be addressed by the SIA (for both construction and operation) are: – Workforce management. – Housing and accommodation. – Local business and industry procurement. – Heath and community wellbeing.	DETAILED
SC3	Heritage Places and Areas	To ensure that the nature and scale of the development does not compromise the recognised heritage significance of a heritage place or heritage area.	▪ Provide details of the location, nature and known potential heritage values of all historic places and areas potentially affected by the development including State and Commonwealth-listed places and areas (including shipwrecks). ▪ Where relevant, provide an assessment of potential impacts from the development on historic heritage places and areas. If Commonwealth, National and World Heritage places have been identified, undertake an assessment of potential impacts to heritage values. ▪ Provide design, management and site protection strategies (prepared by an appropriately qualified heritage consultant in accordance with the PDI Code if relevant) to avoid, mitigate or manage negative impacts on heritage values and enhance any positive impacts.	STANDARD

Appendix A – Schedule 4 of the EPBC Regulations - Matters to be addressed by the environmental impact statement (EIS)

1 General information

1.01 The background of the action including:

(a) the title of the action;

(b) the full name and postal address of the designated proponent;

(c) a clear outline of the objective of the action;

(d) the location of the action;

(e) the background to the development of the action;

(f) how the action relates to any other actions (of which the proponent should reasonably be aware) that have been, or are being, taken or that have been approved in the region affected by the action;

(g) the current status of the action;

(h) the consequences of not proceeding with the action.

2 Description

2.01 A description of the action, including:

(a) all the components of the action;

(b) the precise location of any works to be undertaken, structures to be built or elements of the action that may have relevant impacts;

(c) how the works are to be undertaken and design parameters for those aspects of the structures or elements of the action that may have relevant impacts;

(d) relevant impacts of the action;

(e) proposed safeguards and mitigation measures to deal with relevant impacts of the action;

(f) any other requirements for approval or conditions that apply, or that the proponent reasonably believes are likely to apply, to the proposed action;

(g) to the extent reasonably practicable, any feasible alternatives to the action, including:

(i) if relevant, the alternative of taking no action;

(ii) a comparative description of the impacts of each alternative on the matters protected by the controlling provisions for the action;

(iii) sufficient detail to make clear why any alternative is preferred to another;

(h) any consultation about the action, including:

(i) any consultation that has already taken place;

(ii) proposed consultation about relevant impacts of the action;

(iii) if there has been consultation about the proposed action—any documented response to, or result of, the consultation;

(i) identification of affected parties, including a statement mentioning any communities that may be affected and describing their views.

3 Relevant impacts

3.01 Information given under paragraph 2.01(d) must include:

(a) a description of the relevant impacts of the action;

(b) a detailed assessment of the nature and extent of the likely short term and long term relevant impacts;

(c) a statement whether any relevant impacts are likely to be unknown, unpredictable or irreversible;

(d) analysis of the significance of the relevant impacts;

(e) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.

4 Proposed safeguards and mitigation measures

4.01 Information given under paragraph 2.01(e) must include:

(a) a description, and an assessment of the expected or predicted effectiveness of, the mitigation measures;

(b) any statutory or policy basis for the mitigation measures;

(c) the cost of the mitigation measures;

(d) an outline of an environmental management plan that sets out the framework for continuing management, mitigation and monitoring programs for the relevant impacts of the action, including any provisions for independent environmental auditing;

(e) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program;

(f) a consolidated list of mitigation measures proposed to be undertaken to prevent, minimise or compensate for the relevant impacts of the action, including mitigation measures proposed to be taken by State governments, local governments or the proponent.

5 Other approvals and conditions

5.01 Information given under paragraph 2.01(f) must include:

(a) details of any local or State government planning scheme, or plan or policy under any local or State government planning system that deals with the proposed action, including:

(i) what environmental assessment of the proposed action has been, or is being, carried out under the scheme, plan or policy;

(ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts;

(b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the Act), including any conditions that apply to the action;

(c) a statement identifying any additional approval that is required;

(d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

6 Environmental record of person proposing to take the action

6.01 Details of any proceedings under a Commonwealth, State or Territory law for the protection of the environment or the conservation and sustainable use of natural resources against:

(a) the person proposing to take the action; and

(b) for an action for which a person has applied for a permit, the person making the application.

6.02 If the person proposing to take the action is a corporation—details of the corporation's environmental policy and planning framework.

7 Information sources

7.01 For information given in a draft public environment report or environmental impact statement, the draft must state:

(a) the source of the information; and

(b) how recent the information is; and

(c) how the reliability of the information was tested; and

(d) what uncertainties (if any) are in the information.

Appendix B – List of relevant guidance material

Guidance material that is considered relevant to the Assessment Requirements, includes but is not limited to, the documents listed below. This list is not exhaustive, but captures key guidance used in the preparation of these requirements and to inform the preparation of the EIS. The proponent must draw on further relevant industry and best practice guidance as part of developing the EIS.

- Commonwealth of Australia, 2013, Matters of National Environmental Significance - Significant impact guidelines 1.1, https://www.dcceew.gov.au/sites/default/files/documents/nes-guidelines_1.pdf
- Commonwealth of Australia, 2013, Matters of National Environmental Significance - Significant impact guidelines 1.2, https://www.dcceew.gov.au/sites/default/files/documents/commonwealth-guidelines_1.pdf
- Commonwealth of Australia, 2023, Species Profile and Threats Database (SPRAT), https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl
- Commonwealth of Australia, 2017, Survey guidelines for Australia's threatened birds, https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-birds-april-2017.pdf
- Commonwealth of Australia, 2011, Survey guidelines for Australia's threatened mammals, https://www.dcceew.gov.au/sites/default/files/documents/survey-guidelines-mammals.pdf
- Commonwealth of Australia 2024, National Guidelines for the Survey of Cetaceans, Marine turtles and the Dugong, Department of Climate Change, Energy, the Environment and Water, Canberra, https://www.dcceew.gov.au/sites/default/files/documents/national-guidelines-survey-cetaceans-marine-turtles-dugong.pdf
- Meek PD, Ballard G and Fleming P, 2012, An introduction to camera trapping for wildlife surveys in Australia, PestSmart Toolkit publication, Invasive Animals Cooperative Research Centre, Canberra, Australia, https://pestsmart.org.au/wp-content/uploads/sites/3/2020/06/CameraTrapManual_2012.pdf
- Commonwealth of Australia, 2017, EPBC Act Policy Statement 3.21: Industry guidelines for avoiding, assessing and mitigating impacts of EPBC Act listed migratory shorebirds, https://www.dcceew.gov.au/sites/default/files/documents/bio4190517-shorebirds-guidelines.pdf
- Commonwealth of Australia, 2024, Environmental Management Plan Guidelines, Department of Climate Change, Energy, the Environment and Water, Canberra, https://www.dcceew.gov.au/sites/default/files/documents/environmental-management-plan-guidelines.pdf
- Commonwealth of Australia, 2012, EPBC Act Environmental Offsets Policy, Department of Sustainability, Environment, Water, Population and Communities, Public Affairs, Canberra, https://www.dcceew.gov.au/sites/default/files/documents/offsets-policy_2.pdf
- Commonwealth of Australia, 2021, Guide to providing maps and boundary data for EPBC Act projects, Department of Agriculture, Water and the Environment, Canberra, https://www.dcceew.gov.au/sites/default/files/documents/epbca-maps-data-guidelines.pdf
- Commonwealth of Australia, 2023, Interim Engaging with First Nations People and Communities on Assessments and Approvals Under the Environment Protection and Biodiversity Conservation Act 1999, Department of Climate Change, Energy, the Environment and Water, Canberra. https://www.dcceew.gov.au/environment/epbc/publications/engage-early.
- Commonwealth of Australia, 2024, National Conservation Values Atlas: Interactive Map (environment.gov.au), https://www.environment.gov.au/webgis-framework/apps/ncva/ncva.jsf

For other EPBC Act publications and resources, please refer to the DCCEEW website, here:

- Commonwealth of Australia, 2024, EPBC Act publications and resources - DCCEEW, Canberra, https://www.dcceew.gov.au/environment/epbc/publications

Appendix C – Scoping Analysis for Level of Assessment

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
Amenity and Environmental Quality (AEQ)						
AEQ1	Air Quality	▪ Construction: dust, vehicle emissions, dust deposition over vegetation. ▪ Operation: vehicle emissions, plant emissions.	▪ Localised and temporary impacts at desalination plant site during construction. ▪ Long overall construction period for pipeline with multiple work fronts and geographically large footprint. ▪ Fast construction of pipeline means that impacts to specific geographic locations are temporary and for short periods as work fronts move along the pipe route. ▪ Ongoing operational impacts minimal – dust and vehicle emissions during maintenance activities.	▪ Direct: transmission of dust and emissions from on-site activities to sensitive receivers. ▪ Cumulative: approved Iron Road deep sea port (particularly if construction periods overlap).	Desal Plant ▪ Rural location with low levels of road traffic and limited industrial activity. ▪ Existing emissions sources include windblown aerosols and dust, vehicle / machinery generated dust from unsealed roads and ground disturbance, agricultural activities, fires. ▪ Few sensitive receptors. Ancillary Water & Electricity Transmission Infrastructure ▪ Primarily rural and remote locations with few sensitive receptors. Sensitivity increases near townships. ▪ Key emission sources along the route include Whyalla (steelworks) and Olympic Dam.	STANDARD
AEQ2	Noise / Vibration	▪ Construction: noise emissions and vibration from heavy machinery, site works, vehicle movements. ▪ Operation: noise emissions from plant operation, vehicle movements, corona aeolian noise from transmission lines.	▪ Localised and temporary impacts at desalination plant site during construction. ▪ Long overall construction period for pipeline with multiple work fronts and geographically large footprint. Possible after hours works. ▪ Fast construction of pipeline means that impacts to specific geographic locations are temporary and for short periods as work fronts move along the pipe route. ▪ Proximity of construction activities to Whyalla, Pimba, Woomera and Roxby Downs. ▪ Underwater noise and vibration during construction – short term localised effects.	▪ Direct: disturbance to sensitive receptors, fauna foraging and breeding. ▪ Cumulative: approved Iron Road deep sea port (particularly if construction periods overlap).	Desal Plant ▪ Existing noise environment dominated by natural noise sources (insects, wind and wave action), local road traffic, Lincoln Highway, agricultural activity. ▪ Relatively flat terrain. ▪ Existing activities in the marine environment, including prawn trawling. ▪ Sensitivity of marine species to noise / vibration. Ancillary Water & Electricity Transmission Infrastructure ▪ Primarily rural and remote locations however existing noise environment expected to vary along corridor depending on adjacent land uses, proximity to roads and towns, and seasonal effects.	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
			▪ Operation (24/7 for plant) and sporadic maintenance activities for pipeline / transmission / ancillary infrastructure.			
AEQ3	Transport and Traffic	▪ Increase in traffic movements. ▪ Potential requirement for road and intersection upgrades. ▪ Creation of new access tracks. ▪ Temporary traffic management (delays and speed restrictions) during construction period. ▪ Interactions between light and heavy vehicles. ▪ Introduction of marine exclusion zones.	▪ Greatest road traffic impacts during construction period. ▪ Potential short term impacts to marine, rail and air operations during construction. ▪ Ongoing localised impacts from marine exclusion zone around the outfall and intake infrastructure.	▪ Direct: potential impacts may include disruption to current land uses, travel times and deterioration of road pavements from increased level of use by heavy vehicles. ▪ Cumulative: approved Iron Road deep sea port (particularly if construction periods overlap).	Desal Plant ▪ Access to site from Lincoln Highway via unsealed local roads. ▪ Lincoln Highway is a State maintained road and major highway on the Eyre Peninsula, serving as the primary route from Port Lincoln to Whyalla and connectivity to numerous towns. Sealed single carriageway with one lane in each direction. ▪ Marine shipping traffic associated with Port Pirie, Whyalla and Port Bonython, as well as commercial fishing boats, tourism operators and recreational vessels. Ancillary Water & Electricity Transmission Infrastructure ▪ Major highways in the region are the Stuart, Eyre, Lincoln and Olympic Dam highways. ▪ Local road network, sealed and unsealed. ▪ Unsealed roads and tracks on private land / pastoral stations. ▪ Sydney–Perth and Adelaide–Darwin transcontinental rail lines which provide regional and interstate passenger and freight services. ▪ Regional airports at Port Augusta, Port Lincoln, Whyalla and Olympic Dam. RAAF airfield at Woomera. Smaller airfields at Cleve and Cowell. Private (unregistered) landing strips expected.	STANDARD
AEQ4	Visual Amenity	Desal Plant ▪ Construction activities. ▪ Industrial type buildings with ancillary structures. ▪ Security fencing. Pipeline & Ancillary ▪ Construction activities. ▪ Pipeline predominantly underground with discreet sections of above ground pipeline. ▪ New high voltage transmission lines, substations, telecommunications towers and pump stations.	▪ Temporary and localised visual impacts during construction. ▪ Ongoing visual impact from new, permanent structures in the landscape. ▪ Increase in scale of development compared to existing at desal plant site. ▪ Day time vs night time impacts may be different (lighting associated with desal plant). ▪ Visual impact of the pipeline likely to be minimal (majority underground).	▪ Direct: new structures in landscape. ▪ Perceived: impact on amenity can be subjective. ▪ Cumulative: approved Iron Road deep sea port, proliferation of industrial, transmission and pipeline infrastructure.	Desal Plant ▪ Dune capped granite headland – shoreline includes two small pocket beaches (north and south) backed by sandy dunes and farmland. ▪ Agricultural landscape – majority of site cleared of vegetation and minimal built form. ▪ Undulating, visually 'open' landscape with views towards coast. ▪ Small pockets of remnant vegetation. ▪ Limited number of land based visual receptors (including users / visitors of coastal roads in the vicinity), ▪ Marine based visual receptors. ▪ Cultural value to traditional landowners. Ancillary Water & Electricity Transmission Infrastructure	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
			▪ Visual impact of transmission lines will vary along the alignment(s) with proximity to townships, roads etc.		▪ Primarily rural and remote landscapes with agricultural structures, electricity transmission infrastructure, scattered dwellings. ▪ Variable natural landscapes and sensitivity along the corridor. ▪ Generally low scale of development, with exceptions (eg Lincoln Gap wind farm, electricity transmission infrastructure). ▪ Rural and remote townships. ▪ Cultural value to traditional landowners.	
Biological Environment (BE)						
BE1	Biosecurity	▪ Potential for movement, spread and/or introduction of weed / pest species during construction phase: earthworks, vehicle and machinery movements. ▪ Biofouling or ballast water from shipping traffic generated by project. ▪ Introduction of marine structures may encourage colonisation by opportunistic or invasive species.	▪ Highest risk during construction phase. ▪ Low risk during operation / maintenance. ▪ Transmission through marine waters at desalination plant. ▪ Geographically large project area for terrestrial portions of the development.	▪ Direct: localised impact ▪ Indirect: effects on ecosystems within broader gulf inc. Marine Parks and commercial fishing industry, flow on effects to tourism, agriculture.	Desal Plant ▪ Dynamic coastal & marine environment – effect of waves, tides, currents and wind. ▪ Historical sheep grazing on majority of desalination plant site. ▪ Gulf supports marine parks, commercial fishing, aquaculture and marine based tourism activities. Ancillary Water & Electricity Transmission Infrastructure ▪ Significant variation along corridor / sites. ▪ Presence of weed / pest species subject to surveys. ▪ The region supports agricultural activities which may be susceptible to weeds / pathogens. ▪ Feral animals are well established in the project area.	STANDARD
BE2	Marine Flora and Fauna	▪ Potential incidental clearance of vegetation (seagrass) during construction – current plan is to avoid. ▪ Potential physical impact to fauna during construction and operation . ▪ Underwater noise and vibration. ▪ Operational marine discharge (refer also to PE1).	▪ Different impacts during construction and operation. ▪ Extent of impact on the seabed depends on final methodology for intake and outfall pipelines. ▪ Impacts may be influenced by hydrodynamics of the Spencer Gulf, seasonal variations, weather events.	▪ Direct: impacts from discharge, seawater intake, coastal and marine infrastructure. ▪ Indirect: flow on effects to ecosystems, recreation, aquaculture and fishing industry from changes in water conditions. ▪ Cumulative: approved Iron Road deep sea port. ▪ Perceived impacts. ▪ MNES: potential significant impact to listed threatened species, communities, and migratory species. To be addressed in	Desal Plant ▪ Spencer Gulf Bioregion. ▪ Shall benthos <16m depth: areas covered by dense seagrass – greatest coverage at northern end of site. ▪ Mid Benthos <18m: main bare fine sand and silty sediment, scattered invertebrates. ▪ Deep benthos >20m: bare silt and clumps of mixed invertebrates, sparse mixed algae. Razor clams at 17-20m depth. ▪ Rocky reefs in discrete patches in shallow water close to shoreline providing valuable habitat. ▪ Highest infauna diversity aligns with seagrass coverage including syngnathids (seahorses and pipefish). ▪ Potential megafauna species include whales, dolphin, fur seals, sealions, turtles, sharks. ▪ High diversity of fish species including pipefish, toadfish, leatherjackets, leafy sea dragon. ▪ Temperature and salinity gradients in the gulf create environmental niches or transition zones – species have	DETAILED

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
				DCCEEW Assessment Requirements.	adapted to local conditions. Some tropical and subtropical species are supported. ▪ Biologically Important Area for the Australian sea lion and southern right whale. ▪ Biologically Important Area for various non-threatened marine birds. ▪ Commercial fisheries species (notably western king prawn and snapper) which are reliant on recruitment and juvenile nursery areas in the northern reaches of the gulf. ▪ Giant Australian Cuttlefish – EPBC listed habitat in northern reaches of the gulf.	
BE3	Terrestrial Flora and Fauna	▪ Construction: clearance of vegetation and extensive land disturbance; disturbance from construction activities may include noise, dust, vibration, light, vehicle strike. ▪ traverses watercourses. ▪ Operation: new light sources; fragmentation of habitat by pipeline / transmission line; bird strike from newly installed transmission lines.	Desal Plant ▪ Localised impacts at facility during construction and operation. Pipeline & Ancillary ▪ Maximum 50m wide pipeline corridor comprising temporary and permanent vegetation clearance. ▪ Potential impact of construction activities on aquatic (freshwater) ecology where the pipeline traverses watercourses (if water is present, not largely semi-arid environments.	▪ Direct – permanent clearance associated with construction, ongoing requirements to maintain clearances to new infrastructure assets. ▪ Direct – impacts from construction (noise, dust, light, vehicle strike etc). ▪ Indirect – bird strike from newly installed transmission lines. ▪ Cumulative: approved Iron Road deep sea port. ▪ MNES: potential significant impact to listed threatened species, communities, and migratory species. To be addressed in DCCEEW Assessment Requirements.	Desal Plant ▪ Majority of site cleared for agriculture. ▪ Remnant vegetation in small, isolated blocks, roadside vegetation, coastal (rushland/sedgeland on the headland and extending to pocket beaches north and south. ▪ Majority of native vegetation is degraded and in relatively poor condition – historic land clearance, vegetation isolation, weed infestations, grazing and refuse dumping. ▪ Waretta and Butler IBRA vegetation associations. ▪ Biologically Important Area for various non-threatened marine birds. ▪ Numerous seabird species identified in area including several EPBC listed species. Ancillary Water & Electricity Transmission Infrastructure ▪ Significant variation along corridor / sites ranging from agricultural land, minor ephemeral water crossings, isolated patches of remnant vegetation, through to open woodlands (varying levels of disturbance). ▪ Largely semi-arid environments. ▪ Interaction with roadside vegetation and creek crossings. ▪ Munyaroo Conservation Park. ▪ Conservation significant flora and fauna species.	DETAILED
Climate Change and Resource Efficiency (CCRE)						
CCRE1	Climate Change Adaptation	▪ Potential impact to desalination plant site from rising sea level exacerbated by storm surge events and wave patterns. ▪ Climate change effects on salinity and Spencer Gulf hydrodynamics. ▪ Impact to infrastructure from climate change related hazards.	▪ Physical threats to desal site from sea level rise, storm surges and changing weather patterns. ▪ Changes in marine environment and weather patterns may alter the impact of the desal plant on the receiving environment.	▪ Direct: damage to infrastructure from climate change related events. ▪ Indirect: supports the provision of a secure, renewable water source that is not impacted by	▪ Max, min and average temperatures will increase. ▪ Average annual rainfall will decline. ▪ Number and intensity of heavy rainfall events will increase. ▪ Time spent in drought will increase. ▪ Sea level rise, exacerbated by storm surge events and wave patterns. ▪ Fire danger anticipated to increase. ▪ Sea surface temperatures will continue to rise.	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
		▪ Sustainable water source for the region.	▪ Physical threat to pipeline and infrastructure through increased hazard risk.	climate change; supports the growth of green technologies to assist in transition to low-carbon economy.	▪ Likely increased salinity and pH in Spencer Gulf. ▪ Upper reaches of the gulf are sensitive to salinity, which may be exacerbated by climate change.	
CCRE2	Greenhouse Gas Emissions	▪ Emissions (type and amount) from the desal plant. ▪ Emissions from vehicles associated with the development (construction & operational)	▪ Spatial extent of emissions transmission unknown.	▪ Direct: emissions ▪ Indirect & cumulative: contribution of emissions to climate change and pollution.	Desal Plant ▪ Sensitive coastal and marine environment. ▪ Disturbed terrestrial site – agricultural landscape. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area.	STANDARD
CCRE3	Sustainable Use of Resources	▪ Construction material requirements for desal plant, pipeline and ancillary infrastructure including water and electricity. ▪ Opportunities for re-use of excavated materials / spoil from desalination plant and pipeline construction. ▪ Ongoing use of seawater – renewable source. ▪ Ongoing electricity requirements. New transmission infrastructure required, possible on-site generation. ▪ Ongoing maintenance requirements.	▪ Impacts at source of construction materials and associated with transportation to the site (ie supply chain). ▪ Impacts at source of power generation.	▪ Direct: ongoing electricity use. ▪ Indirect: reduced reliance on Great Artesian Basin, River Murray, and ground water sources; possible decommissioning of Pt August to Woomera Pipeline. ▪ Indirect: impacts associated with sourcing materials for construction (eg fossil fuels, large volumes of concrete, steel).	Desal Plant ▪ Sensitive coastal and marine environment. ▪ Pastoral land with connectivity to State road network. Ancillary Water & Electricity Transmission Infrastructure ▪ Variation along corridor / sites. ▪ Covers large geographical area.	STANDARD
CCRE4	Waste Management	Desal Plant ▪ Various types and volumes of waste generated during construction including spoil and wastewater from tunnel boring / jack-up barge. ▪ Various types and volumes of waste generated during operation including chemicals and hazardous substances. Pipeline & ancillary ▪ Waste management protocols required at all temp laydown areas, accommodation camps, work sites along corridors. ▪ Possibility of multiple active work locations along the corridor.	▪ Localised storage / treatment of waste streams within project site during construction. ▪ Off-site transportation of waste materials (to landfill, recycling, other waste receivers etc).	▪ Direct: generation of waste, potential for sedimentation, spills, ongoing discharge of concentrated brine to marine waters. ▪ Indirect: transportation of wastes to/from site, pressure on landfill sites, opportunities for recycling.	Desal Plant ▪ Sensitive coastal and marine environment. Ancillary Water & Electricity Transmission Infrastructure ▪ Variation along corridor / sites. ▪ Covers large geographical area.	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
		Unlikely to generate significant volumes of waste during operation.				
Land, Regional and State Economies (LRSE)						
LRSE1	Local, regional and state economies	▪ New sustainable water source. ▪ Job creation during construction, skill development. ▪ Impact of temporary construction activities (environmental, housing, services, amenity). ▪ Price / wage inflation. ▪ Townships in the region may benefit from increased demand for services.	▪ Local, regional and state-wide impacts. ▪ Greatest direct impact during construction. ▪ Ongoing impact through provision of sustainable water source for the region.	▪ Direct: job creation, increased demand for local housing / services / supplies. ▪ Indirect: indirect jobs in transport and logistics, support functions (food, accommodation etc); expansion of customer markets (mining, agriculture, hydrogen industry). ▪ Cumulative: approved Iron Road deep sea port (particularly if construction periods overlap).	Desal Plant ▪ Historical sheep grazing on majority of desalination plant site. ▪ Broader locality is predominantly agricultural land (sheep / lambs and broadacre crops) with scattered dwellings. ▪ Port Neill 7km to NE – small population with economy supported from surrounding agricultural districts, closest boat ramp. ▪ Tumby Bay 30km to SW – major population centre of the Council area with large population of retirees, central of agricultural district, fishing and tourism industries. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Numerous communities / varying demographic profiles along corridors / sites. ▪ Whyalla, Port Augusta, Port Lincoln are the largest population centres. ▪ The region supports marine industries (fishing, aquaculture, shipping, tourism), agricultural industries (dryland cropping), and mining.	DETAILED
Hazards and Risks (HR)						
HR1	Bushfire	▪ Risk likely higher during construction with heavy machinery, ignition points. ▪ Potential for higher fuel loads during summer. ▪ Potential for spread of bushfire to neighbouring properties and beyond. ▪ Dependent on weather conditions.	▪ Severity, duration and extent of impact dependent on various factors including type of fire emergency, local conditions, emergency response capacity.	▪ Direct: damage to property / infrastructure; risk to life; loss of essential services. ▪ Indirect: transmission of smoke, fumes, pollutants via air and surface waters; impacts to adjacent land uses in event of emergency.	Desal Plant ▪ Site within Hazards (Bushfire – General) Overlay ▪ CFS Tumby Bay and District Group (Region 6) with stations at Port Neill, Lipson, Brooker, Ungarra, Yallunda Flat, Tumby Bay, Koppio, Kockaleechie. Supported by Region 6 Air Support. ▪ No recorded bushfires at site / locality for last 40 years. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area – Regions 4 and 6 of SA. ▪ Whyalla serviced by SA Metropolitan Fire Service. ▪ Varying fire risk areas & site conditions. ▪ Varying proximity to emergency services.	STANDARD
HR2	Flooding	▪ Flooding risk (from surface waters / stormwater or storm surge).	▪ Dependent on site location and local conditions	▪ Direct: damage to property ▪ Indirect: mobilisation and transmission of contaminants / pollutants	Desal Plant ▪ Hazards (Flooding – Evidence Required) Overlay ▪ Potential drift hazard zone. ▪ Nearest SES Station Tumby Bay (Eyre District). Ancillary Water & Electricity Transmission Infrastructure ▪ Hazards (Flooding – Evidence Required) Overlay	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
					▪ Covers large geographical area – SES North Region (Eyre and Outback districts). ▪ Varying site conditions (largely semi-arid environments).. ▪ Varying proximity to emergency services.	
HR3	Site and Groundwater Contamination	▪ Potential for spills / leaks of pollutants during construction. ▪ Construction activities may include abrasive blasting, concrete batching, fuel burning, treatment of water (chlorine etc), flushing of pipeline. ▪ Potential for contamination to be encountered during construction. ▪ Operational activities may include chemical storage and warehousing. ▪ Interaction with groundwater and surface water including creek crossings.	▪ Marine, coastal and terrestrial environments. ▪ Potential impacts during construction and operation. ▪ On and off-site impacts dependent on mobilisation and transmission of contaminants / pollutants (due to wind, water action etc).	▪ Direct: spills or accidents Indirect: mobilisation and transmission of contaminants / pollutants	Desal Plant ▪ Negligible acid sulfate soil potential. ▪ Historical sheep grazing on majority of desalination plant site. ▪ Potential historical sources of contamination include use of pesticides, herbicides, fuel storage, septic tanks and asbestos from older buildings. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Site conditions variable along the corridor. ▪ Potential interaction with acid sulfate soils. ▪ Section 83A (EP Act) site contamination notifications over land at Whyalla, , adjacent Stuart Highway at Pernatty Lagoon (Oakden Hills) & Olympic Dam.	STANDARD
HR4	Dangerous Substances	▪ Construction activities may include abrasive blasting, concrete batching, fuel burning, chemical use and storage, treatment of water (chlorine etc), flushing of pipeline. ▪ Operational activities may include chemical storage and warehousing.	▪ Potential impact if pollutants enter waterways, surface waters, marine waters	▪ Direct: spills or accidents ▪ Indirect: mobilisation and transmission of contaminants / pollutants	Desal Plant ▪ Sensitive coastal and marine environment Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Varying site conditions.	STANDARD
Land Use and Site Conditions (LUSC)						
LUSC1	Land tenure, protected areas and land use	Desal Plant ▪ Loss of agricultural land to infrastructure land use. ▪ Marine exclusion zones and loss of fishing grounds. ▪ Interaction with private land, Crown land, native title, offshore waters. Pipeline & Ancillary ▪ Interaction with numerous land uses, tenure and other land use rights along the corridor. ▪ Adjacency to various land uses. ▪ Tenure arrangements may include easements, licences, freehold acquisition and temporary lease or licence.	Desal Plant ▪ Land and offshore. ▪ Potential impacts of the desalination plant on existing adjacent marine parks, aquaculture zones & leases, commercial and recreational fisheries. Pipeline & Ancillary ▪ 600km long, up to 50m wide corridor. ▪ Follows existing transmission corridors where possible. ▪ Interaction with protected areas.	▪ Direct: temporary and permanent disruption of existing land uses; fragmentation of land by infrastructure corridors. ▪ Indirect: land not available / restricted for future, intended purposes. ▪ MNES: potential significant impact to Commonwealth Lands. To be addressed in DCCEEW Assessment Requirements.	Desal Plant Land: ▪ District Council of Tumby Bay. ▪ Rural and Conservation Zones. ▪ Land owned by IRD Port Assets Pty Ltd and leased to local farmers. ▪ Site is within the Declared area for the Iron Road Deep Sea Port major development. ▪ Native Title and ILUAs. Desal Plant Marine: ▪ Out of Council area. ▪ Coastal Waters and Offshore Islands Zone. ▪ Port Neill Aquaculture Zone – 2.5km northeast; Port Neill Aquaculture Exclusion Zone adjacent the subject site; no current leases or licences. ▪ Closest aquaculture leases 33km north (Arno Bay) and 30km south (Cape Euler).	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
					▪ Franklin Harbour Marine Park to northeast. ▪ Sir Joseph Banks Marine Park / Conservation Park to south. ▪ Lipson Island conservation reserve to south. ▪ Commercial and recreational fisheries for numerous species; aquaculture potential. ▪ Spencer Gulf shipping lane for export of bulk goods and petroleum products. Ancillary Water & Electricity Transmission Infrastructure ▪ Seven (7) local government areas. ▪ Predominantly Rural and Remote Areas Zone, with variability closer to townships. Major land uses in the region are cropping, livestock grazing and mining operations. ▪ Various tenure arrangements. ▪ Mining tenements and mineral exploration licences. ▪ Department of Defence land including Cultana Training Centre, Woomera Commonwealth land. ▪ Native Title and ILUAs. ▪ Munyaroo Conservation Park, Whyalla Conservation Park. ▪ Major infrastructure includes Sydney-Darwin & Adelaide-Darwin rail lines, major highways, Moomba to Port Bonython liquid line, Moomba Adelaide Pipeline system, high voltage overhead transmission lines, Lincoln Gap wind farm.	
Physical Environment (PE)						
PE1	Coastal and Marine	▪ Potential physical impacts to physical coastal & marine environments and processes. ▪ Interruption of marine habitat connectivity from temporary pipes during construction. ▪ Potential impacts on hydrodynamics, water movements (currents and wave climate). ▪ Operational marine discharge – mixing of marine waters with brine: potential impacts on marine ecology, water quality, plume dispersion, toxicity / accumulation of (e.g. anti scalants). Refer also to BE2 (marine flora and fauna).	▪ Localised physical impact from built form. ▪ Localised impact at outfall risers. ▪ Near-field zone impacts. ▪ Far-field zone impacts.	▪ Direct: permanent infrastructure and ongoing discharge of concentrated brine to marine waters. ▪ Indirect: potential impacts to marine based industry from visual and environmental impacts. ▪ Cumulative: Approved Iron Road deep sea port.	▪ Coastal Area Overlay. ▪ Spencer Gulf Bioregion, Dutton Marine Biounit. ▪ Relatively sheltered system – semi-enclosed body of water. ▪ Relatively shallow – typical depth of 40m in the lower gulf and 15-20m in the upper gulf. ▪ 'Inverse estuary' – evaporation exceeds freshwater input, resulting in increasing temperature and salinity in the upper gulf, particularly in the summer months. ▪ Naturally low in nutrients and readily responsive to nutrient inputs. ▪ Low to moderate wave energy – ocean swell and wind generated sea waves, driven by tidal currents. ▪ Whole of gulf circulation with annual exchange of water via a clockwise 'gyre', with ocean water drawn northwards along the western gulf. ▪ Salinity 36 to 38psu (compared to 35 psu in open waters off SA coast) – higher due to lack of freshwater inputs and high rates of evaporation. ▪ Consistent sub-tidal topography, free of navigational structures.	DETAILED

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
					▪ The 20m depth contour is approx. 1200m (1.2km) offshore.	
PE2	Soils, Landform and Geology	Desal Plant ▪ Bulk earthworks (excavation and filling of land) to create terraces. ▪ Potential physical penetration of coastal environment for intake and outfall pipelines. ▪ Soil erosion. Pipeline & Ancillary ▪ Extensive land disturbance to construct the pipeline. ▪ Below ground installation proposed except at discreet locations.	Desal Plant ▪ Localised modification to landform will occur during construction phase – temporary (ie stockpiling) and permanent. ▪ Extent of impact on the seabed depends on final methodology for intake and outfall pipelines. Pipeline & Ancillary ▪ 600km long, up to 50m wide corridor. ▪ Excavation for temporary and permanent infrastructure.	▪ Direct: permanent infrastructure, and changes to natural landform. ▪ Indirect: changes to overland water flows and other ecological processes; impact on cultural values.	Desal Plant ▪ Dune capped granite headland surrounded by low hills and rises. ▪ Shoreline includes two small pocket beaches. ▪ Rocky reef in discrete patches of shallow water close to the shoreline. ▪ Thin to moderate layer of soil (i.e. between 1 m and 9 m thick) of sandy to clayey soil layers that may contain calcrete rubble, overlying a weathered bedrock zone of sandy gravel (approx. 2m thick), above strong, coarse grained igneous to metamorphic rock in the form of granite or gneiss (to max depth 30m). ▪ Negligible acid sulfate soil potential. ▪ Negligible subsoil acidity. ▪ Inherent fertility ranges from moderate and moderately low, and very low on the headland. ▪ Expansive clays will require further consideration. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Varying site conditions along the corridor. ▪ Eyre Yorke Block and Gawler IBRA bioregions (various subregions). ▪ Notable feature – the Carrapateena lateral pipeline traverses the Arcoona Plateau (stony tablelands landscape). ▪ Notable feature – Lake Dutton and Lake Windabout in the northern third of the project area (highly ephemeral salt lakes) with cultural value to traditional owners.	STANDARD
PE3	Surface Water and Groundwater	▪ Accidental spills from equipment, fuel and chemical storage. ▪ Soil erosion and run-off from stockpiles / disturbed surfaces. ▪ Soil compaction. ▪ Alterations to existing surface flow patterns. ▪ Potential for intersection with groundwater at desalination plant (tunnel boring launch shaft, intake and outfall pipes). ▪ Release of water to environment from pipeline – pH and re-chlorination management.	▪ Potential impacts during construction. ▪ Impacts may be within the construction footprint and off-site / downstream depending on local factors (hydraulics, hydrology, soil and topography, vegetation). ▪ Operational impacts are expected to be negligible. ▪ Discharges from the pipeline from (planned) periodic flushing or draining events covered by standard operating procedures.	▪ Direct: changes to surface water and groundwater flows, sedimentation, pollutants from accidental spills. ▪ Indirect: movement of water and pollutants (from accidental spills) off site, downstream impacts. ▪ Cumulative: approved Iron Road deep sea port.	Desal Plant ▪ Ephemeral creek systems draining towards the coast. ▪ Spring fed creek located 2km inland from the coast. ▪ Water erosion potential ranges from moderate and moderately high to low on the headland. ▪ Limited information on groundwater. No groundwater dependent ecosystems are known to occur. Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Largely semi-arid environments. ▪ Varying site conditions along the corridor; however groundwater is generally of poor to marginal quality. No groundwater dependent ecosystems are known to occur.	STANDARD

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
			▪ Potential for unplanned water discharge from the pipeline (scour valves) – unlikely.		▪ Pipeline alignment includes major and minor creek crossings. Watercourses in the northern portion of the project area are highly episodic. ▪ No surface water features of formal conservation significance.	
Design (DQ)						
DQ1	Urban Design and Place-Making	▪ Extensive cut and fill during construction to create a benched site. ▪ New built infrastructure – industrial in nature. ▪ Potential visual and amenity impacts. ▪ Opportunities for visitor / tourist facilities. ▪ Opportunities for landscaping / re-vegetation.	▪ Ongoing impact over life of project. ▪ Day time vs nighttime impacts may be different.	▪ Direct: visual impact ▪ Indirect: impacts to use and enjoyment of surrounding coastal land and marine waters. ▪ Perceived: Reduced amenity due to industrial-scale development on the coast. ▪ Cumulative: approved Iron Road deep sea port.	Desalination Plant ▪ Coastal location. ▪ Agricultural landscape – majority of site cleared of vegetation and minimum built form. ▪ Undulating, visually 'open' landscape with views towards coast. Ancillary Water & Electricity Transmission Infrastructure ▪ NA	STANDARD
Social and Community (SC)						
SC1	Aboriginal Cultural Heritage	▪ Legislative requirements for Native Title and Traditional Owner rights –. ▪ . ▪ Aboriginal Heritage Act 1993: it is an offence to damage, disturb or interfere with an Aboriginal site, object or remains without an authorisation. ▪ Potential to disturb previously undiscovered sites of cultural significance during construction, primarily from ground disturbance. ▪ Possible impact on intangible cultural values and connection to country. ▪ Positive impact on mound springs from reduced reliance on groundwater.	▪ Large geographical area with various sites and traditional owners. ▪ Temporary and/or permanent damage / disturbance during construction. ▪ Low risk during operation – no ground disturbance required outside of previously cleared / disturbed land.	▪ Direct: impact to cultural heritage sites / places, connection to country, intangible cultural values. ▪ Indirect: loss of trust in government, wellbeing of Aboriginal communities. ▪ Cumulative: degradation of cultural values and heritage places.	Desal Plant ▪ Traditional lands of Barngarla People. ▪ Archaeological sites of interest previously identified. ▪ Aboriginal cultural values may be significant to sightlines associated with significant landscape features. Ancillary Water & Electricity Transmission Infrastructure ▪ Traditional lands of Barngarla People and Kokatha People. ▪ Native Title rights and Indigenous Land Use Agreements (ILUAs). ▪ Numerous recorded and/or registered sites exist adjacent the project alignment. ▪ Aboriginal cultural values may be significant to sightlines associated with significant landscape features.	DETAILED
SC2	Community Wellbeing / Social Impact Assessment	▪ Community concern regarding infrastructure land uses in pastoral, coastal and marine environments. ▪ New interface impacts. ▪ Pressure on / competition for housing, local services, facilities, infrastructure.	▪ Different impacts during construction and operation. ▪ Increased disturbance during construction, with multiple work fronts along the pipeline at any one time.	▪ Direct: positive and negative impacts on local communities. ▪ Perceived: environmental and health impacts. ▪ Cumulative: approved Iron Road deep sea port	Desal Plant ▪ Few sensitive receptors. ▪ Wider community and interest group concern for sensitive coastal / marine environments. ▪ Transient / tourist population on Eyre Peninsula. . ▪ 3km NE of Cowleys Beach (parking area). ▪ 10km N-NE of Lipson Cove (campground).	DETAILED

Library Ref	Environmental Attribute	Description	Scale of Impact	Nature of Impact	Sensitivity of Receiving Environment	Level of Assessment
		▪ Impact to community safety, lifestyles, cultural practices, amenity value. ▪ Job creation, increased demand for workers, new skill development, pathways for further education.	▪ Fast construction of pipeline means that impacts to specific geographic locations are temporary and for short periods as work fronts move along the pipe route.	(particularly if construction periods overlap).	Ancillary Water & Electricity Transmission Infrastructure ▪ Covers large geographical area. ▪ Various communities including Whyalla, Port Augusta, Pimba, Woomera, Roxby Downs.	
SC3	Heritage Places and Areas	Desal Plant ▪ Possible chance finds during construction. Pipeline & Ancillary ▪ Possibility for known sites in proximity to corridor.	▪ No direct impact anticipated – known sites avoided. ▪ Alterations to visual landscape context of listed places.	▪ Direct. ▪ Indirect: new transmission lines / ancillary infrastructure may form part of landscape context for listed places.	Desal Plant ▪ No listed local or state heritage places on or near site – closest are in Port Neill. ▪ Nearest shipwreck approx. 8.3km to north. ▪ Nearest geoheritage site approx. 10km to the north. ▪ Cuttlefish Sanctuary Zone (National Heritage List) over 180km to the northeast. Ancillary Water & Electricity Transmission Infrastructure ▪ Several heritage places and geoheritage sites in proximity to the corridor.	STANDARD