Terms of reference for an environmental impact statement

Capricornia Pumped Hydroelectric Energy Storage and Transmission project

September 2024

COORDINATOR-GENERAL

Queensland Government

The Department of State Development and Infrastructure connects industries, businesses, communities and government (at all levels) to leverage regions' strengths to generate sustainable and enduring economic growth that supports well-planned, inclusive and resilient communities.

Acknowledgement of Country

The department acknowledges the First Nations peoples in Queensland: Aboriginal and Torres Strait Islander peoples and their connections to the lands, winds and waters we now all share. We pay our respect to Elders, past, present and emerging. We also acknowledge the continuous living culture of First Nations Queenslanders – their diverse languages, customs and traditions, knowledges and systems. We acknowledge the deep relationship, connection and responsibility to land, sea, sky and Country as an integral element of First Nations identity and culture.

The Country is sacred. Everything on the land has meaning and all people are one with it. We acknowledge First Nations peoples' sacred connection as central to culture and being. We acknowledge the stories, traditions and living cultures of First Nations peoples and commit to shaping our state's future together. The department recognises the contribution of First Nations peoples and communities to the State of Queensland and how this continues to enrich our society more broadly.

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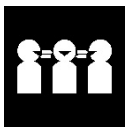

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Part A About these terms of reference

1. Introduction

1.1 This document outlines the terms of reference (TOR) for the environmental impact statement (EIS) for the Capricornia Pumped Hydroelectric Energy Storage (PHES) and Transmission project (the project) being assessed under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). The project is proposed by Eungella PHES Pty Ltd (trading as Capricornia Energy Hub) as trustee for Eungella PHES Trust and also representing Eungella Infrastructure Pty Ltd (the proponents).

1.2 Information requirements for all projects are identified in the Coordinator-General's *Preparing an EIS: Guideline for proponents (February 2024)*, which must be read in conjunction with, and forms part of this TOR for the project.[1]

1.3 The proposed project is a PHES project and transmission line located approximately 80 kilometres (km) west of Mackay and 10 km north-west of Eungella in the North and Far North Queensland renewable energy zone. The proposed project has the capacity to supply up to 750 megawatts (MW) of electricity for up to 16 hours (resulting in a storage capacity of 12 gigawatt hours (GWh)).

1.4 The proposed project comprises the following:

(a) approximately 18 gigalitre (GL) upper reservoir with valley infill wall and an instream lower reservoir within Broken River, both with associated spillways

(b) approximately 750 MW powerhouse generation facility, intakes, and tunnels for water conveyance to connect the reservoirs and powerhouse

(c) approximately 18km long overhead transmission line and substation connecting to the existing Powerlink Strathmore to Nebo 275 kilovolt (kV) transmission line

(d) supporting infrastructure (temporary and permanent) including access roads and tunnels, sediment, stormwater and other environmental control systems, laydown areas, staging areas, workshops, construction camps (including necessary supporting facilities such as wastewater treatment and disposal, power supply and generation, communications and water supply), switchyard, spoil material use or disposal, quality control and testing facilities, an in-reservoir quarry (upper reservoir), crushing and batching plants, and administration and communication facilities.

2. Indigenous recognition and native title

2.1 It is acknowledged that the project is partially located on lands that the Federal Court of Australia has confirmed native title to preserved lands for the benefit or use of First Nations peoples.

2.2 The Widi People of the Nebo Estate #1 received acknowledgment of their native title rights in July 2019 (Native Title Determination: Widi People of the Nebo Estate #1 [Federal Court number: QUD372/2006]). With respect to the project area, the determination recognised non-exclusive rights over the land on which the PHES reservoirs are situated, and downstream of the project.

2.3 The Birriah People received acknowledgment of their native title rights in March 2016 (Native Title Determination: Birriah People [Federal Court number: QUD6244/1998]). With respect to the

[1] *Preparing an environmental impact statement – Guideline for proponents (February 2024)* is available via: https://www.statedevelopment.qld.gov.au/coordinator-general/coordinator-general-resources

project area, the determination recognised non-exclusive rights over the land on which the transmission study area is situated, and downstream of the project.

2.4 Accepting statutory processes and regulated decision-making requirements, as far as practicable, the proponent is to demonstrate engagement and consideration of the views of the Widi and Birriah Peoples. It is recognised that that every aspect of the environment (land, water, air, flora, fauna) has a cultural dimension.

3. Statutory basis

3.1 On 18 April 2024, the Coordinator-General declared the project to be a 'coordinated project for which an EIS is required' under section 26(1)(a) of the SDPWO Act. This declaration initiates the statutory environmental impact assessment procedure of Part 4 of the SDPWO Act, which requires the proponent to prepare an EIS for the project.

3.2 This TOR sets out the matters the proponent is to address in an EIS for the project and is approved by the Coordinator-General under section 30 of the SDPWO Act.

4. Accredited EIS process for projects under Commonwealth legislation

4.1 On 7 and 11 December 2023, the Australian Minister for the Environment and Water decided that the Capricornia Energy Hub Transmission Project (EPBC 2023/09627) and the Capricornia Energy Hub Pumped Hydroelectric Energy Storage Project (EPBC 2023/09626) are both declared 'controlled action/s' requiring assessment under the *Environment Protection and Biodiversity Conservation Act 1999* (Cth) (EPBC Act), due to the likely potential impacts on matters of national environmental significance (MNES). The MNES controlling provision applicable to the project is listed threatened species and communities (sections 18 and 18A of the EPBC Act).

4.2 Refer to Appendix 2 for further information on the relevant listed threatened species and ecological communities.

4.3 The Commonwealth Minister for the Environment and Water also decided that the 'controlled action/s' would be assessed by accredited assessment under section 87(4) of the EPBC Act. The EIS process under Part 4 of the SDPWO Act is the accredited assessment process and a single EIS will be prepared which considers both controlled actions.

4.4 The EIS must include an assessment of impacts on MNES for each controlled action. The MNES assessment must be two stand-alone reports provided as an appendix to the EIS that fully addresses matters relevant to the controlling provisions for each controlled action under the EPBC Act. The report must include clear cross-references to the EIS where relevant.

4.5 Section 10 of this TOR, developed in consultation with the Department of Climate Change, Energy, the Environment and Water (DCCEEW), sets out the information that must be included in the EIS relating to MNES.

5. More information

5.1 For information about the project or the EIS process conducted under the SDPWO Act, visit **www.statedevelopment.qld.gov.au/cg**

Part B EIS content and suggested structure

The content requirements and suggested structure for all EIS projects is set out in section 4 of the Coordinator-General's document *Preparing an EIS: Guideline for proponents*. This section outlines the project specific content requirements.

6. Project description

Proposed development

6.1 In addition to the requirements set out in the document *Preparing an EIS: Guideline for proponents,* the EIS is to describe:

(a) all energy requirements for construction and operation of the project, and identify expected energy sources

(b) the quantum, and timing of available renewable energy in the National Electricity Market compared to energy requirements of the project and timing of operations, including projected increases in renewable energy capacity, and decommissioning of existing energy generation

(c) the timing, volume and quality of water required for each stage of the project (construction, initial fill, ongoing maintenance fills) and describe from where and how the water will be sourced, treated (if required) and how it will be managed and delivered to the site

(d) a clear delineation of project scope with a description of project components to be assessed and approved separately to the EIS process (e.g. concrete batch plants), including a statement explaining the reason(s) why the project component should be approved separately to the EIS process

(e) describe using maps, concept, design and layout plans at a suitable scale, in both plan and cross-section views, requirements for constructing, upgrading or relocating all infrastructure associated with the project. Show the locations of any necessary infrastructure easements on the plans, such as roads, conveyors, bridges, tracks and pathways, dams and weirs, bore fields, power lines and other cables, wireless technology (such as microwave telecommunications), and pipelines for any services, whether underground or above.

Design of infrastructure

Water storage infrastructure

6.2 Describe the purpose of all dams/reservoirs/levees proposed in the project area. Show their locations on suitably scaled maps, and provide plans and cross-sections, illustrating such features as embankment heights, spillways, intake works, outlet works, discharge points, design storage allowances, and maximum volumes.

6.3 Outline the proposed method of vegetation management before inundation of the reservoirs (e.g. clear all vegetation prior to inundation or allow trees to remain in situ and be naturally inundated).

6.4 Discuss the impacts to reservoir bank stability from fluctuating water levels under various scenarios such as pre-clearing the vegetation prior to inundation versus keeping inundated vegetation in-situ. Outline risks across the operational life of the project. Describe how landslide risk will be minimised through the proposed vegetation management actions.

Construction

6.5 Describe the process and criteria used, including relevant supporting information, figures and maps at a suitable scale, and data, to select the preferred design and construction techniques for the reservoirs and the required connections between them, including:

(a) surface elevation and volume-elevation curves, full supply levels (FSLs) and details of any staging or prospects for future expansion showing site boundaries, development sequencing and timeframes

(b) maximum (final) height, minimum operating level and width (including height above stream bed) and spillway height and width, including height above stream bed of all water storage infrastructure

(c) location of all water storage infrastructure in relation to waterways[2] (as per Queensland Waterways for Waterway Barrier Works layer) and watercourses[3] as defined under the *Water Act 2000*)

(d) details of the upper and lower reservoir operations including where water will be sourced from (especially for the first fill), the minimum operating levels for operation of the PHES, real-time quantification of likely headwater fluctuations, including horizontal fluctuations, and in reservoir water levels and likely extraction regime (e.g. when water will be sourced and expected demands versus yield), likely release (into the reservoirs, downstream releases or spillway releases) timings, volumes, frequencies, durations, and necessary provisions for adjustment of lower dam releases with consideration of the headwater fluctuation.

(e) storage capacity, maximum and minimum depths, average depth, area of inundation at FSL, dead storage levels, the extent of any buffer and management areas required, including a description of the flood margin and means of its determination, and total area of waterways inundated for the lower reservoir

(f) modelled headwater and tailwater levels at the site at different flows, climatic conditions, water supply, and extraction rates

(g) general design of intake/outlet works and offtake works into the reservoirs including siting, footprint, capacity, relation to water levels (variable), location, effective erosion and sediment control measures, ability to regulate flows, waterway diversion, levees or embankments, aquatic fauna exclusion and protection systems and location of intake/outlet in relation to any fauna passage device

(h) spillway and apron design including spillway gate design and operation, if relevant, spillway face finish and gradient, spillway crest design, and capacity, including gauge specification and operation, adequate spillway capacity in relation to inflow rates (rainfall events and pumped inflows), spillway height above bed/ground level, stilling basin design and any other proposed dissipation devices

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[2] Waterways is defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of sea. Waterway identification guidance can be found on the Business Queensland website at: https://www.business.qld.gov.au/industries/farms-fishing-forestry/fisheries/development/waterways/qld

[3] Watercourse is defined in section 5 of the *Water Act 2000* and includes a creek or other stream, including a stream in the form of an anabranch or a tributary, in which water flows permanently or intermittently, regardless of the frequency of flow events— (a) in a natural channel, whether artificially modified or not; or (b) in an artificial channel that has changed the course of the stream. Watercourse identification maps can be found on the Watercourse identification map (WIM) webpage on the Business Queensland website at: **https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map**. If the project area contains a feature mapped as "unmapped", or if the feature is not mapped on the WIM, a watercourse determination may be required. Determining the type of water feature using the WIM is important for applying relevant provisions of the *Water Act 2000* and subordinate legislation.

(i) Identify and discuss any necessary changes to the operation of the Eungella Dam during the construction period and operation of the project.

6.6 Provide an assessment by a Registered Professional Engineer of Queensland (RPEQ) engineering consultant detailing the future safety, condition and performance of proposed infrastructure.

Storage capacity

6.7 With support of the necessary event based and long-term hydrologic modelling and hydraulic modelling, quantify and describe the magnitude, duration, timing and frequency of spill when the capacity of storage(s) is exceeded, including timing, volume, duration and downstream extent of spills:

(a) details of the spillway, apron, stilling basin and dissipater designs, if relevant, and how the designs will minimise injury and mortality to fish or other aquatic fauna, including turtles, passing over the spillway either during spillway flows or during no flows

(b) location and details, rationale and likely effectiveness of any provision for incorporating appropriate fauna passageways and/or exclusion methods, if relevant, (including fishway and/or turtle passage or stream diversions) in the design, and the demonstrated effect on the viability of the proposed project.[4]

6.8 Provide detail on:

(a) appropriate representation of water storages behaviour using conceptual models of the water storage extent at FSL and various levels of drawdown to full drawdown to allow assessment of the effect on aquatic and riparian (edge) habitat, groundwater dependant ecosystems, bank stability and associated sedimentation/water quality impacts and benthic process of the changing storage levels during operations

(b) estimated water requirements for pre and post development condition (itemising any volumes required to be released to downstream water users and to meet environmental requirements including the volume, timing and water quality of environmental flows designed to mimic and manage waterway environmental conditions to ensure downstream aquatic ecosystem productivity is effectively maintained)

(c) proposed remote operation, and design, location of and access to automated component control housings in relation to flood levels and relevant environmental conditions, including safe access to onsite facilities for operational staff during adverse/emergency weather conditions

(d) the physical form of the stream bed, channel, banks and vegetation upstream of FSL of both reservoirs (where waterways and watercourses are present as defined under the *Fisheries Act 1994* and/or the *Water Act 2000*) and within the upper reservoir footprint, including AHD levels (e.g. presence of natural features including snags likely to be impacted), abiotic factors (e.g., sunlight, water temperature, velocity, pH, soils, sediment/bed substrate type), bathymetry and fluvial geomorphology processes, including shape, flow regime, connectivity, water quality and chemistry and related aquatic ecosystems.

[4] Persons who are suitably qualified and experienced in biology and fauna passage design and construction are to be engaged to provide advice regarding: (i) whether upstream passage of aquatic fauna is required, (ii) provision and adequacy of downstream aquatic fauna passage, and (iii) oversee the design, construction and commissioning of any fauna passageways.

(e) the physical form of the stream beds downstream of the proposed lower and upper reservoir walls (e.g. presence of natural features likely to be impacted, such as deep pools, riffles and other refugia for upstream moving fauna); project and components' impacts on downstream stream bed morphology, and bank and channel stability and environmental flows is be addressed as per section 9.

(f) details of any other associated instream structures including any upstream or downstream permanent or temporary waterway barrier works e.g. for access, water delivery or water storage purposes.

6.9 Describe how risks associated with the potential failure of the reservoirs, seepage through the foundations or embankments of the dam, and/or overtopping of the structures will be avoided, minimised, mitigated or managed, and monitored through water infrastructure design to protect people, property and the environment.

Tunnelling Infrastructure

6.10 For all proposed tunnels and subsurface caverns, describe, map and illustrate at a suitable scale:

(a) locations and dimensions (length and width)

(b) depths below ground level

(c) location in relation to groundwater

(d) construction methodology

(e) associated surface infrastructure, including temporary and permanent access, tunnel portals, headworks and ventilation requirements.

6.11 Assessment of impacts as a result of tunnelling, including any blasting, are to be addressed as per section 9, including:

(a) interactions with groundwater, including risks to water quality, aquatic ecosystems and groundwater drawdown

(b) subsurface impacts on land stability and root systems of overlying vegetation

(c) reuse and disposal of surplus excavated material and water

(d) management of soils

(e) direct clearing for associated surface infrastructure

(f) impacts on surrounding infrastructure, wildlife and amenity as a result of construction activities.

Pumped hydro power stations and transmission infrastructure

6.12 Describe, dimension, map and illustrate at a suitable scale:

(a) all permanent and temporary work areas (including access corridors) including decommissioning and repair methods for temporary work areas

(b) transmission line system from the underground hydroelectric power station to the surface switchyard

(c) ancillary infrastructure required to directly support the construction and operation of the pumped hydro power station and connection to transmission infrastructure including emergency and maintenance access tunnels and shafts, ventilation shafts and any surface infrastructure

(d) tunnelling required between reservoirs for the delivery of water to supply the pumped hydro power stations, including the design of the tunnels and materials used in the construction and operation, disposal and reuse of surplus excavated material, along with geological maps/ test bore hole results, anticipated geological formations encountered and water within these formations expected to be impacted by the tunnelling.

6.13 Describe the source of any foundation material required for the underground power station, its composition, expected physical and chemical properties and quantities of soil/rock to be excavated and to be sourced e.g. rock, sand, riverbed material and the proposed locations for storage and disposal and appropriate management of any waste material resulting from the construction of the foundations.

6.14 Describe how the underground power station and associated infrastructure would be designed to prevent the entrainment, injury and mortality of fish and other aquatic fauna, with impact assessment of design to be provided as per section 9 of this TOR.

Ancillary infrastructure requirements

6.15 Detail the location of all ancillary works to be undertaken, with concept and layout plans, at an appropriate scale, showing the disturbance footprint extent and suitable impact assessment, proximity to any protected and environmentally significant areas, waterways, requirements for new infrastructure, and/or the upgrading, buffer zones, retention, relocation and/or decommissioning of existing infrastructure to service the project. Infrastructure to be considered is to include, but is not limited to:

(a) resource extraction areas (such as quarries and borrow pits)

(b) transport and utility infrastructure and corridors, including necessary access roads and tracks, waterway crossings and any vessel launching/loading facilities

(c) site construction facilities including workforce accommodation, crusher plant, concrete batch plant, quarries, sand extraction areas, material stockpile and laydown areas, helipads, storage of explosives and chemical products

(d) water supply, water treatment, energy supply (from the grid) and generation to support construction including fuel, telecommunications, solid waste disposal, wastewater treatment and disposal, and sewerage systems

(e) other infrastructure (such as buildings, yards, pumps, dips)

(f) fencing strategy for all temporary and permanent fencing, including a description of how the facility will be secured to prevent public access water pipelines or other linear infrastructure, whether underground or above.

(g) water retention and release points and infrastructure.

6.16 Describe whether the infrastructure is permanent or temporary and nominate if it constitutes waterway barrier works.

6.17 Nominate the building and construction standards for all works.

6.18 Describe the timing of requirements for this infrastructure and detail the decommissioning and rehabilitation schedule for all project-related infrastructure.

6.19 Include names of the required infrastructure owners and service providers as appropriate, discuss the status of the engagement with these providers, regarding the capacity of existing or proposed infrastructure to accommodate/or not accommodate project requirements.

6.20 Identify infrastructure alternatives considered and justify selected options, including why the nominated preferred option was chosen, particularly with respect to potential environmental impacts.

Project staging

6.21 Provide a detailed description, including maps, of the staging of project activities (construction and operation), including scope of works (on the project site and required infrastructure), disturbance area, buffer zones, physical layout of the project over time, likely timing of the project including any stages and the sequencing of these stages.

Pre-construction

6.22 Identify if any land acquisition is proposed, including proposed ownership details and land tenure. This should also identify resource tenures and the location of any former mine workings.

6.23 Describe the pre-construction activities, showing the dimensions, location and disturbance footprints with appropriate scaled maps and figures, including, but not limited to:

(a) timing, staging and sequencing of pre-construction activities and days and hours of operation (including night-time works)

(b) existing former mine workings including shafts and adits

(c) proposed temporary and permanent infrastructure

(d) proposed vegetation clearing and mulching and buffer zones (including footprints, proposed removal techniques, staging use or disposal of cleared vegetation and clear rationale for these methods as having the least potential environmental impact), top- and sub-soil removal and stockpiling and associated management strategies and mitigation measures.

(e) interference with watercourses (as described under the *Water Act 2000*), waterways (as described under the *Fisheries Act 1994*), and floodplain areas including wetlands

(f) proposed dewatering, treatment, and management of site drainage and river flow

(g) proposed placing of materials (concrete, fill and filter materials)

(h) project site access arrangements where access to the site is on tenure not held by the proponent, including the status of any consents and approvals required to access land or purchase land or obtain easements

(i) project site access arrangements where the land is subject to resource authorities

(j) proposed development, upgrades, realignments, relocation, deviation or restricted access to roads and other infrastructure including water, power and telecommunications

(k) all environmentally relevant activities and all notifiable activities

(l) effective environmental management strategies and mitigation measures included as part of the project design

(m) proposed earthworks, construction methods, any use of quarry materials from a watercourse, associated equipment, and techniques

(n) pre-disturbance surveys, including geotechnical, topographic, noise and vibration, air quality, flora and fauna, water quality and flow, cultural heritage, contaminated land, visual

amenity and how this information will be used in the final design and construction of the project[5]

(o) effective erosion and sediment control measures, water sensitive urban design features, and measures and controls for managing hazards, flooding, actual and potential acid sulfate soils and contaminated land

(p) approvals, licences and permits required for the construction works (e.g., operational works, building works etc), including timing and delivery of the required supporting information

(q) any required preparatory activities including demolition, temporary augmentation or other preparatory activities on existing structures including recreational infrastructure, and upstream and downstream, instream and floodplain

(r) any land contamination survey, sampling and decontamination methods and programs

(s) for all components, the proposed earthworks, construction methods, associated equipment and techniques

(t) existing infrastructure and easements on affected land within and adjoining the project area

(u) biosecurity management of weeds, pests and diseases for pre-construction activities, including where personnel, plant and equipment are introduced to undeveloped areas.

Construction

6.24 Identify the extent and nature of construction activities required for the upper and lower reservoirs, power generation (including head and tailraces and associated pumps; access tunnels; portals; inlets and outlets), quarries, transmission infrastructure and associated ancillary infrastructure including access requirements.

6.25 Include maps and figures at a suitable scale, showing site boundaries, land tenure, disturbance areas, buffer zones, development sequencing and timeframes and the layout of construction facilities to be used.

6.26 Describe the nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling and appropriate management of raw material.

6.27 Detail the placement, potential impacts, and proposed management and mitigation for extracted materials, including impacts:

(a) on drainage features and surface runoff

(b) from erosion of stockpiles and runoff

(c) as a result of leaching and seepage from stockpiles.

6.28 Describe any removal or sourcing materials for structures e.g. earthen/sand, concrete, rock and/or sheet pile, source location, stockpile locations, volume, tonnage and quality of natural resources required.

6.29 Identify if diversions of waterways are required during construction and if so, describe, how fauna (terrestrial and aquatic) passage would be provided through any diversions and, if applicable, proposals for the reinstatement of the waterways after construction has ceased. Reference should be made to Department of Agriculture and Fisheries (DAF) Guidelines for Fish Salvage, (e.g. if any dewatering is required) and outcomes to be achieved in accordance with Department

[5] Water quality and aquatic ecosystem health monitoring at all stages of the project to be undertaken in accordance with the Monitoring and Sampling manual (Qld Government, 2019).

of Regional Development, Manufacturing and Water (DRDMW) Guideline: **Works that interfere with water in a watercourse—watercourse diversions.**[6]

6.30 Describe changes to waterways (as defined under the *Fisheries Act 1994)* and watercourses (as defined under the *Water Act 2000*), the change in hydrology upstream and downstream of any construction site for any component of the project, including flooding and overland flow on or off the site, including crossings, spillway, fishways, downstream barriers, flood levees, water off-takes and, locations of any proposed water discharge points. Where any changes are proposed, note what licencing provisions may be required under the *Water Act 2000*.

6.31 Demonstrate water quality management methods for changes in watercourses, stream diversions, hydrology and stream function, including monitoring and reporting schedules.

6.32 Demonstrate that the construction of the various project components will help to achieve functioning, healthy and resilient riverine, floodplain and wetlands ecosystems which maintain and/or enhance environmental outcomes.

6.33 The description of construction activities is to include, with appropriately scaled maps, as appropriate to each component of the project:

(a) construction, environmental and safety standards, methods, impact avoidance, minimisation and mitigation measures, management strategies and site management arrangements

(b) any new connections to electricity transmission infrastructure, routes and easements required

(c) where the power generation and transmission infrastructure connections will be constructed and how they will be transported to the site, including details of any necessary road and waterway crossing upgrades, land disturbance and vegetation clearing

(d) construction sequencing and staging plans (where relevant, provide detailed plans, drawings and maps to illustrate these matters)

(e) proposed construction methods, associated equipment and techniques

(f) timetable for construction, including days and hours of operation for proposed construction works, specifying any activities to be undertaken at night

(g) capacity of plant and equipment, their chemical and physical processes, identify any emissions and provide the estimated quantity of chemicals or hazardous materials that will be stored onsite, including the relevant dangerous goods codes for that method of storage, storage management locations

(h) known locations of new or altered works and structures and infrastructure necessary (such as construction laydown areas and buffer zones) to enable the construction and operation of the development, whether on or off the project area, and intersections required with existing infrastructure (e.g. water pipeline, road, power etc)

(i) any activity that is a prescribed ERA

(j) general construction requirements including blasting, excavation and tunnelling, dredging, haul road establishment, bed-levelling, crushing, screening, concrete batching, fuel and chemical storage, workshop facilities, office facilities, on-site mess and ablutions facilities

[6] Department of Natural Resources, Mines and Energy, *Guideline: Works that interfere with water in a watercourse for a resource activity-watercourse diversions authorised under the Water Act 2000*, Department of Natural Resources, Mines and Energy, Queensland Government, 2019.

(k) location and access including coordinates of the boundary points in decimal degrees (latitude and longitude to five (5) decimal places, GDA2020) of any new or established quarry or extraction operations (i.e. extraction voids, borrow pits, dredging and stream bank excavations) as well as any other activities associated with the extraction and screening activity (i.e. screening plant locations, material stock piles, releases to waters) (note: for the purposes of this proposed project, extraction and screening have the meanings identified in Schedule 2 – ERA 16 *Environmental Protection Regulation 2019)*

(l) source of materials and infrastructure for the project, their nature and mode of delivery

(m) describe how emergency events (i.e. flood, landslide, earthquake or tremor, bushfire, drought etc.) would be managed during construction, including appropriate communication with Sunwater to ensure implementation of the Emergency Action Plan (EAP) for Eungella Dam is not compromised

(n) any potential disruption to flows in watercourses/waterways and tributaries during construction and any diversion works required including coffer dams, temporary diversions and cut-off drains

(o) management of fauna and vegetation material generated by clearing for construction and the reservoir areas

(p) number, capacity and type of vehicles, machinery, plant and equipment used for construction activities and including the method of transport of construction machinery and materials to and within the construction site/s. Full details of transport volumes, modes and routes are to be provided in accordance with section 9 – Transport

(q) water balance for the water supply requirements. For each component of the works, potable, recycled water, dust suppression, concrete batching, fill conditioning, washdowns, road construction, camp operation and upper reservoir filling are to be identified and quantified. For each water requirement, the source, volume, quality, means of access and transport, treatment processes and storage method are to be provided

(r) any take or interference with water in a watercourse, lake or spring, overland flow water, and underground water (both direct and in-direct)

(s) stormwater drainage systems and the proposed treatment, disposal and/or re-use arrangements, including any off-site services, stormwater release and monitoring locations with coordinates in decimal degrees (latitude and longitude to five decimal places, GDA 2020)

(t) capture, appropriate management, containment/disposal and quantity of construction spoil. Full details of physical and chemical properties of soils and spoil are to be provided in accordance with section 9 – Land

(u) solid and liquid waste management (full details of the waste volumes, characteristics and management strategies) are to be provided in accordance with section 9 – Waste management

(v) contaminated land management (full details of any identified contaminated material, appropriate management and disposal) to be provided in accordance with section 9 - Land

(w) public and workforce safety, medical facilities to be provided on site and provision for access to emergency services, onsite security services

(x) allowance for provision of power back-up in emergency, noting that any potential impact on local supplies in the area is to be addressed as per section 9

(y) biosecurity management of construction areas, access routes and ancillary infrastructure, including personnel hygiene stations, vehicle washdown bays, access management; include how any biosecurity event would be managed and rehabilitated

(z) construction site demobilisation and environmental protection and management measures (to be completed after rehabilitation).

Rehabilitation

6.34 Describe the following rehabilitation activities and methods to be undertaken during and after construction, providing maps and plans where required, including:

(a) site rehabilitation actions, closure and decommissioning works for removal of infrastructure

(b) options, strategies, methods, timing, outcomes, and management for the progressive rehabilitation of the environment disturbed by the project. A preferred rehabilitation strategy is to be developed with a view to minimise the amount of land disturbed at any one time

(c) rehabilitation methods for capital works and revegetation, with reference to meeting Rehabilitation guidelines[7]

(d) final topography and excavation depths of any quarries, sand extraction areas, borrow areas, trenches, sediment control structures, waste areas, temporary waterway barrier sites, dam and weir sites, construction areas, easements, buffer zones, laydown areas and all other forms of landform impact are to be described and identified on maps at a suitable scale

(e) any proposals to reinstate fish, turtle or other aquatic fauna passage through waterways diverted during construction, after construction has ceased

(f) actions to be undertaken and processes required to remove land from the environmental management register and/or contaminated land register

(g) land permanently impacted and not being considered for rehabilitation is to be clearly mapped.

(h) how achievement of the rehabilitation objectives would be monitored, audited and reported, and how corrective actions would be effectively managed.

Operation

6.35 Describe how each component of the project would be operated with appropriately scaled maps and plans (where required), including:

(a) operations of each component (e.g. hours of operation for each component of the project)

(b) infrastructure commissioning process including landscaping, headrace and tailrace and the rehabilitation of affected areas after construction (including any ongoing water supply requirements for these works)

(c) provision for the potential necessary structural and operating adjustments relating to upstream and downstream fauna passage (including fauna monitoring), fauna exclusion devices, approach channels etc. that will be identified during post-commissioning monitoring

[7] Refer to DESI *Rehabilitation – EIS information guideline* at **https://www.qld.gov.au/__data/assets/pdf_file/0017/242315/eis-tm-rehabilitation-information-guide.pdf**

(d) potential long-term groundwater dewatering treatment, disposal and management associated with the subsurface infrastructure (tunnels and power station)

(e) arrangements for administration, maintenance and repair and control of the works for the duration of the presence of the infrastructure (reservoirs, fishways, pumping infrastructure including any proposal for screening, turtle passage, pipes, roads, recreational facilities, site restoration activities and all other components of the project)

(f) operational arrangements for the project including flow releases, operation of fauna passage infrastructure, operation of gates (if relevant), intake and outlet works, pumps, including details of remote operation and administration, on-site staffing, safety requirements for staff and the public and routine maintenance including water requirements post construction for landscaping, revegetation and office use

(g) water use, sources, volumes and storage requirements, described separately for storage fill and other operational activities including the provision of fauna passage

(h) proposed access associated with the reservoirs, for operations and maintenance including infrastructure for recreational purposes and their accessibility during or following events such as flooding and bushfires

(i) use and management of surrounding land and any obligations or restrictions thereon

(j) any restrictions on access of land exposed at water levels below FSL or within the water storage

(k) energy, any co-location of power and telecommunications requirements and sources

(l) solid, liquid and gaseous waste generated and proposed methods of treatment, management, and disposal, including any requirements for dewatering of underground infrastructure

(m) type, volume and rate of chemicals and hazardous materials to be used and stored onsite, including the relevant dangerous goods codes for that method of storage, storage management and locations

(n) transport needs and expected traffic

(o) expected life of all components of the infrastructure, management of and timely access to spare parts (e.g. for fauna passage materials) and any anticipated major maintenance periods

(p) demonstrate that safe and adequate fish passage is provided, in addition to the effectiveness, operational range and frequency of any proposed fauna passageway and/or spillway proposed for the lower reservoir and any potential changes to existing fauna passageway's and/or spillways for Broken River and the safe design and operation of all water infrastructure to avoid injuries to fauna traversing or utilising the reservoir habitats

(q) any proposed recreational uses of dams, weirs, water storages and potential restriction in this regard due to rapid fluctuations of the lakes water level

(r) capacity of plant and equipment, any emissions and their chemical and physical processes

(s) stormwater drainage systems and the proposed treatment, disposal and/or re-use arrangements, including any off-site services, stormwater release and monitoring locations with coordinates in decimal degrees (latitude and longitude to five decimal places, GDA 2020)

(t) describe how flood events would be managed post-construction, including management of water extraction and releases during a flood event.

(u) Water supply release arrangements for existing water entitlement users and the environment during the commissioning process.

Decommissioning

6.36 It is recognised that project components are anticipated to have a long operational life spanning many decades. This section of the EIS is to present options for final land use, general strategies and methods for decommissioning and rehabilitation and how the final landform will be made stable, secure and non-polluting. This should apply to all components of the project including underground infrastructure and reuse and recycling of associated materials should it ever be required.

Site description

Refer to requirements set out section 4.4.3 in the *Preparing an EIS: Guideline for proponents.*

Project rationale and alternatives

6.37 In addition to the requirements set out in the *Preparing an EIS: Guideline for proponents,* the EIS is to:

(a) provide details of market considerations, design considerations and calculations that led to the proposed project capacity and generation durations

(b) provide a detailed justification and options analysis for lower impact alternative reservoir sites and/or designs. This should include an assessment of the proposed construction of the reservoirs, social and environmental considerations; and demonstration that the proposed project design has been developed to avoid or minimise impact on environmental values and environmental integrity.

7. Planning and legislative requirements

7.1 In addition to the requirements set out in the *Preparing an EIS: Guideline for proponents,* the EIS is to:

(a) describe any proposals for locating infrastructure or offsets on state land, and proposed tenure dealings under the *Land Act 1994*, including justification for proposed use of state land over other land

(b) consider the provisions of the Australian Government native title and cultural heritage legislation, including the *Native Title Act 1993* and *Environment Protection and Biodiversity Conservation Act 1999*, as well as the Queensland *Aboriginal Cultural Heritage Act 2003*

(c) consider the provisions of the *Regional Planning Interests Act 2014* (RPI Act) and whether a regional interests development approval (RIDA) is required pursuant to the RPI Act

(d) describe all environmentally relevant activities including information in relation to ERA 16[8]. Ensure that technical information provided for the project is consistent with DESI's technical information requirements for an environmental authority application, and at a minimum, includes:

[8] **Technical information requirements for an environmental authority application | Business Queensland**

(i) detailed description of the activity, and how the activity will be carried out, including hours of activity

(ii) maximum depth of proposed extraction (mAHD)

(iii) maximum amount of material to be extracted per year

(iv) information on whether groundwater will be intercepted and if there is potential for groundwater impact, include how it will it be monitored and managed to ensure any resultant drawdown does not negatively impact groundwater dependent environments or any other groundwater users in the area

(v) map showing proposed extraction, screening, stockpiling and operational areas

(vi) GPS points (in decimal degrees GDA 2020 to four decimal places) of proposed extraction, screening, stockpiling and operational areas, and proposed release points (if applicable)

(vii) noise and blasting impact assessment including quantification of impacts, anticipated noise levels from the activity, as well as anticipated noise levels that will be experienced at nearby sensitive receptors. A risk assessment of project impacts should be produced to demonstrate if modelling is required

(viii) air impact assessment including anticipated dust levels likely to be generated by the activity, as well as anticipated dust levels that will be experienced at nearby sensitive receptors. A risk assessment of project impacts should be produced to demonstrate if modelling is required

(ix) an erosion and sediment control plan for the project including location of all sedimentation ponds; GPS locations of all pond release points; release methods for each release point; anticipated contaminants including from chemical storage, manufacture of explosives; levels of contaminants in releases; frequency of releases

(x) impact mitigation and monitoring measures for all identified impacts

(xi) details of the proposed rehabilitation of land disturbed by the activity in accordance with relevant guidance in section 5.3.3 of the *Preparing an EIS: Guideline for proponents*

(e) consider the provisions of the *Electricity Act 1994* and describe the relevant process to obtain the required electricity licence(s)

(f) describe any approvals, permits or entitlements required under the *Water Act 2000* and relevant Water Plan(s) and address relevant legislative requirements and water volume limitations, including but not limited to, amendments to the relevant Water Supply Scheme Resource Operations Licence or replacement of the relevant Water Supply Scheme Operations Manual and licences and/or allocation to take and interfere with water

(g) describe how the provisions of the *Water Supply (Safety and Reliability) Act 2008* (WSSR Act) and related instruments will be met by the proposed dam infrastructure

(h) consider the provisions of the *Mineral Resources Act 1989* (MRA) regarding impacts on resource authority holders by the proposed project. The EIS should also discuss the extent and adequacy of the restricted areas (RAs) currently in place in the transmission study area. See s391 of the MRA

(i) as per Section 4.5 of the *Preparing an EIS: Guideline for proponents,* an assessment against the relevant State Development Assessment Provisions (SDAP) codes is likely to include, but is not limited to, the following:

(i) SDAP state code 10: Taking or interfering with water

(ii) SDAP state code 15: Removal of quarry material from a watercourse or lake

(iii) SDAP state code 16: Native vegetation clearing[9]

(iv) SDAP state code 18: Constructing or raising waterway barrier works in fish habitats

(v) SDAP state code 20: Developing a referable dam

(vi) SDAP state code 22: Environmentally relevant activities

(j) describe actions to be undertaken and processes required to surrender any approvals or licences obtained for the project, including for example any Environmental Authorities obtained under the EP Act for ERAs relevant to the proposed project, or for any water related approvals or licences.

8. Stakeholder consultation

8.1 Section 4.6 of the *Preparing an EIS: Guideline for proponents* outlines the community and stakeholder engagement requirements for preparing an EIS.

[9] Queensland Government, *Guide to State Development Assessment Provisions – State code 16: Native vegetation clearing*, Version 3.00, 2023 for Coordinated project (all other purposes), Department of Resources, can be used to inform a response to SDAP State Code 16.

9. Assessment of project specific matters

Water resources

Objectives and outcomes

The design, construction and operation of the project are to:

(a) avoid, minimise and/or mitigate adverse impacts to water resources and Indigenous water resources uses, values and aspirations

(b) use water resources in an equitable, sustainable and efficient manner

(c) maintain and monitor environmental flows, water quality objectives, in-stream habitat diversity, habitat connectivity and naturally occurring inputs from riparian zones to support aquatic biotic communities

(d) protect or enhance the condition, environmental values and natural functions of waterways, watercourses, lakes, springs, aquifers and other natural water systems—including the stability of beds and banks of waterways and watercourses

(e) protect the volumes, reliability and quality of water resources so that current lawful users of water (such as entitlement holders and stock and domestic users) and other beneficial uses of water (such as spring flows, wetlands, seasonal flows, groundwater recharge and groundwater-dependent ecosystems) are not adversely impacted by the development.

The performance outcomes corresponding to some of these objectives are in schedule 8, part 3 of the EP Regulation.

Surface water

Existing environment

9.1 Provide maps of existing waterways or water features. Identify:

(a) drainage channels, wetlands, flood-prone or low-lying land within and adjacent to the project area

(b) waterways (ephemeral or perennial) and water features including any natural or artificial waterway barriers

(c) existing water supply schemes within and adjacent to the project area

(d) relevant drainage basin(s), sub-basins and associated sub-catchments

(e) any semi-permanent or permanent waterways/watercourses, riffles and pools, waterholes, stock watering locations and groundwater aquifers (including where surface water interactions are likely) and surface expression of groundwater

(f) features mapped as a watercourse, lake, spring or drainage feature on the Watercourse Identification Map (WIM). Where a feature is mapped as “unmapped” or the feature is not mapped, in the project area, provide evidence the feature has been determined as a watercourse, lake, spring or drainage feature for the purposes of the *Water Act 2000*.

9.2 Describe the existing relevant Water Plan and water plan outcomes, relevant statutory instruments, water allocation security objectives and environmental flow objectives.

9.3 Develop and where possible calibrate a hydrologic model and 2D hydraulic model/s of the Broken River catchment and other catchments (if affected by the project). Describe the hydrologic

regimes and flooding extent of any waterways, creeks and streams within the project area and external to the project area impacted by the project. The model should include 50%, 20%, 10%, 5%, 2%, 1%, 0.1% and 0.05% annual exceedance probability (AEP) events and probably maximum flood (PMF).

9.4 Describe existing surface drainage patterns, waterway features, environmental values and flows in streams in the project area including seasonal variations using suitable locations between identified stream nodes.

9.5 Discuss the history of flooding including extent, levels and frequency (upstream and downstream).

9.6 Describe the current operation and management of the Eungella Dam and distribution system, including yield, operating strategy, supply reliability, allocation and use of water supplies, water use efficiency and the environmental flow regime.

9.7 Describe and compare the existing environment, current and full entitlement flow characteristics (for existing water supply) including seasonal flow patterns, flow volumes and duration using relevant indicators from the relevant Water Plan and others such as sediment loads, bed and bank stability and ecological impacts as appropriate to this project after consultation with fluvial geomorphologists and ecologists. Graphical representations at all Water Plan nodes downstream of the development are to be included.

9.8 Detail diversions or interception of overland flow, including volumes, at a site and catchment scale. Include maps of suitable scale showing the location of diversions and other water-related infrastructure including the size of any overland flow dam, ensuring that overland flow storage capacity meets the requirements listed under the relevant Water Plan.

9.9 Describe existing and potential users and uses of water in the area potentially affected by the proposed project, including municipal, agricultural, industrial, mining, recreational, educational, environmental and cultural uses of water including Indigenous water resource uses, values and aspirations.

Impact assessment and mitigation measures

9.10 Identify the location of all proposed infrastructure in relation to potentially impacted waters.

9.11 Incorporate the 1D and 2D project features for both construction and operation phase in the hydraulic model/s developed in accordance with Section 9.3 and use the model/s to identify the flooding condition and the potential flooding impact of the project across the Broken River catchment (and other catchments if required) and proposed the necessary measures to mitigate those impacts where possible. The model to be set up with appropriate grid size and with necessary adjustments of the date from the LiDAR survey for the purpose the study.

9.12 Develop suitable conceptual site models (descriptive text, tables, box-and-arrow diagrams, pictorial) that represent the pre-disturbance, construction and operation stages that adequately describes how the ecological and water systems function in the project area. Conceptual models should be used in the project's risk and impact assessments to effectively describe the key processes, biological and chemical pathways, interactions and connections between sources of potential impact and receptors for all components of the proposed project. The site-specific models should as a minimum adequately describe the sources, routes of transport, contaminated media, routes of exposure, endpoint receptors, indirect effects, temporal and seasonal considerations.

9.13 Complete and submit a failure impact assessment (FIA) certified by an RPEQ for all dam infrastructure in accordance with DNRME 2018 Guideline for failure impact assessment of water

dams, to determine the consequences on downstream populations if the dam failed. At a minimum, include:

(a) detail any potential threat to people and property downstream of the dam from flooding caused by dam failure, including cascade failure

(b) determine if the proposed dam infrastructure requires regulation as being "referable"

(c) emergency action planning, flood mitigation

(d) consultation with DRDMW

(e) performance outcomes for proposed dam infrastructure associated with both the upper reservoir and lower reservoir are to be developed and detailed, with reference to relevant Queensland and the Australian National Committee on Large Dams guidelines.[10]

NOTE: The FIA should consider all credible failure modes with and without concurrent downstream events to determine the scenario which provides the maximum incremental population at risk (PAR). Appropriate sensitivity testing should be undertaken on all key parameters, notably roughness, boundary placement and breach development. The FIA should be accompanied by signed RPEQ and quality statements contained within the FIA guideline and recommend a failure impact rating (if applicable) (i.e. category 1 or 2) for the dam.

9.14 Describe impacts of the project on the outcomes and objectives of the relevant Water Plan including how the project will conform to the relevant Water Plan and how any impacts will be mitigated. In the assessment of impacts, use DRDMW Chief Executive approved IQQM hydrological model for the Burdekin Basin Water Plan to inform the assessment. The assessment should consider applicable outcomes of the Burdekin Basin Water Plan, performance indicators and objectives, strategies to meet the outcomes, changed processes and volumes, downstream users and environment, overland flow provisions and other statutory instruments underpinning the Water Plan (i.e., water management protocol). Regarding the impact assessment:

(a) consultation with DRDMW regarding the modelling assumptions, procedure and outcomes of the modelling is recommended

(b) consultation with Sunwater regarding potential changes to operation of Eungella Dam is recommended.

9.15 Discuss the changes in the stream flows and eco-hydraulic indicators that may be anticipated as a result of the proposed project in:

(a) no flow spells – frequency, timing and duration, including pools as dry season refugia

(b) low flow spells – frequency, timing and duration, including riffles and low flow migration species

(c) medium flows– frequency, timing and duration, including flows that reduce estuarine salinity

(d) high flows– frequency, timing and duration, including flows that provide flows for riparian and floodplains.

9.16 Provide hydrological modelling outputs including hydrographs of predicted changes in flow regime and assess potential impacts to environmental flows at a range of locations representative of key habitats, biota and existing water uses under the current and full entitlement scenarios (with the project in operation). Address and include clear descriptions of the following:

[10] Refer https://ancold.org.au/product-category/guidelines/

(a) the impacts of the project on the reliability of supply for all water users and environmental needs in the Eungella Dam supply catchment

(b) effects of drainage or dewatering works, excavation, placement of fill, clearing or any other alterations to existing topography and landform on the hydrology of works sites including any alteration to drainage patterns, fluvial processes and the water table and secondary influence on flooding. If levee banks or stream diversion constructions are proposed, the effects on neighbouring landholders are to be considered. This should also include tunnel infrastructure and estimates of necessary drawdown and take of water during the construction phase

(c) proposed drainage structures for all aspects of the project, including supporting infrastructure such as access roads

(d) timing of the construction works relative to likely period of flooding and proposals to minimise the risk of flood damage

(e) changes in inundation frequency, timing and duration of waterways and floodplain/wetlands, and potential impacts on flood levels upstream and downstream of the storage areas and at any new or existing crossing of waterways. The extent of flood modelling will be to the points at which no significant impact occurs. Flood studies are to include a range of annual exceedance probabilities as detailed for the existing scenario (refer item 9.3). Use hydrographs to represent flood levels at different locations

(f) changes to sediment transport, potential erosion/scouring and changes in deposition upstream and downstream bank and channel morphology, instream habitats and stability of riparian vegetation

(g) alterations to riparian vegetation, and bank and channel morphology

(h) any potential implications of climate change as determined in section 9 – Climate, and section 9 - Hazards, health and safety

(i) any potential impacts the construction and operation of the project may have on surrounding waterways and downstream environmental values

(j) models should address the range of climatic conditions that may be experienced at the site throughout all phases of the project, and adequately assess the potential cumulative impacts of the proposed project on water resources including to the post-decommissioning phase

(k) any potential impacts the construction and operation of the project may have on downstream water users and infrastructure (e.g. pump stations) with respect to water quality, potential changes in flow regime and availability of water for extraction

(l) any potential impacts the construction and operation of the project may have on downstream flora and fauna (inclusive of fish) with respect to water quality (i.e water pollutant limits and chemistry), and potential changes in flow regime that are critical for spawning, movement and feeding.

9.17 Undertake the necessary hydrology and flood modellings for the pre and post development condition and different stages of the construction phase as required to describe the following with regard to construction and operational impacts:

(a) effect of environmental flow requirements on dam reliability and water availability for consumptive use[11]

(b) impacts of the project on flow regime indicators (water allocation security objectives and environmental flow objectives in accordance with the relevant Water Plan and stipulation of the assumptions made (e.g. extraction patterns, release patterns, release capacity, consumptive use)

(c) effect of water storages, diversions and levees, tunnelling, water harvesting (losses) and operational releases on environmental flow requirements, dam reliability and water availability for consumptive use and on terrestrial, aquatic and groundwater dependent ecosystem ecological communities and proposed mitigation measures

(d) changes in the reliability of supply to current water entitlement holders and any impacts on the operation of existing water extraction

(e) changes in flow patterns including changes in the magnitude of flow events, flow frequency and timing of flows, volumes and duration, connectivity, and changes in flows reaching estuarine waters, when compared at a meaningful scale with pre-development (i.e. the existing landscape) and current flows in the system

(f) natural recharge via flooding or elevated flow events

(g) natural recharge via environmental flow events

(h) changes in the reliability of water supply and changes in flow patterns and water levels in aquifers which are upstream and downstream from the project

(i) water supply to the project during drought/ low flow periods, and how project operations would occur under these conditions.

9.18 Provide information on the project's water usage, including details about the source, quality and quantity of all water required for the project and its construction activities.

9.19 Provide a detailed water balance for all stages of the project (pre-construction, construction, operations [including initial filling and maintenance filling], rehabilitation and decommissioning). Include groundwater collected during dewatering of underground infrastructure and quarries, and management of incident rainfall on bunded areas such as spoil piles. Quantify the water balance analysis including evaporative and seepage losses from the upper and lower reservoirs and water passage through the underground infrastructure. Describe mitigation measures and standard practices to prevent or minimise water losses and how this influences the water balance model for the project.

9.20 Identify and evaluate all surface water and groundwater supply options for the project, and address the quality and quantity, security of supply, resource availability, any requirements to access unallocated water reserves under the Water Plan (Burdekin Basin) 2011, as well as any relevant authorisation requirements under the *Water Act 2000* and its subordinate legislation. Demonstrate eligibility to hold any relevant authorisations.

9.21 Determine the potable water demand for the project, including the temporary demands during the construction period. Include details of any existing town water supply to meet such requirements. Detail should also be provided to describe any proposed on-site water storage and treatment for use by the site workforce and in the accommodation camp during the construction phase.

[11] Consumptive use means the use of water for private benefit consumptive purposes, including irrigation, industry, urban and stock and domestic use.

9.22 Identify the quantity, quality and location of all potential discharges of water and contaminants by project, including treated wastewater and sewage. Describe whether the discharges would be from point sources (whether uncontrolled and controlled discharges) or diffuse sources (such as irrigation to land of treated wastewater/sewage effluent) and describe the receiving environment (such as land or surface waters). Provide any relevant stream flow data or other information on discharge water quality, including any potential variation in discharge water quality that will be used in combination with proposed discharge rates to estimate instream dilution and water quality. Chemical and physical properties of any discharge water and wastewater, including concentrations of constituents, at the point of entering natural surface waters must be discussed along with toxicity of effluent constituents to human health, flora and fauna.

9.23 Describe and map:

(a) any proposed waterway/watercourse diversions including watercourse diversion design, operation, monitoring regime, and measures to be implemented to avoid impacts on local wetlands, streams, groundwater-dependent ecosystems, waterways and watercourses

(b) any existing or proposed diversions or interception of overland flow water. Ensuring that the take of overland flow water meets the requirements of the relevant water plan.

9.24 Describe how the project will integrate with, or impact on, existing infrastructure and the operational requirements of the Bowen Broken Water Supply Scheme. Identify if any amendments are required to the resource operations licence (ROL) and Operations Manual held by Sunwater Limited, or whether new statutory instruments are required (e.g. Distribution Operation Licence). This includes details on what entity will hold the statutory instruments for the project and Bowen Broken Water Supply Scheme at the completion of the project.

9.25 Provide a site-specific assessment of estimated losses from the proposed upper reservoir storage, PHES operations and lower reservoir in Broken River. This includes and is not limited to, direct consumption during power generation, evaporation, seepage and oscillation of water levels in all dams, and passage through the underground infrastructure. Describe how all losses will be measured and accounted for to inform management strategies and provide transparency. Any proposed mitigation and management strategies should be discussed.

9.26 Provide details of the authorisations required to cover any proposed losses and mechanisms for the project to access additional water in the event of significant loss, e.g. dam failure, evaporation etc.

9.27 Provide a site-specific assessment of estimated rainfall gains directly into the proposed upper and lower reservoir storage, including any management strategies.

9.28 Provide information on all proposed water accounting frameworks, including, but not limited to, existing take and Capricornia PHES operations. This may include details on capacity share arrangement water accounting rules, water measurement requirements and reporting arrangements.

9.29 Provide sufficient information on the project's water measurement plan, including details relating to:

(a) water taken to the upper reservoir and released to the lower reservoir

(b) water storage and transfer

(c) environmental losses and gains (evaporation rates and seepage estimations) for the upper and lower reservoir.

9.30 Provide information on the operational characteristics of cycling water between the reservoirs, including, but not limited to, water cycles characteristics, cycle frequency, range of storage levels that the PHES will operate in, and ceasing operations (e.g. during spilling events).

9.31 Describe the cumulative impacts of the proposed project, in conjunction with existing development and possible future development (as described by government priorities, projects under assessment, approved plans and existing project approvals), to water resources in the region. Use DRDMW's hydrological modelling to conduct this assessment.

9.32 For any works that may require a riverine protection permit, specific information is required including location of works, dimensions of excavation, fill and vegetation clearing, potential impacts to bed and banks from construction and operation, and measures to mitigate bed and bank erosion during construction.

9.33 Identify all proposed locations and details of extraction of material within a watercourse (quarry material) and delineate between quarry material intended for beneficial re-use or otherwise).

Groundwater

Existing environment

9.34 Describe the historic and existing environment for groundwater resources that may be affected by the project and the possible significance of the project to groundwater depletion or recharge, or potential saltwater intrusion of existing aquifers. The review is to include an on-ground survey of existing groundwater supply facilities (i.e. bores, wells or excavations) within the project area and adjacent to the project area. Include in the description:

(a) proximity of all groundwater supply facilities to the project and value of these facilities for rural, industrial and/or domestic use

(b) quality, quantity and significance of groundwater in the project area and any surrounding area potentially affected by the project's activities

(c) current use and volume of groundwater used within any potential area of impact. Provide surveys, location and source of existing groundwater supply facilities (e.g. bores, wells or excavations)

(d) any groundwater dependent ecosystems within any potential area of impact, including wetlands, riparian vegetation, instream ecosystems and stygofauna communities

(e) the nature of the aquifers at and near the sites, geology/stratigraphy, aquifer type, depth to and thickness of the aquifer, hydrogeology of the aquifers, depth to water level and seasonal changes in levels, groundwater flow directions and aquifer hydraulic parameters

(f) the movement of underground water to and from the aquifer(s), including how the aquifer(s) interact with each other and surface water, and the effect of geological structures on this movement

(g) interaction with surface water in each sub-catchment and possible sources and volumes of recharge

(h) seasonal variations, including consideration of a range of wet and dry climatic conditions (e.g. drought impact recharge) of groundwater levels and groundwater flow directions

(i) basic water quality of all aquifers in the project area, including major ions, pH, electrical conductivity, dissolved oxygen and dissolved metals. Also address vulnerability of aquifers within the project area to pollution

(j) groundwater resources proposed to be used by the project, including a description of the quality, quantity, usage rate and required location of those resources

(k) characteristics of target aquifers, including seasonal variability, value as water supply sources, capacity to provide the required volumes of water at the expected usage rate, recharge potential and profile of existing extraction.

Impact assessment and mitigation measures

9.35 Matters to be addressed are to include descriptions of the following:

(a) inputs, movements, exchanges and outputs of surface water and groundwater that would or may be affected by the project, including consideration of changes in hydrostatic pressure

(b) potential for underground infrastructure to disrupt groundwater flows, groundwater partitioning, groundwater quality and groundwater interactions with surface water bodies

(c) impacts of the project at the local scale and in a regional context including:

(i) changes in flow regimes from diversions, water take and discharges

(ii) groundwater draw-down, mounding and recharge

(iii) effects on riparian vegetation, instream ecosystems, and alterations to bank and channel morphology

(iv) direct and indirect impacts arising from the development, including potential impacts from groundwater drawdown depleting water in the root zone of vegetation with conservation value, particularly in localities with threatened species

(v) the effects of taking, or interfering with, water on the physical integrity of the aquifer

(d) impacts of the project on groundwater dependant ecosystems, including impacts on stygofauna and proposed mitigation measures

(e) effect of project construction on the availability and quality of groundwater resources downstream and if impacts to the availability of groundwater to other users are likely to trigger the requirement for a make good agreement under the *Water Act 2000*

(f) impacts of vegetation clearing, sedimentation, groundwater or surface water salinity and changes to depth below natural surface level of groundwater resources

(g) extent of the area within which groundwater resources are likely to be affected by the proposed operations of any component of the project, including effects of water storage, presence of the dam wall and downstream flow releases, effects of underground infrastructure, changes to groundwater salinity and changes to depth below natural surface level of groundwater resources

(h) impacts of any required extraction of groundwater resources and proposed mitigation measures to reduce the impact of the project on groundwater quality including the potential for interconnection between the target and underlying aquifers

(i) decommissioning of any temporary groundwater bores

(j) detail a construction and operation groundwater monitoring program for the project, to monitor any impacts as a result of the project, including on groundwater quality and hydrology, changes to depth below natural surface level of groundwater resources, and groundwater dependent ecosystems. The monitoring program should provide adequate

spatial coverage of all geologic units and monitoring bores should be constructed in accordance with the Minimum construction requirements for water bores in Australia[12]

(k) assessment of the long-term integrity of the upper reservoir bed liners/grouting in relation to seepage losses and associated potential interaction with groundwater

(l) a groundwater management plan, for the life of the project, which details management strategies for predicted impacts on groundwater.

9.36 Develop a robust groundwater conceptual model using a series of maps, cross-sections, block models and tables of aquifer characteristics to represent groundwater interactions with the lower storage and upper storage, and above and underground infrastructure, including: evaluation of data availability, hydrostratigraphy, identification and consideration of proximity to sensitive receptors, groundwater recharge and discharge processes, surface-groundwater interactions and lateral in/out groundwater flows lateral in/out groundwater flows; hydrogeological boundaries; description of hydrogeological domains; water quality; aquifer and aquitard properties; quantification of stresses and inputs; uncertainty assessment of the conceptual model; changes to depth below natural surface level of groundwater resources and impact pathways from the project. Check the conceptual model using simple analytical models and water balance calculations. The granularity of the model should be dependent on the predicted extent of any impacts to groundwater.

Water-related cultural values

Existing environment

9.37 Discuss Traditional Custodians' water related cultural values and use as relevant to the project, including information regarding economic development opportunities and methods proposed to protect these values, including, but not limited to:

(a) Aboriginal peoples and Torres Strait Islander peoples distinct cultural rights under the *Human Rights Act 2019*

(b) the cultural and spiritual values of water under section 6 (2)(k) of the EPP (Water and Wetland Biodiversity).

Impact assessment and mitigation measures

9.38 Describe the project's potential impacts on water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples.

9.39 Describe how water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples will be protected and/or promoted through water allocation and management strategies, relevant to the project.

9.40 Where Country may be affected by existing or future water infrastructure projects in the area, assess the cumulative impacts of these projects on the water-related cultural values, uses and aspirations linked to water for Aboriginal and Torres Strait Islander peoples.

[12] National Uniform Drillers Licensing Committee (2020) Fourth edition, available from **Construction requirements for water bores | Business Queensland**

Water quality

Objectives and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse impacts to water quality

b) protect environmental values of Queensland waters and maintain or enhance water quality to achieve water quality objectives

c) protect the environmental values of groundwater and any associated surface ecological systems

d) protect the environmental values of receiving marine waters and wetlands.

Existing environment

9.41 Describe the historic and existing water quality (surface and groundwater) of the local and regional water catchment that may be affected by any component of the project using historical and current water quality data and additional sampling data where required. Include consideration of the seasonal variation of water quality with a focus on wet versus dry season variations.

9.42 Identify locally derived trigger values, generally in accordance with best practice environmental management, including the DESI Guideline Water—EIS information guideline and accounting for variable flow conditions.

9.43 With reference to the EPP (Water and Wetland Biodiversity) (Burdekin River (lower) and Bowen River sub-basins Environmental Values and Water Quality Objectives) and section 9 the EP Act, identify the current water quality environmental values and water quality objectives of surface and ground waters within the project area and surrounds, and those downstream that may be affected by the project activities, including any human uses and cultural values of water.

9.44 Demonstrate how the relevant water quality objectives will be met during construction and operation of the project. Discuss how the project will contribute to the reduction targets outlined in the Reef 2050 Water Quality Improvement Plan 2017–2022 and Reef 2050 Long-Term Sustainability Plan.

9.45 The water quality assessment required by item 9.41 is to include a literature review supplemented by a suitable sampling program supported by sufficient site-specific baseline data. The following matters are to be discussed:

(a) relationship of water quality to flow, using local catchment examples

(b) water quality issues (such as stratification, eutrophication and deoxygenation) within and downstream from existing storages in the system

(c) confirmed or likely causes of existing water quality impacts

(d) suitability of existing raw water quality for proposed on-site uses and any treatment required

(e) current water quality issues related to specific uses of water as related to the project (e.g. potable supply)

(f) use of suitable water chemistry parameters to determine the level of surface water and groundwater connectivity baseline groundwater quality variability and its suitability for environmental and human use

(g) any water quality variations upstream and downstream of the reservoir/s or other infrastructure

(h) surface water quality analysis that allows assessment of water quality objectives, including, as a minimum, electrical conductivity, pH, sulphate, fluoride, dissolved oxygen, turbidity, total suspended solids, nutrients, dissolved and total metals and metalloids, total recoverable hydrocarbons, dissolved inorganic nitrogen (DIN), fine sediment, E coli, pesticides and herbicides, any other relevant contaminant of potential concern, and major anions and cations. Groundwater indicators must include, as a minimum, the same indicators (except turbidity and total suspended solids) and should allow for all water quality objectives for local groundwater to be assessed and, where relevant, derived.

9.46 The information provided to support the water quality assessment required by item 9.41 should be formatted to ensure that surface water and sediment quality interpretations and monitoring locations and frequency can be assessed and visualised in relation to relevant EVs. This can be demonstrated by:

(a) for raw data include date, flow condition at the time of sampling, water quality data in an Excel or CSV format.

(b) data should be presented within statistical summaries tables with data date range, percentiles (20^{th}, 50^{th}, 75^{th}, 80^{th}, min, max), total sample size (n), trend statistical analysis (where data is available), statistics compared against all relevant water quality objectives for the ease of comparison.

(c) graphs should include indicator-specific box plot comparing various monitoring points, time trend graphs for each indicator to identify seasonality and fluctuations associated with stages of hydrographs.

(d) groundwater chemistry data (major ions) should be presented in both a table with Australian Drinking Water Guidelines (ADWG) exceedances highlighted and as Piper Diagrams (ternary plots). Surface water chemistry should be plotted with groundwater chemistry on a Piper Diagram for comparative analyses.

(e) maps, at a suitable scale, related to water quality should indicate the locations of the following:

(i) Groundwater and surface water (and sediment) quality sampling locations, indicating if they are upstream or downstream monitoring points

(ii) waterway/watercourse names

(iii) wetlands

(iv) groundwater dependent ecosystems

(v) spatial location/s of scheduled and relevant environmental values or contaminant source locations - include off-take locations for human drinking water supply offtake and treatment, irrigation, stock access and recreational area.

9.47 Describe the water quality variability within the study area associated with climatic and seasonal factors, variability of freshwater flows and extreme events using suitable reference locations and sufficient data to adequately establish baseline condition and define natural variation, including seasonal variation.

Impact assessment and mitigation measures

9.48 With reference to the project construction and operational water balance, describe the quantity, quality, location, duration and timing of all potential and/or proposed releases of contaminants to waters. Releases may include controlled water discharges to surface water waterways/watercourses, uncontrolled discharges when the design capacity of storages is exceeded, spills of products during loading or transportation, contaminated run-off from construction, operational decommissioning areas of the project and surround, or run-off from disturbed acid sulfate, sodic or dispersive soils.

9.49 Describe how water quality may be impacted by the construction and operation of the project due to increased water circulation and subsequent turbidity arising from sediment disturbance (greater mixing of the water column and potential suspension and redistribution of sediments particularly resulting from shoreline erosion due to fluctuations in water levels).

9.50 Describe the likely impacts of the project on downstream ecosystems associated with sediment entrapment and discharge from the project. The assessment should consider the project's contribution to sediment erosion rates in the sub-catchment (based on existing available information) and any impacts associated with elevated turbidity and sedimentation stress, any impacts from the finer clay and silt sediment fractions and any reduced supply of coarse sediment on downstream catchment values.

9.51 Describe the volume, chemical and physical characteristics of the predicted resuspension sediments and any other organic matters during each project stage.

9.52 Model the spread and assess the impacts of any plumes or higher turbidity zones to spatially relevant environmental values.

9.53 Discuss the impacts of resuspension of materials under various scenarios such as pre-clearing the vegetation prior to inundation versus keeping inundated vegetation in-situ over time. The modelling and impact assessment should include an assessment of predicted water quality changes for a broad range of relevant physio-chemical and chemical properties or contaminants. If the ongoing daily process of resuspension and mobilisation is likely to impact pH, DO, temperature, ammonia, nutrients (including DIN), turbidity and oxidation processes these impacts should be clearly described and discussed in terms of mitigation, management, and any potential residual impacts.

9.54 Assess any potential impacts that resuspension and mobilisation may have on aquatic ecosystems, fisheries, recreational activities, and supply of (human) drinking water (including any potential requirements for additional water pre-treatments or secondary treatment/s due to the PHES project).

9.55 Detail any approvals and/or stakeholder engagement needed in terms of PHES operations and long-term sediment re-suspension impacts to environmental values.

9.56 Develop and describe suitable indicators for measuring PHES re- suspension impacts and set project objectives and commitments to protect environmental values from the potential impacts of long-term re- suspension impacts.

9.57 Detail management measures to minimise impacts and, a monitoring program that would audit the success of management measures to determine whether objectives have been met and describe corrective actions to be used if monitoring shows that objectives are not being met.

9.58 Describe how releases of water from the Eungella Dam may impact on water quality in the lower reservoir and downstream. Additionally, describe how releases of water from the upper and lower reservoirs may impact water quality in Broken River downstream of the lower reservoir.

9.59 Demonstrate how the relevant water quality guidelines or final objectives (as outlined in water quality information sources in section 5.2 of the *Preparing an EIS: Guideline for proponents)* will be met and how relevant environmental values are to be protected during construction, operation and decommissioning.

9.60 Demonstrate the proposed project can meet the environmental objectives and performance outcomes in schedule 8, part 3 of the EP Regulation and undertake the assessment of impacts on water in accordance with DESI guidelines (refer section 5.2 of the *Preparing an EIS: Guideline for proponents).*

9.61 Describe the impacts of the project on upstream and downstream water quality and any impacts on social, environmental and cultural outcomes of the relevant Water Plan, and the policies and guidelines outlined in *Preparing an EIS: Guideline for proponents*. Information is to be supported with references to relevant legislation, policies and guidelines.

9.62 Matters to be addressed are to include clear descriptions of the following:

(a) possible sources of water contamination or other changes in water quality during specific construction activities such as sand and gravel extraction, site clearing, excavation, dewatering of foundations, temporary or permanent road construction and related drainage, wastewater from concrete batching plants, vehicle and equipment wash down activities, sewage or grey water treatment and disposal, use of chemicals in foundation cleaning, grouting or testing and accidents or spillage

(b) likely quality of water leaving construction sites taking into account the management and mitigation measures proposed

(c) likely quality and appropriate management of drainage from spoil stockpiles and associated potential impacts

(d) quality of water within the upper and lower reservoir during the first filling phase and for the period of the subsequent decomposition of drowned vegetation

(e) quality of water within the upper and lower reservoir under projected operating conditions including annual seasonal variation, extended wet or dry period, the effects of inundated soil types and wind driven re-suspension, impacts of surrounding or upstream land uses

(f) effects of depth and holding time within the upper and the lower reservoir, particularly on turbidity, conductivity, stratification, temperature, dissolved oxygen and the quality of operational water movements

(g) potential for stratification and 'turn-over' of the water storage areas (including potential for blue-green algae blooms) and implications for water quality management, supply and use (including for stock and domestic users, industrial users, urban potable use or recreational use of the storage)

(h) potential effect of algae and macrophytes on water quality and vice versa

(i) effects on downstream water quality under varying scenarios of releases/spills including potential impacts on:

(i) sediment deposition in instream pools affecting waterhole persistence

(ii) sediment deposition on banks and riparian vegetation colonisation

(iii) riffle substrate changes and dependent biota changes

(iv) turbidity impacts on aquatic macrophyte colonisation and species diversity

(v) sedimentation and turbidity impacts on native aquatic fauna

(j) a model of the time it would take for the stratification to occur, and the potential establishment of an anoxic environment in the reservoirs. Include the location of the intakes within the reservoirs and the hydrodynamic information obtained in item 9.29. Use the modelled results to predict and avoid:

(i) recycling of nutrients and metals between the reservoirs

(ii) oxidising the anoxic bottom layer and causing environmental harm

(iii) contamination of any drinking water supply

(k) management of nutrients and oxygen levels from decomposition of any submerged vegetation within the impounded waters in any water releases from the dam.

9.63 Describe and include in the Environmental Management Plan (EMP) avoidance and mitigation measures, management strategies and contingency plans for:

(a) potential accidental discharges of contaminants, nutrients and sediments during construction and operation

(b) stormwater run-off, erosion and sedimentation from the construction of the project with reference to the International Erosion Control Association's Best Practice Erosion and Sediment Control document and the former Department of Environment and Resource Management's Urban Stormwater Quality Planning Guidelines 2010 (see *Preparing an EIS: Guideline for proponents).* Include stormwater release criteria. The storm water release criteria must provide sufficient justification as to the limits proposed and reference any relevant criteria, such as the *Environmental Protection (Water and Wetlands Biodiversity) Policy 2019*, or ANZECC water quality guidelines, to demonstrate that any release can be conducted in a sustainable manner that does not result in environmental harm

(c) flooding of relevant river systems, the effects of tropical cyclones and other extreme events

(d) management of acid sulfate, sodic and dispersive soils

(e) impacts to other properties and the environment during flood events

(f) treatment and disposal processes for all wastewater produced as a result of the project, including construction activities.

9.64 Describe how monitoring would be used to demonstrate that objectives were being assessed, audited and met. For example, provide measurable criteria, effective trigger values, standards and/or indicators, and suitable adaptive management measures that will be used to assess the condition of the ecological values and health of surface water and groundwater environments. Propose corrective actions to be used if objectives are not likely to be met.

Land

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate any serious environmental harm on sensitive land uses and sensitive receptors

b) locate infrastructure and activities to protect adjacent environmental values and sensitivities

c) minimise changes to land tenure

d) avoid or minimise reduction of priority agricultural areas and strategic cropping land

e) protect the environmental values of land including soils, subsoils, landforms and associated flora and fauna

f) enable the operation of the site in accordance with best practice environmental management.

Land use and tenure

Existing environment

9.65 Identify all state and regional planning interests (e.g. priority agricultural areas, Key Resource Areas, strategic cropping areas and strategic environmental areas) potentially impacted by the project, and the source of mapping to identify those interests. Where mapping is not available, identify the methodology followed to prepare the mapping and its scale.

9.66 Describe the following:

(a) landscape and existing and proposed land uses and infrastructure, in and around the project area that may be impacted by the project including numbers of freehold properties, Traditional Custodians land and cultural practice areas, protected areas, State leasehold land, reserves, unallocated state land, legally secured offset areas, state forest, timber reserves, watercourses (including stream order information), easements and road reserves. This should be supported by maps with Lot/Plan descriptions

(b) identify townships and urban areas located near the project area

(c) any tenures or other registered interests, overlying and adjacent to the project area

(d) identify all planning schemes, regional and land use plans and overlays relevant to the project

(e) provisions of the planning schemes (including land use plans) and assessment benchmarks and criteria relating to material changes of use and operational works that apply to the project

(f) design and locational factors influencing the selection of the project components and the project area

(g) any known or potential sources of contaminated land, including any area which has been or is being used for a 'Notifiable Activity' as listed in Schedule 3 of the EP Act, is potentially contaminated, or is on the Environmental Management Register or Contaminated Land Register.

9.67 Describe and map the extent of any known agriculture, horticulture, petroleum, mining and exploration activities, quarries of commercial significance, commercial plantation timber, or state-owned forest products and timber or quarry material, including, but not limited to:

(a) petroleum and other pipeline infrastructure

(b) registered Exploration Permits Minerals other than coal (EPM) and applications for EPM's

(c) mineral development licences and applications for mineral development licences

(d) mining leases (ML's) and applications for ML's, including access arrangements, and restricted areas under the *Mineral Resources Act 1989*

(e) key resource areas, including known economic resources and their future availability

(f) findings of the Agricultural Land Audit and AgTrends Spatial web mapping app[13]

(g) geothermal and greenhouse gas storage tenures

(h) active, disused, or abandoned mine workings in the project area and surrounds

(i) stock route network

(j) agricultural land considered as a priority agricultural area and/or strategic cropping land, and any other matters identified in the RPI Act and RPI Regulation 2014.

Impact assessment and mitigation measures

9.68 Detail how the construction and operation phases of the project will change existing and potential land uses of the project site/s and adjacent areas.

9.69 Present using map/s any proposed lot consolidation.

9.70 Demonstrate that the project can meet the environmental objectives and performance outcomes relevant to land in schedule 8 of the EP Regulation.

9.71 Describe potential impacts of the proposed land uses, taking into consideration the proposed measures to be used to avoid or minimise potential impacts.

9.72 Address impacts on any identified agriculture, tourism, education, horticulture, petroleum, mining and exploration activities, including any consultation undertaken with tenement holders, with respect to accessing land, impact assessment and mitigation measures. For any impacts on mining or resource exploration activities, liaise with any authorised tenement holder whose mining interests overlay the development footprint to advise of the proposal and ascertain any future exploration activities.[14] Address impacts on any identified commercial plantation timber, state-owned forest products and timber or quarry material.

9.73 Describe any proposed tenure to be applied for as part of this project, and proposed land tenure approach/es with stakeholders and State government agencies, including anticipated timeframes, necessary to secure tenure for the project.

9.74 Identify any historical workings within or adjacent to the project area. Demonstrate how historical workings have been avoided where possible. Where avoidance is not possible describe the proposed mitigation measures and management strategies to be employed.

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[13] **https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agtrends-spatial**

[14] The location of exploration permit and other mining interests can be viewed via GeoResGlobe at: https://georesglobe.information.qld.gov.au . Additional information is available online at: **www.qld.gov.au/environment/land/abandoned-mines**

9.75 Describe how any proposed land use may result in land becoming contaminated. Describe the actions to be undertaken to avoid, identify, remediate, manage land that is contaminated or becomes contaminated.

9.76 Detail the proposed measures to be undertaken during the construction and maintenance phases of the project to avoid and minimise land degradation. Land degradation includes but is not limited to soil erosion, the expression of salinity, waterlogging, and mass movement by gravity of soil or rock.

9.77 Identify existing and potential Native Title rights and interests impacted by the project and the potential for managing those impacts by Indigenous Land Use Agreements or other measures. Detail and illustrate on maps the following Native Title considerations:

(a) current tenure of all land or waters within the project area (which may include creeks)

(b) a native title assessment that determines presence, or otherwise, of Native Title over all land or waters within the project area

(c) land or waters where Native Title has been determined to exist by the Federal Court

(d) land or waters that are covered by a Native Title determination application

(e) land or waters that are covered by a registered Indigenous Land Use Agreement.

9.78 Describe any proposed land acquisition approach/es and other required land dealings with stakeholders and State government agencies, including anticipated timeframes, necessary to secure tenure for the project. Include any proposal for compulsory acquisition process potentially applicable to each tenure impacted, including the head of power to compulsorily acquire the land. Describe any existing or proposed tenures or land interests impacted by the project which will entitle payment of lawfully required compensation and the corresponding parties who will receive or pay compensation for each tenure.

9.79 Identify any infrastructure or access tracks associated with the project to be located within, or which may have impacts on, the stock route network managed under the *Stock Route Management Act 2002*. This includes any Reserves which form part of the network (i.e. for water, camping purposes). Demonstrate how the project will maintain the ongoing functionality and connectivity of the stock route network.

9.80 Describe, using graphics and figures, temporary and permanent changes to the landscape, land uses and the visual impact of the project on communities, particularly those living in townships. Describe the proposed mitigation measures and management strategies that are to be used to avoid or minimise impacts.

9.81 Describe the potential impacts on views of the project from key vantage points, particularly from any protected areas or recreational areas.

9.82 Assess the likely potential impacts to agricultural interests, including:

(a) agricultural land of SPP significance to the agriculture state interest. This assessment is to include how the project is consistent (or otherwise) with protecting Agricultural Land Classification Class A and Class B land for sustainable agricultural use, in accordance with state interest – agriculture 2 (a)-(c)

(b) how any adverse impacts will be mitigated to ensure there is no net loss in the availability and utility of that land for an agricultural use. This would include land subject and adjacent to project activities.

Topography, geology and soils

Existing environment

9.83 Describe in detail, including maps and itemised sources of information, the geology and geomorphology of the project area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance.

9.84 Identify and investigate the soil toposequence associated with water movement, salinity, sodicity and cracking clay soils, as well as areas of potential and actual acid sulfate soils. Identify the potential for acid forming rock in spoil material.

9.85 For soils that will be newly inundated by the project and could potentially be a source of sediment, design and implement a sediment characterisation program to address spatial variability. Include:

(a) vertical full-length cores

(b) any known contaminated land

(c) indicators such as total organic carbon and

(d) detailed analysis of sediment size characterisation.

9.86 Provide details, including maps, of existing soil conservation works (contour banks, waterway discharge points, onsite soil balance, etc.) and existing erosion control works, in particular, those approved as project plans or property plans approved under the provisions of the *Soil Conservation Act 1986*.

Impact assessment and mitigation measures

9.87 Where significant earthworks are proposed, assess the impact of these works on affected soils and landscapes. Describe how these works affect land use, land management and associated land degradation risks. This investigation of soils and landscapes should be undertaken in accordance with the latest version of the guidance materials identified in section 5.3 - Land, of the *Preparing an EIS: Guideline for proponents* and relevant published soil and land resource information available from **www.qld.gov.au/environment/land/management/soil/soil-data/reports**.

9.88 Describe how the tunnelling, installation, construction and maintenance of the underground power station will impact the long-term stability of the geology of the project area, including reference to groundwater reserves and any potential for subsidence.

9.89 Assess the risk to the project from the geology of the site in relation to reservoir construction, tunnelling and underground excavation. Demonstrate that there will be sufficient coverage in the geotechnical surveys and data for the site to assess and minimise risk of intersecting non-competent material or other potential barriers to the proposed works.

9.90 Investigate the risks to the soil and landscape associated with land degradation. This is to include a salinity risk assessment to predict, manage and mitigate salinity risk in accordance with *A risk framework for preventing salinity*[15]. Where irrigation water is applied to land, assess the:

(a) water balance to assess the impacts of deep drainage

(b) salt balance

[15] Grundy MJ, Silburn DM, Chamberlain T (2007). A risk framework for preventing salinity. Environmental Hazards. 7: 97–105

(c) unsaturated zone.

9.91 Investigate land degradation in the form of erosive soil loss associated with increase run-off, clearing or other changes to hydrology in accordance with the guidelines identified in section 5.3 of the *Preparing an EIS: Guideline for proponents.*

9.92 Where potential and actual acid sulfate soils have been identified, prepare an acid sulfate soil management plan in accordance with accepted industry guidelines and the guidance materials identified in section 5.3 of the *Preparing an EIS: Guideline for proponents,* that appropriately manages the disturbance of acid sulfate soils to avoid or minimise the mobilisation and release of acid, iron, or other contaminants.

9.93 Identify activities or operations likely to impact on existing erosion control works and any soil conservation works.

9.94 Evaluate and quantify the risk to the project from landslides and land slippage and from seismic activity.

9.95 Describe proposed mitigation measures to avoid or minimise project impacts related to land use, soil values, existing conservation works and sediment and erosion control works (e.g. artificial wetlands). Including mitigation and management measures where any acid forming rock is to be placed in spoil disposal areas.

9.96 Demonstrate how landforms, during and after disturbance, will meet any requirements of project or property plans approved under the *Soil Conservation Act 1986*.

Protected areas and other lands with environmental significance

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse impacts to protected areas, Ramsar Convention, state forests, legally secured offset areas and other State or privately-owned lands with nature conservation or forest production values or land used for Commonwealth or State environmental offsets.

b) protect the environmental and resource values of protected areas, State forests, legally secured offset areas and other State or privately-owned lands with particular environmental and forest production values.

c) ensure the project's design enables operation of the project in accordance with best practice environmental management.

Existing environment

9.97 Illustrate the context of the project in relation to surrounding and impacted protected areas, Ramsar wetlands, highly protected zones of state marine parks, NC Act listed wildlife, legally secured offset areas, state forests, timber reserves and other privately-owned lands with nature conservation or other forest production values. This includes the location of:

(a) existing and proposed infrastructure (including surface structures servicing the underground infrastructure)

(b) proposed inundation and impoundment area(s)

(c) proposed buffers (including firebreaks and safety buffers)

(d) existing and proposed access tracks required for construction, ongoing operation access and maintenance, and

(e) any areas of disturbance required for the establishment of all temporary construction facilities.

Impact assessment and mitigation measures

9.98 Describe the potential direct and indirect impacts on the natural and cultural resources and values of all protected areas and state forests (including 'forest products' and 'natural resource products'), within and adjacent to the project area arising from the construction and operation of the project.[16]

9.99 Describe alternatives considered to avoid adverse impacts on all protected areas and state forests.

9.100 Where adverse impacts on all protected areas and state forests cannot be reasonably avoided, describe:

(a) legislative mechanisms that would need to be followed for approval of these impacts

(b) how these impacts would be minimised, mitigated, and appropriately managed

(c) how these impacts would be offset (e.g. what compensatory measures would be provided by the proponent).

9.101 Provide a description of how ecological processes and connectivity to habitats, corridors and waterways are maintained between protected areas and adjoining areas where these are impacted by the project.

[16] 'Natural resources' and 'cultural resources' within the definitions under the *Nature Conservation Act 1992*. 'Protected areas' within the definition under the *Environmental Offsets Act 2014*. Values to be enhanced or protected include the qualities of the environment that are conducive to protecting the health and biodiversity of ecosystems.

Flora and fauna

Objective and outcomes

The design, construction and operation of the project are to:

a) protect the environmental values of land including soils, subsoils, landforms, habitats and associated flora and fauna

b) minimise environmental harm in areas of high conservation value and special significance and sensitive land uses at the site and adjacent places

c) avoid, minimise and/or mitigate adverse and significant residual impacts (SRIs) to flora and fauna (including wetlands) which are matters of state environmental significance (MSES) or MNES, and where they cannot be avoided, offset any significant residual impacts

d) identify and appropriately safeguard MSES and MNES to support healthy and resilient ecosystems

e) manage the impacts on the environment by seeking to achieve ecological sustainability, including protected wildlife and habitat

f) ensure the sustainable, long-term conservation of biodiversity

g) identify critical habitat and connectivity corridors for all MSES and MNES species and ensure they receive special management considerations and protection through a management plan for the proposed project

h) protect all environmental values relevant to adjacent and receiving environmentally sensitive areas, including aquatic ecosystems and wetlands

i) provide for the conservation of the marine environment avoid constructing or raising waterway barrier works in fish habitats, or where this is not feasible, ensure waterway barrier works in fish habitats are constructed to maintain connectivity, habitat values, fish safety and fish passage.

General content

9.102 Address the project's impacts on Matters of Local Environmental Significance (MLES) (if relevant), MSES[17] and other regionally significant biodiversity, and cultural and environmental values. Where an MSES is also an MNES a cross-reference to where it has also been assessed in the MNES chapter should be provided. It is recommended that the flora and fauna section be structured to include a separate assessment for each MSES.

9.103 Include details on the scope, methodology, timing, effort and results of field surveys undertaken in the EIS, with reference to the relevant survey guidelines. Ecological survey reports including field proformas and data sheets should be provided as searchable and hyperlinked appendices.

9.104 Identify, describe and map (at a suitable scale) all terrestrial and aquatic (including groundwater dependent ecosystems) ecological values present or likely to be present within the area that will be directly or indirectly impacted by the project. Base the description on the desktop assessment, vegetation surveys, plant and animal species surveys, and the assessment of the condition of the vegetation communities and species habitats.

[17] MSES are a component of the biodiversity state interest that is defined under the State Planning Policy (SPP) and defined under the Environmental Offsets Regulation 2014 (Offset Regulation). MSES includes certain environmental values that are protected under Queensland legislation.

9.105 Using maps at a suitable scale, illustrate the context of the project area in relation to surrounding MSES. This includes the location and disturbance footprint of:

(a) existing and proposed infrastructure (including water discharge points, connections to power transmission lines and pipelines), and project activities

(b) proposed buffers (including firebreak and safety buffers)

(c) access tracks required for construction and maintenance (including widening or realignment of existing tracks)

(d) any areas of disturbance required for sourcing quarry material and the establishment of temporary non-resident workforce accommodation and construction laydown areas.

9.106 When identifying impacts ensure impact figures are appropriately scaled and provided for each activity/component and for stages of the project.

Existing environment

9.107 Identify and describe MSES, state and regionally significant biodiversity and natural environmental values of the terrestrial and aquatic ecosystems likely to be impacted by the project. Where MSES are addressed in the section on MNES, specific cross referencing is required.

9.108 Describe the existing quality and suitability of habitat for MSES species that are known, likely, and have the potential to occur in the project area, including details of how the outcome of the likelihood of occurrence was determined. Provide the area of existing habitat in hectares (ha) for each MSES species in the project area based on field verification and describe field verification methodology. For habitat area calculations, identify the use of high value regrowth vegetation and non-remnant areas.

9.109 The location of fauna and flora of cultural, conservation, and state and national environmental significance in the project area, and in surrounding areas, are to be identified, described and shown on maps in relation to their habitat and connectivity in the landscape (including upstream and downstream of the project). Include:

(a) regulated vegetation including prescribed regional ecosystems and essential habitat

(b) wetlands (including wetlands of high ecological significance), watercourses and drainage features

(c) threatened species and other protected wildlife records

(d) connectivity areas

(e) protected wildlife habitat

(f) waterways providing for fish passage

(g) protected areas and conservation areas.

9.110 Provide a detailed description of all native fish, turtle, platypus and crustacean species and macrophyte (vegetative) and other fauna spawning/breeding locations[18]:

(a) known to occur within the area impacted by the project (as identified through on-ground seasonal studies)

[18] Consider Department of Regional Development, Manufacturing and Water science and monitoring products available at https://www.qld.gov.au/environment/library

(b) identified as likely to occur (via desktop assessment).

9.111 Describe, using relevant literature and the results of surveys, the natural and existing upstream and downstream movement and habitat requirements of all aquatic, semi-aquatic and terrestrial flora and fauna species in the project area and in connection with the surrounding area. Identify sensitivity to change (including as a result of the project) of aquatic and terrestrial flora and fauna groups and of significant species.

9.112 Describe all flow dependent ecological assets and their critical links to stream flow, including their relevant ecological thresholds.

9.113 Describe how the features of the annual flow underpins:

(a) structure and function of the aquatic ecosystem including peak wet season flows and their variability

(b) draw period of flows and flood residence times during wet and dry season transition

(c) low and disconnected flows during the dry season

(d) initial flushing flows during the dry to wet season transition.

Impact assessment

9.114 Provide a description of all relevant impacts (direct, indirect, cumulative and facilitated) on the biodiversity and environmental values of affected areas (such as breeding, roosting, nesting and foraging habitat) arising over the lifetime of the project (including potential/likely and known impacts) in accordance with guidance materials identified in section 5.4 of *Preparing an EIS: Guideline for proponents.* This should include detail on the likely magnitude, duration and frequency of the impacts. The assessment is to include, but not be limited to:

(a) identification of all significant flora and fauna species (including the koala, greater glider, northern quoll, yellow-bellied glider, and the grey-headed flying fox etc.) and ecological communities in both terrestrial and aquatic environments, wetlands (including tidal and intertidal), and in sensitive areas, biodiversity values, connectivity and supporting ecological processes[19]

(b) fauna and flora of cultural significance to Aboriginal and Torres Strait Islander Peoples

(c) fish and fauna passage within waterways

(d) terrestrial and aquatic ecosystems including riverine, lacustrine, groundwater dependent ecosystems, wetlands (tidal and intertidal) and their interaction

(e) alterations to riparian vegetation, habitat type and availability, connectivity, bank and channel morphology with particular reference to impacts due to fluctuations in water levels, including for any recorded fish and fauna (including turtles and platypus) spawning and nesting sites

(f) changes to hydrology and environmental flows resulting in potential impacts to downstream terrestrial and aquatic habitats

(g) area (in metres squared (m^2)) of permanent and temporary impacts to aquatic plants

(h) existing integrity and potential impacts on ecological processes, including habitats of listed threatened, near-threatened or special least-concern species

[19] Where an MSES is also an MNES, specific cross-referencing to where it has been assessed in the MNES chapter should be provided.

(i) impacts on aquatic and terrestrial fauna and flora species resulting from water quality changes due to increased water circulation and sediment disturbance (potential suspension and redistribution of sediments resulting from shoreline erosion due to fluctuations in water levels) during the construction and operation of the project

(j) connectivity of habitat and ecosystems and impacts on access to different habitat requirements by species

(k) integrity of landscapes and places, including wilderness, reserves and similar natural places

(l) provision of a lower and upper reservoir and the potential direct and indirect impacts to fauna and flora communities and habitat

(m) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants including consideration of methylmercury

(n) impacts on terrestrial and aquatic species and ecosystems whether due to vegetation clearing, hydrological changes, discharges of contaminants to water, air or land, noise and other relevant matters. Include impacts to root systems of vegetation from tunnelling and blasting and identify if these activities will result in the subsequent death and "clearing" of native vegetation regulated under the *Vegetation Management Act 1999*

(o) extent of edge effects created as a result of cleared vegetation and associated impacts on access to food resources for fauna species at new edges

(p) actions of the project that require an authority under the NC Act and *Water Act 2000* (e.g. riverine protection permit), assessable development under the *Planning Act 2016*, VM Act, *Fisheries Act 1994* and an authority and/or permit under the EP Act

(q) biological diversity including listed flora and fauna species and regional ecosystems

(r) protected areas, state forest, tenures, biodiversity offset areas approved by the state or commonwealth governments

(s) impacts on native fauna during all phases of project delivery, due to their proximity to the project area (e.g. light, noise, vibration, waste, discharges or overflow of contaminants to water, hydrological changes, vegetation clearing, interaction with transmission lines (e.g. bird strike risk) and vehicle movements

(t) landscape connectivity impacts within the context of the Biodiversity Planning Assessment (BPA) for the Brigalow Belt Bioregion.

9.115 In a tabular format, identify all impacted MSES onsite and in proximity to the site, quantify any overlaps between MSES and MNES, and identify relevant legislation and assessment requirements.

9.116 If relevant, identify, map and discuss where proposed clearing is exempt or considered accepted development for the project under the Planning Regulation, including but not limited to matters outlined in Schedule 21, Part 1 – section 1(1), section 1(10)(a), and section 1(10)(b). Where relevant, clearly state what exemptions apply to the clearing of vegetation for the project. Identify the requirements that need to be met/have been met to enable those clearing exemptions to apply or for the proposed clearing of vegetation to be considered accepted development.

9.117 Demonstrate how the proposal avoids native vegetation clearing, or where avoidance is not reasonably possible, minimises clearing to conserve vegetation, avoid land degradation and maintain ecological processes.

9.118 Provide detail regarding proposed works within waterways for any infrastructure that constitutes assessable waterway barrier works, provide cross-sections of the waterway that show the barrier in relation to the bed and banks, and long-sections of the waterway that show the barrier in relation to the bed upstream and downstream of the structure. Describe how the barrier and hydrological conditions provide for safe, bi-directional fish passage for all members of the fish community and other aquatic fauna such as turtles and platypus.

9.119 Describe alternative measures that would avoid the need for waterway barriers or propose measures to mitigate the impacts of their construction and operation.

9.120 Describe the methodology of constructing the water storage infrastructure through modelling or any other appropriate method. Demonstrate how the chosen method avoids, minimises and mitigates potential impacts on aquatic and riparian habitat and aquatic and terrestrial fauna. Include plans to protect the health and welfare of native aquatic species (including fish, turtles, platypus and any other species that has the potential for entrainment or entrapment). Consider the requirement for fish salvage operations in accordance with the DAF Guidelines for Fish Salvage.[20]

9.121 Describe the potential disruption to flows in waterways and tributaries and any proposals to divert waterways and/or flows (including coffer dams, temporary diversions and cut-off drains). Reference is to be made to DAF's Guidelines for Fish Salvage, for example, if any dewatering is required. The description is to include:

(a) proposed fauna passage through any diversions

(b) proposals for the reinstatement of the waterways after construction has ceased, if applicable

(c) details on how fauna salvage, entrapment and safe movement will be monitored.

9.122 Describe, illustrate, and demonstrate how the project provides safe and adequate upstream and downstream aquatic fauna passage, including, but not limited, to the fish and turtle community of the site, and monitoring and maintenance measures. Any intakes are to be appropriately designed to minimise fish and aquatic fauna entrapment and entrainment. Refer to Design specifications for fish-protection screens in Australia[21] and the practical guide to modern fish-protection screening in Australia for further guidance.[22]

9.123 Provide plans and supporting information demonstrating how safe and adequate bi-directional fish passage will be provided in relation to any waterway barrier works proposed. This includes, but is not limited to:

(a) plans of fish passage infrastructure detailing the design features

(b) an operational plan that demonstrates how and when any fish passage infrastructure will operate to provide fish passage[23]

(c) a maintenance plan including contingency measures to remediate any deficiencies in the fishways/s

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[20] Queensland Government, *Guidelines for Fish Salvage*, Department of Agriculture and Fisheries, 2018, **https://www.daf.qld.gov.au/business-priorities/fisheries/habitats/policies-guidelines/factsheets/guidelines-for-fish-salvage**

[21] https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0006/1373577/Design-specifications-for-fish-protection-screens_FINAL_WPA.pdf.

[22] https://researchoutput.csu.edu.au/ws/portalfiles/portal/180574914/A_guide_to_modern_fish_protection_screening_in_Australia_FINAL_WPA.pdf.

[23] Any fishways should be designed by a person suitably qualified and experienced in fish passage biology (refer to Appendix 1 of the SDAP Guideline for State Code 18).

(d) a monitoring plan that defines measures of success in terms of quantitative performance outcomes of fishway operation

(e) the location of fish passage infrastructure should be considered in relation to any pumping infrastructure.

9.124 Demonstrate that pumping infrastructure is designed in accordance with best practice guidelines[24] and that water quality associated with pumping infrastructure and water level fluctuations is suitable to maintain the health and productivity of fish, and the resources on which they rely.

9.125 Set out a process for the design, construction, and monitoring of:

(a) any fauna passage device(s) to ensure they provide safe and adequate passage as intended, and

(b) aquatic fauna exclusion devices (e.g. screening of pumping infrastructure) to ensure the devices exclude aquatic fauna and do not result in the injury or death of aquatic fauna.

Mitigation measures

9.126 Demonstrate how the project aligns with the vision, outcomes and goals of the Biodiversity Conservation Strategy for Queensland.

9.127 Provide a detailed salvage and relocation plan for all impacted native species including specific considerations on culturally significant species and MSES. Salvage and relocation plan must provide clear methodologies and monitoring of success and identify contingency actions. The Plan must also provide proposed relocation sites and include details on handling and transporting methods.

9.128 Assess the need for safety fire breaks and the need for buffer zones (e.g. along waterways) and the retention, rehabilitation or construction of fauna movement corridors, including the role of buffer zones in maintaining and enhancing riparian vegetation and wetlands to promote bank stability, to enhance habitat connectivity and provide habitat. Provide specific details on fauna movement to, through and from the project area including fauna movement infrastructure considerations and any proposed locations (e.g. fauna underpass or rope bridges).

9.129 Propose rehabilitation criteria and objectives that are to be used to measure progressive rehabilitation of disturbed areas. Include a description of rehabilitation methods with reference to the rehabilitation guidelines.[25] Describe how the achievement of the objectives will be monitored and audited, and how corrective actions will be managed. Proposals for rehabilitation of disturbed areas are to incorporate suitable terrestrial and aquatic habitat as appropriate.

9.130 Propose and demonstrate the ability to implement practical measures (based on demonstrated successful methodologies) to avoid, minimise, mitigate and/or offset direct or indirect impacts on ecological environmental values, including measures for protecting or enhancing natural values and assess how the nominated quantitative indicators and standards may be achieved for nature conservation management. In particular, address measures to protect or preserve any listed threatened, near-threatened species, near-threatened, culturally significant, or special least concern species. Discuss the effectiveness of these measures and reference relevant studies and literature which support the effectiveness of these measures.

[24] Refer to “The practical guide to modern fish-protection screening in Australia” and “Design specifications for fish-protection screens in Australia” for further information and current best-practice designs.
[25] Queensland Government, Guide to State Development Assessment Provisions – State code 16: Native vegetation clearing, Version 3.00, 2023 for Coordinated project (all other purposes), Department of Resources, Appendix 11 Rehabilitation.

9.131 Provide details on how proposed mitigation and offset locations have been identified towards reducing detrimental impacts on the local flora and fauna populations.

Offsets

9.132 After demonstrating that all reasonable on-site avoidance and mitigation measures have been applied, identify whether the project will result in a significant residual impact (SRI) on MSES, requiring an offset with reference to the Queensland Environmental Offsets Policy, Queensland Environmental Offsets Policy: Significant Residual Impact Guideline or the Significant Residual Impact Guideline for matters of state environmental significance and prescribed under the *Sustainable Planning Act 2009* – Queensland Environmental Offsets Policy and the Queensland Environmental Offsets framework (see section 5.4.2 of the *Preparing an EIS: Guideline for proponents).*

9.133 Address local, state and Commonwealth offset obligations, in accordance with relevant state and Commonwealth legislation and policies, and clearly identify where there are overlaps across jurisdictions. Identify, describe, and illustrate the extent (such as in a map and table) of any SRI overlap between MLES, MNES and MSES.

9.134 Where an SRI is predicted to occur on a prescribed environmental matter, describe and quantify the SRI and propose offsets consistent with the requirements of Queensland's Environmental Offsets Act and the latest version of the Queensland Environmental Offsets Policy (see section 5.4 of the *Preparing an EIS: Guideline for proponents).*

9.135 Demonstrate a conservation outcome for all impacted prescribed environmental matters requiring an offset.

9.136 Provide an offset strategy as an appendix to the EIS that outlines the proposed offset delivery approach to address the project's SRI on MSES and MNES. The offset delivery approach is to include:

(a) identified SRI offset obligations for MSES and MNES across the State and Commonwealth jurisdictions. The extent of any SRI overlap between MNES and MSES should be identified, described and illustrated, noting that any SRI to marine plants (MSES) does not overlap with any MNES as these are separate matters. This could be provided in the form of a table and maps

(b) for staged offsets, take into account the full extent of potential impacts on prescribed environmental matters for the entire project as part of the SRI assessment

(c) an assessment of the vulnerability of any proposed offset site/s under climate change scenarios (e.g. reduced water availability, increased bushfire risk, sea level rise)

(d) an evaluation of how the proposed offset will achieve a conservation outcome for the impacted matter

(e) identification of whether SRI to MSES will be addressed through a financial or proponent driven offset, including an offset delivery plan for any proponent driven offsets.

9.137 Describe any active restoration actions that would be undertaken to improve, enhance and manage native vegetation, fish habitat, or threatened species habitat on a proposed offset site (note: applying high intensity management to low condition sites are most relevant to habitat reconstruction).

9.138 Describe how the achievement of the offset strategy will be monitored and audited, and how corrective actions will be managed.

9.139 Describe how the relevant locations provide ongoing habitat and habitat connections for those flora and fauna populations within the project impact areas.

9.140 Detail how impacts to agricultural values that result from meeting environmental offsets required for the project will be avoided, minimised or mitigated.

Biosecurity

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate the spread of terrestrial and aquatic weeds, terrestrial and aquatic pest animals, animal and plant pests and disease, pathogens and contaminants

b) control and manage existing terrestrial and aquatic weeds, terrestrial and aquatic pest animals and diseases

c) comply with relevant provisions of the *Biosecurity Act 2014*, Commonwealth animal and pest strategies, biosecurity plans, weeds of national significance and designated pests under the *Public Health Act 2005* and relevant policies, legislation and guidelines.

Existing environment

9.141 Survey terrestrial and aquatic pest animals and weeds and describe their current distribution and abundance in the project area and surrounds. Include the scope, methodology, timing, effort and results of pest surveys. Provide figures that delineate the location and timing of pest surveys. Provide maps showing their distribution in relation to the project area and ecologically significant areas identified as containing, or likely to contain, listed flora, fauna and ecological communities of MNES or MSES. This survey is to include prohibited and restricted matters listed in the *Biosecurity Act 2014* and Biosecurity Regulation 2016, and high-risk ornamental fish and aquarium animals, Weeds of National Significance, pests and weeds declared under Mackay Regional Council and Isaac Regional Council local laws and designated pests under the *Public Health Act 2005*. See the *Preparing an EIS: Guideline for proponents*.

Impact assessment and mitigation measures

9.142 Describe the project's construction and operational impacts on the spread of terrestrial and aquatic pest animals, terrestrial and aquatic weed species and disease within the project area construction and operational access routes and into adjoining properties (where relevant). Conduct the impact assessment in accordance with the guidance materials identified in section 5.4.4 of the *Preparing an EIS: Guideline for proponents).*

9.143 Propose detailed measures using best practice to remove, control and limit the spread of pests, weeds and diseases within and surrounding the project area and adjacent areas. Detail alignment with any relevant local government area Biosecurity Plans. Include a discussion on minimising any susceptibility to biosecurity risks with the introduction and/or expansion of temporary and permanent infrastructure.

9.144 All proposed measures are to be in accordance with any relevant biosecurity surveillance or prevention measures authorised under the *Biosecurity Act 2014* and any requirements under VM Act/Planning Act.

9.145 Detail a monitoring program that would audit the success of biosecurity measures, identify whether objectives have been met, and describe corrective actions to be used if monitoring indicates objectives are not being met.

Hazards, health and safety

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate the risk of, and adverse impacts from, natural and human-made natural hazards to protect people, property and the environment

b) community's resilience to natural hazards is enhanced

c) development is appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment

d) any risk associated with explosives use, transportation, storage or manufacture is within an acceptable level, in accordance with the *Explosives Act 1999* and codes and standards including the Australian Standard AS2187.1 Explosives - Storage, transport and use - storage

e) if the production of hazardous contaminants and waste is unavoidable, ensure that the project treats and/or contains hazardous contaminants until their disposal at an approved facility.

Existing environment

9.146 Describe the likelihood and severity of hazards and health and safety risks in and around the project area including, but not limited to cyclone, flooding, bushfire, earthquakes, landslide, and heatwave.

Impact assessment and mitigation measures

9.147 Prepare a preliminary risk assessment and describe the potential risks to people, property, waterways, flora and fauna that may be associated with the project for all components of the project and in accordance with relevant standards. The assessment is to include:

(a) potential hazards, accidents, fire and abnormal events that may occur during all stages of the project, including estimated probabilities of occurrence

(b) identification of all hazardous substances (including hazardous waste) and any explosives to be used, transported, stored, processed or produced and the rate of usage

(c) evaluation of the risks associated with the secure storage, use and transportation of explosives to ensure the risks are within an acceptable standard in accordance with Australian Standard AS2187.1 Explosives - Storage, transport and use – storage

(d) identification of the need for appropriate explosive licences and notice of proposed blasting prior to explosives use

(e) potential hazards posed by wildlife interactions, natural events (for example, cyclone, flooding, bushfire, earthquakes[26], landslide, heatwave[27]) and implications related to climate change. Identify the cumulative impact of a number of natural hazards occurring at the one

[26] The State Earthquake Risk Assessment includes probabilities of major seismic events for all local government areas and is to be used to inform risk consideration and management.
[27] Use State Heatwave Risk Assessment.

time. Describe possible adaptation strategies (preferred and alternative) based on climate change projections for the proposed project site

(f) how potential flooding of the lower and upper reservoir would be managed, including location of spillway/s and discharge pathway(s)

(g) potential hazards associated with changes to water quality, including impacts within and downstream of the reservoirs, resulting from reservoir turnovers, altered mixing, reduced water quality, and floating hazards/debris as a result of the proposed project.

(h) how the project may potentially affect hazards away from the project site (for example, changing flooding characteristics, bushfire, landslide).

(i) evaluation of physical, geotechnical and pollution risks associated with historic/abandoned mining sites within the project area.

9.148 Detail how siting, layout and operation of the development as well as other measures will avoid or mitigate risks.

9.149 Discuss how any potential impacts to human health associated with the project have been considered in accordance with the Department of Health's Guideline: *Health considerations – Environmental Impact Statement*.[28]

9.150 Detail measures required to ensure that the proposed project avoids the release of hazardous materials as a result of a natural hazard event/s.

9.151 Assess the vulnerability of the area to natural and induced hazards, including drought, floods, thunderstorms, bushfires and cyclones. Consider the relative frequency, duration, intensity and magnitude of these events together with the risk they pose to:

(a) the construction, operation and decommissioning of the proposed project

(b) the rehabilitation of the site

(c) flora and fauna at the site and in the vicinity of the site including arboreal species

(d) environmental values of the site and surrounding areas.

9.152 Detail management measures that would be taken to minimise the risks of these events to the project, environmental values and human safety including how dead storage would be avoided.

9.153 Assess potential wildlife hazards and their mitigation, including development of a mosquito management plan in accordance with Queensland Health guidelines, natural events (e.g. cyclone, flooding, earthquake, bushfire) and implications related to climate change and adaptation.

9.154 Provide details on the safeguards that will reduce the likelihood and severity of hazards, consequences and risks to persons, waterways, flora and fauna within and adjacent to the project area/s, including any need for safety fire breaks and buffer zones in consideration of fauna movement, riparian and wetland corridors. Identify the residual risk following application of mitigation measures. Present an assessment of the overall acceptability of the impacts of the project in light of the residual uncertainties and risk profile.

9.155 Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans, if required) for the range of situations identified in the risk assessment developed in this section. As part of the emergency response plan include:

[28] Refer to Queensland Health's Health Considerations – Environmental Impact Statement – Guidelines for proponents at: https://www.health.qld.gov.au/__data/assets/pdf_file/0034/444949/environ-impact-state-guidelines.pdf.

(a) reference to existing EAP for the Eungella Dam, and how the plan will be updated for construction and operation of the project

(b) a bushfire management plan, certified by a suitably qualified person, in consultation with the Queensland Fire Department (comprising Queensland Fire and Rescue and Rural Fire Service Queensland) addressing bushfire hazard and risk to infrastructure (including ancillary infrastructure, i.e. workers accommodation), construction and operations, and including the following information at a minimum:

  (i) a bushfire hazard analysis

  (ii) mitigation strategies to achieve the relevant development outcomes in Part E of the State Planning Policy – Natural Hazards, Risk and Resilience

  (iii) provides details of the proposed ongoing management of fuel loads across the subject site through grazing or mechanical means including the asset protection zone proposed.

(c) a safety and emergency management plan addressing construction and operations, and including the following information at a minimum:

  (i) evacuation plans for the construction and operation phases of the development

  (ii) access routes, egress routes and meeting points for all emergency responders, including coordinates for a helicopter landing site

  (iii) safety management plans and emergency response procedures in consultation with the state and regional emergency service providers (including Queensland Fire Department, Queensland Fire and Rescue, Queensland Ambulance Service) and provide an adequate level of training to staff who will be tasked with emergency management activities.

(d) dam failure EAP outlining what actions to take in the event of an incident including who to notify and where to evacuate, and including the following information at a minimum:

  (i) potential dam hazards or emergency events and actions to take in response

  (ii) identify stakeholders and communication protocols

  (iii) consideration of emergency events in the context of community disaster management process.

9.156 Provide details on consultation undertaken and the proposed communication plan arrangements with the Mackay Regional Council and Isaac Regional Council in the event of an emergency (e.g. commencing and ceasing take, emergencies, incident management etc.)

9.157 Detail any consultation undertaken with the relevant state, district and local emergency response authorities and organisations, including the Local Disaster Management Group.

9.158 Describe how the achievement of the hazards, health and safety objectives would be monitored, audited and reported, and how corrective/preventative actions would be effectively managed.

Flooding

9.159 Provide a hydraulic and hydrological analysis (flood impact assessment) demonstrating the design flood peak discharges for the site and surrounding area which exist in the pre- and post-development scenarios for all flood and stormwater events including a range of AEPs up to Probable Maximum Flood and dam failure scenario.

9.160 Assess how the project may change flooding characteristics upstream and downstream of the reservoir/s. The flood model needs to adequately encompass existing and future state-controlled transport corridors. Mapping (afflux, water level/depth and velocity) should be provided to clearly illustrate the existing environment scenario, and the post development impacts for all relevant design events. Include a discussion on historical events. Include a discussion on extent of modelled impacts in relation to existing townships (e.g. flood extent for modelled event(s) and changes to the flood hazard categories (depth and velocities).

9.161 The assessment is to consider all infrastructure associated with or existing near the project area including the proposed upper and lower reservoirs, levees (if applicable), roads, spoil disposal area, disturbed land and other infrastructure and all proposed measures to avoid or minimise risks to people, property (including damage to other properties), flora and fauna and the environment during flood events. Where the development is increasing impervious area, provide a peak discharge analysis with adequate details of the pre and post development impervious area of the site and give adequate consideration to the detention basin requirements.[29]

9.162 Assess the project's vulnerabilities to climate change (e.g. changing patterns of rainfall, hydrology, temperature and extreme weather events). Describe possible adaptation strategies (preferred and alternative) based on climate change projections for the proposed project site. Demonstrate that flood storage capacity is maintained on the site with the development. Overland flow paths/ hydraulic conveyance should be maintained on the site as part of the proposed development. The existing environment flow scenario will need to be replicated in the post development condition. The development design will need to address any concentration of flows, potential for back-up/ponding and scour/erosion which may undermine existing and future State-controlled transport corridors.

9.163 Describe how design and management of all stages of the project will mitigate potential impacts on level of flood risk, both upstream and downstream of the reservoirs.

Economics

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse economic impacts arising from the project

b) capitalise on opportunities potentially available for capable local businesses and communities

c) create a net economic benefit to the region and State.

Existing environment

9.164 Describe the existing economic environment consistent with the Coordinator-General's Economic Impact Assessment Guideline (April 2017) (see section 5.6 of Preparing an EIS: Guideline for proponents).

9.165 The analysis is to describe the local and regional economies likely to be impacted by the project and identify the relevant stakeholders, and include:

(a) map/s illustrating the local and regional economies that could be potentially impacted by the project

[29] *Queensland Urban Drainage Manual, Fourth Edition.*

(b) population of relevant local government areas

(c) regional economy's key industries and their contribution to regional output

(d) relevant economic indicators (e.g. agriculture, water prices, energy prices)

(e) predicted electricity supply and demand, transmission, and the strategic direction of the region and the State in relation to electricity supply and demand (with particular reference to intra-day storage as identified in the Queensland Energy and Jobs Plan [30])

(f) existing electricity infrastructure in the region and any plans for connection to the project

(g) existing and proposed water infrastructure in the region.

9.166 Describe the preferred project delivery model (including funding sources) and expected timeframes, outlining assumptions on economic externalities that have the potential to impact on the delivery model and/or expected timeframes.

Impact assessment and mitigation measures

9.167 Identify the net economic impacts of the project on the local and regional area and the state ensuring the analysis is consistent with the *Coordinator-Generals' Economic Impact Assessment Guideline*.

9.168 The economic impact assessment is to address matters including, but not limited to:

(a) labour demand, including the ability for labour (including specialists) to be drawn from the existing local, regional and state workforce, and the potential effects this may have on local and regional businesses

(b) raw input demand, including the ability for existing local, regional and state suppliers to provide relevant raw and manufactured inputs

(c) anticipated impacts the project will have on water prices, grazing, agriculture, domestic and industrial energy prices, wages, economic growth, renewable energy projects

(d) anticipated value of offsets required for all components of the project.

9.169 Provide an analysis of the project's contribution to climate change-related economic and financial risks and benefits to Queensland based on best practice assessment frameworks, such as the Task Force on Climate-related Financial Disclosures (TCFD) framework. This analysis must be based on a scenario consistent with achieving the goals of the Paris Agreement (of which Australia is a signatory) to limit global warming to as close to 1.5°C as possible. Additional scenarios can be included for comparison; however, the central assessment should be aligned with 1.5°C.

9.170 Provide a demand analysis for the project as justification for the scale and scope of the proposal, with emphasis on the following:

(a) demand for energy generated having regard to existing and proposed facilities

(b) timeframe for uptake of identified energy demand.

9.171 Undertake a regional impact assessment (RIA) that quantifies the employment by industry (including an estimate of supply chain employment) and value-added contribution of the project to

[30] Queensland Energy and Jobs Plan, available from: **https://www.epw.qld.gov.au/__data/assets/pdf_file/0031/32989/queensland-energy-and-jobs-plan-overview.pdf**. Refer also the Queensland SuperGrid Infrastructure Blueprint, available from: https://www.epw.qld.gov.au/__data/assets/pdf_file/0030/32988/queensland-supergrid-infrastructure-blueprint.pdf.

the local, regional and state economies. The RIA is to estimate the changes in key indicators including:

(a) gross regional and state product

(b) energy prices for residential, mining, agriculture and large industrial users

(c) water prices for residential and industrial users

(d) gross value added by industry.

9.172 Undertake analysis that identifies the structure of the project and the relevant direct costs and benefits from the project. This analysis is to consider:

(a) key construction inputs and milestones in the form of a project timeline

(b) relevant renewal costs related to the project (including projected repair/replacement of infrastructure)

(c) operational costs, including all input costs of production

(d) costs associated with impacts to recreational values, impacts to environmental values, including protected species, their habitats, environmental management, monitoring, mitigation and offsets associated with the project

(e) benefits, including revenue projections (and stipulating unit/price assumptions)

(f) expected project life and any residual value over the assessment period.

9.173 The analysis should also consider all direct private, indirect, and external social costs and benefits. These would include:

(a) external net benefits (such as third parties who are providing inputs such as water, agriculture and energy) to the project

(b) external net costs (to third parties, community, local and State Government) as a direct result of the project

(c) comparisons of all direct, indirect and external costs and benefits and valuing those direct, indirect and external costs and benefits in monetary terms

(d) assumptions for benefits and costs, including risk assessments

(e) all beneficiaries (e.g. individuals, the community, local and State Government) of the project. If there are specific issues related to the cost of water, these should be identified as external costs and benefits.

Social

Objective and outcomes

The design, construction and operation of the project are to:

a) ensure benefit to residents of communities in the vicinity of the project

b) avoid, minimise and mitigate adverse social impacts arising from the project

Existing environment

9.174 Include a social baseline study of the project's potentially affected communities[31] in accordance with the Coordinator-General's Social Impact Assessment (SIA) Guideline and supplementary material (see section 5.6 of the *Preparing an EIS: Guideline for proponents*). The baseline should describe the people, communities, and key stakeholders directly or indirectly affected by the project.

9.175 Use the latest qualitative and quantitative data in the social baseline study and supplement it through stakeholder engagement processes. Identify and reference relevant data contained in local and state government publications, reports, plans, and documentation, including regional and community plans.

Impact assessment and mitigation measures

9.176 Prepare an SIA for the project that is informed by a consultative and inclusive stakeholder engagement program[32] in accordance with stakeholder consultation requirements of the *Preparing an EIS: Guideline for proponents* and consistent with the relevant requirements of the Coordinator-General's SIA Guideline and Supplementary material.

9.177 Describe the outcomes of consultation with directly affected people, communities and key stakeholders including, but not limited to, landholders, Aboriginal and Torres Strait Islander peoples,[33] local governments, state agencies, local and regional commerce and community development groups, and social and public service providers (e.g. Queensland Health, Queensland Police Service and Queensland Emergency Services).

9.178 Describe the project's potential social impacts (both beneficial and adverse) on potentially affected people, communities, and key stakeholders. Provide an assessment of the size, significance, and likelihood of these impacts at the local and regional level, including:

(a) direct and indirect impacts from any existing projects (including other existing development and/or proposed development of which the proponent should reasonably be aware in the Mackay Regional local government area (LGA) and Isaac Regional LGA and the project. Every effort should be made to find information from all sources relevant to the assessment of cumulative impacts, including projects which do not trigger an EIS process

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[31] Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

[32] It is recommended that the proponent commence engaging at the earliest possible stage with all potentially affected stakeholders to discuss and explain the project and to identify and respond to issues and concerns identified as social impacts.

[33] Refer to The Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance) which outlines the statutory obligations that apply to, and DCCEEW's expectations of, proponents engaging with First Nations people and communities under the EPBC Act. The guidance applies to proponents undertaking referral, assessment, and approval processes under Chapter 4 of the EPBC Act. Available via: **https://www.dcceew.gov.au/environment/epbc/publications/engage-early.**

(b) key population/demographic shifts and effects to existing lifestyles, the health and social wellbeing of families and communities

(c) needs of vulnerable groups including those that are socially disadvantaged, Aboriginal and Torres Strait Islander peoples, the aged and people with a disability

(d) potential social benefits of the project on the local and regional area in relation to the alternatives

(e) assess the perception of risk from the proposed activity on the community and determine factors of influence

(f) potential project impacts and/or benefits (including cumulative impacts) on health, community and well-being

(g) discuss the longitudinal cumulative impacts, or 'project fatigue', where the community in the study area has been subject to a number of large-scale projects in recent years

(h) identify any mitigation measures and/or strategies that might be deployed by the proponent during all phases of the project

(i) impacts of the project on established fish stocking and attractor programs.[34]

9.179 Describe any impacts on, and mitigation measures to address, the use of and access for recreational, natural and culturally important areas, waterways and landscapes (Aboriginal and non-Aboriginal) potentially affected by the project during all phases of the project. This should include potential impacts on stakeholder aspirations for future use of recreational, natural and culturally important areas, waterways and landscapes.

9.180 Identify the percentage of workers likely to be sourced locally, including from affected communities, for all phases and the proposed methodologies for workforce recruitment.

9.181 Identify targets (number and percentage) for workers who identify as Aboriginal and Torres Strait Islander people to be employed for all project phases, including recruitment strategies and training programs to achieve the targets. Also identify the percentage of procurement from Aboriginal and Torres Strait Islander owned businesses during the construction and operational phases and the proposed strategies to achieve this percentage.

9.182 Describe the housing strategy to accommodate construction and operational workers. Describe how this will impact the residential land supply, housing and accommodation market of the Mackay and Isaac LGAs. Analysis of the existing housing and accommodation market must include, but not be limited to, unoccupied dwellings, rates of rented dwellings, rates of home ownership, demand for and availability of affordable and social housing, employer provided subsidised accommodation, capacity and quality of worker accommodation villages (WAVs) quality of available housing stock and current bank loan ration requirements. The housing strategy is to be informed by the SIA and impact management plan requirements of the Workforce Management and Housing and Accommodation sections of the (SIA) Guideline, 2018.

9.183 Develop a social impact management plan (SIMP) in line with the Coordinator-General's SIA Guideline and Supplementary material, which will include management measures developed in consultation with potentially affected people, communities and key stakeholders, to avoid and mitigate the project's potential adverse impacts and enhance the potential benefits. The SIMP should also identify management measures to overcome perceived or real barriers to genuine participation or engagement with the project. This includes, but is not limited to barriers relating to:

[34] Fishing in stocked impoundments: **https://www.qld.gov.au/recreation/activities/boating-fishing/rec-fishing/dams .**

(a) salary and other employment conditions

(b) absence of discrimination or disadvantage

(c) housing availability, suitability and affordability

(d) genuine ability for employees to be at home with family every night

(e) satisfaction with banking conditions, for example loan valuation ratio and servicing conditions, where employees seek to owner occupy

(f) facilitative transport modes, including buses to towns rather than camps

(g) fatigue management measures

(h) rostering options including shift length, structure and changeovers.

9.184 Describe the framework to monitor the effectiveness of proposed management measures, including timeframes and key performance indicators for implementing these measures. The framework must identify roles and responsibilities, and relevant stakeholders.

Cultural heritage

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse impacts on Aboriginal and Torres Strait Islander Peoples' cultural heritage

b) achieve the purposes of the *Aboriginal Cultural Heritage Act 2003*

c) ensure that the nature and scale of the project does not compromise the cultural heritage significance of a heritage place or heritage area.

Existing environment

9.185 Identify the Traditional Custodians of the land within the project area.

9.186 Undertake a cultural heritage assessment and describe the existing cultural heritage values of Aboriginal and Torres Strait Islander Peoples that may be affected by the project and the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.

9.187 Undertake a study of the known and potential Queensland (non-Indigenous) historical heritage values of the area identified through the *Queensland Heritage Act 1992*, in accordance with the Non-Indigenous cultural heritage – EIS information guideline (see section 5.6 of the *Preparing an EIS: Guideline for proponents).* Identify values at local and State thresholds and assess the significance of identified values using recognised criteria.

Impact assessment and mitigation measures

9.188 Undertake an impact assessment on Aboriginal and Torres Strait Islander Peoples' cultural heritage in accordance with the latest version of DESI Aboriginal and Torres Strait Islander cultural heritage – EIS information guideline (see section 5.6 of the *Preparing an EIS: Guideline for proponents*).

9.189 Unless section 86 of the *Aboriginal Cultural Heritage Act 2003* (ACH Act) applies, the proponent must develop a Cultural Heritage Management Plan (CHMP) in accordance with the requirements

of Part 7 of the ACH Act and any associated agreements that have been reached. The CHMP must be informed by the results of a cultural heritage study or survey.

9.190 Identify impacts on Queensland (non-Indigenous) historical heritage identified under the *Queensland Heritage Act 1992*.

9.191 Identify impacts to Traditional Owners outside the project footprint who may be impacted by downstream impacts on the Broken River and the broader cultural landscape. Demonstrate that the proposed actions are compliant with human rights under the Queensland Human Rights Act 2019.

9.192 Provide strategies to mitigate and manage all impacts on Indigenous and non-Indigenous cultural heritage values. Include strategies to address unexpected archaeological discoveries and cultural places in accordance with Non-Indigenous cultural heritage guideline in section 5.6 of the *Preparing an EIS: Guideline for proponents* and the project CHMP.

Noise and vibration

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse noise and vibration impacts to sensitive receivers and structural damage to buildings or other infrastructure or landforms as a result of construction vibration

b) protect the environmental values of the acoustic environment.

The performance outcomes corresponding to noise are in schedule 8, part 3 of the EP Regulation.

Existing environment

9.193 Describe and illustrate the locations of any sensitive receptors that are listed in Schedule 1 of the Environmental Protection (Noise) Policy 2019 (EPP (Noise)). Describe any other environmental values and infrastructure that could be impacted by emissions from the proposed project.

9.194 Describe the existing noise and vibration sources and baseline levels within the project area.

Impact assessment and mitigation measures

9.195 Describe the characteristics of the noise and vibration sources, including any blasting, or rock ripping, emitted by the project (point source and general emissions) during construction, operation, upset conditions, and decommissioning of the proposed project.

9.196 Conduct a noise and vibration impact assessment in accordance with the latest version of DESI Noise and vibration—EIS information guideline, Schedule 1 of the EPP (Noise) and Applications for activities with noise impacts (see section 5.7 of the *Preparing an EIS: Guideline for proponents*). The assessment must include:

(a) a description of the surrounding existing and planned sensitive receptors and at-risk landforms and the associated environmental values in order to set noise criteria which protects the environmental values

(b) a description of the project's noise and vibration impacts on sensitive receivers and proposed mitigation measures through all phases of the project.

9.197 Assess the blasting and vibration impacts from construction and operation of the project on any existing infrastructure, and other existing and planned future infrastructure (including any aquatic

fauna passage infrastructure) and the potential for structural impacts and functional impacts on these. Safety considerations should be included in the impact assessment. Include how risks from blasting and vibration will be mitigated and appropriately managed.

9.198 Describe how the proposed project would be managed to be consistent with best practice environmental management, including the control of background creep in noise as outlined in the EPP (Noise). The assessment must address the compatibility of the proposed project's noise emissions with existing and potential land uses in surrounding areas.

9.199 Describe how the project's acoustic quality objectives will be monitored and audited, and how corrective actions will be managed in accordance with best practice environmental management. Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in schedule 8 of the EP Regulation.

Climate

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate the risk of, and adverse impacts to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology and extreme weather events), with particular reference to any additional environmental management measures required, and how those measures may change over time

b) keep global warming below 2°C, preferably 1.5°C, above pre-industrial levels through the reduction of greenhouse gas (GHG) emissions by supporting Queensland's emission reduction targets

c) prepare for climate change through climate resilient project development.

Existing environment

9.200 Describe the extremes of climate (e.g., drought, floods, cyclones and bushfires) relevant to the project site including under climate change scenarios.

Impact assessment and mitigation measures

9.201 Conduct an assessment in accordance with DESI Climate – EIS Information Guideline and Air – EIS information guideline (see section 5.8 of the *Preparing an EIS: Guideline for proponents*).

9.202 Describe the project site's climate patterns that are relevant to the environmental impact assessment, particularly the project's discharges to water and air, and propagation of noise. Assess the project's vulnerabilities to current climate patterns in relation to water quality and quantity management (surface and groundwaters) and unplanned or emergency water releases.

9.203 Climate information is to be presented in a statistical form including long-term averages and extreme values reflecting extreme weather events (e.g. droughts, floods, cyclones and bushfires), as necessary. It should also be illustrated by graphs, wind rose diagrams or other relevant graphic means as necessary.

9.204 Assess the project's vulnerabilities to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology, and frequency of extreme weather events). Demonstrate how the proposal accounts for climate change impacts and builds in fire, flood and drought resistance and resilience measures. In the assessment of climate hazards and risks, reference relevant climate projection data and employ appropriate risk assessment methodologies, including the frequency

and magnitude of major weather events, and any consequence and management actions for the proposed project. The assessment of climate hazards and risks should reference relevant climate projection data (e.g. Queensland Future Climate high-resolution climate projection data[35]) and employ an appropriate climate risk assessment methodology.

9.205 Describe the adaptation strategies and/or activities designed to minimise greenhouse gas emissions as a result of the project and climate change impacts to the project, subsequent land uses on the project (e.g. rehabilitation projects) and surrounding land uses. Include considerations of any impacts on neighbouring micro-climates (e.g. topoclimates or refugia). Adaptation activities are to be designed to avoid perverse outcomes, such as increased emissions of greenhouse gases or maladaptive outcomes for surrounding land uses.

Greenhouse gas emissions

Existing environment

9.206 Discuss the existing local and regional air shed environment of greenhouse gases (GHG).

Impact assessment and mitigation measures

9.207 Describe how the project will be constructed and operated to limit GHG emissions.

9.208 Provide information regarding GHG emissions and energy production and consumption consistent with requirements of *National Greenhouse and Energy Reporting Act 2007 (Cth)* and its subordinate legislation, including methodology, emissions factors, and calculations used to estimate the project's GHG emissions.

9.209 Provide an inventory of projected annual emissions for the construction phase, operational phase and for the overall project for each GHG, with total emissions expressed in 'CO_2 equivalent terms' (CO_2e). Inventory is to be consistent with requirements of the *National Greenhouse and Energy Reporting Act 2007* (Cth) and its subordinate legislation, including methodology, emissions, factors, and calculations used to estimate the project's GHG emissions and should include:

(a) calculation of GHG emissions from land clearing and inundation of land, and any forgone GHG uptake as a result of vegetation clearance 36

(b) quantification of the CO2e (including methane) from the reservoirs for the construction and operational phases and life of the project, including consideration of timing and frequency for stratification to occur, and the potential establishment of an anoxic environment in the reservoirs

(c) any opportunities for GHG offsets for each project phase.

9.210 Undertake an assessment of GHG emissions in accordance with *Guideline – Greenhouse gas emissions,*[37] *including*:

(a) an estimate of the projected annual Scope 1 and Scope 2 CO_2e emissions[38] over the life of the project. Include both unabated emissions and emissions after all avoidance and abatement measures have been accounted

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[35] Available from https://longpaddock.qld.gov.au/qld-future-climate/dashboard.
[36] Consider the *IPCC 2019 Refinement to the 2006 IPCC Guidelines (Wetlands) for National Greenhouse Gas Inventories* to quantify fugitive methane emissions before and after the PHES reservoirs' formation for the life of the project.
[37] Refer to Appendix 1, Air.
[38] Scope 1 emissions – direct emissions of GHGs from sources within the boundary of the facility and from the facility (including emissions from vegetation clearing). Scope 2 emissions – emissions of GHGs from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility.

(b) for medium to high emitting projects,[39] provide an estimate of annual Scope 3 emissions[40] and total Scope 3 emissions over the life of the project.

9.211 Describe how the project will contribute to meeting targets identified in Queensland's 2035 Clean Economy Pathway, the *Energy (Renewable Transformation and Jobs) Act 2024* and the *Clean Economy Jobs Act 2024*, and potential impacts on state and national GHG inventories.

9.212 Describe how the project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.

9.213 Describe the assumptions and data inputs applied to develop the emissions estimates and the emissions reduction targets. The calculation of baseline should follow the methodology outlined in the National Greenhouse and Energy Reporting (Safeguard Mechanism) Rule 2015. If International Best Practice benchmarks are not available, detail how the project baseline has been estimated and identify how the International Best Practice benchmark will be integrated should values become available.

9.214 Identify risks and likely magnitude of impacts to environmental values from Scope 1, 2 and 3 emissions.[41]

9.215 If determined to be a medium to high emitting project, provide a GHG Abatement Plan including:

(a) potential impacts on state and national GHG inventories

(b) consideration of the requirements outlined in Appendix A of the DESI Guideline - Greenhouse gas emissions (ESR/2024/6819)

(c) measures (preferred and alternatives) proposed to avoid and/or minimise scope 1, scope 2 and scope 3 GHG emissions of the proposed project and forgone GHG update, and how the preferred measures minimise emissions and achieve energy efficiency

(d) any opportunities to further offset GHG emissions through accredited and verified offsets that represent genuine emissions reductions that meet the principles of the Carbon Credits (Carbon Farming Initiative) Act 2011

(e) opportunities to reduce GHG emissions through renewable energy use and innovation

(f) quantification of the emissions expected to be abated for each avoidance and mitigation measure

(g) any voluntary initiatives or research into reducing the lifecycle and embodied energy carbon intensity of the proposed project's processes or products

(h) a process for regularly reviewing new technologies to identify opportunities to further reduce greenhouse gas emissions and use energy efficiently, consistent with best practice environmental management

(i) description of the practicality, effectiveness and risks for each avoidance, reduction and mitigation or offsets measure

(j) comparison of preferred measures for emission controls and energy consumption with best practice International environmental management in the relevant industry sector

[39] Section 3.2, *Guideline – Greenhouse gas emissions* – full reference at Appendix 1, Air.
[40] Scope 3 emissions – emissions of GHGs which occur as a consequence of the activities of the project, but from sources now owned or controlled by the facility's business.
[41] Section 3.4, *Guideline - Greenhouse gas emissions* – full reference at Appendix 1, Air.

(k) assessment and description of the practicality, effectiveness and risks for each avoidance and mitigation measure with clear evidence that the proposed mitigation and avoidance measures have been factored into the economic feasibility of the proposed project

(l) monitoring, auditing and transparent public reporting on:

(i) GHG emissions from all relevant activities

(ii) periodic energy audits that measure progress towards improving energy efficiency

(iii) the success of mitigation measures outlined in the GHG Abatement Plan

(iv) ongoing training and capacity building around decarbonisation options, technology and reporting.

Air

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse air impacts to sensitive receivers

b) protect or enhance the environmental values of the airshed, the health and biodiversity of ecosystems and human health and wellbeing.

The performance outcomes corresponding to these objectives are in schedule 8, part 3 of the EP Regulation.

Existing environment

9.216 Discuss the existing local and regional air shed environment and quality in the context of environmental values, including:

(a) background/ambient levels and sources of particulates, gaseous and odorous compounds, any major constituents and contaminants. Include all available data from any site-specific air monitoring, the National Pollutant Inventory (NPI) reporting, and/or ambient air quality monitoring undertaken by the Queensland Government

(b) pollutants

(c) baseline monitoring results

(d) locations of sensitive receptors (including ecologically significant species and habitats).

9.217 Provide baseline data on local meteorology and ambient levels of pollutants for later modelling of air quality. Parameters should include air temperature, wind speed and directions, atmospheric stability, mixing depth and other parameters necessary for input to the model.

9.218 The assessment of environmental values should describe and map at a suitable scale the location of all sensitive air receptors adjacent to all project components. An estimate of typical background air quality levels should be based on surveys at representative sites where data from existing DESI monitoring stations cannot be reliably extrapolated.

Impact assessment and mitigation measures

9.219 The assessment of impacts on air from all components of the project (i.e. on and off-site) should be in accordance with DESI Air – EIS information guideline and Application requirements for activities with impacts to air.

9.220 Provide an emissions inventory and description of the characteristics of any contaminants or materials that may be released, and the release rate, as a result of the construction or operations of the project, including point source and fugitive emissions. An emissions inventory (point source and fugitive) during construction, commissioning, operations, maintenance and a range of possible/likely upset conditions is to be included for the project site. The emission inventory must consider all potential air emission sources from activities including but not limited to land clearing, excavation and stockpiling of topsoil, blasting and excavation of rock, earthmoving and surface preparation, vehicles travelling on unsealed roads, temporary quarries and concrete batching plants.

9.221 Predict the potential impacts of the releases to air from project activities on environmental values of the receiving environment using established and accepted methods.

9.222 The description of impacts should take into consideration the assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts. The impact prediction is to:

(a) address residual impacts on the environmental values (including appropriate indicators and air quality objectives) of the air receiving environment, with reference to sensitive receptors, using recognised quality assured methods. This should include all relevant values potentially impacted by the activity, under the EP Act, EP Regulation and Environmental Protection (Air) Policy 2019 (EPP (Air))

(b) address the cumulative impact of the release with other known releases of contaminants, materials or wastes associated with existing development and potential future development (as described by approved plans and existing project approvals). Quantify the human health risk and amenity impacts associated with emissions from the project for all contaminants whether or not they are covered by the National Environmental Protection (Ambient Air Quality) Measure or the EPP (Air).

9.223 Detail the measures to avoid, minimise and manage impacts on air quality and how the proposed project activities would be consistent with best practice environmental management.

9.224 Address the compatibility of the proposed project's air emissions with existing or potential land uses in surrounding areas.

9.225 Describe how the proposed project will avoid and/or minimise potential impacts on air quality, dust and odour management. Identify measures to be implemented on-site to control and mitigate impacts and describe how the proposed project activities will be consistent with best practice environmental management.

9.226 Describe how the achievement of the air objectives would be monitored, audited and reported, and how corrective/preventative actions would be managed for the life of the project.

Transport

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse impacts to the condition and operation of existing and planned transport infrastructure

b) maintain the safety, efficiency and operational integrity of all affected transport modes for the project workforce and other transport system

c) ensure impact mitigation works are compatible with transport infrastructure planning.

General content

9.227 Describe the total transport task for the project, including workforce, inputs and outputs during the construction and operational phases. Refer to DESI Transport - EIS information guideline (see section 5.10 of the *Preparing an EIS: Guideline for proponents).*

9.228 Present the transport assessment in separate sections for each project-affected mode (road, rail, air and sea) as appropriate for each phase of the project, including the proposed transportation and delivery of pre-assembled modules to site (if applicable).

Existing environment

9.229 Describe the existing and future (as planned by State or local government) transport network and corridors including detailed maps to appropriate scales showing relevant:

(a) construction laydown areas and workers accommodation areas

(b) locations where project components cross or are located in proximity to or located within existing and planned:

(i) road and railway corridors

(ii) road and rail infrastructure

(iii) airports and airstrips

(iv) sea ports

(v) access routes used by resource authority holders in and around the project area including any ML access routes.

Impact assessment and mitigation measures

9.230 Describe the total transport activities associated with all phases of the project (from pre-construction through to operation). The information should include but not be limited to:

(a) background traffic growth and existing traffic data

(b) expected annual volumes, weights and origins/destinations of materials, products, hazardous goods, and wastes

(c) details concerning road transportation for each major transport task (for example, fuel, plant and equipment, consumables, wastes) including heavy vehicle classification, load size (highlighting over-mass and over-sized loads), number of trips, service frequency and duration

(d) details concerning rail transportation including number of trips, load size, service frequency and duration

(e) maps of routes to be used for all project transport tasks

(f) over-mass or oversized loads, including the number and type of vehicles, with a description of the likely timing and routes of those loads highlighting any vulnerable bridges or other structures along the proposed routes

(g) traffic generated by workforce personnel and service providers for all phases of the project.

9.231 Identify proposed transport routes and project site access points to/from public roads including their suitability for the proposed use and required upgrades in accordance with relevant local and/or state policies, standards and manuals.

9.232 Prepare a transport assessment in accordance with the latest version of DESI's Transport – EIS information guideline and present each project-affected mode (road, rail, air services, port and maritime) as appropriate for each phase of the project. The assessment must be completed by an RPEQ and include:

(a) how the existing and future safety, condition and performance of transport infrastructure (local and State) will be impacted by the project's pre-construction, construction and operational phases

(b) details of the adopted assessment methodology for impacts on roads within the road impact assessment report in accordance with the latest Queensland Department of Transport and Main Roads (DTMR), Guide to Traffic Impact Assessment (GTIA) for State-controlled roads and the local government impact assessment methodologies for local government roads

(c) for State-controlled roads, to ensure that all impact types (road safety, access and frontage, intersection delay, road link capacity, pavement, and transport infrastructure (including bridges, culverts and grids) and wayfinding and road signs as detailed in the GTIA are considered and mitigated. Particular emphasis is to also be placed on the following sections of the GTIA:

(i) section 8.4.2 Heavy Vehicle Routes

(ii) section 9 Road Safety

(iii) section 13 Pavement

(iv) section 14 Transport Infrastructure (specifically 14.3.1 Structural integrity of transport infrastructure.

9.233 Identify, assess and address the project's impacts on all existing and future railway corridors, particularly railway level crossings and any aspect of the proposed project interfacing or interfering with existing and future railway corridors in accordance with relevant standards and requirements such as the SDAP, the Guide for Development in a Transport Environment: Rail, the Manual of Uniform Traffic Control Devices, Part 7: Railways and railway manager standards. This is to include the construction and operation impacts of the proposed project. Traffic data should be provided for development generated traffic during construction and operation, background traffic growth and timelines for development staging, construction and delivery.

9.234 Demonstrate that any necessary transport impact mitigation works will not compromise existing and future transport infrastructure corridors planning and works, with reference to the latest version of DTMR's Queensland Transport and Roads Investment Program and the Development Assessment Mapping System.

9.235 Demonstrate how project impacts will be mitigated. Mitigation measures are to be prepared in consultation with relevant transport authorities (e.g. local governments, DTMR, Civil Aviation Safety Authority, Maritime Safety Queensland, Aurizon and Queensland Rail).

Waste management

Objective and outcomes

The design, construction and operation of the project are to:

a) avoid, minimise and/or mitigate adverse impacts of hazardous contaminants and waste generated by the project to protect people, property and the environment

b) manage any waste transported, generated, or received as part of carrying out the activity in a way that protects all environmental values and community enjoyment of the region

c) ensure waste infrastructure has the capacity to adequately accommodate waste, and any upgrades to waste infrastructure are funded by the proponent.

Existing environment

9.236 Describe existing waste infrastructure including location, capacity and accepted waste streams relevant to the project.

9.237 Describe if any pre-existing contaminated material identified on property lots listed on the Environmental Management Register (EMR) are within the project footprint. If contaminated material was identified, describe:

(a) details of any site investigations undertaken by suitably qualified persons, including findings of the investigation

(b) using maps at a suitable scale, illustrate the context of the project area in relation to identified contaminated material

(c) outline the management or disposal of any identified contaminated material.

Impact assessment and mitigation measures

9.238 For wastes other than wastewater, describe all the expected waste streams, including hazardous contaminants, generated by project activities during the construction, operation, rehabilitation and decommissioning.

9.239 Describe the quantity, and physical and chemical characteristics of each significant waste stream, any attributes that may affect its dispersal in the environment, and its associated risk of causing environmental harm.

9.240 Conduct the impact assessment in accordance with the latest version of the DESI's Waste—EIS information guidelines and Applications for activities with waste impacts (ESR/2015/1836) (see section 5.11 of the *Preparing an EIS: Guideline for proponents*). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in schedule 8 of the EP Regulation.

9.241 Describe objectives and practical mitigation measures to ensure environmental values are protected or enhanced from potential impacts from wastes.

9.242 Describe the geochemistry of all waste rock, including spoil and rejects. Assess the potential risks associated with this waste stream (in particular any soil or rock that has the potential to create and leach acids) and describe the management of progressive placement and any disposal

strategy to minimise any potential impacts on environmental values of the proposed project area. Describe how high-risk waste material will be managed in the rehabilitation plan.

9.243 Describe waste management planning for the project, especially how these plans are to be applied to prevent or minimise environmental impacts from waste for each stage of the project, including pre-construction. Waste management planning is to include detail of all identified waste types, waste volumes and proposed locations for waste disposal. Include consideration of the circular economy and resource recovery opportunities, and regional partnerships which would seek to support the project and increase regional resource recovery capacity.

9.244 Assess and describe the proposed management measures against the preferred waste management hierarchy, namely: avoid waste generation; cleaner production; recycle; reuse; reprocess and reclaim; waste to energy; treatment; disposal. This includes the generation and storage of waste.

9.245 If the production of hazardous contaminants and waste is unavoidable, describe proposed treatment and/or storage of hazardous contaminants until they can be disposed of at an approved facility.

9.246 Describe how securing of storage containers of hazardous contaminants during flood events would meet the requirements of schedule 8 of the EP Regulation.

9.247 Describe how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives would be monitored, audited and managed.

9.248 Provide relevant information on existing and proposed sewage infrastructure relevant to ERA 63, by referring to relevant DESI policies and guidelines, depending on the proposed sewage collection and treatment infrastructure, the reuse and/or disposal of treated wastewater, and sewage wastes generated. This should include:

(a) options under consideration for sewage/wastewater treatment, including detail on likely location, size, capacity and operational methods of any plant and associated infrastructure / irrigation areas

(b) characteristics, quantity and quality of sewage/wastewater to be treated, disposed of and utilised for the project

(c) groundwater characteristics of any proposed sewage/wastewater storage, treatment infrastructure and effluent disposal site(s) and risk of contamination to groundwater

(d) soil characteristics of any proposed effluent disposal site(s)

(e) wet weather wastewater storage management options, capacities and management measures.

9.249 Provide a description of local climate data and weather patterns which can be obtained from the Queensland Government SILO climate database, relevant to wastewater storage and effluent disposal activities (**www.data.qld.gov.au/dataset/silo-climate-database**).

9.250 Provide a description of the flood frequency for any proposed sewage treatment infrastructure and treated sewage irrigation area(s) and assess the risk of inundation due to flooding.

Cumulative impacts

Objective and outcomes

The design, construction and operation of the project are to avoid, minimise and/or mitigate potential adverse impacts arising from the combined effects of past, present and reasonably foreseeable projects on the environmental, social, economic, and cultural values.

General requirements

9.251 Potential cumulative environmental, social, economic, and cultural impacts are to be considered for the design, construction, and operational phases of the project in the dimensions of scale, intensity, duration or frequency of impacts.

9.252 The cumulative impact assessment is to consider the combined effect of potential impacts of different components of the project on the same value (intra-project cumulative impacts), and the impacts of other relevant projects, acting in combination on the same value (inter-project cumulative impacts).

9.253 The combined incremental impacts of the project should generally be considered. Combined incremental impacts of the project may relate to:

(a) multiple forms of impact at one location (e.g. a sensitive receiver may be impacted by noise and vibration, dust, air quality, traffic)

(b) a form of impact occurring at several locations (e.g. noise and vibration impacts will occur at multiple construction sites and along transport routes)

(c) an environmental, social or cultural value being impacted at several locations or by a number of forms of impact (e.g. water quality may be impacted by construction activities at a number of locations, by habitat change and by operational activities such as downstream flow regime change).

9.254 The cumulative impact assessment is to include consideration of all infrastructure to be developed in support of the project including, but not limited to, any necessary upgrades to supporting infrastructure, such as roads, waterway crossings and waste management infrastructure, outside the project area.

9.255 Preparation of the cumulative impact assessment is to include information from other proponents for related projects undergoing assessment. The proponent for this project should also provide detail on this project to other proponents undertaking a cumulative assessment for connecting infrastructure.

9.256 Describe how stakeholder consultation and communication strategies for the project have considered the potential for cumulative impacts, including the impact of consultation of the same stakeholders by multiple proponents.

9.257 Describe the cumulative impacts of the project, in conjunction with existing and proposed development and known future development (as described by projects under assessment, approved plans, government priorities and existing project approvals) to the following matters:

(a) proposed land uses, including impacts from contaminants, materials or wastes associated with existing development and future known development

(b) capacity of infrastructure corridors and resources (e.g. pipelines, energy, water, renewable energy, etc.) intended to be accessed by the proponent

(c) extent of renewable energy development that could be supported by the project [42] [43]

(d) soils

(e) area coverage, health and resilience of terrestrial and aquatic ecosystems, including habitat for listed threatened species

(f) surface water and groundwater quality

(g) surface water and groundwater resources for all phases of the project (including post decommissioning phase), including management of impacts on underground water rights under the *Water Act 2000*, and impacts on surface water flows (volumes, timing, duration), number of riffles, pools and waterholes, instream and floodplain connectivity, sediment transport and existing water users.

(h) release of contaminants, materials or wastes and the disposal of waste

(i) air quality

(j) noise

(k) natural hazards occurring at the same time

(l) public health and safety

(m) Aboriginal and Torres Strait Islander peoples water related cultural values and aspirations.

9.258 Describe how cumulative impacts for the above listed matters may be affected by climate change.

9.259 Describe the potential cumulative effects, reversible and irreversible impacts, the risk of environmental harm, management strategies, and the ability to avoid, minimise, mitigate and/or offset the cumulative impacts from existing and future development projects.

Cumulative impacts on hydrology

9.260 Submit the environmental, operational and infrastructure parameters used to run the Integrated Quantity Quality Model (IQQM) for the project to the DRDMW, a copy of the IQQM scenario (IQQM system file) and an assessment of the IQQM run against Water Plan (Burdekin Basin) 2007 Environmental Flow Objectives and Water Allocation Security Objectives as well as general and specific ecological outcomes. Note: this information may be shared with other project proponents required to undertake cumulative impact assessments in the Burdekin Basin.

9.261 DRDMW will compile and return an updated IQQM model to enable the development of the draft EIS. The only parameters that can be changed will be those that relate to the proponent's own project.

9.262 Include a cumulative impact scenario using the DRDMW Chief Executive approved IQQM which considers the interaction of the project with other current and proposed projects in the Burdekin Basin. Describe the project's contribution to the cumulative impacts of current and proposed water infrastructure projects on catchment hydrology. Present the key inputs, assumptions and outputs of an appropriately calibrated run of catchment modelling (cumulative impact scenario) using the approved IQQM.

9.263 Using the outputs of the cumulative impact scenario, describe the level of compliance achieved by the project with general and specific ecological outcomes of the Water Plan (Burdekin Basin) 2007 or any draft water plan, as well as environmental flow objectives and water allocation

[42] https://www.epw.qld.gov.au/energyandjobsplan/about
[43] https://aemo.com.au/-/media/files/major-publications/isp/2022/appendix-3-renewable-energy-zones.pdf?la=en

security objectives of the current and any draft Water Plan for the Burdekin Basin, including an assessment against relevant performance indicators and outcomes.

10. Matters of national environmental significance

The project was referred to DCCEEW as two separate EPBC Act referrals, the Capricornia Energy Hub (CEH) Transmission Project (EPBC 2023/09627), and the Capricornia Energy Hub (CEH) Pumped Hydroelectric Energy Storage (PHES) Project (EPBC 2023/09626).

On 7 December 2023, a delegate for the Minister for the Environment and Water determined the CEH Transmission Project (EPBC 2023/09627) to be a 'controlled action', requiring environmental approval under the EPBC Act.

On 11 December 2023, a delegate for the Minister for the Environment and Water determined the CEH PHES project (EPBC 2023/09626) to be a 'controlled action' requiring environmental approval under the EPBC Act.

The controlling provision for both actions is listed threatened species and communities (sections 18 and 18A of the EPBC Act)

The project comprising both the CEH Transmission Project (EPBC 2023/09627) and the CEH PHES Project (EPBC 2023/09626), will be assessed by accredited assessment under the SDPWO Act.

The appendices of the EIS are to include two stand-alone reports providing an assessment of impacts of each of the proposed actions on the relevant controlling provision. Each of the MNES reports are to contain sufficient information to be read alone, and where appropriate, reference technical data or supplementary reports. Any detailed technical information to support the text in the MNES report is to be included as appendices to the relevant MNES report.

Ensure habitat definitions for listed threatened species are in accordance with definitions available in the EPBC Act Guidelines or other relevant, most recent, statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the Species Profile and Threats (SPRAT) database). Ensure that the habitat definitions also take into account all relevant Queensland regional ecosystems and other available information. The most up to date documentation and/or scientific expert advice needs to be used.

Note: Where 'action' is used below, it is to mean all components of the respective proposed action in each MNES report.

General content

10.1 Each MNES report is to take into consideration the EPBC Act Significant Impact Guidelines, other relevant statutory documentation (such as relevant recovery plans and conservation advices accessible via the SPRAT database) and Commonwealth policy guidelines (see Appendix 1).

10.2 Each MNES report should contain sufficient information to allow the Australian Government Minister (or delegate) to make an informed decision on whether or not to approve the taking of the action under Part 9 of the EPBC Act for the purposes of each controlling provision.

10.3 Each MNES report should contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed developments on MNES and how these impacts are proposed to be avoided, mitigated, and/or offset.

10.4 The proponent is to ensure that each MNES report assesses compliance of the action with principles of ecologically sustainable development (ESD) and the objects of the EPBC Act (see Chapter 1 Part 1 of the EPBC Act).

Specific content

General information

10.5 Provide the background and context of the action including:

(a) title of the action

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

(c) clear outline of the objective of the action

(d) location of the action including regional context

(e) background to the development of the action

(f) how the action relates to any, or potentially interacts with any other actions (of which the proponent should reasonably be aware) that have been, are currently, or will be, taken or that have been approved in the region

(g) current status of the action

(h) consequences of not proceeding with the action.

10.6 Separately discuss the description, existing known location/s, likelihood of occurrence, demonstrated impact, avoidance, mitigation and compensatory measures (including offset) for each MNES triggered.

Description of the action

10.7 All components of the action are to be described in detail, including construction, commissioning, operation, maintenance, decommissioning and rehabilitation. This is to include the precise location of all works to be undertaken, structures to be built or elements of the action that may have impacts on MNES. It is suggested that each component of the action is discussed in a separate section.

10.8 The description of the action is to also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts. At a minimum, this section is to also include, with appropriately scaled mapping, details of:

(a) all infrastructure constructed and construction methods, including final heights of new dams

(b) ancillary or supporting infrastructure, associated works or safety works including new construction and upgrades

(c) all new and existing roads, as well as details on which roads are sealed and unsealed, and traffic volume

(d) all temporary and permanent fencing used, including a description of each fencing type and location. Include schematic diagrams of fence types and maps of where fences are proposed to be located

(e) realignment or replacement of services, structures, access etc. required as a result of the action

(f) re-establishment of existing quarries (if applicable) and establishment of new quarries (resource extraction areas) location, size, method of extraction of materials and transport of materials

(g) treatment of contaminated land, including method of treatment, disposal of waste and contaminated material, standards and minimum thresholds required for removal/disposal

(h) maximum life of the action, including construction, operation, decommissioning and rehabilitation

(i) number of jobs for the life of the action, including number of jobs for Indigenous employees

(j) associated works and supporting infrastructure deemed necessary as part of the action or safety works

(k) other such actions, including, but not limited to, earthworks, use of explosives, changes to hydrological flow and groundwater, concrete batching plant, material storage, construction facilities, fines and dust control management, waste management generally and management of spills/contaminants/pollutants (e.g. prevention from entering waterways and groundwater).

10.9 The description of the action is to provide the total size (in ha) of the project site and the total size (in ha) of the disturbance footprint. If the disturbance footprint is the same as the project site, the MNES section is to include a statement to this effect. The description is also to include separate calculations of the total area of the inundation areas in ha.

10.10 Each MNES report is to include a map (or maps) which clearly identify all components (including but not limited to laydown areas, existing and new access roads, widening of any roads, fencing) of the action and their location within the project site.

10.11 Each MNES report is to include map/s of presence/records and habitat areas that may support MNES to a suitable scale, in order to assess the proximity and location of the proposed action in relation to MNES.

10.12 All maps must follow the Guide to providing maps and boundary data for EPBC Act projects (2021).

Feasible alternatives

10.13 Outline any feasible alternatives to the action to the extent reasonably practicable, including:

(a) if relevant, the alternative of taking no action and/or at a reduced scale

(b) if relevant, alternative designs depending on the outcome of exploratory works/investigatory works

(c) a comparative description of the impacts of each alternative on listed threatened species and communities

(d) sufficient detail (including feasibility studies and cost analysis) to make clear why any alternative is preferred to another

(e) short, medium and long-term advantages and disadvantages of the options, including but not limited to, the environmental outcomes to be achieved for MNES under each alternative.

Description of the Environment

10.14 Describe the environment of the project site and surrounding areas (i.e. adjacent, upstream and/or downstream) that may be affected by the action. At a minimum, this section needs to include details of:

(a) terrestrial and aquatic ecosystems, including key vegetation communities and relevant watercourses

(b) total size (in ha) of Regional Ecosystems (REs) ground-truthed to be present on site, as well as a map/s showing the size (in ha) of RE patches and native vegetation regrowth

(c) estuarine, riverine and coastal environments, including inshore coastal areas, vegetation, underwater ecological features, key habitats

(d) native flora and fauna, both terrestrial and aquatic. Include species records of each vegetation community or relevant regional ecosystem

(e) pest species and weeds' distribution and abundance. Include information on age classes and other relevant information such as location of burrows of pest animals. Weeds are to be categorised in accordance with relevant legislation and regulations, from weeds of national significance (WoNS), State listed and those listed by Isaac Regional Council and Mackay Regional Council

(f) important habitat areas, recognised populations and habitat, and aggregations of listed species

(g) surface water and groundwater hydrology and quality

(h) cultural heritage values, people and communities and other relevant social considerations

(i) historical anthropogenic uses of the project site (if relevant) and existing condition of the overall environment within, adjacent to, downstream and upstream of the project site.

10.15 For each triggered MNES matter, include a brief description, status of matter in the region and the key threatening processes. Describe the key threatening processes applicable to each MNES within the proposed action site/s. For further MNES information requirements, please refer to the Listed Threatened Species and Ecological Communities section below.

Relevant impacts

10.16 All relevant impacts of the action are to be assessed in accordance with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database, including but not limited to:

(a) habitat clearance and inundation

(b) habitat fragmentation and degradation

(c) injury or death (such as from vehicle strike)

(d) disturbance from dust, light, vibration and noise

(e) behavioural changes

(f) introduction, spread and/or increase in pests, weeds and diseases

(g) changes to hydrological regimes (including flow changes and flooding)

(h) impacts to groundwater levels in root zones of relevant vegetation habitat

(i) impacts to water quality (including direct and facilitated), waste and chemical pollution, land contamination

(j) barriers to fauna movement and edge effects.

10.17 Describe all relevant impacts of the action (direct, indirect, cumulative and facilitated), including the magnitude, duration and frequency of the impacts (including any temporary impacts). Relevant impacts are the impacts that the action will have, or is likely to have, on MNES. 'Likely' is taken to mean a "real or not remote chance or possibility". All stages and components of the action must be addressed, and the following information provided:

(a) a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts, taking into consideration any indirect impacts (e.g. light and dust pollution, noise from operations, construction and explosives, increased risk of predation)

(b) a statement, with supporting evidence, whether any relevant impacts are likely to be unknown, unpredictable or irreversible

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

(d) consideration must be given to specific habitat features such as hollow bearing trees, nest trees, refuge habitat, foraging, breeding and dispersal habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable).

10.18 Provide a detailed assessment of any likely impact that the action may have on (at the local, regional, state, national and international scale) the MNES above. The assessment of impacts should include a discussion of the overall implication of all relevant impacts on population and sub-population size (including genetic diversity), species recovery, health and species range for each relevant MNES.

10.19 Identify and assess the cumulative impacts on MNES (terrestrial, aquatic and marine) created by the project and the activities of other existing and proposed adjacent, upstream and downstream relevant developments, water users and land users.

10.20 Establish and describe clear spatial and temporal boundaries for the assessment of cumulative impacts.

10.21 Address the potential cumulative impact of the action on ecosystem resilience. Where relevant to the potential impact, a risk assessment is to be conducted and documented.

10.22 Describe the change in the duration, frequency, magnitude and timing of river flows and releases for current and future water infrastructure projects in the Burdekin Basin and potential influence on aquatic and marine biota and water quality, within and at end of the catchment.

10.23 Identify water quality and environmental flow objectives within and at the outflow point of the Burdekin Basin.

Avoidance, mitigation and management measures

10.24 Describe in detail measures proposed to avoid, mitigate and manage relevant impacts during all stages of the action on MNES. The proposed 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, other projects, etc.). Each MNES report is to include:

(a) proposed measures to be undertaken to avoid and mitigate the relevant impacts of the action on MNES, including those required by other Commonwealth, State and local government approvals

(b) an assessment of the predicted effectiveness of the proposed measures

(c) any statutory or policy basis for the proposed measures, including reference to the SPRAT database and relevant approved conservation advices, and a discussion on whether the proposed measures are not inconsistent with relevant and current recovery plans, conservation advices and threat abatement plans

(d) details of ongoing management, including monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed measures

(e) details on measures, if any, proposed to be undertaken by State and local government, including the name of the agency responsible for approving each measure

(f) information on the timing, frequency and duration of the measures to be implemented

(g) the outcomes to be achieved for each relevant MNES through the implementation of individual or combined mitigation measures, including details of how these outcomes can be measured

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

(i) assessment on the functionality of retained/avoided vegetation to MNES within the project site.

10.25 Provide detailed measures that will be implemented to avoid, mitigate and manage impacts on MNES. Proposed management plans and/or broad objectives to describe avoidance, mitigation and management must be expressed in committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) is to be used. Avoidance and mitigation measures must be clearly demonstrated.

10.26 The SPRAT database, and associated statutory documents, may provide some examples of relevant mitigation measures for listed threatened species and ecological communities. All proposed measures for MNES are to consider the 'S.M.A.R.T' principle:

- S – Specific (what and how)
- M – Measurable (baseline information, number/value, auditable)
- A – Achievable (timeframe, money, personnel)
- R – Relevant (conservation advices, recovery plans, threat abatement plans)
- T – Time-bound (specific timeframe to complete).

Environmental offsets[44]

Note

According to the EPBC Act *Environmental Offsets Policy* (2012), environmental offsets are measures that compensate for the residual significant impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures have been implemented. It is important to consider environmental offsets early in the assessment process and correspondence with DCCEEW regarding offsetting is highly encouraged.

It is DCCEEW's standard practice that, if environmental offsets are required, an Offset Proposal and an Offset Area Management Plan (OAMP) are included in the assessment documentation for assessment and approval. Further, it is DCCEEW's expectation that the environmental offset is legally secured under relevant Queensland legislation prior to the commencement of the action. Where this is not achievable, DCCEEW will likely recommend to the Minister (or delegate) that the conditions of approval require the environmental offset/s including any OAMP be approved, and legally secured, prior to the commencement of the action, and for the duration of the impact.

Offsets must be consistent with the principles of the *EPBC Act Environmental Offsets Policy* (2012), including being specific to the species or ecological community being impacted, addressing the attribute of the protected matter that is impacted, and deliver an outcome for the protected matter that is demonstrably equal or better than if neither the impact nor the offset occurred.

10.27 Provide an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures have been applied. For all MNES deemed likely to have residual significant impacts, an environmental offset will be required, under the *EPBC Act Environmental Offsets Policy (2012)* (EPBC Offsets Policy). To streamline the assessment process and provide confidence in the proposed outcomes, after all reasonable measures to avoid and mitigate impacts are implemented should residual significant impacts remain, the proponent must prepare and submit an offset proposal and Offset Area Management Plan(s) (OAMP) compensating for these impacts.

Offset Proposal

10.28 The objective of an Offset Proposal is to demonstrate that the measures put in place to compensate for the residual significant impacts of an action on MNES meet the requirements of the EPBC Offsets Policy

10.29 The EIS must identify the residual significant impacts for each MNES, including:

(a) a summary of residual significant impacts as a result of the proposed action. The summary must be supported by spatial information (e.g. area) and maps showing the location of residual impacts

(b) where relevant, overlap(s) of MNES and MSES offset requirements should be detailed in a tabular format

[44] It is important to consider environmental offsets early in the assessment process. If environmental offsets are required, it is standard practice that an Offset Proposal and/or an Offset Area Management Plan (OAMP) are to be included in the assessment documentation for assessment and approval.

(c) where an SRI to an MSES is identified as also being an MNES, evidence is to be provided on why/how the MNES is the same or substantially the same prescribed matter and impact, in addition any potential duplication of offset requirements should be identified.

10.30 The EIS must quantify the residual significant impacts for each MNES and derive a Quantum of Impact value for input to the Commonwealth Offsets Assessment Guide (OAG). The methods to determine Quantum of Impact values should be:

(a) described in sufficient detail to allow a suitably qualified ecologist to undertake an independent audit of Quantum of Impact values. For Quantum of Impact values which apply Habitat Quality Scores (HQS), the HQS methodology must also be described.

(b) suitable for the relevant MNES and aligned to the appropriate protected matter attributes (e.g., area of habitat, number of features) depending on a protected matter's habitat or ecology that a proposed action may be likely to impact.

(c) consistent with the Commonwealth's guidance document (How to use the Offset Assessment Guide) and approved by the Commonwealth and OCG. The methods must be science-based, scale and attributes appropriate (e.g., distinguish between areas of breeding or foraging habitat) and directly apply field survey data/analysis, and noting that chosen methods must be applied consistently at both the impact and offset sites. In accordance with the Commonwealth's guidance document, HQS methodology must incorporate site context, site condition, and, for threatened species, species stocking rate.

10.31 The EIS must propose an Offset Proposal to compensate for residual significant impacts to MNES. The Offset Proposal must:

(a) describe the proposed offsetting mechanisms to compensate for impacts to each MNES and to deliver on the required conservation gains

(b) address all the EPBC Offset Policy principles and demonstrate how each principle will be met (including through quantitative means via the OAG and HQS results)

(c) if proposed, describe how staging of the impacts or environmental offset/s will be managed

(d) demonstrate how the offset site and proposed management actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans

(e) must demonstrate how the proposed offset is suitable and meets the principles of the EPBC Offsets Policy and must include sufficient information to assess it using the EPBC OAG.

10.32 For proposed indirect offset mechanisms (up to a maximum of 10% of the Quantum of Impact), the Offset Proposal must contain details of the objectives, proposed outcomes, financial contributions and management arrangements for each proposed activity.

10.33 For proposed direct offset mechanisms (such as land-based offset sites), the Offset Proposal must also contain details of the proposed offset site/s:

(a) location, size and condition, environmental values present and surrounding land uses. This must be supported by pictures, HQS data, spatial information and maps at representative locations and appropriate resolution/scales

(b) if relevant, stages of environmental offset areas

(c) details of the nature and scale of the conservation gains proposed to be achieved for each relevant MNES, including the associated conservation objectives, actions and outcomes.

Gains involving the creation, restoration, revegetation and/or protection of MNES habitat must also identify the specific MNES gains being targeted (e.g., population extent, breeding habitat)

(d) proximity to known areas, populations, and/or habitat of impacts to MNES being offset and evidence that the MNES, and/or their habitat, can and are likely to be present in the potential offset area/s

(e) details of how the environmental offset/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant triggered, listed threatened species and communities

(f) an assessment of how the offset sites and impact sites are like-for-like, i.e., the environmental values for the MNES at the offset site are of the same type or equivalent to that affected by the proposed action

(g) compensation of the required Quantum of Impact value for each MNES, as demonstrated by the OAG. OAG inputs must be described and justified to quantify the amount of increased levels of protection and/or the area and scale of the proposed quality gains. Raw quality gains must be calculated for each OAG scenario input (start quality, future quality without the offset and future quality with offset) using the same HQS method/s applied at the impact site (justifying all estimated future gains)

(h) proposed OAG calculations. These must be submitted to the OCG and Commonwealth (as early as possible for their review, revision and approval) and include a description and/or justification of additional OAG inputs, including:

(i) time over which loss is averted (maximum 20 years)

(ii) time until ecological benefit

(iii) risk of loss (%) without offset

(iv) risk of loss (%) with offset

(v) confidence in result (percentage).

Note: risk of loss should not include consideration of stochastic events (e.g., bushfires), activities that contribute to changes in habitat quality scores or impacts that would otherwise require an offset under any relevant legislation.

10.34 For each Offset site, provide an OAMP prepared by a suitably qualified person and in accordance with *Commonwealth Environmental Management Plan Guidelines (2014)*. The OAMP must contain at a minimum:

(a) a summary of residual significant impacts for each MNES and identify and quantify (ha) any overlap(s) with offset requirements for MSES in a tabular format. A map showing the location of residual significant impacts for each MNES is to be provided

(b) where an SRI to a MSES is identified as also being a MNES, evidence is to be provided on why/how the MNES is the same or substantially the same prescribed matter and impact, in addition any potential duplication of offset requirements should be identified

(c) the methodology, with justification and supporting evidence, used to inform the inputs of the OAG in relation to the project impact site for each relevant MNES, including:

(i) quantum of impact – area (in ha)

(ii) quantum of impact – quality (A methodology that is suitable for the relevant listed threatened species in question must be used to assess site quality, site condition and

species stocking rate. A methodology that is suitable for the relevant ecological community must be used to assess site quality and site condition. [i.e. approved by DCCEEW, OCG and/or supported by literature]. Noting the same scoring mechanism must be used at both the impact site and the offset site. In instances where an alternative method is proposed e.g. for aquatic species, this method must be clearly explained to enable an accurate assessment of its adequacy)

(d) description of the proposed offset area, including its proximity to the populations or habitats of MNES impacted by the proposed action and, any other known populations or habitat of MNES that are triggered by the proposed action

(e) details of the environmental offset(s) (in ha) for residual significant impacts of the action on relevant MNES, and/or their habitat. This should be broken down into attributes (e.g. breeding and foraging habitat where relevant) and detail how the environmental offset(s) meets the principles of the EPBC Offsets Policy, including the OAG, in particular how the proposed environmental offset/s will achieve an overall conservation outcome for the EPBC protected matter

(f) specific details of the nature of the conservation gain to be achieved for relevant MNES, including descriptions for the creation, restoration and revegetation of habitat in the proposed offset area/s

(g) detail how conservation gains and restoration management measures across the proposed offset area benefit the ecology and presence of each triggered MNES

(h) details of the management strategies that will be implemented to ensure the conservation gains are achieved

(i) details of a strategy for the staging of environmental offset/s for each project stage (if proposed)

(j) details of appropriate offset area/s (including a map/s) to compensate for the residual significant impact on relevant MNES, and/or their habitat

(k) the methodology, with justification and supporting evidence, used to inform the inputs to the OAG in relation to each potential offset area/s for each relevant MNES, including:

  (i) time over which loss is averted (maximum 20 years)

  (ii) time until ecological benefit

  (iii) risk of loss (%) without offset

  (iv) risk of loss (%) with offset

  (v) confidence in result (percentage)

(l) evidence that the relevant MNES, and/or their habitat, can and are likely to be present in the potential offset area/s

(m) information about how the proposed offset area/s provides connectivity with other relevant habitats and biodiversity corridors

(n) details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s

against development incompatible with conservation, including content of a proposed legal mechanisms.[45]

10.35 Where offset area/s have been nominated, include an OAMP as an appendix to the EIS which includes information to demonstrate how the environmental offset/s compensate for residual significant impacts of the action on relevant MNES, and/or their habitat, in accordance with the principles of the EPBC Offsets Policy and all requirements of the OAG. The OAMP is to include:

(a) specific, committal and measurable environmental outcomes which detail the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s

(b) a description of the environmental offset/s, including location, size, condition, environmental values present and surrounding land uses

(c) detailed baseline data, including from field validation surveys, and quantifiable ecological data on habitat quality and other supporting evidence that documents the presence of the relevant MNES, and the quality of their habitat within the environmental offset areas

(d) detailed baseline data of vegetation community characteristics, including structure and floristics utilising biodiversity condition assessment methodology. Species lists and summary tables for each measured unit must be included in an appendix

(e) detailed baseline fauna habitat information, including specific information relevant to the conservation and enhancement of habitat quality of any triggered MNES. These fauna habitat features include but are not limited to, the locations of large trees (specific to any MNES that is triggered), tree hollows, locations of relevant winter flowering vegetation patches

(f) impacts of threats present supported by baseline surveys showing the extent of threats. Reference must be made to the relevant statutory documents when detailing the impacts of threat to MNES an assessment of the site habitat quality for the offset area/s using an appropriate methodology, with justification and supporting evidence (A methodology that is suitable for the relevant listed threatened species in question must be used to assess site quality, site condition and species stocking rate. A methodology that is suitable for the relevant ecological community must be used to assess site quality and site condition. (i.e. approved by DCCEEW, OCG and/or supported by literature), noting the same scoring mechanism must be used at both the impact site and the offset site)

(g) details of how the environmental offset/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant triggered, listed threatened species and communities

(h) maps and shapefiles to clearly define the location and boundaries of the environmental offset/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the listed threatened species and communities that the environmental offset/s compensates for, and the size of the environmental offset/s in ha)

(i) description of the presence, abundance and distribution of the triggered MNES in the areas surrounding the proposed offset area

[45] It is expected that the environmental offset is legally secured under relevant Queensland legislation prior to the commencement of the action. Where this is not achievable, DCCEEW will likely recommend to the Minister (or delegate) that the conditions of approval require the environmental offset/s or the OAMP be approved, and legally secured, prior to the commencement of the action.

(j) specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the environmental offset/s over a specified timeframe

(k) details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria. These are to be summarised in a table with committed reporting periods listed. This information must include triggers and adaptive management actions

(l) conservation management strategies to revegetate, rehabilitate, conserve, protect or enhance habitat within the offset area must include information on prohibited actions (such as grazing), fencing plan, access and signage, fire management, weed control, pest animal control, cultural heritage management, waste management and management zones. Provide this information on a map/s at a suitable scale to allow the assessment of the OAMP. The OAMP should clearly demonstrate how improved health and viability of the protected matter/s is achieved by the conservation management strategies implemented across the site and for the specified duration

(m) interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria. The first five years would include milestones and reporting at years 1, 3 and 5

(n) details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the environmental offset/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions)

(o) monitoring methods are to be specified and targeted towards the objectives of the OAMP

(p) proposed timing for the submission of internal monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved. Interim monitoring reports must also describe the works and management measures completed within the offset area during the reporting period. Provide a summary table showing the management efforts completed each year

(q) trigger values and timing for the implementation of corrective actions if monitoring activities indicate the interim milestones will not or have not been achieved

(r) risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with an appropriate risk assessment matrix

(s) if proposed for listed threatened species and communities, evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans

(t) details of the legal mechanism for legally securing the proposed offset area/s, such that legal security remains in force over the offset area/s for the duration of the impact and to provide enduring protection for the offset area/s against development and land uses incompatible with conservation.

10.36 The OAMP is to provide evidence, derived from field validation surveys and vegetation assessments, to demonstrate that an EPBC Act protected matter (e.g. listed threatened species,

ecological community) is occupying or is able to occupy the proposed environmental offset/s. Field validation surveys are to be undertaken in accordance with Commonwealth guidelines, State guidelines and/or best practice survey methodologies.

10.37 Supporting evidence is to be included in the OAMP to justify how proposed management action/s are additional to the existing requirements of the landholder in managing their land (e.g. weed and pest management requirements under the Queensland *Biosecurity Act 2014*, existing grazing regimes, etc.) as required by the principles of the EPBC Offsets Policy.

10.38 The OAMP is to include robust scientific evidence (e.g. published research, pilot studies, previously successful projects/programs, etc.) to demonstrate the success of proposed measures to create, revegetate, regenerate and/or improve habitat (e.g. tree planting, nest boxes, artificial hollows, etc.) in the proposed environmental offset/s for a listed threatened species or ecological community.

10.39 Where the proposed environmental offset/s supports an offset for multiple MNES, proposed management action/s for one EPBC Act protected matter must not be detrimental (i.e. have an impact) to other EPBC Act protected matters.

10.40 Where an environmental offset/s is proposed, with a completed OAG calculation, all inputs must be supported by robust scientific evidence and/or supporting evidence (e.g. historical grazing regimes, satellite imagery, statements from landholders, etc.).

Listed threatened species and communities (sections 18 and 18A)

10.41 Each MNES report is to address impacts on listed threatened species and communities which may include, but is not limited to, those identified at 0 based on the likelihood of significant impacts.[46]

Information requirements

10.42 The assessment of listed threatened species and communities in each MNES report is to have the following structure and detail:

(a) description

(b) desktop analysis

(c) survey effort

(d) survey outcomes

(e) habitat assessment

(f) impact assessment

(g) avoidance, mitigation and management

(h) rehabilitation requirements

(i) statutory requirements

(j) significant impact assessment.

[46] This may not be a complete list of listed threatened species and ecological communities that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the project, are assessed for the Minister's consideration. If the listing or up-listing of a species occurs after the controlled action decision (7 December and 11 December 2023) the species will continue to be assessed under the level of threatened status it was before this event. However, any new recovery plans and other updated documentation must be still considered in the assessment.

Description

10.43 Describe each listed threatened species and ecological communities (including EPBC Act listing status, distribution, habitat, life history, threatening processes etc.). These descriptions are to align with the information in the SPRAT database and relevant Commonwealth documents.[47] Note: As noted in Appendix 2, it is the responsibility of the person proposing to take the action to keep up to date with all new statutory documents released since the time of the controlled action decisions on 7 December 2023 and 11 December 2023 for threatened species and ecological communities, as a part of the assessment.

Desktop analysis

10.44 Describe the desktop assessment methodology used to inform the field surveys within, adjacent to, downstream and upstream of the project site. Each MNES report is to identify and describe known historical records of listed threatened species and ecological communities in the broader region (this may also include downstream of the project site). All known records are to be supported by an appropriate source (including Commonwealth and State databases, published research, publicly available survey reports, etc), the year of the record and a brief description of the habitat in which the record was identified.

10.45 The proponent must ensure that a recent Protected Matters Search Tool (PMST) report has been generated and considered before finalising the draft EIS.[48] This PMST report should be provided as an attachment to the EIS.

Survey effort

10.46 Provide details of the scope, methodology, timing and effort of field surveys (to be undertaken by qualified species experts with demonstrated experience in detecting the relevant listed threatened species and ecological communities) within, adjacent to, downstream and upstream of the project site. Provide details of:

(a) how surveys were undertaken in accordance with relevant Commonwealth and state guidelines or best practice survey guidelines at the time of the surveys

(b) if relevant, the justification for divergence from relevant Commonwealth and State guidelines or best practice survey guidelines at the time of the surveys

(c) how surveys were undertaken with reference to relevant DCCEEW documents (e.g. approved conservation advices, recovery plans, draft referral guidelines and Listing Advices, and the SPRAT Database), including published research and other relevant sources

(d) In the absence of published best practice species specific guidelines, the justification for survey effort supported by species experts and available scientific literature.

10.47 Surveys are to be of a suitable standard, including the scope, timing and spatial and temporal replication, to maximise the probability of detection of cryptic or difficult to detect terrestrial and aquatic species. In the instance where suitable methods exist, species experts should be sought to input on the most suitable method of detection of the species. Additionally, consideration of

[47] The habitat assessment should be undertaken in line with the habitat descriptions outlined in the SPRAT Database and relevant DCCEEW documents (e.g., recovery plans and conservation advice). However, the proponent may deviate from the information available in the SPRAT Database when undertaking the habitat assessments if appropriate. Any variation in habitat assessment approach must be discussed with DCCEEW prior to the submission of the draft EIS and must be supported by scientific evidence including published research, independent expert advice and information derived from field surveys.

[48] Protected Matters Search Tool report – **https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool.**

similar species survey requirements to form the basis of suitable detection methods is recommended. Surveys are to also target areas upstream, downstream and adjacent to the project site, particularly for species which regularly disperse through the landscape or aquatic environments (particularly seasonally) and/or have large home ranges. Maps demonstrating survey effort and distribution are to be included.

Survey outcomes

10.48 State the total number of records (individuals and evidence of presence) of listed threatened species and ecological communities within, adjacent to, upstream and/or downstream of the project site. 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 Protected Matters Search Tool (PMST).

10.49 The species occurrence records must be provided in accordance with DCCEEW's Guide to providing maps and boundary data for EPBC Act projects (2021). Sensitive ecological data must be identified and treated in accordance with *DCCEEW's Sensitive Ecological Data – Access and Management Policy V1.0 (2016)* or subsequent revision.

Habitat assessment

10.50 Provide a robust assessment of the potential habitat available within, adjacent to, upstream and/or downstream of the project site for listed threatened species and ecological communities. This is to include the assessment of specific habitat requirement/s relevant to each listed threatened species and ecological community (e.g. breeding, foraging, dispersal, important habitat, roosting, etc.).

10.51 Habitat assessments are to be derived from information obtained from:

(a) field surveys and vegetation assessments (e.g. hollow-bearing tree surveys and species-specific surveys)

(b) the SPRAT Database

(c) relevant DCCEEW documents (e.g. approved conservation advices, recovery plans, listing advices, referral guidelines, etc.)

(d) published research and other relevant sources including species experts where required.

10.52 Detailed mapping of habitat type/s for relevant listed threatened species and ecological communities that are found to be, or may potentially be, present within, adjacent to, upstream and/or downstream of the project site are to be included in each MNES report, and must:

(a) be specific to the habitat assessment undertaken for each listed threatened species and ecological community

(b) include an overlay of the disturbance footprint, with the area (in ha) of disturbance overlaying threatened species and ecological communities habitat specified

(c) include known records of individuals (or evidence of individuals) derived from desktop analysis and/or field surveys.

10.53 Each MNES report is not to solely rely on Queensland RE mapping to determine habitat for listed threatened species - habitat assessments must consider and align with the information in the SPRAT Database, relevant DCCEEW documents and species expert advice. Some Queensland REs align with the descriptions for some ecological communities and therefore the use of Queensland REs is acceptable in these cases, however, should not be solely relied upon.

10.54 Provide a detailed habitat assessment for the listed threatened species and communities listed in Appendix 2 that may be significantly impacted and any other listed threatened species and/or ecological communities identified during desktop analysis and/or field surveys.

10.55 The habitat assessment must include the total amount of habitat (in ha) within, adjacent to, upstream and downstream of the project site for each listed threatened species and ecological community.

10.56 Habitat for each species must be further refined to provide any landscape attributes and/or specific habitat features that are present, the density of these attributes/features and the importance and function they represent to the relevant species. These must be shown on a map where applicable. For example, the greater glider (southern and central) (*Petauroides volans*) has different habitat requirements for denning and foraging, notably, the presence of suitable sized and density of hollows. The assessment of these habitat types for this species should be undertaken separately, as to accurately capture the true habitat value present on site for the species.

10.57 It is considered reasonable that a species may use a project site at some point in time if the vegetation and/or habitat feature/s to support its requirements are present. As such, even if a listed threatened species and/or community is not recorded during field surveys, the potential for occurrence of listed threatened species and communities is to also be considered and assessed in the MNES section.

Impact assessment

10.58 Describe and assess all relevant impacts (direct, indirect, facilitated and cumulative) to listed threatened species and ecological communities identified at Appendix 2, and any other listed threatened species and communities that are found to be or may potentially be present in areas that may be impacted by the action. This includes (but is not limited to) listed threatened species and communities in downstream catchment areas and wetlands, including estuarine, coastal and marine environments, and in areas adjacent to disturbance areas that may be subject to edge disturbances from impacts including but not limited to dust, noise and artificial light.

10.59 Identify and describe which component/s and stage/s of the action and/or consequential actions are of relevance to each listed threatened species and/or ecological community.

10.60 For threatened ecological communities, the total direct and indirect impact (in ha) to each identified patch within and adjacent to the project site is to be provided in each MNES report compared to its current extent. Assessment of the impact to threatened ecological communities must include any relevant buffers directly surrounding the patch. Justification must be provided as to the size of any buffer applied, or in cases where a buffer is not applied. Further, the impact assessment for ecological communities is to include a discussion on the post-impact viability of each individual patch within and adjacent to the project site to be directly impacted from fragmentation as a result of vegetation clearance and/or degradation.

10.61 Provide the total amount of each type of habitat (in ha) in the disturbance footprint for each listed threatened species and ecological community, with reference to habitat quality and usage, and paying attention to published definitions and standards. This assessment should be supported by maps which clearly identify the interference between impacted and retained habitat, with tables of coordinates appended.

10.62 Assess how the action impacts the outcomes, objectives and targets of recovery actions of relevant commonwealth recovery plans and threat abatement plans.

Avoidance, mitigation and management[49]

10.63 Describe all relevant species-specific measures proposed to avoid, mitigate and manage potential impacts on listed threatened species and ecological communities, including details on how these proposed measures line up with key life-cycle events of relevant threatened species (e.g. key breeding periods).

10.64 Each MNES report is not to just state proposed management plans and/or broad objectives to describe avoidance, mitigation and management measures. The MNES section is to include detailed measures that will be implemented to avoid, mitigate and manage impacts on listed threatened species and ecological communities (e.g., re-location/translocation plans). Committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) must be used. Where relevant, management measures should reference the guidance/best practice from which they are sourced. For example, for proposed Koala-safe movement solutions should reference the Queensland Government *Koala-Sensitive Design Guideline* 2022, or subsequent edition.

10.65 There should be a clear explanation of how and to what extent impacts on each listed threatened species and community have been (in order of preference) avoided and mitigated, before proposing environmental offsets.

Statutory requirements

10.66 Where relevant, discuss how the proponent has had regard to the most recent approved conservation advice/s.

10.67 Each MNES report is to demonstrate, with supporting evidence, that the action will not be inconsistent with:

(a) Australia's obligations under:

(i) the Biodiversity Convention

(ii) the Convention on Conservation of Nature in the South Pacific (Apia Convention)

(iii) the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)

(b) a recovery plan or threat abatement plan.

Significant impact assessment

10.68 After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on relevant listed threatened species and ecological communities. The significant impact assessment is to refer to the DCCEEW's *Significant impact guidelines 1.1* (2013).

10.69 Each MNES report must provide a clear and definitive conclusion (i.e. 'likely' or 'unlikely'), for each proposed action, including the extent and nature of residual significant impacts on relevant listed threatened species and ecological communities to align with the EPBC Offsets Policy.

[49] Appropriate measures may be detailed on the SPRAT Database for relevant listed threatened species and ecological communities. All proposed measures must consider the 'S.M.A.R.T' principle (see below) and as outlined at the 'Avoidance, Mitigation and Management Measures' section above

Other approvals and conditions

10.70 Provide information on any other approvals or requirements for approvals and any conditions that apply, or that the proponent reasonably believes are likely to apply, to the action. This is to 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 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 EPBC Act), including any conditions that apply to the action:

(i) a statement identifying any additional approval that is required

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

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

10.71 The information provided 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:

(a) the person proposing to take the action

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

10.72 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.

Economic and social matters

10.73 The economic and social impacts of the action, both positive and negative, must be analysed in each MNES report. Matters of interest may include:

(a) details of any public consultation activities undertaken, including any consultation with Indigenous stakeholders, and their outcomes[50]

(b) projected economic costs (e.g. capital investment) and benefits of the action, including the basis for their estimation through cost/benefit analysis or similar studies

(c) employment opportunities expected to be generated by the action (including construction and operational phases), including number of jobs for Indigenous employees.

10.74 Economic and social impacts are to be considered at the local, regional and national levels. Details of the relevant cost and benefits of alternative options to the action, as identified above, are to also be included.

[50] Refer to Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance) which outlines the statutory obligations that apply to, and the department DCCEEW's expectations of, proponents engaging with First Nations people and communities under the EPBC Act 1999. The guidance applies to proponents undertaking referral, assessment, and approval processes under Chapter 4 of the EPBC Act. Available via: **https://www.dcceew.gov.au/environment/epbc/publications/engage-early**

Principles of Ecologically Sustainable Development (ESD)

10.75 Provide a discussion of how the action will conform to the principles of ESD, as described under Part 1, Section 3A of the EPBC Act:[51]

(a) decision making processes should effectively integrate both long term and short term economic, environmental, social and equitable considerations

(b) if there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation

(c) the principle of inter-generational equity—that the present generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations

(d) the conservation of biological diversity and ecological integrity should be a fundamental consideration in decision making

(e) improved valuation, pricing and incentive mechanisms should be promoted.

Information sources provided in each MNES report

10.76 For information given in each MNES report, the report is to state:

(a) the source of the information

(b) how recent the information is

(c) how the reliability of the information was tested

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

[51] Ecologically Sustainable Development Steering Committee, *National Strategy for Ecologically Sustainable Development,* Australian Government, Canberra, 1992.

Acronyms and abbreviations

The following acronyms and abbreviations have been used in this document.

Table 1 Acronyms and abbreviations

Acronyms/abbreviation	Definition
ACH Act	*Aboriginal Cultural Heritage Act 2003*
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ANZLIC	Australian and New Zealand Land Information Council
CBA	Cost-Benefit Analysis
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO_2	Cardon dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAF	Department of Agriculture and Fisheries (Qld)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Cth)
DESI	Department of Environment, Science and Innovation (Qld)
DRDMW	Department of Regional Development, Manufacturing and Water (Qld)
DSDI	Department of State Development and Infrastructure (Qld)
DTMR	Department of Transport and Main Roads (Qld)
EIS	Environmental Impact Statement
EMP	Environmental Management Plans
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
EPM	Exploration Permit Minerals other than coal
EPP	Environmental Protection Policies
ERA	Environmentally Relevant Activities

Acronyms/abbreviation	Definition
ESD	Ecologically Sustainable Development
FSL	Full Supply Level
GHG	Greenhouse Gases
GTIA	Guide to Traffic Impact Assessment
HQS	Habitat Quality Scores
LGA	Local Government Area
ML	Mining lease
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
MRA	*Mineral Resources Act 1989*
MW	Megawatts
NC Act	*Nature Conservation Act 1992*
NGER	*National Greenhouse and Energy Reporting Act 2007* (Cth)
NPI	National Pollutant Inventory
OAG	Offsets Assessment Guide (Cth)
OAMP	Offset Area Management Plan
OCG	Office of the Coordinator-General
PHES	Pumped Hydroelectric Energy Storage
PMST	Protected Matters Search Tool
RA	Restricted Area
RE	Regional Ecosystem
RIA	Regional Impact Assessment
RIDA	Regional Interests Development Approval
ROL	Resource operations licence

Acronyms/abbreviation	Definition
RPI	*Regional Planning Interests Act 2014*
SDAP	State Development Assessment Provisions
SDPWO Act	*State Development and Public Works Organisation Act 1971*
SIA	Social Impact Assessment
SIMP	Social Impact Management Plan
SPP	State Planning Policy
SPRAT	Species Profile and Threats
TCFD	Task Force on Climate-related Financial Disclosures
TOR	Terms of Reference

Appendix 1. Policies and guidelines

In addition to the policies and guidelines identified in the document *Preparing an EIS: Guideline for proponents*, the EIS is to consider the project specific planning schemes, policies and guidelines identified in this appendix.

EIS Technical Guidelines

Please note all Department of Environment, Science and Innovation Technical EIS information guidelines have been updated in 2024. Please refer to latest versions where relevant, available at: **Resources | Environment, land and water | Queensland Government (www.qld.gov.au).**

General

- Isaac Regional Council, Isaac Regional Council Planning Scheme 2021, viewed March 2024.
- Mackay Regional Council, Mackay Regional Council Planning Scheme 2017 v4.0, viewed March 2024.

Flora and Fauna

- Queensland Government, *Guide to State Development Assessment Provisions – State code 16: Native vegetation clearing (Coordinated project - all other purposes)*, Version 3.00, March 2023, Department of Resources
- Queensland Government, *Guide to State Development Assessment Provisions – State Code 16: Native vegetation clearing*, Version 3.00, 2023 Department of Resources
- Queensland Government, *Significant Residual Impact Guideline: For matters of state environmental significance and prescribed activities assessable under the Sustainable Planning Act 2009*, December 2014, Department of State Development, Infrastructure and Planning.
- Queensland Government, *Queensland Environmental Offsets Policy: Significant Residual Impact Guideline*, December 2014, Department of Environment and Heritage Protection
- Queensland Government, *State code 16: Native vegetation clearing*, State Development Assessment Provisions, Version 3.00, February 2022, Department of State Development, Infrastructure, Local Government and Planning.

Water

- CSIRO, *Sediment Quality Assessment A Practical Guide Second Edition*, 2016, viewed 5 September 2024.
- CSIRO, *Revision of the ANZECC/ARMCANZ Sediment Quality Guidelines*, 2013, viewed 5 September 2024.
- Queensland Government, *Reef 2050 Water Quality Improvement Plan 2017-2022*, 2018, viewed 5 September 2024.

Regulated structures

- Department of Environment, Science and Innovation, *Structures which are dams or levees constructed as part of environmentally relevant activities*, 2024, viewed 5 September 2024.

Ecological surveys

- Department of Environment, Science and Innovation, *Terrestrial Vertebrate Fauna Survey Guidelines for Queensland*, 2022, viewed 5 September 2024.
- Department of Environment, Science and Innovation, *Methodology for surveying and mapping regional ecosystems and vegetation communities in Queensland*, Version 7.0, 2024, viewed 5 September 2024.
- Department of Environment, Science and Innovation, *Flora Survey Guidelines – Protected Plants*, 2020, viewed 5 September 2024.

Matters of national environmental significance

- Australian Government, *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance*, Department of the Environment and Energy, 2013, viewed 22 March 2024.
- Australian Government, *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance)*, 2023, Department of Climate Change, Energy, the Environment and Water, viewed 22 March 2024.
- Australian Government, *EPBC Act 1999 Environmental Offsets Policy*, Department of the Environment and Energy, 2012, viewed 22 March 2024.
- Australian Government, Species Profile and Threats Database, Department of Climate Change, Energy, the Environment and Water, Canberra, viewed 22 March 2024.
- Australian Government, *Environmental Management Plan Guidelines*, Department of Climate Change, Energy, the Environment and Water, 2024, view 12 January 2024.
- Queensland Government, *Matters of national environmental significance–EIS information guideline*, 2024, Department of Environment and Science, Brisbane viewed 22 March 2024.

Appendix 2. MNES listed threatened species and communities

The following list includes the listed threatened species and ecological communities relevant to the controlled action under the EPBC Act, against which, the project's potential impacts are to be assessed in each MNES report of the EIS.

The list below may not be a complete list of listed threatened species and ecological communities that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the action, are assessed for the Minister's consideration. If the listing or up-listing of a species occurs after the controlled action decision (7 December 2023 for the CEH Transmission Project (EPBC 2023/09627) and 11 December 2023 for the CEH PHES Project (EPBC 2023/09626) the species will continue to be assessed under the level of threatened status it was before this event. However, any new recovery plans and other updated documentation must be still considered in the assessment.

Listed threatened species and communities (section 18 & section 18A)

Threatened ecological communities

Table 2 Relevant threatened ecological communities for each controlled action

Species name	Status under the EPBC Act	Transmission Line (EPBC2023/09627)	PHES (EPBC2023/09626)
Semi-evergreen vine thickets of the Brigalow Belt (North and South) and Nandewar Bioregions	Endangered	✓	✓
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	✓	✓
Natural Grasslands of the Queensland Central Highlands and northern Fitzroy Basin	Endangered	✓	✓
Brigalow (*Acacia harpophylla* dominant and co-dominant)	Endangered	✓	✓

Listed threatened species

Table 3 Relevant threatened species

Species Name	Status under the EPBC Act	Transmission Line (EPBC2023/09627)	PHES (EPBC2023/09626)
Birds			
sharp-tailed sandpiper (*Calidris acuminata)*	Vulnerable	✓	✓

Species Name	Status under the EPBC Act	Transmission Line (EPBC2023/09627)	PHES (EPBC2023/09626)
curlew sandpiper (*Calidris ferruginea)*	Critically Endangered	✓	✓
red goshawk *(Erythrotriorchis radiatus)*	Endangered	✓	✓
grey falcon (*Falco hypoleucos*)	Vulnerable	✓	✓
Latham's snipe, Japanese snipe (*Gallinago hardwickii)*	Vulnerable	✓	✓
squatter pigeon (southern) (*Geophaps scripta scripta)*	Vulnerable	✓	✓
white-throated needletail (*Hirundapus caudacutus)*	Vulnerable	✓	✓
star finch (eastern), star finch (southern) *(Neochmia ruficauda ruficauda)*	Endangered	✓	✓
southern black-throated finch (*Poephila cincta cincta)*	Endangered	✓	✓
Australian painted snipe *(Rostratula australis)*	Endangered	✓	✓
masked owl (northern) *(Tyto novaehollandiae kimberli)*	Vulnerable	✓	✓
Frog			
Eungella day frog *(Taudactylus eungellensis)*	Endangered	✓	✓
Mammal			
northern quoll, Digul (Gogo-Yimidir), Wijingadda (Dambimangari), Wiminji (Martu) (*Dasyurus hallucatus)*	Endangered	✓	✓
ghost bat (*Macroderma gigas)*	Vulnerable	✓	✓
yellow bellied glider (south-eastern) (*Petaurus australis australis)*	Vulnerable	✓	✓
greater glider (southern and central (*Petauroides Volans)*	Endangered	✓	✓

Species Name	Status under the EPBC Act	Transmission Line (EPBC2023/09627)	PHES (EPBC2023/09626)
koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (*Phascolarctos cinereus*)	Endangered	✓	✓
grey-headed flying-fox *(Pteropus poliocephalus)*	Vulnerable	✓	✓
Reptile			
ornamental snake (*Denisonia maculate)*	Vulnerable	✓	✓
yakka skink (*Egernia rugosa)*	Vulnerable	✓	✓
Plant			
hairy-joint grass *(Arthraxon hispidus)*	Vulnerable	✓	✓
bluegrass (*Dichanthium setosum)*	Vulnerable	✓	✓
king blue-grass *(Dichanthium queenslandicum)*	Endangered	✓	✓
black ironbox (*Eucalyptus raveretiana)*	Vulnerable	✓	✓
Omphalea celata	Vulnerable	✓	✓
Ozothamnus eriocephalus	Vulnerable	✓	✓
square tassel fern (*Phlegmariurus tetrastichoides)*	Vulnerable	✓	✓
Polianthion minutiflorum	Vulnerable	✓	✓
quassia *(Samadera bidwillii)*	Vulnerable	✓	✓
granite nightshade (*Solanum graniticum)*	Endangered	✓	✓

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