

# Terms of reference for an environmental impact statement

## Big-T Pumped Hydropower Energy Storage project

April 2023

The Department of State Development, Infrastructure, Local Government and Planning 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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## Part A About these terms of reference

### 1. Introduction

- 1.1 This document outlines the terms of reference (TOR) for the Big-T Pumped Hydropower Energy Storage (PHES) project (the project), proposed by BE Power Projects Pty Ltd as Trustee for Big-T Unit Trust (the proponent) and being assessed under the *State Development and Public Works Organisation Act 1971* (SDPWO Act).
- 1.2 The proposed project is a pumped hydropower energy storage project located approximately 45 kilometres (km) north-east of Toowoomba in the Southern Queensland renewable energy zone. The proposed project has the capacity to generate up to 400 megawatts (MW) of continuous electricity for 10 hours per day, and a battery energy storage system with a capacity of 200 MW.
- 1.3 The proposed project comprises of the following:
  - (a) new upper reservoir located on Mt Sevastopol
  - (b) underground water conveyances and intake/outlet infrastructure connecting the water conveyances between the upper reservoir and existing Lake Cressbrook (lower reservoir)
  - (c) underground power station cavern, housing two 200 MW reversible turbines and access tunnel
  - (d) 15 km underground double-circuit 275 kilovolt transmission line and a new switching station
  - (e) evacuation and ventilation tunnel
  - (f) upgrade of Sebastapool and Three Mile Roads and new 3 km access road to the tunnel portals and lower intake
  - (g) a battery energy storage system.

### 2. Statutory basis

- 2.1 The Coordinator-General has declared the project to be a 'coordinated project for which an environmental impact statement (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.
- 2.2 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.

### 3. Accredited EIS process for projects under Commonwealth legislation

- 3.1 On 22 March 2022, the delegate for the former Australian Minister for the Environment determined the project to be a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC reference 2021/9140). Therefore, the project requires further assessment and approval under the EPBC Act.
- 3.2 The relevant controlling provision for the proposed project is listed threatened species and communities (sections 18 and 18A of the EPBC Act). Refer to Appendix 2 for further information on relevant listed threatened species and ecological communities.

- 3.3 The delegate for the Australian Minister for the Environment and Water also confirmed that the proposed project would be assessed by EIS under a bilateral agreement between the Australian Government and the State of Queensland (section 45 of the EPBC Act).
- 3.4 The EIS process has been accredited under the bilateral agreement, hence the EIS is to state the controlling provisions for the project and describe the particular aspects of the environment that led to the controlled action decision.
- 3.5 In accordance with the bilateral agreement, the EIS must include an assessment of impacts to matters of national environmental significance (MNES). The MNES assessment must be a stand-alone report provided as an appendix to the EIS that fully addresses matters relevant to the controlling provision under the EPBC Act. The report must include clear cross-references to the EIS where relevant.
- 3.6 Section 14 of this TOR, developed in consultation with the Department of Climate Change, Energy, the Environment and Water (DCCEEW), sets out the information which must be included in the EIS relating to MNES.

## 4. EIS guidelines

- 4.1 This TOR is to be read in conjunction with the Coordinator-General's *Preparing an environmental impact statement: Guideline for proponents* (see Appendix 1), which provides guidance on the following:
  - (a) participants in the EIS process
  - (b) consultation requirements
  - (c) EIS format and copy requirements.
- 4.2 In addition, subject-specific policies and guidelines are referenced throughout this TOR and are listed in Appendix 1.

## 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](http://www.statedevelopment.qld.gov.au/cg)

# Part B General approach and requirements for an EIS

## 6. General approach

- 6.1 The objectives of the EIS are to:
  - (a) provide a detailed description of the proposed project
  - (b) ensure that all relevant environmental, social and economic impacts of the project are identified and assessed
  - (c) detail the management and mitigation measures proposed to avoid, minimise and/or mitigate any adverse impacts including proposed ongoing monitoring
  - (d) demonstrate that the project is based on sound environmental principles and practices.
- 6.2 For the purposes of the EIS process, 'environment' is defined in Schedule 2 of the SDPWO Act and includes:
  - (a) ecosystems and their constituent parts, including people and communities

- (b) all natural and physical resources
  - (c) the qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community
  - (d) the social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).
- 6.3 The EIS should address matters relevant to the environmental objective assessment and performance outcomes specified in schedule 8 of the Environmental Protection Regulation 2019.
- 6.4 The detail at which the EIS deals with matters relevant to the project is to be proportional to the scale of the potential impacts on environmental values. When determining the scale of an impact, consideration is to be given to its intensity, duration, cumulative effect, irreversibility, the risk of environmental harm, the effectiveness of any proposed management strategies to avoid or at least mitigate impacts and the ability to offset any residual impacts.
- 6.5 The EIS must address other matters not covered in the TOR in the following circumstances:
- (a) studies reveal a matter that had not been foreseen when the TOR was finalised
  - (b) an issue not previously identified but is in the public interest
  - (c) the Coordinator-General directs the proponent in writing to address a matter as an information request under section 34B of the SDPWO Act
  - (d) new or amended legislation or policies come into effect after the TOR has been finalised, regardless of whether or not the legislation or policies have been listed in the TOR. Transitional arrangements or exemptions may apply for individual projects
  - (e) the proponent makes amendments to the proposed project that would result in a change in the nature, timing or location of any impacts<sup>1</sup>.

## 7. Requirements of an EIS

- 7.1 The EIS is to:
- (a) be prepared in accordance with, and meet the minimum requirements of Schedule 1 of the State Development and Public Works Organisation Regulation 2020
  - (b) be prepared in accordance with relevant policies, standards and guidelines, including but not limited to those listed in Appendix 1. Application of such guidelines, standards and policies will be confirmed throughout the development of the EIS in consultation between the Coordinator-General, the proponent and advisory agencies
  - (c) be prepared and completed by suitably qualified and experienced professional/s, relevant to the field of expertise required for each subject matter
  - (d) provide all available baseline information relevant to the environmental risks of the project including seasonal and long-term variations. Site-specific baseline data should be used. Include detail about the quality of the information provided, in particular: the source of the information; how recent the information is; how the reliability of the information was tested,

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<sup>1</sup> The proponent is to notify the Coordinator-General of any amendments to the proposed project as described in the project's initial advice statement.

and any assumptions, exclusions and limitations<sup>2</sup>. All data, modelling and input/output information used in the EIS to determine the existing environment and/or assess impacts must be provided in an appropriate electronic format (e.g. shapefiles)

- (e) assess and justify the extent to which there is a need and demand for the project
- (f) present the feasible project options that were considered in selecting the preferred option including the consequences of not proceeding with the project (the 'do nothing' option). Demonstrate why the preferred option/s has been selected by summarising the comparative environmental, social and economic impacts of each project option, with particular regard to the principles of ecologically sustainable development (ESD)
- (g) provide detailed strategies regarding all matters for the protection, or enhancement (as desirable) of all relevant environmental values in terms of outcomes and possible conditions that can be measured and audited. In general, the preferred hierarchy for managing likely impacts is: (a) to avoid; (b) to minimise or otherwise mitigate; (c) remedy and (d) if necessary, and possible, to offset
- (h) include a consolidated commitment register that lists all measures (including monitoring programs and management plans) demonstrated in the EIS assessment to avoid, minimise or otherwise mitigate, remedy or offset project impacts and that would need to be implemented during construction and operation, to meet the predicted project outcomes
- (i) include detailed environmental management plans (EMP) for both the construction and operation phases of the project. The EMP should be developed from, and be consistent with, the information in the EIS and set specific commitments to implement best practice environmental management in order to protect the identified environmental values. The EMP are to be presented as stand-alone documents without reference to other parts of the EIS.

## 7.2 The contents of the EMP are to comprise:

- (a) the proponent's commitments to acceptable levels of environmental performance resulting from the project, including environmental objectives, i.e. levels of expected environmental harm, performance standards and associated measurable indicators, including progressive and final rehabilitation, performance monitoring and reporting
- (b) effective impact prevention and control strategies to satisfy the commitments
- (c) effective corrective actions to rectify any deviation from environmental performance standards
- (d) a figure showing the full extent of proposed disturbance for the project.

## 7.3 Each matter assessed in the EIS (as described in section 13 and 14 of this TOR) is to:

- (a) include a concise description of the potential impacts of the project. Provide maps where applicable
- (b) describe the measures proposed to avoid, minimise or otherwise effectively mitigate, or remedy impacts to meet environmental standards and acceptable outcomes, and where necessary to offset those impacts

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<sup>2</sup> Any technical reports supporting the assessment and conclusions made in the EIS should be provided. These reports can be provided as appendices.



- (c) demonstrate how monitoring will confirm environmental outcomes, including using baseline data to track environmental outcomes.
- 7.4 Assess the extent to which the construction, operation and decommissioning (to the extent known) of the project meets all statutory and regulatory requirements of the State and Commonwealth and that the intended outcomes are consistent with current State and Commonwealth legislation, policies (including passed and uncommenced legislation) plans, schemes and guidelines. If there is a conflict, explain how the project can be approved.
- 7.5 For all the relevant matters, identify and describe the environmental values and matters that are to be protected. Environmental values and matters are specified in the EPBC Act, *Environmental Protection Act 1994* (EP Act), the Environmental Protection Regulation 2019 (EP Regulation), environmental protection policies (EPPs), *Vegetation Management Act 1999* (VM Act), *Nature Conservation Act 1992* (Qld) (NC Act), State Planning Policy 2017 (SPP), State Development Assessment Provisions (SDAP) and relevant guidelines.<sup>3</sup>
- 7.6 Include, as an appendix to the EIS, a table cross-referencing where each requirement of the TOR is addressed in the EIS, to the lowest available subsection.
- 7.7 Describe the stakeholder engagement activities that have occurred during the preparation of the EIS, including appropriate Aboriginal and Torres Strait Islander consultation, identify the issues raised during consultation, and explain how the responses from the community and agencies have and will be incorporated into the design and outcomes of the project. Describe how the community and agencies will be kept informed of the consultation outcomes.
- 7.8 The EIS is to be prepared and submitted electronically (USB or large file transfer) inclusive of all plans and documents that form the EIS. The electronic documents submitted are to satisfy the criteria detailed in Table 1.

**Table 1 Format requirements**

Format requirements	
Document size	<p>The EIS and accompanying appendices are to be produced on A4 size and are to be capable of being photocopied.</p> <p>Each PDF file should not be larger than 10 MB and must meet the accessibility requirements described in the <i>Adobe Acrobat X Pro Accessibility Guide: PDF Accessibility Overview</i>, available at: <a href="http://www.adobe.com/accessibility/products/acrobat/training.html">www.adobe.com/accessibility/products/acrobat/training.html</a></p>
Format and style	The format and style of the document is to be appropriate for publication on the Internet.
Plans, maps, diagrams and other illustrative material	All plans, maps, diagrams, and other illustrative material is to be provided at a suitable scale and must be included in a PDF format so that they are legible and easily understood.
	Plans, maps and diagrams are to be located within the appropriate EIS chapter/s, as close as possible to where referenced in the text.
	Plans, maps and diagrams are to be to scale on A4 or A3 size with the scale clearly displayed on each. The plan, map or diagram is also to state the original size (e.g. A1). Each should be in colour, where possible, and have a resolution between 300 and 900 dpi.
Locations	All geographical coordinates throughout the EIS are to be provided in latitude and longitude against the Geocentric Datum of Australia 2020 (GDA2020).

<sup>3</sup> Examples are included in Appendix 1.

Format requirements	
Elevations	Elevations detailed in the EIS are to be provided to Australian Height Datum (AHD). Plans, maps and diagrams included in the EIS should have contours at suitable increments relevant to the scale, location, potential impacts and components of the project.
References	All sources must be appropriately referenced using the Harvard standard. The reference list should include the address of any Internet webpages used as data sources.
Spatial data file format requirements	
Guidelines	Refer to DES <i>Guideline – Spatial information submission</i> (see Appendix 1).
File names	File names are to be descriptive and provided in one of the following formats: ESRI file geodatabase (.GDB) - preferred ESRI Shapefiles. GDB/shape.
Data attributes	Provide raw sampling and monitoring data in the form of both pdf and excel spreadsheets as an appendix to the EIS. Provide other numerical data at the request of the administering authority. All data is to contain descriptive attributes or columns, including but not limited to the following: <ul style="list-style-type: none"> <li>• date data was created</li> <li>• version number</li> <li>• who created the data (i.e. the company name)</li> <li>• datum (e.g. GDA2020)</li> <li>• category or stage.</li> </ul>
Projection	
Projection	Data can be provided in any projection; however, a geographic projection system is preferred. The datum shall be GDA2020.
Metadata	
Use standards	ISO 19115:2015 ANZLIC ISO 1.1.

## Part C EIS content and suggested structure

### 8. Executive summary

- 8.1 The executive summary is to describe the project and convey the most important aspects and environmental management options in a concise and readable form. It is to use plain English, avoid jargon, be written as a stand-alone document and structured to follow the EIS.

### 9. Introduction

- 9.1 The introduction is to clearly explain the function of the EIS, why it has been prepared and what it sets out to achieve. The introduction is also to include an overview of the structure of the document.

### Project proponent

- 9.2 Describe the following:
- (a) proponent's full name, street and postal addresses, Australian Business Number, and details of any joint venture partners
  - (b) nature and extent of business activities
  - (c) proponent's (including directors) experience in pumped hydro technologies and developing and implementing comparable major projects
  - (d) proponent's (including directors) environmental record in Australia, including a list of any breach of, or proceedings against the proponent under a law of the Commonwealth or any State, for the protection of the environment or the conservation and sustainable use of natural resources (an environmental law), during the previous ten years
  - (e) proponent's environmental, health, safety and community policies
  - (f) experience, qualifications and certification of all suitably qualified consultants and sub-consultants engaged by the proponent to complete the EIS
  - (g) all potential or actual conflicts of interest for the proponent and all consultants and sub-consultants engaged by the proponent.

### The environmental impact assessment process

- 9.3 Provide an outline of the environmental impact assessment process, including the role of the EIS in the Coordinator General's decision-making process, noting which milestones have been completed, and an estimated timeframe for completing each remaining EIS stage(s). The information in this section is required to ensure readers are informed of the process to be followed and are aware of any opportunities for input and participation.
- 9.4 Inform the reader how and when properly made public submissions on the EIS are to be addressed and considered in the assessment and decision-making processes under the SDPWO Act and any other relevant legislation.
- 9.5 Describe the assessment process under the EPBC Act with the accreditation under the SDPWO Act.

## 10. Project description

### Proposed development

- 10.1 The EIS is to describe and illustrate, with the inclusion of scaled drawings and site plans, the following about the project:
- (a) project title
  - (b) project operation, using easily understood conceptual drawings that show the totality of power generation for a full cycle of movement of water between reservoirs (including where and when pumping is required and where water is gravity fed), the generation, use and transmission of electricity, how the electricity storage components function and quantification of fluctuations in upper and lower reservoir water levels
  - (c) nature, location, scale and relation to landscape features of all project components and construction, operation and decommissioning activities, including but not limited to:
    - (i) survey/assessment/feasibility works, permanent infrastructure, construction areas, laydown areas, access requirements and boundaries of the project's footprint
    - (ii) construction activities (e.g. administrative facilities, lay down areas, concrete batching plant(s), extractive resource area(s), screening plant(s) and crushing plant(s) etc)
    - (iii) full supply level (FSL) inundation areas and flood margins of the upper reservoir, including identification of the waterways upstream of the existing inundation area(s) that will be inundated by the FSL (including AHD levels)
    - (iv) all infrastructure elements and development necessary to deliver the project and locations shown clearly on figures at an appropriate scale, including but not limited to the location of laydown areas, spoil placement locations, stockpiles, ventilation shafts, waterways, upper reservoir design and location, spillway design, required transmission lines and access road to the upper dam site, and including:
      - tunnel depth, size and geology impacted
      - existing infrastructure within the Cressbrook Creek Water Supply Scheme Resource Operations Licence
    - (v) locations where waterway barrier works constitute assessable development requiring a development approval or accepted development for operational work that is constructing or raising waterway barrier works
    - (vi) location of diversions or interception of overland flow and other water-related infrastructure, including watercourses (as defined under the *Water Act 2000*)<sup>4</sup> diversion design, treatment and operation
    - (vii) water supply volumes required on-site, including a breakdown between potable and non-potable and their respective sources, during both the construction and operational phases

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<sup>4</sup> Watercourse identification maps (WIP) can be found on the Business Queensland website at: <https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the *Water Act 2000*, Water Plans and regulatory documents.

- (viii) proposed on-site water storage and treatment for use by the site workforce during the construction phase
- (ix) proposed infrastructure relevant to environmentally relevant activities (ERA) (including ERA63 - sewage treatment, ERA 8 - chemical storage, ERA16 – extractive and screening activities and ERA64 water treatment)
- (x) other utility requirements including electricity, gas, telecommunications
- (xi) waste management (including storage, transport and disposal) during construction and operation activities
- (d) the definition of the ‘project area’<sup>5</sup> which, as a minimum, encompasses:
  - (i) 58/CSH2241 (Lot 58) – freehold parcel owned by TRC, including Lake Cressbrook
  - (ii) 2/SP300942 (Lot 2) – privately owned freehold parcel which the proponent has an Option Agreement to purchase
  - (iii) RP223812 (Lot 10) – freehold parcel owned by the proponent
  - (iv) Road ‘right to way’ of Sebasptapool and Three Mile roads.
- (e) transport requirements to site (including fly-in-fly-out workforce or drive-in-drive-out) and within the site (e.g., access tracks and haul roads, vehicle types and traffic frequency/intensity)
- (f) expected capital expenditure
- (g) regional and local infrastructure context of the project’s footprints, including water supply and electricity infrastructure (with maps at suitable scales)
- (h) relationship to other major projects and/or development (of which the proponent should reasonably be aware)
- (i) workforce numbers to be employed by the project during its various phases, expressed as annual average full-time equivalent positions created during each phase
- (j) where and how personnel are to be accommodated during construction and operation of the project and the likely recruitment and rostering arrangements to be adopted
- (k) all energy requirements for the project. Present and illustrate the quantum and timing of available renewable energy in the National Electricity Market compared to renewable electricity requirements of the project and timing of operations.

## Design of infrastructure

### Water storage infrastructure

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

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<sup>5</sup> Note the ‘project area’ does not necessarily reflect the area that may be impacted by the project and technical investigations/surveys in the EIS may extend beyond the project area to satisfy assessment guidelines.

- 10.3 Describe the process and criteria used, including relevant supporting information and data, to select the preferred design and construction techniques for the reservoirs and required connections between them, including:
- (a) FSLs and details of any staging or prospects for future expansion showing site boundaries, development sequencing and timeframes
  - (b) maximum (final) height and width (including height above stream bed) and spillway height and width, including height above stream bed of all water storage infrastructure (new or existing)
  - (c) location of all water storage infrastructure in relation to waterways<sup>6</sup> and watercourses<sup>7</sup> (as per Queensland Waterways for Waterway Barrier Works layer and watercourses as defined under the *Water Act 2000*)
  - (d) details of upper and lower reservoir operations including where water will be sourced from (especially for first fill), the minimum operating levels, quantification of likely headwater 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 and durations
  - (e) storage capacity, maximum and minimum depths, average depth, area of inundation at FSL, dead storage level, the extent of any buffer and management areas required, including a description of the flood margin and means of its determination, total length of beds of rivers or tributaries inundated for the upper reservoir
  - (f) modelled headwater and tailwater levels at the site at different flows and extraction rates
  - (g) general design of intake/outlet works and offtake works into the reservoirs including siting, footprint, capacity, relation to water levels, location, screening and ability to regulate flows, aquatic fauna exclusion and protection systems and location of intake/outlet in relation to any fauna passage device, any existing infrastructure in the vicinity of the outlet works (including Cressbrook dam embankment, spillway etc.)
  - (h) spillway 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) and spillway height above bed/ground level.
- 10.4 Detail and clarify how existing dam infrastructure and the proposed Cressbrook Dam spillway upgrade (including access provisions required for that project), are related to the project, including any design considerations necessary to support the proposed Cressbrook Dam spillway upgrade.
- 10.5 Provide an assessment by a Registered Professional Engineer of Queensland engineering consultant detailing the existing and future safety, condition and performance of proposed infrastructure.
- 10.6 Performance outcomes for both the upper reservoir and Lake Cressbrook (lower reservoir) are to be developed and detailed, with reference to relevant guidelines of the Australian National Committee on Large Dams.

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<sup>6</sup> Waterways is defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of the sea.

<sup>7</sup> Watercourse identification maps (WIP) can be found on the Business Queensland website at:

<https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the *Water Act 2000*, Water Plans and regulatory documents.

- 10.7 Quantify and describe the predicted 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 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 turtleway or stream diversions) in the design, and the demonstrated effect on the viability of the proposed project<sup>8</sup>
  - (c) infrastructure to enable and/or restrict recreational use of the existing Lake Cressbrook
  - (d) dimensions including length, depth, width and volume of all water storage infrastructure involved in the project
  - (e) construction methods, including removing any materials and 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
  - (f) appropriate representation of water storage 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, bank stability and associated sedimentation/water quality impacts and benthic processes of the changing storage levels during operations
  - (g) estimated water yields and their associated performance/reliability (itemising any volumes for environmental requirements including environmental releases)
  - (h) details of proposed remote operation, and design and location of automated component control housings in relation to flood levels and relevant environmental conditions
  - (i) description of the physical form of the stream bed upstream or within the upper reservoir footprint, including AHD levels (e.g. presence of natural features including snags likely to be impacted)
  - (j) details of the physical form of the stream beds downstream foot of the upper reservoir walls (e.g. presence of natural features likely to be impacted, deep pools, riffles and other refugia for upstream moving fauna) and the project and components' impacts on stream bed morphology, and bank and channel stability
  - (k) details of associated instream structures including any upstream or downstream permanent or temporary waterway barrier works e.g. for access, water delivery or water storage purposes
  - (l) description of the water security requirements of Toowoomba Regional Council for operation of Lake Cressbrook as water supply infrastructure
  - (m) detail how the proposed Toowoomba to Warwick pipeline is being considered as part of the project.

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<sup>8</sup> 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.



- 10.8 Describe how risks associated with upper reservoir failure, seepage through the floor, embankments of the dam, and/or with overtopping of the structure will be avoided, minimised or mitigated to protect people, property and the environment.

### Tunnelling Infrastructure

- 10.9 For all proposed tunnels, describe, map and illustrate:
- (a) tunnel locations
  - (b) depths below ground level
  - (c) location in relation to groundwater
  - (d) construction methodology
  - (e) associated surface infrastructure, including temporary and permanent access requirements.
- 10.10 Assess impacts as a result of tunnelling including:
- (a) interactions with groundwater, including risk of groundwater drawdown and groundwater drawdown as a result of tunnelling
  - (b) subsurface impacts on root systems of overlying vegetation
  - (c) reuse and disposal of surplus excavated material
  - (d) management of soils
  - (e) direct clearing for associated surface infrastructure (ventilation shafts, access points and tracks, valves etc.)
  - (f) impacts on surrounding infrastructure, wildlife and amenity as a result of construction activities.

### Pumped hydro-electric power stations and power transmission infrastructure

- 10.11 Describe, dimension, map and illustrate:
- (a) all permanent and temporary work areas, including access corridors and drill pad areas for geotechnical investigations, including decommissioning and repair methods for temporary work areas
  - (b) infrastructure which comprises the waterway tunnels linking the two storages and proposed pumped underground hydro-electric power station
  - (c) underground transmission line system from the underground hydroelectric power station to the substation near Crows Nest. Include a description of the transmission infrastructure and impacted properties/tenure
  - (d) transmission line route from the substation to the end point (i.e. connection in the grid), and associated easement and buffer requirements
  - (e) ancillary infrastructure required to directly support the construction and operation of the pumped hydro-electric power station and transmission infrastructure including emergency and maintenance access tunnels and shafts, ventilation shafts and any surface infrastructure
  - (f) any proposed tunnelling required for the delivery of water to supply the pumped hydro-electric 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.

- 10.12 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 disposal of waste material resulting from the construction of the foundations.
- 10.13 Describe how the pumped hydro-electric power station and associated infrastructure would prevent the entrainment, injury and mortality of fish and other aquatic fauna. Any intakes are to be appropriately screened to prevent fish and aquatic fauna entrapment and entrainment. Refer to Design specifications for fish-protection screens in Australia<sup>9</sup> and The practical guide to modern fish-protection screening in Australia for further guidance<sup>10</sup>.

#### Ancillary infrastructure requirements

- 10.14 Detail the location of works to be undertaken, with concept and layout plans, at an appropriate scale, requirements for new infrastructure, and/or the upgrading, 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 and any vessel launching/loading facilities
  - (c) site construction facilities including workforce accommodation, water supply and treatment, energy supply from the grid, generators and fuel, telecommunications, solid waste disposal, wastewater treatment and disposal, and sewerage systems
  - (d) infrastructure for recreational and tourist purposes
  - (e) other infrastructure (such as buildings, yards, pumps, fences, dips)
  - (f) water pipelines
  - (g) water release points and infrastructure.
- 10.15 Describe whether the infrastructure is permanent or temporary and nominate if it constitutes waterway barrier works.
- 10.16 Nominate the building and construction standards for the works.
- 10.17 Describe the timing of requirements for this infrastructure and detail the decommissioning schedule for all project-related infrastructure.
- 10.18 Include names of the required infrastructure owners and service providers as appropriate, together with evidence as to whether discussions have been held with these providers, regarding the capacity of existing or proposed infrastructure to accommodate/or not accommodate project requirements.
- 10.19 Identify infrastructure alternatives considered and justify selected options particularly with respect to environmental impacts.

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<sup>9</sup> [https://www.dpi.nsw.gov.au/data/assets/pdf\\_file/0006/1373577/Design-specifications-for-fish-protection-screens\\_FINAL\\_WPA.pdf](https://www.dpi.nsw.gov.au/data/assets/pdf_file/0006/1373577/Design-specifications-for-fish-protection-screens_FINAL_WPA.pdf)

<sup>10</sup> [https://researchoutput.csu.edu.au/ws/portalfiles/portal/180574914/A\\_guide\\_to\\_modern\\_fish\\_protection\\_screening\\_in\\_Australia\\_FINAL\\_WPA.pdf](https://researchoutput.csu.edu.au/ws/portalfiles/portal/180574914/A_guide_to_modern_fish_protection_screening_in_Australia_FINAL_WPA.pdf)

## Project staging

- 10.20 Provide a detailed description of the proposed project activities (construction and operation), including scope of works (on the project site and required infrastructure – new and upgraded), disturbance area, physical layout of the project over time, likely timing of the project including any stages and the sequencing of these stages.

### Pre-construction

- 10.21 Identify if any land acquisition is proposed, including proposed ownership details.
- 10.22 Describe the pre-construction activities, showing the dimensions, location with appropriate scaled maps, including:
- (a) timing, staging and sequencing of pre-construction activities and days and hours of operation (including night-time works)
  - (b) proposed infrastructure
  - (c) proposed vegetation clearing and mulching (including footprints, proposed removal techniques, staging, use or disposal of cleared vegetation and clear justification for these methods as having the least environmental impact), top- and sub-soil removal and stockpiling and associated management measures
  - (d) interference with watercourses (as described under the *Water Act 2000*)<sup>11</sup>, waterways (as described under the *Fisheries Act 1994*), and floodplain areas including wetlands
  - (e) project site access arrangements where access to the site is on tenure not held by the proponent
  - (f) proposed upgrades, realignments, relocation, deviation or restricted access to roads and other infrastructure including water, power and telecommunications
  - (g) all environmentally relevant activities and all notifiable activities
  - (h) effective environmental management measures included as part of the project design
  - (i) proposed earthworks, construction methods, associated equipment and techniques
  - (j) pre-disturbance surveys, including geotechnical, topographic, noise, air, flora and fauna, water quality, cultural heritage, contaminated land and how this information will be used in the final design and construction of the project<sup>12</sup>
  - (k) 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
  - (l) consents and approvals required to access land or purchase land or obtain easements
  - (m) approvals, licences and permits required for the construction works (e.g., operational works, building works etc)
  - (n) 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

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<sup>11</sup> As shown on the Queensland Government Water Watercourse identification map

<sup>12</sup> 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).

- (o) any land contamination survey methods and sampling methods, decontamination methods and programs
- (p) establishment of construction site facilities and services
- (q) for all components, the proposed earthworks, construction methods, associated equipment and techniques
- (r) existing infrastructure and easements on affected land within the project area and adjoining areas
- (s) biosecurity management of weeds, pests and diseases for pre-construction activities, including where personnel, plant and equipment are introduced to undeveloped areas.

## Construction

- 10.23 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) and transmission infrastructure and associated ancillary infrastructure including access requirements.
- 10.24 Illustrations showing site boundaries, disturbance areas, buffer zones, development sequencing and timeframes and the layout of construction facilities to be used.
- 10.25 Describe the nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw material.
- 10.26 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 DAF's Guidelines for Fish Salvage (e.g. if any dewatering is required).
- 10.27 Describe changes to waterways<sup>13</sup> (as defined under the *Fisheries Act 1994*) and watercourses<sup>14</sup> (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*.
- 10.28 Demonstrate water quality management methods for changes in watercourses, hydrology and stream function, including monitoring and reporting schedules.
- 10.29 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.
- 10.30 The general 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 and site management arrangements

<sup>13</sup> Waterways is defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of the sea.

<sup>14</sup> Watercourse identification maps (WIP) can be found on the Business Queensland website at: <https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the *Water Act 2000*, Water Plans and regulatory documents.

- (b) any new electricity transmission infrastructure, routes and easements required
- (c) where the power generation and transmission infrastructure will be constructed and how they will be transported to the site, including details of any necessary road upgrades
- (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) nature and location of construction workforce accommodation and laydown areas
- (h) capacity of high-impact plant and equipment, their chemical and physical processes, identify 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 and locations
- (i) known locations of new or altered works and structures and infrastructure necessary (such as construction laydown areas) 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)
- (j) any activity that is a prescribed ERA
- (k) 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
- (l) 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) (note: for the purposes of this, proposed project, extraction and screening have the meanings identified in Schedule 2 – ERA 16 Environmental Protection Regulation 2019)
- (m) source of materials and infrastructure for the project, their nature and mode of delivery
- (n) mitigation works within the site and off-site (e.g. sediment and erosion protection, sediment traps, fencing including materials and methods) to protect downstream water quality and environmental values, noting any capacity restrictions of dams under the relevant Water Plan(s).
- (o) describe how emergency events (i.e. flood, landslide, bushfire, drought etc.) would be managed during construction
- (p) any potential disruption to flows in watercourses<sup>15</sup>/waterways<sup>16</sup> and tributaries during construction and any diversion works required including coffer dams, temporary diversions and cut-off drains

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<sup>15</sup> Watercourse identification maps (WIP) can be found on the Business Queensland website at:

<https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the *Water Act 2000*, Water Plans and regulatory documents.

<sup>16</sup> Waterways is defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of the sea.

- (q) management of fauna and vegetation material generated by clearing for construction and the reservoir areas
- (r) 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 13 – Transport
- (s) water balance for the water supply requirements. For each component of the works, potable, recycled water, dust suppression and ablutions are to be identified and quantified. For each water requirement, the source, volume, means of access and transport, treatment processes and storage method are to be provided
- (t) any take or interference with water in a watercourse, lake or spring, overland flow water, and underground water (both direct and in-direct)
- (u) 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 (5) decimal places, GDA 2020), and stormwater release criteria. The stormwater 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
- (v) capture, 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 13 – Land
- (w) solid and liquid waste management (full details of the waste volumes, characteristics and management strategies) are to be provided in accordance with section 13 – Waste management
- (x) public and workforce safety, medical facilities to be provided on site and provision for access to emergency services
- (y) allowance for provision of power back-up in emergency and potential impact on local supplies in the area
- (z) security services
- (aa) 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
- (bb) construction site demobilisation.

## Rehabilitation

- 10.31 Describe the following rehabilitation activities and methods to be undertaken during and after construction, providing maps where required, including:
- (a) site rehabilitation actions, closure and decommissioning works for removal of infrastructure
  - (b) options, strategies, methods 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<sup>17</sup>
- (d) final topography and excavation depths of any quarries, 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.

## Operation

10.32 Describe how each component of the project would be operated with appropriately scaled maps, including the following:

- (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 fauna passage, fauna access to spillways, fauna exclusion devices, approach channels, screens, etc. that will be identified during post-commissioning monitoring
- (d) arrangements for administration, maintenance and repair and control of the works for the duration of the presence of the infrastructure (reservoirs, fishways, turtleways, pipes, roads, recreational facilities, site restoration activities and all other components of the project)
- (e) operational arrangements for the project including flow releases, 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
- (f) water use, sources, volumes and storage requirements, described separately for storage fill and other operational activities
- (g) 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
- (h) use and management of surrounding land and any obligations or restrictions thereon
- (i) any restrictions on access of land exposed at water levels below FSL or within the water storage

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<sup>17</sup> Refer to DES *Rehabilitation – EIS information guideline* at [https://www.qld.gov.au/data/assets/pdf\\_file/0017/242315/eis-tm-rehabilitation-information-guide.pdf](https://www.qld.gov.au/data/assets/pdf_file/0017/242315/eis-tm-rehabilitation-information-guide.pdf)



- (j) energy, any co-location of power and telecommunications requirements and sources
- (k) solid, liquid and gaseous waste generated and proposed methods of treatment and disposal, including any requirements for dewatering of underground infrastructure
- (l) 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
- (m) transport needs and expected traffic
- (n) expected life of the infrastructure and any anticipated major maintenance periods
- (o) demonstrate the effectiveness, operational range and frequency of any proposed fauna passageway and/or spillway proposed for the upper reservoir and any potential changes to existing fauna passageway's and/or spillways for Lake Cressbrook and the safe design and operation of all water infrastructure to avoid injuries to fauna traversing or utilising the reservoir habitats
- (p) existing, ongoing and proposed recreational uses of dams, weirs, water storages
- (q) any impact the changed operation at Cressbrook Dam will have on the safety, condition and performance of Cressbrook Dam and how potential failure or maloperation of the upper storage will be averted or mitigated
- (r) capacity of high-impact plant and equipment
- (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 (5) decimal places, GDA 2020), and stormwater release criteria. The stormwater 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.

## Decommissioning

- 10.33 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 general strategies and methods for decommissioning and rehabilitation of all components of the project, including underground infrastructure and reuse and recycling of associated materials should it ever be required.

## Site description

- 10.34 Provide all property descriptions for land impacted by the project area, and adjacent properties. Provide details of existing and proposed tenure arrangements for all properties and buildings potentially impacted by the project. Include details of any buildings, easements, roads and railways (existing and/or proposed, public and private), leases, reserves, unallocated state land, Native Title land (claims under consideration and decided) and cultural practice areas, approved Indigenous Land Use Agreements, permits to occupy, mining tenures, stock routes, conservation tenures, state forest, native forest and timber reserves, and approved state and/or Commonwealth biodiversity offset strategies.
- 10.35 Describe and illustrate with suitably scaled maps all transport corridors, private roads, local and state-controlled roads, pipelines, private and government owned corporation energy

infrastructure, rail, air services<sup>18</sup>, maritime and other infrastructure or services within the project area and the surrounding region which are relevant to the project (permanently or temporarily), including its construction and operation activities and finish materials (roads).

- 10.36 Describe and illustrate, with suitably scaled maps, potential impacts to property detailed in 10.35 and 10.36 above as a result of the proposed project. In particular, impacts to amenity and safety as a result of project infrastructure and implications to properties in the vicinity of the proposed upper reservoir in the event of dam failure.
- 10.37 Describe the rainfall patterns (including magnitude and seasonal variability of rainfall), overland flow paths, air temperatures, humidity, wind (direction and speed) and any other special factors (e.g. temperature inversions) that may affect management of the project.
- 10.38 Describe and illustrate the topography of the project area and surroundings on maps and highlight any significant features. Include and name watercourses/waterways (including stream order information), lakes, springs and unmapped features in accordance with the *Water Act 2000*. When mapping watercourses, lakes, springs and unmapped features identify any existing relevant watercourse identification maps<sup>19</sup>.
- 10.39 Map the location and boundaries of the project's footprint, including all inundation areas and infrastructure elements and development necessary for the project. Show all key aspects including excavations, stockpiles, areas of fill, subsidence areas, services infrastructure, plant locations, levees, water storages and dams, existing groundwater bores, stormwater infrastructure and drainage systems, spill containment bunds, buildings, bridges and culvert, haul and access roads (identifying sealed and non-sealed), transmission line trenching, causeways, stockpile areas and loading and unloading facilities. Include discussion of any environmental design features of these facilities, including bunding of plant and storage facilities.
- 10.40 Describe and illustrate at appropriate scales specific information for each component of the project including the precise location of the project area and activities at the significant stages of construction, operation, rehabilitation and decommission in relation to any waterbodies, waterways<sup>20</sup>, protected areas (e.g. conservation parks, nature refuges, national parks, etc.), forest reserves and state forests, legally secured offset area, matters of national, state and local environmental significance, regional biodiversity corridors and regional biodiversity value areas, the location of any sensitive receptors and proposed buffers surrounding the working areas, lands identified for conservation (either through retention in their current natural state or to be rehabilitated) and Traditional Owner land and cultural practice areas. Include maps at a catchment scale illustrating the relationship between the project location and upstream and downstream riverine, estuarine, coastal and marine ecosystems.
- 10.41 Describe and map in plan and cross-sections the geology and landforms of the project area and any relevant areas within the project surrounds (including the boundaries of water catchment areas). Show geological structures, such as aquifers, faults, economic resources (such as agricultural, timber, quarries, and mining including historic), and any other relevant projects and known development proposals that could have an influence on, or be influenced by, the project and its construction and operational activities.

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<sup>18</sup> As defined in the State Development Assessment Provisions

<sup>19</sup> Watercourse identification maps (WIP) can be found on the Business Queensland website at:

<https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the Water Act 2000, Water Plans and regulatory documents.

<sup>20</sup> Waterways are defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of the sea



- 10.42 Describe, map and illustrate soil types and profiles of the project area including added fill and/or exposed ground surface at a scale relevant to the proposed project and in accordance with relevant guidelines. Identify soils that would require specific management due to wetness, erosivity, sodicity, depth, acidity, salinity or other features.
- 10.43 Describe with concept and layout plans, in both plan and cross-section views, requirements for constructing, upgrading or relocating all infrastructure associated with the project. Show the locations and dimensions (including clearing) of any necessary infrastructure easements on the plans, including infrastructure such as roads, rail (and the rail corridor), tracks and pathways, environmental no-go areas, fencing, dams and weirs, bore fields, energy transmission infrastructure, power lines and other cables, wireless technology (such as microwave telecommunications), pipelines for any services, whether underground or above, vents, portals or any other above ground infrastructure (including access tracks) associated with the underground infrastructure.
- 10.44 Describe the site in the context of planning schemes, adopted and emerging land use plans applicable to Toowoomba Regional Council and Somerset Regional Council, regional plans, state policies and government priorities for the project area and the region. A description of the hierarchy of government policies in the regional plans is to be included. Plans and drawings provided must be of sufficient detail for the approvals being sought to enable the Coordinator-General and advisory agencies to assess the impacts of the project.
- 10.45 Describe the findings of the Agricultural Land Audit<sup>21</sup> and any land identified as strategic cropping land, priority agricultural area, priority living area or strategic environmental area for the project area.
- 10.46 Describe tourist destinations and sites used for recreation in the project area.

## Project rationale and alternatives

- 10.47 Demonstrate the need and scale of the project including in a regional, state and national context. The demonstrated need should also take into account other major water, energy and PHES infrastructure projects also proposed for the region.
- 10.48 Provide a summary of the current status of PHES technologies in Australia and globally. Discuss known environmental impacts associated with PHES operations and how these are managed/mitigated.
- 10.49 Describe the objectives and rationale for the project, including strategic, economic, environmental and social implications, technical feasibility and commercial drivers. Provide details of market considerations, design considerations and calculations that led to the proposed capacity and generation durations (10 hours and 1 hour) for continuous and battery generated electricity.
- 10.50 Describe the expected benefits and opportunities associated with the project and the relevant recipients of these benefits and opportunities (supported by relative evidence).
- 10.51 Describe with evidence-based information how the environmental benefits of the proposed project balance the residual environmental costs. To allow a meaningful comparison, environmental costs and benefits should be quantified.

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<sup>21</sup> The Queensland Agricultural Land Audit identifies land important to current and future production and the constraints to development, highlighting the diversity and importance of Queensland's agricultural industries. For more information visit <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agricultural-land-audit/land-audit>

- 10.52 Demonstrate how electricity supply can be guaranteed from renewable sources and include consideration of the scenario where grid electricity for the project cannot be supplied through renewable sources.
- 10.53 Present feasible alternatives of the project's configuration including conceptual, technological, scale and locality alternatives that may improve environmental outcomes. Detail the criteria used to determine the alternatives. Provide sufficient detail to enable an understanding for preferred option/s.
- 10.54 Demonstrate:
- (a) how the selected project configuration avoids and minimises impacts to the environment and results in best-case outcomes for each impact to identified environmental values over alternative project configurations
  - (b) that the design of the proposed project and its predicted outcomes are consistent with best practice environmental management during construction, operation, and decommissioning.
- 10.55 A detailed justification and options analysis for lower impact alternative sites and/or designs should be presented. This should include a detailed assessment of the potential use of Perseverance Dam as the headwater reservoir; social and environmental considerations; and clear demonstration that the proposed project has the least impact of all options on environmental values and environmental integrity.
- 10.56 Present alternatives to development of all components of the project. Describe how these alternatives have been considered and why the project is the preferred option.
- 10.57 Justify the preferred option, including using a cost-benefit analysis as described at section 13 – Economics. Identify and describe interdependencies of each component of the project, particularly in regard to how infrastructure requirements relate to the viability of the project.
- 10.58 Discuss the consequences of not proceeding with any component of the project.

## 11. Planning and legislative requirements

- 11.1 Identify all government approvals required for the project and detail all approvals for which conditions are being sought through this EIS process<sup>22</sup>, including relevant project stages and components, administering authority and timeframes (using a tabular format). Sufficient information and assessment are required for conditions of approval to be drafted and for the administering authorities to decide whether an approval is to be granted. Explain how the EIS process (and the EIS itself) informs the issue of development approvals / leases / licences / permits / consents required for the project. Provide details of any works that are accepted development, and those that are assessable development.
- 11.2 Identify any local, state or commonwealth approvals (e.g. development approvals / leases / licences / permits / consents) required for the project for which approval will be sought separate to the EIS, including relevant project stages and components, administering authority and timeframes (using a tabular format). Explain reasoning for seeking these approvals separate to the EIS and explain how this approach would not unnecessarily delay the delivery of the proposed project.

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<sup>22</sup> Approvals for which conditions are being sought should consider consideration provisions of Part 4 of the SDPWO Act

- 11.3 Describe any proposals for locating infrastructure on state land, including justification for proposed use of state land over other land.
- 11.4 Identify the names of the local governments and planning scheme areas traversed by the project, any proposed material changes of use and operational works assessment benchmarks for all activities and defined uses associated with this project under each of those schemes during pre-construction, construction and operation of the project.
- 11.5 Provide an assessment against the relevant planning schemes, regional plans, state policies and government priorities for the project area and the region. Consider the provisions relative to the project and address where required, providing evidence where provisions do not apply.
- 11.6 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.
- 11.7 Consider the provisions of the *Electricity Act 1994* and describe the relevant process to obtain a transmission licence to be nominated as a generation entity and connecting to the electricity grid.
- 11.8 Describe any approvals 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 Cressbrook Creek Water Supply Scheme Resource Operations Licence held by Toowoomba Regional Council, amendments or replacement of Toowoomba Regional Councils Cressbrook Creek Water Supply Scheme Operations Manual and Licences to interfere.
- 11.9 Describe water supply agreements that would need to be put in place with Toowoomba Regional Council to address dead storage, losses (consumption) and water required for construction and operation.
- 11.10 Describe any legislative requirements that would need to be met in relation to the project's potential impacts on protected areas, reserves, declared fish habitat areas and State forests. If the project's potential impacts are considered to be inconsistent with the values of these areas, include a description of any proposed revocation process for changing the boundaries of state forest, reserves and national parks or other protected areas.
- 11.11 The State Planning Policy (SPP) and the SDAP prescribed in the Planning Regulation 2017 (Planning Regulation) set out the matters of interest to the State for development assessment. The EIS is to:
- (a) identify the SPP and SDAP state codes relevant to the project
  - (b) demonstrate the project's consistency with the relevant SPP
  - (c) demonstrate the project satisfies the information requirements by providing an assessment against the most up to date version of the relevant SDAP state codes. (including State code 25: Development in South East Queensland koala habitat areas)<sup>23</sup>
- 11.12 The EIS is to provide, where relevant, the information required under section 125 of the EP Act in support of the project's application for any required ERAs. Any ERA to be conducted as part of the project should be listed separately with the appropriate ERA number, activity name and required threshold (see Schedule 2, EP Regulation for a list of ERAs). The assessment and supporting information, where relevant, is to be sufficient for the administering authority to

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<sup>23</sup> Further information on SDAP requirements can be accessed from: <https://planning.dsdmip.qld.gov.au/planning/better-development/the-development-assessment-process/the-states-role/state-development-assessment-provisions>

decide whether an approval should be granted.<sup>24</sup> Environmental values, information and approval requirements are specified in the EP Act, the EP Regulation, EPP and relevant guidelines.

- 11.13 Describe the assessment process under the bilateral agreement between the Australian Government and the State of Queensland.
- 11.14 Describe the approvals process under the EPBC Act.

## 12. Stakeholder consultation

- 12.1 In preparing the EIS, consult with:
  - (a) directly affected landholders, persons affected by any required operations manual relevant stakeholders including local, state and Australian government agencies, government owned corporations, industry operators, Aboriginal and Torres Strait Islander peoples<sup>25</sup> and potentially affected communities, directly affected communities<sup>26</sup> and indirectly affected key stakeholders<sup>27</sup>
  - (b) persons (including downstream users) affected by any operations manual that may be required for the project, including Toowoomba Regional Council, Department of Resources (owners of Cressbrook Creek Weir and Lower Cressbrook Weir) and any downstream users who benefit from releases made from Cressbrook Dam.
- 12.2 Describe in a stakeholder engagement report, the stakeholder engagement activities that have occurred during the preparation of the EIS, identify the issues raised during the consultation, and explain how the responses from stakeholders have been incorporated into the design and outcomes of the project.
- 12.3 Describe how stakeholders will be kept informed of the consultation outcomes throughout the EIS process, detailed design, and throughout project delivery and construction.

## 13. Assessment of project specific matters

- 13.1 This section sets out the scope of project specific matters that are to be given detailed treatment in the EIS. Assessment of each matter is to consider the potential direct and indirect impacts of the project at the local and/or regional scale.
- 13.2 The EIS is to assess the potential catchment-wide impacts, including upstream and downstream, where relevant.
- 13.3 The proponent is to engage with the Office of the Coordinator-General throughout the development of the EIS to clarify the scope of assessment of each project specific matter.

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<sup>24</sup> For technical information requirements see <https://www.business.qld.gov.au/running-business/environment/licences-permits/applying/technical>

<sup>25</sup> This includes Aboriginal and Torres Strait Islander peoples with interest in land directly affected by the proposal as well as those that could be potentially impacted (i.e. downstream Traditional Owners). In developing an engagement plan for consulting with Aboriginal and Torres Strait Islander peoples, input from relevant government agencies such as the Department of Regional Development, Manufacturing and Water is required. Any Aboriginal and Torres Strait Islander peoples who hold distinct cultural rights for the purposes of the *Human Rights Act 2019* within the project area.

<sup>26</sup> Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

<sup>27</sup> Refer to Appendix 1 of the Coordinator-General's social impact assessment Guideline for a list of key stakeholders.

## 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 and values
- (b) use water resources and riverine quarry material in an equitable, sustainable and efficient manner
- (c) ensure equitable, sustainable and efficient use of water resources
- (d) 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
- (e) protect or enhance the condition, environmental values and natural functions of waterways, watercourses, lakes, springs, aquifers and other natural water systems and watercourses—including the stability of beds and banks of waterways and watercourses
- (f) protect the volumes 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, groundwater recharge and groundwater-dependent ecosystems) are not adversely impacted by the development.
- (g) not compromise the operation of the Cressbrook Creek Water Supply Scheme.

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

### Surface water

#### Existing environment

- 13.4 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 streams and pools, stock watering locations and groundwater aquifers (including where surface water interactions are likely).
- 13.5 Describe the existing hydrologic regime of Lower Cressbrook Creek, Oaky Creek and Lake Cressbrook and their tributaries. Include a description of the hydrologic regimes of any waterways, creeks and streams within the project area and external to the project area impacted by the project.
- The description should include descriptions of 86.5% AEP, 63.2% AEP, 50% AEP, 20% AEP, 10% AEP, 5% AEP, 2% AEP, 1% AEP and 0.1% AEP events. The description should include historical plots of the level of Cressbrook Dam including levels where the functioning of the energy generation project will be impaired.

- 13.6 Describe existing surface drainage patterns and flows in streams in the project area including seasonal variations using suitable locations between identified stream nodes.
- 13.7 Discuss the history of flooding including extent, levels and frequency (upstream and downstream).
- 13.8 Describe the current operation and management of the Cressbrook Dam and distribution system, including yield, operating strategy, supply reliability, allocation and use of water supplies, water use efficiency and the environmental flow regime. Include a description of the existing relevant Water Plan, the resource operations plan/s, water allocation security objectives and environmental flow objectives.
- 13.9 Describe the agreement between Toowoomba Regional Council and Seqwater for water supply from Wivenhoe to Cressbrook, and the conditions for this to occur (if required).
- 13.10 Describe and compare the existing environment pre-development baseline (without current water resource development), 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 a range of nodes are to be included.
- 13.11 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.
- 13.12 Describe the relevant environmental values defined in section 9 of the EP Act and water quality objectives identified in the EPP (Water and Wetland Biodiversity) 2019.
- 13.13 Describe existing and potential users and uses of water in areas potentially affected by the proposed project, including municipal, agricultural, industrial, mining, recreational and environmental uses of water.

### ***Impact assessment and mitigation measures***

- 13.14 Identify the position of the reservoirs and ancillary works, hydro-electric water storage and power generation infrastructure including the underground power station, associated reservoirs, tunnels, bores, ventilation shafts, waterways, watercourses and power transmission infrastructure
- 13.15 Describe impacts of the project on the outcomes 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, hydrological modelling is to be used to inform the assessment, the general, specific and ecological outcomes of the relevant Water Plan, indicators and objectives, strategies to meet the outcomes, unallocated water rules, processes and volumes, downstream users and environment, overland flow provisions and Water Plan implementation (i.e., water management protocol).
- 13.16 Discuss the changes in the stream flows and eco-hydraulic indicators from pre-development to current conditions, and the corresponding changes that may be anticipated as a result of the proposed project in:
  - (a) in-stream and off-stream wetland inundation frequency timing and duration, including instream pools as dry season refugia



- (b) sediment/nutrient/energy processes in the catchments, including delivery to the coastal (Moreton Bay) and near shore environment.
- 13.17 Provide modelling outputs including hydrographs of predicted changes in flow regime and potential impacts to environmental flows at a range of locations representative of key habitats and biota under the current and full entitlement scenarios (with the project in operation). Address and include clear descriptions of the following:
- (a) level of service analysis (based on the severity, frequency and duration of restriction)
  - (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 flood regimes including frequency and duration of floodplain/wetland inundation, and potential impacts on flood levels upstream and downstream of the storage area and at any new crossing of watercourses. 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. 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 13 – Climate and Hazard, 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.
- 13.18 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

- (b) how the project will conform to the relevant Water Plan and how impacts will be mitigated. Use hydrological modelling to inform the assessment of impacts on:
    - (i) general, specific and ecological outcomes of the Plan
    - (ii) strategies to meet the outcomes
    - (iii) unallocated water rules
    - (iv) processes and volumes
    - (v) downstream users and environment
    - (vi) overland flow provisions
    - (vii) plan implementation (i.e. water management protocol)
  - (c) 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 uses)
  - (d) effect of water storages, diversions and levees, tunnelling, water harvesting (losses) and operational releases on environmental flow requirements, weir reliability and water availability for consumptive use and on terrestrial, aquatic and groundwater dependent ecosystem ecological communities
  - (e) changes in the reliability of supply to current water entitlement holders and any impacts on the operation of existing water extraction
  - (f) 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
  - (g) natural recharge via flooding or elevated flow events
  - (h) natural recharge via environmental flow events
  - (i) 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
  - (j) water supply to the project during drought/ low flow periods, and how project operations would occur under these conditions.
- 13.19 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.
- 13.20 Provide a detailed water balance for the project. Quantify the water balance analysis including evaporative and seepage losses from the upper reservoir and water losses from passage through the underground infrastructure.
- 13.21 For each source of water supply (surface and groundwater) for the project, address the quality and quantity, security of supply and resource availability, as well as any water licencing requirements under the *Water Act 2000* and its subordinate legislation.
- 13.22 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 during the construction phase.



- 13.23 Provide detailed designs for all infrastructure utilised in the treatment of onsite water including how any onsite water supplies are to be treated, contaminated water is to be disposed of and any decommissioning requirements and timing of temporary water supply/treatment.
- 13.24 Identify the quantity, quality and location of all potential discharges of water and contaminants by the 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 in-stream dilution and water quality. Chemical and physical properties of any discharged 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.
- 13.25 Provide details on the proposed sewage collection and treatment infrastructure and the reuse and/or disposal of treated wastewater and sewage wastes generated.
- 13.26 Describe and map any diversions or interception of overland flow. Describe the relevant impacts of any proposed waterway/watercourse diversions and describe waterway/watercourse diversion design, operation, monitoring regime, and measures to be implemented to avoid impacts on local wetlands, streams, groundwater dependent ecosystems and waterways. Ensure that any overland flow storage capacity meets the requirements listed under the relevant Water Plan.
- 13.27 Describe how the project will prioritise access to water from Cressbrook Dam for town water supply over the water needs of the project.
- 13.28 Describe how the project will integrate with existing infrastructure and the operational requirements of the Cressbrook Creek Water Supply Scheme. Identify any amendments required to the ROL and Operations Manual held by Toowoomba Regional Council.
- 13.29 Provide a site-specific assessment of estimated losses from the proposed upper reservoir storage, PHES operations and Cressbrook Dam. This includes, but is not limited to direct consumption during power generation, evaporation, seepage and oscillation of water levels in all dams. Any proposed mitigation and management strategies should be discussed.
- 13.30 Advice about the authorisations required to cover any proposed losses and mechanisms for BE Power to access additional water in the event of significant loss, eg. dam failure, evaporation etc.
- 13.31 Provide details on the proposed communication plan arrangements between project proponent and Toowoomba Regional Council eg. commencing and ceasing take, emergencies, incident management etc.
- 13.32 Provide a site specific assessment of estimated rainfall gains directly into the proposed upper reservoir storage, including any management strategies.
- 13.33 Provide information on all proposed water accounting frameworks, including but not limited to existing take, introduced water, Toowoomba to Warwick pipeline, Big T PHES operations. This may include a detailed explanation on capacity share arrangement water accounting rules, water measurement requirements and reporting arrangements.
- 13.34 Provide sufficient information on the project's water measurement plan, including details relating to:

- (a) water taken to the upper reservoir and released to Cressbrook Dam
  - (b) water storage and transfer
  - (c) environmental losses and gains (evaporation rates and seepage estimations) for the upper reservoir and Cressbrook Dam.
- 13.35 Provide information on the operational characteristics of taking water from Cressbrook Dam to the upper reservoir, including but not limited to, water cycles characteristics, cycle frequency, range of storage levels in Cressbrook Dam that Big-T PHES will operate in, and ceasing operations (eg. during spilling events).
- 13.36 Any proposed changes to the operation or operational rules of Perseverance Dam as a result of the proposed project.
- 13.37 Describe the cumulative impacts of the proposed project, in conjunction with existing development and possible future development (as described by approved plans and existing project approvals), to water resources in the region.
- 13.38 Provide an assessment against SDAP state code 18: Constructing or raising waterway barrier works in fish habitats (see Appendix 1) for any assessable waterway barrier works required for the project, including construction activities.
- 13.39 Provide an assessment against SDAP state code 10: Taking or interfering with water for any assessable operational works that take or interfere with water required for the project, including construction activities.
- 13.40 Describe the long term security of water supply to the proposed project over the life of the project given potential climate change and increased demands on Cressbrook Dam as a drinking water supply with population or industrial expansion.

## Groundwater

### *Existing environment*

- 13.41 Describe the historic and existing environment for hydrogeology 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. Describe:
- (a) proximity of 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) 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
  - (e) 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

- (f) interaction with surface water in each sub-catchment and possible sources and volumes of recharge
- (g) seasonal variations, including consideration of a range of wet and dry climatic conditions (e.g. drought impacting recharge) of groundwater levels and groundwater flow directions
- (h) basic water quality of the aquifer and its vulnerability to pollution
- (i) groundwater resources proposed to be used by the project, including a description of the quality, quantity, usage rate and required location of those resources
- (j) 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***

13.42 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 and recharge
  - (iii) effects on riparian vegetation 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
- (d) impacts of the project on groundwater dependant ecosystems, including impacts on stygofauna and proposed mitigation measures
- (e) effect of dewatering and water storage foundations
- (f) effect of project construction on the availability and quality of groundwater resources downstream
- (g) impacts of vegetation clearing, sedimentation, salinity and depth below natural surface level of local groundwater resources
- (h) 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
- (i) impacts of the project on the objectives, requirements and outcomes of any underground water management area or relevant Water Plan regulating underground water including how the project will conform to the Plan and how any impacts will be mitigated. In the assessment of impacts, hydrogeological modelling is to be used to inform the assessment, the general, specific and ecological outcomes of the Plan, indicators and objectives, strategies to meet the outcomes, unallocated water rules, processes and

volumes, downstream users and environment, overland flow provisions and Plan implementation (i.e. water management protocol)

- (j) 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
- (k) decommissioning of any temporary groundwater bores
- (l) 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, and groundwater dependent ecosystems
- (m) assessment of the long-term integrity of the upper reservoir bed liners/grouting in relation to seepage losses and associated potential interaction with groundwater
- (n) a groundwater management plan, for the life of the proposed project, which details management strategies for predicted impacts on groundwater

13.43 Develop a groundwater conceptual model to represent groundwater interactions with the lower storage and upper storage and above and underground infrastructure; groundwater recharge and discharge processes; surface-groundwater interactions; and impact pathways from the project.

- (a) the development of the groundwater conceptual model should occur in consultation with the Office of the Coordinator-General (and other advisory agencies) during preparation of the draft EIS. Subject to this consultation, development of a numerical groundwater flow model may be required, consistent with the conceptual model, for impact assessment.

## Water-related cultural values

### **Existing environment**

13.44 Discuss traditional owners' cultural values and water-related cultural use as relevant to the project, including information regarding economic development opportunities and methods proposed to protect these values, including but not limited to Aboriginal peoples and Torres Strait Islander peoples distinct cultural rights under the *Human Rights Act 2019*.

### **Impact assessment and mitigation measures**

- 13.45 Describe the project's potential impacts on water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples.
- 13.46 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.
- 13.47 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.

## 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.

The performance outcomes corresponding to these objectives are in Schedule 8, Part 3 of the EP Regulation

### Existing environment

- 13.48 Describe the existing water quality (surface and groundwater) of the local and regional water catchment that may be affected by any component of the project.
- 13.49 With reference to the EPP (Water and Wetland Biodiversity) 2019 (Upper Brisbane River 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.
- 13.50 Define the relevant water quality objectives applicable to the environmental values and demonstrate how these will be met by the project during construction, operation, decommissioning and following proposed project completion. Where water quality objectives are not available local water quality objectives should be derived according to DES's latest Water quality guidelines (Queensland Government, 2020) and include any semi-permanent or permanent pools, including stock water.
- 13.51 Describe historic and existing surface water and groundwater quality in terms of physical, chemical and biological characteristics within the proposed water storage areas, upstream and downstream of the area including consideration of seasonal or flow variations where applicable. Off-stream waterbodies and existing water storage areas are to be included where relevant.
- 13.52 Describe the baseline water quality in Lake Cressbrook and the current operational management measures in place to ensure the water quality of Lake Cressbrook meets minimum (health and safety) drinking supply requirements (Lake Cressbrook is a principal water supply for Toowoomba Regional Council).
- 13.53 The basis for this assessment 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 present 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) correlate groundwater quality results with surface water data to define interactions
- (g) baseline groundwater quality variability and its suitability for environmental and human use
- (h) any water quality variations along the length of any alluvium upstream and downstream of the dam or other infrastructure
- (i) surface water quality samples that include, as a minimum, electrical conductivity, pH, sulphate, fluoride, dissolved oxygen, turbidity, total suspended solids, nutrients, dissolved and total metals and metalloids, total recoverable hydrocarbons 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
- (j) water quality samples must include as a minimum, electrical conductivity, pH, dissolved oxygen and major anions and cations<sup>28</sup>
- (k) describe known water quality issues in the existing Lake Cressbrook, and provide details of how these are managed.

13.54 Include a description of 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

13.55 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 streams, 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 surrounds, or run-off from disturbed acid sulfate, sodic or dispersive soils.

13.56 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). Discuss how established water quality management measures for Lake Cressbrook are proposed to be implemented or revised during construction and operation.

13.57 Describe measures to ensure the water quality of Lake Cressbrook meets the minimum (health and safety) drinking supply requirements of Toowoomba Regional Council, and measures to manage water quality in both the upper storage and Lake Cressbrook to ensure the water quality objectives, as per the EPP (Water and Wetland Biodiversity) 2019 (Upper Brisbane River

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<sup>28</sup> Refer to the Department of Regional Development, Manufacturing and Water current monitoring programs and water quality collection standards, including those associated with any relevant Resource Operation Licences at <https://www.business.qld.gov.au/industries/mining-energy-water/water/authorisations/operations>



Environmental Values and Water Quality Objectives), for Lake Cressbrook and downstream waters are also met and maintained.

- 13.58 Describe how emergency releases of water from the upper reservoir would impact water quality in Lake Cressbrook and downstream.
- 13.59 Demonstrate how the relevant water quality guidelines or final objectives (as outlined in water quality information sources in Appendix 1) will be met and how relevant environmental values are to be protected during construction, operation and decommissioning.
- 13.60 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 DES guidelines:
  - (a) Application requirements for activities with impacts to water
  - (b) Water – EIS information guideline
  - (c) Monitoring and sampling manual
  - (d) Queensland Water Quality Guidelines
  - (e) Using monitoring data to assess groundwater quality and potential environmental impacts
  - (f) Technical guideline – Licensing wastewater releases to Queensland water (see Appendix 1).
- 13.61 Describe the impacts of the project on upstream and downstream water quality, environmental values and the water quality objectives of the relevant Water Plan, policies and guidelines outlined in Appendix 1. Information is to be supported with references to relevant legislation, policies and guidelines.
- 13.62 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 of drainage from spoil stockpiles and associated potential impacts
  - (d) quality of water within the upper reservoir impoundment during the first filling phase and for the period of the subsequent decomposition of drowned vegetation the quality of water within the upper reservoir impoundment 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
  - (e) effects of depth and holding time within Lake Cressbrook and the upper reservoir, particularly on turbidity, conductivity, stratification, temperature, dissolved oxygen and the quality of operational water movements
  - (f) 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) for both Lake Cressbrook and the upper reservoir

- (g) potential effect of algae and macrophytes on water quality and vice versa
  - (h) effects on downstream water quality under varying scenarios of releases/spills including potential impacts on instream pools (dry season refugia), estuarine, near shore environments and Moreton Bay
  - (i) 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 13.34. 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 the drinking water supply
  - (j) management of nutrients and oxygen levels from decomposition of any submerged vegetation within the impounded waters in any water releases from the dam.
- 13.63 Describe and include in the EMP avoidance, mitigation 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* and the former Department of Environment and Resource Management's *Urban Stormwater Quality Planning Guidelines 2010* (see Appendix 1)
  - (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.
- 13.64 Describe how monitoring would be used to demonstrate that objectives were being assessed, audited and met. For example, provide measurable criteria, standards and/or indicators that will be used to assess the condition of the ecological values and health of surface water environments. Propose corrective actions to be used if objectives are not likely to be met.



## Land

### Objectives 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

13.65 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 private properties, Traditional Owner land and cultural practice areas, protected areas, State leasehold land, reserves, unallocated state land, legally secured offset areas, state forest, 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 (including resource tenures), 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) SDAP codes relevant to the project (including those exempt due to coordinated project status)
- (g) design and locational factors influencing the selection of the project components and the project area
- (h) 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.

13.66 Describe and map the extent of any known agriculture, horticulture, petroleum, mining and exploration activities, quarries of commercial significance 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 and applications for exploration permits
- (c) mineral development licences and applications for mineral development licences
- (d) mining leases and applications for mining leases, including access arrangements
- (e) known economic resources and their future availability
- (f) active, disused, or abandoned workings within the project area and surrounds
- (g) findings of the Agricultural Land Audit and AgTrends Spatial web mapping app<sup>29</sup>
- (h) geothermal and greenhouse gas storage tenures
- (i) active, disused, or abandoned mine workings in the project area and surrounds
- (j) stock route network
- (k) agricultural land considered as a priority agricultural area and/or of strategic cropping land, and any other matters identified in the *Regional Planning Interests Act 2014* (RPI Act) and RPI Regulation.

### **Impact assessment and mitigation measures**

- 13.67 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.
- 13.68 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.
- 13.69 Present using map/s any proposed lot consolidation.
- 13.70 Demonstrate that the project can meet the environmental objectives and performance outcomes relevant to land in Schedule 8 of the EP Regulation.
- 13.71 Describe potential impacts of the proposed land uses, taking into consideration the proposed measures to be used to avoid or minimise potential impacts.
- 13.72 Address impacts on any identified agriculture, 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.<sup>30</sup> Address impacts on any identified state-owned forest products and timber or quarry material.
- 13.73 If relevant, describe any proposed tenure to be applied for as part of this project.
- 13.74 Identify any historical workings within or adjacent to the project area. Demonstrate how historical workings have been avoided where possible. Describe how the project is to incorporate safety measures to mitigate hazards with abandoned mines and ensure the safety of personnel.

<sup>29</sup> <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agtrends-spatial>

<sup>30</sup> 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](http://www.qld.gov.au/environment/land/abandoned-mines).

- 13.75 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.
- 13.76 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.
- 13.77 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.
- 13.78 Describe any proposed land acquisition approach/es 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 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.
- 13.79 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.
- 13.80 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 that are to be used to avoid or minimise impacts.
- 13.81 Describe the potential impacts on views of the project from key vantage points, particularly from any protected areas, recreational areas, or from the Cressbrook Dam water surface.
- 13.82 Include a detailed assessment of 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

- 13.83 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.
- 13.84 Identify and investigate the soil toposquences 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.
- 13.85 Provide details, including maps, existing soil conservation works (contour banks, waterway discharge points 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

- 13.86 Where significant earthworks are proposed, assess the impact of these works on affected soils and landscapes including potential impacts on State-owned timber or quarry material. 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:
  - (i) *Guideline for coordinated projects involving clearing for agriculture (land suitability requirement)*, *Guidelines for Surveying Soil and Land Resources*, *Australian Soil and Land Survey Field Handbook*, *Guidelines for Agricultural Land Evaluation in Queensland*, the *DES EIS Information Guideline – Land*
  - (ii) where linear features are proposed, *Guidelines for Soil Survey along Linear Features*
  - (iii) if any quarry material is needed for construction, the *DES EIS information guideline—Quarry material* (see Appendix 1).
- 13.87 Describe how the tunnelling, installation and construction of the underground power station will impact the long term stability of the geology of the project area, including reference to groundwater reserves.
- 13.88 Assess the risks to the project from the geomorphology of the site in relation to reservoir construction, tunnelling and underground excavation. Demonstrate that there is sufficient coverage in the geotechnical surveys and data for the site to assess and minimise risks of intersecting non-competent material or other potential barriers to the proposed works.
- 13.89 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* (see Appendix 1). Where irrigation water is applied to land, assess the:
  - (a) water balance to assess the impacts of deep drainage
  - (b) salt balance
  - (c) unsaturated zone.

- 13.90 Investigate land degradation in the form of erosive soil less associated with increase run-off, clearing or other changes to hydrology in accordance with *Soil Conservation Guidelines for Queensland* and *Best Practice Erosion and Sediment Control* (see Appendix 1).
- 13.91 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 requirements of the *SPP – State interest guideline emissions and hazardous activities* that appropriately manages the disturbance of acid sulfate soils to avoid or minimise the mobilisation and release of acid, iron, or other contaminants.
- 13.92 Identify activities or operations likely to impact on existing erosion control works and any soil conservation works.
- 13.93 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). Include mitigation and management measures where any acid forming rock is to be place in spoil disposal areas.
- 13.94 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

### Objectives and outcomes

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

- (a) avoid, minimise and/or mitigate adverse impacts to protected areas, 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

- 13.95 Illustrate the context of the project in relation to surrounding and impacted protected areas under the NC Act, 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 temporary non-resident workforce accommodation and construction laydown areas.

#### Impact assessment and mitigation measures

- 13.96 Describe the potential direct and indirect impacts on the natural and cultural resources and values of all protected areas and state forests, within and adjacent to the project area arising from the construction and operation of the project.<sup>31</sup>
- 13.97 Describe alternatives considered to avoid adverse impacts on all protected areas.
- 13.98 Where adverse impacts on all protected areas 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 and mitigated
  - (c) how these impacts would be offset (e.g. what compensatory measures would be provided by the proponent).
- 13.99 Provide a description of how ecological processes and connectivity to habitats, corridors and waterways are maintained between protected areas and adjoining areas where adjoining areas are impacted by the project.

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<sup>31</sup> 'Natural resources' and 'cultural resources' within the definitions under the *Nature Conservation Act 1992*. 'Protected areas' within the definition under the Environmental Offsets Regulation 2014.



## Flora and fauna

### Objectives 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) minimises environmental harm on areas of high conservation value and special significance and sensitive land uses at 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 residual impacts
- (d) identify and appropriately safeguard MSES to support healthy and resilient ecosystems
- (e) manages 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 for all MSES species and ensure it receives 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) provides for the conservation of the marine environment (Moreton Bay), avoid constructing or raising waterway barrier works in fish habitats, or where this is unreasonably possible, ensure waterway barrier works in fish habitats are constructed to maintain connectivity, habitat values and fish passage
- (j) ensure waterway barrier works in fish habitats are constructed to maintain connectivity, habitat values and fish passage.

### General content

- 13.100 This section should specifically address the project's impacts on MSES and other regionally significant biodiversity, and cultural and natural environmental values. Where a MSES is also a MNES a cross reference to where it has also been assessed in the MNES chapter should be provided. It is recommended that this section is structured to include separate assessment for each MSES.
- 13.101 Include details on the scope, methodology, timing, effort and results of field surveys undertaken in the EIS. Ecological survey reports including field proformas and data sheets should be provided as searchable and hyperlinked appendices.
- 13.102 Using maps at a suitable scale, illustrate the context of the project area in relation to surrounding MSES. This includes the location of:
  - (a) existing and proposed infrastructure (including water discharge points, power transmission lines and pipelines), and project activities
  - (b) proposed buffers (including firebreak and safety buffers)
  - (c) access tracks (including existing) required for construction and maintenance

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

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

### **Existing environment**

13.104 Identify and describe matters of MSES<sup>32</sup>, 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.

13.105 Describe the existing quality and suitability of habitat for MSES species that are known and have the potential to occur in the project area. Provide the area of existing habitat (ha) for each MSES species in the project area based on field verification. For habitat area calculations, identify the use of high value regrowth vegetation and non-remnant areas for species such as the koala.

13.106 The location of fauna and flora of cultural, 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 records
- (d) connectivity areas
- (e) protected wildlife habitat
- (f) waterways providing for fish passage
- (g) protected areas and conservation areas.

13.107 Provide a detailed description of all native fish, turtle, and crustacean species and macrophyte (vegetative) fish and other fauna spawning/breeding locations<sup>33</sup>:

- (a) known to occur within the area impacted by the project (as identified through on-ground, seasonal studies)
- (b) identified as likely to occur (via desktop assessment).

13.108 Describe, using relevant literature and the results of surveys, the natural and existing upstream and downstream movement and habitat requirements of all 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.

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<sup>32</sup> 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.

<sup>33</sup> Consider Department of Regional Development, Manufacturing and Water science and monitoring products available at <https://www.qld.gov.au/environment/library>

- 13.109 Describe all flow dependent ecological assets and their critical links to stream flow, including their relevant ecological thresholds.
- 13.110 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**

- 13.111 Provide a description of all relevant impacts (direct, indirect, cumulative and facilitated) on the biodiversity and natural 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 DES guidelines (see Appendix 1). 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, brush-tailed rock wallaby, greater glider, the white-throated needletail 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<sup>34</sup>
  - (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 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 (turtles) spawning and nesting sites
  - (f) changes to hydrology and environmental flows resulting in potential impacts to downstream terrestrial and aquatic habitats
  - (g) area (m<sup>2</sup>) 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
  - (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

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<sup>34</sup> Where a MSES is also a MNES, specific cross referencing to where it has been assessed in the MNES chapter should be provided

- (k) integrity of landscapes and places, including wilderness, reserves and similar natural places
  - (l) provision of a permanent upper reservoir and the potential direct and indirect impacts to fauna and flora habitat
  - (m) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants
  - (n) 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
  - (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 construction and operation of the project 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.
- 13.112 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.
- 13.113 If relevant, identify 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), 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.
- 13.114 Provide an assessment against SDAP State Code 16: *Native vegetation clearing* addressing the relevant assessment benchmarks for a coordinated project for all other purposes.
- 13.115 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.
- 13.116 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.
- 13.117 Describe alternative measures that would avoid the need for waterway barriers or propose measures to mitigate the impacts of their construction and operation.

- 13.118 Describe the methodology of constructing the water storage infrastructure (through modelling or any other appropriate method) and demonstrate how the chosen method minimises and mitigates potential impacts on aquatic and riparian habitat and aquatic and terrestrial fauna and include plans to protect the health and welfare of native fish species through fish salvage operations in accordance with the Department of Agriculture and Fisheries' *Guidelines for Fish Salvage* (Appendix 1), turtles and any other species with the potential for entrainment or entrapment.
- 13.119 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* (Appendix 1), 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.
- 13.120 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.
- 13.121 Set out a process for the design, construction, and monitoring of any fauna passage device(s) to provide maximum transparency and safe passage and relevant waterway barriers impacted or installed as a result of the project.
- 13.122 For any infrastructure that constitutes waterway barrier works, provide cross-sections of the waterway that show the barrier in relation to the bed and banks and long-sections that show the barrier in relation to the bed upstream and downstream of the structure. Describe how the barrier and hydrological conditions provide for fish passage.

### **Mitigation measures**

- 13.123 Demonstrate how the project aligns with the vision, outcomes and goals of the Biodiversity Conservation Strategy for Queensland.
- 13.124 Provide a detailed salvage and relocation plan for impacted species including MSES.
- 13.125 Assess the need for safety fire breaks and the need for buffer zones 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.
- 13.126 Propose rehabilitation criteria and objectives that are to be used to measure progressive rehabilitation of disturbed areas. 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.
- 13.127 Describe, illustrate, and demonstrate how the project provides safe and adequate upstream and downstream aquatic fauna passage, including but not limited to the fish community of the site and monitoring and maintenance measures.
- 13.128 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 or special least concern species. Discuss the effectiveness of these measures and reference relevant studies and literature which support the effectiveness of these measures.

## Offsets

- 13.129 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 (see Appendix 1) and the Queensland Environmental Offsets framework.
- 13.130 Address both 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 MNES and MSES.
- 13.131 Where an SRI is predicted 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 Appendix 1).
- 13.132 Demonstrate a conservation outcome for all impacted prescribed environmental matters, including koala, and detail how the proposed project addresses recent amendments that have been made to the Queensland planning framework to address the key threat of loss of habitat for koala populations, with the objective of no net loss of habitat as a minimum.
- 13.133 Provide as an appendix to the EIS an offset strategy 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.
- 13.134 Describe any active restoration actions that would be undertaken to improve, enhance and manage native vegetation or threatened species habitat on a proposed offset site (note: applying high intensity management to low condition sites is most relevant to habitat reconstruction). Describe how the achievement of the offset strategy will be monitored and audited, and how corrective actions will be managed.



- 13.135 Describe any proposed measures that would be used to avoid, minimise or mitigate any impact on agricultural values when meeting environmental offset requirements required for the project.

## Biosecurity

### Objectives 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 diseases, 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

- 13.136 Survey terrestrial and aquatic pest animals and weeds and describe their current distribution and abundance in the project area and surrounds. 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, Weeds of National Significance, pests and weeds declared under Toowoomba Regional Council and Somerset Regional Council local laws and designated pests under the *Public Health Act 2005*. See Appendix 1 for relevant guidelines.

### Impact assessment and mitigation measures

- 13.137 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 latest version of DES's Biosecurity—EIS information guideline (Appendix 1).
- 13.138 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.
- 13.139 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 the *VM Act/Planning Act 2016*.
- 13.140 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

### Objectives and outcomes

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

- (a) risk of, and adverse impacts from, natural and human-made natural hazards are identified, avoided, minimised or managed and mitigated 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) production of hazardous contaminants and waste is prevented or minimised.

### Existing environment

- 13.141 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, heatwave.

### Impact assessment and mitigation measures

#### General

- 13.142 Describe the potential risks to people, property, waterways, flora and fauna that may be associated with the project in the form of a preliminary risk assessment for all components of the project and in accordance with relevant standards. The assessment is to include:
- (a) potential hazards, accidents, spillages, 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<sup>35</sup>, landslide, heatwave<sup>36</sup>) and implications related to climate change. Identify the cumulative impact of a number of natural hazards occurring at the one time. Describe possible adaptation strategies (preferred and alternative) based on climate change projections for the proposed project site

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<sup>35</sup> 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.

<sup>36</sup> Use State Heatwave Risk.

- (f) how potential flooding of the upper reservoir would be managed, including location of by-wash and discharge pathway
  - (g) impact of water level fluctuations (changing FSL) associated with the extraction and release of water on recreational values of Cressbrook Dam/Cressbrook Lake. Detail measures for ensuring the safety of recreational users and the public and protecting them from water level fluctuation hazards at Cressbrook Dam 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).
- 13.143 Detail how siting, layout and operation of the development as well as other measures will avoid or mitigate risks.
- 13.144 Discuss how any potential impacts to human health associated with the project have been considered in accordance with the Health considerations guideline.<sup>37</sup>
- 13.145 Detail measures required to ensure that the proposed project avoids the release of hazardous materials as a result of a natural hazard event/s.
- 13.146 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.
- 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.
- 13.147 Assess the proposed project's vulnerabilities to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology, and extreme weather events). The assessment of climate hazards and risks should reference relevant climate projection data (e.g. Queensland Future Climate high-resolution climate projection data<sup>38</sup>) and employ an appropriate climate risk assessment methodology. Describe the adaptation strategies and/or activities designed to minimise climate change impacts to the proposed project, subsequent land uses on that site (e.g. rehabilitation projects) and surrounding land uses. Adaptation activities are to be designed to avoid perverse outcomes, such as increased emissions of greenhouse gases or maladaptive outcomes for surrounding land uses.
- 13.148 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.
- 13.149 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

<sup>37</sup> 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/enviro-impact-state-guidelines.pdf](https://www.health.qld.gov.au/__data/assets/pdf_file/0034/444949/enviro-impact-state-guidelines.pdf)

<sup>38</sup> Available from <https://longpaddock.qld.gov.au/qld-future-climate/dashboard>.

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.

- 13.150 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:
- (a) reference to the existing Emergency Action Plans (EAPs) for the Cressbrook Dam, and how these are to 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 and Emergency Services addressing 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 (DILGP 2017)
    - (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) safety management plans and emergency response procedures in consultation with the state and regional emergency service providers (including Queensland Fire and Emergency Services) and provide an adequate level of training to staff who will be tasked with emergency management activities.
- 13.151 Detail any consultation undertaken with the relevant state, district and local emergency response authorities and organisations, including the Local Disaster Management Group.
- 13.152 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**

- 13.153 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 up to a 1% Annual Exceedance Probability (AEP). This should include at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2%, 1% and 0.2% AEP, and Probable Maximum Flood and dam failure scenario.
- 13.154 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 discussion on extent of modelled impacts in relation to existing townships (e.g. flood extent for modelled event(s) extends to X km upstream of township X).

- 13.155 The assessment is to consider all infrastructure associated with or existing on or near the project area including the proposed upper reservoir, levees (if applicable), roads, waste rock dumps, 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 of the *Queensland Urban Drainage Manual, Fourth Edition* (see Appendix 1).
- 13.156 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.
- 13.157 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 reservoir(s).

## Economic

### Objectives and outcomes

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

- (a) avoid 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

- 13.158 Describe the existing economic environment consistent with the Coordinator-General's Economic Impact Assessment Guideline (April 2017) (see Appendix 1). 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
  - (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 supply demand as identified in the Queensland Energy and Jobs Plan<sup>39</sup>)

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<sup>39</sup> <https://www.epw.qld.gov.au/energyandjobsplan>

- (f) existing electricity infrastructure in the region and any plans for connection to the project
  - (g) existing and proposed water infrastructure in the region.
- 13.159 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

- 13.160 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*.
- 13.161 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.
- 13.162 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.
- 13.163 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.
- 13.164 Quantify the employment (including an estimate of supply chain employment) and value-added contribution of the project to the local, regional and state economies in a regional impact assessment (RIA) using computable general equilibrium modelling. The RIA is to estimate the changes in key indicators including:
- (a) gross regional product
  - (b) gross state product
  - (c) employment by industry
  - (d) energy prices for residential, mining, agriculture and large industrial users
  - (e) water prices for residential and industrial users
  - (f) gross value added by industry.



- 13.165 Undertake a cost-benefit analysis (CBA) that identifies the structure of the project and the relevant direct costs and benefits from the project. The CBA is to consider:
- (a) key construction inputs and milestones
  - (b) project timeline
  - (c) relevant renewal costs related to the project (including projected repair/replacement of infrastructure)
  - (d) operational costs, including all input costs of production
  - (e) costs associated with environmental management, monitoring, mitigation and offsets associated with the project
  - (f) benefits, including revenue projections (and stipulating unit/price assumptions)
  - (g) expected project life and any residual value over the assessment period.
- 13.166 In addition, the CBA 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 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

### Objectives and outcomes

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

- (a) avoid and/or mitigate adverse social impacts arising from the project
- (b) enhance opportunities and benefits for affected local and regional communities, including Aboriginal and Torres Strait Islander peoples.

### Existing environment

- 13.167 Identify and describe people, communities, and key stakeholders<sup>40</sup> directly or indirectly affected by the project.
- 13.168 Include a social baseline study of the project's potentially affected communities<sup>41</sup> in accordance with the Coordinator-General's *Social Impact Assessment* (SIA) Guideline (see Appendix 1).

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<sup>40</sup> Refer to Appendix 1 of the SIA Guideline for a list of key stakeholders.

<sup>41</sup> Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

- 13.169 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

- 13.170 Prepare an SIA for the project that is informed by a consultative and inclusive stakeholder engagement program<sup>42</sup> in accordance with section 12 – Stakeholder consultation and consistent with the relevant requirements of the Coordinator-General's *SIA Guideline*, having regard to the requirements of Building Queensland's *Social Impact Evaluation Guide* (see Appendix 1).
- 13.171 Describe the outcomes of consultation with directly and affected people, communities and key stakeholders including but not limited to landholders, Aboriginal and Torres Strait Islander peoples, local governments, state agencies, local and regional commerce and community development groups, social and public service providers (e.g. Queensland Health, Queensland Police Service and Queensland Emergency Services).
- 13.172 Describe the project's potential social impacts (both beneficial and adverse) on potentially affected people, communities, and key stakeholders. This should include:
- (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 Toowoomba LGA and Somerset LGA) and the project (including impacts of the project on established fish stocking and attractor programs<sup>43</sup>) including an assessment of the size, significance, and likelihood of these impacts at the local and regional level, including:
    - (i) key population/demographic shifts and effects to existing lifestyles, the health and social wellbeing of families and communities
    - (ii) needs of vulnerable groups including those that are socially disadvantaged, Aboriginal and Torres Strait Islander peoples, the aged and people with a disability
    - (iii) potential social benefits of the project on the local and regional area in relation to the alternatives
    - (iv) assess the perception of risk from the proposed activity on the community and determine factors that influence this
    - (v) significance of health and community well-being impacts and/or benefits
    - (vi) potential project impacts (including cumulative impacts) on health and well-being
    - (vii) 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
    - (viii) identify any special strategies that might be deployed by the proponent during the construction and operation of the project to mitigate impacts.

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<sup>42</sup> It is recommended that the proponent is to 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.

<sup>43</sup> Fishing in stocked impoundments: <https://www.qld.gov.au/recreation/activities/boating-fishing/rec-fishing/dams>

- 13.173 Describe any impacts on 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 construction and operation.
- 13.174 Identify the percentage of workers likely to be sourced from potentially affected communities, including Aboriginal and Torres Strait Islander peoples, for the construction and operational phases and the proposed methodologies for workforce recruitment. Also identify the percentage of procurement from Aboriginal and Torres Strait Islander owned businesses during both the construction and operational phases and the proposed strategies to achieve this percentage.
- 13.175 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 Toowoomba and Somerset Region; and in the social impact management plan (SIMP), provide management measures to accommodate workers to ensure the availability and affordability of local and regional housing is not adversely impacted. The housing strategy is to be informed by the social impact assessment and impact management plan requirements of the Workforce Management and Housing and Accommodation sections of the SIA Guideline.
- 13.176 Include a SIMP that describes 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.
- 13.177 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

### Objectives 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

- 13.178 Identify the existing and historic Traditional Owners of the land within the project area.
- 13.179 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.
- 13.180 For aspects of Queensland (non-Indigenous) historical heritage identified through the *Queensland Heritage Act 1992*, undertake a study of, and describe, the known and potential historical cultural, archaeological, underwater cultural heritage artefacts and landscape heritage values of the area potentially affected by the project in accordance with the *Non-Indigenous cultural heritage – EIS information guideline* (see Appendix 1). Identify values at local and State thresholds and assess the significance of identified values using recognised criteria.

## Impact assessment and mitigation measures

- 13.181 Undertake an impact assessment on Aboriginal and Torres Strait Islander Peoples' cultural heritage in accordance with the latest version of DES *Aboriginal and Torres Strait Islander cultural heritage – EIS information guideline* (see Appendix 1).
- 13.182 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 *Aboriginal Cultural Heritage Act 2003* and any associated agreements that have been reached. The CHMP must be informed by the results of a cultural heritage study or survey.
- 13.183 Identify impacts on Queensland (non-Indigenous) historical heritage identified under the *Queensland Heritage Act 1992*.
- 13.184 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 the Non-indigenous cultural heritage guideline in Appendix 1 and the project CHMP.

## Noise and vibration

### Objectives 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
- (b) protect the environmental values of the acoustic environment
- (c) avoid, minimise and/or mitigate structural damage to buildings or other infrastructure as a result of construction vibration.

The performance outcomes corresponding to these objectives are in Schedule 8, Part 3 of the EP Regulation

### Existing environment

- 13.185 Describe and illustrate the locations of any sensitive receptors that are listed in Schedule 1 of the *Environmental Protection (Noise) Policy 2019* (EPP (Noise)). Also describe any other environmental values and infrastructure that could be impacted by emissions from the proposed project.
- 13.186 Describe the existing noise and vibration sources and baseline levels within the project area.

## Impact assessment and mitigation measures

- 13.187 Describe the characteristics of the noise and vibration sources, including any blasting, or rock ripping, that are to be emitted by the project (point source and general emissions) during construction, operation, upset conditions, and decommissioning of the proposed project.
- 13.188 Conduct a noise and vibration impact assessment in accordance with the latest version of DES Noise and vibration—EIS information guideline (Appendix 1) and Applications for activities with noise impacts (Appendix 1). The assessment must address low-frequency (<200 Hz) noise emissions and potential cumulative impact of the proposed project with other emissions of noise from any existing developments and known possible future development in the area.
- 13.189 The EIS must:

- (a) characterise the surrounding existing and planned sensitive receptors in accordance with Schedule 1 of the EPP (Noise) and the associated environmental values in order to set noise criteria which protects the environmental values
  - (b) describe the project's noise and vibration impacts on sensitive receivers in accordance with Schedule 1 of the EPP (Noise) and detail the proposed mitigation measures that demonstrate best practice environmental management and compliance with the noise criteria for construction, operational and decommissioning phases.
- 13.190 Assess the blasting and vibration impacts from construction and operation of the project on the existing and planned future infrastructure at Cressbrook Dam (including any fauna passageway) and the potential for structural impacts and functional impacts on these. Safety considerations should be included in the impact assessment.
- 13.191 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 Environmental Protection (Noise) Policy 2019. The EIS must address the compatibility of the proposed project's noise emissions with existing and potential land uses in surrounding areas.
- 13.192 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.

## Climate

### Objectives 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 the project from 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) contribute toward Queensland's emissions reduction and renewable energy targets by developing and implementing decarbonisation measures for the project
- (c) contribute towards Queensland's implementation of the Queensland Energy and Jobs Plan.

### Existing environment

- 13.193 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

- 13.194 Conduct the assessment in accordance with DES *Climate – EIS Information Guideline* and *Air – EIS information guideline* (see Appendix 1).
- 13.195 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.
- 13.196 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.

- 13.197 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<sup>44</sup>) and employ an appropriate climate risk assessment methodology.
- 13.198 Describe the adaptation strategies and/or activities designed to minimise 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

**Note:** The Queensland Resources Industry Development Plan (QRIDP), released in June 2022, includes an action to require industry to develop plans to decarbonise operations. The QRIDP states that the Queensland Government, led by the Department of Environment and Science (DES), will develop a decarbonisation plan policy that:

- results in substantial and consistent reductions in Scope 1 and 2 emissions
- is outcomes-based, allowing companies to achieve least-cost abatement from across their portfolio of Queensland assets
- includes transparent and regular reporting on progress
- is adaptive, providing a basis for future actions to ensure new technologies, approaches and progress can be taken into account
- enables the energy system to plan Queensland's renewable energy requirements.

DES is developing the draft Industry Decarbonisation Plan Policy in accordance with the QRIDP, which will be subject to industry and community consultation. Accordingly, the Decarbonisation Plan policy may change prior to finalisation of the EIS for the project. The proponent will be required to be consistent with the Industry Decarbonisation Plan Policy once finalised.

## Existing environment

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

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<sup>44</sup> Available from <https://longpaddock.qld.gov.au/qld-future-climate/dashboard>.



- 13.200 Describe the proponent's obligations under the *Commonwealth National Greenhouse and Energy Reporting Act 2007* (NGER Act). Information regarding GHG emissions and energy production and consumption provided in the EIS must be consistent with requirements of the NGER Act and its subordinate legislation.

#### Impact assessment and mitigation measures

- 13.201 Provide an inventory of projected annual emissions for the life of the project for each GHG, with total emission expressed in 'CO<sub>2</sub> equivalent terms'. Calculate the GHG emission from land clearing and inundation of land. Utilising the hydrodynamic modelling quantify the CO<sub>2</sub>e (including methane) from the reservoirs. Quantify emissions for the following categories as per the National Greenhouse and Energy Reporting Scheme including scope 3 emissions:
- (a) scope 1 emissions – direct emissions of greenhouse gases from sources within the boundary of the facility and as a result of the facilities (including emissions from vegetation clearing and emissions generated by the reservoirs)
  - (b) scope 2 emissions – emissions of greenhouse gases from the production of electricity, heat or steam that the facility will consume, but that are physically produced by another facility
  - (c) scope 3 emissions – emissions of greenhouse gases which occur as a consequence of the activities of a facility, but from sources not owned or controlled by that facility's business.
- 13.202 Estimate both unmitigated emissions and predicted emissions (for the life of the project) after all avoidance and mitigation measures have been accounted for using an appropriate methodology in accordance with Australian and international guidelines. Briefly describe the methods used to make the estimates. Include forgone GHG uptake as a result of vegetation clearance.
- 13.203 Assess the potential impacts of the proposed project on the state and national GHG inventories including Queensland's published emissions targets.
- 13.204 Demonstrate and outline in a Decarbonisation Plan how the project will assist in meeting Queensland's 2030 emissions reduction targets and to achieve net zero emissions by 2050, including through the project's development and operation.
- 13.205 Address the following matters in the Decarbonisation Plan<sup>45</sup> for the life of the project, with key targets, commitment to measures and transparent reporting of progress:
- (a) how the project will be consistent with the relevant published Industry Decarbonisation Plan Policy
  - (b) measures (preferred and alternatives) proposed to avoid and/or minimise scope 1 and scope 2 GHG emissions of the proposed project and forgone GHG uptake
  - (c) options for avoiding and/or mitigating Scope 3 emissions (e.g. working with supply chains)
  - (d) how the preferred measures minimise emissions and achieve energy efficiency
  - (e) any opportunities to further offset GHG emissions through accredited and verified offsets that represent genuine emissions reductions within Australia (i.e. will be recognised in the National Greenhouse Accounts)

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<sup>45</sup> As per requirements in section 6.4, should a new policy or legislation be passed to regulate greenhouse gases, the proponent must meet all requirements of the policy that apply to the project.

- (f) opportunities to reduce GHG emissions through renewable energy use and innovation
- (g) quantify the emissions expected to be abated for each avoidance and mitigation measure.
- (h) any voluntary initiatives or research into reducing the lifecycle and embodied energy carbon intensity of the proposed project's processes or products
- (i) 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
- (j) describe the practicality, effectiveness and risks for each avoidance, reduction and mitigation or offsets measure
- (k) compare preferred measures for emission controls and energy consumption with best practice International environmental management in the relevant industry sector
- (l) assess and describe the practicality, effectiveness and risks for each avoidance and mitigation measure and provide clear evidence that the proposed mitigation and avoidance measures have been factored into the economic feasibility of the proposed project
- (m) 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 Decarbonisation Plan
  - (iv) ongoing training and capacity building around decarbonisation options, technology and reporting.

## Air

### Objectives 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
- (c) protect the health and biodiversity of ecosystems
- (d) protect human health and wellbeing.

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

### Existing environment

13.206 Describe the existing air quality that may be affected by the project in the context of environmental values.

13.207 Discuss the existing local and regional air shed environment, including:

- (a) background/ambient levels and sources of particulates, gaseous and odorous compounds, any major constituent 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).
- 13.208 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.
- 13.209 The assessment of environmental values is to 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 DES monitoring stations cannot be reliably extrapolated.

#### Impact assessment and mitigation measures

- 13.210 The assessment of impacts on air from all components of the project (i.e. on and off-site) is to be in accordance with DES *Air – EIS information guideline and Application requirements for activities with impacts to air* (see Appendix 1). Demonstrate the project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.
- 13.211 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.
- 13.212 Predict the potential impacts of the releases to air from project activities on environmental values of the receiving environment using established and accepted methods.
- 13.213 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))<sup>46</sup>
  - (b) address the cumulative impact of the release with other known releases of contaminants, materials or wastes associated with existing development and possible 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).
- 13.214 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.
- 13.215 Address the compatibility of the proposed project's air emissions with existing or potential land uses in surrounding areas.

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<sup>46</sup> 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/enviro-impact-state-guidelines.pdf](https://www.health.qld.gov.au/data/assets/pdf_file/0034/444949/enviro-impact-state-guidelines.pdf)

- 13.216 Describe how the proposed project will avoid and/or minimise potential impacts to 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.
- 13.217 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

### Objectives 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

- 13.218 The EIS should include a clear summary of the total transport task for the project, including workforce, inputs and outputs during the construction and operational phases. Refer to DES *Transport - EIS information guideline, 2020* (see Appendix 1).
- 13.219 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.

### Existing environment

- 13.220 Include a description of 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.

### Impact assessment and mitigation measures

- 13.221 Provide a detailed description and tabular summaries of the total transport activities associated with all stages of the project, (from pre-construction through operation). The information is to 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.
- 13.222 Identify any 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.
- 13.223 Undertake the transport assessment in accordance with the latest version of DES's Transport - EIS information guideline (Appendix 1) and present separate sections for each project-affected mode (road, rail, air services, port and maritime) as appropriate for each phase of the project.
- 13.224 Provide a detailed assessment by a Registered Professional Engineer of Queensland engineering consultant of 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.
- 13.225 Include 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 three local government impact assessment methodologies for local government roads. For State-controlled roads, this assessment should 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:
- (a) section 8.4.2 *Heavy Vehicle Routes*
  - (b) section 9 *Road Safety*
  - (c) section 13 *Pavement*.
- 13.226 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.
- 13.227 Identify, assess and address the project's impacts on existing and future railway corridors, particularly railway level crossings and any development interfacing or interfering with existing and future railway corridors in accordance with relevant standards and requirements such as the State Development Assessment Provisions, 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 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.

- 13.228 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

### Objectives 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
- (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
- (d) ensure upgrades to waste infrastructure are funded by the proponent.

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

### Existing environment

- 13.229 Describe existing waste infrastructure including location, capacity and accepted waste streams relevant to the project.

### Impact assessment and mitigation measures

- 13.230 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.
- 13.231 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.
- 13.232 Conduct the impact assessment in accordance with the latest version of the DES's *Waste—EIS information guidelines and Applications for activities with waste impacts* (ESR/2015/1836) (see Appendix 1). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.
- 13.233 Describe how the waste storage and collection arrangements for the proposed development meet the requirements of Toowoomba Regional Council's *Technical Guidelines for New Developments Waste Storage and Collection Requirements* and P0<sub>31</sub> of the Environmental Standards Code.<sup>47</sup>

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<sup>47</sup> Environmental Standards Code accessible at Part 09 Development codes via: <https://www.tr.qld.gov.au/planning-building/planning-scheme-strategies-tools/planning-scheme-new/13289-access-the-toowoomba-regional-planning-scheme-9>



- 13.234 Define and describe objectives and practical mitigation measures to ensure environmental values are protected or enhanced from the potential impacts from wastes.
- 13.235 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 leech 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.
- 13.236 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.
- 13.237 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.
- 13.238 If the production of hazardous contaminants and waste is unavoidable, describe proposed treatment and/or storage of hazardous contaminants until they can be disposed at an approved facility.
- 13.239 Describe how securing of storage containers of hazardous contaminants during flood events would meet the requirements of schedule 8 of the Environmental Protection Regulation.
- 13.240 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.
- 13.241 Provide relevant information on existing and proposed sewage infrastructure relevant to environmentally relevant activity (ERA) 63, by referring to relevant DES policies and guidelines, depending on the proposed sewage collection and treatment infrastructure proposed, the reuse and/or disposal of treated wastewater, and sewage wastes generated.

## Cumulative impacts

### Objective and outcome

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

- 13.242 Potential cumulative environmental, social, economic, and cultural impacts are to be considered for the design, construction, and operational phases of the project.
- 13.243 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).
- 13.244 Describe the cumulative impacts of the project, in conjunction with existing development and known future development (as described by approved plans 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 <sup>48 49</sup>
- (d) soils
- (e) area coverage, health and resilience of terrestrial and aquatic (including marine) ecosystems
- (f) surface and groundwater quality
- (g) surface 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*
- (h) release of contaminants, materials or wastes
- (i) air quality
- (j) noise
- (k) impact and disposal of waste
- (l) natural hazards occurring at the same time
- (m) public health and safety.

13.245 Describe how cumulative impacts for the above listed matters may be affected by climate change.

13.246 Describe measures that would be used to avoid, minimise or mitigate any identified cumulative impacts.

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<sup>48</sup> <https://www.epw.qld.gov.au/energyandjobsplan/about>

<sup>49</sup> <https://aemo.com.au/-/media/files/major-publications/isp/2022/appendix-3-renewable-energy-zones.pdf?la=en>

## 14. Matters of national environmental significance

On 22 March 2022, the project was determined to be a controlled action, requiring environmental approval under the Australian EPBC Act (EPBC reference 2021/9140).

The controlling provision for the proposed action is as follows:

- 18 and 18A – Listed threatened species and communities.

The project will be assessed by EIS under the assessment bilateral agreement between the Australian and Queensland governments.

The MNES section of the TOR should be a stand-alone chapter that primarily focuses on the MNES listed above. This section (the 'MNES section') is to contain sufficient information to be read alone with reference to technical data or supplementary reports where appropriate. Any detailed technical information to support the text in the MNES section is to be included as appendices to the EIS.

Ensure habitat definitions for listed threatened species are in accordance with definitions available in the EPBC Act Guidelines or other relevant 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 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 needs to be used.

Note: Where 'action' is used below, it is to mean the project (all components) in the MNES section.

### General content

- 14.1 The MNES chapter 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).
- 14.2 The MNES chapter should contain sufficient information to allow the Australian 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.
- 14.3 The MNES chapter should contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed developments on MNES.
- 14.4 The proponent is to ensure that the MNES section assesses compliance of the action with principles of ESD and the objects of the EPBC Act (see Chapter 1 Part 1 of the EPBC Act).

### Specific content

#### General information

- 14.5 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.

14.6 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*

14.7 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.

14.8 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
- (b) all new and existing roads, as well as details on which roads are sealed and unsealed, and traffic volume
- (c) 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
- (d) ancillary or supporting infrastructure, associated works or safety works including new construction and upgrades
- (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) which includes 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).

- 14.9 The description of the action is to provide the total size (in hectares) of the project site and the total size (in hectares) 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.
- 14.10 The MNES section 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.
- 14.11 The MNES section 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.

### **Feasible alternatives**

- 14.12 Outline any feasible alternatives to the action to the extent reasonably practicable, including:
- (a) if relevant, the alternative of taking no action
  - (b) a comparative description of the impacts of each alternative on listed threatened species and communities
  - (c) sufficient detail (including feasibility studies and cost analysis) to make clear why any alternative is preferred to another
  - (d) 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**

- 14.13 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 is to include details of:
- (a) terrestrial and aquatic ecosystems, including key vegetation communities and relevant watercourses
  - (b) total size (in hectares) of Regional Ecosystems present on site, as well as a map/s showing the size (in hectares) of Regional Ecosystem 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 Somerset Regional Council and Toowoomba Regional Council important habitat areas, recognised populations and habitat, and aggregations of listed species
  - (f) surface water and groundwater hydrology and quality

- (g) cultural heritage values, people and communities and other relevant social considerations
  - (h) 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.
- 14.14 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**

- 14.15 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 Species Profile and Threats (SPRAT) Database, including but not limited to:
- (a) habitat clearance
  - (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 and/or increase in numbers of pests and weeds
  - (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 surface water quality
  - (j) impacts to water quality (including direct and facilitated), waste and chemical pollution, land contamination and greenhouse gas emissions
  - (k) barriers to fauna movement and edge effects.
- 14.16 The MNES section is to include a description of all relevant impacts of the action (direct, indirect, cumulative and facilitated), including the magnitude, duration and frequency of the 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 edge effects from these 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 species habitat such as hollow bearing trees, nest trees, refuge habitat, foraging and breeding habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable).
- 14.17 The MNES section is to 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) and species range for each relevant MNES.

- 14.18 The MNES section is to 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.
- 14.19 Establish and describe clear spatial and temporal boundaries for the assessment of cumulative impacts.
- 14.20 The MNES section is to 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.

### ***Avoidance, mitigation and management measures***

- 14.21 The MNES section is to include detailed descriptions of measures proposed to be undertaken by the proponent to avoid, mitigate and manage relevant impacts of 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.). The MNES section 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.
- 14.22 The MNES section is to not 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 MNES. 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.

14.23 The SPRAT Database, and associated statutory documents, may provide some relevant mitigation measures for listed threatened species and ecological communities. All proposed measures for MNES is to consider the 'S.M.A.R.T' principle:

- (a) S – Specific (what and how)
- (b) M – Measurable (baseline information, number/value, auditable)
- (c) A – Achievable (timeframe, money, personnel)
- (d) R – Relevant (conservation advices, recovery plans, threat abatement plans)
- (e) T – Time-bound (specific timeframe to complete).

## Environmental offsets<sup>50</sup>

### Note

According to the EPBC Act *Environmental Offsets Policy* (2012), environmental offsets are measures that compensate for the residual adverse 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 the Department regarding offsetting is highly encouraged.

It is DCCEEW's standard practice that, if environmental offsets are required, a draft Offset Strategy and/or a draft 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 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.

14.24 The MNES chapter is to include an assessment<sup>51</sup> 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 *Environmental Offsets policy* (2012). To streamline the assessment process and provide confidence in the proposed outcomes, the proponent should prepare and submit an offset strategy and Offset Area Management Plan(s) compensating for these impacts.

### Offset Strategy

14.25 The objective of an Offset Strategy is to demonstrate that the measures put in place to compensate for the residual impacts of an action on MNES meet the requirements of the EPBC *Environmental Offsets Policy* (2012).

14.26 The EIS must identify the residual impacts for each MNES, including:

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<sup>50</sup> It is important to consider environmental offsets early in the assessment process. If environmental offsets are required, it is standard practice that a draft Offset Strategy and/or a draft Offset Area Management Plan (OAMP) are to be included in the assessment documentation for assessment and approval.

<sup>51</sup> It is recommended that environmental offset requirements are discussed separately for each MNES after the detailed assessment of impacts, discussion of proposed avoidance and mitigation measures and assessment of residual significant impacts.

- (a) a summary of residual significant impacts at the impact site(s). 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
  - (c) 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.
- 14.27 The EIS must quantify the residual impacts for each MNES and derive a Quantum of Impact value for input to the Commonwealth Offsets Assessment Guide. 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 Commonwealths 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., distinguishes 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 Commonwealths guidance document site quality and site condition components must be assessed and combined for Area of community HQS. An additional species stocking rate component must be combined with these components for Area of habitat HQS.
- 14.28 The EIS must propose an Offset Strategy to compensate for residual impacts to MNES. The Offset Strategy must:
- (a) describe the proposed offsetting mechanisms compensate for impacts to each MNES and to deliver on the required conservation gains
  - (b) directly address all the EPBC Environmental Offset policy principles and demonstrate how each principle will be met (including through quantitative means via the Offset Assessment Guide 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.
- 14.29 For proposed indirect offset mechanisms compensate for impacts to each MNES (up to a maximum of 10% of the Quantum of Impact) the Offset Strategy must contain details of the objectives, proposed outcomes, financial contributions and management arrangements for each proposed activity.
- 14.30 For proposed direct offset mechanisms (such as land-based offset sites), the Offset Strategy 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, spatial information and maps at representative locations and appropriate resolution / scales
- (b) if relevant, stages of environmental offset areas
- (c) details of the nature 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) compensation of the required Quantum of Impact value for each MNES, as demonstrated by the Commonwealths 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)
- (g) proposed OAG calculations. These must be submitted to the OGC 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).

- 14.31 For each Offset site, provide a draft Offset Area Management Plan (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 significant residual 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 Commonwealth Offsets assessment guide in relation to the project impact site for each relevant MNES, including:
    - (i) quantum of impact – area (in hectares)

- (ii) quantum of impact – quality (A methodology that is suitable for the relevant MNES in question must be used to assess site quality, site condition and species stocking rate (i.e. approved by the department, OCG and/or supported by literature), noting the same scoring mechanism must be used at both the impact site and the offset site)
- (d) description of the proposed offset area, including its proximity to known populations or habitat of MNES that are triggered by the proposed action
- (e) details of the environmental offset(s) (in hectares) 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 Act Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide, 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 a strategy for the staging of environmental offset/s for each project stage (if proposed)
- (i) details of appropriate offset area/s (including a map/s) to compensate for the residual significant impact on relevant MNES, and/or their habitat
- (j) the methodology, with justification and supporting evidence, used to inform the inputs to the Commonwealth Offsets Assessment Guide 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)
- (k) evidence that the relevant MNES, and/or their habitat, can and are likely to be present in the potential offset area/s
- (l) information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors
- (m) 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.<sup>52</sup>

<sup>52</sup> 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, DCCEE will 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.

- 14.32 Where offset area/s have been nominated, include a draft 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 Offsets Policy and all requirements of the Offsets Assessment Guide. The draft 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 MNES in question must be used to assess site quality, site condition and species stocking rate (i.e. approved by the department, 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 hectares)
  - (i) Description of the presence, abundance and distribution of the triggered MNES in the areas surrounding the proposed offset area
  - (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 offset area management plan

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 offset area management plan
- (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 include a detailed description of the works and management measures completed within the offset area during the reporting period. A summary table must also be provided 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 at least 20 years to provide enduring protection in perpetuity for the offset area/s against development incompatible with conservation.

- 14.33 The draft 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 or can be present in 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.

- 14.34 Supporting evidence is to be included in the draft 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 Act Offsets Policy.
- 14.35 The draft 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.
- 14.36 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.
- 14.37 Where an environmental offset/s is proposed, with a completed Offsets Assessment Guide<sup>53</sup> 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)

- 14.38 The MNES section is to address impacts on listed threatened species and communities which may include, but is not limited to, those identified at Appendix 2 based on the likelihood of significant impacts.<sup>54</sup>

#### Information requirements

- 14.39 The assessment of listed threatened species and communities in the MNES section 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<sup>55</sup>
  - (g) Avoidance, mitigation and management<sup>56</sup>
  - (h) Rehabilitation requirements
  - (i) Statutory requirements
  - (j) Significant impact assessment.<sup>57</sup>

<sup>53</sup> As outlined at the 'Avoidance, Mitigation and Management Measures' section above.

<sup>54</sup> 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 (22 March 2022) 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..

<sup>55</sup> The impact assessment must meet the requirements outlined in the 'Relevant Impacts' sections above.

<sup>56</sup> As outlined at the 'Avoidance, Mitigation and Management Measures' sections above.

<sup>57</sup> As outlined at the 'Environmental Offsets' sections above.

## Description

- 14.40 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<sup>58</sup>.

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 referral decision on the 22 March 2022 for threatened species and ecological communities, as a part of the assessment. For example, the Greater Glider (southern and central) (*Petauroides Volans*) had new Conservation Advice published on the 5 July 2022, and the Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*) was listed as Vulnerable and had Conservation Advice published on the 2 March 2022, both of which will need to be considered when assessing impacts to the species.

## Desktop analysis

- 14.41 Describe the desktop assessment methodology used to inform the field surveys within, adjacent to, downstream and upstream of the project site. The MNES section 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 (i.e. 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.
- 14.42 The proponent must ensure that a recent Protected Matters Search Tool (PMST) report<sup>59</sup> has been generated and considered before finalising the draft EIS. This PMST should be provided as an attachment to the EIS.

## Survey effort

- 14.43 Provide details of the scope, methodology, timing and effort of field surveys (is 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.
- 14.44 Surveys are to be of a suitable standard, including the scope, timing and spatial and temporal replication, to be able to detect cryptic or difficult to detect terrestrial and aquatic species.

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<sup>58</sup> The habitat assessment should be undertaken in line with the habitat descriptions outlined in 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 preliminary documentation and must be supported by scientific evidence including published research, independent expert advice and information derived from field surveys (DCCEEW does not accept the consideration of Queensland Regional Ecosystem mapping to determine habitat for listed threatened species).

<sup>59</sup> Protected Matters Search Tool report - <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>

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

- 14.45 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.

### Habitat assessment

- 14.46 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.).
- 14.47 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, draft referral guidelines, etc.)
  - (d) published research and other relevant sources.
- 14.48 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 the MNES section, 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 hectares) 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.
- 14.49 The MNES section is not to consider Queensland regional ecosystem (RE) mapping to determine habitat for listed threatened species - habitat assessments must consider and align with the information in the SPRAT Database and relevant DCCEEW documents. However, some Queensland REs align with the descriptions for some ecological communities and therefore the use of Queensland REs is acceptable in these cases.
- 14.50 Provide the total amount of each type of habitat (in hectares) within, adjacent to, upstream and downstream of the project site for each listed threatened species and ecological community.
- 14.51 The number of features that provide suitable habitat (e.g. number of tree hollows) for listed threatened species should be provided. These should be shown on a map where applicable.
- 14.52 The MNES section is to also include 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.

- 14.53 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<sup>60</sup>

- 14.54 Describe and assess all relevant impacts (direct, indirect, facilitated and cumulative) to listed threatened species and ecological communities 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 such as dust and noise.
- 14.55 Identify 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.
- 14.56 For threatened ecological communities, the total direct impact (in hectares) to each identified patch within and adjacent to the project site is to be provided in the MNES section compared to its current extent. 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.
- 14.57 Provide the total amount of each type of habitat (in hectares) in the disturbance footprint for each listed threatened species and ecological community. This assessment should be supported by maps which clearly identify the interface between impacted and retained habitat, with tables of coordinates appended.
- 14.58 Assess how the action impacts the outcomes, objectives and targets of relevant reports and documents.

#### Avoidance, mitigation and management<sup>61</sup>

- 14.59 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).
- 14.60 The MNES section 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. Committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) must be used.

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<sup>60</sup> The impact assessment must meet the requirements outlined in the 'Relevant Impacts' section above

<sup>61</sup> 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

## Statutory requirements

- 14.61 Where relevant, discuss how the proponent has had regard to the most recent approved conservation advice/s.
- 14.62 The MNES section is to demonstrate, with supporting evidence, that the action will not be inconsistent with Australia's obligations under:
- (a) the Biodiversity Convention
  - (b) the Convention on Conservation of Nature in the South Pacific (Apia Convention)
  - (c) the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)
  - (d) a recovery plan or threat abatement plan.

## Significant impact assessment<sup>62</sup>

- 14.63 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 DCCEE's *Significant impact guidelines 1.1* (2013).
- 14.64 The MNES section must provide a clear and definitive conclusion (i.e. 'likely' or 'unlikely'), including the extent and nature, of residual significant impacts on relevant listed threatened species and ecological communities to align with the EPBC Act *Environmental Offsets Policy* (2012).

## Other approvals and conditions

- 14.65 The MNES section is to include 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.

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<sup>62</sup> As outlined at the 'Environmental Offsets' section above.



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

- 14.66 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.
- 14.67 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

- 14.68 The economic and social impacts of the action, both positive and negative, must be analysed in the MNES section. Matters of interest may include:
- (a) details of any public consultation activities undertaken, including any consultation with Indigenous stakeholders, and their outcomes<sup>63</sup>
  - (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.
- 14.69 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.

## Principles of Ecologically Sustainable Development (ESD)

- 14.70 Provide a discussion of how the action will conform to the principles of ESD,<sup>64</sup> as described under Part 1, Section 3A of the EPBC Act:
- (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.

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<sup>63</sup> 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'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>

<sup>64</sup> Refer to the National Strategy for Ecologically Sustainable Development (1992) at <https://environment.gov.au/about-us/esd>.

## Information sources provided in the MNES section

14.71 For information given in the MNES section, the MNES section 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.

## 15. Appendices to the EIS

- 15.1 Appendices are to provide the complete technical evidence used to develop assumptions, statements and findings in the main text of the EIS.
- 15.2 No significant issue or matter is to be mentioned for the first time in an appendix. Such matters are to be addressed in the main text of the EIS.
- 15.3 Include a table listing the section and subsection of the EIS where each requirement of the TOR is addressed.
- 15.4 Include a list citing all reference material used or relied on in the EIS.
- 15.5 Include a glossary of terms and a list of acronyms and abbreviations.

## Part D Acronyms and abbreviations

The following acronyms and abbreviations have been in this document.

Acronym/abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i>
AHD	Australian Height Datum
CBA	cost benefit analysis
DCCEEW	Department of Climate Change, Energy the Environment and Water
EIS	environmental impact statement
EP Act	<i>Environmental Protection Act 1994</i>
EP regulation	Environmental Protection Regulation 2019
EPBC Act	<i>Environmental Protection Biodiversity Conservation Act 1999 (Cwth)</i>
EPP	Environmental Protection Policy (under the EP Act)
ERA	environmentally relevant activity
ESD	ecologically sustainable development
GDA2020	Geocentric Datum of Australia 2020
km	kilometres
ML	megalitres
MNES	matters of national environmental significance
MSES	matters of state environmental significance
NC Act	<i>Nature Conservation Act 1992</i>
OAMP	Offset Area Management Plan
RIA	regional impact analysis
RPI Act	<i>Regional Planning Interests Act 2014</i>
SDAP	State Development Assessment Provisions
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i>
SIA	social impact assessment
SIMP	Social Impact Management Plan
SPP	State Planning Policy 2017
TOR	terms of reference
VM Act	<i>Vegetation Management Act 1999</i>

# Appendix 1. Policies and guidelines

## General

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## Appendix 2. MNES listed threatened species and communities

The following list includes the listed threatened ecological communities and species relevant to the controlled action under the EPBC Act, which at a minimum, the project's potential impacts are to be assessed in the MNES section 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 (22 March 2022) 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)

- Lowland Rainforest of Subtropical Australia
- Poplar Box Grassy Woodland on Alluvial Plains
- Subtropical eucalypt floodplain forest and woodland of the new South Wales North Coast and South East Queensland bioregions
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived native Grassland

### Listed threatened species

#### Listed threatened plants

- Hairy-joint Grass (*Arthraxon hispidus*)
- Three-leaved Bosistoa, Yellow Satinheart (*Bosistoa transversa*)
- Ooline (*Cadellia pentastylis*)
- Bluegrass (*Dichanthium setosum*)
- Tall Velvet Sea-berry (*Haloragis exalata* subsp. *velutina*)
- *Leionema obtusifolium*
- Wandering Pepper-cress (*Lepidium peregrinum*)
- Macadamia Nut, Queensland Nut Tree, Smooth-shelles Macadamia, Bush Nut, Nut Oak (*Macadamia integrifolia*)
- *Paspalidium grandispiculatum*
- Mt Berryman Phebalium (*Phebalium distans*)
- *Plectranthus omissus*
- Scrub Turpentine, Brown Malletwood (*Rhodamnia rubescens*)
- Native Guava (*Rhodomyrtus psidioides*)
- Quassia (*Samadera bidwillii*)
- Blotched Sarcocylus, Weinthals Sarcanth (*Sarcocylus weinthalii*)
- *Sophora fraseri*



- Austral Toadflax, Toadflax (*Thesium australe*)

### Listed threatened fauna

#### Terrestrial

- Large-eared Pied Bat, Large Pied Bat (*Chalinolobus dwyeri*)
- Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] (*Dasyurus hallucatus*)
- Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) *Dasyurus maculatus maculatus*
- Ghost Bat (*Macroderma gigas*)
- Greater Glider (southern and central) (*Petauroides volans*)
- Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*)
- Brush-tailed Rock-wallaby (*Petrogale penicillata*)
- Koala (*Phascolarctos cinereus*)
- Long-nosed Potoroo (northern) (*Potorous tridactylus tridactylus*)
- New Holland Mouse, Pookila (*Pseudomys novaehollandiae*)
- Grey-headed Flying fox (*Pteropus poliocephalus*)
- Five-clawed Worm-skink, Long-legged Worm-skink (*Anomalopus mackayi*)
- Adorned Delma, Collared Delma (*Delma torquata*)
- Dunmall's Snake (*Furina dunmalli*)
- Grey Snake (*Hemiaspis damelii*)

#### Birds

- Regent Honeyeater (*Anthochaera phrygia*)
- Australasian Bittern (*Boaureus poiciloptilus*)
- Curlew Sandpiper (*Calidris ferruginea*)
- South-eastern Glossy Black-Cockatoo (*Calyptorhynchus lathami lathami*)
- Coxen's Fig-Parrot (*Cyclopsitta diophthalma coxeni*)
- Red Goshawk (*Erythrorhynchis radiatus*)
- Grey Falcon (*Falco hypoleucos*)
- Squatter Pigeon (southern) (*Geophaps scripta scripta*)
- Painted Honeyeater (*Grantiella picta*)
- White-throated Needletail (*Hirundapus caudacutus*)
- Swift Parrot (*Lathamus discolor*)
- Eastern Curlew, Far Eastern Curlew (*Numenius madagascariensis*)
- Australian Painted Snipe (*Rostratula australis*)
- Black-breasted Button-quail (*Turnix melanogaster*)



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