

Terms of reference for an environmental impact statement

Mt Rawdon Pumped Hydro project

June 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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Contact us

☎ 1800 001 048

@ mtrawdon@coordinatorgeneral.qld.gov.au

🌐 www.statedevelopment.qld.gov.au

✉ PO Box 15517, City East, Queensland 4002

🏠 1 William Street, Brisbane 4000

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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 Mt Rawdon Pumped Hydro project (the project) proposed by Mt Rawdon Operations Pty Ltd (Mt Rawdon Operations) and ICA Investment Services Pty Ltd (ICA Investment Services) (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 with the capacity to store up to 20,000 megawatt hours (MWh) (or 20 gigawatt hours) of energy, allowing for up to 40 hours of continuous electricity generation at 500 megawatts per hour (MW/hr), 20 hours of continuous generation at 1 gigawatt per hour (GW/hr), or 10 hours of generation at 2 GW/hr.
- 1.3 The proposed project comprises:
 - (a) a pumped hydro-electricity generation facility, comprising a lower storage reservoir (formed by the decommissioned mine pit of the Mt Rawdon Mine), upper storage reservoir (formed by a purpose-built valley fill dam), waterway tunnels linking the two storages, underground power station cavern, switchyard and associated access works
 - (b) an aboveground electricity transmission line and substation, connecting the generation facility to the existing Powerlink transmission network
 - (c) upgrades/duplication of the existing water pipeline (connecting the generation facility to Paradise Dam), comprising a pump, pipes and power supply to enable the first fill of the storage reservoirs
 - (d) temporary facilities required during the construction phase, comprising a construction camp (including water and wastewater systems and access haul roads and tracks), concrete batching plant, quarry, laydown areas and material stockpiles.
- 1.4 The proposed project is located near Mount Perry, 75 kilometres (km) south-west of Bundaberg, Queensland, in the local government areas of North Burnett and Bundaberg, and partially within the mining tenements of the existing Mt Rawdon Mine. The proposed project is located within the Central Queensland renewable energy zone.

2. Statutory basis

- 2.1 The Coordinator-General has declared the Mt Rawdon Pumped Hydro 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, for which the proponent is required 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, following the outcomes of public consultation.

3. Accredited EIS process for controlled actions under Commonwealth legislation

- 3.1 The proponent referred the project to the Australian Government Department of Climate Change, Energy, the Environment and Water (DCCEEW) (EPBC2022/09283 and

EPBC2022/09284). On 27 September 2022 and 16 November 2022, the delegate for the Australian Minister for the Environment and Water decided that the project (lodged as two separate referrals) is a 'controlled action' requiring approval under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) due to the likely potential impacts on matters of national environmental significance (MNES). The MNES controlling provision applicable to both the pumped hydro project (EPBC2022/09284) and transmission line (EPBC2022/09283) is:

(a) listed threatened species and communities (sections 18 and 18A of the EPBC Act).

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

3.3 The assessment of the controlling provisions, mitigation measures and any offsets for residual impacts are to be described and illustrated in a stand-alone report in the EIS that fully addresses the matters relevant to the controlling provisions. The MNES section of the EIS is to address the cumulative impacts of the project and each of the two referrals in their own right. Stand-alone assessments of each controlled action against the controlling provision are to be provided as separate appendices (included as part of the EIS). Section 15 of this TOR, developed in consultation with the DCCEE, 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 2), 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 2.

5. More information

5.1 For information about the project or the EIS process under the SDPWO Act, visit 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 proposed project are identified and assessed
 - (c) detail the management, monitoring and mitigation measures proposed to avoid, minimise and/or mitigate any adverse impacts
 - (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 Address matters relevant to the environmental objective assessment and performance outcomes specified in Schedule 8 of the Environmental Protection Regulation 2019 (Qld) (EP Regulation).
- 6.4 The detail at which the EIS deals with matters relevant to the proposed 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 this 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 to be addressed
 - (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, guidelines or policies come into effect after the TOR has been finalised, regardless of whether the legislation, guidelines or policies have been listed in the TOR¹
 - (e) the proponent makes amendments to the proposed project that would result in a change in the nature, timing or location of any impacts.²

¹ Note transitional arrangements or exemptions may apply for individual projects.

² The proponent is to notify the Coordinator-General of any amendments to the proposed project as described in the project's initial advice statement.

6.6 Section 14, Climate – Greenhouse Gas Emissions (GHG) of this TOR has been prepared in collaboration with the Department of Environment and Science (DES). In accordance with the Queensland Resources Industry Development Plan (QRIDP) (June 2022), DES is developing an Industry Decarbonisation Plan Policy, which may change the requirements of Section 14, Climate – GHG. The proponent may be required to be consistent with the Industry Decarbonisation Plan Policy once finalised.

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 the latest version of relevant policies, standards and guidelines, including but not limited to those listed in Appendix 2. 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 professionals, relevant to the field of expertise required for each subject matter
- (d) provide all available baseline information relevant to the environmental risks of the proposed project including seasonal and long-term variations. Site specific baseline data should be used. Include details 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, and any assumptions, exclusions and limitations.³ 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 proposed project
- (f) present the feasible project options that were considered in selecting the preferred option including the consequences of not proceeding with the proposed project (the 'do nothing' option). Demonstrate why the preferred option 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
- (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

³ Any technical reports supporting the assessment and conclusions made in the EIS should be provided. These reports can be provided as appendices.

be implemented during construction and operation, to meet the predicted project outcomes

- (i) include detailed environmental management plans (EMPs) for both the construction and operation phases of the project. The EMPs 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 EMPs are to be presented as a stand-alone documents without reference to other parts of the EIS.

7.2 The contents of the EMP are to comprise:

- (a) the project's commitments to acceptable levels of environmental performance, 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 performance standards
- (d) a figure showing the full extent of project disturbance area.

7.3 Each matter assessed in the EIS (as described in sections 14 and 15 of this TOR) is to:

- (a) include a concise description of the potential impacts of the proposed project
- (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 potential impacts
- (c) demonstrate how monitoring will be used to confirm environmental objectives are being met, including using baseline data to track environmental outcomes
- (d) include a figure showing the full extent of proposed disturbance for the project.

7.4 Assess the extent to which the construction, operation, decommissioning and rehabilitation (to the extent known) of the proposed 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 and guidelines. If there is a conflict, explain how the proposed 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* (Qld) (EP Act), the EP Regulation, environmental protection policies (EPPs), State Planning Policy 2017 (SPP), State Development Assessment Provisions (SDAP) and relevant guidelines.⁴

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/s.

7.7 Describe the stakeholder engagement activities that have occurred during the preparation of the EIS, including Aboriginal and Torres Strait Islander peoples' stakeholder consultation. Identify the issues raised during consultation and explain how the responses from the

⁴ Examples are included in Appendix 2.

community and agencies have and will be incorporated into the design and outcomes of the proposed project.

- 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	The EIS and accompanying appendices are to be produced on A4 size and are to be capable of being photocopied. Each PDF file must meet the accessibility requirements described in the <i>Adobe Acrobat X Pro Accessibility Guide: PDF Accessibility Overview</i> , available at: www.adobe.com/accessibility/products/acrobat/training.html
Format and style	The format and style of the document is to be appropriate for publication on the Internet.
Data	Provide raw sampling and monitoring data in both PDF and excel spreadsheet formats, and other numerical data as requested.
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 dot points per inch (DPI).
Locations	All geographical coordinates throughout the EIS are to be provided in latitude and longitude against the Geocentric Datum of Australia 2020 (GDA2020).
Elevations	Elevations detailed within 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 component 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 requirements⁵	
Guidelines	Refer to DES Guideline – <i>Spatial information submission</i> (see Appendix 2).
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	All data is to contain descriptive attributes or columns, including but not limited to the following: <ul style="list-style-type: none"> • date data was created • version number • who created the data (i.e. the company name) • datum (e.g. GDA2020) • category or stage.

⁵ Refer to Refer to DES Guideline – *Spatial information submission* (see Appendix 2).

Format requirements

Projection

Projection	Data can be provided in any projection; however geographic information is preferred. The datum shall be GDA2020.
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Metadata

Use standards	ISO 19115:2015 ANZLIC ISO 1.1
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Part C EIS content and suggested structure

8. Executive summary

- 8.1 The executive summary is to describe the proposed 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 align with 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 address and Australian Business Number, and details of any joint venture partners
 - (b) nature and extent of each proponent's business activities
 - (c) proponent's (including director's) experience in pumped hydro technologies and developing and implementing comparable major projects
 - (d) proponent's (including director's) 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) a description and declaration of 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 completion date for 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 the following about the proposed project:
- (a) project title
 - (b) expected capital expenditure
 - (c) need and rationale for the project
 - (d) nature, location and scale of all project components and activities relevant to the proposed project construction, operation and decommissioning activities. This information should be provided separately for the electricity transmission line and pumped hydro components
 - (e) upper reservoir design and location, spillway design and access to the upper reservoir site
 - (f) proposed project operation, using easily understood conceptual drawings showing 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 and how the energy storage components function
 - (g) vertical water level fluctuation, volume proposed within upper and lower reservoirs and frequency and duration of emptying (pumping) and filling (generating)
 - (h) clarify and detail the interaction and relationship between the proposed project and Mt Rawdon Mine including:
 - (i) aspects of the proposed project reliant on the Mt Rawdon Mine and infrastructure
 - (ii) timeframes and acceptable site conditions for any project transfer
 - (iii) arrangements for how ownership and site responsibility will be managed between the mine and the proposed project.
 - (i) extent of inundation areas, catchment areas, flood margins and overland flows in and out of the project site including water diversions
 - (j) proposed on-site water storage and treatment for use by the project, including site workforce
 - (k) proposed sewage infrastructure relevant to environmentally relevant activity (ERA) 63, including wastewater treatment and any proposed irrigation
 - (l) other utility requirements including electricity, gas and telecommunications
 - (m) transport requirements, including access to the site and within the site (e.g. access tracks and haul roads)
 - (n) regional and local infrastructure context of the proposed project, including electricity and water supply infrastructure (with maps at suitable scales)
 - (o) 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

- (p) relationship to other major projects and/or developments (of which the proponent should reasonably be aware)
- (q) workforce numbers to be employed by the project during all project phases and source of local workforce (include peak, direct workforce numbers and estimated proportion of fly-in fly-out (FIFO)⁶ workforce, expressed as annual average full-time equivalent positions created during each phase) This information should be provided separately for the proposed pumped hydro component and electricity transmission line
- (r) where and how personnel are to be accommodated during construction and operation of the proposed project
- (s) where relevant, the likely recruitment of workers from local and regional communities and workers who will live in regional communities and rostering arrangements for local, regional and FIFO workers to be adopted
- (t) proposed travel arrangements of the workforce to and from work, including use of FIFO workforce or drive-in drive-out workforce.

Infrastructure requirements

- 10.2 Detail the location of works to be undertaken, with concept and layout plans (in plan and cross-section views and including existing infrastructure within and adjacent to the project site), requirements for new infrastructure, or the upgrading, retention, relocating and/or decommissioning of existing infrastructure on and off site to service the proposed project.
- 10.3 Provide plans for each project component, with sufficient detail to enable the Coordinator-General and relevant agencies to adequately assess the project in the context of the approvals being sought through the EIS process.
- 10.4 Infrastructure to be considered is to include, but is not limited to, pumped storage hydro-electricity generation facility, electricity transmission line and substation, water pipeline and temporary facilities including construction camp (including water and wastewater systems), access roads (including any waterway crossings), concrete batching plant, quarry, laydown areas and material stockpiles.
- 10.5 Describe the timing of requirements for all project related infrastructure (from pre-construction through to decommissioning/rehabilitation of the project).
- 10.6 Detail whether the infrastructure is permanent or temporary and nominate if it constitutes waterway barrier works.
- 10.7 Provide details of the alignment options assessed for any proposed new access road, electricity transmission line, telecommunication and water supply pipelines, including justification for the preferred and final alignment chosen. This assessment is to include justification for locating any infrastructure on state land over other land and reference any relevant legislation.
- 10.8 Include names of the required infrastructure 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.

⁶ FIFO is defined in Schedule 1 under the *Strong and Sustainable Resource Communities Act 2017* which means a worker who travels to the project by aeroplane, or another means, from a place that is not a nearby regional community for the project.

- 10.9 Specify the timing of and volume of water required for each stage of the project (construction, initial fill, and ongoing maintenance fills) and describe where the water will be sourced from, including any interactions with water associated with the Mt Rawdon Mine, the Perry River Dam, Paradise Dam and Fred Haigh Dam. Detail:
- (a) how water within the Mt Rawdon Mine pit and any other water structure associated with the mine is being considered as part of the proposed project
 - (b) how the proposed Paradise Dam upgrade is being considered as part of the proposed project
 - (c) how the existing Paradise Dam to Mt Rawdon Mine pipeline is being considered as part of the proposed project.
- 10.10 Describe the purpose of all dams or levees proposed on the proposed project area. Show their locations and dimensions on appropriately scaled maps and provide plans and cross-sections illustrating such features as waterways and watercourses, embankment heights, length and crest level, spillway type and dimensions, discharge outlets, design storage allowances, discharge capacities (spillways and outlets) and maximum storage volumes.
- 10.11 Describe how storage structures and other infrastructure would be sited to avoid or minimise risks from flooding.
- 10.12 Detail all energy requirements for the project. Present and illustrate the quantity and timing of available renewable energy in the National Electricity Market compared to renewable electricity requirements of the project and timing of operations.
- 10.13 Describe how the project will access renewable generated electricity for its power supply and demonstrate that the project demand will not result in additional demand for non-renewable electricity sources by other users (or the project in the event there are insufficient renewable sources available).

Design of infrastructure

Water storage infrastructure

- 10.14 Describe the process and criteria used, including relevant supporting information and data to select the preferred design and construction techniques for the lower storage and upper storage reservoirs, including:
- (a) transition from existing mining water supply and containment structures (e.g. Mt Rawdon Mine pit) to the lower storage reservoir
 - (b) fully supply level (FSL) inundation areas and details of any staging or prospects for future expansion showing site boundaries, development sequencing and timeframes
 - (c) maximum (final) wall height and width and spillway height and width, including heights above stream bed/ground level, of all water storage infrastructure
 - (d) location of all water storage infrastructure in relation to waterways⁷ and watercourses⁸

⁷ 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.

⁸ 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.

- (e) details of the storage operations and behaviour, including the minimum operating levels, likely headwater fluctuations in storage water levels and impacts to those fluctuations on embankment and storage extremity stability, likely release timings (into the reservoirs, downstream releases or spillway releases), volumes, frequencies and durations
- (f) storage capacity, maximum and minimum depths, average depth, 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 and tributaries inundated
- (g) general design and location of turbines and pumping infrastructure (including details of screening), inlet and outlet works, and offtake works into the reservoirs including siting, capacity, relation to water levels, location, screening and ability to regulate flows, aquatic fauna exclusion and protection systems and location of outlet in relation to any fauna passage device, any existing infrastructure in the vicinity of the outlet works.
Demonstrate the avoidance of injury and mortality to fish
- (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
- (i) details of the spillway, apron and dissipater designs 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 periods of no flow, if relevant
- (j) quantify and describe the predicted duration, timing and frequency of spills when the capacity of storage is exceeded, including timing, volume, duration and downstream extent of spills
- (k) 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 effect on the viability of the proposed project⁹
- (l) construction methods including removal of any materials and sourcing materials for structures e.g. earthen/sand, concrete, rock and/or sheet pile, location, volume, tonnage and quality of natural resources required
- (m) modelling of the storage behaviours under various scenarios to allow assessment of the effect on aquatic and riparian (edge) habitat of the various storage levels to full storage capacity
- (n) details of proposed operation and design (including any automated components) in relation to flood levels and relevant environmental conditions
- (o) details of associated instream structures, including any permanent or temporary waterway barrier works e.g. for access or water delivery
- (p) details of the physical form of the stream beds within at least 1000 metres (m) of the 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 proposed project's impacts on stream bed morphology, and bank and channel stability

⁹ 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.

- (q) details of any environmental releases and associated infrastructure.
- 10.15 Describe how risks associated with failure of the lower or upper storage reservoirs, seepage through the floor, embankments of the storages, and/or with overtopping of the structure will be avoided, minimised or effectively mitigated to protect people, property and the environment. This is to include a failure impact assessment of the existing and proposed water storages and describe the outcomes of that assessment including where population is at risk should a failure occur and any mitigation measures.

Tunnelling Infrastructure

- 10.16 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
 - (f) location in relation to waterways and watercourses including whether they are below the bed of waterways (e.g. via horizontal directional drilling) to avoid impacts to waterways.
- 10.17 Assess potential impacts as a result of tunnelling including:
- (a) interactions with groundwater, including risk of groundwater drawdown and groundwater drawdown-induced during tunnelling
 - (b) tunnel dewatering
 - (c) geotechnical qualities of project area, including risk of landslides
 - (d) subsurface impacts on root systems of overlying vegetation
 - (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 station and transmission line

- 10.18 Describe, map and illustrate with appropriately scaled maps:
- (a) all permanent and temporary work areas, including access corridors, laydown areas, material stockpiles and drill pad areas for geotechnical investigations
 - (b) infrastructure which comprises the waterway tunnels linking the two storages and proposed pumped underground hydro-electric power station
 - (c) aboveground transmission line system from the underground power station to the energy distribution network. Include a description of the transmission infrastructure and impacted properties/tenure
 - (d) aboveground transmission line route from the power station to the end point, and associated easement and buffer requirements

- (e) ancillary infrastructure required to 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 and access requirements
 - (f) any proposed tunnelling required for the delivery of water to supply the pumped hydro-electric power station, 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.
- 10.19 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 sourced e.g. rock, sand, riverbed material and the proposed locations for disposal of waste material resulting from the construction of the foundations.
- 10.20 Describe how the pumped hydro-electric power station and associated infrastructure would prevent the entrainment, injury and mortality of fish and other aquatic fauna. For example, intakes are to be appropriately screened to prevent fish and other aquatic fauna entrapment and entrainment. Refer to *Design specifications for fish-protection screens in Australia*¹⁰ and *The practical guide to modern fish-protection screening in Australia*¹¹ for further guidance.

Ancillary infrastructure requirements

- 10.21 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 proposed project. Infrastructure to be considered is to include, but is not limited to:
- (a) water pipeline/s
 - (b) water release points and infrastructure
 - (c) resource extraction areas and associated infrastructure
 - (d) transport and utility infrastructure and corridors, including necessary access roads and tracks in relation to waterways, including any required upgrades to existing waterway crossings
 - (e) site construction facilities, including construction workforce accommodation, water supply and treatment, energy supply from the grid, fuel and chemical storage, solid waste disposal (i.e. construction waste, waste rock and general waste), wastewater treatment and disposal, and sewerage systems
 - (f) other infrastructure (such as buildings, yards, pumps, fences, dips).
- 10.22 Detail whether the infrastructure is permanent or temporary and nominate if it constitutes waterway barrier works.
- 10.23 Nominate the building and construction standards for the works.

¹⁰https://www.dpi.nsw.gov.au/_data/assets/pdf_file/0006/1373577/Design-specifications-for-fish-protection-screens_FINAL_WPA.pdf
¹¹https://researchoutput.csu.edu.au/ws/portalfiles/portal/180574914/A_guide_to_modern_fish_protection_screening_in_Australia_FINAL_WPA.pdf

- 10.24 Describe the timing of requirements for this infrastructure and detail the decommissioning schedule for all project-related infrastructure.
- 10.25 Identify 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.
- 10.26 Identify infrastructure alternatives considered and justify selected options, particularly with respect to environmental impacts.

Project staging

- 10.27 Provide a detailed description of the proposed project activities within each phase of the project (decommissioning relevant mining activities, pre-construction, construction and operation and decommissioning/rehabilitation), including scope of works (on the project site and required infrastructure – new and upgraded), disturbance area, physical layout of the proposed project over time, likely timing of the project including any stages and the sequencing of these stages.

Pre-construction

- 10.28 Identify if any land acquisition is proposed and detail the land ownership details.
- 10.29 Describe the pre-construction activities and their location, including the decommissioning of relevant mining activities, with appropriate scaled maps, including:
- (a) pre-disturbance surveys, including geotechnical, topographic, contaminated land, flora and fauna, water quality, cultural heritage, air quality, noise and vibration and how this information will be used in the final design and construction of the proposed project¹²
 - (b) all pre-construction activities including the timing, staging and sequencing (e.g. vegetation clearing, site access, works within, including interference with watercourses¹³, waterways, and floodplain areas including nearby Perry River Dam, and Paradise Dam) and days and hours of operation (including night-time works)
 - (c) consents and approvals required to access land or purchase land or obtain easements
 - (d) current and additional approvals, licences and permits require for water take
 - (e) approvals, licences and permits required for the construction works
 - (f) proposed infrastructure, including establishment of construction site facilities and services
 - (g) any required demolition, temporary augmentation or other preparatory activities on existing structures
 - (h) proposed vegetation clearing, top- and sub-soil removal and stockpiling
 - (i) project area access arrangements where access to the site is on tenure not held by the proponent

¹² 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).

¹³ As shown on the Queensland Government Water Watercourse identification map.

- (j) proposed upgrades, realignments, relocation, deviation or restricted access to roads and other infrastructure including water, power and telecommunications
- (k) solid, liquid and gaseous waste generated and proposed methods of treatment and disposal including any requirements for dewatering of underground infrastructure
- (l) all ERAs, notifiable activities and land listed on the Environmental Management Register (EMR) and Contaminated Land Register (CLR)
- (m) effective environmental management measures included as part of the project design
- (n) effective erosion and sediment control measures, water sensitive urban design features, and measures and controls for managing flooding, actual and potential acid sulfate soils and contaminated land
- (o) existing infrastructure and easements on affected land
- (p) land and water contamination survey and sampling methods, any decontamination required and proposed decontamination methods and programs
- (q) biosecurity management of weeds, pests and diseases for pre-construction activities, including where personnel, plant and equipment are introduced to undeveloped areas.

Construction

- 10.30 Identify the extent and nature of construction activities required for the lower storage and upper storage 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.
- 10.31 Illustrate site boundaries, buffer zones, development sequencing and timeframes and the layout of construction facilities.
- 10.32 Describe the nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw material.
- 10.33 Describe proposals to divert waterways/drainage features during construction, 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).
- 10.34 Describe changes to hydrology, flooding and overland flow on or off the site as a result of the construction of project components, including upper reservoir, crossings, spillway, fishways, downstream barriers, flood levees, water off-takes and, locations of any proposed water discharge points.
- 10.35 Describe the construction activities and their location, with appropriately scaled maps, including:
 - (a) construction timetable, sequencing and staging plans (provide detailed plans, drawings and maps to illustrate these matters, where relevant)
 - (b) proposed construction methods, associated equipment and techniques
 - (c) days and hours of operation for proposed construction works, specifying any activities undertaken at night
 - (d) water sources, use, volumes and storage requirements during construction

- (e) site drainage, effective erosion and stormwater management, flood protection and waste-water management
- (f) dimensions of earth and rock works and excavations
- (g) known locations of new or altered works and structures and infrastructure necessary (such as construction laydown areas) for the proposed project at all stages of its development, whether on or off the project area or right of way and intersections required with existing infrastructure (including but not limited to water pipeline, road, power)
- (h) disturbance areas including buffer zones
- (i) type, amount and source of construction materials required for the proposed project and mode of delivery
- (j) the construction, environmental and safety standards, methods and site management arrangements
- (k) any new electricity transmission or water infrastructure, including routes and easements
- (l) 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
- (m) nature and location of workforce accommodation
- (n) any activity that is an ERA
- (o) 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
- (p) 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 stockpiles) (note: for the purposes of this, the terms 'proposed project', 'extraction' and 'screening' have the meanings identified in Schedule 2 – ERA 16, EP Regulation 2019)
- (q) source of materials and infrastructure for the project, their nature and mode of delivery
- (r) mitigation works within the site and off-site (e.g. sediment and erosion protection, sediment traps, fencing) to protect water quality and environmental values
- (s) details of how flood landslides and bushfire events would be managed during construction
- (t) any potential disruption to flows in watercourses/waterways and tributaries during construction and any diversion works required including temporary diversions and cut-off drains
- (u) management of fauna and vegetation material generated by clearing for construction and the upper and lower storage reservoirs
- (v) 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 14 – Transport

- (w) 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
- (x) capacity of high-impact plant and equipment, their chemical and physical processes, and chemicals or hazardous materials to be used
- (y) any take or interference with water in a watercourse, lake or spring, overland flow water, and underground water (both direct and in-direct)
- (z) 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, GDA2020), 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.
- (aa) 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 14 – Land
- (bb) solid and liquid waste management (full details of the waste volumes, characteristics and management strategies) are to be provided in accordance with section 14 – Waste management
- (cc) public and workforce safety, medical facilities to be provided on site and provision for access to emergency services
- (dd) allowance for provision of power back-up in emergency and potential impact on local supplies in the area
- (ee) security services
- (ff) construction site demobilisation
- (gg) biosecurity management of construction areas, access routes and ancillary infrastructure, including personnel hygiene stations, vehicle washdown bays, access management.

Mine closure activities

- 10.36 Describe and map any Mt Rawdon Mine closure and rehabilitation activities that would impact on the proposed project. Provide a clear description of all mine decommissioning, environmental protection mitigation measures, management strategies, and rehabilitation activities directly relevant to the proposed project and how any disturbance or rehabilitation activities associated with the Mt Rawdon Mine not forming part of the proposed project, will be differentiated.

Rehabilitation

- 10.37 Describe the rehabilitation activities to be undertaken during and after construction, providing maps where appropriate. This information should be provided separately for the electricity transmission line and pumped hydro components, and should describe:

- (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 proposed project. A preferred rehabilitation strategy is to be developed with a view to minimise the amount of land disturbed at any one time
 - (c) where capital works, revegetation and rehabilitation methods are to be utilised, describe rehabilitation methods
 - (d) final topography and excavation depths of any quarries, borrow areas, trenches, sediment control structures, waste areas, temporary waterway barrier 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.
- 10.38 Describe how the rehabilitation costs of the Mt Rawdon Mine (on or off mining lease) have been considered in the proposed rehabilitation outcomes including consideration of:
- (a) Department of Environment and Science's Estimated rehabilitation cost under the Environmental Protection Act 1994 (ESR/2018/4425)
 - (b) estimated rehabilitation cost calculator – mining (ESR/2018/4425) and supporting guideline – User guide of estimated rehabilitation cost calculator user guide – mining (ESR/2019/4326).

Operation

- 10.39 Describe how each component of the proposed project would be operated with appropriately scaled maps, including:
- (a) hours of operation for each component of the proposed project
 - (b) infrastructure commissioning process including landscaping, headrace and tailrace and the rehabilitation of affected areas after construction
 - (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 (storage reservoirs, pipes, roads, transmission lines, fauna passage and exclusion infrastructure, and all other components of the proposed project)
 - (e) operational arrangements for the proposed 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
 - (f) water requirements post construction for landscaping, revegetation and office use

- (g) proposed access to each project component for operations and maintenance activities, 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, including land exposed at water levels below FSL or within the water storage, particularly they relate to safety considerations
- (j) energy requirements, including any co-location of power and telecommunications requirements and sources
- (k) transport needs and expected traffic
- (l) expected life of the infrastructure and any anticipated major maintenance periods
- (m) demonstrate the effectiveness, operational range and frequency of any proposed fauna passage and the safe design and operation of all water infrastructure to avoid injuries to fauna traversing or utilising the habitat
- (n) capacity of high-impact plant and equipment
- (o) solid, liquid and gaseous waste generated and proposed methods of effective treatment and disposal, including requirements for dewatering of underground infrastructure
- (p) type, volume and rate of chemicals and hazardous materials to be used and stored
- (q) water use, sources, volumes and storage requirements. This should be described separately for storage fill and other operational activities
- (r) existing and ongoing use of infrastructure and land associated with the Mt Rawdon Mine or rehabilitation activities (e.g. accommodation facilities, offices and mine voids), noting location in proximity to project components
- (s) Detail 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

- 10.40 It is recognised that project components are anticipated to have a long operational life spanning many decades. This section is to present general strategies, options and methods for decommissioning and rehabilitation of the proposed project, including underground infrastructure, should it ever be required.

Site description

- 10.41 Provide property descriptions for all land potentially impacted by the proposed project, including 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 and exploration tenures, stock routes, conservation tenures, state forest, native forest and timber reserves, and legally secured offset areas (if any).

- 10.42 Describe and illustrate, with suitably scaled maps, potential impacts to property detailed in section 10.41 above as a result of the proposed project. In particular, consider 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 or spillway releases.
- 10.43 Describe and illustrate with appropriately scaled maps all transport corridors, private roads, local and state-controlled roads, pipelines, private and government owned corporation energy infrastructure, rail, air services,¹⁴ maritime and other infrastructure or services in the region relevant to or impacted by the proposed project (permanently or temporarily), including its construction and operation activities.
- 10.44 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 proposed project.
- 10.45 Describe and illustrate the topography of the project area and surroundings on maps and highlight any significant features. Include and name rivers and creeks, watercourses, lakes, springs and unmapped features in accordance with the *Water Act 2000* (Qld) (Water Act). When mapping watercourses, lakes, springs and unmapped features identify any existing relevant watercourse identification maps¹⁵. Watercourses and drainage features identified on the Vegetation Management Watercourse and Drainage Feature map (s 20AB of the *Vegetation Management Act 1999* (Qld) (VM Act)) must be described and illustrated.
- 10.46 Map the location and boundaries of the project's footprint, including all inundation areas and infrastructure elements and development necessary for the proposed 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 culverts, 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.
- 10.47 Describe and illustrate at an appropriate scale specific information for each component of the proposed project including the precise location of the project area and activities at the significant stages of construction, operation, rehabilitation and closure in relation to:
- (b) any waterbodies and waterways¹⁶
 - (c) protected areas (included but not limited to conservation parks, nature refuges, national parks), forest reserves, state forests and legally secured offset area (if any)
 - (d) matters of national and state environmental significance

¹⁴ As defined in the State Development Assessment Provisions.

¹⁵ 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.

¹⁶ 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.

- (e) relevant mapped areas identified in the Wide Bay Burnett Regional Plan (e.g. priority agricultural areas, regional biodiversity corridors and regional biodiversity value areas)
- (f) the location of any proposed buffers surrounding the working areas
- (g) lands identified for conservation (either through retention in their current natural state or to be rehabilitated)
- (h) 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.

- 10.48 Describe and map in plan and cross-sections the geology and landforms of the project area and surrounds, including the boundaries of water catchment areas. Show geological structures, such as aquifers, faults and economic resources (such as agricultural, timber, quarries and existing/historic mining projects), and any other relevant projects and known development proposals that could have an influence on, or be influenced by, the proposed project and its construction and operational activities.
- 10.49 Describe, map and illustrate land, 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 the Department of Environment and Science (DES) *Application requirements for activities with impacts to land* and DES *Land – EIS information guideline* (see Appendix 2). Identify soils that would require specific management due to wetness, erodibility, sodicity, depth, acidity, salinity or other features.
- 10.50 Describe with concept and layout plans, in both plan and cross-section views, requirements for constructing, upgrading or relocating all infrastructure associated with the proposed 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, 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.
- 10.51 Describe the site in the context of planning schemes, regional plans, state policies and government priorities for the project area.
- 10.52 Describe the findings of the Queensland Agricultural Land Audit¹⁷ and any land identified as strategic cropping land, priority agricultural area, priority living area or strategic environmental area for the project area.
- 10.53 Describe tourist destinations and sites used for recreation in and adjoining the proposed project area.
- 10.54 Provide plans and drawings with sufficient detail to enable the Coordinator-General and relevant agencies to adequately assess the project in the context of the approvals being sought.

¹⁷ 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>

11. Project rationale and alternatives

- 11.1 Demonstrate the need for the proposed project and its scale by evaluating projected outputs and usage, including in a regional, state and national context. The demonstrated need should also consider other major water, energy and pumped hydropower projects proposed for the region.
- 11.2 Describe the objectives and rationale for the proposed 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 storage and electricity supply capacity.
- 11.3 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.
- 11.4 Describe the impact of any maintenance periods on the ability and capacity of the hydro-electric water storage and power generation infrastructure facility to supply electricity to meet demand.
- 11.5 Present feasible alternatives of the proposed project's configuration (including individual infrastructure detailed in section 1), including conceptual, technological, scale and locality alternatives that may improve environmental outcomes. This includes, but is not limited to, the location of possible impoundments off waterways. Detail the criteria used to determine the alternatives. Provide sufficient detail to enable an understanding for preferred option/s.
- 11.6 Describe and evaluate the comparative environmental, social and economic impacts of each alternative (including the option of not proceeding), with particular regard to the principles of ecologically sustainable development.
- 11.7 Describe how the selected project configuration (including individual infrastructure within each project component detailed in section 1.3):
 - (a) 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) results in designs and predicted outcomes that are consistent with best practice environmental management during construction, operation, and decommissioning.
- 11.8 A detailed, reasoned, evidence-based justification and options analysis for lower impact alternative sites and/or designs should be presented.
- 11.9 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.
- 11.10 For unproven elements of a process, technology or activity, identify and describe any global leading practice environmental management that relates to the elements, where available. Demonstrate that the design of the proposed project and its predicted outcomes are consistent with best practice environmental management during construction, operation, and decommissioning of the proposed project.
- 11.11 Present alternatives to development of the proposed project. Describe how these alternatives have been considered and why the proposed project is the preferred option.
- 11.12 Justify the preferred option, including using a cost-benefit analysis as described at section 14 of this TOR. Identify and describe interdependencies of each component of the proposed

project, particularly in regard to how infrastructure requirements relate to the viability of the project.

- 11.13 Describe the expected benefits and opportunities associated with the proposed project and the relevant recipients of these benefits and opportunities (supported by relative evidence).
- 11.14 Justify with evidence-based information that the environmental benefits of the proposed project outweigh the residual environmental costs. To allow a meaningful comparison, environmental costs and benefits must be quantified.
- 11.15 Discuss the consequences of not proceeding with the proposed project.

12. Legislative requirements and project approvals

- 12.1 Identify all government approvals required for the proposed project and detail all approvals for which conditions are being sought through the EIS process,¹⁸ including relevant project stages and components, administering authority and timeframes (using 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 approvals/leases/licences/permits/consents required for the proposed project. Provide details of any works that are accepted development, and those that are assessable development.
- 12.2 Identify any approvals (approvals/leases/licences/permits/consents) required for the proposed project that will be sought separate to the EIS, including relevant project stages and components, administering authorities, timeframes and associated public notification requirements (using a tabular format). Explain why approvals being sought separate to the EIS would not unnecessarily delay the delivery of the proposed project in a timely manner should the Coordinator-General consider the proposed project suitable to proceed.
- 12.3 Provide a table indicating all key approvals, stages, timing considerations and associated public notification requirements. Identify the name of the local government and planning scheme areas traversed by the proposed project, any proposed material changes of use and operational works assessment benchmarks for all activities associated with this project under the scheme during pre-construction, construction and operation of the project.
- 12.4 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 relevant to the proposed project and address where required, providing evidence where provisions do not apply.
- 12.5 Consider the provisions of the *Planning Act 2016* (Qld) (Planning Act) and the *Minister's Guidelines and Rules* for making a Ministerial Infrastructure Designation (MID) for the proposed electricity transmission line. The EIS is to provide, if relevant, the information necessary to support the environmental assessment and consultation process for a MID.
- 12.6 Consider the provisions of the *Regional Planning Interests Act 2014* (Qld) (RPI Act) and whether a regional interests development approval (RIDA) is required pursuant to the RPI Act. The EIS is to provide, where relevant, the information necessary and in sufficient detail to support an application for a RIDA. The assessment and supporting information, where relevant, is to be sufficient for the administering authority to decide whether a RIDA could be granted.

¹⁸ Approvals for which conditions are being sought should consider the consideration provisions of Part 4 of the SDPWO Act.

- 12.7 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.
- 12.8 Identify if any approval would be needed to undertake waterway barrier works under the Planning Act and Planning Regulation 2017 (Planning Regulation).
- 12.9 Describe any approvals or entitlements required under the Water Act, Water Regulation 2016 and Water Plan (Burnett Basin) 2014 (Water Plan)¹⁹ and address relevant legislative requirements and water volume limitations.
- 12.10 Describe water supply options and arrangements that would need to be put in place to address any likely annual losses and water required for construction and operation.
- 12.11 Describe any approvals or legislative requirements that would be relevant under the *Nature Conservation Act 1992 (Qld)* (NC Act) and regulations.
- 12.12 Describe any legislative requirements that would need to be met in relation to the proposed project's potential impacts on protected areas, declared fish habitat areas, state forests and legally secured offset areas (if any). If the proposed project's potential impacts are considered to be inconsistent with the values of these areas, include a description of the revocation process for changing the boundaries of state forests and protected areas.
- 12.13 The SPP and the SDAP²⁰ 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 proposed project
 - (b) demonstrate the proposed project's consistency with the relevant SPP
 - (c) demonstrate that each component of the proposed project satisfies the information requirements by providing an assessment against the most up to date version of the relevant SDAP state codes (e.g. upper reservoir, lower reservoir, pipelines and waterway crossings).
- 12.14 The EIS is to provide, where relevant, the information required under sections 125 and/or 226 of the EP Act in support of the proposed project's application for any new and/or amended ERAs. Any ERA to be conducted as part of the project should be listed separately with the appropriate ERA number, activity name and threshold (see Schedule 2, EP Regulation for a list of ERAs). The assessment and supporting information for an ERA, where relevant, is to be sufficient for the administering authority to decide whether an approval should be granted.²¹ Environmental values, information and approval requirements are specified in the EP Act, the EP Regulation, EPP and relevant guidelines.
- 12.15 Describe the assessment process for the EPBC Act under the accredited assessment process between the Australian Government and the State of Queensland and the approvals process under the EPBC Act.

13. Stakeholder consultation

- 13.1 In preparing the EIS, consult with directly affected landholders, relevant stakeholders including local, state and Australian government agencies, Aboriginal and Torres Strait Islander

¹⁹ Water Plan refers to the Water Plan (Burnett Basin) 2014 and any draft plan.

²⁰ 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>.

²¹ For technical information requirements see <https://www.business.qld.gov.au/running-business/environment/licences-permits/applying/technical>

peoples²² and potentially affected communities,²³ directly affected communities and indirectly affected key stakeholders.²⁴

- 13.2 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 proposed project.

14. Assessment of project specific matters

- 14.1 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 proposed project at the local and/or regional scale.
- 14.2 The EIS is to assess the potential catchment-wide impacts, including upstream and downstream, where relevant.
- 14.3 The proponent is to engage with the Office of the Coordinator-General throughout the development of the EIS to clarify the scope of assessment for each project specific matter.

Land

Objectives

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

- (a) protect the environmental values of land, including soils, subsoils, landforms and associated flora and fauna
- (b) protect the environmental and resource values of protected areas, state forests or privately owned lands with particular environmental and forest production values
- (c) avoid or minimise environmental harm on areas of high conservation value and special significance and sensitive land uses at adjacent places
- (d) protect all environmental and resource values relevant to adjacent sensitive uses located within and adjacent to the project area
- (e) ensure the operation of the proposed project in accordance with best practice environmental management.

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

²² i.e. 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. 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 Treaty, Aboriginal and Torres Strait Islander Partnerships, Communities and the Arts is required.

²³ Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

²⁴ Refer to Appendix 1 of the Coordinator-General's social impact assessment Guideline for a list of key stakeholders.

Land use and tenure

Existing environment

- 14.4 Describe the following:
- (a) landscape and existing and proposed land uses and infrastructure, in and around the project area, including numbers of private properties, Traditional Owner land and cultural practice areas, protected areas, state leasehold land, reserves, unallocated state land, state forest, watercourses (including stream order information), easements and road reserves potentially impacted by the project, supported by maps including lot and plan descriptions
 - (b) identify townships and urban areas located near the project area
 - (c) any tenures, including national park, conservation park, state forest, nature refuge, stock routes, biodiversity offset areas approved by the state or Australian governments (if any) and resource tenures overlying and adjacent to the project area or area likely to be impacted
 - (d) identify all planning schemes, regional and land use plans and overlays relevant to the proposed project, and assessment benchmarks and criteria relating to material changes of use and operational works that apply to the proposed project
 - (e) SDAP codes relevant to the proposed project (including those exempt due to coordinated project status)
 - (f) design and locational factors influencing the selection of the project components and the project area.
- 14.5 Describe and map the extent of any known agriculture, horticulture, petroleum, mining and exploration activities or extractive (quarry) resources of significance, 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) geothermal and greenhouse gas storage tenures
 - (f) known extractive resources
 - (g) active, disused, or abandoned mine workings in the project area and surrounds
 - (h) stock route network
 - (i) agricultural land considered as a priority agricultural area and/or of strategic cropping land, and any other matters identified in the RPI Act and RPI Regulation
 - (j) findings of the Queensland Agricultural Land Audit and AgTrends Spatial web mapping app.²⁵
- 14.6 Illustrate the context of the proposed project in relation to surrounding and impacted protected areas under the NC Act, biodiversity offset areas approved by the state or Australian

²⁵ <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/business/expand/land-audit>

Governments (if any) state forests, timber reserves and other privately owned lands with nature conservation or other forest production values. This includes the location of:

- (a) the full disturbance footprint of existing and proposed infrastructure (including surface structures servicing the underground infrastructure)
- (b) the 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
- (e) any areas of disturbance required for the establishment of temporary non-resident workforce accommodation and construction laydown areas.

Impact assessment

- 14.7 The assessment of impacts on land is to be in accordance with Department of Environment and Science (DES) *Application requirements for activities with impacts to land* and *DES Land – EIS information guideline* (see Appendix 2). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes relevant to land in Schedule 8 of the EP Regulation.
- 14.8 Identify all state and regional planning interests (e.g. priority agricultural areas, priority living areas, strategic cropping areas and key resource areas) potentially impacted by the proposed 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.
- 14.9 Describe using graphics and figures, temporary and permanent changes to the landscape and potential impacts of the proposed land uses, taking into consideration the proposed measures that would be used to avoid or minimise potential impacts.
- 14.10 Detail how the construction and operational phases of the proposed project will change existing and potential land uses of the project area/s and adjacent areas.
- 14.11 Address impacts on any identified agriculture, horticulture, State-owned quarry material, 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 and exploration activities, liaise with any authorised tenement holder whose mining interests overlay the development footprint to advise of the proposal and ascertain any future exploration activities.
- 14.12 Describe any potential impacts on any existing or historical mine workings within or adjacent to the project area.
- 14.13 Identify existing and potential Native Title rights and interests impacted by the proposed project.
- 14.14 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.
- 14.15 Describe any proposed tenure to be applied for as part of this project, including any necessary approvals and/or owners' consent.
- 14.16 Describe any proposed procedures to change the conditions of a state lease to include agricultural activities, if relevant.
- 14.17 Describe the proposed land acquisition approach/es with stakeholders and state government agencies, including anticipated timelines, necessary to secure tenure for the proposed project. Include any compulsory acquisition process potentially applicable to each tenure impacted. 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.
- 14.18 Identify any infrastructure or access tracks associated with the proposed project to be located within, or which may have impacts on, the stock route network managed under the *Stock Route Management Act 2002* (Qld) (Stock Route Management Act).
- 14.19 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 demonstrate how the proposed 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) agricultural land considered as a priority agricultural area and/or strategic cropping land, and any other matters identified in the RPI Act and RPI Regulation. Refer to the Department of State Development, Infrastructure, Local Government and Planning (DSDILGP) *RPI Act Statutory guideline 11/16 – Companion guide* and Department of Agriculture and Fisheries (DAF) *DAFF Environmental impact assessment companion guide* (see Appendix 2).
- 14.20 Describe the potential direct and indirect impacts on the natural and cultural resources and values of all protected areas and state forest, within and adjacent to the project area arising from the construction and operation of the proposed project²⁶.
- 14.21 Address the cumulative impacts of the proposed land uses in conjunction with existing and potential future impacts to the land. This includes impacts from contaminants, materials or wastes associated with the proposed project, existing development and possible future development (as described by approved plans and existing project approvals).

Mitigation measures

- 14.22 Describe the proposed mitigation measures to avoid or minimise impacts on existing and proposed land uses.
- 14.23 Demonstrate how current and historical mine workings have been avoided where possible. If relevant, describe how the proposed project is to incorporate safety measures to effectively mitigate hazards with current and closed mines and ensure the safety of personnel.
- 14.24 Identify the potential for managing impacts on existing and potential Native Title rights and interests by Indigenous Land Use Agreements or other measure in accordance with the *Native*

²⁶ 'Natural resources', 'cultural resources' and 'protected areas' within the definitions under the *Nature Conversation Act 1992*.

Title Act 1993 (Qld) (Native Title Act) and consistent with the Queensland native title work procedures (see Appendix 2).

- 14.25 Demonstrate how the proposed project will maintain the ongoing functionality and connectivity of the stock route network.
- 14.26 Describe the proposed effective mitigation measures to avoid or minimise impacts on agricultural land uses. Demonstrate how any potential 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 directly impacted by and adjacent to project activities.
- 14.27 Describe alternatives considered to avoid adverse potential impacts on all protected areas.
- 14.28 Where adverse impacts on all protected areas cannot be reasonably avoided, describe:
 - (a) the 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.

Visual amenity

Existing environment

- 14.29 Describe and illustrate the landscape character and visual amenity in and around the project area, including key natural landscape features, major views, view sheds and outlooks that contribute to the amenity of the area.

Impact assessment and mitigation measures

- 14.30 Provide an assessment of the potential temporary and permanent visual impacts of the development on the amenity of the surrounding area particularly from nearby townships and significant vantage points of the broader public domain. This should include a detailed photomontage analysis of the visual impacts of the development.
- 14.31 Describe any proposed measures to avoid, minimise or mitigate potential impacts on landscape character and visual amenity.

Topography, geology and soils

Existing environment

- 14.32 Describe, including maps, the geology and geomorphology of the project area, with reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance.
- 14.33 Describe the geological and seismic properties that could impact upon ground stability and influence the nature and location of project activities, including reservoir, tunnels, underground infrastructure and power transmission lines.
- 14.34 Identify and investigate areas of salinity, sodic, dispersive and cracking clay soils, and potential for actual areas of acid sulfate soils. Where potential areas are identified, further investigations (including field surveys) should be undertaken in accordance with accepted industry guidelines and requirements of the *SPP – State interest guideline emissions and hazardous activities*.

- 14.35 Identify and investigate the soil types associated with water movement, salinity, sodicity and cracking clay soils, as well as areas of potential and actual acid sulfate soils.
- 14.36 Detail any known or potential sources of contaminated land (on and off site), 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.
- 14.37 Provide details, including maps, existing soil conservation works (including but not limited to 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* (Qld) (Soil Conservation Act).

Impact assessment

- 14.38 Where significant earthworks are proposed, assess the impact of these works on affected soils and landscapes. Describe how these works affect land use, land management and associated land degradation risks. The assessment of impacts on topography, geology and soils will be undertaken in accordance with the latest version of:
 - (a) *the DES EIS Information Guideline – Land, Guidelines for Surveying Soil and Land Resources, Australian Soil and Land Survey Field Handbook, Guidelines for Agricultural Land Evaluation in Queensland, Queensland Soil and Land Resource Survey Information Guideline and Queensland Land Resource Assessment Guidelines – Volume 1: Soil and land resource assessment and Volume 2: Field tests* (see Appendix 2)
 - (b) where linear features are proposed, *Guidelines for Soil Survey along Linear Features* (see Appendix 2)
 - (c) if any quarry material is needed for construction, the *DES EIS information guideline—Quarry material* (see Appendix 2).
- 14.39 Identify activities or operations likely to impact on existing erosion control works and any soil conservation works, in particular, those approved as project plans or property plans under the Soil Conservation Act.
- 14.40 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 2). 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.
- 14.41 Investigate land degradation in the form of erosive soil associated with increased 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 2).
- 14.42 Describe how any proposed land use may result in land becoming contaminated as a result of the project.
- 14.43 Describe potential for subsidence or other geological instabilities and changes as a result of underground works.

- 14.44 Investigate and assess land stability over time including landform design, construction and geotechnical stability of the upper storage reservoir. Use landform evolution modelling to inform landform stability impact assessments.
- 14.45 Assess the risks to the project from the geology 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 adequately assess the risks of intersecting non-competent material and rock defects and to evaluate the engineering properties of the rock mass for the proposed hydroelectric water storage and power generation infrastructures.

Mitigation measures

- 14.46 Detail proposed measures taken during the construction and maintenance of the proposed 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.
- 14.47 Describe the actions to be undertaken to avoid, identify, remediate and manage land that is contaminated or becomes contaminated.
- 14.48 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.
- 14.49 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).
- 14.50 Propose detailed mitigation measures for any significant impacts that would result from subsidence including impacts on infrastructure, land, hydrology, flora and fauna.
- 14.51 Demonstrate how landforms, during and after disturbance, will meet any requirements of project or property plans approved under the Soil Conservation Act.

Rehabilitation and mine closure

- 14.52 Address the rehabilitation requirements of the EP Act including the provisions requiring an amended proposed progressive rehabilitation and closure plan (PRCP) and PRCP schedule for Mt Rawdon Mine that includes the proposed generation facility as an approved post-mining land use where appropriate. The PRC planning component and PRCP schedule are to:
- (a) provide a proposed PRCP for the proposed project in accordance with DES *Submission of a progressive rehabilitation and closure plan* (see Appendix 2). The PRCP must show how and where activities will be carried out on land in a way that maximises the progressive rehabilitation of the land to a stable condition and provide for the condition to which the holder must rehabilitate the land before the Environmental Authority may be surrendered. The PRCP must consist of two components:
 - (i) rehabilitation planning part
 - (ii) PRCP schedule
 - (b) demonstrate that the proposed rehabilitation is consistent with DES *Guideline – Progressive rehabilitation and closure plans* (see Appendix 2) and best practice approaches about the strategies and methods for progressive and final rehabilitation

- (c) demonstrate that voids will be backfilled to the greatest extent possible
- (d) demonstrate that the rehabilitation of the environment disturbed by construction, operation and decommissioning of the proposed project can meet the environmental objectives and performance outcomes in Schedule 8A of the EP Regulation.

Rehabilitation planning part

- 14.53 Provide the rehabilitation planning part of the proposed PRCP, by addressing the following:
- (a) describe each resource tenure, including the area of each tenure
 - (b) describe the relevant activities and the likely duration of the relevant activities
 - (c) include a detailed description, including maps, of how and where the relevant activities are to be carried out
 - (d) include details of the consultation undertaken in developing the proposed PRCP
 - (e) include details of how ongoing consultation will be undertaken to discuss rehabilitation to be carried out under the plan
 - (f) state the extent to which each proposed post-mining land use or non-use management area is consistent with the outcome of consultation with the community in developing the plan and any strategies or plans for the land of a local government, the state government or the Australian Government
 - (g) for each proposed post-mining land use, state the proposed methods or techniques for rehabilitating the land to a stable condition in a way that supports the rehabilitation milestones under the proposed PRCP schedule
 - (h) identify the risks of a stable condition for land identified as a proposed post-mining land use not being achieved, and detail measures to manage or minimise the risks
 - (i) for each proposed non-use management area, state the reasons why the area cannot be rehabilitated to a stable condition because of either of the below:
 - (i) carrying out rehabilitation of the land would cause a greater risk of environmental harm than not carrying out the rehabilitation or
 - (ii) the risk of environmental harm as a result of not carrying out rehabilitation of the land is confined to the area of the relevant resource tenure and adjoining areas (where adjoining areas are impacted by the proposed project), and the proponent considers, having regard to each public interest consideration, that it is in the public interest for the land not to be rehabilitated to a stable condition
 - (j) include copies of reports or other evidence relied on for each proposed non-use management area
 - (k) for each proposed non-use management area, state the proposed methodology for achieving best practice management of the area to support the management milestones under the proposed PRCP schedule for the area
 - (l) include other information requirements outlined in the DES *Guideline – Progressive rehabilitation and closure plans* (see Appendix 2).
- 14.54 Show a comparison of pre-activity site topography and the expected final topography of the site with any excavations, waste areas and dam sites on appropriately scaled maps.

14.55 Show a comparison and provide modelling results of pre-activity, during operations and expected final landform of the site in relation to the river floodplains and flood levels up to and including the 'probable maximum flood level' based on the Bureau of Meteorology's 'probable maximum precipitation' forecast for the locality on appropriately scaled maps. The maps and modelling are to detail where final voids, mined areas, subsidence, and uncompacted overburden and workings prior to disturbance, during operations and at the end of operations would lie in relation to the river floodplains and flood levels.

PRCP schedule

- 14.56 Provide a proposed PRCP schedule²⁷ which describes time-based milestones for achieving each post-mining land uses or non-use management area for the proposed project. Present the proposed PRCP schedule in the table template included in DES *Submission of a progressive rehabilitation and closure plan* (see Appendix 2).
- 14.57 The proposed PRCP schedule, must identify:
- (a) all land within the resource tenure as either a post-mining land use or non-use management area
 - (b) when land becomes available for rehabilitation or improvement
 - (c) rehabilitation milestones to achieve a post-mining land use
 - (d) management milestones to achieve a non-use management area
 - (e) milestone criteria that demonstrate when each milestone has been completed
 - (f) completion dates for each milestone to be achieved
 - (g) a final site design
 - (h) all milestone criteria must be consistent with the SMART principles²⁸.
- 14.58 Develop a plan of a proposed scheduling and extent of rehabilitation works that would minimise the amount of land disturbed at any one time and minimise the residual loss of land and water bodies with ecological or productive value.

²⁷ DES *Progressive rehabilitation and closure plans* (see Appendix 2) contains further information about how to develop a PRCP schedule and/or where an existing PRCP schedule is in place, apply to amend an existing PRCP schedule (see Appendix 2).

²⁸ SMART milestones are: **S**pecific – it is clear what must be done; **M**easurable – it must be possible to know when it has been achieved; **A**chievable – it is capable of being achieved; **R**easonable/relevant – there is a clear connection between the milestone and the desired outcomes. The requirement is reasonable; **T**ime Specific – it is clear when the milestone will be completed.

Flora and fauna

Objectives

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

- (a) avoid impacts to waterways associated with upper and lower reservoirs
- (b) avoid, minimise and/or mitigate adverse significant residual impacts to flora and fauna (including wetlands)
- (c) avoid significant residual impacts to MNES and MSES, mitigate impacts where they cannot be avoided, and offset any residual impacts
- (d) manage the impacts on the environment by seeking to achieve ecological sustainability, including protected wildlife and habitat and ecologically sustainable development as defined in the Fisheries Act
- (e) identify critical habitat for all MSES species and ensure it receives special management considerations and protection through a management plan for the proposed project
- (f) identify and appropriately safeguard MNES to support healthy and resilient ecosystems
- (g) ensure the sustainable, long-term conservation of biodiversity
- (h) protect all environmental values relevant to adjacent and receiving environmentally sensitive areas including aquatic ecosystems and wetlands
- (i) provide for the conservation of the aquatic environment, 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 and avoid adverse impacts to fish health.

General content

- 14.59 This section should specifically address the proposed 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.
- 14.60 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. Waterway surveys and fish sampling should be timed following periods of substantial flow (e.g. 63% Annual Exceedance Probability (AEP)).
- 14.61 Field surveys and field survey reporting must include data collection on connectivity and the EIS should clearly identify the guidelines used to inform the field survey designs and method.
- 14.62 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)
 - (b) proposed buffers (including firebreak and safety buffers)

- (c) access tracks (including existing) required for construction, operation 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
 - (e) sites of potential unplanned releases (spillway etc.) from the reservoirs.
- 14.63 When identifying potential impacts ensure impact figures are provided for each activity/component and stages of the proposed project.

Existing environment

- 14.64 Identify, describe and locate MSES²⁹, state and regionally significant biodiversity and natural environmental values of the terrestrial and aquatic ecosystems likely to be impacted by the proposed project. This is to include watercourses impacted by groundwater drawdown/interactions or diversion; watercourses floodplain ecology (especially as it relates to potential changed hydrology and water quality from project activities e.g. watercourse diversions, water storage facilities such as dams and levees, and groundwater drawdown impacts); groundwater-dependent ecosystems and high ecological significance wetlands. Where MSES are addressed in the section on MNES, specific cross referencing is required.
- 14.65 Describe the existing quality and suitability of habitat for species that are known and have the potential to occur in the project area and zone of impact from the proposed project. Provide the area of existing habitat (in ha) for each species in the project area based on field verification.
- 14.66 The location of fauna and flora of cultural, state and national environmental significance in the project area, and in surrounding areas, are to be shown on maps in relation to their habitat and connectivity in the landscape. Include maps, upstream and downstream of the proposed project showing areas of:
- (a) regulated vegetation including prescribed regional ecosystems, essential habitat, wetlands, watercourses and drainage features (over the project and adjoining areas)
 - (b) wetlands (including wetlands of high ecological significance), watercourses and drainage features (over the project and adjoining areas)
 - (c) threatened species records
 - (d) connectivity areas
 - (e) protected wildlife habitat
 - (f) waterways
 - (g) protected areas and conservation areas
 - (h) biodiversity offset areas approved by the state or Australian Governments.
- 14.67 Provide a detailed description of all native fish, turtle, aquatic mammal and crustacean species:
- (a) known to occur within the area impacted by the proposed project (as identified through on-ground seasonal studies)
 - (b) identified as likely to occur (via desktop assessment).

²⁹ 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. MSES includes certain environmental values that are protected under Queensland legislation.

- 14.68 Describe all flow dependent ecological assets and their critical links to stream flow, including their relevant ecological thresholds.
- 14.69 Describe, using relevant literature, habitat mapping 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 surrounding area. Describe the sensitivity to change (including as a result of the proposed project) of aquatic and terrestrial flora and fauna groups, regional ecosystems and significant species in reference to site specific impacts.
- 14.70 Describe how the features of the annual flow underpins the structure and function of the aquatic ecosystem including peak wet season flows and their variability; the draw period of flows and flood residence times during wet and dry season transition; low and disconnected flows during the dry season and the initial flushing flows during the dry to wet season transition.

Impact assessment

- 14.71 Using maps at suitable scales, illustrate the context of the project in relation to surroundings MSES and protected areas. 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) existing and proposed access tracks required for construction and maintenance
 - (d) any other areas of disturbance required to undertake the project.
- 14.72 Describe the potential direct and indirect impacts on the biodiversity and natural environmental values of affected areas (such as breeding, roosting, nesting and foraging habitat) arising from the construction, operation, maintenance and decommissioning of the proposed project (including potential/likely and known impacts) in accordance with DES guidelines (see Appendix 2). This should include detail on the likely magnitude, duration and frequency of the potential impacts. The assessment is to consider, but not be limited to potential impacts on:
- (a) all significant flora and fauna species and ecological communities (including but not limited to the koala, northern quoll, spot-tailed quoll, greater glider, white-throated snapping turtle, collared Delma, Australian lungfish, isis tamarind, curlew sandpiper, eastern curlew, pineapple zamia, *Cycas megacarpa* and lesser-swamp orchid) in both terrestrial and aquatic environments and in sensitive areas, biodiversity values, connectivity and supporting ecological processes³⁰
 - (b) flora and fauna of cultural significance to Aboriginal and Torres Strait Islander peoples
 - (c) waterways providing for fish and/or fauna passage
 - (d) terrestrial and aquatic ecosystems (including groundwater-dependent ecosystems) and subterranean fauna such as stygofauna and their interaction. The EIS must provide the information requirements contained in the latest EIS information guideline Groundwater dependent ecosystems and IESC's Information guidelines (IESC, 2020) (see Appendix 2) including relevant information guidelines explanatory notes (e.g. uncertainty analysis, assessing groundwater dependent ecosystems)

³⁰ Where a MSES is also a MNES, specific cross referencing to where it has been addressed in the MNES chapter should be provided.

- (e) alterations to riparian vegetation, habitat availability, connectivity and bank and channel morphology
- (f) changes to hydrology and environmental flows and potential impacts to downstream terrestrial and aquatic habitats
- (g) the existing integrity of ecological processes, including habitats of listed threatened, near-threatened or special least-concern species
- (h) potential impacts on aquatic and terrestrial fauna and flora species resulting from water quality changes during the construction and operation of the proposed project
- (i) connectivity of habitat and ecosystems and impacts on access to different habitat requirement by species
- (j) Connectivity area(s) as defined by Schedule 2 of the Environmental Offsets Regulation and in consideration of Section 3 of the Environmental Offsets Policy Significant Residual Impact Guideline 2014
- (k) integrity of landscapes and places, including wilderness and similar natural places
- (l) provision of permanent water bodies and the potential direct and indirect impacts to fauna and flora habitat
- (m) chronic, low-level exposure to contaminants or the bioaccumulation of contaminants
- (n) terrestrial and aquatic fauna and flora species during construction and operation of the proposed project due to their location within or proximal 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, and other relevant matters)
- (o) direct and indirect impacts of edge effects of cleared vegetation and access to food resources biological diversity including listed flora and fauna species and regional ecosystems
- (p) in a tabular format, identify all impacted MNES onsite and in proximity to the site, quantify any overlaps between MSES and MNES and identify relevant legislation and assessment requirements
- (q) conservation, national parks, state forest tenures, biodiversity offset areas approved by the state or Australian governments
- (r) biotic and abiotic conditions within the upper and lower reservoirs including but not limited to:
 - (i) turbidity
 - (ii) dissolved oxygen
 - (iii) thermal stratification (or lack of)
 - (iv) contaminated water/sediments/nutrients
 - (v) acidity
 - (vi) compliance with relevant water quality guidelines
 - (vii) impacts to aquatic flora and fauna within and downstream of the reservoirs.

- 14.73 Provide a description of how ecological processes and connectivity to habitats and corridors are maintained between state forest areas and adjoining areas where adjoining areas are impacted by the proposed project.
- 14.74 Provide a description of how ecological processes and connectivity to fish habitats and waterways are maintained between adjoining waterways impacted by the project.
- 14.75 Identify and discuss where proposed vegetation clearing³¹ is assessable, accepted or exempt development for the proposed project under the Planning Regulation. Evaluate proposed assessable clearing against SDAP State Code 16, considering the *Guide to the State Development Assessment Provisions State Code 16: Native vegetation clearing*, addressing the relevant assessment benchmarks for a coordinated project for all other purposes. Note that all clearing of native woody vegetation, including Category X areas (under the VM Act), on state land tenures (excluding those tenures with purposes listed under section 7 of the VM Act, i.e. national parks and state forests) is assessable unless an exemption or Accepted Development Vegetation Clearing Code applies.
- 14.76 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 safe, bi-directional fish passage.
- 14.77 Describe how safe, bi-directional movement will also be maintained for other aquatic fauna such as turtles.
- 14.78 Describe the potential disruption to flows in waterways and tributaries and demonstrate how the chosen method minimises and mitigates potential impacts on aquatic and riparian habitat (including dams, temporary diversions and drains) and species. Reference is to be made to DAF *Guidelines for Fish Salvage* (see Appendix 2) and consideration given to turtles and any other species with the potential for entrainment or entrapment, 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.

Mitigation measures

- 14.79 Describe how the achievement of the flora and fauna objectives are to be monitored and audited, and how corrective actions are to be managed for all phases of the proposed project.
- 14.80 Describe, illustrate and demonstrate how all the phases of the proposed project provide safe and adequate upstream and downstream aquatic fauna passage, including but not limited to, the fish and turtle communities of the site, and monitoring and maintenance measures.
- 14.81 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.
- 14.82 Propose and demonstrate the ability to implement effective and practical measures (based on demonstrated successful methodologies) to avoid, minimise and/or mitigate direct or indirect impacts on ecological environmental values, including measures for protecting or enhancing natural values such as water quality and hydrological regime and assess how the nominated

³¹ See definition of clearing under Schedule 1 of the VM Act

quantitative indicators and standards may be achieved for nature conservation management. In particular, address measures to protect or preserve any listed threatened, near threatened or special least concern species. Discuss the effectiveness of the measures and reference relevant studies and literature which support the effectiveness of these measures. Provide a detailed salvage and relocation plan for impacted species including MSES.

- 14.83 Demonstrate how the project aligns with the vision, outcomes and goals of the Biodiversity Conservation Strategy for Queensland.
- 14.84 Assess the need for safety fire breaks and the need for buffer zones and the retention, rehabilitation or planting/construction of fauna movement corridors. The assessment must take into account the role of buffer zones in maintaining and enhancing riparian vegetation and wetlands to promote bank stability, habitat connectivity, enhance water quality and provide habitat.
- 14.85 Demonstrate that the proposed project will avoid the need for waterway barriers or propose measures to mitigate impacts on affected waterways, drainage features and wetlands. Include effective mitigation strategies for construction and operation stages of the proposed project.
- 14.86 Set out a process for monitoring any bi-directional fish and other fauna movement between each impoundment. Describe management measures to safely prevent fauna passage between the upper and lower storage reservoirs.
- 14.87 Propose rehabilitation criteria, in relation to natural values, that would be used to measure progressive rehabilitation of disturbed areas. Proposals for rehabilitation of disturbed areas must incorporate in a suitable habitat, provision of low shrubs, ground level hollow logs, stick piles, nest hollows, ground litter, fish passage and suitable terrestrial and aquatic habitat as appropriate.

Offsets

- 14.88 After demonstrating that all reasonable on-site avoidance and mitigation measures have been applied, identify whether the proposed 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 2) and the Queensland Environmental Offsets framework.
- 14.89 Address both state and Commonwealth offset obligations and clearly identify where there are overlaps across jurisdictions.
- 14.90 Describe and quantify any SRI and demonstrate any proposed land-based offset sites and their suitability and habitat quality, or alternative offset types, are consistent with the requirements of the *Queensland Environmental Offsets Policy* (see Appendix 2).
- 14.91 Demonstrate a conservation outcome for all impacted prescribed environmental matters including koala and 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.
- 14.92 Provide as an appendix to the EIS an offset proposal which outlines the proposed offset delivery approach to address the project's SRI on MSES and MNES. The offset delivery approach is to include:

- (a) both state and commonwealth offset obligations, and clearly identify any overlaps across jurisdictions
 - (b) identify, describe and illustrate the extent of any SRI overlap between MNES and MSES (such as in a map and table)
 - (c) for staged offsets, take into account the full extent of potential impacts on prescribed environmental matters from the entire project as part of the SRI test
 - (d) an assessment of the vulnerability of any proposed offset site/s under climate change scenarios (e.g. reduced water availability, increased bushfire risk)
 - (e) the results of a habitat quality assessment³² on both the impact area and the proposed offset area/s to compensate for impacts
 - (f) discussion and sound review of the availability of the offset for each MNES and MSES matter proposed to be offset and the ability to enter into long-term conservation agreements
 - (g) an evaluation of how the proposed offset will achieve a conservation outcome for the impact matter
 - (h) 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.
- 14.93 Describe any active rehabilitation 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).
- 14.94 Describe how the achievement of the offset proposal will be monitored and audited, and how corrective actions will be effectively managed.
- 14.95 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 proposed project.

Biosecurity

Objectives

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

- (a) avoid, minimise and/or mitigate the introduction and 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 animal and plant pests and diseases
- (c) comply with relevant provisions of the *Biosecurity Act 2014* (Qld) (Biosecurity Act), Commonwealth animal and pest strategies, biosecurity plans, Weeds of National Significance and designated pests under the *Public Health Act 2005* (Qld) (Public Health Act).

³² The site habitat quality score must be derived in accordance with the Queensland Guide to determining terrestrial habitat quality: Methods for assessing habitat quality under the Queensland Environmental Offsets Policy (Version 1.3, February 2020), or subsequent published revision

Existing environment

- 14.96 Survey terrestrial and aquatic pest animals and weeds and describe the current distribution and abundance of terrestrial and aquatic pest animals and weeds 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 includes prohibited and restricted matters listed in the Biosecurity Act, Biosecurity Regulation 2016 (Qld), Weeds of National Significance, pests and weeds declared under North Burnett Regional Council and Bundaberg Regional Council local laws and designated pests under the Public Health Act (see Appendix 2 for relevant guidelines).

Impact assessment

- 14.97 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 the DES *Biosecurity—EIS information guideline* (see Appendix 2).

Mitigation measures

- 14.98 Propose detailed measures using best practice to remove, control and limit the spread of pests, weeds, diseases, pathogens and contaminants within and surrounding the project area and adjacent areas. Detail 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.
- 14.99 All proposed measures are to be in accordance with any relevant biosecurity surveillance or prevention measures authorised under the Biosecurity Act and any requirements under the VM Act.
- 14.100 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.

Water quality

Objectives

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

- (a) avoid, minimise and/or mitigate adverse impacts to water quality
- (b) protect environmental values of waters and wetlands
- (c) protect environmental values of groundwater and associated surface ecological systems
- (d) maintain or enhance water quality to achieve water quality objectives.

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

Existing environment

- 14.101 With reference to the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 (EPP (Water and Wetland Biodiversity)) and section 9 the EP Act, identify the environmental values of surface water (including wetlands) and groundwater within the project area, its surrounds and immediately downstream/ downgradient areas that may be affected by project activities, including all existing human and environmental users and culturally significant values of water.
- 14.102 Describe historic and existing surface water and groundwater quality in terms of physical, chemical and biological characteristics of surface waters and groundwater within and surrounding the project area which may be affected.
- 14.103 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 sufficient baseline water quality monitoring data at suitable reference locations and sufficient data to adequately establish baseline condition and define natural variation, including seasonal variation.
- 14.104 Define the relevant water quality objectives applicable to the environmental values and demonstrate how these will be met by the proposed 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 (see Appendix 2).
- 14.105 Spatially identify any semi-permanent or permanent streams and pools, stock watering locations, groundwater aquifers (including where surface water interactions are likely) and other environmental values locations and include any semi-permanent or permanent pools, including stock water.
- 14.106 The analysis is to include a literature review supplemented by a suitable sampling program and sufficient site-specific baseline data. The following additional 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 (if any)
 - (d) suitability of existing raw water quality for proposed on-site uses and any treatment required
 - (e) correlate groundwater quality results with surface water data to define interactions
 - (f) characterise baseline groundwater quality variability and its suitability for environmental and human use
 - (g) identify any water quality variations along the length of any alluvium upstream and downstream of infrastructure, or surface water locations
 - (h) surface water quality samples must 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 the same indicators (except turbidity and total suspended solids) as a minimum and should allow for all water quality objectives for local groundwater to be assessed.

Impact assessment

- 14.107 The assessment of impacts on water is to be in accordance with DES guideline *Application requirements for activities with impacts to water*, *Water – EIS information guideline*, *Monitoring and sampling manual*, *Queensland Water Quality Guidelines*, *Using monitoring data to assess groundwater quality and potential environmental impacts* and *Technical guideline – Licensing wastewater releases to Queensland water* (see Appendix 2). Demonstrate the proposed project can meet the environmental objectives and performance outcomes in Schedule 8, Part 3 of the EP Regulation.
- 14.108 Address section 41AA of the EP Regulation regarding releases of particular contaminants to Great Barrier Reef (GBR) catchment water and other waters and address the information requirements of the 'Reef discharge standards for industrial activities' guideline. Confirm if:
- (i) the proposed activity will be carried out in the GBR catchment or other waters mentioned in section 41AA subsection (1)(b) of the EP Regulation
 - (j) the proposed activity will result in a residual impact (where fine sediment (or dissolved inorganic nitrogen)) is released to water because of the relevant activity and will remain or is likely to remain in the GBR catchment or other waters mentioned in subsection (1)(b)
 - (k) mitigation measures are proposed for the relevant activity to avoid or minimise the release of fine sediment or DIN into the GBR catchment or other waters mentioned in subsection (1)(b) and
 - (l) offset measures are proposed to reduce the load of fine sediment or DIN in the GBR catchment or other waters mentioned in subsection (1)(b).
- 14.109 Identify the predicted quantity and quality (including location, timing and duration) of all potential and/or proposed discharges of water and wastewater sewage by the proposed project, whether as point sources or diffuse sources (such as seepage from waste rock dumps/waste management areas or irrigation to land of treated sewage effluent). Provide receiving environment stream flow data and 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.
- 14.110 Describe the risks associated with emergency releases including the probability, frequency, magnitude and duration of an event and how emergency releases of water from the lower and upper storage reservoirs would potentially impact local water quality, including downstream environmental values, water uses and users.
- 14.111 Describe the treatment of contaminated water to a level that is suitable for release into the environment and describe how the upper and lower storages will function so that contaminated water will not be discharged into waterways (e.g. when reservoirs spill).
- 14.112 Describe the potential impacts of any discharges on the quality and quantity of receiving waters (including groundwater) taking into consideration the assimilative capacity of the receiving environment given existing water quality and other potential point source discharges in the catchment. The assessment is to include, but not be limited to:
- (a) options for controlled discharge at times of natural stream flow must be investigated to ensure that adequate flushing of wastewater is achieved

- (b) provide water quality limits that are appropriate to maintain background water quality and protect other water uses
- (c) necessary streamflow conditions in receiving waters under which controlled discharges will be allowed
- (d) consider the resultant quality and hydrology of receiving waters and the practices and procedures that would be used to avoid or minimise impacts.

Refer to DES *Receiving environment monitoring program guideline for use with environmentally relevant activities under the EP Act* (see Appendix 2).

- 14.113 Demonstrate how the proposed project will protect environmental values and achieve water quality objectives and ensure that environmental impacts would be avoided or minimised through the implementation of management strategies that comply with the management hierarchy and management intent of the EPP (Water and Wetland Biodiversity) 2019.
- 14.114 Describe the impacts of the proposed project on water quality, environmental values and the water quality objectives of the Water Plan, policies and guidelines outlined in Appendix 2. Information is to be supported with references to relevant legislation, policies and guidelines.
- 14.115 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 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 considering the management and mitigation measures proposed
 - (c) likely quality of drainage from spoil stockpiles and associated potential impacts
 - (d) quality of water within the lower storage and upper storage reservoirs during the first filling phase
 - (e) quality of water within the lower storage and upper storage reservoirs under projected operating conditions including annual seasonal variation, extended wet or dry period, the effects of inundated soil types and wind driven re-suspension and impacts of surrounding land uses, and how water quality will be managed
 - (f) environmental and engineering risks associated with the transfer and storage of contaminated/mine affected water from the lower storage reservoir to the upper storage reservoir, including risks and potential impacts on identified environmental values and hydro-electric water storage and power generation infrastructure.
 - (g) a model of the time it would take for the stratification to occur, and the potential establishment of an anoxic environment in the reservoirs. Use the modelled results to predict and avoid:
 - (i) recycling of nutrients and metals between the reservoirs
 - (ii) oxidising the anoxic bottom layer and impacting water quality.
- 14.116 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 quality.

Mitigation measures

- 14.117 Describe and include in the EMP avoidance, mitigation strategies and contingency plans for:
- (a) management of contaminated water flows and clear delineation of contaminated water storages
 - (b) potential accidental discharges of contaminants and sediments during construction and operation
 - (c) stormwater run-off from the project facilities, associated infrastructure and adjacent activities
 - (d) flooding of relevant river systems, the effects of tropical cyclones and other extreme rainfall or climatic events
 - (e) erosion and sedimentation during construction, operation³³ and decommissioning of the proposed project, with reference to the *International Erosion Control Association's Best Practice Erosion and Sediment Control* (see Appendix 2), including the use of development free buffers
 - (f) effective management of acid sulfate, sodic, saline and dispersive soils
 - (g) potential impacts to other properties and the environment during flood events
 - (h) the treatment and disposal processes for all wastewater produced as a result of the proposed project, including pre-construction and construction activities
 - (i) to avoid and minimise impacts occurring to groundwater.
- 14.118 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.
- 14.119 Describe and quantitative standards and indicators which will be used to describe the ecological values and health of surface water environments.

³³ Mine affected water should be managed in accordance with the mine water management plan described in 14.139 of this TOR.

Water resources

Objectives

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

- (a) avoid, minimise and/or mitigate adverse impacts to water resources
- (b) ensure equitable, sustainable and efficient use of water resources
- (c) maintain and monitor environmental flows and water quality objectives to support the long-term condition and viability of in-stream habitat diversity, viability of terrestrial, riverine, wetland, lacustrine and naturally occurring inputs from riparian zones to support aquatic biotic communities
- (d) protect or enhance the condition, environmental values and natural functions of waterways, watercourses, lakes, springs, aquifers and other natural water systems and watercourses – including the stability of beds and banks of waterways and watercourses
- (e) protect the volumes and quality of water resources so that current lawful uses (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.

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

Existing environment

- 14.120 Include a description of water storages currently or historically implemented for the Mt Rawdon Mine and describe if any water storages are proposed to be retained for the proposed project.
- 14.121 Describe water related environmental values (refer to section 9 of the EP Act), existing surface water resources and adjoining waterways and groundwater aquifer systems within the study area in terms of water levels, recharge and discharge processes and the flow directions.
- 14.122 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.
- 14.123 Describe existing surface drainage patterns and flows in streams in the proposed project area including seasonal variations.
- 14.124 Describe any existing and/or constructed waterbodies, including any watercourse, waterhole, pool or riffles, waterway, lake or spring within and adjacent to the project, and the presence or absence of riparian vegetation and the presence of a defined channel (either intermittent or continuous) along the alignment of the waterway.
- 14.125 Discuss the history of flooding including extent, levels and frequency (upstream, at the project area and downstream).
- 14.126 Provide maps at a suitable scale of all existing waterways or water features within or adjacent to the project area to clearly illustrate any intersection with project components or disturbance areas. Identify:

- (a) waterways providing for fish passage, drainage channels, 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) 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 and power transmission infrastructure in relation to waterways and watercourses
 - (d) existing water supply schemes within and adjacent to the project area
 - (e) relevant drainage basin/s, sub-basins and associated sub-catchments
 - (f) any semi-permanent or permanent streams and pools, stock watering locations and groundwater aquifers (including where surface water interactions are likely).
- 14.127 Detail diversion 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 such as reservoirs.
- 14.128 Describe the relevant provisions (e.g. outcomes, strategies and objectives) of the Water Plan and other relevant Water Plan implementation documents relating to the proposed project.

Impact assessment

- 14.129 Provide details of proposed monitoring, impoundment, extraction, discharge, injection, use or loss of surface water or groundwater (including volumes and rates).
- 14.130 Provide details of existing and proposed changes to stormwater regimes, including changes to flow paths/patterns such as significant diversion or interception of overland flow and locations of interference/disturbance of watercourses and floodplain areas. Include maps of suitable scale showing the location, extent and dimensions of diversions, changes to flow and other water-related infrastructure in relation to the proposed development and existing mining infrastructure including lower and upper storage reservoirs, other water storages, sediment dams, mine affected dams, pipes and tunnels, drains, diversions, bunds, monitoring points and release points. Detail any significant diversion or interception of overland flow, including the effects of subsidence and detail the effects of drainage or dewatering works, excavation, placement of fill, clearing or any other alterations to existing topography and landform on the hydrology of the work site.
- 14.131 Describe any proposed watercourse diversion design, operation and monitoring based on current engineering practice and relevant guidelines including the Department of Regional Development, Manufacturing and Water (DRDMW) *Works that interfere with water in a watercourse – watercourse diversions* (see Appendix 2).
- 14.132 Provide a water balance, including an assessment of the potential impacts on the receiving environment and aquatic and ecological communities from any interference with waters such as redirection of flood waters through the installation of levees or construction of other facilities and infrastructure such as the waste rock dump and any proposed water storage infrastructure.
- 14.133 Describe any quantitative standards and indicators which will be used to describe the ecological values and health of surface water environments.
- 14.134 Design and construct suitable conceptual and hydrological models to describe the inputs, movements, exchanges and outputs of surface water and groundwater that may be affected

- by the proposed project. The 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. Include:
- (a) changes in flow regimes from diversions, water take and discharges
 - (b) alterations to riparian vegetation bank characteristics, including bank stability and channel morphology
 - (c) potential direct and indirect impacts arising from the proposed project
 - (d) potential impacts and effective management of any mine-affected water.
- 14.135 Qualify and quantify the impact of pumping operations on water quality within the impoundments and any associated impacts to aquatic flora and fauna within and downstream of the impoundments.
- 14.136 Quantify evaporative and seepage losses and infiltration from the reservoirs and water losses from passage through the underground infrastructure.
- 14.137 Provide information on the proposed water usage by the proposed project, including details about:
- (a) the sources and ultimate supply required to meet the demand for full production, including timing of demands
 - (b) the quality and quantity of all water supplied to the site during the construction and operational phases based on minimum yield scenarios for water reuse, rainwater reuse and any bore water volumes
 - (c) a water balance analysis including evaporative and seepage losses and infiltration
 - (d) a site plan outlining actions to be taken in the event of failure of the main water supply.
- 14.138 Determine the potable water demand for the proposed project, including the temporary demands during the construction period. Include details and ability (i.e. capacity to supply without adversely affecting existing level of reliability/supply security) 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 office during construction and operational phases.
- 14.139 Describe the options for supplying water for the proposed project and describe how the proposed project meets the economic, social and ecological outcomes of the Water Plan and if relevant, demonstrate no adverse impact on the security of existing town water supply source(s). Using hydrological modelling, demonstrate how the proposed project will conform to the Water Plan and how any impacts will be mitigated. The assessment of impacts should consider the Water Plan strategies (e.g. unallocated water) and objectives (i.e. environmental flow and water allocation security) and the rules contained in any associated Water Plan documents (e.g. water management protocol) to meet the outcomes of the Water Plan.
- 14.140 Describe and quantify the impact of sourcing water for first fill from Paradise Dam, including any delays to fishway operation and flows through the fishway at Paradise Dam. Include the duration of first fill in addition to the time taken to refill Paradise Dam to sufficient levels for the operation of the fishway to recommence. If the operation of the fishway is impacted, detail the impacts and consider alternative water source locations.

- 14.141 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, including management of potential impacts on underground water rights under the Water Act.

Mitigation measures

- 14.142 Provide detailed designs for all infrastructure utilised in the treatment of on-site 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 permanent or temporary water supply/treatment infrastructure is to occur.
- 14.143 Provide a water management plan, for the life of the proposed project, which details management strategies of mine-affected water, sediment-only-affected water and drainage from areas not disturbed by the proposed project activities.
- 14.144 Describe effective measures that would be used to avoid, minimise or mitigate any potential impacts on surface water and groundwater resources, including the flow regime.
- 14.145 Describe how the achievement of the water resources objectives would be monitored, audited, reported, and how corrective/preventative actions would be managed.

Groundwater

Existing environment

- 14.146 Describe the quality, quantity and significance of groundwater in the project area and any surrounding area potentially affected by the project's activities. The EIS is to:
- (a) characterise the nature, type, geology/stratigraphy and depth to and thickness of the aquifers, their hydraulic properties (including adjacent surface water storages where there is potential connectivity), basic water quality of the aquifers and value as water supply sources
 - (b) provide an analysis of the movement of underground water to and from the aquifer/s, including how the aquifers interacts with other aquifers and surface water, and the effect of geological structures on this movement (should include the connectivity and movement of water between the reservoirs and aquifers)
 - (c) interaction with surface water across the project area and possible sources and volumes of aquifer recharge
 - (d) provide historical groundwater level data using hydrographs and groundwater contours to characterise seasonal variations of groundwater levels and groundwater flow directions
 - (e) provide historical groundwater quality data to characterise the extent of any contamination of groundwater at the site or adjacent to the site, the trends associated with that contamination and the degree to which the proposed project will intersect with, utilise or distribute contaminated groundwater
 - (f) provide surveys, location and source of existing groundwater supply facilities (e.g. bores, wells, or excavations).

Impact assessment

- 14.147 Develop suitable groundwater conceptual and hydrological models as necessary to represent groundwater interactions with lower storage and upper storage, groundwater recharge and discharge process, surface-groundwater interaction and impact pathways from current and proposed extraction of groundwater, construction and operation of the proposed project and current and past mining activities, including the supporting data, investigation and analysis. A numerical groundwater flow model, consistent with the conceptual model, should also be developed for impact assessment. The model should be developed in consideration of the leading practices and approaches to mine void modelling published by the Queensland Mine Rehabilitation Commissioner (Appendix 2) and should be peer-reviewed by an independent suitably qualified person/s consistent with the Australian groundwater modelling guidelines (see Appendix 2). The models should include a site water balance (including any voids) to determine the upper and lower bounds of future water levels during project operation, before and after mine closure, the calculated trends of water quality in the voids and in the groundwater over time and changes to the extent of any groundwater contamination (as a result of mining) from the project construction and operation. The model should be capable of simulating:
- (a) aquifers affected or likely to be affected
 - (b) quantity of water types extracted over time from the proposed project
 - (c) drawdown or pressure impact in the target formations, as well as the surrounding aquifers, from direct and indirect extraction of groundwater or from other mining activities or as a result of the proposed project
 - (d) the predicted qualities of water to be taken or interfered with
 - (e) change in groundwater level or hydrostatic pressures and potential extent of any contaminated groundwater over time and at specific locations of interest in relation to environmental values and the proposed project
 - (f) potential for underground infrastructure to disrupt groundwater flows, groundwater partitioning, groundwater quality and groundwater interactions with surface water bodies
 - (g) if relevant, an assessment of the potential impacts on the objectives and requirements of any underground water management area or relevant Water Plan regulating underground water
 - (h) the proposed project's potential impacts 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
 - (v) the potential impacts of the proposed project on groundwater dependent ecosystems, including impacts on stygofauna and proposed effective mitigation measures
 - (vi) extent of the area within which groundwater resources are likely to be affected by the proposed operation of any component of the proposed project.

Mitigation measures

- 14.148 Propose a network of groundwater monitoring bores before and after the commencement of the proposed project that would be suitable for the purposes of monitoring groundwater quality and potential hydrology impacts that may occur as a result of the existing resource activity and proposed development. Include details on investigation, adaptive management frameworks, reporting timeframes and actions if exceedances are detected.
- 14.149 Provide a policy outline of compensation, effective mitigation and management measures where potential adverse impacts are identified, if relevant. Describe how 'make good' provisions under the Water Act would apply to any water users that may be adversely affected by the exercise of underground water rights in connection with any existing resource tenure associated with the project site.
- 14.150 Present a groundwater management plan, for the life of the proposed project, which details management strategies for predicted and potential impacts on groundwater.

Water-related cultural values

Existing environment

- 14.151 Describe the cultural and spiritual values of nearby and affected watercourses in consideration of s125(1)(l)(i)(A) of the Environmental Protection Act 1994 and water-related cultural use as relevant to the proposed project. Include 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

- 14.152 Detail the proposed project's potential impacts on water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples.
- 14.153 Detail 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 proposed project.
- 14.154 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.

Air

Objectives

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

- (a) avoid, minimise and/or mitigate adverse air impacts to sensitive receptors
- (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

- 14.155 Describe the existing air quality environment that may be affected by the proposed project in the context of environmental values.
- 14.156 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 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.
- 14.157 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.
- 14.158 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

- 14.159 The assessment of impacts on air from all components of the proposed 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 2).
- 14.160 Demonstrate the proposed project can meet the environmental objectives and performance outcomes in Schedule 8, Part 3 of the EP Regulation.
- 14.161 Provide an emissions inventory and description of the characteristics of the contaminants or materials released, and the release rates as a result of the construction and operation of the proposed project, including point source and fugitive emissions. An emissions inventory (point source and fugitive) during construction, commissioning, operations, maintenance, existing mine closure and a range of possible/likely upset conditions is to be included.

- 14.162 Predict the potential impacts of the releases to air from project activities on environmental values of the receiving environment using established and accepted methods.
- 14.163 The description of impacts should take into consideration the sensitivity and assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or effectively minimise potential impacts. The impact prediction is to:
- (a) address residual impacts on the environmental values (including appropriate indicators and air quality objectives) of the air receiving environment, with reference to sensitive receptors, using recognised quality assured methods. This should include all relevant values potentially impacted by the activity, under the EP Act, EP Regulation and Environmental Protection (Air) Policy 2019 (EPP (Air))
 - (b) address the cumulative impact of the release with other known releases of contaminants, materials or wastes associated with existing development and 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 proposed project for all contaminants whether or not they are covered by the National Environmental Protection (Ambient Air Quality) Measure or the EPP (Air).

Mitigation measures

- 14.164 Detail the measures to avoid, minimise and manage impacts on air quality, including dust and odour management, and how the proposed project activities would be consistent with best practice environmental management.
- 14.165 Address the compatibility of the proposed project's air emissions with existing or potential land uses in surrounding areas.
- 14.166 Identify measures to be implemented on-site to effectively control and mitigate potential impacts and describe how the proposed project activities will be consistent with best practice environmental management.
- 14.167 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 proposed project.

Noise and vibration

Objectives

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

- (a) avoid, minimise and/or mitigate adverse noise and vibration impacts to sensitive receptors
- (b) protect or enhance 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

- 14.168 Describe the existing noise and vibration sources and baseline levels within the project area.
- 14.169 Describe and illustrate the locations of any sensitive receptors that are listed in Schedule 1 of the Environmental Protection (Noise) Policy 2019 (EPP (Noise)) and estimate typical

background noise and vibration levels based on surveys at representative sites in accordance with the Noise Measurement Manual 2013, Department of Environment and Science (Qld). Also describe any other environmental values and infrastructure that could be impacted by emissions from the proposed project.

- 14.170 If the proposed project could adversely impact on the noise and vibration environment, undertake baseline monitoring at a selection of sensitive receptors potentially affected by the project. Describe the results of any baseline monitoring.

Impact assessment

- 14.171 Describe the characteristics of the noise and vibration sources, including any blasting or rock ripping, that would be emitted by the proposed project (point source and general emissions) during construction, commissioning, operation, upset conditions, and decommissioning of the proposed project.
- 14.172 Conduct a noise and vibration impact assessment in accordance with the latest version of *DES Noise and vibration—EIS information guideline and Applications for activities with noise impacts* (ESR/2015/1838) (see Appendix 2). 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.
- 14.173 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 potential noise and vibration impacts on sensitive receivers in accordance with Schedule 1 of the EPP (Noise) and detail the proposed effective mitigation measures that demonstrate best practice environmental management and compliance with the noise criteria for construction, operational and decommissioning phases.
- 14.174 Assess the potential blasting and vibration impacts from construction and operation of the proposed project on the existing Mt Rawdon Mine and other existing and planned future infrastructure (including any fauna passageway), and the potential for structural impacts and functional impacts on these. Safety considerations should be included in the impact assessment.
- 14.175 Demonstrate the proposed project can meet the environmental objectives and performance outcomes in Schedule 8, Part 3 of the EP Regulation.

Mitigation measures

- 14.176 Describe how the environmental objectives for noise and vibration would be monitored, audited and reported, and how corrective/preventative actions would be effectively managed for the life of the proposed project.
- 14.177 Describe how the proposed project activity would be managed to be consistent with best practice environmental management, including the control of background creep in noise as outlined in the EPP (Noise). The EIS must address the compatibility of the proposed project's noise emissions with existing and potential land uses in surrounding areas.
- 14.178 Describe any expected exceedances of the acoustic quality objectives following the provision and/or application of avoidance and mitigation measures, and how any residual impacts would be adequately addressed.

Waste management

Objectives

The design, construction, operation and decommissioning 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
- (c) ensure waste infrastructure has the capacity to adequately accommodate waste from the project or is appropriately upgraded.

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

Existing environment

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

Impact assessment

- 14.180 The assessment of impacts on waste is to be in accordance with the latest version of the DES *Waste – EIS information guideline* and *Application requirements for activities with waste impacts* (see Appendix 2) and *Technical guideline: Wastewater release to Queensland waters*.
- 14.181 Demonstrate the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.
- 14.182 Describe the quantity, categorisation, disposal requirements, and physical and chemical characteristics of each significant waste, including form (liquid, solid, gas), environmental hazard rating, and toxicity of each significant waste any attributes that may affect its dispersal in the environment, and its associated risk of causing environmental harm.
- 14.183 Detail the geochemistry of all waste rock, including spoil and rejects. Assess the potential risks associated with this waste stream and describe the management of progressive placement and any disposal strategy, including use in mine rehabilitation at the Mt Rawdon mine site, and measures to minimise any potential impacts on environmental values of the proposed project area. Detail how high-risk waste material will be managed in the rehabilitation plan.
- 14.184 Provide relevant information on existing and proposed sewage infrastructure relevant to ERA 63, by referring to relevant administering authority policies and guidelines (e.g. Assessment guideline - Assessing applications for sewage treatment works (ESR/2015/1652), depending on the proposed sewage collection and treatment infrastructure proposed, the reuse and/or disposal of treated wastewater and sewage wastes generated.
- 14.185 As it relates to the impact and disposal of waste, 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).

Mitigation measures

- 14.186 Detail waste management planning for the proposed project especially how these plans are to be applied to prevent or minimise potential environmental impacts from waste for each stage

of the proposed project. Waste management planning is to include detail of all identified waste types, waste volumes and proposed locations for waste disposal.

- 14.187 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.
- 14.188 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 reported, and how corrective/preventative actions would be effectively managed.
- 14.189 Define and describe objectives and effective practical measures for protecting or enhancing environmental values from the potential impacts from waste streams.
- 14.190 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.
- 14.191 Provide information on existing and proposed sewage infrastructure relevant to 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.

Transport

Objectives

The design, construction, operation and decommissioning 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.

Existing environment

- 14.192 Provide a detailed description of background traffic growth and existing traffic data.
- 14.193 Include a description of the existing and future (as planned by state or local governments) transport network and corridors including detailed maps to appropriate scales showing relevant:
 - (a) construction laydown and worker's accommodation areas
 - (b) road and railway corridors
 - (c) road and rail infrastructure
 - (d) airports, airstrips
 - (e) sea ports.

Impact assessment

- 14.194 Provide a detailed description and tabular summaries of the total transport activities associated with all stages of the proposed project (from pre-construction through to decommissioning). The information is to include but not limited to:
- (a) background traffic growth, and existing traffic data
 - (b) expected annual volumes and weights and origins/destinations of materials, products, hazardous goods and wastes
 - (c) details concerning road transportation for each major transport task (e.g. fuel, plant and equipment, consumables, hazardous goods, wastes) including heavy vehicle classification, load size, 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 proposed routes
 - (g) traffic generated by workforce personnel and service providers for all phases of the proposed project.
- 14.195 Identify any project area 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.
- 14.196 Undertake the transport assessment in accordance with the latest version of DES's *Transport-EIS information guideline* (Appendix 2) and present in separate sections for each project-affected mode (road, rail, air services, port and maritime) as appropriate for each phase of the proposed project.
- 14.197 Provide a detailed assessment by a Registered Professional Engineer of Queensland of how the existing and future safety, condition and performance of transport infrastructure (e.g. existing and future local and state controlled roads, railway corridors, port and air services) will be impacted by the proposed project from pre-construction through to decommissioning.
- 14.198 Provide a detailed traffic impact assessment in accordance with the latest Department of Transport and Main Roads (DTMR) *Guide to Traffic Impact Assessment* (GTIA) (see Appendix 2), including any practice notes, guidelines and documents referred to in the GTIA. This assessment must assess the project's impacts on all impact types (road safety, access and frontage, intersection delay, road link capacity, pavement, and transport infrastructure) as detailed in GTIA. Particular emphasis is to also be placed on the following sections of GTIA:
- (a) section 8.4.2 Heavy Vehicle Routes
 - (b) section 9 Road Safety
 - (c) section 13 Pavement.
- 14.199 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 (DAMS). Where accelerated pavement impacts or safety issues are identified, demonstrate proposed mitigation measures such as the

implementation of Road Compensation Agreements and Road Use Management Plans with the road authority.

- 14.200 Provide a detailed assessment for the project's impacts on local government roads in accordance with the relevant local government's impact assessment methodology.
- 14.201 Identify, assess and address the project's impacts on all existing and future railway corridors, particularly railway level crossings and any aspect of the proposed project interfacing or interfering with existing and future railway corridors in accordance with relevant standards and requirements such as the SDAP, the Guide for Development in a Transport Environment: Rail, the Manual of Uniform Traffic Control Devices, Part 7: Railways and railway manager standards. This is to include the construction and operation impacts of the proposed project. Traffic data should be provided for development generated traffic during construction and operation, background traffic growth and timelines for development staging, construction and delivery.

Mitigation measures

- 14.202 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).
- 14.203 Demonstrate how the project impacts will be mitigated in accordance with the GTIA and any practice notes, guidelines and documents referred to in the GTIA.

Social

Objectives

The construction and operation of the project are to:

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

Existing environment

- 14.204 Identify and describe people, communities, and key stakeholders³⁴ directly or indirectly affected by the proposed project.
- 14.205 Include a social baseline study of the proposed project's potentially affected communities,³⁵ in accordance with the Coordinator-General's *Social Impact Assessment Guideline* (March 2018) (SIA Guideline) (see Appendix 2).
- 14.206 Use the latest qualitative and quantitative data and supplementing 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.

³⁴ Refer to Appendix 2 of the SIA Guideline for a list of key stakeholders.

³⁵ Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

- 14.207 The social baseline study should include:
- (a) an analysis of community characteristics such as community culture and values, demographic profile, community history, community well-being, land ownership and utilisation of natural resources
 - (b) assessment of the capacity and accessibility of infrastructure, facilities and services, including health and emergency services
 - (c) an analysis of the existing housing and accommodation market
 - (d) a profile of the local and regional labour market
 - (e) relevant data contained in local and state government publications, reports, plans, and documentation, including regional and community plans
 - (f) details of other resource and infrastructure projects in the area, both planned and currently operating, based on publicly accessible information.

Impact assessment

- 14.208 In consultation with the Office of the Coordinator-General (OCG), prepare a social impact assessment (SIA) for the proposed project that is consistent with the requirements of the SIA Guideline.
- 14.209 The SIA is to describe the potential impacts (positive and negative) of the proposed project that is informed by an inclusive and collaborative community and stakeholder engagement program,³⁶ consistent with the SIA Guideline.
- 14.210 Describe the outcomes of consultation with directly affected people, communities and key stakeholders including but not limited to landholders, Aboriginal and Torres Strait Islander peoples, local governments, state agencies, local and regional commerce and community development groups, social and public service providers (e.g. Queensland Health and Queensland Emergency Services).
- 14.211 Address and describe the type, level and significance of the project's social impacts (beneficial and adverse), based on the outcomes of community engagement processes and the social baseline study.
- 14.212 Describe any potential impacts on the use of and access to recreational, natural and culturally important areas, waterways and landscapes (Aboriginal and non-Aboriginal) potentially affected by the proposed project.
- 14.213 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 Bundaberg LGA and North Burnett LGA) and the proposed project 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

³⁶ 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.

- (ii) the needs of vulnerable groups including those that are socially disadvantaged, the aged and people with a disability
 - (iii) the potential social benefits of the proposed 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) the 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 proposed project to mitigate impacts.
- 14.214 Describe any potential 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.
- 14.215 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.
- 14.216 Describe the housing strategy to accommodate construction and operational workers.
- 14.217 Include a social impact management plan 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.
- 14.218 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.
- 14.219 Consider the impact of new technologies on the operation of the proposed project including possible impacts on the proposed workforce composition, potential new labour requirements and opportunities for local training and development (where relevant).

Mitigation measures

- 14.220 Include a social impact management plan (SIMP), developed in consultation with potentially affected people, communities and key stakeholders, identifying mitigation and management measures for project impacts and information on how the proposed project would enhance social benefits in accordance with the SIA guideline.
- 14.221 The SIMP must include management measures for the five key matters listed in the SIA Guideline; and 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.
- 14.222 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.

- 14.223 The SIMP should consider potential partnerships and opportunities for linkages with other projects planned or operating in the area and possible alignment with existing strategies that would benefit the management of any cumulative social impacts.

Cultural heritage

Objectives

The design, construction, operation and decommissioning 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

- 14.224 Identify the Traditional Owners of the land within the project area.
- 14.225 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 proposed project and the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.
- 14.226 For aspects of non-Indigenous historical heritage identified through the *Queensland Heritage Act 1992* (Qld) (Queensland Heritage Act), 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 proposed project in accordance with the *Non-Indigenous cultural heritage – EIS information guideline* (see Appendix 2). Identify values at local and state thresholds and assess the significance of identified values using recognised criteria. Any such study is to be conducted by an appropriately qualified cultural heritage practitioner.

Impact assessment and mitigation measures

- 14.227 Detail potential impacts on Aboriginal and Torres Strait Islander peoples' cultural heritage in accordance with *DES Aboriginal and Torres Strait Islander cultural heritage – EIS information guideline* (see Appendix 2).
- 14.228 Unless section 86 of the *Aboriginal Cultural Heritage Act 2003* (Qld) (ACH Act) applies, the proponent is to develop a Cultural Heritage Management Plan (CHMP) or plans in accordance with the requirements of Part 7 of the ACH Act and any associated agreements that have been reached. The CHMP must be informed by the results of a cultural heritage study or survey.
- 14.229 Detail potential impacts on Queensland (non-Indigenous) historical heritage identified under the Queensland Heritage Act.
- 14.230 Provide strategies to mitigate and manage all impacts on cultural heritage values of Aboriginal and Torres Strait Islander peoples and non-Indigenous cultural heritage values. Include a strategy to address unexpected archaeological discoveries and cultural places in accordance with the relevant part of the *Non-Indigenous cultural heritage–EIS information guideline* (see Appendix 2).

Economic

Objectives

The construction, operation and decommissioning 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, including Aboriginal and Torres Strait Islander owned business
- (c) create a net economic benefit to the region and state.

Existing environment

- 14.231 Describe the existing economic environment consistent with the Coordinator-General's *Economic Impact Assessment Guideline* (April 2017) (see Appendix 2). The analysis is to describe the local and regional economies likely to be impacted by the proposed project and identify the relevant stakeholders, and include:
- (a) map/s illustrating the local and regional economies that could be potentially impacted by the proposed project
 - (b) population of relevant local government areas
 - (c) the regional economy's key industries and their contribution to regional output
 - (d) relevant economic indicators (e.g. agriculture, water prices and 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
 - (f) existing electricity infrastructure in the region and any plans for connection to the proposed project
 - (g) existing and proposed renewable energy infrastructure projects in the region.
- 14.232 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

- 14.233 Identify the net economic impacts of the proposed project on the local and regional area and the state ensuring the analysis is consistent with the Coordinator-General's *Economic Impact Assessment Guideline* (April 2017).
- 14.234 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 proposed project will have on water prices, grazing, agriculture, domestic and industrial energy prices, wages, economic growth, renewable energy projects

- (d) the anticipated value of offsets required for all components of the proposed project.
- 14.235 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.
- 14.236 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.
- 14.237 Quantify the employment and value-added contribution of the proposed project to the local, regional and state economies in a regional impact assessment using computable general equilibrium modelling. The assessment is to estimate the changes in key indicators including:
- (a) gross regional product
 - (b) gross state product
 - (c) employment by industry
 - (d) water prices for residential, mining, agriculture and industrial users
 - (e) gross value added by industry.
- 14.238 Undertake a cost-benefit analysis (CBA) which identifies the structure of the proposed project and the relevant direct costs and benefits from the proposed project.
- (a) The CBA is to consider:
 - (i) key construction inputs and milestones
 - (ii) the project timeline
 - (iii) relevant renewal costs related to the proposed project (including projected repair/replacement of infrastructure)
 - (iv) operational costs, including all input costs of production
 - (v) costs associated with environmental management, monitoring, mitigation and offsets associated with the proposed project
 - (vi) benefits, including revenue projections (and stipulating unit/price assumptions)
 - (vii) expected project life and any residual value over the assessment period.
 - (b) The CBA should also consider all direct private, indirect, and external social costs and benefits. These would include:
 - (i) external net benefits to the proposed project
 - (ii) external net costs (to third parties, community, local and state government) as a direct result of the proposed project
 - (iii) comparisons of all direct, indirect and external costs and benefits and valuing those direct, indirect and external costs and benefits in monetary terms
 - (iv) assumptions for benefits and costs, including risk assessments

- (v) all beneficiaries (e.g. individuals, the community, local and state government) of the proposed project. If there are specific issues related to the cost of water, these should be identified as external costs and benefits.
- 14.239 Compare the estimated costs and benefits of the site's proposed final land uses to demonstrate that a variety of configurations have been investigated to optimise the final landform design against the estimated costs and benefits of the following alternative land uses:
- (a) full rehabilitation of the site with no final void/s and non-use management areas
 - (b) rehabilitation with partial backfilling of void/s
 - (c) usual practice such as overburden waste dumps and stockpiles
 - (d) alternative location and configuration of infrastructure and structures.
- 14.240 Identify any existing or proposed incompatible land uses within and adjacent to the site, including the impacts on economic resources and the future availability and viability of the resource including extraction, processing and transport location to markets.

Climate

Objectives

The design, construction, operation and decommissioning 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 emission reduction and renewable energy targets by developing and implementing decarbonisation measures for the project.

Existing environment

- 14.241 Describe the extremes of climate (e.g. drought, floods and bushfires) relevant to the proposed project area. Include accounts of the recent rainfall events and any unplanned releases from the Mt Rawdon Mine Site as a result of those rain events.
- 14.242 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 that may affect management of the project.

Impact assessment and mitigation measures

- 14.243 Conduct the assessment in accordance with DES *Climate – EIS Information Guideline* and *Air – EIS information guideline* (see Appendix 2).
- 14.244 Describe the project area's climate patterns that are relevant to the environmental impact assessment, particularly the proposed project's discharges to water and air. Assess the proposed project's vulnerabilities to current climate patterns, particularly in relation to water quality and quantity management (surface and groundwaters) and unplanned or emergency water releases.
- 14.245 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 and bushfires), as

necessary. It should also be illustrated by bar charts, wind rose diagrams or other relevant graphic means as necessary.

- 14.246 Assess the project's vulnerabilities to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology, and frequency of extreme weather events). Include an assessment of climate change and potential sea-level rise scenarios and in-combination effects for flood and drought events. Demonstrate how the proposal accounts for climate change impacts and builds in fire, drought and flood 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 data³⁷) and employ an appropriate climate risk assessment methodology.
- 14.247 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.

Greenhouse gas emissions

Existing environment

- 14.248 Describe and illustrate the existing significant sources of GHG at the proposed project site, within the surrounding area and the airshed, including the background/ambient levels of typical GHGs (such as carbon dioxide and methane).
- 14.249 Describe the proponent's obligations under the *National Greenhouse and Energy Reporting Act 2007* (Cth) (NGER Act), where applicable. 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

- 14.250 Provide an inventory of projected annual emissions for the life of the proposed project for each GHG, with total emission expressed in 'CO₂ equivalent terms' for the following categories as per the National Greenhouse and Energy Reporting Scheme (NGER Scheme):
- (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.

³⁷ Available from <https://longpaddock.qld.gov.au/qld-future-climate/dashboard>.

- 14.251 Estimate both unmitigated emissions and predicted emissions after all avoidance and mitigation measures have been accounted using an appropriate methodology in accordance with relevant Australian and international guidelines. Include forgone GHG uptake and sequestration as a result of vegetation clearance.
- 14.252 Assess the potential impacts of the proposed project on the state and national GHG inventories including Queensland's and Australia's published emissions targets.
- 14.253 Provide a decarbonisation plan³⁸, that is consistent with the relevant published Industry Decarbonisation Plan Policy, for the life of the proposed project, which includes the following:
- (a) how the proposed project will be developed and operated to meet Queensland and Australia's published emission targets
 - (b) a detailed assessment and explanation of feasible alternatives that were considered to avoid or reduce the project's emissions (including the option of not proceeding)
 - (c) a description of:
 - (i) measures (preferred and alternatives) proposed to avoid and/or minimise Scope 1 and Scope 2 GHG emissions of the proposed project and forgone GHG sequestration
 - (ii) opportunities and commitments for offsetting GHG emissions through accredited and verified offsets that represent genuine emissions reductions within Australia (i.e. will be recognised in the National Greenhouse Accounts)
 - (iii) opportunities to reduce greenhouse gas emissions through renewable energy use and innovation
 - (iv) any voluntary initiatives or research into reducing the lifecycle and embodied energy carbon intensity of the project's processes or products
 - (v) any additional carbon offsetting options for emissions that cannot be reduced (including, but not limited to, through carbon offsets, vegetation management)
 - (vi) any fire management of offset areas in the Offset Area Management Plan (OAMP) and planned burning programs, in consultation with the Queensland Fire and Emergency Services or other organisation involved in fire management.
 - (d) a process for regularly reviewing new technologies to identify opportunities to further reduce GHG emissions and use energy efficiently, consistent with best practice environmental management
 - (e) an assessment of the practicality, effectiveness and risks for each avoidance and mitigation measure, and clear evidence that mitigation and avoidance measures have been factored into the economic feasibility of the proposed project
 - (f) a commitment to:
 - (i) periodic energy audits that measure progress towards improving energy efficiency
 - (ii) monitoring and transparent public reporting of GHG emissions as per the NGER Scheme, as well as public reporting on the success of mitigation measures outlined in the decarbonisation plan

³⁸ As per requirements in section 7.4, 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 (e.g. the Commonwealth Safeguard Mechanism and the Queensland Industry Decarbonisation plan).

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

Hazards, health and safety

Objectives

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

- (a) avoid, minimise and/or mitigate the risk of, and adverse impacts from, natural and human-made hazards to protect human life and property
- (b) enhance the community's resilience to natural hazards
- (c) ensure development is appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment.
- (d) ensure any risk associated with explosives use, transportation, storage or manufacture is within an acceptable level, in accordance with the *Explosives Act 1999* (Qld) (Explosives Act) and codes and standards including the Australian Standard AS2187.1 Explosives - Storage, transport and use - Storage
- (e) if the production of hazardous contaminants and waste is unavoidable, the project treats and/or contains hazardous contaminants until their disposal at an approved facility.

Existing environment

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

Impact assessment

- 14.255 Describe the potential risks to people, property, waterways, flora and fauna that may be associated with the proposed project in the form of a risk assessment for all components of the project and in accordance with relevant standards, guidelines and *DES Approved form for submission of a draft terms of reference for environmental impact statements* (see Appendix 2).
- 14.256 The assessment is to include:
- (a) the safety of employees during design and planning of the proposed project
 - (b) potential hazards (including abandoned mines), accidents, spillages, fire, structural failure and abnormal climatic or seismic events that may occur during all stages of the proposed project, including estimated probabilities of occurrence
 - (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) that any risk associated with explosives use, transportation, storage or manufacture is within an acceptable level, in accordance with the Explosives Act and codes and standards including the Australian Standard AS2187.1 Explosives - Storage, transport and use – storage
 - (e) identify the need for appropriate explosive licences and notice of proposed blasting prior to explosives use

- (f) the identification of all hazardous substances (including hazardous waste) and any explosives to be used, transported, stored, processed or produced and the rate of usage
 - (g) potential hazards posed by wildlife interactions, natural events (e.g. cyclone, rain events and flooding, bushfire, earthquakes³⁹, landslide, heatwave⁴⁰) 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 area
 - (h) how the proposed project may potentially affect hazards away from the project area (for example, changing flooding characteristics, bushfire, landslide)
 - (i) how potential flooding or overtopping of the lower and upper storage reservoirs would be managed
 - (j) how the proposed project may potentially affect hazards away from the project site (for example, changing flooding characteristics, bushfire, landslide).
- 14.257 The hazard analysis and risk assessment must be undertaken in accordance with:
- (a) AS/NZS ISO 31000:2018 *Risk management – Guidelines* and with HB 203:2012 *Managing environment related risk* (see Appendix 2)
 - (b) refer to relevant Local Disaster Management Group Plans and Queensland Emergency Risk Management Framework, including state risk assessment plans for heatwave, earthquake and severe wind⁴¹.
- 14.258 Assess the vulnerability of the area to natural and induced hazards, including drought, severe wind, heat, floods, storms, earthquakes, bushfires and cyclones. Consider the relative frequency 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.
- 14.259 Describe natural hazards that may affect the site with at least a one per cent annual exceedance probability or 100-year average reoccurrence interval level, including mapping of the potential hazard areas at the site.

Mitigation measures

- 14.260 Detail how siting, layout and operation of the development as well as other measures will avoid or mitigate risks. Include details of how the design and operation of the intake and outlet works at both upper and lower reservoirs will ensure that risks to people and fauna from being entrained or trapped within the works will be avoided.
- 14.261 Describe the proposed procedures and safeguards built into the design and management/operational practices to:
- (a) reduce the potential for chemical leaks and spills

³⁹ 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.

⁴⁰ Use State Heatwave Risk.

⁴¹ See <https://www.disaster.qld.gov.au/qermf/Pages/Assessment-and-plans.aspx>

- (b) enable the detection of spills and leaks and management measures to be implemented to rectify
 - (c) provide procedures for managing water in containment areas
 - (d) outline an inventory and describe the characteristics and management involved in the handling, storage, spill management, transport and disposal of all chemicals, products/by-products and potential contaminants as a result of construction, operation, maintenance, commissioning and decommissioning.
- 14.262 Describe measures required to ensure that the proposed project avoids the release of hazardous materials as a result of a natural hazard event/s. Sufficient detail must be provided to demonstrate that the securing of storage containers of hazardous contaminants during flood events meets the requirements of schedule 8 of the EP Regulation.
- 14.263 Detail measures required to manage mosquitoes in accordance with Queensland Health guidelines.
- 14.264 Provide details on the safeguards that will reduce the likelihood and severity of natural and induced hazards, consequences and risks to persons, waterways, flora and fauna within and adjacent to the project area/s, including any need for safety fire breaks and buffer zones in consideration of fauna movement, riparian and wetland corridors. Identify the residual risk following application of mitigation measures. Present an assessment of the overall acceptability of the potential impacts of the proposed project with consideration to the residual uncertainties and risk profile.
- 14.265 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. The emergency plan is to detail:
- (a) a bushfire management plan, prepared and certified by a suitably qualified person, in consultation with the Queensland Fire and Emergency Services, for the construction and operational phases, and any proposed offset locations (if applicable). The bushfire management plan is to include:
 - (i) a bushfire hazard analysis
 - (ii) mitigation strategies to achieve the relevant development outcomes in Part E of the *State Planning Policy – Natural Hazards, Risk and Resilience*
 - (iii) details of the proposed ongoing management of fuel loads across the project area through grazing or mechanical means, including the asset protection zone.
 - (b) a safety and emergency management plan for the construction and operational phases. The safety and emergency management plan is to include:
 - (i) evacuation plans
 - (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.
- 14.266 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.

- 14.267 Detail any consultation undertaken with the relevant state, district and local emergency response authorities and organisations, including the Local Disaster Management Group and how outcomes of the consultation have been included in the impact analysis and planning.

Flooding and regulated structures

Objectives

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

- (a) avoid, minimise and/or mitigate the risk of, and adverse impacts from, flooding or dam/storage failure to protect human life, property and the environment
- (b) operate in accordance with best practice environmental management.

Existing environment

- 14.268 Describe the likelihood and history of flooding onsite and in proximity to the project site, including the extent, levels and frequency and current flood risk for a range of annual exceedance probabilities (AEP) up to the probable maximum flood (PMF) for potentially affected waterways in accordance with requirements in *Queensland Government Regulated structures - EIS Information Guideline* (see Appendix 2).
- 14.269 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% AEP. This should include at least the following flood and stormwater events: 63.2%, 50%, 20%, 10%, 5%, 2% and 1% AEP, and Probable Maximum Flood and dam failure scenario.
- 14.270 Assess how the proposed 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 pre-development scenario, and the post development impacts for all relevant design events. Include a discussion on historical events.
- 14.271 The assessment is to consider all infrastructure associated with the proposed project including the proposed lower and upper storage reservoirs, 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 2).
- 14.272 Assess the proposed project's vulnerabilities to climate change (e.g. changing patterns of rainfall, hydrology, temperature and the frequency of 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 pre-development 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.

- 14.273 Describe the purpose of all dams or levees proposed on the project area. Show their locations on appropriately scaled maps, and provide plans and cross-sections, illustrating such features as embankment heights, spillways, discharge points, design storage allowances, and maximum volumes.
- 14.274 Identify any existing or proposed (potential) regulated structures at the project area.

Impact assessment

- 14.275 Use flood modelling (and any additional data) to assess how the proposed project may potentially change flooding and run-off characteristics onsite and both upstream and downstream of the site. The flood modelling assessment should consider local and regional flooding and all infrastructure and works associated with or near the proposed project including levees, roads and linear infrastructure, proposals to divert creeks/watercourses or construction of in-stream infrastructure and all proposed measures to avoid or minimise impacts.
- 14.276 Describe, illustrate and assess where any proposed project infrastructure or components would lie in relation to the extent of any modelled flood level, including, if relevant, the PMF.
- 14.277 Environmental objectives and performance outcomes for dams or levees are to be developed with reference to guidelines prepared by industry, the Australian National Committee on Large Dams and *DES Guideline – Structures which are dams or levees constructed as part of the environmentally relevant activities* (see Appendix 2).
- 14.278 Conduct the impact assessments on any potential regulated structures in accordance with *DES Regulated structures – EIS information guideline, Guideline – Structures which are dams or levees constructed as part of environmentally relevant activities* and *Manual for assessing consequence categories and hydraulic performance of structures* (see Appendix 2).
- 14.279 List and describe all dams and levees existing or proposed on the project area and undertake a consequence category assessment for each potential regulated structure according to the criteria outlined in the *DES Manual for assessing consequence categories and hydraulic performance of structures* (see Appendix 2). The assessment must be undertaken for the three different failure event scenarios described in DES manual, e.g. for seepage, overtopping and dam break. Regulated structures must comply with the *DES Manual for assessing consequence categories and hydraulic performance of structures* (see Appendix 2) in accordance with Schedule 8, Division 2 of the EP Regulation.
- 14.280 Following the consequence category assessment, determine the consequence category ('low, significant, or high') according to Table 1 of *DES Manual for assessing consequence categories and hydraulic performance of structures*, present the results in the EIS and provide certified copies of the consequence category determination for each of the proposed dams or levees assessed.

Mitigation measures

- 14.281 Illustrate how any regulated structure on site would be monitored managed during periods of high incidental rainfall and/or flooding on site so that any potential impacts to land or water are minimised.
- 14.282 Describe monitoring and management measures to minimise impacts of flooding to project infrastructure, including the management of mine affected water post flooding.
- 14.283 Describe how storage structures and other infrastructure would be sited to avoid or minimise risks from flooding.

- 14.284 Detail how design and management of all stages of the proposed project will mitigate potential impacts on level of flood risk.
- 14.285 Describe how risks associated with dam or storage failure, seepage through the floor, embankments of the dams, and overtopping of these structures will be avoided, minimised or effectively mitigated to protect people, property and the environment.

Cumulative impacts

Objectives and outcomes

The design, construction and operation of the proposed 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

- 14.286 Potential cumulative environmental, social, economic, and cultural impacts are to be considered for the design, construction, and operational phases of the proposed project.
- 14.287 The cumulative impact assessment is to consider the combined effect of potential impacts of different components of the proposed project on the same value (intra-project cumulative impacts) and the potential impacts of other relevant projects acting in combination on the same value (inter-project cumulative impacts).
- 14.288 Describe the cumulative impacts of the proposed 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^{42 43}
 - (d) soils
 - (e) 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 proposed project (including post decommissioning phase), including management of impacts on underground water rights under the Water Act
 - (h) release of contaminants, materials or wastes
 - (i) air quality
 - (j) noise

⁴² <https://www.epw.qld.gov.au/energyandjobsplan/about>

⁴³ <https://aemo.com.au/-/media/files/major-publications/isp/2022/appendix-3-renewable-energy-zones.pdf?la=en>

- (k) impact and disposal of waste
- (l) natural hazards occurring at the same time
- (m) public health and safety.

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

15. Matters of national environmental significance

Note

The project was referred on 1 September 2022 as two separate referrals to DCCEEW (transmission line EPBC 2022/09283 and pumped hydro project EPBC 2022/09284).

On 27 September 2022, the delegate for the Minister for the Environment and Water determined the transmission line project (EPBC 2022/09283) to be a 'controlled action' under section 75 of the EPBC Act.

On 16 November 2022, the pumped hydro project (EPBC 2022/09284) was also determined to be a 'controlled action' by a delegate of the Minister for the Environment and Water.

The controlling provision for both actions is listed threatened species and communities (sections 18 and 18A of the EPBC Act). The project, including the pumped hydro and transmission line projects, will be assessed by accredited assessment under the SDPWO Act.

The appendices of the EIS are to include two stand-alone reports providing an assessment of impacts of each of the proposed actions on the relevant controlling provision. Each of the MNES reports are to contain sufficient information to be read alone with reference to technical data or supplementary reports where appropriate. Any detailed technical information to support the text in the MNES reports is to be included as appendices to the draft 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 species profile and threats (SPRAT) database). Ensure that the habitat definitions also take into account all relevant Queensland regional ecosystems and other available information. The most up to date documentation needs to be used.

If it is necessary to make use of material that is considered to be of a confidential or sensitive nature, the proponent is to consult with the OCG and DCCEEW on the preferred presentation of that material, before it is published.

General content

- 15.1 The MNES section 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 2).
- 15.2 The MNES chapter should contain sufficient information to allow the Australian Minister for the Environment and Water (or delegate) to make an informed decision on whether or not to

approve the taking of the action, and if approved, what conditions to attach, under Part 9 of the EPBC Act for each controlling provision.

- 15.3 The MNES chapter should contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed developments on MNES.
- 15.4 The proponent is to ensure that the MNES section assesses compliance of the action with the principles of Ecologically Sustainable Development and the objects of the EPBC Act (see Chapter 1, Part 1 of the EPBC Act).

Specific content

Note

Where 'action' is used below, it is to mean the proposed action for each individual project referred to DCCEE in the MNES reports.

The appendices of the EIS are to include two stand-alone reports providing an assessment of impacts of the each of the two proposed actions on relevant controlling provisions.

Where a controlling provision does not apply to a proposed action, the information requirements in the TOR are not required in the assessment.

General information

- 15.5 Provide the background and context of the action including:
- the title of the action
 - the full name and postal address of the designated proponent
 - a clear outline of the objective of the action
 - the location of the action
 - the background to the development of the action
 - how the action relates to 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 affected by the action
 - the current status of the action
 - the consequences of not proceeding with the action.
- 15.6 Separately discuss the description, existing known location/s, likelihood of occurrence, demonstrated impact, avoidance, mitigation and compensatory measures (including offset) for each MNES triggered.
- 15.7 The structure of each MNES report should follow the content of this chapter where practicable. To avoid duplicating information, cumulative impacts may be addressed in each individual MNES report, or in the body of the EIS, if preferred.

Description of the action

- 15.8 All components of the action are to be described in detail, including construction, 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.

- 15.9 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 description is to also include details of:
- (a) all infrastructure proposed to be 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 infrastructure proposed to be constructed and upgrades of existing ancillary infrastructure
 - (e) realignment or replacement of services, structures, access etc. required as a result of the action
 - (f) establishment of new quarries (resource extraction areas) which includes location, size, method of extraction of materials and transport of materials
 - (g) maximum life of the action, including construction, operation, decommissioning and rehabilitation
 - (h) number of jobs for the life of the action, including number of jobs for Aboriginal and Torres Strait Islander employees
 - (i) associated works and supporting infrastructure deemed necessary as part of the action or safety works, including temporary roads
 - (j) other activities including but not limited to, changes to hydrological flow, concrete batching plant, material storage, construction camp and facilities, fines and dust control management, waste management generally and management of spills/contaminants/pollutants (e.g. prevention from entering waterways).
- 15.10 The description of the action is to provide the total size (in hectares) of the project area and the total size (in hectares) of the disturbance footprint. If the disturbance footprint is the same as the project area, the MNES section is to include a statement to this effect.
- 15.11 The MNES section must include map/s which clearly identify all project 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 area.
- 15.12 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.
- 15.13 Maps and associated spatial data must be developed consistently with the published guide: Guide to providing maps and boundary data for EPBC Act projects - DCCEEW.

Feasible alternatives

- 15.14 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, and a water resource, in relation to coal seam gas and large coal mining
- (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 feasible alternatives.

Description of the environment

- 15.15 Describe the environment of the project area 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 (e.g. Burnett River catchment area)
 - (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) native flora and fauna, both terrestrial and aquatic, including species records of each vegetation community or relevant regional ecosystem
 - (d) pest species and weeds distribution and abundance, including 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 North Burnett and Bundaberg Regional Councils
 - (e) important habitat areas, recognised populations and habitat, and aggregations of listed species
 - (f) surface water and groundwater hydrology and quality of potentially affected creeks and tributaries, including but not limited to Burnett River, Perry River, Swindon Creek, Twelve Mile Creek, Mingo Creek, Mingham Creek and Outside Creek
 - (g) groundwater dependent ecosystems of potentially affected creeks and tributaries, including but not limited to Perry River, Swindon Creek, Twelve Mile Creek, Mingham Creek, Mingo Creek and Outside Creek
 - (h) cultural heritage values, people and communities and other relevant social considerations
 - (i) historical anthropogenic uses of the project area (if relevant) and existing condition of the overall environment within, adjacent to, downstream and upstream of the project area.
- 15.16 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

- 15.17 All relevant impacts of the action are to be assessed in accordance with the latest relevant DCCEE policies and guidelines, and information provided in the SPRAT Database, including but not limited to:
- (a) habitat clearance, fragmentation and degradation

- (b) injury or death (such as from vehicle strike or collisions with powerlines)
 - (c) disturbance from dust, light, vibration and noise
 - (d) behavioural changes
 - (e) introduction and/or increase in numbers of pests and weeds
 - (f) changes to hydrological regimes (including flow changes)
 - (g) impacts to groundwater or surface water quality (including indirect and facilitated impacts)
 - (h) waste and chemical pollution.
- 15.18 The MNES section is to include a description of all relevant impacts of the action (direct, indirect, cumulative⁴⁴ 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, explosives and 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.
- 15.19 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) on the relevant controlling provision. 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.
- 15.20 The MNES section is to identify and assess the cumulative impacts on MNES (terrestrial and aquatic) created by the proposed project and the activities of other existing and proposed adjacent, upstream and downstream relevant developments, water users and land users.
- 15.21 The MNES section is to establish and describe clear spatial and temporal boundaries for the assessment of cumulative impacts.

Avoidance, mitigation and management measures

- 15.22 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.).
- 15.23 The MNES reports must demonstrate how the project was designed to avoid, minimise and mitigate impacts to the maximum possible extent and that all efforts have been made to avoid, minimise and mitigate potential impacts before resorting to offsets for any residual impacts.

⁴⁴ Cumulative impact assessment is to assess all relevant impacts of the project (two proposed actions); the project and development and other activities in the area.

15.24 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 Australian Government, 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) the name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.

15.25 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.) must be used. Avoidance and mitigation measures must be clearly demonstrated.

15.26 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 are to consider the 'SMART' 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).

15.27 Any management plans relied upon to mitigate and monitor impacts on MNES must be included as appendices to the EIS in draft or final format.

Note

According to the EPBC Act *Environmental Offsets Policy* (2012) (Offsets Policy) sets out that environmental offsets are measures that compensate for the residual adverse impacts of an action on the environment. Offsets provide environmental benefits to counterbalance the impacts that remain after avoidance and mitigation measures. It is important to consider environmental offsets early in the assessment process and correspondence with DCCEEW regarding offsetting is highly encouraged.

It is DCCEEW's standard practice that if environmental offsets are required, a draft Offset Strategy and an Offset Area Management Plan (OAMP) are included in the EIS for assessment and approval. Further, it is DCCEEW's expectation that, if the project is approved, 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.

- 15.28 The MNES section is to include an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures have been applied. An environmental offset will be required for all MNES which are deemed likely to have residual significant impacts from the action, under the Offsets Policy. To streamline the assessment process and provide confidence in the proposed outcomes, the proponent must prepare and submit an offset strategy and Offset Area Management Plan/s compensating for these impacts.

Offset Strategy

- 15.29 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 Offsets Policy. This information could be included as part of the OAMP, details below.
- 15.30 If it is determined that a residual significant impact is likely, include an Offset Strategy as an appendix to the EIS that provides, at a minimum:
- (a) specific details of 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) details of the scale of environmental offset/s (in hectares) to compensate for the residual significant impacts of the proposed action on relevant MNES
 - (c) details of the proposed offset area/s (including map/s) to compensate for the residual significant impacts of the proposed action on relevant MNES
 - (d) the methodology, with justification and supporting evidence, used to inform the inputs of the Offsets Assessment Guide in relation to the project site and offset area/s for each relevant MNES, including:
 - (i) total area of habitat (in hectares)
 - (ii) where a 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

(iii) habitat quality (for example, using the Queensland Government *Guide to determining terrestrial habitat quality: A toolkit for assessing land based offsets under the Queensland Environmental Offsets Policy* [2020]; noting that the proponent must follow species-specific survey guidelines approved by the department when assessing habitat quality for each relevant species, and the method to calculate habitat quality scores must be adequate for the Offsets Assessment Guide).

- (e) details, with supporting evidence, of how the environmental offset/s meets the requirements of the Offsets Policy
- (f) the methodology, with justification and supporting evidence, used to inform the inputs of the Offsets Assessment Guide in relation to each potential offset area/s for each relevant MNES, including:
 - (i) time over which loss is averted (max. 20 years)
 - (ii) time until ecological benefit
 - (iii) risk of loss (%) without offset
 - (iv) risk of loss (%) with offset and
 - (v) confidence in result (%).
- (g) evidence that the relevant MNES, and/or their habitat, can be present in the potential offset area/s
- (h) information about how the potential offset area/s provides connectivity with other relevant habitats and biodiversity corridors
- (i) details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide enduring protection for the potential offset area/s against development incompatible with conservation
- (j) details of the mechanism by which offset area managers will be required to implement the management measures proposed.

15.31 Where offset area/s have been nominated, include an OAMP as an appendix to the EIS which includes information to demonstrate how the environmental offset/s compensate for residual 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 offset area/s, including location, size, condition, environmental values present and surrounding land uses
- (c) baseline data and other supporting evidence, that documents the presence of the relevant MNES, and the quality of their habitat within the offset area/s
- (d) an assessment of the site habitat quality for the offset area/s (e.g. using the Queensland Government *Guide to determining terrestrial habitat quality: methods for assessing habitat quality under the Queensland Environmental Offsets Policy 2020*)

- (e) details of how the offset area/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant MNES
- (f) maps and shapefiles to clearly define the location and boundaries of the offset area/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the relevant MNES that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares)
- (g) describe the presence, abundance and distribution of the relevant MNES in the areas surrounding the proposed offset area
- (h) specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the offset area/s over a 20-year period
- (i) 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
- (j) conservation management strategies to revegetate, rehabilitate, conserve, protect or enhance habitat within the offset area must include information on prohibited actions (such as grazing), fencing plan, access and signage, fire management, weed control, pest animal control, cultural heritage management, waste management and management zones. Provide this information on a map/s at a suitable scale to allow the assessment of the OAMP
- (k) interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria
- (l) 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 offset area/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions)
- (m) monitoring methods are to be specified and targeted towards the objectives of the offset area management plan
- (n) proposed timing for the submission of monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved. Interim monitoring reports must also include:
 - (i) a detailed description of the works and management measures completed within the offset area during the reporting period
 - (ii) a summary table must show the management efforts completed each year.
- (o) timing for the implementation of tangible, on-ground corrective actions to be implemented if monitoring activities indicate the interim milestones have not been achieved
- (p) 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 a risk assessment matrix

- (q) 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
 - (r) details and execution timing of the mechanism to legally secure 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 for the offset area/s against development incompatible with conservation
 - (s) all proposed management actions, monitoring approach and corrective actions must be written using committed language (e.g. 'will' and 'must').
- 15.32 The OAMP must be prepared by a suitably qualified person and in accordance with DCCEEW's *Environmental Management Plan Guidelines* (2014)⁴⁵.
- 15.33 The OAMP is to provide evidence, derived from field validation surveys and vegetation assessments, to demonstrate that an EPBC Act protected matter (e.g. listed threatened species or 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.
- 15.34 Supporting evidence is to be included in the OAMP to justify how proposed management action/s are additional to the existing requirements of the landholder in managing their land (e.g. weed and pest management requirements under the Biosecurity Act, existing grazing regimes, etc.) as required by the principles of the EPBC Act Offsets Policy.
- 15.35 The OAMP is to include robust scientific evidence (e.g. published research, pilot studies, previously successful projects/programs, etc.) to demonstrate the success of proposed measures to create, revegetate, regenerate and/or improve habitat (e.g. tree planting, nest boxes, artificial hollows, etc.) in the proposed environmental offset/s for a listed threatened species or ecological community.
- 15.36 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.
- 15.37 Where an environmental offset/s is proposed, with a completed OAG calculation, all inputs must be supported by robust scientific evidence and/or supporting evidence (e.g. historical grazing regimes, satellite imagery, statements from landholders, etc.).

Listed threatened species and communities (sections 18 and 18A)

- 15.38 The MNES section is to address, at a minimum, impacts on listed threatened species and communities listed for the action at Appendix 1,⁴⁶ as well as any other listed species and/or communities not included in the list at Appendix 1, which are recorded in the area or that are determined as part of the assessment to have the potential to occur in the area and be impacted by the project.

⁴⁵ DCCEEW expects that an EPBC Act protected matter is present in the proposed environmental offset/s if it is present in the project area to align with the EPBC Act Offsets Policy.

⁴⁶ This may not be a complete list of listed threatened species and ecological communities that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the project, are assessed for the Minister's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decisions (27 September 2022 and 16 November 2022) do not affect the assessment and approval process. However, it is the proponents' responsibility to check any updated information for listed species to ensure the latest relevant statutory documents are considered in the assessment.

Information requirements

- 15.39 The structure of the assessment of listed threatened species and communities in the MNES section for the action must be the following:
- (a) description
 - (b) desktop analysis
 - (c) survey effort
 - (d) survey outcomes
 - (e) habitat assessment
 - (f) impact assessment⁴⁷
 - (g) avoidance, mitigation and management measures⁴⁸
 - (h) rehabilitation requirements
 - (i) statutory requirements
 - (j) significant impact assessment⁴⁹.

Description

- 15.40 For the 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.
- 15.41 Describe each listed threatened species and ecological communities (including EPBC Act listing status, distribution, habitat, life history, etc.); these descriptions are to align with the information in the SPRAT Database and relevant DCCEEW documents⁵⁰.

Desktop analysis

- 15.42 Describe the desktop assessment methodology used to inform the field surveys within, adjacent to and/or downstream of the project area. The MNES section must identify and describe known historical records of listed threatened species and ecological communities in the broader region. Appropriate sources should be used (i.e. Commonwealth and State databases, published research, publicly available survey reports, etc.) and where relevant, the year of the record should be noted.
- 15.43 The proponent must ensure that a recent Protected Matters Search Tool (PMST) report⁵¹ has been generated and considered before finalising the draft EIS. This PMST should be provided as an attachment to the EIS.

⁴⁷ The impact assessment must meet the requirements outlined in the 'Relevant Impacts' sections 15.16-15.20 above.

⁴⁸ As outlined at the 'Avoidance, Mitigation and Management Measures' sections 15.21-15.26 above.

⁴⁹ As outlined at the 'Environmental Offsets' sections 15.27-15.36 above.

⁵⁰ DCCEEW strongly recommends that the habitat assessment is undertaken in line with the habitat descriptions outlined in SPRAT Database and relevant DCCEEW documents. 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 environmental impact statement 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 (RE) mapping to determine habitat for listed threatened species).

⁵¹ Protected Matters Search Tool report - <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>

Survey effort

- 15.44 Provide details of the scope, methodology, timing and effort of field surveys (which must be undertaken by qualified species experts with demonstrated experience in detecting the relevant listed threatened species and ecological communities) within, adjacent to, downstream and/or upstream of the project area. 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.
- 15.45 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. Surveys are to also target the entire study area, 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

- 15.46 State the total number of records (individuals and evidence of presence) of listed threatened species and ecological communities within the study area. 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

- 15.47 Provide a robust assessment of the potential habitat available within the entire study area 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, known important habitat, suitable habitats, roosting, etc.).
- 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 (where relevant).
- 15.48 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 area 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
 - (c) include known records of individuals (or evidence of individuals) derived from desktop analysis and/or field surveys.
- 15.49 Habitat assessment must include the measurement of tree diameter, in relation to habitat suitability for listed threatened species such as the Greater Glider (basal diameter >30cm can be used as a proxy for hollow bearing trees suitable for this species).

- 15.50 The MNES section must not just consider Queensland Regional Ecosystem (RE) mapping to determine habitat for listed threatened species; habitat assessments are to 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.
- 15.51 Provide the total amount of each type of habitat (in hectares) within, adjacent to, upstream and downstream of the project area for each listed threatened species and ecological community.
- 15.52 The MNES section must also include a detailed habitat assessment for the listed threatened species and communities in Appendix 1 and any other listed threatened species and/or ecological communities identified during desktop analysis and/or field surveys. These should be shown on a map where applicable.
- 15.53 DCCEEW considers it is not unreasonable that a species may use a project area 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 ⁵²

- 15.54 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 action⁵³. This includes, but is not limited to, listed threatened species and communities in downstream catchment areas and wetlands and in areas adjacent to disturbance areas that may be subject to edge disturbances from impacts such as dust and noise.
- 15.55 Where relevant, consider the anticipated/predicted future climatic conditions at the site in the assessment of impacts on Commonwealth matters, and how changes in climate and the frequency and severity of weather events may interact with, exacerbate or reduce the impacts of the project on MNES over time. This should include, but not be limited to the:
- (a) loss, fragmentation, or drying of potential climate refugia and/or climate refuges for Commonwealth matters as a result of the proposed action – consider the potential impacts of removing or otherwise impacting this climate refugia and/or climate refuges for the long-term survival of the species in the region
 - (b) increased risk of fire as a result of the construction and operation of the proposed action under drier conditions and periods of extreme heat
 - (c) overtopping of water storages during extreme rain events and downstream impacts on Commonwealth matters
 - (d) inclusion of difference climate scenarios in surface water modelling.
- 15.56 For threatened species and communities, the total direct impact (in hectares) to each identified patch within and adjacent to the project area is to be provided in the MNES section and 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 area that may be impacted by fragmentation as a result of vegetation clearance.

⁵² Impact assessment must include the indirect, facilitated and cumulative impacts the action will have on listed threatened species and ecological communities in downstream catchment areas and wetlands, including estuarine, coastal and marine environments.

⁵³ The impact assessment must meet the requirements outlined in the 'Relevant Impacts' sections 15.16-15.20 above.

- 15.57 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.
- 15.58 Assess the impacts of habitat fragmentation in the proposed action area and surrounding areas, including consideration of species' movement patterns.
- 15.59 Assess the likely duration of impacts to MNES as a result of the proposed action.
- 15.60 Discuss whether the impacts are likely to be repeated, for example as part of maintenance.
- 15.61 Discuss whether any impacts are likely to be unknown, unpredictable or irreversible.
- 15.62 Assess the impacts of erosion, sedimentation, hydrological changes, noise, vibration, dust and vehicle strike resulting from the construction and operation of the proposed project to habitat in the project area and surrounding areas.
- 15.63 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.
- 15.64 Assess how the action impacts the outcomes, objectives, and targets of relevant reports and documents including, but not limited to conservation advices, recovery plans, threat abatement plans and the *Threatened Species Action Plan (2022)* avoidance, mitigation and management.
- 15.65 Describe all relevant species-specific measures proposed to avoid, mitigate and manage potential impacts on listed threatened species and ecological communities⁵⁴.
- 15.66 Discuss how cumulative impacts are considered in the avoidance and mitigation measures.
- 15.67 The MNES section must not just state proposed management plans and/or broad objectives to describe avoidance, mitigation and management measures.⁵⁵ 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.

Rehabilitation requirements

- 15.68 Include rehabilitation acceptance criteria, including for the restoration of habitat for relevant listed threatened species and communities.
- 15.69 Provide a summary of the procedures, including contingency measures, that will be undertaken to achieve the rehabilitation acceptance criteria.
- 15.70 Provide a summary of a monitoring program to determine the success of rehabilitation activities implemented by the proponent.
- 15.71 Describe the details of any rehabilitation activities proposed to be undertaken as required by Commonwealth, state or territory, and local government legislation. Attach relevant Commonwealth, state or territory, and local government approvals and permits as supporting documents to the preliminary documentation.

⁵⁴ As outlined at the 'Avoidance, Mitigation and Management Measures' sections 15.21-15.26 above.

⁵⁵ 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.

Statutory requirements

- 15.72 Where relevant, discuss how the proponent has had regard to the most recent approved conservation advice.
- 15.73 The MNES section must 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) an approved recovery plan or threat abatement plan.

Significant impact assessment ⁵⁶

- 15.74 After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on relevant listed threatened species and ecological communities. The significant impact assessment is to refer to the DCCEEW's *Significant impact guidelines 1.1* (2013) and any other species-specific guidelines as relevant.
- 15.75 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

- 15.76 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 proposed 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 proposed action has been, or is being, carried out under the scheme, plan or policy
 - (ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts.
 - (b) a description of any approval that has been obtained from a state, territory or Commonwealth government agency or authority (other than an approval under the EPBC Act), including any conditions that apply to the action
 - (c) a statement identifying any additional approval that is required
 - (d) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

⁵⁶ As outlined at the 'Environmental Offsets' sections 15.27-15.36 above.

Environmental record of person/s proposing to take the action

- 15.77 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.
- 15.78 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

- 15.79 The economic and social impacts of the action, both positive and negative, are to be analysed in the MNES section. Matters of interest may include:
- (a) details of any public consultation activities undertaken, including any consultation with Aboriginal and Torres Strait Islander stakeholders, and their outcomes
 - (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 Aboriginal and Torres Strait Islander employees.
- 15.80 Consultation with Aboriginal and Torres Strait stakeholders must be undertaken in accordance with the *Interim Engaging with First Nations People and Communities on Assessment and Approvals under the Environment Protection and Biodiversity Conservation Act 1999 (interim guidance)* (2023). An explanation of how Indigenous stakeholders' views of the action's impacts on biodiversity and cultural heritage have been sought and considered must be included.
- 15.81 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)

- 15.82 Provide a discussion of how the proposed project will conform to the principles of ESD, 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.

Information sources provided in the MNES section

15.83 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.

16. Appendices to the EIS

- 16.1 Appendices are to provide the complete technical evidence used to develop assumptions, statements and findings in the main text of the EIS.
- 16.2 No significant issue or matter is to be mentioned for the first time in an appendix—it is to be addressed in the main text of the EIS.
- 16.3 Include a table listing the section and sub-section of the EIS where each requirement of the TOR is addressed.
- 16.4 Include a list citing all reference material used or relied on in the EIS.
- 16.5 Include a glossary of terms and a list of acronyms and abbreviations.

Part D Acronyms and abbreviations

Table 2 Acronyms and abbreviations

Acronym/abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003 (Qld)</i>
AHD	Australian height datum
ABN	Australian Business Number
Biosecurity Act	<i>Biosecurity Act 2014 (Qld)</i>
Biosecurity Regulation	Biosecurity Regulation 2016 (Qld)
CBA	cost-benefit analysis
Cth	Commonwealth
DAF	Department of Agriculture and Fisheries
DCCEEW	Australian Government Department of Climate Change, Energy, the Environment and Water (formerly known as DAWE - the Australian Government Department of Agriculture, Water and the Environment)
DES	Department of Environment and Science
DISER	Australian Government Department of Industry, Science, Energy and Resources
DPI	dots per inch
DTMR	Department of Transport and Main Roads
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
e.g.	for example
EIS	environmental impact statement
EMP	environmental management plan
EOW	end of waste
EP Act	<i>Environmental Protection Act 1994 (Qld)</i>
EP Regulation	Environmental Protection Regulation 2019 (Qld)
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999 (Cth)</i>
EPPs	Environmental protection policies
ERA	Environmentally relevant activity
ESD	Ecologically sustainable development
FIFO	fly-in, fly-out
Fisheries Act	<i>Fisheries Act 1994 (Qld)</i>
FSL	Full supply level
GDA2020	geocentric datum of Australia 2020
GHG	greenhouse gas
GTIA	Guide to Traffic Impact Assessment
ha	Hectare
HQS	habitat quality score

Acronym/abbreviation	Definition
i.e.	that is
km	kilometre
m	metre
MNES	matters of national environmental significance
MSES	matters of state environmental significance
mtpa	million tonnes per annum
Native Title Act	<i>Native Title Act 1993</i> (Qld)
NC Act	<i>Nature Conservation Act 1992</i> (Qld)
NGER	national greenhouse and energy reporting
NPI	national pollutant inventory
OAG	Offsets Assessment Guide
OAMP	offset area management plan
PDF	portable document format
Planning Act	<i>Planning Act 2016</i> (Qld)
Planning Regulation	Planning Regulation 2017
PRCP	progressive rehabilitation and closure plan
Public Health Act	Public Health Act 2005 (Qld)
Qld	Queensland
Queensland Heritage Act	<i>Queensland Heritage Act 1992</i> (Qld)
RE	regional ecosystem
RIDA	regional interests development approval
RPI Act	<i>Regional Planning Interests Act 2014</i> (Qld)
ROM	Run of mine
SDAP	State Development Assessment Provisions
SDPWO Act	<i>State Development and Public Works Organisation Act 1971</i> (Qld)
SIA	social impact assessment
SIMP	social impact management plan
SIA Guideline	Coordinator-General's Social Impact Assessment Guideline 2018
Soil Conservation Act	<i>Soil Conservation Act 1986</i> (Qld)
SPP	State Planning Policy
SPRAT	species profile and threats
SRI	significant residual impact
Stock Route Management Act	<i>Stock Route Management Act 2002</i> (Qld)
SSRC Act	<i>Strong and Sustainable Resource Communities Act 2017</i> (Qld)
TOR	terms of reference
USB	universal serial bus
VM Act	<i>Vegetation Management Act 1999</i> (Qld)



Acronym/abbreviation	Definition
Water Act	<i>Water Act 2000</i>
Water Plan	Water Plan (Burnett Basin) 2014

Appendix 1. MNES listed threatened species and communities

Table 3 and Table 4 list the threatened ecological communities and species relevant to the controlled action under the EPBC Act, which at a minimum, is to be included in the impact assessment in the MNES section.

Note: The lists at Table 3 and Table 4 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 Australian Minister for the Environment and Water's consideration. Any listing events (e.g. the listing or up-listing of a species) that occur after the controlled action decision (27 September 2022 and 16 November 2022) are not required to be considered in the assessment.

Table 3 Relevant threatened ecological communities for each action

Species name	Status under the EPBC Act	Transmission line (EPBC2022/90279)	Pumped hydro project (EPBC2022/09284)
Poplar Box Grassy Woodland on Alluvial Plains	Endangered	✓	✓

Table 4 Relevant threatened species for each action

Species name	Status under the EPBC Act	Transmission line (EPBC2022/90279)	Pumped hydro project (EPBC2022/09284)
Birds			
Red Goshawk (<i>Erythrotriorchis radiatus</i>)	Vulnerable	✓	✓
Grey Falcon (<i>Falco hypoleucos</i>)	Vulnerable	✓	✓
Squatter Pigeon (southern) (<i>Geophaps scripta scripta</i>)	Vulnerable	✓	✓
Painted Honeyeater (<i>Grantiella picta</i>)	Vulnerable	✓	✓
White-throated Needletail (<i>Hirundapus caudacutus</i>)	Vulnerable	✓	✓
Australian Painted Snipe (<i>Rostratula australis</i>)	Endangered	✓	✓
Black-breasted Button-quail (<i>Turnix melanogaster</i>)	Vulnerable	✓	✓
Fish			
Australian Lungfish (<i>Neoceratodus forsteri</i>)	Vulnerable	✓	✓
Mammals			
Large-eared Pied Bat, Large Pied Bat (<i>Chalinolobus dwyeri</i>)	Vulnerable	✓	

Species name	Status under the EPBC Act	Transmission line (EPBC2022/90279)	Pumped hydro project (EPBC2022/09284)
Northern Quoll, Digul [Gogo-Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] (<i>Dasyurus hallucatus</i>)	Endangered	✓	✓
Spot-tailed Quoll (southeastern mainland population) (<i>Dasyurus maculatus maculatus</i>)	Endangered	✓	✓
Greater Glider (southern and central) (<i>Petauroides volans</i>)	Endangered	✓	✓
Koala (combined populations of Queensland, New South Wales and the Australian Capital Territory) (<i>Phascolarctos cinereus</i>)	Endangered	✓	✓
Grey-headed Flying-fox (<i>Pteropus poliocephalus</i>)	Vulnerable	✓	✓
Yellow-bellied Glider (south-eastern) (<i>Petaurus australis australis</i>)	Endangered	✓	✓
Plants			
Cossinia (<i>Cossinia Australiana</i>)	Endangered	✓	✓
<i>Cycas megacarpa</i>	Endangered	✓	✓
Quassia (<i>Samadera bidwillii</i>)	Vulnerable	✓	
Reptiles			
Adorned Delma, Collared Delma (<i>Delma torquata</i>)	Vulnerable	✓	✓
Yakka Skink (<i>Egernia rugosa</i>)	Vulnerable	✓	✓
Southern Snapping Turtle, White-throated Snapping Turtle (<i>Elseya albagula</i>)	Critically Endangered	✓	✓
Dunmall's Snake (<i>Furina dunmalli</i>)	Vulnerable	✓	✓

Appendix 2. Policies and guidelines

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Office of the Coordinator-General
PO Box 15517 City East Qld 4002 Australia
tel 1800 001 048
mtrawdon@coordinatorgeneral.qld.gov.au

