

Draft terms of reference for an environmental impact statement

Borumba Pumped Hydro Energy Storage Project

February 2024

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

Acknowledgement of Country

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

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

Copyright

This publication is protected by the *Copyright Act 1968*.

Licence



This work, except as identified below, is licensed by the Department of State Development and Infrastructure under a Creative Commons Attribution-NonCommercial-No Derivative Works (CC BY-NC-ND) 4.0 Australia licence. To view a copy of this licence, visit: <http://creativecommons.org.au/>

You are free to copy, communicate and adapt this publication, as long as you attribute it as follows:

© Department of State Development and Infrastructure, February 2024.

Third party material that is not licensed under a Creative Commons licence is referenced within this document. All content not licensed under a Creative Commons licence is all rights reserved. Please contact the Department of State Development and Infrastructure, the copyright owner if you wish to use this material.

Translating and interpreting service



The Queensland Government is committed to providing accessible services to Queenslanders of all cultural and linguistic backgrounds. If you have difficulty understanding this publication and need a translator, please call the Translating and Interpreting Service (TIS National) on 13 1450 and ask them to contact the Queensland Department of State Development and Infrastructure on 07 3328 4811.

Disclaimer

While every care has been taken in preparing this publication, to the extent permitted by law, the State of Queensland accepts no responsibility and disclaims all liability (including without limitation, liability in negligence) for all expenses, losses (including direct and indirect loss), damages and costs incurred as a result of decisions or actions taken as a result of any data, information, statement or advice, expressed or implied, contained within. To the best of our knowledge, the content was correct at the time of publishing.

Any references to legislation are not an interpretation of the law. They are to be used as a guide only. The information in this publication is general and does not take into account individual circumstances or situations. Where appropriate, independent legal advice should be sought.

Copies of this publication are available on our website at www.statedevelopment.qld.gov.au/cg and further copies are available upon request.

Contact us

Phone: 1800 001 048

Email: xxx@coordinatorgeneral.qld.gov.au

Web: www.statedevelopment.qld.gov.au/cg

Post: PO Box 15517 City East Qld 4002

Address: 1 William Street Brisbane QLD 4000 (Australia)

Source number D24/13040

Contents

1.	Introduction.....	1
2.	Statutory basis.....	1
3.	Accredited EIS process for projects under Commonwealth legislation.....	2
4.	More information.....	2
5.	Project description	3
	Proposed development	3
	Design of infrastructure	3
	Water storage infrastructure	3
	Tunnelling Infrastructure	5
	Pumped hydro power stations and power infrastructure	6
	Ancillary infrastructure requirements	6
	Project staging	7
	Pre-construction	7
	Construction	8
	Rehabilitation.....	11
	Operation	12
	Decommissioning.....	13
	Site description	13
	Project rationale and alternatives	14
6.	Planning and legislative requirements	14
7.	Stakeholder consultation	14
8.	Assessment of project specific matters.....	15
	Water resources	15
	Surface water	15
	Existing environment.....	15
	Impact assessment and mitigation measures.....	16
	Groundwater.....	21
	Existing environment.....	21
	Impact assessment and mitigation measures.....	21
	Water-related cultural values	23
	Existing environment.....	23

Impact assessment and mitigation measures	23
Water quality	23
Existing environment	23
Impact assessment and mitigation measures	25
Land	27
Land use and tenure.....	27
Existing environment	27
Impact assessment and mitigation measures	28
Topography, geology and soils	30
Existing environment	30
Impact assessment and mitigation measures	30
Protected areas and other lands with environmental significance	32
Existing environment	32
Impact assessment and mitigation measures	32
Flora and fauna.....	33
General content.....	33
Existing environment	34
Impact assessment.....	35
Mitigation measures	38
Offsets.....	38
Biosecurity.....	40
Existing environment	40
Impact assessment and mitigation measures	40
Hazards, health and safety	41
Existing environment	41
Impact assessment and mitigation measures	41
General.....	41
Flooding.....	44
Economic	45
Existing environment	45
Impact assessment and mitigation measures	45
Social.....	47
Existing environment	47
Impact assessment and mitigation measures	47
Cultural heritage.....	49
Existing environment	49
Impact assessment and mitigation measures	49

Noise and vibration	50
Existing environment	50
Impact assessment and mitigation measures	50
Climate	51
Existing environment	51
Impact assessment and mitigation measures	51
Greenhouse gas emissions	52
Existing environment	52
Impact assessment and mitigation measures	52
Air	54
Existing environment	54
Impact assessment and mitigation measures	55
Transport	56
General content	56
Existing environment	56
Impact assessment and mitigation measures	56
Waste management	58
Existing environment	58
Impact assessment and mitigation measures	58
Cumulative impacts	59
General requirements	59
9. Matters of national environmental significance	61
Specific content	62
General information	62
Description of the action	62
Feasible alternatives	63
Description of the Environment	64
Relevant impacts	64
Avoidance, mitigation and management measures	65
Environmental offsets	67
Offset Proposal	67
K'gari (Fraser Island): World heritage values of a declared World Heritage property (sections 12 and 15A) and National Heritage places (sections 15B and 15C):	73
Description	74
Impact assessment	74
Avoidance, mitigation and management	74
Statutory requirements	75

Significant impact assessment.....	75
Listed threatened species and communities (sections 18 and 18A)	75
Information requirements.....	75
Description	76
Desktop analysis	76
Survey effort.....	76
Survey outcomes.....	77
Habitat assessment.....	77
Impact assessment.....	78
Avoidance, mitigation and management.....	79
Statutory requirements	79
Significant impact assessment	80
Ramsar wetlands (sections 16 and 17B).....	80
Description	81
Impact assessment.....	81
Avoidance, mitigation and management.....	82
Statutory requirements	82
Significant impact assessment	82
Listed migratory species (sections 20 and 20A)	83
Other approvals and conditions.....	83
Environmental record of person(s) proposing to take the action.....	84
Economic and social matters.....	84
Principles of Ecologically Sustainable Development (ESD)	84
Information sources provided in the MNES section.....	85

Appendices

- Appendix 1. Policies and guidelines
- Appendix 2. MNES listed threatened species and communities

Tables

Table 1	Acronyms and abbreviations	86
---------	----------------------------------	----

Part A About these terms of reference

1. Introduction

- 1.1 This document outlines the draft terms of reference (TOR) for the Borumba Pumped Hydro Energy Storage (PHES) project (the project), proposed by Queensland Hydro Pty Ltd (Qld Hydro, the proponent) being assessed under the *State Development and Public Works Organisation Act 1971* (SDPWO Act).
- 1.2 Information requirements for all projects are identified in the Coordinator-General's *Preparing an environmental impact statement – Guideline for proponents (February 2024)*¹, which must be read in conjunction with, and forms part of, this draft TOR for the Borumba PHES project.
- 1.3 The proposed project is a pumped hydropower energy storage project located approximately 48 kilometres (km) south-west of Gympie in the Southern Queensland renewable energy zone. The proposed project has the capacity to supply up to 2,000 MW electricity for up to 24 hours (resulting in a storage capacity of 48,000 MWh).
- 1.4 The proposed project comprises of the following*:
 - (a) a new dam wall 300 m downstream of the existing Borumba Dam wall to increase the storage capacity of Lake Borumba (lower reservoir)
 - (b) main dam wall and saddle dams to form an upper reservoir approximately 330 m higher than the lower reservoir
 - (c) underground power station, pump turbines and other infrastructure
 - (d) underground tunnels including water tunnels to transfer water between the upper and lower reservoirs, cable, ventilation tunnels and access tunnels
 - (e) electrical switchyard for connection between the power station and the transmission network
 - (f) supporting infrastructure (temporary and permanent) including access roads, maintenance buildings, treatment plants, spoil and laydown areas, construction camps, explosives store, quarries and/or borrow pits, helipads and telecommunications.

***note** –transmission lines are outside this project scope; development of transmission infrastructure to connect this project to the electricity grid is the responsibility of a separate proponent.

2. Statutory basis

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

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

2.2 This draft TOR sets out the matters the proponent is to address in an EIS for the project and will be finalised by the Coordinator-General under section 30 of the SDPWO Act following the outcomes of public consultation.

3. Accredited EIS process for projects under Commonwealth legislation

- 3.1 On 19 December 2023, the Commonwealth Minister for the Environment and Water determined the project to be a 'controlled action' under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (EPBC reference 2023/09646). Therefore, the project requires further assessment and approval under the EPBC Act.
- 3.2 The relevant controlling provision for the proposed action are:
- World Heritage properties (sections 12 & 15A)
 - National Heritage places (sections 15B & 15C)
 - Ramsar wetlands (sections 16 & 17B)
 - Listed threatened species and communities (sections 18 & 18A)
 - Listed migratory species (sections 20 & 20A)
- 3.3 Refer to Appendix 2 for further information on relevant listed threatened species and ecological communities and listed migratory species.
- 3.4 The Commonwealth Minister for the Environment and Water also decided under section 87 of the EPBC Act that the proposed action would be assessed by accredited assessment under the SDPWO Act. The EIS process under Part 4 of the SDPWO Act is the accredited assessment process.
- 3.5 The EIS must include an assessment of impacts to matters of national environmental significance (MNES). The MNES assessment must be a stand-alone report provided as an appendix to the EIS that fully addresses matters relevant to the controlling provision under the EPBC Act. The report must include clear cross-references to the EIS where relevant.
- 3.6 Section 8 of this draft TOR, developed in consultation with the Department of Climate Change, Energy, the Environment and Water (DCCEEW), sets out the information which must be included in the EIS relating to MNES.

4. More information

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

Part B EIS content and suggested structure

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

5. Project description

Proposed development

- 5.1 In addition to the requirements set out in the document *Preparing an EIS: Guideline for proponents*, the EIS is to describe:
- (a) all energy requirements for construction and operation of the project, and identify expected energy sources
 - (b) Present and illustrate the quantum, and timing of available renewable energy in the National Electricity Market compared to energy requirements of the project and timing of operations
 - (c) specify the timing of and volume of water required for each stage of the project (construction, initial fill, ongoing maintenance fills) and describe form where and how the water will be sourced, and how it will be delivered to the site.

Design of infrastructure

Water storage infrastructure

- 5.2 Describe the purpose of all dams or levees proposed on the project area. Show their locations on suitably scaled maps, and provide plans and cross-sections, illustrating such features as embankment heights, spillways, intake works and outlet works, discharge points, design storage allowances, and maximum volumes.
- 5.3 Describe the process and criteria used, including relevant supporting information and data, to select the preferred design and construction techniques for the reservoirs and required connections between them, including:
- (a) full supply levels (FSLs) and details of any staging or prospects for future expansion showing site boundaries, development sequencing and timeframes
 - (b) maximum (final) height and width (including height above stream bed) and spillway height and width, including height above stream bed of all water storage infrastructure (new or existing)
 - (c) location of all water storage infrastructure in relation to waterways² and watercourses³ (as per Queensland Waterways for Waterway Barrier Works layer and watercourses as defined under the *Water Act 2000*)
 - (d) details of the upper and lower reservoir operations including where water will be sourced from (especially for first fill), the minimum operating levels for operation of the PHES and

² Waterways is defined in Schedule 1 under the *Fisheries Act 1994* which includes a river, creek, stream, watercourse, drainage feature or inlet of sea.

³ 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.

water support from the Borumba Dam, real-time quantification of likely headwater fluctuations, including horizontal fluctuations, and in reservoir water levels and likely extraction regime (e.g. when water will be sourced and expected demands versus yield), likely release (into the reservoirs, downstream releases or spillway releases) timings, volumes, frequencies and durations

- (e) storage capacity, maximum and minimum depths, average depth, area of inundation at FSL, dead storage levels, the extent of any buffer and management areas required, including a description of the flood margin and means of its determination, total area of waterways inundated for the upper reservoir, and total area of increase in waterways inundated for the lower reservoir.
 - (f) modelled headwater and tailwater levels at the site at different flows, climatic conditions, water supply, and extraction rates
 - (g) general design of intake/outlet works and offtake works into the reservoirs including siting, footprint, capacity, relation to water levels (variable), location, effective erosion and sediment control measures, ability to regulate flows, aquatic fauna exclusion and protection systems and location of intake/outlet in relation to any fauna passage device, any existing infrastructure in the vicinity of the outlet works (including Borumba dam embankment, spillway etc.)
 - (h) spillway and apron design including spillway gate design and operation, if relevant, spillway face finish and gradient, spillway crest design, and capacity, including gauge specification and operation, adequate spillway capacity in relation to inflow rates (rainfall events and pumped inflows), spillway height above bed/ground level, stilling basin design and any other proposed dissipation devices
- 5.4 Detail and clarify how existing dam infrastructure and the proposed Borumba Dam wall and spillway (including access provisions required for that project) are related to the Borumba PHES project, including any design considerations necessary.
- 5.5 Provide an assessment by a Registered Professional Engineer of Queensland (RPEQ) engineering consultant detailing the existing and future safety, condition and performance of proposed infrastructure.
- 5.6 Quantify and describe the predicted duration, timing and frequency of spill when the capacity of storage(s) is exceeded, including timing, volume, duration and downstream extent of spills:
- (a) details of the spillway, apron, stilling basin and dissipater designs, if relevant, and how the designs will minimise injury and mortality to fish or other aquatic fauna, including turtles, passing over the spillway either during spillway flows or during no flows
 - (b) location and details, rationale and likely effectiveness of any provision for incorporating appropriate fauna passageways and/or exclusion methods, if relevant, (including fishway and/or turtle passage or stream diversions) in the design, and the demonstrated effect on the viability of the proposed project⁴
 - (c) infrastructure to enable and/or restrict recreational use of the existing Lake Borumba.

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

5.7 Provide detail on

- (a) appropriate representation of water storages behaviour using conceptual models of the water storage extent at FSL and various levels of drawdown to full drawdown to allow assessment of the effect on aquatic and riparian (edge) habitat, groundwater dependant ecosystems, bank stability and associated sedimentation/water quality impacts and benthic process of the changing storage levels during operations
- (b) estimated water yields and their associated performance/reliability (itemising any volumes for environmental requirements including the volume, timing and quality of environmental flows designed to mimic and manage waterway environmental conditions to ensure downstream aquatic ecosystem productivity is maintained)
- (c) details of proposed remote operation, and design, location of and access to automated component control housings in relation to flood levels and relevant environmental conditions, including safe access to onsite facilities for operational staff during adverse/emergency weather conditions
- (d) description of the physical form of the stream bed upstream of FSL of both reservoirs and within the upper reservoir footprint, including AHD levels (e.g. presence of natural features including snags likely to be impacted)
- (e) details of the physical form of the stream beds downstream of the proposed lower and upper reservoir walls (e.g. presence of natural features likely to be impacted, such as deep pools, riffles and other refugia for upstream moving fauna) ; project and components' impacts on downstream stream bed morphology, and bank and channel stability and environmental flows is be addressed as per section 8.
- (f) details of any other associated instream structures including any upstream or downstream permanent or temporary waterway barrier works e.g. for access, water delivery or water storage purposes
- (g) description of the water security requirements of Seqwater for operation of Lake Borumba as water supply infrastructure

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

Tunnelling Infrastructure

5.9 For all proposed tunnels, describe, map and illustrate at a suitable scale:

- (a) locations and dimensions (length and width)
- (b) depths below ground level
- (c) location in relation to groundwater
- (d) construction methodology
- (e) associated surface infrastructure, including temporary and permanent access and ventilation requirements.

5.10 Assessment of impacts as a result of tunnelling, including any blasting, are to be is be addressed as per section 8, including:

- (a) interactions with groundwater, including risks to water quality and groundwater drawdown
- (b) subsurface impacts on land stability and root systems of overlying vegetation
- (c) reuse and disposal of surplus excavated material and water
- (d) management of soils
- (e) direct clearing for associated surface infrastructure
- (f) impacts on surrounding infrastructure, wildlife and amenity as a result of construction activities.

Pumped hydro power stations and power infrastructure

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

- (a) all permanent and temporary work areas, including access corridors and drill pad areas for geotechnical investigations, including decommissioning and repair methods for temporary work areas
- (b) underground transmission line system from the underground hydroelectric power station to the surface switchyard
- (c) ancillary infrastructure required to directly support the construction and operation of the pumped hydro power station and connection to transmission infrastructure including emergency and maintenance access tunnels and shafts, ventilation shafts and any surface infrastructure
- (d) tunnelling required between reservoirs for the delivery of water to supply the pumped hydro power stations, including the design of the tunnels and materials used in the construction and operation, disposal and reuse of surplus excavated material, along with geological maps/ test bore hole results, anticipated geological formations encountered and water within these formations expected to be impacted by the tunnelling.

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

5.13 Describe how the pumped hydro power station and associated infrastructure would be designed to prevent the entrainment, injury and mortality of fish and other aquatic fauna, with impact assessment of design to be provided as per section 8 of this TOR.

Ancillary infrastructure requirements

5.14 Detail the location of all ancillary works to be undertaken, with concept and layout plans, at an appropriate scale, requirements for new infrastructure, and/or the upgrading, buffer zones, retention, relocation and/or decommissioning of existing infrastructure to service the project. Infrastructure to be considered is to include, but is not limited to:

- (a) resource extraction areas (such as quarries and borrow pits)
- (b) transport and utility infrastructure and corridors, including necessary access roads and tracks and any vessel launching/loading facilities

- (c) site construction facilities including workforce accommodation, water to support construction including crusher plant, concrete batch plant, quarries, sand extraction areas, material stockpile and laydown areas, helipads, storage of explosives and chemical products
 - (d) site construction facilities including workforce accommodation, water supply and treatment, energy supply from the grid, generators and fuel, telecommunications, solid waste disposal, wastewater treatment and disposal, and sewerage systems
 - (e) infrastructure for recreational and tourist purposes, including boat access/ramps and active transport modes
 - (f) other infrastructure (such as buildings, yards, pumps, fences, dips)
 - (g) water pipelines
 - (h) water retention and release points and infrastructure.
- 5.15 Describe whether the infrastructure is permanent or temporary and nominate if it constitutes waterway barrier works.
- 5.16 Nominate the building and construction standards for all works.
- 5.17 Describe the timing of requirements for this infrastructure and detail the decommissioning schedule for all project-related infrastructure.
- 5.18 Include names of the required infrastructure owners and service providers as appropriate, discuss the status of the engagement with these providers, regarding the capacity of existing or proposed infrastructure to accommodate/or not accommodate project requirements.
- 5.19 Identify infrastructure alternatives considered and justify selected options, including why the nominated preferred option was chosen, particularly with respect to potential environmental impacts.

Project staging

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

Pre-construction

- 5.21 Identify if any land acquisition is proposed, including proposed ownership details.
- 5.22 Describe the pre-construction activities, showing the dimensions, location and disturbance footprints with appropriate scaled maps and figures, including, but not limited to:
- (a) timing, staging and sequencing of pre-construction activities and days and hours of operation (including night-time works)
 - (b) proposed temporary and permanent infrastructure
 - (c) proposed vegetation clearing and mulching and buffer zones (including footprints, proposed removal techniques, staging use or disposal of cleared vegetation and clear rationale for these methods as having the least potential environmental impact), top- and sub-soil removal and stockpiling and associated management strategies and mitigation measures.

- (d) interference with watercourses (as described under the *Water Act 2000*)⁵, waterways (as described under the *Fisheries Act 1994*), and floodplain areas including wetlands
- (e) proposed dewatering, treatment, and management of site drainage and river flow
- (f) proposed placing of materials (concrete, fill and filter materials)
- (g) project site access arrangements where access to the site is on tenure not held by the proponent, including the status of any consents and approvals required to access land or purchase land or obtain easements
- (h) proposed development, upgrades, realignments, relocation, deviation or restricted access to roads and other infrastructure including water, power and telecommunications
- (i) all environmentally relevant activities and all notifiable activities
- (j) effective environmental management strategies and mitigation measures included as part of the project design
- (k) proposed earthworks, construction methods, any use of quarry materials from a watercourse, associated equipment, and techniques
- (l) pre-disturbance surveys, including geotechnical, topographic, noise, air, flora and fauna, water quality, cultural heritage, contaminated land, visual amenity and how this information will be used in the final design and construction of the project⁶
- (m) effective erosion and sediment control measures, water sensitive urban design features, and measures and controls for managing hazards, flooding, actual and potential acid sulfate soils and contaminated land
- (n) approvals, licences and permits required for the construction works (e.g., operational works, building works etc)
- (o) any required preparatory activities including demolition, temporary augmentation or other preparatory activities on existing structures including recreational infrastructure, and upstream and downstream, instream and floodplain
- (p) any land contamination survey, sampling and decontamination methods and programs
- (q) for all components, the proposed earthworks, construction methods, associated equipment and techniques
- (r) existing infrastructure and easements on affected land within and adjoining the project area
- (s) biosecurity management of weeds, pests and diseases for pre-construction activities, including where personnel, plant and equipment are introduced to undeveloped areas

Construction

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

⁵ As shown on the Queensland Government Water Watercourse identification map

⁶ 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)

- 5.24 Include maps and figures at a suitable scale, showing site boundaries, land tenure, disturbance areas, buffer zones, development sequencing and timeframes and the layout of construction facilities to be used.
- 5.25 Describe the nature, sources, location and quantities of all materials to be handled, including the storage and stockpiling of raw material.
- 5.26 Describe any removal or sourcing materials for structures e.g. earthen/sand, concrete, rock and/or sheet pile, source location, stockpile locations, volume, tonnage and quality of natural resources required
- 5.27 Detail plans for the existing Borumba dam wall and any saddle dams, whether these will be partially dismantled, disposal of dam wall material, stability of remaining dam walls subject to inundation, how the existing wall will be modified to avoid, minimise or manage entrapment of aquatic fauna between the proposed new and existing dam walls.
- 5.28 Identify if diversions of waterways are required during construction and if so, describe, how fauna (terrestrial and aquatic) passage would be provided through any diversions and, if applicable, proposals for the reinstatement of the waterways after construction has ceased. Reference should be made to Department of Agriculture and Fisheries (DAF) Guidelines for Fish Salvage, (e.g. if any dewatering is required) and outcomes to be achieved in accordance with Department of Regional Development, Manufacturing and Water (DRDMW) Guideline [Works that interfere with water in a watercourse—watercourse diversions](#).
- 5.29 Describe changes to waterways⁷ (as defined under the *Fisheries Act 1994*) and watercourses⁸ (as defined under the *Water Act 2000*), the change in hydrology upstream and downstream of any construction site for any component of the project, including flooding and overland flow on or off the site, including crossings, spillway, fishways, downstream barriers, flood levees, water off-takes and, locations of any proposed water discharge points. Where any changes are proposed, note what licencing provisions may be required under the *Water Act 2000*.
- 5.30 Demonstrate water quality management methods for changes in watercourses, stream diversions, hydrology and stream function, including monitoring and reporting schedules.
- 5.31 Demonstrate that the construction of the various project components will help to achieve functioning, healthy and resilient riverine, floodplain and wetlands ecosystems which maintain and/or enhance environmental outcomes.
- 5.32 The description of construction activities is to include, with appropriately scaled maps, as appropriate to each component of the project:
- (a) construction, environmental and safety standards, methods, mitigations measures, management strategies and site management arrangements
 - (b) any new connections to electricity transmission infrastructure, routes and easements required

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.

- (c) where the power generation and transmission infrastructure connections will be constructed and how they will be transported to the site, including details of any necessary road upgrades, land disturbance and vegetation clearing
- (d) construction sequencing and staging plans (where relevant, provide detailed plans, drawings and maps to illustrate these matters)
- (e) proposed construction methods, associated equipment and techniques
- (f) timetable for construction, including days and hours of operation for proposed construction works, and community consultation, specifying any activities to be undertaken at night
- (g) nature and location of construction workforce accommodation, sewage treatment and laydown areas
- (h) capacity of high-impact plant and equipment, their chemical and physical processes, identify and provide the estimated quantity of chemicals or hazardous materials that will be stored onsite, including the relevant dangerous goods codes for that method of storage, storage management locations
- (i) known locations of new or altered works and structures and infrastructure necessary (such as construction laydown areas and buffer zones) to enable the construction and operation of the development, whether on or off the project area, and intersections required with existing infrastructure (e.g. water pipeline, road, power etc)
- (j) any activity that is a prescribed ERA
- (k) general construction requirements including blasting, excavation and tunnelling, dredging, haul road establishment, bed-levelling, crushing, screening, concrete batching, fuel and chemical storage, workshop facilities, office facilities, on-site mess and ablutions facilities
- (l) location and access including coordinates of the boundary points in decimal degrees (latitude and longitude to five (5) decimal places, GDA2020) of any new or established quarry or extraction operations (i.e. extraction voids, borrow pits, dredging and stream bank excavations) as well as any other activities associated with the extraction and screening activity (i.e. screening plant locations, material stock piles) (note: for the purposes of this, proposed project, extraction and screening have the meanings identified in Schedule 2 – ERA 16 Environmental Protection Regulation 2019)
- (m) source of materials and infrastructure for the project, their nature and mode of delivery
- (n) mitigation works within the site and off-site (e.g. sediment and erosion protection, sediment traps, fencing including materials and methods) to protect downstream water quality and environmental values, noting any capacity restrictions of dams under the relevant Water Plan(s)
- (o) describe how emergency events (i.e. flood, landslide bushfire, drought etc.) would be managed during construction
- (p) any potential disruption to flows in watercourses⁹/waterways¹⁰ and tributaries during construction and any diversion works required including coffer dams, temporary diversions and cut-off drains

⁹ Watercourse identification maps (WIP) can be found on the Business Queensland website at: <https://www.business.qld.gov.au/industries/mining-energy-water/water/maps-data/watercourse-map>. Determining the type of water feature using the WIP is important for applying relevant provisions of the Water Act 2000, Water Plans and regulatory documents.

¹⁰ Waterways is defined in Schedule 1 under the Fisheries Act 1994 which includes a river, creek, stream, watercourse, drainage feature or inlet of the sea.

- (q) management of fauna and vegetation material generated by clearing for construction and the reservoir areas
- (r) number, capacity and type of vehicles, machinery, plant and equipment used for construction activities and including the method of transport of construction machinery and materials to and within the construction site/s. Full details of transport volumes, modes and routes are to be provided in accordance with section 8 – Transport
- (s) water balance for the water supply requirements. For each component of the works, potable, recycled water, dust suppression, concrete batching, fill conditioning, washdowns, road construction, camp operation and upper reservoir filling are to be identified and quantified. For each water requirement, the source, volume, quality, means of access and transport, treatment processes and storage method are to be provided
- (t) any take or interference with water in a watercourse, lake or spring, overland flow water, and underground water (both direct and in-direct)
- (u) stormwater drainage systems and the proposed treatment, disposal and/or re-use arrangements, including any off-site services, stormwater release and monitoring locations with coordinates in decimal degrees (latitude and longitude to five decimal places, GDA 2020), and storm water release criteria. The storm water release criteria must provide sufficient justification as to the limits proposed and reference any relevant criteria, such as the Environmental Protection (Water and Wetlands Biodiversity) Policy 2019, or ANZECC water quality guidelines, to demonstrate that any release can be conducted in a sustainable manner that does not result in environmental harm
- (v) capture, containment/disposal and quantity of construction spoil. Full details of physical and chemical properties of soils and spoil are to be provided in accordance with section 8 – Land
- (w) solid and liquid waste management (full details of the waste volumes, characteristics and management strategies) are to be provided in accordance with section 8 – Waste management
- (x) contaminated land management (full details of any identified contaminated material, appropriate management and disposal) to be provided in accordance with section 8 - Land
- (y) public and workforce safety, medical facilities to be provided on site and provision for access to emergency services, onsite security services
- (z) allowance for provision of power back-up in emergency, noting that any potential impact on local supplies in the area is to be addressed as per section 8.
- (aa) biosecurity management of construction areas, access routes and ancillary infrastructure, including personnel hygiene stations, vehicle washdown bays, access management; include how any biosecurity event would be managed and rehabilitated
- (bb) construction site demobilisation.

Rehabilitation

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

- (a) site rehabilitation actions, closure and decommissioning works for removal of infrastructure
- (b) options, strategies, methods and management for the progressive rehabilitation of the environment disturbed by the project. A preferred rehabilitation strategy is to be developed with a view to minimise the amount of land disturbed at any one time

- (c) rehabilitation methods for capital works and revegetation, with reference to meeting Rehabilitation guidelines¹¹
- (d) final topography and excavation depths of any quarries, sand extraction areas, borrow areas, trenches, sediment control structures, waste areas, temporary waterway barrier sites, dam and weir sites, construction areas, easements, buffer zones, laydown areas and all other forms of landform impact are to be described and identified on maps at a suitable scale
- (e) any proposals to reinstate fish, turtle or other aquatic fauna passage through waterways diverted during construction, after construction has ceased
- (f) actions to be undertaken and processes required to remove land from the environmental management register and/or contaminated land register
- (g) land permanently impacted and not being considered for rehabilitation is to be clearly mapped.

Operation

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

- (a) operations of each component (e.g. hours of operation for each component of the project)
- (b) infrastructure commissioning process including landscaping, headrace and tailrace and the rehabilitation of affected areas after construction (including any ongoing water supply requirements for these works)
- (c) provision for the potential necessary structural and operating adjustments relating to upstream and downstream fauna passage (including fauna monitoring), fauna exclusion devices, approach channels etc. that will be identified during post-commissioning monitoring
- (d) potential long-term groundwater dewatering associated with the subsurface infrastructure (tunnels and power station)
- (e) arrangements for administration, maintenance and repair and control of the works for the duration of the presence of the infrastructure (reservoirs, fishways, pumping infrastructure including any proposal for screening, turtle passage, pipes, roads, recreational facilities, site restoration activities and all other components of the project)
- (f) operational arrangements for the project including flow releases, operation of fauna passage infrastructure, operation of gates (if relevant), intake and outlet works, pumps, including details of remote operation and administration, on-site staffing, safety requirements for staff and the public and routine maintenance including water requirements post construction for landscaping, revegetation and office use
- (g) water use, sources, volumes and storage requirements, described separately for storage fill and other operational activities including the provision of fauna passage
- (h) proposed access associated with the reservoirs, for operations and maintenance including infrastructure for recreational purposes and their accessibility during or following events such as flooding and bushfires
- (i) use and management of surrounding land and any obligations or restrictions thereon

¹¹ Refer to DESI *Rehabilitation – EIS information guideline* at https://www.qld.gov.au/data/assets/pdf_file/0017/242315/eis-tm-rehabilitation-information-guide.pdf

- (j) any restrictions on access of land exposed at water levels below FSL or within the water storage
- (k) energy, any co-location of power and telecommunications requirements and sources
- (l) solid, liquid and gaseous waste generated and proposed methods of treatment and disposal, including any requirements for dewatering of underground infrastructure
- (m) type, volume and rate of chemicals and hazardous materials to be used and stored onsite, including the relevant dangerous goods codes for that method of storage, storage management and locations
- (n) transport needs and expected traffic
- (o) expected life of all components of the infrastructure, management of and timely access to spare parts (e.g. for fauna passage materials) and any anticipated major maintenance periods
- (p) demonstrate the effectiveness, operational range and frequency of any proposed fauna passageway and/or spillway proposed for the upper reservoir and any potential changes to existing fauna passageway's and/or spillways for Lake Borumba and the safe design and operation of all water infrastructure to avoid injuries to fauna traversing or utilising the reservoir habitats
- (q) existing, ongoing and proposed recreational uses of dams, weirs, water storages
- (r) identify where the proposed changed operation of Borumba Dam is predicted to effect safety, condition and performance of Borumba Dam and how design will address risk of potential failure or maloperation of the upper storage
- (s) capacity of high-impact plant equipment
- (t) stormwater drainage systems and the proposed treatment, disposal and/or re-use arrangements, including any off-site services, stormwater release and monitoring locations with coordinates in decimal degrees (latitude and longitude to five decimal places, GDA 2020), 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

5.35 It is recognised that project components are anticipated to have a long operational life spanning many decades. This section of the EIS is to present general strategies and methods for decommissioning and rehabilitation of all components of the project including underground infrastructure and reuse and recycling of associated materials should it ever be required.

Site description

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

Project rationale and alternatives

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

- (a) provide details of market considerations, design considerations and calculations that led to the proposed project capacity and generation durations
- (b) provide a detailed justification and options analysis for lower impact alternative sites and/or designs. This should include an assessment of the proposed construction of the upper reservoir, as the headwater reservoir, social and environmental considerations; and demonstration that the proposed project has the least impact of all options on environmental values and environmental integrity.

6. Planning and legislative requirements

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

- (a) describe any proposals for locating infrastructure or offsets on state land, and proposed tenure dealings under the *Land Act 1994*, including justification for proposed use of state land over other land
- (b) consider the provisions of the *Regional Planning Interests Act 2014* (RPI Act) and whether a regional interests development approval (RIDA) is required pursuant to the RPI Act
- (c) 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.
- (d) describe any approvals or entitlements required under the *Water Act 2000* and relevant Water Plan(s) and address relevant legislative requirements and water volume limitations, including but not limited to, amendments to the Mary Valley Water Supply Scheme Resource Operations Licence held by Queensland Bulk Water Supply Authority (Seqwater), amendments or replacement of Mary Valley Water Supply Scheme Operations Manual and, if necessary, Licences to Interfere.
- (e) Describe how the provisions of the *Water Supply (Safety and Reliability) Act 2008* (WSSR Act) and related instruments will be met by the proposed dam infrastructure.
- (f) Describe water supply agreements that would need to be put in place with Seqwater to address dead storage, losses (consumption) and water required for construction and operation.
- (g) Consider the provisions of the *Mineral Resources Act 1989* (MRA) regarding impacts on resource authority holders by the proposed project. The EIS should also discuss the extent and adequacy of the restricted areas (RAs) currently in place across parts of the project site. See s391 of the MRA.

7. Stakeholder consultation

7.1 The stakeholder consultation requirements for preparing an EIS are set out in Section 4.5 of *Preparing an environmental impact statement – Guideline for proponents*.

8. Assessment of project specific matters

Water resources

Objectives and outcomes

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

- (a) avoid, minimise and/or mitigate adverse impacts to water resources and Indigenous water resources uses, values and aspirations
- (b) use water resources in an equitable, sustainable and efficient manner
- (c) maintain and monitor environmental flows, water quality objectives, in-stream habitat diversity, habitat connectivity and naturally occurring inputs from riparian zones to support aquatic biotic communities
- (d) protect or enhance the condition, environmental values and natural functions of waterways, watercourses, lakes, springs, aquifers and other natural water systems—including the stability of beds and banks of waterways and watercourses
- (e) protect the volumes and quality of water resources so that current lawful users of water (such as entitlement holders and stock and domestic users) and other beneficial uses of water (such as spring flows, wetlands, seasonal flows, groundwater recharge and groundwater-dependent ecosystems) are not adversely impacted by the development.
- (f) not compromise the operation of the Mary Valley Water Supply Scheme.

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

Surface water

Existing environment

- 8.1 Provide maps of existing waterways or water features. Identify:
- (a) drainage channels, wetlands, flood-prone or low-lying land within and adjacent to the project area
 - (b) waterways (ephemeral or perennial) and water features including any natural or artificial waterway barriers
 - (c) existing water supply schemes within and adjacent to the project area
 - (d) relevant drainage basin(s), sub-basins and associated sub-catchments.
 - (e) any semi-permanent or permanent streams and pools, stock watering locations and groundwater aquifers (including where surface water interactions are likely).
- 8.2 Describe the existing relevant Water Plan and water plan outcomes, the resource operations plan/s, water allocation security objectives and environmental flow objectives.
- 8.3 Develop and calibrate a hydraulic model of the Yabba Creek catchment, including Lake Borumba. Describe the hydrologic regimes of any waterways, creeks and streams within the project area and external to the project area impacted by the project.

- 8.4 The model should include 86.5%, 63.2%, 50%, 20%, 10%, 5%, 2%, 1% and 0.1% annual exceedance probability (AEP) events. The description should include historical plots of the level of Borumba Dam.
- 8.5 Describe existing surface drainage patterns and flows in streams in the project area including seasonal variations using suitable locations between identified stream nodes.
- 8.6 Discuss the history of flooding including extent, levels and frequency (upstream and downstream).
- 8.7 Describe the current operation and management of the Borumba Dam and distribution system, including yield, operating strategy, supply reliability, allocation and use of water supplies, water use efficiency and the environmental flow regime. Describe the existing relevant Water Plan, the relevant statutory instruments, water allocation security objectives and environmental flow objectives.
- 8.8 Describe the agreement between Gympie Regional Council and Seqwater for water supply, and the conditions for this to occur (if required).
- 8.9 Describe and compare the existing environment, current and full entitlement flow characteristics (for existing water supply) including seasonal flow patterns, flow volumes and duration using relevant indicators from the relevant Water Plan and others such as sediment loads, bed and bank stability and ecological impacts as appropriate to this project after consultation with fluvial geomorphologists and ecologists. Graphical representations at all Water Plan nodes downstream of the development are to be included.
- 8.10 Detail diversions or interception of overland flow, including volumes, at a site and catchment scale. Include maps of suitable scale showing the location of diversions and other water-related infrastructure including the size of any overland flow dam, ensuring that overland flow storage capacity meets the requirements listed under the relevant Water Plan.
- 8.11 Identify the relevant environmental values defined in section 9 of the EP Act and water quality objectives provided in the EPP (Water and Wetland Biodiversity) 2019.
- 8.12 Describe existing and potential users and uses of water in the area potentially affected by the proposed project, including municipal, agricultural, industrial, mining, recreational and environmental uses of water.

Impact assessment and mitigation measures

- 8.13 Identify the location of all proposed infrastructure in relation to potentially impacted waters.
- 8.14 For both construction and operations, develop a hydraulic model which project impacts across the Yabba creek catchment. Identify any infrastructure proposed to be located within locations that may be impacted by flooding, as identified in the hydraulic model.
- 8.15 Provide a failure impact assessment undertaken by a RPEQ for lower and upper reservoir in accordance with *Water Supply (Safety and Reliability) Act 2008*, at a minimum to include:
 - (a) detail any potential threat to people living downstream of the dam from unexpected flooding caused by dam failure
 - (b) determine if the lower and upper reservoir require regulation as being “referable”

- (c) emergency action planning, flood mitigation
 - (d) consultation with the Department of Regional Development, Manufacturing and Water (DRDMW)
 - (e) performance outcomes for both the upper reservoir and Lake Borumba (lower reservoir) are to be developed and detailed, with reference to relevant guidelines of the Australian National Committee on Large Dams.¹²
- 8.16 Describe impacts of the project on the outcomes of the relevant Water Plan including how the project will conform to the relevant Water Plan and how any impacts will be mitigated. In the assessment of impacts, hydrological modelling is to be used to inform the assessment, applicable outcomes of the relevant Water Plan, performance indicators and objectives, strategies to meet the outcomes, changed processes and volumes, downstream users and environment, overland flow provisions and other statutory instruments underpinning the Water Plan (i.e., water management protocol).
- 8.17 Discuss the changes in the stream flows and eco-hydraulic indicators that may be anticipated as a result of the proposed project in:
- (a) No flow spells – frequency, timing and duration, including pools as dry season refugia
 - (b) Low flow spells – frequency, timing and duration, including riffles and low flow migration species
 - (c) Medium flows– frequency, timing and duration, including flows that reduce estuarine salinity
 - (d) High flows– frequency, timing and duration, including flows that provide flows for riparian and floodplains.
- 8.18 Provide modelling outputs including hydrographs of predicted changes in flow regime and potential impacts to environmental flows at a range of locations representative of key habitats and biota under the current and full entitlement scenarios (with the project in operation). Address and include clear descriptions of the following:
- (a) level of service analysis (based on the severity, frequency and duration of restriction)
 - (b) effects of drainage or dewatering works, excavation, placement of fill, clearing or any other alterations to existing topography and landform on the hydrology of works sites including any alteration to drainage patterns, fluvial processes and the water table and secondary influence on flooding. If levee banks or stream diversion constructions are proposed, the effects on neighbouring landholders are to be considered. This should also include tunnel infrastructure and estimates of necessary drawdown and take of water during the construction phase
 - (c) proposed drainage structures for all aspects of the project, including supporting infrastructure such as access roads
 - (d) timing of the construction works relative to likely period of flooding and proposals to minimise the risk of flood damage
 - (e) changes in inundation frequency, timing and duration of waterways and floodplain/wetlands, and potential impacts on flood levels upstream and downstream of the storage areas and at any new crossing of waterways. The extent of flood modelling will be to the points at which no significant impact occurs. Flood studies are to include a range of annual exceedance

¹² Refer <https://ancold.org.au/product-category/guidelines/>

probabilities as detailed for the existing scenario (refer item 8.4). Use hydrographs to represent flood levels at different locations

- (f) changes to sediment transport, potential erosion/scouring and changes in deposition upstream and downstream bank and channel morphology, instream habitats and stability of riparian vegetation
- (g) alterations to riparian vegetation, and bank and channel morphology
- (h) any potential implications of climate change as determined in Section 10 – Climate and Hazards, health and safety
- (i) any potential impacts the construction and operation of the project may have on surrounding waterways and downstream environmental values
- (j) models should address the range of climatic conditions that may be experienced at the site throughout all phases of the project, and adequately assess the potential cumulative impacts of the proposed project on water resources including to the post-decommissioning phase
- (k) any potential impacts the construction and operation of the project may have on downstream water users and infrastructure (e.g. pump stations) with respect to water quality, potential changes in flow regime and availability of water for extraction.

8.19 Describe the following with regard to construction and operational impacts:

- (a) effect of environmental flow requirements on dam reliability and water availability for consumptive use
- (b) impacts of the project on flow regime indicators (water allocation security objectives and environmental flow objectives in accordance with the relevant Water Plan and stipulation of the assumptions made (e.g. extraction patterns, release patterns, release capacity, consumptive uses)
- (c) effect of water storages, diversions and levees, tunnelling, water harvesting (losses) and operational releases on environmental flow requirements, weir reliability and water availability for consumptive use and on terrestrial, aquatic and groundwater dependent ecosystem ecological communities and proposed mitigation measures
- (d) changes in the reliability of supply to current water entitlement holders and any impacts on the operation of existing water extraction
- (e) changes in flow patterns including changes in the magnitude of flow events, flow frequency and timing of flows, volumes and duration, connectivity, and changes in flows reaching estuarine waters, when compared at a meaningful scale with pre-development (i.e. the existing landscape) and current flows in the system
- (f) natural recharge via flooding or elevated flow events
- (g) natural recharge via environmental flow events
- (h) changes in the reliability of water supply and changes in flow patterns and water levels in aquifers which are upstream and downstream from the project
- (i) water supply to the project during drought/ low flow periods, and how project operations would occur under these conditions.

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

- 8.21 Provide a detailed water balance for the project (construction and operations). Include groundwater collected during dewatering of underground infrastructure and quarries, and management of incident rainfall on bunded areas such as spoil piles. Quantify the water balance analysis including evaporative and seepage losses from the upper and lower reservoirs and water passage through the underground infrastructure.
- 8.22 For each source of water supply (surface and groundwater) for the project, address the quality and quantity, security of supply and resource availability, as well as any water licencing requirements under the *Water Act 2000* and its subordinate legislation.
- 8.23 Determine the potable water demand for the project, including the temporary demands during the construction period. Include details of any existing town water supply to meet such requirements. Detail should also be provided to describe any proposed on-site water storage and treatment for use by the site workforce during the construction phase.
- 8.24 Provide detailed designs for all infrastructure utilised in the treatment of onsite water including how any onsite water supplies are to be treated, contaminated water is to be disposed of and any decommissioning requirements and timing of temporary water supply/treatment.
- 8.25 Identify the quantity, quality and location of all potential discharges of water and contaminants by project, including treated wastewater and sewage. Describe whether the discharges would be from point sources (whether uncontrolled and controlled discharges) or diffuse sources (such as irrigation to land of treated wastewater/sewage effluent) and describe the receiving environment (such as land or surface waters). Provide any relevant stream flow data or other information on discharge water quality, including any potential variation in discharge water quality that will be used in combination with proposed discharge rates to estimate instream dilution and water quality. Chemical and physical properties of any discharge water and wastewater, including concentrations of constituents, at the point of entering natural surface waters must be discussed along with toxicity of effluent constituents to human health, flora and fauna.
- 8.26 Provide details on the proposed sewage collection and treatment infrastructure, and any proposed treatment of dewatered groundwater, and the reuse and/or disposal of treated wastewater and sewage wastes generated.
- 8.27 Describe and map any diversions or interception of overland flow. Describe the relevant impacts of any proposed waterway/watercourse diversions and describe watercourse diversion design, operation, monitoring regime, and measures to be implemented to avoid impacts on local wetlands, streams, groundwater dependent ecosystems, waterways and watercourses. Ensure that any overland flow storage capacity meets the requirements listed under the relevant Water Plan.
- 8.28 Describe how the project water needs will be met while ensuring access to water from Borumba Dam for urban water supply and security in line with the relevant Water Plan.
- 8.29 Describe how the project will integrate with existing infrastructure and the operational requirements of the Mary Valley Water Supply Scheme. Identify any amendments required to the resource operations licence (ROL) and Operations Manual held by Queensland Bulk Water Supply Authority (Seqwater) or new statutory instruments required (e.g. Distribution Operation Licence). This includes detail on what entity holds the statutory instruments for the project and Mary Valley Water Supply Scheme at completion of the project.

- 8.30 Provide a site-specific assessment of estimated losses from the proposed upper reservoir storage, PHES operations and Borumba Dam. This includes, and is not limited to, direct consumption during power generation, evaporation, seepage and oscillation of water levels in all dams, and passage through the underground infrastructure. Describe how all losses will be measured and accounted to inform management strategies and provide transparency. Any proposed mitigation and management strategies should be discussed.
- 8.31 Provide details of the authorisations required to cover any proposed losses and mechanisms for Queensland Hydro to access additional water in the event of significant loss, e.g. dam failure, evaporation etc.
- 8.32 Provide a site-specific assessment of estimated rainfall gains directly into the proposed upper reservoir storage, including any management strategies.
- 8.33 Provide information on all proposed water accounting frameworks, including but not limited to existing take and Borumba PHES operations. This may include details on capacity share arrangement water accounting rules, water measurement requirements and reporting arrangements.
- 8.34 Provide sufficient information on the project's water measurement plan, including details relating to:
- (a) water taken to the upper reservoir and released to Lake Borumba
 - (b) water storage and transfer
 - (c) environmental losses and gains (evaporation rates and seepage estimations) for the upper reservoir and Lake Borumba.
- 8.35 Provide information on the operational characteristics of taking water from Lake Borumba or Yabba Creek to the upper reservoir, including but not limited to, water cycles characteristics, cycle frequency, range of storage levels in Lake Borumba that Borumba PHES will operate in, and ceasing operations (e.g. during spilling events).
- 8.36 Any proposed changes to the operation or operational rules of Lake Borumba as a result of the proposed project.
- 8.37 Describe the cumulative impacts of the proposed project, in conjunction with existing development and possible future development (as described by approved plans and existing project approvals), to water resources in the region.
- 8.38 Provide an assessment against SDAP state code 10: Taking or interfering with water for any assessable operational works that take or interfere with water required for the project, including construction activities.
- 8.39 Provide an assessment against SDAP state code 15: Removal of quarry material from a watercourse or lake for any assessable operational works required for the project, including construction activities.
- 8.40 Provide an assessment against SDAP state code 18: Constructing or raising waterway barrier works in fish habitats for any assessable waterway barrier works required for the project, including construction activities.

- 8.41 Provide an assessment against SDAP state code 20: Developing a referable dam for any assessable operational works requiring the development of a referable dam required for the project.
- 8.42 Describe the long term security of water supply to the proposed project over the life of the project given potential climate change and increased demands on Borumba Dam as a drinking water supply with population or industrial expansion.

Groundwater

Existing environment

- 8.43 Describe the historic and existing environment for groundwater resources that may be affected by the project and the possible significance of the project to groundwater depletion or recharge, or potential saltwater intrusion of existing aquifers. The review is to include an on-ground survey of existing groundwater supply facilities (i.e. bores, wells or excavations) within the project area and adjacent to the project area. Describe:
- (a) proximity of groundwater supply facilities to the project and value of these facilities for rural, industrial and/or domestic use
 - (b) quality, quantity and significance of groundwater in the project area and any surrounding area potentially affected by the project's activities
 - (c) current use and volume of groundwater used within any potential area of impact. Provide surveys, location and source of existing groundwater supply facilities (e.g. bores, wells or excavations)
 - (d) any groundwater dependent ecosystems within any potential area of impact, including wetlands, riparian vegetation, instream ecosystems and stygofaunal communities
 - (e) the nature of the aquifers at and near the sites, geology/stratigraphy, aquifer type, depth to and thickness of the aquifer, hydrogeology of the aquifers, depth to water level and seasonal changes in levels, groundwater flow directions
 - (f) the movement of underground water to and from the aquifer(s), including how the aquifer(s) interact with each other and surface water, and the effect of geological structures on this movement
 - (g) interaction with surface water in each sub-catchment and possible sources and volumes of recharge
 - (h) seasonal variations, including consideration of a range of wet and dry climatic conditions (e.g. drought impact recharge) of groundwater levels and groundwater flow directions.
 - (i) basic water quality of the aquifer and its vulnerability to pollution
 - (j) groundwater resources proposed to be used by the project, including a description of the quality, quantity, usage rate and required location of those resources
 - (k) characteristics of target aquifers, including seasonal variability, value as water supply sources, capacity to provide the required volumes of water at the expected usage rate, recharge potential and profile of existing extraction.

Impact assessment and mitigation measures

- 8.44 Matters to be addressed are to include descriptions of the following:

- (a) inputs, movements, exchanges and outputs of surface water and groundwater that would or may be affected by the project, including consideration of changes in hydrostatic pressure
- (b) potential for underground infrastructure to disrupt groundwater flows, groundwater partitioning, groundwater quality and groundwater interactions with surface water bodies
- (c) impacts of the project at the local scale and in a regional context including:
 - (i) changes in flow regimes from diversions, water take and discharges
 - (ii) groundwater draw-down and recharge
 - (iii) effects on riparian vegetation and alterations to bank and channel morphology
 - (iv) direct and indirect impacts arising from the development, including potential impacts from groundwater drawdown depleting water in the root zone of vegetation with conservation value, particularly in localities with threatened species
- (d) impacts of the project on groundwater dependant ecosystems, including impacts on stygofauna and proposed mitigation measures
- (e) effect of lake dewatering and partial decommissioning of existing dam wall
- (f) effect of project construction on the availability and quality of groundwater resources downstream
- (g) impacts of vegetation clearing, sedimentation, groundwater or surface water salinity and changes to depth below natural surface level of local groundwater resources
- (h) extent of the area within which groundwater resources are likely to be affected by the proposed operations of any component of the project, including effects of water storage, presence of the dam wall and downstream flow releases, effects of underground infrastructure, changes to groundwater salinity and changes to depth below natural surface level of groundwater resources
- (i) impacts of the project on the objectives, requirements, and outcomes of any underground water management area or relevant Water Plan regulating underground water including how the project will conform to the Plan and how any impacts will be mitigated. In the assessment of impacts, hydrogeological modelling is to be used to inform the assessment, the general, specific and ecological outcomes of the Plan, indicators and objectives, strategies to meet the outcomes, unallocated water rules, processes and volumes, downstream users and environment, overland flow provisions and Plan implementation (i.e. water management protocol)
- (j) impacts of any required extraction of groundwater resources and proposed mitigation measures to reduce the impact of the project on groundwater quality including the potential for interconnection between the target and underlying aquifers
- (k) decommissioning of any temporary groundwater bores
- (l) detail a construction and operation groundwater monitoring program for the project, to monitor any impacts as a result of the project, including on groundwater quality and hydrology, changes to depth below natural surface level of groundwater resources, and groundwater dependent ecosystems
- (m) assessment of the long-term integrity of the upper reservoir bed liners/grouting in relation to seepage losses and associated potential interaction with groundwater
- (n) a groundwater management plan, for the life of the project, which details management strategies for predicted impacts on groundwater.

- 8.45 Develop a groundwater conceptual model to represent groundwater interactions with the lower storage and upper storage and above and underground infrastructure; groundwater recharge and discharge processes; surface-groundwater interactions; changes to depth below natural surface level of groundwater resources and impact pathways from the project.
- (a) The development of the groundwater conceptual model should occur in consultation with the Office of the Coordinator-General (and other advisory agencies) during preparation of the draft EIS. Subject to this consultation, development of a numerical groundwater flow model may be required, consistent with the conceptual model, for impact assessment.

Water-related cultural values

Existing environment

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

Impact assessment and mitigation measures

- 8.47 Describe the project's potential impacts on water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples.
- 8.48 Describe how water-related cultural values, uses and aspirations of water resources for Aboriginal and Torres Strait Islander peoples will be protected and/or promoted through water allocation and management strategies, relevant to the project.
- 8.49 Where country may be affected by existing or future water infrastructure projects in the area, assess the cumulative impacts of these projects on the water-related cultural values, uses and aspirations linked to water for Aboriginal and Torres Strait Islander peoples.

Water quality

Objectives and outcomes

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

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

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

Existing environment

- 8.50 Describe the existing water quality (surface and groundwater) of the local and regional water catchment that may be affected by any component of the project using current water quality data.

- 8.51 With reference to the EPP (Water and Wetland Biodiversity) 2019 (Mary River Environmental Values and Water Quality Objectives) and section 9 the EP Act, identify the current water quality environmental values and water quality objectives of surface and ground waters within the project area and surrounds, and those downstream that may be affected by the project activities, including any human uses and cultural values of water.
- 8.52 Demonstrate how the relevant water quality objectives will be met during construction and operation of the project.
- 8.53 Describe historic and existing surface water and groundwater quality in terms of physical, chemical and biological characteristics within the proposed water storage areas, upstream and downstream of the area including consideration of seasonal or flow variations where applicable. Off-stream waterbodies and existing water storage areas are to be included where relevant. Include baseline water quality in Lake Borumba and the current operational management measures in place to ensure compliance with relevant water quality guidelines (Lake Borumba stores water for drinking and irrigation as part of the Mary Valley irrigation scheme).
- 8.54 The water quality assessment required by 7.52 is to include a literature review supplemented by a suitable sampling program supported by sufficient site-specific baseline data. The following matters are to be discussed:
- (a) relationship of water quality to flow, using local catchment examples
 - (b) water quality issues (such as stratification, eutrophication and deoxygenation) within and downstream from existing storages in the system
 - (c) confirmed or likely causes of present water quality impacts
 - (d) suitability of existing raw water quality for proposed on-site uses and any treatment required
 - (e) current water quality issues related to specific uses of water as related to the project (e.g. potable supply)
 - (f) use of suitable water chemistry parameters to determine the level of surface water and groundwater connectivity baseline groundwater quality variability and its suitability for environmental and human use
 - (g) any water quality variations upstream and downstream of the dam or other infrastructure
 - (h) surface water quality analysis that allow assessment of water quality objectives, including, as a minimum, electrical conductivity, pH, sulphate, fluoride, dissolved oxygen, turbidity, total suspended solids, nutrients, dissolved and total metals and metalloids, total recoverable hydrocarbons and major anions and cations. Groundwater indicators must include, as a minimum, the same indicators (except turbidity and total suspended solids) and should allow for all water quality objectives for local groundwater to be assessed
 - (i) Describe known water quality issues in the existing Lake Borumba, and provide details of how these are managed
- 8.55 Describe the water quality variability within the study area associated with climatic and seasonal factors, variability of freshwater flows and extreme events using suitable reference locations and sufficient data to adequately establish baseline condition and define natural variation, including seasonal variation.

Impact assessment and mitigation measures

- 8.56 With reference to the project construction and operational water balance, describe the quantity, quality, location, duration and timing of all potential and/or proposed releases of contaminants to waters. Releases may include controlled water discharges to surface water streams, uncontrolled discharges when the design capacity of storages is exceeded, spills of products during loading or transportation, contaminated run-off from construction, operational decommissioning areas of the project and surround, or run-off from disturbed acid sulfate, sodic or dispersive soils.
- 8.57 Describe how water quality may be impacted by the construction and operation of the project due to increased water circulation and subsequent turbidity arising from sediment disturbance (greater mixing of the water column and potential suspension and redistribution of sediments particularly resulting from shoreline erosion due to fluctuations in water levels). Discuss how established water quality management measures for Lake Borumba are proposed to be implemented or revised during construction and operation.
- 8.58 Describe measures to be implemented during project construction and operations to ensure the water quality of Lake Borumba meets the minimum (health and safety) drinking supply requirements of Gympie Regional Council, and measures to manage water quality in both the upper storage and Lake Borumba to ensure the water quality objectives, as per EPP (Water and Wetland Biodiversity) 2019, (Mary River Environmental Values and Water Quality Objectives) for Lake Borumba and downstream waters are also met and maintained.
- 8.59 Describe how emergency releases of water from the upper and lower reservoirs may impact water quality in Lake Borumba and downstream of Borumba dam wall.
- 8.60 Demonstrate how the relevant water quality guidelines or final objectives (as outlined in water quality information sources in section 5.2 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*) will be met and how relevant environmental values are to be protected during construction, operation and decommissioning.
- 8.61 Demonstrate the proposed project can meet the environmental objectives and performance outcomes in Schedule 8, Part 3 of the EP Regulation and undertake the assessment of impacts on water in accordance with DESI guidelines (refer section 5.2 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*).
- 8.62 Describe the impacts of the project on upstream and downstream water quality and any impacts on social, environmental and cultural outcomes of the relevant Water Plan, and the policies and guidelines outlined in *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*. Information is to be supported with references to relevant legislation, policies and guidelines.
- 8.63 Matters to be addressed are to include clear descriptions of the following:
- (a) possible sources of water contamination or other changes in water quality during specific construction activities such as sand and gravel extraction, site clearing, excavation, dewatering of foundations, temporary or permanent road construction and related drainage, wastewater from concrete batching plants, vehicle and equipment wash down activities, sewage or grey water treatment and disposal, use of chemicals in foundation cleaning, grouting or testing and accidents or spillage

- (b) likely quality of water leaving construction sites taking into account the management and mitigation measures proposed
- (c) likely quality of drainage from spoil stockpiles and associated potential impacts
- (d) quality of water within the upper reservoir impoundment during the first filling phase and for the period of the subsequent decomposition of drowned vegetation the quality of water within the upper reservoir impoundment under projected operating conditions including annual seasonal variation, extended wet or dry period, the effects of inundated soil types and wind driven re-suspension, impacts of surrounding or upstream land uses
- (e) effects of depth and holding time within Lake Borumba and the upper reservoir, particularly on turbidity, conductivity, stratification, temperature, dissolved oxygen and the quality of operational water movements
- (f) potential for stratification and 'turn-over' of the water storage areas (including potential for blue-green algae blooms) and implications for water quality management, supply and use (including for stock and domestic users, industrial users, urban potable use or recreational use of the storage) for both Lake Borumba and the upper reservoir
- (g) potential effect of algae and macrophytes on water quality and vice versa
- (h) effects on downstream water quality under varying scenarios of releases/spills including potential impacts on:
 - (i) Sediment deposition in instream pools affecting waterhole persistence
 - (ii) Sediment deposition on banks and riparian vegetation colonisation
 - (iii) Riffle substrate changes and dependent biota changes
 - (iv) Turbidity impacts on aquatic macrophyte colonisation and species diversity
 - (v) Turbidity and oxygen impacts on Australian lungfish spawning habitat, egg viability and young-of-the-year habitat
 - (vi) Sedimentation impacts on Mary River cod spawning habitat and egg viability
 - (vii) Sedimentation and turbidity impacts on food resources of Mary River turtle and White-throated turtle as well as nesting bank substrate changes
 - (viii) Estuarine, near shore environments and Great Sandy Strait
- (i) a model of the time it would take for the stratification to occur, and the potential establishment of an anoxic environment in the reservoirs. Include the location of the intakes within the reservoirs and the hydrodynamic information obtained in 10.32. Use the modelled results to predict and avoid:
 - (i) recycling of nutrients and metals between the reservoirs
 - (ii) oxidising the anoxic bottom layer and causing environmental harm
 - (iii) contamination of the drinking water supply
- (j) management of nutrients and oxygen levels from decomposition of any submerged vegetation within the impounded waters in any water releases from the dam.

8.64 Describe and include in the EMP avoidance, mitigation strategies and contingency plans for:

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

- (b) stormwater run-off, erosion and sedimentation from the construction of the project with reference to the International Erosion Control Association's Best Practice Erosion and Sediment Control and the former Department of Environment and Resource Management's Urban Stormwater Quality Planning Guidelines 2010 (see *Preparing an EIS, Guideline for Proponents*)
- (c) flooding of relevant river systems, the effects of tropical cyclones and other extreme events
- (d) management of acid sulfate, sodic and dispersive soils
- (e) impacts to other properties and the environment during flood events
- (f) treatment and disposal processes for all wastewater produced as a result of the project, including construction activities.

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

Land

Objective and outcomes

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

- a) avoid, minimise and/or mitigate any serious environmental harm on sensitive land uses and sensitive receptors
- b) locate infrastructure and activities to protect adjacent environmental values and sensitivities
- c) minimise changes to land tenure
- d) avoid or minimise reduction of priority agricultural areas and strategic cropping land
- e) protect the environmental values of land including soils, subsoils, landforms and associated flora and fauna
- f) enable the operation of the site in accordance with best practice environmental management.

Land use and tenure

Existing environment

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

8.67 Describe the following:

- (a) landscape and existing and proposed land uses and infrastructure, in and around the project area that may be impacted by the project including numbers of freehold properties, Traditional Custodians land and cultural practice areas, protected areas, State leasehold land, reserves, unallocated state land, legally secured offset areas, state forest, timber

reserves, watercourses (including stream order information), easements and road reserves. This should be supported by maps with Lot/Plan descriptions

- (b) identify townships and urban areas located near the project area
- (c) any tenures or other registered interests, overlying and adjacent to the project area
- (d) identify all planning schemes, regional and land use plans and overlays relevant to the project
- (e) provisions of the planning schemes (including land use plans) and assessment benchmarks and criteria relating to material changes of use and operational works that apply to the project
- (f) SDAP codes relevant to the project (including those exempt due to coordinated project status)
- (g) design and locational factors influencing the selection of the project components and the project area
- (h) any known or potential sources of contaminated land, including any area which has been or is being used for a 'Notifiable Activity' as listed in Schedule 3 of the EP Act, is potentially contaminated, or is on the Environmental Management Register or Contaminated Land Register.

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

- (a) petroleum and other pipeline infrastructure
- (b) registered exploration permits 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, and identify restricted areas under the *Mineral Resources Act 1989*
- (e) key resource areas, including known economic resources and their future availability
- (f) findings of the Agricultural Land Audit and AgTrends Spatial web mapping app¹³
- (g) geothermal and greenhouse gas storage tenures
- (h) active, disused, or abandoned mine workings in the project area and surrounds
- (i) stock route network
- (j) agricultural land considered as a priority agricultural area and/or strategic cropping land, and any other matters identified in the RPI Act and RPI Regulation 2014.

Impact assessment and mitigation measures

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

8.70 Present using map/s any proposed lot consolidation.

¹³ <https://www.business.qld.gov.au/industries/farms-fishing-forestry/agriculture/agribusiness/agtrends-spatial>

- 8.71 Demonstrate that the project can meet the environmental objectives and performance outcomes relevant to land in Schedule 8 of the EP Regulation.
- 8.72 Describe potential impacts of the proposed land uses, taking into consideration the proposed measures to be used to avoid or minimise potential impacts.
- 8.73 Address impacts on any identified agriculture, horticulture, petroleum, mining and exploration activities, including any consultation undertaken with tenement holders, with respect to accessing land, impact assessment and mitigation measures. For any impacts on mining or resource exploration activities, liaise with any authorised tenement holder whose mining interests overlay the development footprint to advise of the proposal and ascertain any future exploration activities.¹⁴ Address impacts on any identified commercial plantation timber, state-owned forest products and timber or quarry material.
- 8.74 Describe any proposed tenure to be applied for as part of this project, and proposed land tenure approach/es with stakeholders and State government agencies, including anticipated timeframes, necessary to secure tenure for the project.
- 8.75 Identify any historical workings within or adjacent to the project area. Demonstrate how historical workings have been avoided where possible. Where avoidance is not possible describe the proposed mitigation measures to be employed.
- 8.76 Describe how any proposed land use may result in land becoming contaminated. Describe the actions to be undertaken to avoid, identify, remediate, manage land that is contaminated or becomes contaminated.
- 8.77 Detail the proposed measures to be undertaken during the construction and maintenance phases of the project to avoid and minimise land degradation. Land degradation includes but is not limited to soil erosion, the expression of salinity, waterlogging, and mass movement by gravity of soil or rock.
- 8.78 Identify existing and potential Native Title rights and interests impacted by the project and the potential for managing those impacts by Indigenous Land Use Agreements or other measures. Detail and illustrate on maps the following Native Title considerations:
- (a) current tenure of all land or waters within the project area (which may include creeks)
 - (b) a native title assessment that determines presence, or otherwise, of Native Title over all land or waters within the project area
 - (c) land or waters where Native Title has been determined to exist by the Federal Court
 - (d) land or waters that are covered by a Native Title determination application
 - (e) land or waters that are covered by a registered Indigenous Land Use Agreement.
- 8.79 Describe any proposed land acquisition approach/es and other required land dealings with stakeholders and State government agencies, including anticipated timeframes, necessary to secure tenure for the project. Include any proposal for compulsory acquisition process potentially applicable to each tenure impacted, including the head of power to compulsorily acquire the land. Describe any existing or proposed tenures or land interests impacted by the project which will

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

entitle payment of lawfully required compensation and the corresponding parties who will receive or pay compensation for each tenure.

- 8.80 Identify any infrastructure or access tracks associated with the project to be located within, or which may have impacts on, the stock route network managed under the *Stock Route Management Act 2002*. This includes any Reserves which form part of the network (i.e. for water, camping purposes). Demonstrate how the project will maintain the ongoing functionality and connectivity of the stock route network.
- 8.81 Describe, using graphics and figures, temporary and permanent changes to the landscape, land uses and the visual impact of the project on communities, particularly those living in townships. Describe the proposed mitigation measures that are to be used to avoid or minimise impacts.
- 8.82 Describe the potential impacts on views of the project from key vantage points, particularly from any protected areas, recreational areas, or from the Borumba Dam water surface.
- 8.83 Assess the likely potential impacts to agricultural interests, including:
- (a) agricultural land of SPP significance to the agriculture state interest. This assessment is to include how the project is consistent (or otherwise) with protecting Agricultural Land Classification Class A and Class B land for sustainable agricultural use, in accordance with state interest – agriculture 2 (a)-(c)
 - (b) how any adverse impacts will be mitigated to ensure there is no net loss in the availability and utility of that land for an agricultural use. This would include land subject and adjacent to project activities.

Topography, geology and soils

Existing environment

- 8.84 Describe in detail, including maps and itemised sources of information, the geology and geomorphology of the project area, with particular reference to the physical and chemical properties of surface and sub-surface materials and geological structures within the proposed areas of disturbance.
- 8.85 Identify and investigate the soil toposequence associated with water movement, salinity, sodicity and cracking clay soils, as well as areas of potential and actual acid sulfate soils. Identify the potential for acid forming rock in spoil material.
- 8.86 Provide details, including maps, of existing soil conservation works (contour banks, waterway discharge points etc.) and existing erosion control works, in particular, those approved as project plans or property plans approved under the provisions of the *Soil Conservation Act 1986*.

Impact assessment and mitigation measures

- 8.87 Where significant earthworks are proposed, assess the impact of these works on affected soils and landscapes, including potential impacts on State-owned timber or quarry material. Describe how these works affect land use, land management and associated land degradation risks. This investigation of soils and landscapes should be undertaken in accordance with the latest version of the guidance materials identified in section 5.3 Land, of the *Preparing an EIS, Guideline for Proponents*.

- 8.88 Describe how the tunnelling, installation and construction of the underground power station will impact the long term stability of the geology of the project area, including reference to groundwater reserves.
- 8.89 Assess the risk to the project from the geomorphology of the site in relation to reservoir construction, tunnelling and underground excavation. Demonstrate that there is sufficient coverage in the geotechnical surveys and data for the site to assess and minimise risk of intersecting non-competent material or other potential barriers to the proposed works.
- 8.90 Investigate the risks to the soil and landscape associated with land degradation. This is to include a salinity risk assessment to predict, manage and mitigate salinity risk in accordance with *A risk framework for preventing salinity*¹⁵. Where irrigation water is applied to land, assess the:
- (a) water balance to assess the impacts of deep drainage
 - (b) salt balance
 - (c) unsaturated zone.
- 8.91 Investigate land degradation in the form of erosive soil loss associated with increase run-off, clearing or other changes to hydrology in accordance with the guidelines identified in Section 5.3 of *Preparing an EIS, Guideline for Proponents*
- 8.92 Where potential and actual acid sulfate soils have been identified, prepare an acid sulfate soil management plan in accordance with accepted industry guidelines and the guidance materials identified in Section 5.3 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*, that appropriately manages the disturbance of acid sulfate soils to avoid or minimise the mobilisation and release of acid, iron, or other contaminants.
- 8.93 Identify activities or operations likely to impact on existing erosion control works and any soil conservation works.
- 8.94 Evaluate and quantify the risk to the project from landslides and land slippage and from seismic activity.
- 8.95 Describe proposed mitigation measures to avoid or minimise project impacts related to land use, soil values, existing conservation works and sediment and erosion control works (e.g. artificial wetlands). Including mitigation and management measures where any acid forming rock is to be placed in spoil disposal areas.
- 8.96 Demonstrate how landforms, during and after disturbance, will meet any requirements of project or property plans approved under the *Soil Conservation Act 1986*.

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

Protected areas and other lands with environmental significance

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse impacts to protected areas, Ramsar Convention, state forests, legally secured offset areas and other State or privately-owned lands with nature conservation or forest production values or land used for Commonwealth or State environmental offsets.
- b) protect the environmental and resource values of protected areas, State forests, legally secured offset areas and other State or privately-owned lands with particular environmental and forest production values.
- c) ensure the project's design enables operation of the project in accordance with best practice environmental management.

Existing environment

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

- (a) existing and proposed infrastructure (including surface structures servicing the underground infrastructure)
- (b) proposed inundation and impoundment area(s)
- (c) proposed buffers (including firebreaks and safety buffers)
- (d) existing and proposed access tracks required for construction, ongoing operation access and maintenance, and
- (e) any areas of disturbance required for the establishment of temporary non-resident workforce accommodation and construction laydown areas.

Impact assessment and mitigation measures

8.98 Describe the potential direct and indirect impacts on the natural and cultural resources and values of all protected areas and state forests, within and adjacent to the project area arising from the construction and operation of the project.¹⁶

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

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

- (a) legislative mechanisms that would need to be followed for approval of these impacts
- (b) how these impacts would be minimised and mitigated

¹⁶ 'Natural resources' and 'cultural resources' within the definitions under the *Nature Conservation Act 1992*. 'Protected areas' within the definition under the *Environmental Offsets Act 2014*.

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

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

Flora and fauna

Objective and outcomes

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

- a) protect the environmental values of land including soils, subsoils, landforms, habitats and associated flora and fauna
- b) minimise environmental harm in areas of high conservation value and special significance and sensitive land uses at the site and adjacent places
- c) avoid, minimise and/or mitigate adverse and significant residual impacts (SRIs) to flora and fauna (including wetlands) which are matters of state environmental significance (MSES) or MNES, and where they cannot be avoided, offset any residual impacts
- d) identify and appropriately safeguard MSES and MNES to support healthy and resilient ecosystems
- e) manage the impacts on the environment by seeking to achieve ecological sustainability, including protected wildlife and habitat
- f) ensure the sustainable, long-term conservation of biodiversity
- g) identify critical habitat and connectivity corridors for all MSES and MNES species and ensure they receive special management considerations and protection through a management plan for the proposed project
- h) protect all environmental values relevant to adjacent and receiving environmentally sensitive areas, including aquatic ecosystems and wetlands
- i) provide for the conservation of the marine environment (Great Sandy Strait), avoid constructing or raising waterway barrier works in fish habitats, or where this is not feasible, ensure waterway barrier works in fish habitats are constructed to maintain connectivity, habitat values, fish safety and fish passage

General content

8.102 Address the project's impacts on MSES and other regionally significant biodiversity, and cultural and 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.

8.103 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.

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

- (a) existing and proposed infrastructure (including water discharge points, connections to power transmission lines and pipelines), and project activities
- (b) proposed buffers (including firebreak and safety buffers)
- (c) access tracks (including existing) required for construction and maintenance
- (d) any areas of disturbance required for sourcing quarry material and the establishment of temporary non-resident workforce accommodation and construction laydown areas.

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

Existing environment

8.106 Identify and describe MSES¹⁷, state and regionally significant biodiversity and natural environmental values of the terrestrial and aquatic ecosystems likely to be impacted by the project. Where MSES are addressed in the section on MNES, specific cross referencing is required.

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

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

- (a) regulated vegetation including prescribed regional ecosystems and essential habitat
- (b) wetlands (including wetlands of high ecological significance), watercourses and drainage features
- (c) threatened species and other protected wildlife records
- (d) connectivity areas
- (e) protected wildlife habitat
- (f) waterways providing for fish passage
- (g) protected areas and conservation areas.

8.109 Provide a detailed description of all native fish, turtle, platypus and crustacean species and macrophyte (vegetative) and other fauna spawning/breeding locations¹⁸:

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

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

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

- 8.110 Describe, using relevant literature and the results of surveys, the natural and existing upstream and downstream movement and habitat requirements of all aquatic and terrestrial flora and fauna species in the project area and in connection with the surrounding area. Identify sensitivity to change (including as a result of the project) of aquatic and terrestrial flora and fauna groups and of significant species.
- 8.111 Describe all flow dependent ecological assets and their critical links to stream flow, including their relevant ecological thresholds.
- 8.112 Describe how the features of the annual flow underpins:
- (a) structure and function of the aquatic ecosystem including peak wet season flows and their variability
 - (b) draw period of flows and flood residence times during wet and dry season transition
 - (c) low and disconnected flows during the dry season
 - (d) initial flushing flows during the dry to wet season transition.

Impact assessment

- 8.113 Provide a description of all relevant impacts (direct, indirect, cumulative and facilitated) on the biodiversity and environmental values of affected areas (such as breeding, roosting, nesting and foraging habitat) arising over the lifetime of the project (including potential/likely and known impacts) in accordance with guidance materials identified in Section 5.4 of *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*. This should include detail on the likely magnitude, duration and frequency of the impacts. The assessment is to include, but not be limited to:
- (a) identification of all significant flora and fauna species (including the koala, brush-tailed rock wallaby, greater glider, the white-throated needletail, and the grey-headed flying fox etc.) and ecological communities in both terrestrial and aquatic environments, wetlands (including tidal and intertidal), and in sensitive areas, biodiversity values, connectivity and supporting ecological processes¹⁹
 - (b) fauna and flora of cultural significance to Aboriginal and Torres Strait Islander Peoples
 - (c) fish and fauna passage within waterways
 - (d) terrestrial and aquatic ecosystems including riverine, lacustrine groundwater dependent ecosystems, wetlands (tidal and intertidal) and their interaction
 - (e) alterations to riparian vegetation, habitat type and availability, connectivity, bank and channel morphology with particular reference to impacts due to fluctuations in water levels, including for any recorded fish and fauna (turtles) spawning and nesting sites
 - (f) changes to hydrology and environmental flows resulting in potential impacts to downstream terrestrial and aquatic habitats
 - (g) area (in metres squared (m²)) of permanent and temporary impacts to aquatic plants
 - (h) existing integrity and potential impacts on ecological processes, including habitats of listed threatened, near-threatened or special least-concern species

¹⁹ Where a MSES is also a MNES, specific cross referencing to where it has been assessed in the MNES chapter should be provided

- (i) impacts on aquatic and terrestrial fauna and flora species resulting from water quality changes due to increased water circulation and sediment disturbance (potential suspension and redistribution of sediments resulting from shoreline erosion due to fluctuations in water levels) during the construction and operation of the project
- (j) connectivity of habitat and ecosystems and impacts on access to different habitat requirements by species
- (k) integrity of landscapes and places, including wilderness, reserves and similar natural places
- (l) provision of a permanent upper reservoir and the potential direct and indirect impacts to fauna and flora communities and habitat
- (m) chronic, low-level exposure to contaminants or the bio-accumulation of contaminants
- (n) terrestrial and aquatic species and ecosystems whether due to vegetation clearing, hydrological changes, discharges of contaminants to water, air or land, noise and other relevant matters. Include impacts to root systems of vegetation from tunnelling and blasting and identify if these activities will result in the subsequent death and “clearing” of native vegetation regulated under the *Vegetation Management Act 1999*.
- (o) extent of edge effects created as a result of cleared vegetation and associated impacts on access to food resources for fauna species at new edges
- (p) actions of the project that require an authority under the NC Act and *Water Act 2000* (e.g. riverine protection permit), assessable development under the *Planning Act 2016*, VM Act, *Fisheries Act 1994* and an authority and/or permit under the EP Act
- (q) biological diversity including listed flora and fauna species and regional ecosystems
- (r) protected areas, state forest, tenures, biodiversity offset areas approved by the state or commonwealth governments
- (s) impacts on native fauna during construction and operation of the project due to their proximity to the project area (e.g. light, noise, vibration, waste, discharges or overflow of contaminants to water, hydrological changes, vegetation clearing, interaction with transmission lines (e.g. bird strike risk) and vehicle movements.

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

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

8.116 Provide an assessment against SDAP State Code 16: Native vegetation clearing addressing the relevant assessment benchmarks for a coordinated project for all other purposes.

8.117 Provide detail regarding proposed works within waterways. For any infrastructure that constitutes assessable waterway barrier works, provide cross-sections of the waterway that show the barrier in relation to the bed and banks, and long-sections of the waterway that show the barrier in relation to the bed upstream and downstream of the structure. Describe how the barrier and hydrological

conditions provide for safe, bi-directional fish passage for all members of the fish community and other aquatic fauna such as turtles.

- 8.118 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.
- 8.119 Describe alternative measures that would avoid the need for waterway barriers or propose measures to mitigate the impacts of their construction and operation.
- 8.120 Describe the methodology of constructing the water storage infrastructure (through modelling or any other appropriate method) and demonstrate how the chosen method minimises and mitigates potential impacts on aquatic and riparian habitat and aquatic and terrestrial fauna and include plans to protect the health and welfare of native fish species through fish salvage operations in accordance with the Department of Agriculture and Fisheries' Guidelines for Fish Salvage²⁰, turtles and any other species with the potential for entrainment or entrapment.
- 8.121 Describe the potential disruption to flows in waterways and tributaries and any proposals to divert waterways and/or flows (including coffer dams, temporary diversions and cut-off drains). Reference is to be made to DAF's Guidelines for Fish Salvage, for example if any dewatering is required. The description is to include:
- (a) proposed fauna passage through any diversions
 - (b) proposals for the reinstatement of the waterways after construction has ceased, if applicable.
- 8.122 Describe, illustrate, and demonstrate how the project provides safe and adequate upstream and downstream aquatic fauna passage, including but not limited to the fish and turtle community of the site, and monitoring and maintenance measures. Any intakes are to be appropriately designed to minimise fish and aquatic fauna entrapment and entrainment. Refer to Design specifications for fish-protection screens in Australia²¹ and The practical guide to modern fish-protection screening in Australia for further guidance²².
- 8.123 Provide plans and supporting information demonstrating how safe and adequate bi-directional fish passage will be provided in relation to any waterway barrier works proposed. This includes but is not limited to plans of fish passage infrastructure detailing the design features, and an operational plan that demonstrate how and when any fish passage infrastructure will operate to provide fish passage²³. The location of fish passage infrastructure should be considered in relation to any pumping infrastructure.
- 8.124 Demonstrate that pumping infrastructure is designed in accordance with best practice guidelines²⁴ and that water quality associated with pumping infrastructure and water level fluctuations is suitable to maintain the health and productivity of fish. Set out a process for the design,

²⁰ Queensland Government, *Guidelines for Fish Salvage*, Department of Agriculture and Fisheries, 2018,

<https://www.daf.qld.gov.au/business-priorities/fisheries/habitats/policies-guidelines/factsheets/guidelines-for-fish-salvage>

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

²²

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

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

²⁴ Refer to "The practical guide to modern fish-protection screening in Australia" and "Design specifications for fish-protection screens in Australia" for further information and current best-practice designs.

construction, and monitoring of any fauna passage device(s) to provide maximum transparency and safe passage and relevant waterway barriers impacted or installed as a result of the project.

8.125 For any infrastructure that constitutes waterway barrier works, provide cross-sections of the waterway that show the barrier in relation to the bed and banks and long-sections that show the barrier in relation to the bed upstream and downstream of the structure. Describe how the barrier and hydrological conditions provide for fish passage.

Mitigation measures

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

8.127 Provide a detailed salvage and relocation plan for impacted species including MSES.

8.128 Assess the need for safety fire breaks and the need for buffer zones and the retention, rehabilitation or construction of fauna movement corridors, including the role of buffer zones in maintaining and enhancing riparian vegetation and wetlands to promote bank stability, to enhance habitat connectivity and provide habitat.

8.129 Propose rehabilitation criteria and objectives that are to be used to measure progressive rehabilitation of disturbed areas. Describe how the achievement of the objectives will be monitored and audited, and how corrective actions will be managed. Proposals for rehabilitation of disturbed areas are to incorporate suitable terrestrial and aquatic habitat as appropriate.

8.130 Describe, illustrate, and demonstrate how the project provides safe and adequate upstream and downstream aquatic fauna passage, including but not limited to the fish community of the site and monitoring and maintenance measures.

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

Offsets

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

8.133 Address both state and Commonwealth offset obligations, in accordance with relevant state and Commonwealth legislation and policies, and clearly identify where there are overlaps across

jurisdictions. Identify, describe, and illustrate the extent (such as in a map and table) of any SRI overlap between MNES and MSES.

- 8.134 Where an SRI is predicted occur on a prescribed environmental matter, describe and quantify the SRI and propose offsets consistent with the requirements of Queensland's Environmental Offsets Act and the latest version of the Queensland Environmental Offsets Policy (see section 5.4 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*)
- 8.135 Demonstrate a conservation outcome for all impacted prescribed environmental matters, including koala, and detail how the proposed project addresses recent amendments that have been made to the Queensland planning framework to address the key threat of loss of habitat for koala populations, with the objective of no net loss of habitat as a minimum.
- 8.136 Provide as an appendix to the EIS an offset strategy that outlines the proposed offset delivery approach to address the project's SRI on MSES and MNES. The offset delivery approach is to include:
- (a) identified SRI offset obligations for MSES and MNES across the state and Commonwealth jurisdictions. The extent of any SRI overlap between MNES and MSES should be identified, described and illustrated, noting that any SRI (MSES) does not overlap with any MNES as these are separate matters. This could be provided in the form of a table and maps
 - (b) for staged offsets, take into account the full extent of potential impacts on prescribed environmental matters for the entire project as part of the SRI assessment
 - (c) an assessment of the vulnerability of any proposed offset site/s under climate change scenarios (e.g. reduced water availability, increased bushfire risk, sea level rise)
 - (d) an evaluation of how the proposed offset will achieve a conservation outcome for the impacted matter
 - (e) identification of whether SRI to MSES will be addressed through a financial or proponent driven offset, including an offset delivery plan for any proponent driven offsets.
- 8.137 Describe any active restoration actions that would be undertaken to improve, enhance and manage native vegetation, fish habitat, or threatened species habitat on a proposed offset site (note: applying high intensity management to low condition sites are most relevant to habitat reconstruction). Describe how the achievement of the offset strategy will be monitored and audited, and how corrective actions will be managed.
- 8.138 Detail how impacts to agricultural values that result from meeting environmental offsets required for the project will be avoided, minimised or mitigated

Biosecurity

Objective and outcomes

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

- a) avoid, minimise and/or mitigate the spread of terrestrial and aquatic weeds, terrestrial and aquatic pest animals, animal and plant pests and disease, pathogens and contaminants
- b) control and manage existing terrestrial and aquatic weeds, terrestrial and aquatic pest animals and diseases
- c) comply with relevant provisions of the *Biosecurity Act 2014*, Commonwealth animal and pest strategies, biosecurity plans, weeds of national significance and designated pests under the *Public Health Act 2005* and relevant policies, legislation and guidelines.

Existing environment

8.139 Survey terrestrial and aquatic pest animals and weeds and describe their current distribution and abundance in the project area and surrounds. Provide maps showing their distribution in relation to the project area and ecologically significant areas identified as containing, or likely to contain, listed flora, fauna and ecological communities of MNES or MSES. This survey is to include prohibited and restricted matters listed in the *Biosecurity Act 2014* and Biosecurity Regulation 2016, and high risk ornamental fish and aquarium animals, Weeds of National Significance, pests and weeds declared under Gympie Regional Council and Somerset Regional Council local laws and designated pests under the *Public Health Act 2005*. See the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents* for relevant guidelines.

Impact assessment and mitigation measures

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

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

8.142 All proposed measures are to be in accordance with any relevant biosecurity surveillance or prevention measures authorised under the *Biosecurity Act 2014* and any requirements under VM *Act/Planning Act 2016*.

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

Hazards, health and safety

Objective and outcomes

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

- a) avoid, minimise and/or mitigate the risk of, and adverse impacts from, natural and human-made natural hazards to protect people, property and the environment
- b) community's resilience to natural hazards is enhanced
- c) development is appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment.
- d) any risk associated with explosives use, transportation, storage or manufacture is within an acceptable level, in accordance with the *Explosives Act 1999* and codes and standards including the Australian Standard AS2187.1 Explosives - Storage, transport and use - storage
- e) production of hazardous contaminants and waste is prevented or minimised.

Existing environment

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

8.145 Identify current hazard, risk and health and safety management measures an emergency response and communication measures for operation of the existing dam, particularly related to interactions with landholder and emergency responders with reference to the existing Emergency Action Plan (EAP)²⁵.

Impact assessment and mitigation measures

General

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

- (a) potential hazards, accidents, fire and abnormal events that may occur during all stages of the project, including estimated probabilities of occurrence
- (b) identification of all hazardous substances (including hazardous waste) and any explosives to be used, transported, stored, processed or produced and the rate of usage
- (c) evaluation of the risks associated with the secure storage, use and transportation of explosives to ensure the risks are within an acceptable standard in accordance with Australian Standard AS2187.1 Explosives - Storage, transport and use – storage
- (d) identification of the need for appropriate explosive licences and notice of proposed blasting prior to explosives use

²⁵ Emergency Action Plan – Borumba Dam: https://www.rdmw.qld.gov.au/__data/assets/pdf_file/0010/1619641/borumba-eap.pdf

- (e) potential hazards posed by wildlife interactions, natural events (for example, cyclone, flooding, bushfire, earthquakes²⁶, landslide, heatwave²⁷) and implications related to climate change. Identify the cumulative impact of a number of natural hazards occurring at the one time. Describe possible adaptation strategies (preferred and alternative) based on climate change projections for the proposed project site
 - (f) how potential flooding of the lower and upper reservoir would be managed, including location of by-wash (spillway?) and discharge pathway(s)
 - (g) impact of water level fluctuations (changing FSL) associated with PHES operation on recreational values of Borumba Dam/Lake Borumba. Detail measures for ensuring the safety of recreational users and the public and protecting them from water level fluctuation hazards at Borumba Dam as a result of the proposed project
 - (h) how the project may potentially affect hazards away from the project site (for example, changing flooding characteristics, bushfire, landslide).
- 8.147 Detail how siting, layout and operation of the development as well as other measures will avoid or mitigate risks.
- 8.148 Discuss how any potential impacts to human health associated with the project have been considered in accordance with the Health considerations guideline.²⁸
- 8.149 Detail measures required to ensure that the proposed project avoids the release of hazardous materials as a result of a natural hazard event/s.
- 8.150 Assess the vulnerability of the area to natural and induced hazards, including drought, floods, thunderstorms, bushfires and cyclones. Consider the relative frequency, duration, intensity and magnitude of these events together with the risk they pose to:
- (a) the construction, operation and decommissioning of the proposed project
 - (b) the rehabilitation of the site
 - (c) flora and fauna at the site and in the vicinity of the site including arboreal species
 - (d) environmental values of the site and surrounding areas.
- 8.151 Detail management measures that would be taken to minimise the risks of these events to the project, environmental values and human safety including how dead storage would be avoided.
- 8.152 Assess the proposed project's vulnerabilities to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology, and extreme weather events). The assessment of climate hazards and risks should reference relevant climate projection data (e.g. Queensland Future Climate high-resolution climate projection data²⁹) and employ an appropriate climate risk assessment methodology. Describe the adaptation strategies and/or activities designed to minimise climate change impacts to the proposed project, subsequent land uses on that site (e.g. rehabilitation projects) and surrounding land uses. Adaptation activities are to be designed to avoid perverse

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

²⁷ Use State Heatwave Risk Assessment

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

²⁹ Available from <https://longpaddock.qld.gov.au/qld-future-climate/dashboard/>

outcomes, such as increased emissions of greenhouse gases or maladaptive outcomes for surrounding land uses.

- 8.153 Assess potential wildlife hazards and their mitigation, including development of a mosquito management plan in accordance with Queensland Health guidelines, natural events (e.g. cyclone, flooding, earthquake, bushfire) and implications related to climate change and adaptation.
- 8.154 Provide details on the safeguards that will reduce the likelihood and severity of hazards, consequences and risks to persons, waterways, flora and fauna within and adjacent to the project area/s, including any need for safety fire breaks and buffer zones in consideration of fauna movement, riparian and wetland corridors. Identify the residual risk following application of mitigation measures. Present an assessment of the overall acceptability of the impacts of the project in light of the residual uncertainties and risk profile.
- 8.155 Provide an outline of the proposed integrated emergency management planning procedures (including evacuation plans, if required) for the range of situations identified in the risk assessment developed in this section. As part of the emergency response plan include:
- (a) reference to existing EAP for the Borumba Dam, and how the plan will be updated for construction and operation of the project
 - (b) a bushfire management plan, certified by a suitably qualified person, in consultation with the Queensland Fire and Emergency Services addressing construction and operations, and including the following information at a minimum:
 - (i) a bushfire hazard analysis
 - (ii) mitigation strategies to achieve the relevant development outcomes in Part E of the State Planning Policy– Natural Hazards, Risk and Resilience
 - (iii) provides details of the proposed ongoing management of fuel loads across the subject site through grazing or mechanical means including the asset protection zone proposed.
 - (c) a safety and emergency management plan addressing construction and operations, and including the following information at a minimum:
 - (i) evacuation plans for the construction and operation phases of the development
 - (ii) safety management plans and emergency response procedures in consultation with the state and regional emergency service providers (including Queensland Fire and Emergency Services) and provide an adequate level of training to staff who will be tasked with emergency management activities.
 - (d) dam failure EAP outlining what actions to take in the event of an incident including who to notify and where to evacuate, and including the following information at a minimum:
 - (i) potential dam hazards or emergency events and actions to take in response
 - (ii) identify stakeholders and communication protocols
 - (iii) consideration of emergency events in the context of community disaster management process.

- 8.156 Provide details on consultation undertaken and the proposed communication plan arrangements with the Gympie Regional Council and Somerset Regional Council in the event of an emergency (e.g. commencing and ceasing take, emergencies, incident management etc.)
- 8.157 Detail any consultation undertaken with the relevant state, district and local emergency response authorities and organisations, including the Local Disaster Management Group.
- 8.158 Describe how the achievement of the hazards, health and safety objectives would be monitored, audited and reported, and how corrective/preventative actions would be effectively managed.

Flooding

- 8.159 Provide a hydraulic and hydrological analysis (flood impact assessment) demonstrating the design flood peak discharges for the site and surrounding area which exist in the pre- and post-development scenarios for all flood and stormwater events up to a 1% Annual Exceedance Probability (AEP). Studies must include a range of AEP, and Probable Maximum Flood and dam failure scenario.
- 8.160 Assess how the project may change flooding characteristics upstream and downstream of the reservoir/s. The flood model needs to adequately encompass existing and future state-controlled transport corridors. Mapping (afflux, water level/depth and velocity) should be provided to clearly illustrate the existing environment scenario, and the post development impacts for all relevant design events. Include a discussion on historical events. Include a discussion on extent of modelled impacts in relation to existing townships (e.g. flood extent for modelled event(s)).
- 8.161 The assessment is to consider all infrastructure associated with or existing on near the project area including the proposed upper reservoir, levees (if applicable), roads, spoil disposal area, disturbed land and other infrastructure and all proposed measures to avoid or minimise risks to people, property (including damage to other properties), flora and fauna and the environment during flood events. Where the development is increasing impervious area, provide a peak discharge analysis with adequate details of the pre and post development impervious area of the site and give adequate consideration to the detention basin requirements.³⁰
- 8.162 Assess the project's vulnerabilities to climate change (e.g. changing patterns of rainfall, hydrology, temperature and extreme weather events). Describe possible adaptation strategies (preferred and alternative) based on climate change projections for the proposed project site. Demonstrate that flood storage capacity is maintained on the site with the development. Overland flow paths/ hydraulic conveyance should be maintained on the site as part of the proposed development. The existing environment flow scenario will need to be replicated in the post development condition. The development design will need to address any concentration of flows, potential for back-up/ponding and scour/erosion which may undermine existing and future State-controlled transport corridors.
- 8.163 Describe how design and management of all stages of the project will mitigate potential impacts on level of flood risk, both upstream and downstream of the reservoirs.

³⁰ *Queensland Urban Drainage Manual, Fourth Edition*

Economic

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse economic impacts arising from the project
- b) capitalise on opportunities potentially available for capable local businesses and communities
- c) create a net economic benefit to the region and State.

Existing environment

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

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

- (a) map/s illustrating the local and regional economies that could be potentially impacted by the project
- (b) population of relevant local government areas
- (c) regional economy's key industries and their contribution to regional output
- (d) relevant economic indicators (e.g. agriculture, water prices, energy prices)
- (e) predicted electricity supply and demand, transmission and the strategic direction of the region and the State in relation to electricity supply and demand (with particular reference to intra-day supply demand as identified in the Queensland Energy and Jobs Plan ³¹)
- (f) existing electricity infrastructure in the region and any plans for connection to the project
- (g) existing and proposed water infrastructure in the region.

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

Impact assessment and mitigation measures

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

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

³¹ Queensland Energy and Jobs Plan, available from: https://www.epw.qld.gov.au/__data/assets/pdf_file/0031/32989/queensland-energy-and-jobs-plan-overview.pdf

- (a) labour demand, including the ability for labour (including specialists) to be drawn from the existing local, regional and state workforce, and the potential effects this may have on local and regional businesses
- (b) raw input demand, including the ability for existing local, regional and state suppliers to provide relevant raw and manufactured inputs
- (c) anticipated impacts the project will have on water prices, grazing, agriculture, domestic and industrial energy prices, wages, economic growth, renewable energy projects
- (d) anticipated value of offsets required for all components of the project.

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

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

- (a) demand for energy generated having regard to existing and proposed facilities
- (b) timeframe for uptake of identified energy demand.

8.171 Undertake a regional impact assessment (RIA) that quantifies the employment by industry (including an estimate of supply chain employment) and value-added contribution of the project to the local, regional and state economies. The RIA is to estimate the changes in key indicators including:

- (a) gross regional and state product
- (b) energy prices for residential, mining, agriculture and large industrial users
- (c) water prices for residential and industrial users
- (d) gross value added by industry.

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

- (a) key construction inputs and milestones in the form of a project timeline
- (b) relevant renewal costs related to the project (including projected repair/replacement of infrastructure)
- (c) operational costs, including all input costs of production
- (d) costs associated with: impacts to recreational values; impacts to environmental values, including protected species, their habitats, environmental management, monitoring, mitigation and offsets associated with the project
- (e) benefits, including revenue projections (and stipulating unit/price assumptions)
- (f) expected project life and any residual value over the assessment period.

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

- (a) external net benefits (such as third parties who are providing inputs such as water, agriculture and energy) to the project
- (b) external net costs (to third parties, community, local and State Government) as a direct result of the project
- (c) comparisons of all direct, indirect and external costs and benefits and valuing those direct, indirect and external costs and benefits in monetary terms
- (d) assumptions for benefits and costs, including risk assessments
- (e) all beneficiaries (e.g. individuals, the community, local and State Government) of the project. If there are specific issues related to the cost of water, these should be identified as external costs and benefits.

Social

Objective and outcomes

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

- a) ensure benefit to residents of communities in the vicinity of the project
- b) avoid, minimise and mitigate adverse social impacts arising from the project

Existing environment

8.174 Include a social baseline study of the project's potentially affected communities³² in accordance with the Coordinator-General's Social Impact Assessment (SIA) Guideline and supplementary material (see section 5.6 of the *Preparing an environmental impact statement: Guideline for proponents*). The baseline should describe the people, communities, and key stakeholders directly or indirectly affected by the project.

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

Impact assessment and mitigation measures

8.176 Prepare an SIA for the project that is informed by a consultative and inclusive stakeholder engagement program³³ in accordance with stakeholder consultation requirements of the *Preparing an environmental impact statement: Guideline for proponents* and consistent with the relevant requirements of the Coordinator-General's SIA Guideline and Supplementary material.

8.177 Describe the outcomes of consultation with directly affected people, communities and key stakeholders including but not limited to landholders, Aboriginal and Torres Strait Islander

³² Potentially affected communities are those local and/or regional communities that may be directly or indirectly affected by the project, whether negatively or positively.

³³ 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.

peoples³⁴, local governments, state agencies, local and regional commerce and community development groups, social and public service providers (e.g. Queensland Health, Queensland Police Service and Queensland Emergency Services), ; recreational users of Lake Borumba and surrounds including upstream and downstream waterways and other directly and indirectly impacted areas the recreational fishing community including local fish stocking group.

8.178 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 Gympie Regional local government area (LGA) and Somerset Regional LGA and the project (including impacts of the project on established fish stocking and attractor programs³⁵) including an assessment of the size, significance, and likelihood of these impacts at the local and regional level, including:
 - (i) key population/demographic shifts and effects to existing lifestyles, the health and social wellbeing of families and communities
 - (ii) needs of vulnerable groups including those that are socially disadvantaged, Aboriginal and Torres Strait Islander peoples, the aged and people with a disability
 - (iii) potential social benefits of the project on the local and regional area in relation to the alternatives
 - (iv) assess the perception of risk from the proposed activity on the community and determine factors of influence
 - (v) potential project impacts and/or benefits (including cumulative impacts) on health, community and well-being
 - (vi) 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
 - (vii) identify any mitigation measures and/or strategies that might be deployed by the proponent during the all phases of the project.

8.179 Describe any impacts on, and mitigation measures to address, the use of and access for recreational, natural and culturally important areas, waterways and landscapes (Aboriginal and non-Aboriginal) potentially affected by the project during all phases of the project.

8.180 Identify the percentage of workers likely to be sourced from affected communities, including Aboriginal and Torres Strait Islander peoples, for the construction and operational phases and the proposed methodologies for workforce recruitment. Also identify the percentage of procurement from Aboriginal and Torres Strait Islander owned businesses during the construction and operational phases and the proposed strategies to achieve this percentage.

³⁴ Refer to Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance) which outlines the statutory obligations that apply to, and the department's expectations of, proponents engaging with First Nations people and communities under the EPBC Act 1999. The guidance applies to proponents undertaking referral, assessment, and approval processes under Chapter 4 of the EPBC Act. Available via: <https://www.dcceew.gov.au/environment/epbc/publications/engage-early>

³⁵ Fishing in stocked impoundments: <https://www.qld.gov.au/recreation/activities/boating-fishing/rec-fishing/dams>

- 8.181 Describe the housing strategy to accommodate construction and operational workers. Describe how this will impact the residential land supply, housing and accommodation market of the Gympie and Somerset LGAs. The housing strategy is to be informed by the SIA and impact management plan requirements of the Workforce Management and Housing and Accommodation sections of the (SIA) Guideline, 2018.
- 8.182 Develop a social impact management plan (SIMP) and include management measures developed in consultation with potentially affected people, communities and key stakeholders, to accommodate workers to ensure the availability and affordability of local and regional housing is not adversely impacted and to avoid and mitigate the project's potential adverse impacts and enhance the potential benefits.
- 8.183 Describe the framework to monitor the effectiveness of proposed management measures, including timeframes and key performance indicators for implementing these measures. The framework must identify roles and responsibilities, and relevant stakeholders.

Cultural heritage

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse impacts on Aboriginal and Torres Strait Islander Peoples' cultural heritage
- b) achieve the purposes of the *Aboriginal Cultural Heritage Act 2003*
- c) ensure that the nature and scale of the project does not compromise the cultural heritage significance of a heritage place or heritage area.

Existing environment

- 8.184 Identify the existing and historic Traditional Custodians of the land within the project area.
- 8.185 Undertake a cultural heritage assessment and describe the existing cultural heritage values of Aboriginal and Torres Strait Islander peoples that may be affected by the project and the environmental values of the cultural landscapes of the affected area in terms of the physical and cultural integrity of the landforms.
- 8.186 Undertake a study of the known and potential Queensland (non-Indigenous) historical heritage values of the area identified through the *Queensland Heritage Act 1992*, in accordance with the Non-Indigenous cultural heritage – EIS information guideline (see section 5.6 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*). Identify values at local and State thresholds and assess the significance of identified values using recognised criteria.

Impact assessment and mitigation measures

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

- 8.188 Unless section 86 of the *Aboriginal Cultural Heritage Act 2003* (ACH Act) applies, the proponent must develop a Cultural Heritage Management Plan (CHMP) in accordance with the requirements of Part 7 of the ACH Act and any associated agreements that have been reached. The CHMP must be informed by the results of a cultural heritage study or survey.
- 8.189 Identify impacts on Queensland (non-Indigenous) historical heritage identified under the *Queensland Heritage Act 1992*.
- 8.190 Provide strategies to mitigate and manage all impacts on Indigenous and non-Indigenous cultural heritage values. Include strategies to address unexpected archaeological discoveries and cultural places in accordance with Non-Indigenous cultural heritage guideline in section 5.6 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents* and the project CHMP.

Noise and vibration

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse noise and vibration impacts to sensitive receivers and structural damage to buildings or other infrastructure or landforms as a result of construction vibration.
- b) protect the environmental values of the acoustic environment

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

Existing environment

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

Impact assessment and mitigation measures

- 8.193 Describe the characteristics of the noise and vibration sources, including any blasting, or rock ripping, emitted by the project (point source and general emissions) during construction, operation, upset conditions, and decommissioning of the proposed project.
- 8.194 Conduct a noise and vibration impact assessment in accordance with the latest version of DESI Noise and vibration—EIS information guideline (), Schedule 1 of the EPP (Noise) and Applications for activities with noise impacts (see section 5.7 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*). The assessment must include:
- (a) a description of the surrounding existing and planned sensitive receptors and at-risk landforms and the associated environmental values in order to set noise criteria which protects the environmental values
 - (b) a description of the project's noise and vibration impacts on sensitive receivers and proposed mitigation measures through all phases of the project.

- 8.195 Assess the blasting and vibration impacts from construction and operation of the project on the existing and planned future infrastructure at Borumba Dam and surrounds (including any fauna passageway) and the potential for structural impacts and functional impacts on these. Safety considerations should be included in the impact assessment.
- 8.196 Describe how risks from blasting and vibration impacts on the existing and planned future infrastructure at Borumba Dam and surrounds will be mitigated.
- 8.197 Describe how the proposed project would be managed to be consistent with best practice environmental management, including the control of background creep in noise as outlined in the Environmental Protection (Noise) Policy 2019. The assessment must address the compatibility of the proposed project's noise emissions with existing and potential land uses in surrounding areas.
- 8.198 Describe how the project's acoustic quality objectives will be monitored and audited, and how corrective actions will be managed in accordance with best practice environmental management.

Climate

Objective and outcomes

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

- a) avoid, minimise and/or mitigate the risk of, and adverse impacts to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology and extreme weather events), with particular reference to any additional environmental management measures required, and how those measures may change over time
- b) contribute toward Queensland's emissions reduction and renewable energy targets by developing and implementing decarbonisation measures for the project, including the contribution towards Queensland's implementation of the Queensland Energy and Jobs Plan.

Existing environment

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

Impact assessment and mitigation measures

- 8.200 Conduct an assessment in accordance with DESI Climate – EIS Information Guideline and Air – EIS information guideline (see section 5.8 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*).
- 8.201 Describe the project site's climate patterns that are relevant to the environmental impact assessment, particularly the project's discharges to water and air, and propagation of noise. Assess the project's vulnerabilities to current climate patterns in relation to water quality and quantity management (surface and groundwaters) and unplanned or emergency water releases.
- 8.202 Climate information is to be presented in a statistical form including long-term averages and extreme values reflecting extreme weather events (e.g. droughts, floods, cyclones and bushfires), as necessary. It should also be illustrated by graphs, wind rose diagrams or other relevant graphic means as necessary.

8.203 Assess the project's vulnerabilities to projected climate change (e.g. changing patterns of temperature, rainfall, hydrology, and frequency of extreme weather events). Demonstrate how the proposal accounts for climate change impacts and builds in fire, flood and drought resistance and resilience measures. In the assessment of climate hazards and risks, reference relevant climate projection data and employ appropriate risk assessment methodologies, including the frequency and magnitude of major weather events, and any consequence and management actions for the proposed project. The assessment of climate hazards and risks should reference relevant climate projection data (e.g. Queensland Future Climate high-resolution climate projection data³⁶) and employ an appropriate climate risk assessment methodology.

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

Greenhouse gas emissions

Note:

DESI is developing the draft Industry Decarbonisation Plan Policy which will be subject to industry and community consultation. Accordingly, the Decarbonisation Plan Policy may change prior to finalisation of the EIS for the project.

Existing environment

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

8.206 Describe and quantify the current GHG emissions at Lake Borumba as a result of the existing water body and dam operation

Impact assessment and mitigation measures

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

8.208 Provide an inventory of projected annual emissions for the life of the project for each GHG, with total emission expressed in 'CO₂ equivalent terms'. Calculate the GHG emission from land clearing and inundation of land. Utilising the hydrodynamic modelling (see 7.61 above) quantify the CO₂e (including methane) from the reservoirs for the life of the project. Incorporate in the model, the timing and the frequency for stratification to occur, and the potential establishment of an anoxic environment in the reservoirs.

8.209 Quantify emissions for the following categories as per the National Greenhouse and Energy Reporting Scheme including scope 3 emissions:

³⁶ Available from <https://longpaddock.qld.gov.au/qld-future-climate/dashboard>.

- (a) scope 1 emissions – direct emissions of greenhouse gases from sources within the boundary of the facility and from the facilities (including emissions from construction and operation transport, 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.

8.210 Estimate both unmitigated emissions and predicted emissions (for the life of the project) after all avoidance and mitigation measures have been accounted for using an appropriate methodology in accordance with Australian and international guidelines. Briefly describe the methods used to make the estimates. Include forgone GHG uptake as a result of vegetation clearance.

8.211 Assess the potential impacts of the proposed project on the state and national GHG inventories including Queensland's published emissions targets.

8.212 Demonstrate and outline in a Decarbonisation Plan³⁷ how the project will assist in meeting Queensland's 2030 emissions reduction targets and to achieve net zero emissions by 2050, including through the project's development and operation.

8.213 Address the following matters in the Decarbonisation Plan for the life of the project, with key targets, commitment to measures and transparent reporting of progress:

- (a) how the project will be consistent with the relevant published Industry Decarbonisation Plan Policy
- (b) measures (preferred and alternatives) proposed to avoid and/or minimise scope 1, scope 2 and scope 3 GHG emissions of the proposed project and forgone GHG uptake, and how the preferred measures minimise emissions and achieve energy efficiency
- (c) any opportunities to further offset GHG emissions through accredited and verified offsets that represent genuine emissions reductions within Australia (i.e. will be recognised in the National Greenhouse Accounts)
- (d) opportunities to reduce GHG emissions through renewable energy use and innovation
- (e) quantify the emissions expected to be abated for each avoidance and mitigation measure.
- (f) any voluntary initiatives or research into reducing the lifecycle and embodied energy carbon intensity of the proposed project's processes or products
- (g) a process for regularly reviewing new technologies to identify opportunities to further reduce greenhouse gas emissions and use energy efficiently, consistent with best practice environmental management
- (h) describe the practicality, effectiveness and risks for each avoidance, reduction and mitigation or offsets measure
- (i) compare preferred measures for emission controls and energy consumption with best practice International environmental management in the relevant industry sector

³⁷ As per requirements in section 6.4, should a new policy or legislation be passed to regulate greenhouse gases, the proponent must meet all requirements of the policy that apply to the project.

- (j) assess and describe the practicality, effectiveness and risks for each avoidance and mitigation measure and provide clear evidence that the proposed mitigation and avoidance measures have been factored into the economic feasibility of the proposed project
- (k) monitoring, auditing and transparent public reporting on:
 - (i) GHG emissions from all relevant activities
 - (ii) periodic energy audits that measure progress towards improving energy efficiency
 - (iii) the success of mitigation measures outlined in the Decarbonisation Plan
 - (iv) ongoing training and capacity building around decarbonisation options, technology and reporting.

Air

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse air impacts to sensitive receivers
- b) protect or enhance the environmental values of the airshed, the health and biodiversity of ecosystems and human health and wellbeing.
- c) The performance outcomes corresponding to these objectives are in Schedule 8, Part 3 of the EP Regulation.

Existing environment

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

- (a) background/ambient levels and sources of particulates, gaseous and odorous compounds, any major constituent and contaminants. Include all available data from any site-specific air monitoring, the National Pollutant Inventory (NPI) reporting, and/or ambient air quality monitoring undertaken by the Queensland Government
- (b) pollutants
- (c) baseline monitoring results
- (d) locations of sensitive receptors (including ecologically significant species and habitats).

8.215 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.

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

Impact assessment and mitigation measures

- 8.217 The assessment of impacts on air from all components of the project (i.e. on and off-site) should be in accordance with DESI Air – EIS information guideline and Application requirements for activities with impacts to air. Demonstrate the project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.
- 8.218 Provide an emissions inventory and description of the characteristics of any contaminants or materials that may be released, and the release rate, as a result of the construction or operations of the project, including point source and fugitive emissions. An emissions inventory (point source and fugitive) during construction, commissioning, operations, maintenance and a range of possible/likely upset conditions is to be included for the project site.
- 8.219 Predict the potential impacts of the releases to air from project activities on environmental values of the receiving environment using established and accepted methods.
- 8.220 The description of impacts should take into consideration the assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts. The impact prediction is to:
- (a) address residual impacts on the environmental values (including appropriate indicators and air quality objectives) of the air receiving environment, with reference to sensitive receptors, using recognised quality assured methods. This should include all relevant values potentially impacted by the activity, under the EP Act, EP Regulation and Environmental Protection (Air) Policy 2019 (EPP (Air))
 - (b) address the cumulative impact of the release with other known releases of contaminants, materials or wastes associated with existing development and possible future development (as described by approved plans and existing project approvals). Quantify the human health risk and amenity impacts associated with emissions from the project for all contaminants whether or not they are covered by the National Environmental Protection (Ambient Air Quality) Measure or the EPP (Air).
- 8.221 Detail the measures to avoid, minimise and manage impacts on air quality and how the proposed project activities would be consistent with best practice environmental management.
- 8.222 Address the compatibility of the proposed project's air emissions with existing or potential land uses in surrounding areas.
- 8.223 Describe how the proposed project will avoid and/or minimise potential impacts to air quality, dust and odour management. Identify measures to be implemented on-site to control and mitigate impacts and describe how the proposed project activities will be consistent with best practice environmental management.
- 8.224 Describe how the achievement of the air objectives would be monitored, audited and reported, and how corrective/preventative actions would be managed for the life of the project.
- 8.225 Provide relevant information on proposed extractive and screening activities relevant to environmentally relevant activity (ERA) 16, by referring to relevant DESI policies and guidelines relevant to extractive and screening activities.

Transport

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse impacts to the condition and operation of existing and planned transport infrastructure
- b) maintain the safety, efficiency and operational integrity of all affected transport modes for the project workforce and other transport system
- c) ensure impact mitigation works are compatible with transport infrastructure planning.

General content

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

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

Existing environment

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

- (a) construction laydown areas and workers accommodation areas
- (b) locations where project components cross or are located in proximity to or located within existing and planned:
 - (i) road and railway corridors
 - (ii) road and rail infrastructure
 - (iii) airports and airstrips
 - (iv) sea ports.

Impact assessment and mitigation measures

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

- (a) background traffic growth and existing traffic data
- (b) expected annual volumes, weights and origins/destinations of materials, products, hazardous goods, and wastes
- (c) details concerning road transportation for each major transport task (for example, fuel, plant and equipment, consumables, wastes) including heavy vehicle classification, load size (highlighting over-mass and over-sized loads), number of trips, service frequency and duration

- (d) details concerning rail transportation including number of trips, load size, service frequency and duration
- (e) maps of routes to be used for all project transport tasks
- (f) over-mass or oversized loads, including the number and type of vehicles, with a description of the likely timing and routes of those loads highlighting any vulnerable bridges or other structures along the proposed routes
- (g) traffic generated by workforce personnel and service providers for all phases of the project.

8.230 Identify project site access points to/from public roads including their suitability for the proposed use and required upgrades in accordance with relevant local and/or state policies, standards and manuals.

8.231 Prepare a transport assessment in accordance with the latest version of DES's Transport – EIS information guideline and present each project-affected mode (road, rail, air services, port and maritime) as appropriate for each phase of the project. The assessment must be completed by a Registered Professional Engineer of Queensland engineering consultant and include:

- (a) how the existing and future safety, condition and performance of transport infrastructure (local and State) will be impacted by the project's pre-construction, construction and operational phases.
- (b) details of the adopted assessment methodology for impacts on roads within the road impact assessment report in accordance with the latest Queensland Department of Transport and Main Roads (DTMR), Guide to Traffic Impact Assessment (GTIA) for State-controlled roads and the three local government impact assessment methodologies for local government roads.
- (c) for State-controlled roads, to ensure that all impact types (road safety, access and frontage, intersection delay, road link capacity, pavement, and transport infrastructure (including bridges, culverts and grids) and wayfinding and road signs as detailed in the GTIA are considered and mitigated. Particular emphasis is to also be placed on the following sections of the GTIA:
 - (i) section 8.4.2 Heavy Vehicle Routes
 - (ii) section 9 Road Safety
 - (iii) section 13 Pavement.

8.232 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.

8.233 Demonstrate how project impacts will be mitigated. Mitigation measures are to be prepared in consultation with relevant transport authorities (e.g. local governments, DTMR, Civil Aviation Safety Authority, Maritime Safety Queensland, Aurizon and Queensland Rail).

Waste management

Objective and outcomes

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

- a) avoid, minimise and/or mitigate adverse impacts of hazardous contaminants and waste generated by the project to protect people, property and the environment
- b) manage any waste transported, generated, or received as part of carrying out the activity in a way that protects all environmental values and community enjoyment of the region
- c) ensure waste infrastructure has the capacity to adequately accommodate waste, and any upgrades to waste infrastructure are funded by the proponent.

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

Existing environment

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

8.235 Describe if any pre-existing contaminated material identified on property lots listed on the Environmental Management Register (EMR) are within the project footprint. If contaminated material was identified, describe:

- (a) details of any site investigations undertaken by suitably qualified persons, including findings of the investigation;
- (b) using maps at a suitable scale, illustrate the context of the project area in relation to identified contaminated material;
- (c) outline the management or disposal of any identified contaminated material.

Impact assessment and mitigation measures

8.236 For wastes other than wastewater, describe all the expected waste streams, including hazardous contaminants, generated by project activities during the construction, operation, rehabilitation and decommissioning.

8.237 Describe the quantity, and physical and chemical characteristics of each significant waste stream, any attributes that may affect its dispersal in the environment, and its associated risk of causing environmental harm.

8.238 Conduct the impact assessment in accordance with the latest version of the DES's Waste—EIS information guidelines and Applications for activities with waste impacts (ESR/2015/1836) (see section 5.11 of the *Coordinator-General's Preparing an environmental impact statement: Guideline for proponents*). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the EP Regulation.

8.239 Describe objectives and practical mitigation measures to ensure environmental values are protected or enhanced from potential impacts from wastes.

- 8.240 Describe the geochemistry of all waste rock, including spoil and rejects. Assess the potential risks associated with this waste stream (in particular any soil or rock that has the potential to create and leach acids) and describe the management of progressive placement and any disposal strategy to minimise any potential impacts on environmental values of the proposed project area. Describe how high-risk waste material will be managed in the rehabilitation plan.
- 8.241 Describe waste management planning for the project especially how these plans are to be applied to prevent or minimise environmental impacts from waste for each stage of the project, including pre-construction. Waste management planning is to include detail of all identified waste types, waste volumes and proposed locations for waste disposal.
- 8.242 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.
- 8.243 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.
- 8.244 Describe how securing of storage containers of hazardous contaminants during flood events would meet the requirements of schedule 8 of the Environmental Protection Regulation.
- 8.245 Describe how nominated quantitative standards and indicators may be achieved for waste management, and how the achievement of the objectives would be monitored, audited and managed.
- 8.246 Provide relevant information on existing and proposed sewage infrastructure relevant to environmentally relevant activity (ERA) 63, by referring to relevant DESI policies and guidelines, depending on the proposed sewage collection and treatment infrastructure proposed, the reuse and/or disposal of treated wastewater, and sewage wastes generated.

Cumulative impacts

Objective and outcomes

The design, construction and operation of the project are to avoid, minimise and/or mitigate potential adverse impacts arising from the combined effects of past, present and reasonably foreseeable projects on the environmental, social, economic, and cultural values.

General requirements

- 8.247 Potential cumulative environmental, social, economic, and cultural impacts are to be considered for the design, construction, and operational phases of the project.
- 8.248 The cumulative impact assessment is to consider the combined effect of potential impacts of different components of the project on the same value (intra-project cumulative impacts), and the impacts of other relevant projects, including the exploratory works for the project, acting in combination on the same value (inter-project cumulative impacts).

8.249 Describe the cumulative impacts of the project, in conjunction with existing development and known future development (as described by approved plans and existing project approvals) to the following matters:

- (a) proposed land uses, including impacts from contaminants, materials or wastes associated with existing development and future known development
- (b) capacity of infrastructure corridors and resources (e.g. pipelines, energy, water, renewable energy, etc.) intended to be accessed by the proponent
- (c) extent of renewable energy development that could be supported by the project ^{38 39}
- (d) soils
- (e) area coverage, health and resilience of terrestrial and aquatic (including marine) ecosystems
- (f) surface water and groundwater quality
- (g) surface water and groundwater resources for all phases of the project (including post decommissioning phase), including management of impacts on underground water rights under the *Water Act 2000*, and impacts on surface water flows (volumes, timing, duration) and instream and floodplain connectivity.
- (h) release of contaminants, materials or wastes and the disposal of waste
- (i) air quality
- (j) noise
- (k) natural hazards occurring at the same time
- (l) public health and safety.

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

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

³⁸ <https://www.epw.qld.gov.au/energyandjobsplan/about>

³⁹ <https://aemo.com.au/-/media/files/major-publications/isp/2022/appendix-3-renewable-energy-zones.pdf?la=en>

9. Matters of national environmental significance

On 19 December 2023, the project was determined to be a controlled action, requiring environmental approval under the Australian EPBC Act (EPBC reference 2023/09646).

The controlling provisions for the proposed action are as follows:

- World Heritage properties (sections 12 & 15A)
- National Heritage places (sections 15B & 15C)
- Ramsar wetlands (sections 16 & 17B)
- Listed threatened species and communities (sections 18 & 18A)
- Listed migratory species (sections 20 & 20A)

The proposed action will be assessed by accredited assessment under the SDPWO Act. The EIS process under Part 4 of the SDPWO Act is the accredited assessment process.

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

Ensure habitat definitions for listed threatened species are in accordance with definitions available in the EPBC Act Guidelines or other relevant, most recent, statutory documents (e.g., referral guidelines, approved listing advice(s), approved conservation advice(s), recovery plan(s), threat abatement plan(s) or comparable policy guidelines, and information contained in relevant Commonwealth databases such as the Species Profile and Threats (SPRAT) database). Ensure that the habitat definitions also take into account all relevant Queensland regional ecosystems and other available information. The most up to date documentation and/or scientific expert advice needs to be used.

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

- 9.1 The MNES chapter is to take into consideration the EPBC Act Significant Impact Guidelines, other relevant statutory documentation (such as relevant recovery plans and conservation advices accessible via the SPRAT database) and Commonwealth policy guidelines (see Appendix 1).
- 9.2 The MNES chapter should contain sufficient information to allow the Australian Minister (or delegate) to make an informed decision on whether or not to approve the taking of the action under Part 9 of the EPBC Act for the purposes of each controlling provision.
- 9.3 The MNES chapter should contain sufficient information to enable interested stakeholders to understand the environmental consequences of the proposed developments on MNES and how these impacts are proposed to be avoided, mitigated, and/or offset.

9.4 The proponent is to ensure that the MNES section assesses compliance of the action with principles of ESD and the objects of the EPBC Act (see Chapter 1 Part 1 of the EPBC Act).

Specific content

General information

9.5 Provide the background and context of the action including:

- (a) title of the action
- (b) full name and postal address of the designated proponent
- (c) clear outline of the objective of the action
- (d) location of the action including regional context
- (e) background to the development of the action
- (f) how the action relates to any, or potentially interacts with any other actions (of which the proponent should reasonably be aware) that have been, are currently, or will be, taken or that have been approved in the region
- (g) current status of the action
- (h) consequences of not proceeding with the action.

9.6 Separately discuss the description, existing known location/s, likelihood of occurrence, demonstrated impact, avoidance, mitigation and compensatory measures (including offset) for each MNES triggered.

Description of the action

9.7 All components of the action are to be described in detail, including construction, commissioning, operation, maintenance, decommissioning and rehabilitation. This is to include the precise location of all works to be undertaken, structures to be built or elements of the action that may have impacts on MNES. It is suggested that each component of the action is discussed in a separate section.

9.8 The description of the action is to also include details on how the works are to be undertaken (including stages of development and their timing) and design parameters for those aspects of the structures or elements of the action that may have relevant impacts. At a minimum, this section is to also include, with appropriately scaled mapping, details of:

- (a) all infrastructure constructed and construction methods, including final heights of new and raised dams
- (b) ancillary or supporting infrastructure, associated works or safety works including new construction and upgrades
- (c) all new and existing roads, as well as details on which roads are sealed and unsealed, and traffic volume
- (d) all temporary and permanent fencing used, including a description of each fencing type and location. Include schematic diagrams of fence types and maps of where fences are proposed to be located

- (e) realignment or replacement of services, structures, access etc. required as a result of the action
- (f) re-establishment of existing quarries (if applicable) and establishment of new quarries (resource extraction areas) which includes location, size, method of extraction of materials and transport of materials
- (g) treatment of contaminated land, including method of treatment, disposal of waste and contaminated material, standards and minimum thresholds required for removal/disposal
- (h) maximum life of the action, including construction, operation, decommissioning and rehabilitation
- (i) number of jobs for the life of the action, including number of jobs for Indigenous employees
- (j) associated works and supporting infrastructure deemed necessary as part of the action or safety works
- (k) other such actions, including, but not limited to, earthworks, use of explosives, changes to hydrological flow and groundwater, concrete batching plant, material storage, construction facilities, fines and dust control management, waste management generally and management of spills/contaminants/pollutants (e.g. prevention from entering waterways and groundwater).

9.9 The description of the action is to provide the total size (in hectares) of the project site and the total size (in hectares) of the disturbance footprint. If the disturbance footprint is the same as the project site, the MNES section is to include a statement to this effect. The description is also to include separate calculations of the total area of the inundation areas in hectares.

9.10 The MNES section is to include a map (or maps) which clearly identify all components (including but not limited to laydown areas, existing and new access roads, widening of any roads, fencing) of the action and their location within the project site.

9.11 The MNES section is to include map/s of presence/records and habitat areas that may support MNES to a suitable scale, in order to assess the proximity and location of the proposed action in relation to MNES.

Feasible alternatives

9.12 Outline any feasible alternatives to the action to the extent reasonably practicable, including:

- (a) if relevant, the alternative of taking no action and/or at a reduced scale
- (b) if relevant, alternative designs depending on the outcome of exploratory works (if approved)
- (c) a comparative description of the impacts of each alternative on listed threatened species and communities
- (d) sufficient detail (including feasibility studies and cost analysis) to make clear why any alternative is preferred to another
- (e) short, medium and long-term advantages and disadvantages of the options, including but not limited to, the environmental outcomes to be achieved for MNES under each alternative.

Description of the Environment

- 9.13 Describe the environment of the project site and surrounding areas (i.e. adjacent, upstream and/or downstream) that may be affected by the action. At a minimum, this section is to include details of:
- (a) terrestrial and aquatic ecosystems, including key vegetation communities and relevant watercourses
 - (b) total size (in hectares) of Regional Ecosystems ground-truthed to be present on site, as well as a map/s showing the size (in hectares) of Regional Ecosystem patches and native vegetation regrowth
 - (c) estuarine, riverine and coastal environments, including inshore coastal areas, vegetation, underwater ecological features, key habitats
 - (d) native flora and fauna, both terrestrial and aquatic. Include species records of each vegetation community or relevant regional ecosystem
 - (e) pest species and weeds' distribution and abundance. Include information on age classes and other relevant information such as location of burrows of pest animals. Weeds are to be categorised in accordance with relevant legislation and regulations, from weeds of national significance (WoNS), State listed and those listed by Somerset Regional Council and Gympie Regional Council important habitat areas, recognised populations and habitat, and aggregations of listed species
 - (f) surface water and groundwater hydrology and quality
 - (g) cultural heritage values, people and communities and other relevant social considerations
 - (h) historical anthropogenic uses of the project site (if relevant) and existing condition of the overall environment within, adjacent to, downstream and upstream of the project site.
- 9.14 For each triggered MNES matter, include a brief description, status of matter in the region and the key threatening processes. Describe the key threatening processes applicable to each MNES within the proposed action site/s. For further MNES information requirements, please refer to the Listed Threatened Species and Ecological Communities section below.

Relevant impacts

- 9.15 All relevant impacts of the action are to be assessed in accordance with the latest relevant Commonwealth policies and guidelines, and information provided in the SPRAT database, including but not limited to:
- (a) habitat clearance
 - (b) habitat fragmentation and degradation
 - (c) injury or death (such as from vehicle strike)
 - (d) disturbance from dust, light, vibration and noise
 - (e) behavioural changes
 - (f) introduction and/or increase in numbers of pests and weeds
 - (g) changes to hydrological regimes (including flow changes and flooding)
 - (h) impacts to groundwater levels in root zones of relevant vegetation habitat
 - (i) impacts to surface water quality

- (j) impacts to water quality (including direct and facilitated), waste and chemical pollution, land contamination and greenhouse gas emissions
 - (k) barriers to fauna movement and edge effects.
- 9.16 Describe all relevant impacts of the action (direct, indirect, cumulative and facilitated), including the magnitude, duration and frequency of the impacts (including any temporary impacts). Relevant impacts are the impacts that the action will have, or is likely to have, on MNES. 'Likely' is taken to mean a "real or not remote chance or possibility". All stages and components of the action must be addressed, and the following information provided:
- (a) a detailed assessment of the nature and extent of the likely short-term and long-term relevant impacts, taking into consideration any indirect impacts (e.g. light and dust pollution, noise from operations, construction and explosives, increased risk of predation).
 - (b) a statement, with supporting evidence, whether any relevant impacts are likely to be unknown, unpredictable or irreversible.
 - (c) any technical data and other information used or needed to make a detailed assessment of the relevant impacts.
 - (d) consideration must be given to specific habitat features such as hollow bearing trees, nest trees, refuge habitat, foraging, breeding and dispersal habitat, sheltering or other microhabitat features relevant to the species within and surrounding the development footprint (if applicable).
- 9.17 Provide a detailed assessment of any likely impact that the action may have on (at the local, regional, state, national and international scale) the MNES above. The assessment of impacts should include a discussion of the overall implication of all relevant impacts on population and sub-population size (including genetic diversity), species recovery, health and species range for each relevant MNES.
- 9.18 Identify and assess the cumulative impacts on MNES (terrestrial, aquatic and marine) created by the project and the activities of other existing and proposed adjacent, upstream and downstream relevant developments, water users and land users.
- 9.19 Establish and describe clear spatial and temporal boundaries for the assessment of cumulative impacts.
- 9.20 Address the potential cumulative impact of the action on ecosystem resilience. Where relevant to the potential impact, a risk assessment is to be conducted and documented.
- 9.21 Describe the change in the duration, frequency, magnitude and timing of river flows and releases for current and future water infrastructure projects in the Mary Basin and potential influence on aquatic and marine biota and water quality, within and at end of the catchment.
- 9.22 Identify water quality and environmental flow objectives within and at the outflow point of the Mary Basin in relation to the Great Sandy Strait Ramsar Site.

Avoidance, mitigation and management measures

- 9.23 Describe in detail measures proposed to avoid, mitigate and manage relevant impacts during all stages of the action on MNES. The proposed measures are to be based on best available

practices, appropriate standards and supported by scientific evidence (e.g. outcomes of successful field trials, research papers, other projects, etc.). The MNES section is to include:

- (a) proposed measures to be undertaken to avoid and mitigate the relevant impacts of the action on MNES, including those required by other Commonwealth, State and local government approvals
- (b) an assessment of the predicted effectiveness of the proposed measures
- (c) any statutory or policy basis for the proposed measures, including reference to the SPRAT database and relevant approved conservation advices, and a discussion on whether the proposed measures are not inconsistent with relevant and current recovery plans, conservation advices and threat abatement plans
- (d) details of ongoing management, including monitoring programs to support an adaptive management approach and determine the effectiveness of the proposed measures
- (e) details on measures, if any, proposed to be undertaken by State and local government, including the name of the agency responsible for approving each measure
- (f) information on the timing, frequency and duration of the measures to be implemented
- (g) the outcomes to be achieved for each relevant MNES through the implementation of individual or combined mitigation measures, including details of how these outcomes can be measured
- (h) name of the agency responsible for endorsing or approving each mitigation measure or monitoring program.
- (i) assessment on the functionality of retained/avoided vegetation to MNES within the project site.

9.24 Provide detailed measures that will be implemented to avoid, mitigate and manage impacts on MNES. Proposed management plans and/or broad objectives to describe avoidance, mitigation and management measures must not be a statement. Committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) is to be used. Avoidance and mitigation measures must be clearly demonstrated.

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

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

Note

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

It is DCCEEW's standard practice that, if environmental offsets are required, an Offset Proposal and an Offset Area Management Plan (OAMP) are included in the assessment documentation for assessment and approval. Further, it is DCCEEW's expectation that the environmental offset is legally secured under relevant Queensland legislation prior to the commencement of the action. Where this is not achievable, DCCEEW will likely recommend to the Minister (or delegate) that the conditions of approval require the environmental offset/s or the OAMP be approved, and legally secured, prior to the commencement of the action, for the duration of the impact.

Offsets must be specific to the species or ecological community being impacted, must address the attribute of the protected matter that is impacted, and must deliver an outcome for the protected matter that is demonstrably equal or better than if neither the impact nor the offset occurred.

- 9.26 Provide an assessment of the likelihood of residual significant impacts occurring on MNES after avoidance, mitigation and management measures have been applied. For all MNES deemed likely to have residual significant impacts an environmental offset will be required, under the EPBC *Environmental Offsets Policy* (2012). To streamline the assessment process and provide confidence in the proposed outcomes, after all reasonable measures to avoid and mitigate impacts are implemented should significant residual impacts remain, the proponent must prepare and submit an offset proposal and Offset Area Management Plan(s) (OAMP) compensating for these impacts.

Offset Proposal

- 9.27 The objective of an Offset Proposal is to demonstrate that the measures put in place to compensate for the residual impacts of an action on MNES meet the requirements of the *EPBC Act Environmental Offsets Policy* (2012).
- 9.28 The EIS must identify the residual impacts for each MNES, including:
- (a) a summary of residual significant impacts as a result of the proposed action. The summary must be supported by spatial information (e.g. area) and maps showing the location of residual impacts.
 - (b) where relevant, overlap(s) of MNES and MSES offset requirements should be detailed in a tabular format.

⁴⁰ It is important to consider environmental offsets early in the assessment process. If environmental offsets are required, it is standard practice that an Offset Proposal and/or an Offset Area Management Plan (OAMP) are to be included in the assessment documentation for assessment and approval.

- (c) where an SRI to 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.
- 9.29 The EIS must quantify the residual impacts for each MNES and derive a Quantum of Impact value for input to the Commonwealth Offsets Assessment Guide (OAG). The methods to determine Quantum of Impact values should be:
- (a) described in sufficient detail to allow a suitably qualified ecologist to undertake an independent audit of Quantum of Impact values. For Quantum of Impact values which apply Habitat Quality Scores (HQS), the HQS methodology must also be described
 - (b) suitable for the relevant MNES and aligned to the appropriate protected matter attributes (e.g., Area of habitat, Number of features) depending on a protected matter's habitat or ecology that a proposed action may be likely to impact
 - (c) consistent with the Commonwealths guidance document (How to use the Offset Assessment Guide) and approved by the Commonwealth and OCG. The methods must be science-based, scale and attributes appropriate (e.g., distinguishes between areas of breeding or foraging habitat) and directly apply field survey data / analysis, and noting that chosen methods must be applied consistently at both the impact and offset sites. In accordance with the Commonwealths guidance document site quality and site condition components must be assessed and combined for Area of community HQS. An additional species stocking rate component must be combined with these components for Area of habitat HQS.
- 9.30 The EIS must propose an Offset Proposal to compensate for residual significant impacts to MNES. The Offset Proposal must:
- (a) describe the proposed offsetting mechanisms to compensate for impacts to each MNES and to deliver on the required conservation gains
 - (b) address all the EPBC Act Environmental Offset policy principles and demonstrate how each principle will be met (including through quantitative means via the Offset Assessment Guide and HQS results)
 - (c) if proposed, describe how staging of the impacts or environmental offset/s will be managed
 - (d) demonstrate how the offset site and proposed management actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans
 - (e) must demonstrate how the proposed offset is suitable and meets the principles of the EPBC Offsets Policy and must include sufficient information to assess it using the EPBC Offsets Assessment Guide.
- 9.31 For proposed indirect offset mechanisms compensate for impacts to each MNES (up to a maximum of 10% of the Quantum of Impact) the Offset Proposal must contain details of the objectives, proposed outcomes, financial contributions and management arrangements for each proposed activity.
- 9.32 For proposed direct offset mechanisms (such as land-based offset sites), the Offset Proposal must also contain details of the proposed offset site/s:
- (a) location, size and condition, environmental values present and surrounding land uses. This must be supported by pictures, HQS data, spatial information and maps at representative locations and appropriate resolution / scales

- (b) if relevant, stages of environmental offset areas
- (c) details of the nature and scale of the conservation gains proposed to be achieved for each relevant MNES, including the associated conservation objectives, actions and outcomes. Gains involving the creation, restoration, revegetation and / or protection of MNES habitat must also identify the specific MNES gains being targeted (e.g., population extent, breeding habitat)
- (d) proximity to known areas, populations, and / or habitat of impacts to MNES being offset and evidence that the MNES, and/or their habitat, can and are likely to be present in the potential offset area/s
- (e) details of how the environmental offset/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant triggered, listed threatened species and communities
- (f) an assessment of how the offset and impacts sites are like-for-like, i.e., the environmental values for the MNES at the offset are of the same type or equivalent to that affected by the proposed action
- (g) compensation of the required Quantum of Impact value for each MNES, as demonstrated by the Commonwealths OAG. OAG inputs must be described and justified to quantify the amount of increased levels of protection and / or the area and scale of the proposed quality gains. Raw quality gains must be calculated for each OAG scenario input (start quality, future quality without the offset and future quality with offset) using the same HQS method/s applied at the impact site (justifying all estimated future gains)
- (h) proposed OAG calculations. These must be submitted to the OCG and Commonwealth (as early as possible for their review, revision and approval) and include a description and/or justification of additional OAG inputs, including:
 - (i) time over which loss is averted (maximum 20 years)
 - (ii) time until ecological benefit
 - (iii) risk of loss (%) without offset
 - (iv) risk of loss (%) with offset
 - (v) confidence in result (percentage).

9.33 For each Offset site, provide an OAMP prepared by a suitably qualified person and in accordance with *Commonwealth Environmental Management Plan Guidelines (2014)*. The OAMP must contain at a minimum:

- (a) a summary of residual significant impacts for each MNES and identify and quantify (ha) any overlap(s) with offset requirements for MSES in a tabular format. A map showing the location of significant residual impacts for each MNES is to be provided
- (b) where an SRI to a MSES is identified as also being a MNES, evidence is to be provided on why/how the MNES is the same or substantially the same prescribed matter and impact, in addition any potential duplication of offset requirements should be identified
- (c) the methodology, with justification and supporting evidence, used to inform the inputs of the Commonwealth Offsets assessment guide in relation to the project impact site for each relevant MNES, including:
 - (i) quantum of impact – area (in hectares)

- (ii) quantum of impact – quality (A methodology that is suitable for the relevant listed threatened species in question must be used to assess site quality, site condition and species stocking rate. A methodology that is suitable for the relevant ecological community must be used to assess site quality and site condition. (i.e. approved by DCCEE, OCG and/or supported by literature), noting the same scoring mechanism must be used at both the impact site and the offset site. In instances where alternative method is proposed e.g. for aquatic species, this method must be clearly explained to enable an accurate assessment of its' adequacy).
- (d) description of the proposed offset area, including its proximity to the populations or habitats of MNES impacted by the proposed action and, any other known populations or habitat of MNES that are triggered by the proposed action
- (e) details of the environmental offset(s) (in hectares) for residual significant impacts of the action on relevant MNES, and/or their habitat. This should be broken down into attributes (e.g. breeding and foraging habitat where relevant) and detail how the environmental offset(s) meets the principles of the EPBC Act Environmental Offsets Policy (2012) (EPBC Act Offset Policy), including the Offsets Assessments Guide, in particular how the proposed environmental offset/s will achieve an overall conservation outcome for the EPBC protected matter
- (f) specific details of the nature of the conservation gain to be achieved for relevant MNES, including descriptions for the creation, restoration and revegetation of habitat in the proposed offset area(s)
- (g) detail how conservation gains and restoration management measures across the proposed offset area benefit the ecology and presence of each triggered MNES
- (h) details of the management strategies that will be implemented to ensure the conservation gains are achieved
- (i) details of a strategy for the staging of environmental offset/s for each project stage (if proposed)
- (j) details of appropriate offset area/s (including a map/s) to compensate for the residual significant impact on relevant MNES, and/or their habitat
- (k) the methodology, with justification and supporting evidence, used to inform the inputs to the Commonwealth Offsets Assessment Guide in relation to each potential offset area/s for each relevant MNES, including:
 - (i) time over which loss is averted (maximum 20 years)
 - (ii) time until ecological benefit
 - (iii) risk of loss (%) without offset
 - (iv) risk of loss (%) with offset
 - (v) confidence in result (percentage)
- (l) evidence that the relevant MNES, and/or their habitat, can and are likely to be present in the potential offset area/s
- (m) information about how the proposed offset/s area provides connectivity with other relevant habitats and biodiversity corridors

- (n) details and execution timing of the mechanism to legally secure the environmental offset/s (under Queensland legislation or equivalent) to provide protection for the offset area/s against development incompatible with conservation, including proposed content of a proposed legal mechanisms. .⁴¹

9.34 Where offset area/s have been nominated, include an OAMP as an appendix to the EIS which includes information to demonstrate how the environmental offset/s compensate for residual significant impacts of the action on relevant MNES, and/or their habitat, in accordance with the principles of the Offsets Policy and all requirements of the Offsets Assessment Guide. The OAMP is to include:

- (a) specific, committal and measurable environmental outcomes which detail the nature of the conservation gain to be achieved for relevant MNES, including the creation, restoration and revegetation of habitat in the proposed offset area/s
- (b) a description of the environmental offset/s, including location, size, condition, environmental values present and surrounding land uses
- (c) detailed baseline data, including from field validation surveys, and quantifiable ecological data on habitat quality and other supporting evidence that documents the presence of the relevant MNES, and the quality of their habitat within the environmental offset areas
- (d) detailed baseline data of vegetation community characteristics, including structure and floristics utilising biodiversity condition assessment methodology. Species lists and summary tables for each measured unit must be included in an appendix
- (e) detailed baseline fauna habitat information, including specific information relevant to the conservation and enhancement of habitat quality of any triggered MNES. These fauna habitat features include, but are not limited to, the locations of large trees (specific to any MNES that is triggered), tree hollows, locations of relevant winter flowering vegetation patches
- (f) impacts of threats present supported by baseline surveys showing the extent of threats. Reference must be made to the relevant statutory documents when detailing the impacts of threat to MNES an assessment of the site habitat quality for the offset area/s using an appropriate methodology, with justification and supporting evidence (A methodology that is suitable for the relevant listed threatened species in question must be used to assess site quality, site condition and species stocking rate. A methodology that is suitable for the relevant ecological community must be used to assess site quality and site condition. (i.e. approved by DCCEE, OCG and/or supported by literature), noting the same scoring mechanism must be used at both the impact site and the offset site)
- (g) details of how the environmental offset/s will provide connectivity with other habitats and biodiversity corridors and/or will contribute to a larger strategic offset for the relevant triggered, listed threatened species and communities
- (h) maps and shapefiles to clearly define the location and boundaries of the environmental offset/s, accompanied by the offset attributes (e.g. physical address of the offset area/s, coordinates of the boundary points in decimal degrees, the listed threatened species and

⁴¹ It is expected that the environmental offset is legally secured under relevant Queensland legislation prior to the commencement of the action. Where this is not achievable, DCCEE will likely recommend to the Minister (or delegate) that the conditions of approval require the environmental offset/s or the OAMP be approved, and legally secured, prior to the commencement of the action

communities that the environmental offset/s compensates for, and the size of the environmental offset/s in hectares)

- (i) description of the presence, abundance and distribution of the triggered MNES in the areas surrounding the proposed offset area
- (j) specific offset completion criteria derived from the site habitat quality to demonstrate the improvement in the quality of habitat in the environmental offset/s over a specified timeframe
- (k) details of the management actions, and timeframes for implementation, to be carried out to meet the offset completion criteria. These are to be summarised in a table with committed reporting periods listed. This information must include triggers and adaptive management actions
- (l) conservation management strategies to revegetate, rehabilitate, conserve, protect or enhance habitat within the offset area must include information on prohibited actions (such as grazing), fencing plan, access and signage, fire management, weed control, pest animal control, cultural heritage management, waste management and management zones. Provide this information on a map/s at a suitable scale to allow the assessment of the OAMP. The OAMP should clearly demonstrate how improved health and viability of the protected matter/s is achieved by the conservation management strategies implemented across the site and for the specified duration
- (m) interim milestones that set targets at 5-yearly intervals for progress towards achieving the offset completion criteria. The first five years would include milestones and reporting at years 1, 3 and 5
- (n) details of the nature, timing and frequency of monitoring to inform progress against achieving the 5-yearly interim milestones (the frequency of monitoring must be sufficient to track progress towards each set of milestones, and sufficient to determine whether the environmental offset/s are likely to achieve those milestones in adequate time to implement all necessary corrective actions)
- (o) monitoring methods are to be specified and targeted towards the objectives of the OAMP
- (p) proposed timing for the submission of internal monitoring reports which provide evidence demonstrating whether the interim milestones have been achieved. Interim monitoring reports must also describe the works and management measures completed within the offset area during the reporting period. Provide a summary table showing the management efforts completed each year
- (q) trigger values and timing for the implementation of corrective actions if monitoring activities indicate the interim milestones will not or have not been achieved
- (r) risk analysis and a risk management and mitigation strategy for all risks to the successful implementation of the OAMP and timely achievement of the offset completion criteria, including a rating of all initial and post-mitigation residual risks in accordance with an appropriate risk assessment matrix
- (s) if proposed for listed threatened species and communities, evidence of how the management actions and corrective actions take into account relevant approved conservation advices and are consistent with relevant recovery plans and threat abatement plans
- (t) details of the legal mechanism for legally securing the proposed offset area/s, such that legal security remains in force over the offset area/s for the duration of the impact and to provide enduring protection for the offset area/s against development and land uses incompatible with conservation.

- 9.35 The OAMP is to provide evidence, derived from field validation surveys and vegetation assessments, to demonstrate that an EPBC Act protected matter (e.g. listed threatened species, ecological community) is occupying or is able to occupy the proposed environmental offset/s. Field validation surveys are to be undertaken in accordance with Commonwealth guidelines, State guidelines and/or best practice survey methodologies.
- 9.36 Supporting evidence is to be included in the OAMP to justify how proposed management action/s are additional to the existing requirements of the landholder in managing their land (e.g. weed and pest management requirements under the Queensland *Biosecurity Act 2014*, existing grazing regimes, etc.) as required by the principles of the EPBC Act Offsets Policy.
- 9.37 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.
- 9.38 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.
- 9.39 Where an environmental offset/s is proposed, with a completed Offsets Assessment Guide 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.).

K'gari (Fraser Island): World heritage values of a declared World Heritage property (sections 12 and 15A) and National Heritage places (sections 15B and 15C):

Note

Though separate controlling provisions, sections 12 and 15A and sections 15B and 15C of the EPBC Act, as reflective of the same place/property, may be able to be addressed as one item. Any particular aspects of each statutory requirements that do not overlap must be addressed.

- 9.40 The primary purpose of management of natural heritage and cultural heritage of a declared World Heritage property is to be, in accordance with Australia's obligations under the World Heritage Convention, to identify, protect, conserve, present, transmit to future generations and, if appropriate, rehabilitate the World Heritage values of the property.
- 9.41 The objective in managing National Heritage places is to identify, protect, conserve, present and transmit, to all generations, their National Heritage values.
- 9.42 The assessment of the K'gari (Fraser Island) World Heritage Area and National Heritage Place in the MNES section is to have the following structure and detail.
- (a) Description
 - (b) Impact assessment
 - (c) Avoidance, mitigation and management

- (d) Statutory requirements
- (e) Significant impact assessment.

Description

- 9.43 Identify and describe the world heritage values of the K'gari (Fraser Island) World Heritage Area that are likely to be impacted by the action. The relevant world heritage values are those described in Statement of outstanding universal value for the K'gari (Fraser Island) World Heritage Area.
- 9.44 Identify and provide a comprehensive description of the place, including information about its location, physical features, condition, historical context and current uses; and describe the national heritage values of the K'gari (Fraser Island) National Heritage Place that are likely to be impacted by the action.

Impact assessment

- 9.45 Describe and assess all impacts (direct, indirect, facilitated and cumulative) of the action on the values and/or integrity of the K'gari (Fraser Island) World Heritage Area and National Heritage Place including, but not limited to:
- (a) nutrient and sediment from catchment runoff
 - (b) pesticide and herbicide from catchment runoff
 - (c) other pollutants (e.g. pharmaceuticals, chemicals, heavy metals) from catchment runoff
 - (d) barriers to water flow
 - (e) modification of coastal habitats
 - (f) change to erosional and depositional processes from alteration to hydrological regime
 - (g) known or potential pest species being introduced or established (including existing pest species being spread or increased in numbers)
 - (h) impacts on listed threatened and migratory species, and marine species
 - (i) greenhouse gas emissions.
- 9.46 Assess the impacts of the action against relevant reports and documents including, but not limited to:
- (a) World Heritage Nomination – IUCN Summary 630: Fraser Island and The Great Sandy Region (Australia) 1992
 - (b) Great Sandy Region Management Plan 1994
 - (c) IUCN Guidance and Toolkit for Impact Assessments in World Heritage Context 2022
 - (d) Significant Impact Guidelines 1.1 - Matters of National Environmental Significance 2013
- 9.47 The MNES section is to demonstrate how the action contributes to an overall or 'net' improvement to ecosystem health, water quality and the condition of the affected values.

Avoidance, mitigation and management

- 9.48 Describe all relevant measures proposed to avoid, mitigate and manage potential impacts on the K'gari (Fraser Island) World Heritage Area and National Heritage Place.

Statutory requirements

9.49 Demonstrate that the action will not be inconsistent with:

- (a) Australia's obligations under the World Heritage Convention or
- (b) the Australian World Heritage management principles or
- (c) a plan that has been prepared for the management of a declared World Heritage property under section 316 or as described in section 321 of the EPBC Act.

Significant impact assessment.

9.50 After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on the K'gari (Fraser Island) World Heritage Area and National Heritage Place. The significant impact assessment is to consider DCCEE's *Significant impact guidelines 1.1 (2013)*.

9.51 The MNES section is to provide a clear and definitive conclusion (i.e. 'likely' or 'unlikely'), including the extent and nature, of residual significant impacts on the K'gari (Fraser Island) World Heritage Area and National Heritage Place to align with the EPBC Act *Environmental Offsets Policy (2012)*.

9.52 Overall, the MNES section is to demonstrate how, with detailed supporting justification, the integrity of the outstanding universal value of the K'gari (Fraser Island) World Heritage Area and National Heritage Place will be maintained throughout the undertaking of the proposed action and after the action has been decommissioned.

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

9.53 The MNES section is to address impacts on listed threatened species and communities which may include, but is not limited to, those identified at Appendix 2 based on the likelihood of significant impacts.⁴²

Information requirements

9.54 The assessment of listed threatened species and communities in the MNES section is to have the following structure and detail:

- (a) description
- (b) desktop analysis
- (c) survey effort
- (d) survey outcomes
- (e) habitat assessment
- (f) impact assessment
- (g) avoidance, mitigation and management

⁴² This may not be a complete list of listed threatened species and ecological communities that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the project, are assessed for the Minister's consideration. If the listing or up-listing of a species occurs after the controlled action decision (19 December 2023) the species will continue to be assessed under the level of threatened status it was before this event. However, any new recovery plans and other updated documentation must be still considered in the assessment

- (h) rehabilitation requirements
- (i) statutory requirements
- (j) significant impact assessment.

Description

9.55 Describe each listed threatened species and ecological communities (including EPBC Act listing status, distribution, habitat, life history, threatening processes etc.); these descriptions are to align with the information in the SPRAT database and relevant Commonwealth documents.⁴³

Note: As noted in Appendix 2, it is the responsibility of the person proposing to take the action to keep up to date with all new statutory documents released since the time of the referral decision on 19 December 2023 for threatened species and ecological communities, as a part of the assessment.

Desktop analysis

9.56 Describe the desktop assessment methodology used to inform the field surveys within, adjacent to, downstream and upstream of the project site. The MNES section is to identify and describe known historical records of listed threatened species and ecological communities in the broader region (this may also include downstream of the project site). All known records are to be supported by an appropriate source (i.e. Commonwealth and State databases, published research, publicly available survey reports, etc.), the year of the record and a brief description of the habitat in which the record was identified.

9.57 The proponent must ensure that a recent Protected Matters Search Tool (PMST) report⁴⁴ has been generated and considered before finalising the draft EIS. This PMST report should be provided as an attachment to the EIS.

Survey effort

9.58 Provide details of the scope, methodology, timing and effort of field surveys (is to be undertaken by qualified species experts with demonstrated experience in detecting the relevant listed threatened species and ecological communities) within, adjacent to, downstream and upstream of the project site. Provide details of:

- (a) how surveys were undertaken in accordance with relevant Commonwealth and state guidelines or best practice survey guidelines at the time of the surveys
- (b) if relevant, the justification for divergence from relevant Commonwealth and State guidelines or best practice survey guidelines at the time of the surveys
- (c) how surveys were undertaken with reference to relevant DCCEEW documents (e.g. approved Conservation Advices, Recovery Plans, draft referral guidelines and Listing

⁴³ The habitat assessment should be undertaken in line with the habitat descriptions outlined in SPRAT Database and relevant DCCEEW documents (e.g., recovery plans and conservation advice). However, the proponent may deviate from the information available in the SPRAT Database when undertaking the habitat assessments if appropriate. Any variation in habitat assessment approach must be discussed with DCCEEW prior to the submission of the preliminary documentation and must be supported by scientific evidence including published research, independent expert advice and information derived from field surveys (DCCEEW does not accept the consideration of Queensland Regional Ecosystem mapping to determine habitat for listed threatened species).

⁴⁴ Protected Matters Search Tool report - <https://www.dcceew.gov.au/environment/epbc/protected-matters-search-tool>

Advices, and the SPRAT Database), including published research and other relevant sources.

- (d) In the absence of published best practice species specific guidelines, the justification for survey effects supported by species experts and available scientific literature.

9.59 Surveys are to be of a suitable standard, including the scope, timing and spatial and temporal replication, to maximise the probability of detection of cryptic or difficult to detect terrestrial and aquatic species. In the instance where suitable methods exist, species experts should be sought to input on the most suitable method of detection of the species. Additionally, consideration of similar species survey requirements to form the basis of suitable detection methods is recommended. Surveys are to also target areas upstream, downstream and adjacent to the project site, particularly for species which regularly disperse through the landscape or aquatic environments (particularly seasonally) and/or have large home ranges. Maps demonstrating survey effort and distribution are to be included.

Survey outcomes

9.60 State the total number of records (individuals and evidence of presence) of listed threatened species and ecological communities within, adjacent to, upstream and/or downstream of the project site. All records are to include the year of the record and a brief description of the habitat in which the record was identified. This data may be used by DCCEEW to update the relevant species distribution models that underpin the publicly available Protected Matters Search Tool (PMST).

9.61 The species occurrence records must be provided in accordance with *DCCEEW's Guidelines for biological survey and mapped data (2018)* using DCCEEW's *Species observation data template*. Sensitive ecological data must be identified and treated in accordance with *DCCEEW's Sensitive Ecological Data – Access and Management Policy V1.0 (2016)* or subsequent revision.

Habitat assessment

9.62 Provide a robust assessment of the potential habitat available within, adjacent to, upstream and/or downstream of the project site for listed threatened species and ecological communities. This is to include the assessment of specific habitat requirement/s relevant to each listed threatened species and ecological community (e.g. breeding, foraging, dispersal, important habitat, roosting, etc.).

9.63 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 including species experts where required.

9.64 Detailed mapping of habitat type/s for relevant listed threatened species and ecological communities that are found to be, or may potentially be, present within, adjacent to, upstream and/or downstream of the project site are to be included in the MNES section, and must:

- (a) be specific to the habitat assessment undertaken for each listed threatened species and ecological community
 - (b) include an overlay of the disturbance footprint, with the area (in hectares) of disturbance overlaying threatened species and ecological communities habitat specified
 - (c) include known records of individuals (or evidence of individuals) derived from desktop analysis and/or field surveys.
- 9.65 The MNES section is not to solely rely on Queensland regional ecosystem (RE) mapping to determine habitat for listed threatened species - habitat assessments must consider and align with the information in the SPRAT Database, relevant DCCEEW documents and species expert advice. Some Queensland REs align with the descriptions for some ecological communities and therefore the use of Queensland REs is acceptable in these cases, however, should not be solely relied upon.
- 9.66 Provide a detailed habitat assessment for the listed threatened species and communities listed in Appendix 2 that may be significantly impacted and any other listed threatened species and/or ecological communities identified during desktop analysis and/or field surveys.
- 9.67 The habitat assessment must include the total amount of habitat (in hectares) within, adjacent to, upstream and downstream of the project site for each listed threatened species and ecological community.
- 9.68 Habitat for each species must be further refined to provide any landscape attributes and/or specific habitat features that are present, the density of these attributes/features and the importance and function they represent to the relevant species. These must be shown on a map where applicable. For example the Greater Glider (southern and central) (*Petauroides volans*) has different habitat requirements for denning and foraging habitat, notably, the presence of suitable sized and density of hollows. The assessment of these habitat types for this species should be undertaken separately, as to accurately capture the true habitat value present on site for the species.
- 9.69 It is considered reasonable that a species may use a project site at some point in time if the vegetation and/or habitat feature/s to support its requirements are present. As such, even if a listed threatened species and/or community is not recorded during field surveys, the potential for occurrence of listed threatened species and communities is to also be considered and assessed in the MNES section.

Impact assessment

- 9.70 Describe and assess all relevant impacts (direct, indirect, facilitated and cumulative) to listed threatened species and ecological communities and any other listed threatened species and communities that are found to be or may potentially be present in areas that may be impacted by the action. This includes (but is not limited to) listed threatened species and communities in downstream catchment areas and wetlands, including estuarine, coastal and marine environments, and in areas adjacent to disturbance areas that may be subject to edge disturbances from impacts including but not limited to dust and noise.
- 9.71 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.

- 9.72 For threatened ecological communities, the total direct impact (in hectares) to each identified patch within and adjacent to the project site is to be provided in the MNES section compared to its current extent. Assessment of the impact to threatened ecological communities must include any relevant buffers directly surrounding the patch. Justification must be provided as to the size of any buffer applied or in cases where a buffer is not applied. Further, the impact assessment for ecological communities is to include a discussion on the post-impact viability of each individual patch within and adjacent to the project site to be directly impacted from fragmentation as a result of vegetation clearance and/or degradation.
- 9.73 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 interference between impacted and retained habitat, with tables of coordinates appended.
- 9.74 Assess how the action impacts the outcomes, objectives and targets of relevant reports and documents.

Avoidance, mitigation and management⁴⁵

- 9.75 Describe all relevant species-specific measures proposed to avoid, mitigate and manage potential impacts on listed threatened species and ecological communities, including details on how these proposed measures line up with key life-cycle events of relevant threatened species (e.g. key breeding periods).
- 9.76 The MNES section is not to just state proposed management plans and/or broad objectives to describe avoidance, mitigation and management measures. The MNES section is to include detailed measures that will be implemented to avoid, mitigate and manage impacts on listed threatened species and ecological communities (e.g. re-location/translocation plans). Committed language (i.e. 'will') rather than non-committal language (i.e. 'may', 'where possible', 'if required', etc.) must be used. Where relevant, management measures should reference the guidance/best practice they are sourced from. For example, for proposed Koala-safe movement solutions should reference the Queensland Government *Koala-Sensitive Design Guideline 2022*, or subsequent edition.

Statutory requirements

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

⁴⁵ Appropriate measures may be detailed on the SPRAT Database for relevant listed threatened species and ecological communities. All proposed measures must consider the 'S.M.A.R.T.' principle (see below) and as outlined at the 'Avoidance, Mitigation and Management Measures' section above

- (d) a recovery plan or threat abatement plan.

Significant impact assessment

- 9.79 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).
- 9.80 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).

Ramsar wetlands (sections 16 and 17B)

The primary purpose of management of a declared Ramsar wetland must be, in accordance with the Ramsar Convention, to describe and maintain the ecological character of the wetland by promoting conservation of the wetland and wise and sustainable use of the wetland for the benefit of humanity in a way that is compatible with maintenance of the natural properties of the ecosystem.

The Great Sandy Strait Ramsar site was listed in 1999, and satisfies 9 of the possible 13 Ramsar criteria¹:

- 1(a): it is a particularly good representative example of a natural or near- natural wetland, characteristic of the appropriate biogeographical region
- 1(b): it is a particularly good representative example of a natural or near-natural wetland, common to more than one biogeographical region
- 1(d): it is an example of a specific type of wetland, rare or unusual in the appropriate biogeographical region
- 2(a): it supports an appreciable assemblage of rare, vulnerable or endangered species or subspecies of plant or animal, or an appreciable number of individuals of any one or more of these species
- 2(b): it is of special value for maintaining the genetic and ecological diversity of a region because of the quality and peculiarities of its flora and fauna
- 3(a): it regularly supports 20 000 waterfowl
- 3(b): it regularly supports substantial numbers of individuals from particular groups of waterfowl, indicative of wetland values, productivity or diversity
- 3(c): where data on populations are available it regularly supports 1% of the individuals in a population of one species or subspecies of waterfowl
- 4(b): it is an important source of food for fishes, spawning ground, nursery and/or migration path on which fish stocks, either within the wetland or elsewhere, depend.

- 9.81 The assessment of the Great Sandy Strait Ramsar site in the MNES section is to have the following structure and detail.
- (a) Description
 - (b) Impact assessment

- (c) Avoidance, mitigation and management
- (d) Statutory requirements
- (e) Significant impact assessment.

Description

- 9.82 Identify and provide a comprehensive description of its ecological character and state the characteristics that make the Great Sandy Strait Ramsar site a wetland of international importance under the Ramsar Convention. Describe the values of the wetland that are likely to be impacted by the action; include and refer to the criteria for identifying wetlands of international importance.
- 9.83 The MNES section is to describe the current pressures on the Great Sandy Strait Ramsar site and the ecological characteristics of the Great Sandy Strait Ramsar site and surrounds in the context of (but not limited to):
- (f) erosion, sediments and salinity (i.e. turbidity)
 - (g) indirect and facilitated impacts of increased intensification and expansion of agriculture and development
 - (h) Prochange in hydrological regime (i.e. connected groundwater and wetland systems, flow changes, hydrological connectivity, increased flooding)
 - (i) change to the physicochemical status of the wetland (i.e. nutrients, other chemicals)
 - (j) habitat modification/loss and/or disruption of lifecycle of listed species
 - (k) introduction or establishment of pest species.
- 9.84 Overall, the MNES section is to demonstrate how, with detailed supporting justification, the integrity of the ecological character of the wetland will be maintained throughout the undertaking of the proposed action, including operation, and after the action has been decommissioned.
- 9.85 The description of the environmental values within and surrounding Great Sandy Strait Ramsar site is to be supported by baseline data derived from field surveys, scientific evidence derived from research papers and expert advice, public consultation, other approval processes, and information collected from desktop research (e.g. Commonwealth and State government databases/websites [including CSIRO], universities, outcomes of previous field surveys, modelling, scientific investigations, etc.).
- 9.86 A description of the role of the Mary River and importance of fresh water flows in the functions of the Great Sandy Strait Ramsar Site. This includes the long-term average yield and pre-development flow of the Mary River.

Impact assessment

- 9.87 Discuss the relevant impacts of the action that endanger the ecological character and/or integrity of the Great Sandy Strait Ramsar site including, but not limited to:
- (a) nutrient and sediment from catchment runoff
 - (b) pesticide and herbicide from catchment runoff
 - (c) other pollutants (e.g. pharmaceuticals, chemicals, heavy metals) from catchment runoff)
 - (d) barriers to water flow

- (e) modification of Coastal habitats
- (f) increase of erosional and depositional processes from alteration to hydrological regime
- (g) known or potential pest species being introduced or established (including existing pest species being spread or increased in numbers)
- (h) impacts on listed threatened and migratory species, and marine species
- (i) greenhouse gas emissions.

9.88 Discuss how changes to water flow may be impacted in differing seasonal conditions such as drought during construction, first filling and operation.

9.89 Assess the impacts of the action against relevant reports and documents including, but not limited to:

- (a) Information Sheet on Ramsar Wetlands (RIS) for the Great Sandy Strait (including Great Sandy Strait, Tin Can Bay and Tin Can Inlet) Ramsar Site 1999
- (b) Lee Long, W.J. and O'Reilly, W.K. (2009). *Ecological Character Description for the Great Sandy Strait Ramsar Site*, Report for the Environmental Protection Agency, Queensland.

Avoidance, mitigation and management

9.90 Describe all relevant measures proposed to avoid, mitigate and manage potential impacts on the Great Sandy Strait Ramsar site a wetland of international importance including but not limited to:

- (a) mitigation measures to be implemented throughout construction and first filling to address low flows and flow variability.
- (b) mitigation measures to be implemented during operation, in particular during drought/low flow events, successive drought years, and in times of peak energy demand.

Statutory requirements

9.91 Demonstrate that the project will not be inconsistent with:

- (a) the Ramsar Convention
- (b) the Australian Ramsar management principles
- (c) if a plan for managing the Great Sandy Strait Ramsar site has been prepared in accordance with section 333 of the EPBC Act.

Significant impact assessment

9.92 After consideration of proposed avoidance, mitigation and management measures, provide an assessment of the likelihood of residual significant impacts on the ecological character of the Great Sandy Strait Ramsar site. The significant impact assessment must consider DCCEE's *Significant impact guidelines 1.1 (2013)*.

9.93 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 the ecological characteristics of the Great Sandy Strait Ramsar site to align with the EPBC Act *Environmental Offsets Policy (2012)*. Overall, the MNES section must demonstrate how, with detailed supporting justification, the integrity of the

ecological character of the Great Sandy Strait Ramsar site will be maintained throughout the undertaking of the proposed action and after the action has been decommissioned.

Listed migratory species (sections 20 and 20A)

9.94 The MNES section is to address, at a minimum, impacts on the listed migratory species at Appendix 2.⁴⁶

9.95 Similar to the 'Listed threatened species and communities' section, the assessment of listed migratory species in the MNES section is to have the following structure and detail. Where there are different requirements to the listed threatened species and communities' section, these are outlined.

- (a) Description
- (b) Desktop analysis
- (c) Survey effort
- (d) Survey outcomes
- (e) Habitat assessment
- (f) Impact assessment
- (g) Avoidance, mitigation and management
- (h) Statutory requirements

note* the Latham's Snipe (*Gallinago hardwickii*) was listed as Vulnerable on 5 January 2024 and had a Conservation Advice published. Although the Latham's Snipe is not to be assessed under S18 and 18A (Listed threatened species and Ecological Communities), the Conservation Advice can still be considered when determining impacts to the species under S20 and 20A (Listed Migratory Species).

- (i) The MNES section must demonstrate, with supporting evidence, that the action will not be inconsistent with Australia's obligations under:
 - (i) the Bonn Convention
 - (ii) China-Australia Migratory Bird Agreement
 - (iii) Japan-Australia Migratory Bird Agreement
 - (iv) an international agreement approved under subsection 209(4) of the EPBC Act.

Other approvals and conditions

9.96 Provide information on any other approvals or requirements for approvals and any conditions that apply, or that the proponent reasonably believes are likely to apply, to the action. This is to include:

- (a) details of any local or State Government planning scheme, or plan or policy under any local or State Government planning system that deals with the proposed action, including:
 - (i) what environmental assessment of the action has been, or is being, carried out under the scheme, plan or policy

⁴⁶ This may not be a complete list of listed migratory species that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed migratory species at the time of the controlled action decision, which will or are likely to be impacted by the action, are assessed for the Minister's consideration. Any listing events that occur after the controlled action decision (28 August 2020) do not affect the assessment and approval process.

- (ii) how the scheme provides for the prevention, minimisation and management of any relevant impacts
- (b) a description of any approval that has been obtained from a State, Territory or Commonwealth agency or authority (other than an approval under the EPBC Act), including any conditions that apply to the action:
 - (i) a statement identifying any additional approval that is required
 - (ii) a description of the monitoring, enforcement and review procedures that apply, or are proposed to apply, to the action.

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

9.97 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.

9.98 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

9.99 The economic and social impacts of the action, both positive and negative, must be analysed in the MNES section. Matters of interest may include:

- (a) details of any public consultation activities undertaken, including any consultation with Indigenous stakeholders, and their outcomes⁴⁷
- (b) projected economic costs (e.g. capital investment) and benefits of the action, including the basis for their estimation through cost/benefit analysis or similar studies
- (c) employment opportunities expected to be generated by the action (including construction and operational phases), including number of jobs for Indigenous employees.

9.100 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)

9.101 Provide a discussion of how the action will conform to the principles of ESD⁴⁸, 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

⁴⁷ Refer to Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance) which outlines the statutory obligations that apply to, and the department DCCEEW's expectations of, proponents engaging with First Nations people and communities under the EPBC Act 1999. The guidance applies to proponents undertaking referral, assessment, and approval processes under Chapter 4 of the EPBC Act. Available via: <https://www.dcceew.gov.au/environment/epbc/publications/engage-early>

⁴⁸ Refer to the National Strategy for Ecologically Sustainable Development (1992) at <https://environment.gov.au/about-us/esd>.

- (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

9.102 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.

Part B Acronyms and abbreviations

The following acronyms and abbreviations have been in this document.

Table 1 Acronyms and abbreviations

Acronyms/abbreviation	Definition
ACH Act	<i>Aboriginal Cultural Heritage Act 2003</i>
AEP	Annual Exceedance Probability
AHD	Australian Height Datum
ANZLIC	Australian and New Zealand Land Information Council
CBA	Cost-Benefit Analysis
CHMP	Cultural Heritage Management Plan
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
CO ₂	Carbon dioxide
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAF	Department of Agriculture and Fisheries (Qld)
DCCEEW	Department of Climate Change, Energy, the Environment and Water (Qld)
DESI	Department of Environment, Science and Innovation (Qld)
DRDMW	Department of Regional Development, Manufacturing and Water (Qld)
DSDI	Department of State Development and Infrastructure (Qld)
DTMR	Department of Transport and Main Roads (Qld)
EIS	Environmental Impact Statement
EMP	Environmental Management Plans
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPP	Environmental Protection Policies
ERA	Environmentally Relevant Activities

Acronyms/abbreviation	Definition
ESD	Ecologically Sustainable Development
FSL	Full Supply Level
GHG	Greenhouse Gases
GTIA	Guide to Traffic Impact Assessment
HQS	Habitat Quality Scores
LGA	Local Government Area
MNES	Matters of National Environmental Significance
MSES	Matters of State Environmental Significance
MRA	<i>Mineral Resources Act 1989</i>
MW	Megawatts
NC Act	<i>Nature Conservation Act 1992</i>
NGER	<i>National Greenhouse and Energy Reporting Act 2007 (Cth)</i>
NPI	National Pollutant Inventory
OAG	Offsets Assessment Guide (Cth)
OAMP	Offset Area Management Plan
OCG	Office of Coordinator-General
PHES	Pumped Hydro Energy Storage
PMST	Protected Matters Search Tool
RA	Restricted Area
RE	Regional Ecosystem
RIA	Regional Impact Assessment
RIDA	Regional Interests Development Approval
ROL	Resource operations licence
RPI	<i>Regional Planning Interests Act 2014</i>

Acronyms/abbreviation	Definition
SDAP	State Development Assessment Provisions
SDPWO Act	<i>State Development Public Works Organisation Act 1971</i>
SIA	Social Impact Assessment
SPP	State Planning Policy
SPRAT	Species Profile and Threats
TCFD	Task Force on Climate-related Financial Disclosures
TOR	Terms of Reference

Appendix 1. Policies and guidelines

In addition to the policies and guidelines identified in the document *Preparing an EIS: Guideline for proponents*, the EIS is consider the project specific planning schemes, policies and guidelines identified in this appendix.

General

Gympie Regional Council, Gympie Regional Council Planning Scheme 2013 v3.0, viewed 22 February 2023, <https://www.gympie.qld.gov.au/downloads/file/2699/gympie-regional-council-planning-scheme-2013-version-3-0>

Somerset Regional Council, Somerset Regional Planning Scheme 2016 v4.2, viewed 6 June 2023, <https://www.somerset.qld.gov.au/our-services/somerset-region-planning-scheme>

Matters of national environmental significance

Australian Government, Significant Impact Guidelines 1.1 – matters of national environmental significance, Department of the Environment and Energy, 2013, viewed 5 June 2023, <http://www.environment.gov.au/epbc/publications/significant-impact-guidelines-11-matters-national-environmental-significance>

Australian Government, *Interim Engaging with First Nations People and Communities on Assessments and Approvals under the EPBC Act (interim guidance)*, 2023, Department of Climate Change, Energy, the Environment and Water, viewed 5 June 2023, <https://www.dcceew.gov.au/environment/epbc/publications/engage-early>

Australian Government, EPBC Act environmental offsets policy, Department of the Environment and Energy, 2012, viewed 6 June 2023, <http://www.environment.gov.au/epbc/publications/epbc-act-environmental-offsets-policy>

Australian Government, Species Profile and Threats Database, Department of Climate Change, Energy, the Environment and Water, 2022, Canberra, viewed 5 June 2023, <https://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>

Australian Government, *Environmental Management Plan Guidelines*, Department of the Environment, 2014, view 12 January 2024, <https://www.dcceew.gov.au/environment/epbc/publications/environmental-management-plan-guidelines>

Queensland Government, *Matters of national environmental significance–EIS information guideline*, 2022, Department of Environment and Science, viewed 5 June 2023, https://www.qld.gov.au/data/assets/pdf_file/0007/140011/eis-tm-mnes-information-guide.pdf

Appendix 2. MNES listed threatened species and communities and migratory species

The following list includes the listed threatened species and ecological communities, and listed migratory species relevant to the controlled action under the EPBC Act, which at a minimum, the project's potential impacts are to be assessed in the MNES section of the EIS.

The list below may not be a complete list of listed threatened species and ecological communities and migratory species that will or are likely be impacted by the action. It is the proponent's responsibility to ensure that any listed threatened species and ecological communities at the time of the controlled action decision, which will or are likely to be impacted by the action, are assessed for the Minister's consideration. If the listing or up-listing of a species occurs after the controlled action decision (19 December 2023) the species will continue to be assessed under the level of threatened status it was before this event. However, any new recovery plans and other updated documentation must be still considered in the assessment.

Listed threatened species and communities (section 18 & section 18A)

Threatened ecological communities

- Coastal Swamp Sclerophyll Forest of New South Wales and Southeast Queensland
- Lowland Rainforest of Subtropical Australia
- White Box-Yellow Box-Blakely's Red Gum Grassy Woodland and Derived native Grassland
- Subtropical eucalypt floodplain forest and woodland of the New South Wales North Coast and South East Queensland bioregions

Listed threatened species

Listed threatened plants

- Hairy-joint Grass (*Arthraxon hispidus*)
- Three-leaved bosistoa, yellow satinheart (*Bosistoa transversa*)
- Nightcap plectranthus, silver plectranthus (*Coleus nitidus*)
- *Coleus omissus*
- *Coleus torrenicola*
- Cossinia (*Cossinia Australiana*)
- Leafless tongue-orchid (*Cryptostylis hunteriana*)
- Wedge-leaf tuckeroo (*Cupaniopsis shirleyana*)
- *Fontainea rostrate* -
- *Fontainea venosa* -
- Tall velvet sea-berry (*Haloragis exalata* subsp. *Velutina*)
- Wandering pepper-cress (*Lepidium peregrinum*)
- Macadamia nut, Queensland nut tree, smooth-shelled macadamia, bush nut, nut oak (*Macadamia integrifolia*)

- Bluegrass (*Dichanthium setosum*)
- Ball nut, possum nut, big nut, beefwood (*Floydia praealta*)
- Small-fruited Queensland nut, Gympie nut (*Macadamia ternifolia*)
- Rough-shelled bush nut, macadamia nut, rough-shelled macadamia, rough-leaved Queensland nut (*Macadamia tetraphylla*)
- Knotweed, tall knotweed (*Persicaria elatior*)
- Lesser swamp-orchid (*Phaius australis*)
- Scrub turpentine, brown malletwood (*Rhodamnia rubescens*)
- Native guava (*Rhodomyrtus psidioides*)
- Quassia (*Samadera bidwillii*)
- Ravine orchid (*Sarcochilus fitzgeraldii*)
- Blotched sarcochilus, weinthals Sarcanth (*Sarcochilus weinthalii*)
- *Sophora fraseri*
- Austral toadflax, toadflax (*Thesium australe*)
- Glossy Spice Bush (*Triunia robusta*)

Listed threatened fauna - Terrestrial

- Pouched Frog (*Assa darlingtoni*)
- Fleay's Frog (*Mixophyes fleayi*)
- Giant Barred Frog, Southern Barred Frog (*Mixophyes iteratus*)
- Australian Fritillary (*Argynnis hyperbius inconstans*)
- Pink Underwing Moth (*Phyllodes imperialis smithersi*)
- Spot-tailed Quoll, Spotted-tail Quoll, Tiger Quoll (southeastern mainland population) (*Dasyurus maculatus maculatus*)
- Northern Quoll, Digul [Gogo- Yimidir], Wijingadda [Dambimangari], Wiminji [Martu] (*Dasyurus hallucatus*)
- Koala (combined populations of Queensland, New South Wales, and the Australian Capital Territory) (*Phascolarctos cinereus* (combined populations of Qld, NSW and the ACT))
- Greater Glider (southern and central) (*Petauroides Volans*)
- Long-nosed Potoroo (northern) (*Potorous tridactylus tridactylus*)
- Grey-headed Flying-fox (*Pteropus poliocephalus*)
- Ghost Bat (*Macroderma gigas*)
- Yellow-bellied Glider (south-eastern) (*Petaurus australis australis*)
- Brush-tailed Rock-wallaby (*Petrogale penicillate*)
- Large-eared Pied Bat, Large Pied Bat (*Chalinolobus dwyeri*)
- Adorned Delma, Collared Delma (*Delma torquate*)
- Yakka Skink (*Egernia rugosa*)
- Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*)
- Dunmall's Snake (*Furina dunmalli*)

Listed threatened fauna - Birds

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

Listed threatened fauna - Aquatic

- Mary River Cod (*Maccullochella mariensis*)
- Australian lungfish, Queensland lungfish (*Neoceratodus forsteri*)
- Southern snapping turtle, white-throated snapping turtle (*Elseya albagula*)
- Mary River turtle, Mary River tortoise (*Elusor macrurus*).

Listed Migratory Species (section 20 and section 20A)

- Fork-tailed swift (*Apus pacificus*)
- Oriental cuckoo (*Cuculus optatus*)
- Latham's snipe (*Gallinago hardwickii*)
- Black-faced monarch (*Monarcha melanopsis*)
- Satin flycatcher (*Myiagra cyanoleuca*)
- Osprey (*Pandion haliaetus*)
- Rufous fantail (*Rhipidura rufifrons*)
- Spectacled monarch (*Symposiachrus trivigatus*)

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

