



Terms of reference for an environmental impact statement under the *Environmental Protection Act 1994*

*Surat Basin Carbon Capture and Storage Project
proposed by Carbon Transport and Storage Corporation (CTSCo) Pty Limited
July 2022*



**Queensland
Government**

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These terms of reference are based on the department's approved form for submission of a draft terms of reference (ESR/2017/4038, version 4.00, 3 March 2022) for resource projects undergoing assessment by environmental impact assessment under the *Environmental Protection Act 1994*.

July 2022

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1. Purpose of the TOR

1.1 Introduction

This document is the terms of reference (TOR) for the proposed Surat Basin Carbon Capture and Storage Project (herein referred to as 'the proposed project') proposed by Carbon Transport and Storage Corporation (CTSCo) Pty Limited being assessed under the environmental impact statement (EIS) process in chapter 3, part 1, of the *Environmental Protection Act 1994* (EP Act). It describes the scope and content that the EIS must include to allow the purposes of the EIS and EIS process, as defined in the EP Act, to be achieved for the proposed project (section 40 of the EP Act).

In summary, the purposes of an EIS and the EIS process are:

- to assess:
 - the potential adverse and beneficial environmental, economic and social impacts of the project
 - management, monitoring, planning and other measures proposed to minimise any adverse environmental impacts of the project
- to consider feasible alternative ways to carry out the project
- to give enough information to the proponent, Commonwealth and State authorities and the public to prepare an environmental management plan for the project
- to help the department decide an environmental authority application for which the EIS is required
- to give information to other Commonwealth and State authorities to help them make informed decisions
- to meet any assessment requirements under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)
- to allow the department to meet its obligations under a bilateral agreement.

The EIS must address key requirements outlined in the EP Act and subordinate legislation, including:

- the requirements of section 40 of the EP Act, which specifies the purpose of an EIS and of the EIS process
- the requirements of sections 125, 126 and 126A which set out the general information requirements for applications for an environmental authority (EA)
- the requirements of chapter 2 and schedule 1 of the Environmental Protection Regulation 2019, including matters to be addressed by assessment under the bilateral agreement between the Australian Government and the State of Queensland
- the environmental objectives and performance outcomes specified in schedule 8 of the Environmental Protection Regulation.

It is important that the EIS provides all the information needed to enable the issuing of an EA for the proposed project as set out in this TOR in conjunction with latest version of the Department of Environment and Science's (herein referred to as 'the department') [EIS information guidelines](#) (DES 2020, 2022). This is because section 139 of the EP Act states that the information stage of the EA application does not apply if the EIS process is complete, unless there has been a subsequent change to the proposed.

While every attempt is made by the department to ensure the final TOR requires an assessment of all relevant matters, the final TOR may not be exhaustive. Therefore, the EIS must address other matters not covered in the final TOR in the following circumstances:

- Studies reveal a matter that had not been foreseen when the TOR was finalised.
- An issue not identified previously is considered contentious by the public, such as a public perception of potential environmental harm or nuisance even though the perception might be mistaken.
- The department directs the proponent in writing to address a matter as an information request under section 62 of the EP Act.
- New or amended legislation or policies come into effect after the TOR has been finalised, regardless of whether or not the legislation or policies have been listed in the TOR. Transitional arrangements or exemptions may apply for individual projects.
- The proponent makes amendments to the proposed project that would result in a change in the nature, timing or location of any impacts.

1.2 Information about the proposed project and assessment

1.2.1 Project proponent

Carbon Transport and Storage Corporation (CTSCo) Pty Limited is the project proponent. CTSCo is a wholly owned indirect subsidiary in Australia of Glencore Holdings Pty Limited (ABN 41 104 160 689), itself being a wholly owned subsidiary of Glencore plc. Glencore plc headquarters are in Baar, Switzerland, and is one of the world's largest diversified natural resource companies. Glencore has a significant presence in Australia through its coal, copper, zinc, lead, nickel, cobalt and agricultural businesses, with 25 active mining operations.

The Project is supported with funding from the Australian Government, Low Emission Technology Australia (LETA) and Glencore plc.

Contact details for the project proponent are:

- Project proponent: Carbon Transport and Storage Corporation (CTSCo) Pty Limited
- ABN: 12 143 012 971
- Registered business address: Level 10, 160 Ann Street, Brisbane QLD 4000
- Postal address: GPO Box 1433, Brisbane QLD 4001

Further details are provided in the Initial Advice Statement (IAS) for the proposed project.

1.2.2 Proposed project description

Carbon Transport and Storage Corporation (CTSCo) Pty Limited, a subsidiary of Glencore plc, was granted the greenhouse gas (GHG) exploration permit, EPQ10 on the 9 December 2019, to explore the potential for GHG storage. EPQ10 is 1,200 sub-blocks (approximately 3,664km²) and is currently the only active GHG exploration tenement in Queensland.

The proponent is developing the Surat Basin Carbon Capture and Storage (CCS) Project in EPQ10, (the proposed project) and is seeking to progress to the next stage of feasibility assessment by conducting a GHG stream (predominately carbon dioxide (CO₂)) test injection of up to 110,000 tonnes per year for three years. The test injection will be into the Precipice Sandstone aquifer, between 2,250m and 2,350m below surface. Under the *Greenhouse Gas Storage Act 2009* (GHG Act) section 30, GHG storage injection testing is a principal authorised activity. However, the current Environmental Authority (EA) (EPPG00646913) for EPQ10, authorises GHG exploration in the form of exploration drilling and associated activities, but Condition 1(a) "*does not authorise the carrying out of CO₂ injection tests on EPQ10*". To progress the proposed project to authorise the test injection of a GHG stream into the Precipice Sandstone aquifer within EPQ10, the proponent is first applying for an EIS, after which an amendment for the existing EA (EPPG00646913) would be submitted.

The proponent referred the proposed project to the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) (Cth), to determine whether or not the proposed project is considered a controlled action. On 9 February 2022, the authorised person of the Australian Government gave notice of their decision that the proposed project is not a controlled action under the EPBC Act, section 75 (EPBC 2021/9122).

The proposed project aims to demonstrate the effective permanent storage of the captured CO₂. Outcomes of the proposed project will assist in determining the long-term feasibility to safely capture and store GHG streams from multiple power generators and other industrial sources, and examine development of a commercial CO₂ supply chain, ultimately reducing CO₂ discharge to the atmosphere. The proposed project plans to source the GHG stream from a Post Combustion Capture (PCC) plant to be constructed at the Millmerran Power Station (MPS). The PCC plant will be operated as part of MPS and is subject to separate approval processes for Millmerran Power Partners as owners and operators of the MPS.

The purpose of the test injection of the GHG stream is to:

- prove that CCS, specifically within EPQ10, can be a safe and viable option to avoid emissions of GHG emissions to the atmosphere with direct capture and storage of a GHG stream from industrial sources to assist in meeting global, Commonwealth and Queensland GHG emission targets
- demonstrate over a three-year period the continuous injection of a GHG stream, with monitoring to occur prior to and continuously throughout the injection period, with the EIS to outline an appropriate monitoring timeframe after injection has ceased to ensure that any adverse impacts to the groundwater resource and environmental values have been effectively mitigated.

- seek to contribute to Glencore's pathway to net zero emissions as part of its global climate change policy by way of the potential to generate Australian Carbon Credit Units under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (CFI Act) if declared to be an eligible offsets project under the CFI Act
- contribute to the global use of CCS as a viable method of avoiding emissions of GHGs to the atmosphere
- provide critical data on all aspects of GHG stream plume behaviour, including but not limited to, potential changes in geochemistry of the target reservoir to assist in the EIS assessment processes for approvals for future CCS projects in Queensland beyond the GHG exploration permit stage under the GHG Act.

The key elements of the proposed project include:

- transportation of the GHG stream by truck from the Millmerran Power Station (MPS) for 260 kilometres (km) to the test injection site using existing public roadways (see Figure 1) involving approximately nine round-trips per day, Monday to Saturday, daylight hours only
- within EPQ10 (see Figure 2):
 - a transport facility to transfer the GHG stream from trucks to holding tanks via Tarawindi Road (also referred to as Harts Road), adjacent to the Moonie Highway
 - conversion of the GHG stream from a cryogenic liquid at -20°C to a supercritical (liquid-like) fluid at 31°C using a water bath heater and pump
 - a nine km flowline to carry the GHG stream as a supercritical fluid from the transport facility to the West Moonie-1 Injection Well
 - transfer of the supercritical GHG stream via the West Moonie-1 Injection Well (drilled in 2020) to the Precipice Sandstone aquifer, 2,250m to 2,350m below surface
 - monitoring infrastructure including the West Moonie-2 monitoring well (drilled in 2021), a Gubberamunda Sandstone aquifer monitoring bore (to be drilled in 2023), a shallow alluvium monitoring bore (drilled in 2021 to 48m into the Grimman Creek Formation), an air quality monitoring station (to be installed in 2023), and buried seismic monitoring lines (to be installed in 2023). Note that the drilling of all wells, installation of air quality monitoring, and seismic activities are permitted under EPQ10 and the current EA, however, these will be included where they form part of the project proposal.

Figure 3 shows the operational lands and land adjoining the operational lands. The operational lands cover 7,763 hectares (ha) and will be subject to Conduct and Compensation Agreements (CCAs) agreed between the proponent and affected persons (landowners). However, the study area of the proposed project's activities within the operational lands covers 1,057 ha, while the disturbance area is anticipated to be approximately 8 ha, as shown in Figure 2.

A construction workforce of approximately 30 full-time equivalent (FTE) persons in-field is anticipated, with an operational workforce in-field of up to five FTE. The proponent does not propose any fly-in, fly-out (FIFO) workforce, and where possible will engage local/regional people for the workforce that have the appropriate qualifications and experience. Personnel not living locally or regionally will use existing local accommodation options in Moonie, St George, Dalby, and Goondiwindi.

The proponent is of the view that the proposed project is unlikely to cause environmental harm or nuisance outside the scope of what is permitted by the EA and/or amendment of the EA, as defined by the section 14 of the EP Act.

For a further description of the proposed project, refer to the Initial Advice Statement (IAS) for the Surat Basin Carbon Capture and Storage Project.

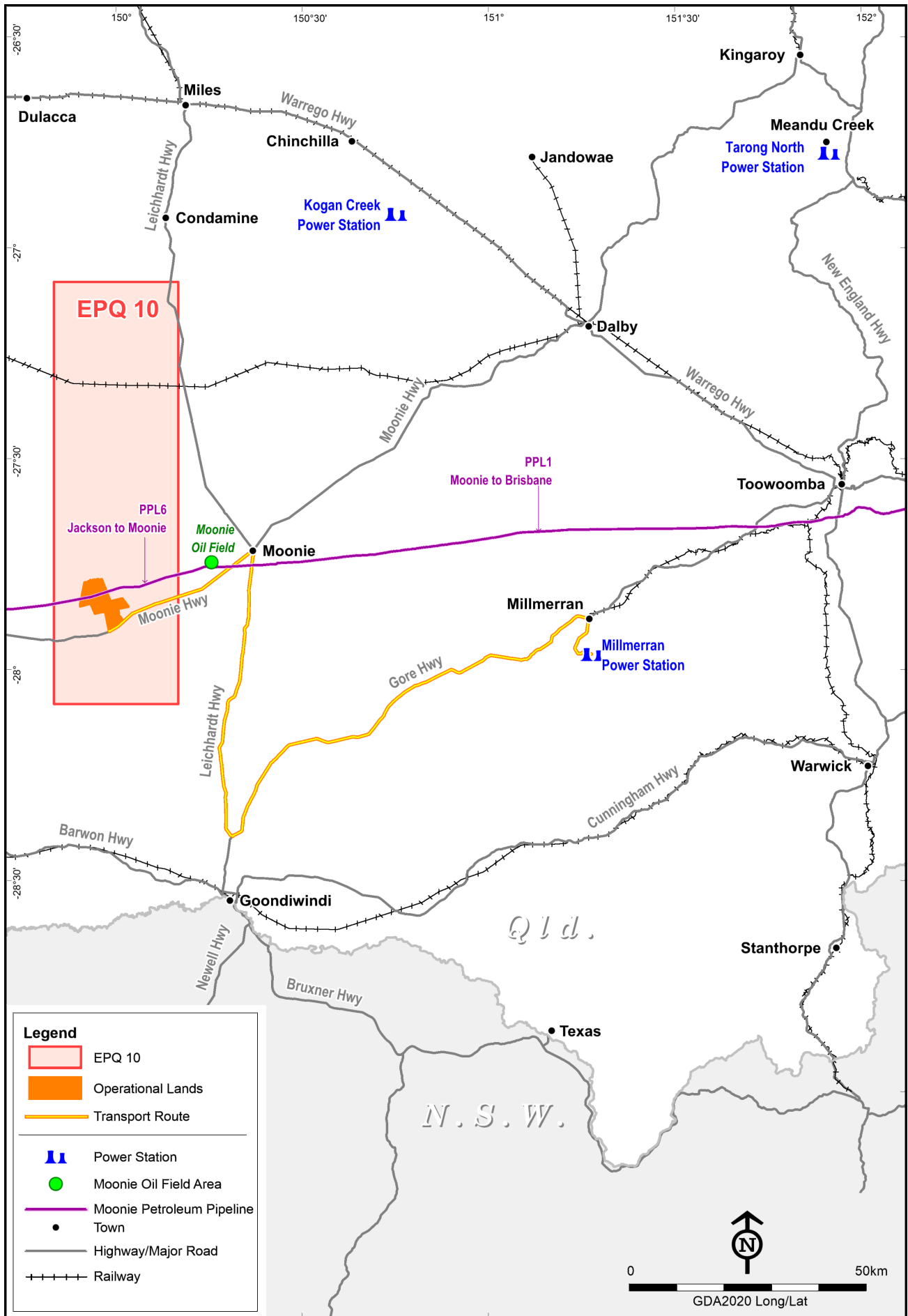


Figure 1: Locality of EPQ10 with Transport Route from Millmerran Power Station

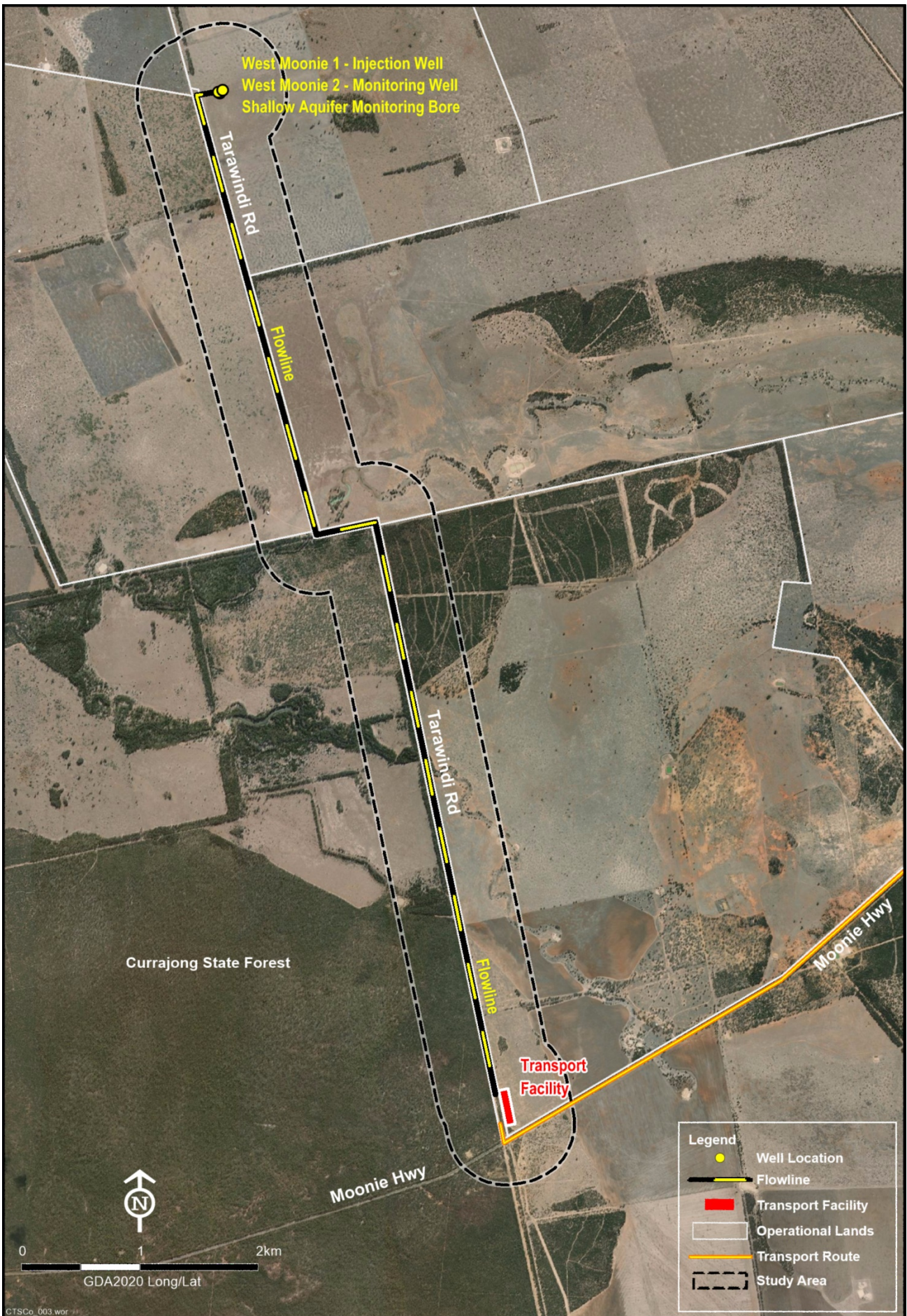


Figure 2: Key Elements of the Project in EPQ10

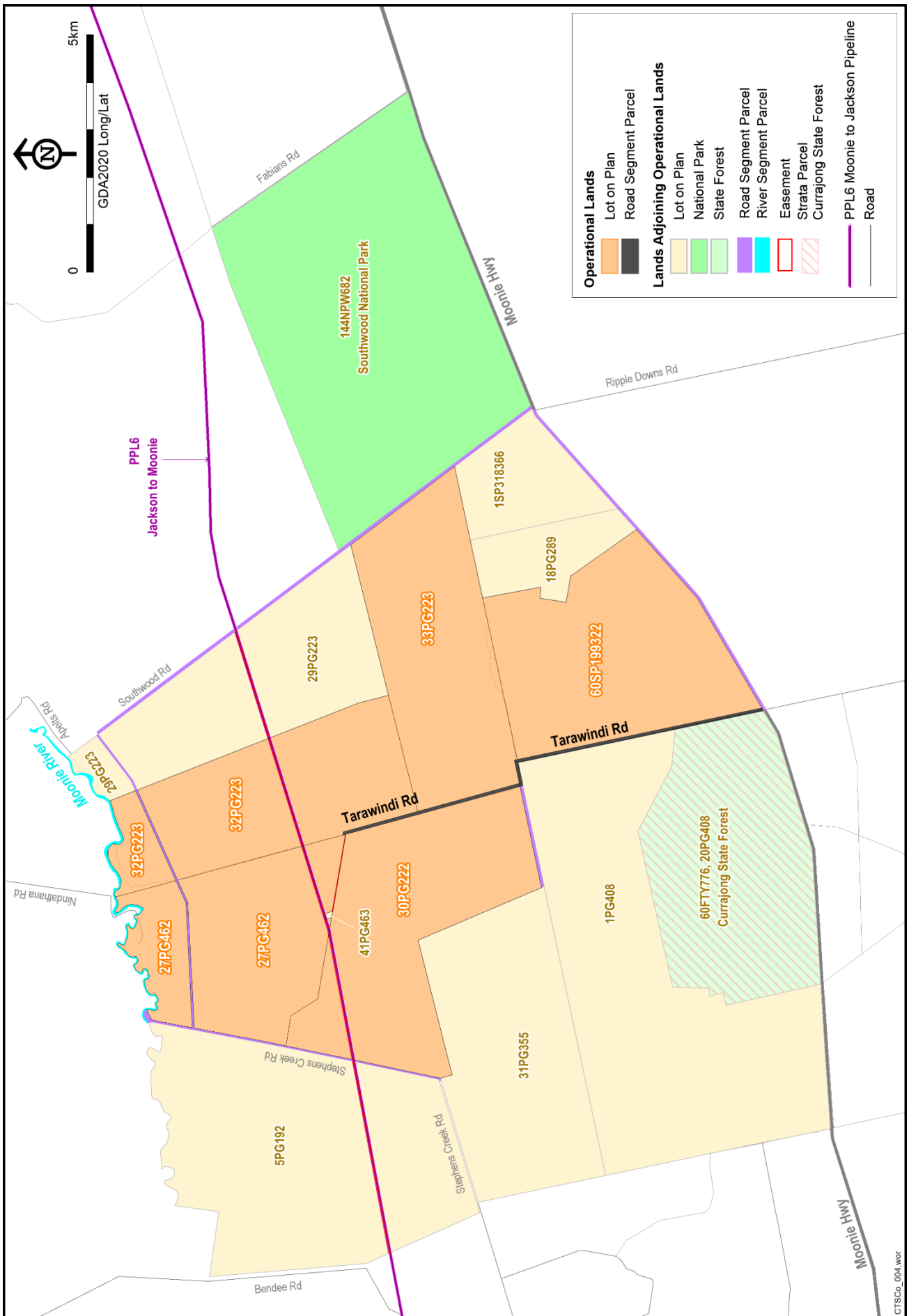


Figure 3: Proposed Project Operational Lands and Land adjoining Operational Lands

1.2.3 EIS assessment process

Under the GHG Act section 30, GHG storage injection testing is a principal authorised activity. However, the current Environmental Authority for EPQ10, authorises GHG exploration in the form of exploration drilling and associated activities, but Condition 1(a) “does not authorise the carrying out of CO₂ injection tests on EPQ10”.

CTSCo applied for an amendment to an existing EA (EPPG00646913) for the Surat Basin Carbon Capture and Storage Project. The department decided that the proposed amendment is a major amendment under the EP Act. On 12 August 2021, CTSCo applied for a decision on whether an EIS would be required for the project. On 10 September 2021, the Department of Environment and Science (the department) issued a notice to advise CTSCo of the decision that an EIS will be required for the proposed project. Under section 139 of the EP Act, the EIS for the Surat Basin Carbon Capture and Storage Project will form the application documents for the requirements of chapter 5 of the EP Act.

On 9 February 2022, the proposed project was determined to not be a controlled action (EPBC 2021/9122) under the EPBC Act (Cth).

Further information on the EIS process under the EP Act is described in the department’s guideline [The environmental impact statement process for resource projects under the *Environmental Protection Act 1994* \(ESR/2016/2167\)](#).

2 Content requirements of the EIS

The remaining sections outline the information requirements of an EIS under the EP Act for the proposed Surat Basin Carbon Capture and Storage Project. It is not necessary for the EIS to follow the structure outlined below, but the relevant requirements for each section must be included in the EIS.

3 Glossary

Provide a glossary of terms and a list of acronyms and abbreviations at the start of the EIS.

4 Executive summary

The EIS must include an executive summary which describes the proposed project and conveys the most important aspects and environmental management commitments relating to the proposed project in a concise and readable form.

5 Introduction

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

5.1 Project proponent

Provide information about the proponent(s) and their business, including:

- the proponent’s full name, street and postal address, and Australian Business Number, including details of any joint venture partners
- the nature and extent of the proponent’s business activities and experience in resource projects
- proponent’s environmental record, including a list of any breach of, or proceedings against the proponent(s) under, a law of the Commonwealth or a State for the protection of the environment or the conservation and sustainable use of natural resources (an environmental law)
- the proponent’s environmental, health, safety and community policies.

5.2 The environmental impact statement process

Outline the steps of the EIS process, noting any completed milestones, and an estimated completion date for each remaining EIS stage. Highlight the steps in which the public will have the opportunity to provide input or comment. This information is required to ensure readers are informed of the EIS process and are aware of their opportunities for input and commenting.

Inform the reader how and when properly made public submissions on the EIS can be made, and outline how the submissions are taken into account in the decision-making process.

5.3 Project approvals process

Describe all approvals under federal, state or local legislation that are required to enable the proposed project to be constructed and operated, and note the legislation under which the approvals are assessed and issued. This information must explain how the EIS fits into the assessment and approval processes for the EA, and any other approvals required of the proposed project before construction and operations can start. If there are any relevant government policies or legislation with which the proposed project is inconsistent, these must be identified in this section.

The proposed project is not a controlled action under the EPBC Act, and therefore the proposed project will not be assessed under the bilateral agreement between the Australian Government and the State of Queensland.

The proposed project will consider the requirements of the Minamata Convention on Mercury that was ratified by the Australian Government on 7 December 2021, including the Guidance on Best Available Techniques and Best Environmental Practices ([UNEP/MinamataConvention/2019/1](#)).

6 Consultation process

Describe the consultation that has taken place and how responses from stakeholders, including government agencies and members of the community, have been incorporated into the design and outcomes of the proposed project. Make specific reference to documented consultation results, where applicable.

Describe any proposed future consultation activities, and outline how the results of that consultation will be used in the ongoing management of the proposed project. Provide information on the development and outcomes of the implementation of consultation for the people, organisations and communities identified as affected or interested persons and stakeholders for the proposed project. Describe issues of potential concern to all stakeholders at various stages of the proposed project from project planning to commencement, project construction, operations and decommissioning. The description of the consultation must address the following matters:

- the objectives of the consultation process
- timing of consultation
- the number and interests of the people, organisations and communities involved in the consultation (particularly the affected and interested persons defined in sections 38 and 41 of the EP Act)
- methods of consultation and communication
- consultation process reporting and feedback methods
- provide a process for landowners (including those of neighbouring properties) to raise concerns or lodge complaints and provide standards for response, resolution, and if required, an appeal/ escalation process
- an assessment explaining how the consultation objectives have been met
- an analysis of the issues and views raised and their completed or planned resolution, including any alterations to the proposed project as a result of feedback received.

7 Proposed project description and alternatives

Describe all aspects of the proposed project that are covered by the EIS's assessment. If there are any aspects of the proposed project that would be assessed separately, describe what they are, and how they would be assessed and approved. If the proposed project is an expansion of an existing activity, clearly state the linkages, overlap and separation between them.

The project description must include all on and off lease activities relevant to the proposed project including construction, operation and decommissioning activities. If the delivery of the proposed project is to be staged, describe the nature and timing of the stages.

7.1 Proposed project

Describe and illustrate the following specific information about the proposed project:

- proposed project title
- proposed project objectives
- expected capital expenditure
- rationale for the proposed project including a life cycle analysis of the carbon emissions, including those emissions generated by the transport, storage and injection of CO₂
- background to the project's development and justification for its need, including an assessment of the relative impacts of the disposal of CO₂ to air (i.e., the status quo) and its proposed disposal to the Precipice Sandstone aquifer
- summarise the historical context, engineering success, constraints in realising projected outcomes and learnings from other CCS projects (national and international) in achieving GHG storage, including applicability to the proposed project
- proposed project description, including the nature and scale of all project components and activities
- remote monitoring of spills or leaks, infrastructure failures, flood responses and other emergency response measures
- whether it is a greenfield or brownfield site
- power and water supply requirements in both construction and operation phases
- transport requirements in both construction and operation phases
- regional and local context of the proposed project's footprint, including maps at suitable scales
- proposed timing of the development, including construction staging, likely schedule of works and anticipated proposed project life
- relationship to other major projects, developments or actions of which the proponent is reasonably aware
- the workforce numbers for all project phases
- where personnel would be accommodated and the likely recruitment and rostering arrangements to be adopted
- proposed travel arrangements of the workforce to and from work, including use of a fly-in-fly-out (FIFO) workforce.

7.2 Site description

Provide real property descriptions of the proposed project land and adjacent properties, any easements, any existing underlying resource tenures, and identification number of any resource activity lease for the proposed project land that is subject to the application.

Describe and illustrate with scaled maps the key infrastructure in and around the site, including state-controlled and local roads, rail lines and loading yards, airfields, ports or jetties, electricity transmission infrastructure, pipelines, and any other infrastructure in the region relevant to the proposed project.

Describe and illustrate the topography of the proposed project site and surrounding area; and highlight and identify any significant features shown on the maps. Map the location and boundaries of the proposed project's footprint including all infrastructure elements and development necessary for the proposed project. Show all key aspects including excavations, stockpiles, areas of fill, subsidence areas, services infrastructure, plant locations, water storages, buildings, bridges and culvert, haul and access roads, causeways, stockpile areas, and any areas of dredging or bed levelling. Include discussion of any environmental design features of these facilities including bunding of storage facilities.

Describe and map the spatial distribution and cross-sections of geological and terrestrial and/or aquatic landforms of the proposed project area in a suitable electronic format. Provide a comprehensive description of the hydrogeology of the project area and surrounds, including: faults, fractures, other areas of potential or known aquifer connectivity, lithographic descriptions, hydrostratigraphic map(s) and economic resources that could have an influence on, or be influenced by, the proposed project. Provide detailed spatial information in a suitable electronic format, that clearly shows the boundaries of water catchments that are significant for the drainage of the project site, including the location of waterways as defined under the *Fisheries Act 1994*.

Describe and illustrate the precise location of the proposed project in relation to any designated and protected areas, waterbodies (such as springs, wetlands and waterways), terrestrial and aquatic ecosystems including groundwater dependent ecosystems and ecological communities. This is to include the location of any proposed buffers surrounding the working areas and lands identified for conservation, either through retention in their current natural state or to be rehabilitated.

Describe, map and illustrate land and soil resources (types and profiles) of the proposed project area at a scale relevant to the site and in accordance with relevant guidelines. Areas that will be disturbed (e.g., flowline corridor, sewage treatment unit) will require more detailed investigation at the appropriate scale. Identify soils that would require particular management due to wetness, erosivity, depth, acidity, salinity, sodicity, microrelief or other feature, including acid sulfate soils.

Describe with concept and layout plans, in both plan- and cross-section views, requirements for constructing, upgrading or relocating all infrastructure associated with the proposed project. Show the locations of any necessary infrastructure easements on the plans, including infrastructure such as roads, rail (and the rail corridor), level crossings, conveyors, bridges, tracks and pathways, dams and weirs, bore fields, power lines and other cables, wireless technology (such as microwave telecommunications), and pipelines for any services, whether underground or above.

7.3 Proposed construction and operations

Describe the following information about the proposed project, including maps and concept, design and layout plans as relevant for the following:

- existing land uses and any previous land use that might have affected or contaminated the land
- existing buildings, infrastructure and easements on the potentially affected land
- the precise location of works to be undertaken, structures to be built or components of the proposed project, including the GHG stream injection well, monitoring infrastructure, flowline, and transportation facility
- all pre-construction activities (including vegetation clearing, site access, interference with watercourses, wetlands and floodplain areas)
- the proposed construction methods, associated equipment and techniques
- road and rail infrastructure, and stock routes, including new constructions, closures and/or realignments
- the location, design and capacity of all other required supporting infrastructure, including water supply and storage, sewerage, electricity from the grid, generators and fuels (whether gas, liquid and/or solid), power stations, renewable energy and telecommunications
- changes to watercourses, flooding and overland flow on or off the site, including water diversions, crossings, flood levees, water off-takes, and locations of any proposed water discharge points
- any take of or interference with water in a watercourse, lake or spring, overland flow, and underground water (both direct and in-direct)
- any infrastructure alternatives, justified in terms of ecologically sustainable development (including energy and water conservation)
- days and hours of construction and operation
- cross sections showing profiles and geological strata, faults and fractures
- the location of any resources that may be sterilised during project activities or related infrastructure
- the sequencing and staging of activities
- the proposed methods and facilities to be used for the capture, transport, transfer and storage of the GHG stream
- information about the composition of the GHG stream, the proposed volume of GHG stream to be injected, the proposed rate of injection of the GHG stream, and the expected migration pathway of the GHG stream after its injection
- the capacity of high-impact plant and equipment, their chemical and physical processes, and chemicals or hazardous materials to be used.

7.4 Feasible alternatives

Present feasible alternatives for the proposed project. Address a range of alternatives including conceptual, technological, locality, configuration, scale and individual elements or components that may improve environmental outcomes as well as the alternative of not proceeding with the proposed project.

Describe and evaluate the comparative environmental, social, and economic impacts of each alternative (including the option of not proceeding), with particular regard to the principles of ecologically sustainable development.

Discuss each alternative and its potential impacts in sufficient detail to enable an understanding of the reasons for preferring certain options and courses of action while rejecting others. Justify why the proposed project and preferred options should proceed.

8 The environmental impact assessment process

For each project specific matter outlined in section 9, the EIS must identify and describe the relevant environmental values, assess potential adverse and beneficial environmental, economic and social impacts of the proposed project; and outline the management, monitoring, planning and other measures proposed to avoid, minimise and/or mitigate any adverse environmental impacts of the proposed project. This must be addressed within the scope of the following requirements.

8.1 Environmental values

For the purposes of the EIS process, 'environment' is defined in section 8 of the EP Act.

Identify and describe the values that must be protected for all the relevant matters including:

- environmental values specified in the EP Act, the Environmental Protection Regulation 2019 (e.g., environmental objectives and performance outcomes as defined in schedule 8), environmental protection policies and associated guidelines
- values under other State legislation, policies and guidelines, including the *Vegetation Management Act 1999*, the *Nature Conservation Act 1992* and the *Regional Planning Interests Act 2014*
- values identified in the project specific matters in section 9.

Consider all available baseline information relevant to the environmental risks of the proposed project, including seasonal and long-term variations. Describe the quality of all information, in particular the source of the information, how recent the information is, how the reliability of the information was tested, and any assumptions and uncertainties in the information.

8.2 Impact assessment

Assess the impacts of the proposed project on environmental values. This includes demonstrating that the proposed project meets the environmental objectives and outcomes for each matter in section 9 and the environmental objectives and performance outcomes for any matters listed in Schedule 8 of the Environmental Protection Regulation.

Impact assessment must address:

- short-, medium- and long-term scenarios
- the scale of an impact, including:
 - the impact's intensity and duration
 - cumulative effects of the proposed project in combination with other major projects or developments of which the proponent is reasonably aware
 - the risk of environmental harm
 - avoidance, mitigation and management strategies and if necessary, offsets provisions
 - the potential for unforeseen impacts
 - the risks associated with unlikely but potentially major impacts
 - direct, indirect, secondary, permanent, temporary, unknown, unpredictable and/or irreversible impacts
 - both positive and negative impacts
 - impact interactions.

8.3 Cumulative impacts

Assess the cumulative impacts of the proposed project on environmental values. Every effort must be made to find information from all sources relevant to the assessment of cumulative impacts including other major projects or developments of which the proponent is reasonably aware. The EIS must outline ways in which the cumulative impact assessment and management could subsequently be progressed further on a collective basis.

Impact assessment must address cumulative impacts, including:

- impacts to environmental values of land, air and water, public health and the health of terrestrial and aquatic ecosystems
- impacts to environmental values over time or in combination with other impacts in the dimensions of scale, intensity, duration or frequency of the impacts
- impacts created by the activities on other adjacent, upstream and downstream developments and infrastructure, and landholders
- impact of proposed project on overall state and national greenhouse gas (GHG) inventories and targets.

8.4 Avoidance and mitigation

Propose and describe avoidance, mitigation and management strategies for the protection or enhancement of identified environmental values. Proposed strategies must:

- adhere to the department's management hierarchy: (a) to avoid; (b) to minimise and mitigate including best practice environmental management; once (a) and (b) have been applied, (c) if necessary and possible, to offset
- include an assessment of the expected or predicted effectiveness, of the mitigation measures for dealing with the proposed project's relevant impacts
- provide the name of the entity responsible for endorsing or approving each mitigation measure or monitoring program
- describe any statutory or policy basis for the mitigation measures
- propose actions to remediate adverse impacts that may potentially occur to the project site, surrounding properties and the receiving aquifer for the GHG stream
- estimate the cost of the mitigation measures
- include an environmental management plan setting out the framework for continuing management, mitigation and monitoring programs for the project's relevant impacts, including any provision for independent environmental auditing
- identify all characteristics that are required to be monitored and appropriate limits
- detect the mobilisation of metals
- include an adaptive management approach to provide confidence that, based on current technologies, the impacts can be effectively managed over the long-term
- be described in context of the department's model conditions and/or site-specific, outcome-focussed conditions that can be measured and audited.

For unproven elements of a resource extraction or processing process, technology or activity, identify and describe any global leading practice environmental management that would apply.

Demonstrate that the design of the proposed project and its predicted outcomes:

- meet the environmental objectives and outcomes listed in section 9 for each matter and the performance outcomes stated in Schedule 8 of the Environmental Protection Regulation 2019
- address the matters outlined in Schedule 1 of the Environmental Protection Regulation 2019 (including items 2 and 4)
- are consistent with the state and national emissions reduction targets, including to power Queensland with 50% renewable energy by 2030, reduce emissions by 30% below 2005 levels by 2030 and achieve net zero greenhouse gas emissions by 2050

- are consistent with best practice environmental management during construction, operation, and decommissioning of the proposed project
- meet all statutory and regulatory requirements of the federal, state and local government, including any relevant plans, strategies, policies and guidelines.

8.5 Conditions and commitments

Provide sufficient evidence and detail through studies, proposed management measures, commitments and supporting information:

- to demonstrate that the predicted outcomes for the proposed project can be achieved
- to meet the requirements of sections 125, 126A of the EP Act
- to meet the requirements of Schedule 1 of the Environmental Protection Regulation 2019
- to meet relevant requirements of the GHG Act
- to meet relevant requirements of the Greenhouse Gas Storage Regulation 2021
- for the administering authority to make recommendations about the suitability of the proposed project, assess whether an approval be granted and recommend draft conditions for inclusion on relevant approvals
- to allow the administering authority to develop a register of commitments, and how those commitments will be achieved during the development and operation of the proposed project.

8.6 Information sources

For information included in the EIS, provide the following: the source of the information, how recent the information is, how the reliability of the information was tested and any gaps and uncertainties in the information, and how these gaps and uncertainties have been adequately addressed.

8.7 Critical matters

8.7.1 Definition of critical matters

The detail in which the EIS deals with all matters relevant to the proposed project must be proportional to the scale of the impacts on environmental values. When determining the scale of an impact, consider the impact's intensity, duration, cumulative effect, irreversibility, the risk of environmental harm, management strategies and offset provisions.

A critical matter is a project specific matter listed in section 9 that has one or more of the following characteristics:

- It has a high or medium probability of causing serious or material environmental harm, or a high probability of causing an environmental nuisance
- It is considered important by the administering authority, and/or there is a public perception that an activity has the potential to cause serious or material environmental harm or an environmental nuisance, or the activity has been the subject of extensive media coverage
- It raises obligations under any other legislation applicable for the proposed project (e.g., *Water Act 2000*).

The final scope of critical matters will be determined by the administering authority when finalising the TOR. However, if a new additional critical matter becomes apparent after the final TOR are issued, the EIS must address that new matter.

8.7.2 Critical environmental matters for this project

Critical environmental matters identified for this proposed project which the EIS must give priority are:

- Air
- Waste management
- Water quality
- Water resources.

Note: Geological formations must be considered as an environmental value in the EIS assessment.

9 Project specific matters

9.1 Climate

Conduct the assessment in accordance with the latest version of the department's [Climate—EIS information guideline](#) (DES 2020). Describe the proposed project area's climate patterns that are relevant to the environmental impact assessment, particularly the proposed project's discharges to water and air, and propagation of noise. Provide climate data in a statistical form including long-term averages and extreme values.

Assess the proposed project's vulnerabilities to projected climate change (e.g., changing patterns of temperature, rainfall, hydrology, and extreme weather events). In the assessment of climate hazards and risks, reference relevant climate projection data and employ appropriate risk assessment methodologies.

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 must be designed to avoid perverse outcomes, such as increased emissions of greenhouse gases or maladaptive outcomes for surrounding land uses.

Provide an inventory of projected annual Scope 1 and Scope 2 emissions for each GHG over the life of the project. Estimate both unmitigated emissions and predicted emissions after all avoidance and mitigation measures have been accounted. Describe the methods used to make the estimates. Provide an estimate of annual Scope 3 GHG emissions for the life of the project.

Assess the potential impacts of the proposed project on the state and national GHG inventories including Queensland's emissions targets i.e., 50% renewable energy target by 2030, 30% emissions reduction below 2005 level by 2030 and zero net emissions by 2050.

Demonstrate and outline in a Decarbonisation Plan in the EIS how the project will assist in meeting Queensland's 2030 emissions reduction target and to achieve net zero emissions by 2050.

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:

- Quantify, describe and illustrate the project's contribution toward Queensland's emissions reduction and renewable energy targets:
 - 30% on 2005 levels by 2030
 - 50% renewable energy by 2030
 - zero net emissions economy by 2050.
- Explain feasible alternatives that were considered to avoid or reduce the project's emissions as well as the alternative of not proceeding with the proposed project. Address conceptual, technological, locality, configuration, scale and individual elements or components.
- Describe:
 - measures (preferred and alternatives) proposed to avoid and/or minimise Scope 1 and Scope 2 GHG emissions of the proposed project
 - options for avoiding and/or mitigating Scope 3 emissions (e.g., working with supply chain and customers).
- Include:
 - opportunities and commitments for offsetting GHG emissions through accredited and verified offsets that represent genuine emissions reductions within Australia (i.e., will be recognised in the National Greenhouse Accounts)
 - opportunities to reduce greenhouse emissions through renewable energy use and innovation
 - any voluntary initiatives, such as projects undertaken as a component of the national Greenhouse Challenge Plus program, or research into reducing the life cycle and embodied energy carbon intensity of the proposed project's processes or products
 - any additional carbon offsetting options for emissions that cannot be reduced (including, but not limited to, through carbon offsets, vegetation management).
- Quantify the emissions expected to be abated for each avoidance and mitigation measure.

- Compare preferred measures for emission controls and energy consumption with best practice International environmental management in the relevant industry sector.
- Describe the practicality, effectiveness and risks for each avoidance and mitigation measure.
- Demonstrate that measures have been factored into the economic feasibility of the project.
- Describe and commit to:
 - periodic energy audits that measure progress towards improving energy efficiency
 - a process for regularly reviewing new technologies to identify opportunities to further reduce GHG emissions and use energy efficiently, consistent with best practice environmental management
 - monitoring, auditing and transparent public reporting on: GHG emissions from all relevant activities; the success of mitigation measures; and the project's contribution to achieving Queensland's 2030 target and achieving net zero by 2050
 - ongoing training and capacity building around decarbonisation options, technology and reporting.

9.2 Land

Environmental objective and outcomes

The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

The choice of the site, at which the activity is to be carried out, avoids or minimises serious environmental harm on areas of high conservation value and special significance and sensitive land uses at adjacent places.

The location for the activity on a site protects all environmental values relevant to adjacent sensitive use.

The design of the facility permits the operation of the site, at which the activity is to be carried out, in accordance with best practice environmental management.

Impact assessment

Conduct the impact assessment in accordance with the latest version of Queensland Soil and Land Resource Survey Information Guideline (DoR 2021), Guidelines for Survey along Linear Features (SSA 2015), [Land—EIS information guideline](#) (DES 2020), [Applications for activities with impacts to land](#) (ESR/2015/1839), [DAFF Environmental impact assessment companion guide](#) (DAFF 2014), [RPI Act statutory guideline 11/16 companion guide](#) (DILGP 2017) and, if any quarry material is needed for construction, the department's [Quarry material—EIS information guideline](#) (DES 2020). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

Describe potential impacts of the proposed land uses, taking into consideration the proposed measures that would be used to avoid or minimise and mitigate impacts. The impact prediction must address the following matters:

- Any changes to the landscape and its associated visual amenity in and around the proposed project area.
- Any existing or proposed mining tenement under the *Mineral Resources Act 1989*, petroleum authority under the *Petroleum and Gas (Production and Safety) Act 2004*, petroleum tenure under the *Petroleum Act 1923*, geothermal tenure under the *Geothermal Energy Act 2010* and greenhouse gas tenure under the GHG Act overlying or adjacent to the proposed project site.
- Temporary and permanent changes to land uses of the proposed project site and adjacent areas, considering:
 - actual and potential agricultural uses
 - regional plans and local government planning schemes
 - any Key Resource Areas that were identified as containing important extractive resources of state or regional significance which the State considers worthy of protection
 - strategic cropping land, priority agricultural areas, priority living area and strategic environmental areas under the Regional Planning Interests Act and the trigger map for strategic cropping land
 - findings of the Agricultural land audit and AgTrends Spatial web mapping app
 - impacts on Property and Project Plans approved under the *Soil Conservation Act 1986*
 - constraints to the expansion of existing and potential agricultural land uses.

- Identify any existing or proposed incompatible land uses within and adjacent to the site, including the impacts on economic resources and the future availability and viability of the resource including extraction, processing and transport location to markets.
- Identify any infrastructure or works proposed to be located within, or which may have impacts on, the stock route network managed under the *Stock Route Management Act 2002*. Demonstrate how the proposed project will ensure the ongoing safe, efficient use of the network by travelling stock by maintaining the ongoing functionality and connectivity of the stock route network, including any associated stock route reserves.
- Provide details on proposed tenure arrangements for the properties impacted by the proposed project, including any leasehold land, unallocated state land, reserves and dedicated road corridors.
- Identify the managing agency/authority for any State owned land, trustees, lessees for Reserves, Lands Lease, land acquisitions or tenure required for the proposed project, including, but not limited to easements and leases. Identify timeframes for the tenure changes, statutory approvals (permits, licences, authorities, owner's consent) required for the use of State land, road closure/alterations, impacts on existing and potential uses of State land, measures to mitigate potential impacts to State land, and any proposals to manage and maintain any structures remaining on State land when the proposed project is decommissioned.

Assess the proposed project against the requirements of the *Regional Planning Interests Act 2014*.

Propose suitable measures to avoid or minimise impacts related to land use.

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

For activities likely to cause land subsidence, assess and provide comprehensive surface subsidence predictions using tools or techniques that enable the location, extent and scale of subsidence, and its effect over time on surface landforms and hydrology to be understood. Propose detailed mitigation measures for any significant impacts that would result from subsidence including impacts on infrastructure, land, hydrology, flora and fauna.

Detail any known or potential sources of contaminated land that could be impacted by the proposed project. Describe how any proposed land use may result in land becoming contaminated.

Identify proposed changes to land use that may lead to land degradation or increased salinity.

Identify existing or potential native title rights and interests possibly impacted by the proposed project and the potential for managing those impacts by an Indigenous Land Use Agreement or other measure in accordance with the *Native Title (Queensland) Act 1993* and consistent with the Queensland Government's [Native title work procedures](#) (DNRM 2017).

Detail (including with the use of maps) the following native title considerations:

- current tenure of all land or waters within the project area (which may include creeks)
- land or waters where native title has been determined to exist by the Federal Court
- land or waters that are covered by a native title determination application
- land or waters that are covered by a registered Indigenous Land Use Agreement.

Describe pathways for resolving any native title considerations that comply with the Queensland Government's [Native title work procedures](#) (such as the negotiation and registration of an Indigenous Land Use Agreement).

9.3 Rehabilitation and closure

Environmental objective and outcomes

Land disturbed by mining activities will be rehabilitated progressively as it becomes available, to minimise the risks of environmental impacts and reduce cumulative areas of disturbed land.

The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

The activity is operated in a way that disturbed land will be rehabilitated or restored to a stable condition; the land is safe and structurally stable, there is no environmental harm being caused by anything on or in the land, and the land can sustain a post-activity land use.

The progress and outcomes of progressive rehabilitation activities will be monitored and reported on to demonstrate how successful they have been in achieving progress towards the agreed final land use, and to inform corrective action where required.

Impact assessment

9.3.1 Other (non-mining) resource projects

Conduct the impact assessment in accordance with the latest version of the department's [Rehabilitation—EIS information guideline](#) (DES 2022), [Streamlined model conditions for petroleum activities](#) (ESR/2016/1989), and [Application requirements for activities with impacts to land](#) (ESR/2015/1840).

The EIS must provide information based on relevant guidelines, current best practice approaches and legislative requirements about the strategies and methods for progressive and final rehabilitation of the environment disturbed by construction, operation, and decommissioning of the proposed project.

Develop a rehabilitation strategy that demonstrates how the site will be rehabilitated progressively during the life of the proposed project, including the timing for successfully achieving the rehabilitation goals for the agreed final landforms and land use. The strategy must:

- Demonstrate how the amount of land disturbed at any one time, and the residual loss of land and water bodies with ecological or productive value, will be minimised.
- Where infrastructure would lie in relation to flood levels up to and including the 'probable maximum flood level' based on the Bureau of Meteorology's 'probable maximum precipitation' forecast for the locality and any effects on flooding or flows.
- Describe how achievement of the rehabilitation objectives would be monitored, audited and reported, and how corrective actions would be managed.
- Assess the desired rehabilitation outcome of the site due to the proposed permanent storage of CO₂ in the Precipice Sandstone aquifer.
- Include suitable options for remediation and or reinstatement of the groundwater resource and geological formations should the project fail and or achieve project outcomes.
- The EIS is to consider the residual risk framework under the EP Act.

Provide a detailed description of the topsoil resource on site and how topsoil storage will be quantitatively and qualitatively managed for the life of the proposed project to prevent topsoil loss from any disturbance areas and to ensure successful revegetation and rehabilitation. The description must include a progressive inventory of topsoil and detail how topsoil will be stripped, salvaged and stockpiled and used in progressive rehabilitation.

9.4 Water

9.4.1 Water quality – a critical matter

Environmental objective and outcomes

The activity will be operated in a way that protects environmental values of waters.

The activity will be operated in a way that protects the environmental values of groundwater and any associated surface ecological systems.

The activity will be managed in a way that prevents or minimises adverse effects on wetlands.

Impact assessment

Conduct the impact assessment in accordance with the department's [Water—EIS information guideline](#) (ESR/2020/5312), [Applications for activities with impacts to water](#) (ESR/2015/1837), [Water quality guidelines](#) (Queensland Government, 2020), [Monitoring and sampling manual](#) (DES 2018), and using monitoring data to assess groundwater quality and potential impacts, Version 2 (DES 2021). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

With reference to the Environmental Protection (Water and Wetland Biodiversity) Policy 2019 and section 9 the EP Act, identify the environmental values of surface waters and groundwaters within the proposed project area and immediately downstream or downgradient (or influenced by the zone of potential water quality of impacts) that may be affected by the proposed project, including any human uses and cultural values of water.

Define the relevant water quality objectives applicable to the environmental values and demonstrate how these will be met by the proposed project during construction, operation, decommissioning and following proposed project completion. Where water quality objectives are not available, local water quality objectives must be derived according to department's latest [Water quality guidelines](#) (Queensland Government, 2020) and include any semi-permanent or permanent streams and pools, relevant groundwater aquifers, and including stock water and domestic use. Present a baseline assessment for water quality in the local aquifers of relevance to the project, including but not limited to: cations; anions; dissolved and total metals and metalloids; pH; salinity (EC); PAHs; BTEX; organics; petroleum; hydrocarbons; noble gases; and redox potential.

Detail the chemical, physical and biological characteristics of surface waters and groundwater within the area that may be affected by the proposed project and at suitable reference locations using sufficient data to define natural variation, including seasonal variation.

Describe the quantity, quality, location, duration, timing and environmental fate processes (chemical reactions, partitioning, hazard, chemical mobility, chemical persistence) of all potential and/or proposed releases of contaminants. Describe all likely chemical impurities within supercritical CO₂ itself (such as BTEX, PAHs, and organics), chemical additives used and chemical by-products (including likely environmental degradation by-products of the likely chemical reactions in groundwater) and relevant environmental fate processes. Releases may include controlled water discharges to surface water streams, groundwater aquifers, uncontrolled discharges when the design capacity of storages is exceeded, spills or leaks of products during loading or transportation (including via pipeline transfers), contaminated run-off from operational areas of the site, including seepage to shallow groundwater from spills or leaks of supercritical CO₂, commingled impurities, and any other potential chemical additives proposed to be used. Impact assessment should describe if supercritical CO₂ storage and transport will require corrosion management, will form more hazardous chemical by-products once injected or if split, or if it will act as a solvent which may increase the transport of other contaminants.

Assess the potential impact of any releases from point or diffuse sources on all relevant environmental values and water quality objectives of the receiving environment. The impact assessment must consider the resultant quality and hydrology of receiving waters and the assimilative capacity of the receiving environment.

Describe how water quality objectives would be achieved and environmental impacts would be avoided or minimised through the implementation of management strategies that comply with the management hierarchy and management intent of the Environmental Protection (Water and Wetland Biodiversity) Policy 2019. Appropriate management strategies may include the use of erosion and sediment control practices, and the separation of clean storm water run-off from the run-off from disturbed and operational areas of the site.

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 environmental values and health of surface water and groundwater environments. Propose corrective actions to be used if objectives are not likely to be met. The impact assessment must also address changes in water quality, including other contaminants present, added or formed due to the transport, industrial processing and addition and interaction of supercritical CO₂ to groundwaters and relevant geological formations. The EIS should provide critical data on GHG stream plume behaviour. Describe strategies to avoid, mitigate, adequately monitor and manage potential impacts. Detailed monitoring programs should be designed with sufficient baseline data and presented for assessing contaminants of potential concern outside, and downgradient of the predicted zones of GHG stream plume impact and or the injection well (to responsively monitor for potential well integrity issues in relevant aquifers). If any corrosive management chemicals, pH control, biocides or other chemical additives are planned, detail all Chemical Abstract Services (CAS) numbers and ingredients of any formulations, estimate rates of use, concentration applied and planned location/s of use. Where chemical additives are planned or chemical impurities likely to be present, fulfill all state and Australian Government requirements pertaining to ecological, environmental, and human health risk assessments.

9.4.2 Water resources – a critical matter

Environmental objective and outcomes
<ul style="list-style-type: none"> • Equitable, sustainable and efficient use of water resources • maintenance of environmental flows and water quality to support the long-term condition and viability of terrestrial, riverine, wetland, lacustrine, estuarine, coastal and marine ecosystems • maintenance of the stability of beds and banks of watercourses, and the shores of waterbodies, estuaries and the coast • maintenance of supply to existing users of surface and groundwater resources.

Impact assessment

Conduct the impact assessment in accordance with the department's [Water—EIS information guideline](#) (DES 2020) and [DAFF Environmental impact assessment companion guide](#) (DAFF 2014). Address the requirements of section 126A of the EP Act.

Describe present and potential users and uses of water in areas potentially affected by the proposed project, including municipal, agricultural, industrial, recreational and environmental uses of water.

Describe the quality, quantity and significance of groundwater in the proposed project area and any surrounding area potentially affected by the proposed project's activities. Include the following:

- characterise: the nature, type, geology/stratigraphy and depth to and thickness of the aquifers; their hydraulic properties; and value as water supply sources
- analyse the movement of underground water to and from the aquifer(s), including how the aquifer(s) interacts with other aquifers and surface water, and the effect of geological structures on this movement
- characterise the quality and volume of the groundwater including seasonal variations of groundwater levels
- provide surveys of existing groundwater supply facilities (e.g., bores, wells, or excavations) including a record of flow and recovery rates and water quality

Model and describe the inputs, movements, exchanges and outputs of surface water and groundwater that would or may be affected by the proposed project. The models used to estimate associated water take must take into account the climatic conditions at the site, assess the potential impacts on water resources and include a site water balance. The model should be peer-reviewed by an independent appropriately qualified person(s) consistent with the *Australian groundwater modelling guidelines* (Barnett et. al. 2012).

Provide a description of the proposed project's impacts at the local scale and in a regional context including:

- describe values of all waters currently extracted from aquifers
- clearly identify the water resources (natural waters in aquifers) that will be permanently unavailable for access by future generations of potential water users as a result of the proposed activity
- provide an options analysis to demonstrate why the Precipice Sandstone aquifer is preferable to other aquifers for long term GHG storage

- provide a detailed description of the physical aspects of the aquifer in terms of its separation from the surrounding aquifers
- modelled changes to the Precipice Sandstone aquifer's characteristics, geochemistry and hydrology from the GHG stream plume
- the mobilisation and fate of any heavy metals (such as lead and arsenic) or other contaminants released due to the interaction between the GHG stream and the Precipice Sandstone aquifer
- the modelled extent, pressure and movement of the GHG stream plume over time
- changes in flow regimes from diversions, water take and discharges
- groundwater draw-down and recharge
- in addition to impacts on recharge, describe impacts on water resources including groundwater that would be temporarily or permanently lost or displaced as a result of the GHG storage process
- alterations to riparian vegetation and bank and channel morphology
- direct and indirect impacts arising from the development
- describe an effective monitoring program for all aquifers and document impacts on all aquifers.

Identify any approvals or entitlements that would be needed under the *Water Act 2000*. Specifically address whether or not the proposed project would take water from, or affect recharge to, aquifers of the Great Artesian Basin. Describe the practices and procedures that would be used to avoid or minimise impacts on water resources.

Describe how 'make good' provisions would apply to any water users that may be adversely affected by the proposed project. Propose a network of groundwater monitoring bores before and after the commencement of the proposed project that would be suitable for the purposes of monitoring groundwater quality and hydrology impacts that may occur as a result of the activity. Include details on investigation timeframes and actions if exceedances are detected.

Include maps of suitable scale showing the location of water-related infrastructure in relation to the proposed project's infrastructure. Detail any significant diversion or interception of overland flow, including the effects of subsidence. Describe the options for supplying water to the proposed project and assess any potential consequential impacts in relation to the objectives and strategies of any water plan and associated planning documents that may apply.

Describe the proposed supply of potable water for the proposed project, including temporary demands during the construction period. Also describe on-site storage and treatment requirements for wastewater from accommodation and/or offices and workshops.

9.4.2.1 Proposed projects within the Surat cumulative management area (CMA)

Assess the changes to stream and aquifer hydrology that may occur due to the proposed project's water take, transfer or recharge of surface water and groundwater. Identify any short-term or long-term adverse or beneficial impacts of the proposed project on surface and groundwater. The assessment must address the range of climatic conditions at the site, and the potential for cumulative impacts to surface water and also groundwater.

As the proposed project is located within the [Surat CMA](#), use the regional groundwater flow model developed by the Office of Groundwater Water Impact Assessment (OGIA) to assess any cumulative impacts of coal seam gas and mining developments on groundwater resources. Additional local-scale models may also be required in order to assess the proposed project's impacts. The assessment must address the following matters:

- changes to surface and groundwater flow regimes due to operations, diversions, water take (including dewatering) and discharges
- alterations to riparian vegetation, and bank and channel morphology
- direct and indirect impacts arising from the development, including increased groundwater levels, and changes to water chemistry of the Precipice Sandstone aquifer
- measures to avoid or minimise impact on relevant aquifers, local wetlands, groundwater dependent ecosystems and waterways
- monitoring during and after operations, and corrective actions that would be taken for any previously unforeseen unacceptable impacts.

9.4.3 Flooding

Environmental objective and outcomes

The construction and operation of the proposed project aims to ensure that the risk and potential adverse impacts from flooding are avoided, minimised or mitigated to protect people, property and the environment.

Impact assessment

Describe the history of flooding onsite and in proximity to the proposed project site. Describe current flood risk for a range of annual exceedance probabilities up to the probable maximum flood for the proposed project site. Assess how the proposed project may potentially change flooding and run-off characteristics on-site and both upstream and downstream of the site. The assessment must consider all infrastructure associated with the proposed project including levees, roads, and linear infrastructure, and all proposed measures to avoid or minimise impacts.

Evidence must be provided to demonstrate that the securing of storage containers of hazardous contaminants during flood events meets the requirements of schedule 8 of the Environmental Protection Regulation.

Describe, illustrate and assess where any proposed infrastructure, including disturbed and rehabilitated areas, would lie in relation to the extent of any historic or modelled flood level, including the probable maximum flood level. Incorporate consultation with landholders regarding historic flood levels on the site to ensure flood immunity of infrastructure during construction and operations. Describe management actions to minimise impacts of flooding to proposed project infrastructure.

Assess the proposed 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.

9.5 Flora and fauna

Environmental objective and outcomes

The activity will be operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.

There will be no potential or actual adverse effect on a wetland as part of carrying out the activity.

The proposed project minimises serious environmental harm on areas of high conservation value and special significance and sensitive land uses at adjacent places.

The location for the activity on a site protects all environmental values relevant to adjacent sensitive use.

The proposed project manages the impacts on the environment by seeking to achieve ecological sustainability, including protected wildlife and habitat.

Critical habitat receives special management considerations and protection through a management plan for the proposed project.

The proposed project avoids significant residual impacts to matters of national environmental significance (MNES) and matters of state environmental significance (MSES), mitigates impacts where they cannot be avoided, and offsets any residual impacts.

The construction, operation and decommissioning of the proposed project must be consistent with all statutory and regulatory requirements of the federal, state and local government and be consistent with their relevant plans, strategies, policies and guidelines that relate to the terrestrial and aquatic ecological environment.

Impact assessment

Describe the potential direct and indirect impacts on the biodiversity and natural environmental values of affected areas impacted by the construction, operation and decommissioning of the proposed project. Take into account any proposed avoidance and/or mitigation measures. The EIS must provide information based on relevant guidelines, including the latest version of the department's [EIS information guidelines](#) (DES 2020–2022) that cover *terrestrial ecology*, *aquatic ecology*, *groundwater dependent ecosystems*, *water*, and *biosecurity*.

Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

9.5.1 Biodiversity

The assessment must include the following key elements:

- identification of all significant species and ecological communities, including MSES, listed flora and fauna species, and regional ecosystems, on the proposed project site and in its vicinity
- terrestrial and aquatic ecosystems including groundwater dependent ecosystems and subterranean fauna such as stygofauna and their interactions
- biological diversity
- the integrity of ecological processes, including habitats of threatened, near threatened or special least-concern species
- connectivity of habitats and ecosystems
- the integrity of landscapes and places, including wilderness and similar natural places
- chronic, low-level exposure to contaminants or the bio-accumulation of contaminants
- direct and indirect impacts on terrestrial and aquatic species and ecosystems whether due to vegetation clearing; hydrological changes; discharges of contaminants to water, air or land; noise; and other relevant matters
- impacts of waterway barriers on fish passage in all waterways as defined by the *Fisheries Act 1994*. Guidance as to the likely location of waterways in Queensland is presented in spatial data layer Queensland Waterways for Waterway Barrier Works.

The EIS should:

- identify on a site plan (and provide digital data in the form of a shapefile or kml file), the location and extent of the clearing of MSES regulated vegetation, for all off lease and on lease infrastructure associated with the proposed project.
- a map of the proposed project footprint with overlays of the Regulated Vegetation Management Map version 5.07 (*Vegetation Management Act 1999*), the impacted regional ecosystems (Vegetation Management Supporting Map version 12.01), impacted wetlands (Vegetation Management Wetlands Map version 7.07), and impacted essential habitat (Essential Habitat Map version 10.07 and Essential Habitat Database version 10.07).

Note: Check for the current versions of the above mapping at the time of writing the EIS.

Describe any actions of the proposed project that require an authority under the *Nature Conservation Act 1992*, and/or would be assessable development for the purposes of the *Vegetation Management Act 1999*, the *Regional Planning Interests Act 2014*, the *Fisheries Act 1994* and the *Planning Act 2016*. Features to consider include regional ecosystems, environmentally sensitive areas, wetlands, nature refuges, protected areas and strategic environmental areas.

Propose practical measures to avoid, minimise, mitigate and/or offset direct or indirect impacts on ecological environmental values.

Assess how the nominated quantitative indicators and standards may be achieved for nature conservation management. In particular, address measures to protect or preserve any threatened, near-threatened or special least concern species.

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

Assess the need for buffer zones and the retention, rehabilitation or planting of movement corridors. The assessment must take into account of the role of buffer zones in maintaining and enhancing riparian vegetation to enhance water quality and habitat connectivity.

Propose rehabilitation success criteria, in relation to natural values, that would be used to measure the progressive rehabilitation of disturbed areas. Describe how the achievement of the objectives would be monitored and audited, and how corrective actions would be managed. Proposals for the rehabilitation of disturbed areas must incorporate, in suitable habitat, provision of low shrubs, ground level hollow logs, stick piles, nest hollows, ground litter and fish passage and habitat.

Specifically address any obligations imposed by State or Commonwealth legislation or policy or international treaty obligations, such as the China–Australia Migratory Bird Agreement, Japan–Australia Migratory Bird Agreement, or Republic of Korea–Australia Migratory Bird Agreement.

9.5.2 Offsets

After demonstrating that all reasonable on-site avoidance and mitigation measures are to be applied, identify whether the proposed project will result in a significant residual impact (SRI) on MSES, requiring an offset with reference to the Queensland Environmental Offsets Policy and applicable and the Queensland Environmental Offsets framework.

Propose offsets consistent with the applicable State and Commonwealth legislation or policies for any significant residual impact (SRI):

- Where a SRI will occur on a prescribed environmental matter as outlined in the Environmental Offsets Regulation 2014, the offset proposal(s) must be consistent with the requirements of Queensland's Environmental Offsets Act and the latest version of the [Queensland environmental offsets policy](#) (EPP/2021/1658).

Provide as an appendix to the EIS, an offset proposal which outlines the proposed offset delivery approach to address the proposed project's SRI on MSES. The document should:

- Address both State and Commonwealth offset obligations, and clearly identify where any overlaps across jurisdictions.
- For staged offsets, take into account the full extent of potential impacts on prescribed environmental matters from the entire proposal as part of the SRI test.

9.5.3 Biosecurity

Environmental objective and outcomes

The construction, operation and decommissioning of the proposed project must ensure:

- the introduction and spread of weeds, pests (including marine pests) and disease, pathogens and contaminants are avoided or minimised
- existing weeds and pests, including marine pests, are controlled, including biosecurity threats and their management
- the performance outcomes correspond to the relevant policies, legislation and guidelines, and that sufficient evidence is supplied (through studies and proposed management measures) to show these outcomes can be achieved.

Impact assessment

Conduct the impact assessment in accordance with the latest version of the department's [Biosecurity—EIS information guideline](#) (DES 2020).

Describe the current distribution and abundance of pest animals and weeds on the proposed project site.

Describe the impact the proposed project's construction and operation will have on the spread of pest animals, weed species and disease.

Propose detailed measures to remove, control and limit the spread of pests, weeds, diseases, pathogens and contaminants on the proposed project site and any areas under the proponent's control. This includes declared plants and animals and restricted areas under Queensland's *Biosecurity Act 2014*, the Commonwealth *Biosecurity Act 2015* and weeds of national significance and designated pests under the Queensland *Public Health Act 2005*. All proposed measures are to be in accordance with biosecurity surveillance or prevention measures authorised under the Biosecurity Act (Qld) and aligned with local government pest management priorities.

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.

9.6 Air – a critical matter

Environmental objective and outcomes

The activity will be operated in a way that protects the environmental values of air.

Impact assessment

Describe the existing air environment at the proposed project site and the surrounding area and the airshed, including the background/ambient levels of those air 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.

Provide an emissions inventory and description of the characteristics of contaminants or materials that would be released from point and diffuse sources and fugitive emissions when carrying out the activity (point source and fugitive emissions). The description must address the construction, commissioning, operation, upset conditions, and closure of the proposed project.

Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

Predict the impacts of the releases from the activity on environmental values of the receiving environment using established and accepted methods and in accordance with the Environmental Protection Regulation, Environmental Protection (Air) Policy 2019 (EPP (Air)) and the latest version of the department's [Air—EIS information guideline](#) (ESR/2020/5294) and [Applications for activities with impacts to air](#) (ESR/2015/1840). The description of impacts must take into consideration the sensitivity and assimilative capacity of the receiving environment and the practices and procedures that would be used to avoid or minimise impacts. The impact prediction must address the cumulative impact of any 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). It must also quantify the human health risk and amenity impacts associated with emissions from the proposed project for all contaminants whether or not they are covered by the *National Environmental Protection (Ambient Air Quality) Measure* or the EPP (Air).

Describe the proposed mitigation measures to limit impacts from air emissions and how the proposed activity will be consistent with best practice environmental management. The EIS must address the compatibility of the proposed project's air emissions with existing or potential land uses in surrounding areas. Potential land uses might be gauged from the zonings of local planning schemes, State Development Areas or other relevant planning frameworks.

Describe the contingency plan for any potential injection difficulties faced by the project, including whether and in what circumstances CO₂ would be released to the atmosphere. Provide a specific assessment of the risks posed to human health and well-being, and wildlife by the accidental release of the GHG stream during all activities associated with the proposed project.

Describe how the proposed project's air emission objectives would be achieved, monitored, audited and reported, and how corrective actions would be managed for the life of the proposed project.

Proponents are responsible for determining if they have obligations under the Commonwealth *National Greenhouse and Energy Reporting Act 2007* (NGER Act) and ensuring that information regarding greenhouse gas emissions and energy production and consumption provided in the EIS is consistent with requirements of the NGER Act and its subordinate legislation.

Provide an inventory of projected annual emissions for each relevant greenhouse gas, with total emissions expressed in 'CO₂ equivalent' terms. Estimate emissions from upstream activities associated with the proposed project, including the fossil fuel-based electricity to be used during construction, operation and decommissioning and briefly describe the methods used to make the estimates. The [National Greenhouse and Energy Reporting \(Measurement\) Determination 2008](#) provides methods and criteria for calculating greenhouse gas emissions and energy data under the NGER Act which should be used in combination with [National greenhouse energy report technical guidelines](#) (DAWE 2020) and [Clean Energy Regulator guidelines](#) (as amended from time to time) as a reference source for emission estimate methods and supplemented with information from other sources where practicable and appropriate.

Assess the potential impacts of operations within the proposed project area on the State and National greenhouse gas inventories and propose greenhouse gas abatement measures, including:

- a description of the proposed preferred and alternative measures to avoid and/or minimise greenhouse gas emissions directly resulting from activities of the proposed project, including such activities as transportation of products and consumables, and energy use by the proposed project

- an assessment of how the preferred measures minimise emissions and achieve energy efficiency
- a comparison of the preferred measures for emission controls and energy consumption with best practice environmental management in the relevant sector of industry
- a description of any opportunities for further offsetting of greenhouse gas emissions through indirect means.

9.7 Noise and vibration

Environmental objective and outcomes

The activity will be operated in a way that protects the environmental values of the acoustic environment.

Impact assessment

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

Fully describe the sources and characteristics of noise and vibration that would be emitted during the construction, commissioning, operation, upset conditions, and closure of the proposed project. Where local and state-controlled roads are to be used, a noise impact assessment must be undertaken to assess potential impacts to noise at sensitive receptors. Describe effective mitigation measures or management strategies, if required. The assessment should be undertaken in accordance with principles of the Noise and vibration EIS information guideline (DES, 2020 ESR/2020/5305 v1.00), Transport EIS information guideline (DES, 2020 ESR/2020/5310 v1.00) and Transport Noise Management Code of Practice Volume 1 – Road Traffic Noise (DTMR, 2013 v2).

Conduct a noise and vibration impact assessment in accordance with the latest version of the department's [Noise and vibration—EIS information guideline](#) (ESR/2020/5305) and [Applications for activities with noise impacts](#) (ESR/2015/1838). The assessment must address low-frequency (<200 Hz) noise emissions and potential cumulative impact of the proposed project with other emissions of noise from any existing developments and known possible future development in the area.

Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

Describe how the proposed activity would be managed to be consistent with best practice environmental management, including the control of background creep in noise as outlined in the Environmental Protection (Noise) Policy 2019. The EIS must address the compatibility of the proposed project's noise emissions with existing or potential land uses in surrounding areas. Potential land uses might be gauged from the zonings of local planning schemes, State Development Areas or other relevant planning frameworks.

Describe how the environmental management objectives for noise and vibrations would be achieved, monitored, audited and reported, and how corrective actions would be managed.

9.8 Waste management – a critical matter

Environmental objective and outcomes

Any waste generated, transported, or received as part of carrying out the activity is managed in a way that protects all environmental values.

Impact assessment

Conduct the impact assessment in accordance with the latest version of the department's [Waste—EIS information guidelines](#) (ESR/2020/5311) and [Applications for activities with waste impacts](#) (ESR/2015/1836). Demonstrate that the proposed project can meet the environmental objectives and performance outcomes in Schedule 8 of the Environmental Protection Regulation 2019.

Describe all the expected waste streams from the proposed project activities during the construction, operational, rehabilitation and decommissioning phases of the proposed project.

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

Define and describe objectives and practical measures for protecting or enhancing environmental values from impacts from wastes.

Assess and describe the proposed management measures against the preferred waste management hierarchy, namely: avoid and reduce waste generation; cleaner production; reduce; recycle; reuse; reprocess and reclaim; waste to energy; treatment; disposal. This includes the generation and storage of waste.

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.

Detail waste management planning for the proposed project, in particular how measures have been applied to prevent or minimise environmental impacts due to waste at each stage of the proposed project.

Use a material/energy flow analysis to provide details of natural resource use efficiency (such as energy and water), integrated processing design, and any co-generation of power and by-product reuse.

Detail how high-risk waste material will be managed in the rehabilitation plan.

Model the predicted behaviour of the dissolved phase CO₂ plume and other potential contaminants, including any potential reactions with existing minerals within the sandstone geological formations. Detail the monitoring program required.

Identify the quantity, quality and location of all potential discharges of water and contaminants by the proposed 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 a risk assessment of the potential impacts on waters, in the near-field or far-field, resulting from controlled or uncontrolled discharges from the site. Address the following matters with regard to every potential discharge of contaminated water:

- Describe the circumstances in which controlled and uncontrolled discharges might occur.
- Provide stream flow data and information on discharge water quality, including any potential variation in discharge water quality that will be used in combination with proposed discharge rates to estimate in-stream dilution and water quality. Chemical and physical properties of any 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.
- Provide an assessment of the available assimilative capacity of the receiving waters given existing water quality and other potential point source discharges in the catchment. Options for controlled discharge at times of natural stream flow must be investigated to ensure that adequate flushing of wastewater is achieved.
- Provide water quality limits that are appropriate to maintain background water quality and protect other water uses.
- Describe the necessary streamflow conditions in receiving waters under which controlled discharges will be allowed.

Provide relevant information on existing and proposed sewage infrastructure relevant to environmentally relevant activity (ERA) 63, by referring to relevant department 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.

Identify [end of waste codes](#) (Queensland Government 2020) under the *Waste Reduction and Recycling Act 2011* which may be relevant for the proposed project.

9.9 Hazards and safety

Environmental objective and outcomes

The construction and operation of the proposed project must ensure:

- the risk of, and the adverse impacts from, natural and man-made hazards are avoided, minimised or mitigated to protect people and property
- the community's resilience to natural hazards is maintained or enhanced
- the storage and handling of hazardous materials are appropriately located, designed and constructed to minimise health and safety risks to communities and individuals and adverse effects on the environment.
- that 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*
- the proposed project prevents or minimises the production of hazardous contaminants and waste
- if the production of hazardous contaminants and waste is unavoidable, the proposed project treats and/or contains hazardous contaminants until their disposal at an approved facility.

Impact assessment

Assess the vulnerability of the area to natural and induced hazards, including floods, bushfires and cyclones. Consider the relative frequency and magnitude of these events together with the risk they pose to the construction, operation and decommissioning of the proposed project, as well as the rehabilitation of the site. Describe measures that would be taken to minimise the risks of these events.

Describe the potential risks to people and property that may be associated with the proposed project in the form of a risk assessment for all components of the proposed project and in accordance with relevant standards. The assessment must address the following matters:

- The safety of employees during design and planning of the proposed project.
- Potential hazards (including those associated with petroleum and gas pipelines, abandoned mines, explosive magazines and the storage and use of explosives as part of construction), accidents, spillages, fire and abnormal events that may occur during all stages of the proposed project, including estimated probabilities of occurrence.
- Hazard analysis and risk assessment in accordance with:
 - *AS/NZS ISO 31000:2018 Risk management guidelines* and with *HB203:2006 Environmental risk management principles and processes*
 - Consider the suite of risk assessments included in the relevant Local Disaster Management Group Plans and the Queensland State Risk Assessments available at <https://www.disaster.qld.gov.au/qermf/Pages/Assessment-and-plans.aspx> (State heatwave assessment, State Earthquake Risk assessment, Sever Wind Hazard Assessment)
 - consider the Queensland Government Climate Change science resources <https://www.qld.gov.au/environment/climate/climate-change/resources/science> including the Queensland Future Climate Dashboard (<https://longpaddock.qld.gov.au/qld-future-climate/dashboard>)
 - the [Queensland Emergency Risk Management Framework](#) (Queensland Government 2020) as the endorsed approach to disaster and emergency risk management in Queensland.
- Consider geophysical risk management such as earthquakes. The State Earthquake Risk Assessment includes probabilities of major seismic events for all local government areas and must be used to inform risk consideration and management.
- Consider specific assessment of the risks of induced seismic activity created by the project. Address the flow-on consequences of such activity, including potential impacts on the safety and stability of the aquifer and associated GHG stream plume, the potential impacts on the integrity of local infrastructure, including conventional oil and gas wells and pipelines, and consideration of potential cumulative effects on geological stability posed by adjacent resource projects (e.g., coal seam gas, enhanced oil recovery, coal mining and other conventional oil and gas extraction).
- Address the potential cyclone and severe wind hazard and risk to the project and the heat and heatwave risk management refer to the State Heatwave Risk.

- Identify all hazardous substances and any dangerous goods to be used, transported, stored, processed or produced and the rate of usage.
- Potential wildlife hazards, including a development of a mosquito management plan in accordance with Queensland Health guidelines, natural events (e.g., cyclone, storm tide inundation, flooding, bushfire) and implications related to climate change and adaptation.
- Describe natural hazards that may affect the site with at least a 1% annual exceedance probability or 100-year average reoccurrence interval level, including mapping of the potential hazard areas at the site.
- How siting, layout and operation of the development will avoid or mitigate the risks, particularly with regard to the release of hazardous materials during natural hazard events.
- Provide details on the safeguards that would reduce the likelihood and severity of hazards, consequences and risks to persons, within and adjacent to the proposed project area(s). For example, describe effective measures that would be taken to respond to a well blow-out, serious leak or other operational upset conditions, particularly if the project is being monitored remotely. Identify the residual risk following application of proposed mitigation measures. Present an assessment of the overall acceptability of the impacts of the proposed project in light of the residual uncertainties and risk profile.
- As part of the emergency response plan include:
 - a bushfire management plan, certified by a suitably qualified person, in consultation with the Queensland Fire and Emergency Services addressing construction and operations, and including the following information at a minimum:
 - i. a bushfire hazard analysis
 - ii. mitigation strategies to achieve the relevant development outcomes in Part E of the State Planning Policy—Natural Hazards, Risk and Resilience (DILGP 2017)
 - iii. provides details of the proposed ongoing management of fuel loads across the subject site through grazing or mechanical means including the proposed asset protection zone.
 - 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.
- 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.
- Outline any consultation undertaken with the relevant emergency management authorities, including the local disaster management group.

9.10 Cultural heritage

Environmental objective and outcomes

The construction and operation of the proposed project must achieve the purposes of the *Aboriginal Cultural Heritage Act 2003* and the *Torres Strait Islander Cultural Heritage Act 2003* with respect to the proposed project site and ensure that the nature and scale of the proposed project does not compromise the cultural heritage significance of a heritage place or heritage area.

Impact assessment

Conduct the impact assessment in accordance with the latest version of the department's [Aboriginal and Torres Strait Islander cultural heritages—EIS information guideline](#) (ESR/2020/5296) and [Non-Indigenous cultural heritage—EIS information guideline](#) (ESR/2020/5302).

Unless section 86 of the *Aboriginal Cultural Heritage Act 2003* or *Torres Strait Islander Cultural Heritage Act 2003* applies, the proponent must develop a Cultural Heritage Management Plan in accordance with the requirements of Part 7 of these Acts.

For non-Indigenous historical heritage, undertake a study of, and describe, the known and potential historical cultural and landscape heritage values of the area potentially affected by the proposed project. Any such study must be conducted by an appropriately qualified cultural heritage practitioner. Provide strategies to mitigate and manage any negative impacts of the proposed project on non-Indigenous cultural heritage values and enhance any positive impacts.

9.11 Social

Environmental objective and outcomes

The construction, operation and closure of the proposed project must ensure that:

- adverse social impacts arising from the proposed project are avoided or mitigated
- benefits for local and regional communities are enhanced.

Impact assessment

Prepare a social impact assessment (SIA) for the proposed project that is consistent with the requirements of the *Strong and Sustainable Resource Communities Act 2017* (SSRC Act) and the Coordinator-General's [SIA guideline](#) (DSDMIP 2018).

Develop the SIA in consultation with the Office of the Coordinator-General, Department of State Development, Infrastructure, Local Government and Planning.

Consultation for the SIA

The SIA is to be informed by an inclusive and collaborative community and stakeholder engagement process, consistent with the SIA guideline. Community and stakeholder engagement is to be iterative throughout preparation of the SIA. Engagement with local government must commence at an early stage.

Demonstrate evidence in the SIA of consultation outcomes from key stakeholder groups (refer to Appendix 1 in the [SIA guideline](#)). The SIA must be informed by the results of community and stakeholder engagement.

The SIA is to consider the impact of new technologies on the operation of the project including possible impacts on the proposed workforce composition, potential new labour requirements and opportunities for local training and development (where relevant).

9.12 Economic

Environmental objective and outcomes

The construction and operation of the proposed project must ensure that:

- avoid or mitigate adverse economic impacts arising from the proposed project
- capitalise on opportunities potentially available for capable local industries and communities
- create a net economic benefit to the region and state.

Impact assessment

Identify the potential adverse and beneficial economic impacts of the proposed project on the local and regional area and the State. Estimate the costs and benefits and economic impacts of the proposal using both regional impact analysis and cost–benefit analysis. Undertake the analysis in accordance with the Coordinator-General's [Economic impact assessment guideline](#) (DSDMIP 2017). Separately address each stage of the proposed project (e.g., construction, operation and decommissioning).

Identify recreational, commercial or indigenous fisheries potentially impacted by the proposed project and undertake consultation with these stakeholders.

Provide an analysis of the economic costs to economic activities on land (for example, agricultural) including any impacts to supply chains.

Describe the measures that would be used to avoid, minimise or mitigate any impact on agricultural values when meeting environmental offset requirements required for the proposed project. Provide a proponent commitment to ensure agricultural values are not adversely impacted by environmental offsets.

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.

Consider the 'social cost of carbon' (or other form of carbon cost) in cost benefit analysis for the proposed project. Provide an analysis of the economic costs of developing and implementing GHG measures to meet the 30% reduction on 2005 levels by 2030 target and net zero by 2050 target.

Discuss and quantify the economic costs of scope 3 greenhouse gas emissions.

Discuss potential alternative pricing scenarios for the social cost of carbon for scope 1, 2 and 3 greenhouse gas emissions, including scenarios using the current European Union Emission Allowance Units price (or the price at the time of drafting the revised draft EIS) and futures prices by the European Union.

Discuss costs and risks associated with difficulty securing debt finance, insurance or other financial services, as a result of the divestment policies of major financial institutions.

Discuss the risks for affected landholders (including organic farming certification) to secure and/or refinance debt, insurance and other financial services and products should impacts occur to adjacent accessible aquifers. Include commitments to provide a management strategy and actions that seeks to avoid, minimise and mitigate such instances at pre-activity rates, premiums and excesses, as well as relative terms and conditions.

9.13 Transport

Environmental objective and outcomes

The construction and operation of the proposed project must aim to:

- maintain the safety and efficiency of all affected transport modes for the proposed project workforce and other transport system users
- avoid and mitigate impacts including those on the condition of transport infrastructure
- ensure any required works are compatible with existing infrastructure and future transport corridors.

Impact assessment

The EIS must include a clear summary of the total transport task for the proposed project, including workforce, inputs and outputs, during the construction, operational and decommissioning phases of the proposed project. Proponents must make appropriate choices for modes of transport to ensure efficiency and minimise impacts on the community.

Undertake the impact assessment in accordance with the department's [Transport—EIS information guideline](#) (DES 2020). The methods used must include, but not necessarily be limited to, the following matters:

- for impacts on roads and rail interfaces with roads – prepare a traffic impact assessment in accordance with the latest DTMR Guide to Traffic Impact Assessment (GTIA) and any practice notes, guidelines and documents referred to in the GTIA, with traffic data in DTMR-suitable formats. This assessment must assess the project's impacts on all impact types (road safety, access and frontage, intersection delay, road link capacity, pavement, and transport infrastructure) as detailed in GTIA. Particular emphasis is to also be placed on the following sections of the GTIA:
 - section 8.4.2 Heavy Vehicle Routes
 - section 9 Road Safety
 - section 13 Pavement.
- demonstrate how the project complies with the *Queensland Level Crossing Safety Strategy 2012-2021 and 2019 Update: On Track to Zero Harm* (see Appendix 1), and any subsequent version of these documents and related strategy, policy and guidance regarding level crossings that is applicable at the time.
- identify, assess and mitigate the project's impacts on all existing and future railway corridors, particularly railway level crossings and any aspect of the project interfacing or interfering with existing and future railway corridors in accordance with relevant standards and requirements such as the SDAP, the Guide for Development in a Transport Environment: Rail, the Manual of Uniform Traffic Control Devices, Part 7: Railways and railway manager standards. This is to include the construction and operation impacts of the project.

Traffic data should be provided for development generated traffic during construction and operation, background traffic growth and timelines for development staging, construction and delivery.

- assessment must specifically include a road safety assessment and pavement impact assessment for any local government roads used in the transport route.

Present the transport assessment for each proposed project-affected mode (road, rail, air, port and sea) as appropriate for each phase of the proposed project. Provide sufficient information to allow an independent assessment of how existing transport infrastructure will be affected by proposed project transport at the local and regional level (e.g., local roads and state-controlled roads).

Discuss how identified impacts will be mitigated for each transport mode. For example, assess how transport trucks could avoid school bus routes and school zones during peak drop off and pick up times (e.g., hours between 7.30am to 9.00am and 2.30pm to 4.30pm) during school days. Mitigation strategies may include works, contributions or other strategies that can be documented in a road-use management plan. The strategies must be prepared in close consultation with relevant transport authorities, including local government and the Queensland Police Service. They must consider the transport authorities' works programs and forward planning, and be in accordance with the relevant methodologies, guidelines and design manuals.

10 Commitments

Provide a consolidated description of all the proponent's commitments to implement avoidance, mitigation, management and design measures (including monitoring programs and management plans) that would need to be applied to meet the predicted project outcomes. Should the proposed project proceed, these commitments would be carried over into conditions as relevant.

11 Conditions

Propose conditions that may be placed on the EA and any other required approvals or licenses. For the EA, conditions may be taken from the department's [environmental authority conditions](#) (DES 2020) including model operating conditions for mining and petroleum activities and/or modified or developed to suit site and project specific issues.

12 Appendices to the EIS

Appendices to the EIS must include the technical data collected, and evidence used to develop assertions and findings in the main text of the EIS.

No significant issue or matter, including statements of uncertainty associated with assertions and findings, should be mentioned for the first time in an appendix—it must be addressed in the main text of the EIS.

Include a table listing the section and sub-sections of the EIS where each requirement of the TOR is addressed.

13 Spatial and electronic data presentation

Maps included in the EIS must have contours at suitable increments relevant to the scale, location, potential impacts and type of proposed project, shown with respect to Australian Height Datum (AHD) and drafted to Geocentric Datum of Australia 2020 (GDA2020). In relatively flat locations, contours must be at one metre intervals. Present geographical coordinates as latitude and longitude against the GDA2020.

Provide spatial data presented in the EIS to the department in appropriate electronic form, such as shape files. This includes all water quality, wastewater quality data and geological structures, such as aquifers, faults, fractures and economic resources. Refer to the department's guideline [Spatial information submission](#) (ESR/2018/4337) for information on the format for spatial information.

Appendix 1 Glossary

The following acronyms, initialisms and abbreviations have been used in this document.

Acronym/abbreviation	Definition
AHD	Australian Height Datum
ASRIS	Australian Soil Resource Information System
CCS	carbon capture and storage
CMU	cumulative management area
CTSCo	Carbon Transport and Storage Corporation Pty Limited
Department	the Queensland Department of Environment and Science
EA	environmental authority
EIS	environmental impact statement
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i> (Commonwealth)
ERA	environmentally relevant activity
FIFO	fly-in-fly-out
GDA2020	Geocentric Datum of Australia 2020
GHG	Greenhouse gases
IESC	Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development
MNES	matters of national environmental significance
MSES	matters of state environmental significance
NGER Act	<i>National Greenhouse Energy Reporting Scheme Act</i>
SIA	social impact assessment
SSRC Act	<i>Strong and Sustainable Resource Communities Act 2017</i>
TOR	terms of reference

Appendix 2 Policies, guidelines and references

Note: These references were correct at the time of publication. Where more recent versions are available, these must be used. For all Department of Environment and Science publications, the latest version of a publication can be found by using the publication number as a search term at the Queensland Government website www.qld.gov.au

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Department of Environment and Science 2020, *Aboriginal and Torres Strait Islander cultural heritages—EIS information guidelines*, ESR/2020/5296, Queensland Government, Brisbane, Queensland, viewed March 2022, <https://www.qld.gov.au/environment/pollution/management/eis-process/about-the-eis-process/developing-an-eis>

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Department of Environment and Science 2020, *Climate—EIS information guideline*, ESR/2020/5298, Queensland Government, Brisbane, Queensland, viewed March 2022, <https://www.qld.gov.au/environment/pollution/management/eis-process/about-the-eis-process/developing-an-eis>

Department of Environment and Science 2020, *Coastal—EIS information guideline*, ESR/2020/5299, Queensland Government, Brisbane, Queensland, viewed March 2022, <https://www.qld.gov.au/environment/pollution/management/eis-process/about-the-eis-process/developing-an-eis>

Department of Environment and Science 2022, *Contaminated land—EIS information guideline*, ESR/2020/5300, Queensland Government, Brisbane, Queensland, viewed March 2022,

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