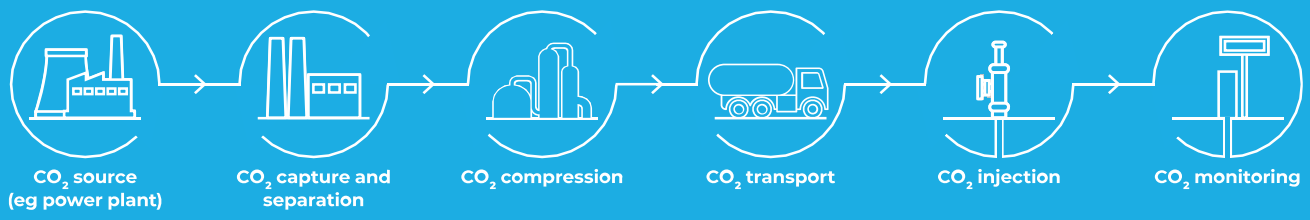
CTSCo
Carbon Transport & Storage

A GLENCORE Company



CTSCo Surat Basin Carbon Capture and Storage Project

INITIAL ADVICE STATEMENT (IAS)

Document No: CTS-ENV-REP-0009

Project proposed by: Carbon Transport and Storage Corporation (CTSCo) Pty Limited

Table of Contents

Figures

Tables

Executive Summary

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 3,664 km^2) and is currently the only active GHG exploration tenement in Queensland.

CTSCo is developing the Surat Basin Carbon Capture and Storage (CCS) Project in EPQ10, (the Project) and is seeking to progress to the next stage of feasibility assessment by conducting a GHG stream (predominately carbon dioxide (CO_2)) test injection of up to 110,000 tonnes per year for three years. The test injection will be into the Precipice Sandstone, between 2,250 m and 2,350 m 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 CO_2 injection tests on EPQ10*". To progress the Project to authorise the test injection of a GHG stream into EPQ10 under the existing EA (EPPG00646913), CTSCo is applying to undertake a major EA amendment by undertaking an EIS.

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

The Project aims to demonstrate the effective permanent storage of the captured CO_2. Outcomes of the 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 CO_2 supply chain, ultimately reducing CO_2 discharge to atmosphere.

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 and for two years after injection has ceased, totalling 5 years of monitoring;
- 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 atmosphere; and
- provide critical data on GHG stream plume behaviour to assist in the EIS assessment processes for approvals for future CCS projects in Queensland beyond the GHG exploration permit stage under the GHG Storage Act.

The key elements of the Project include:

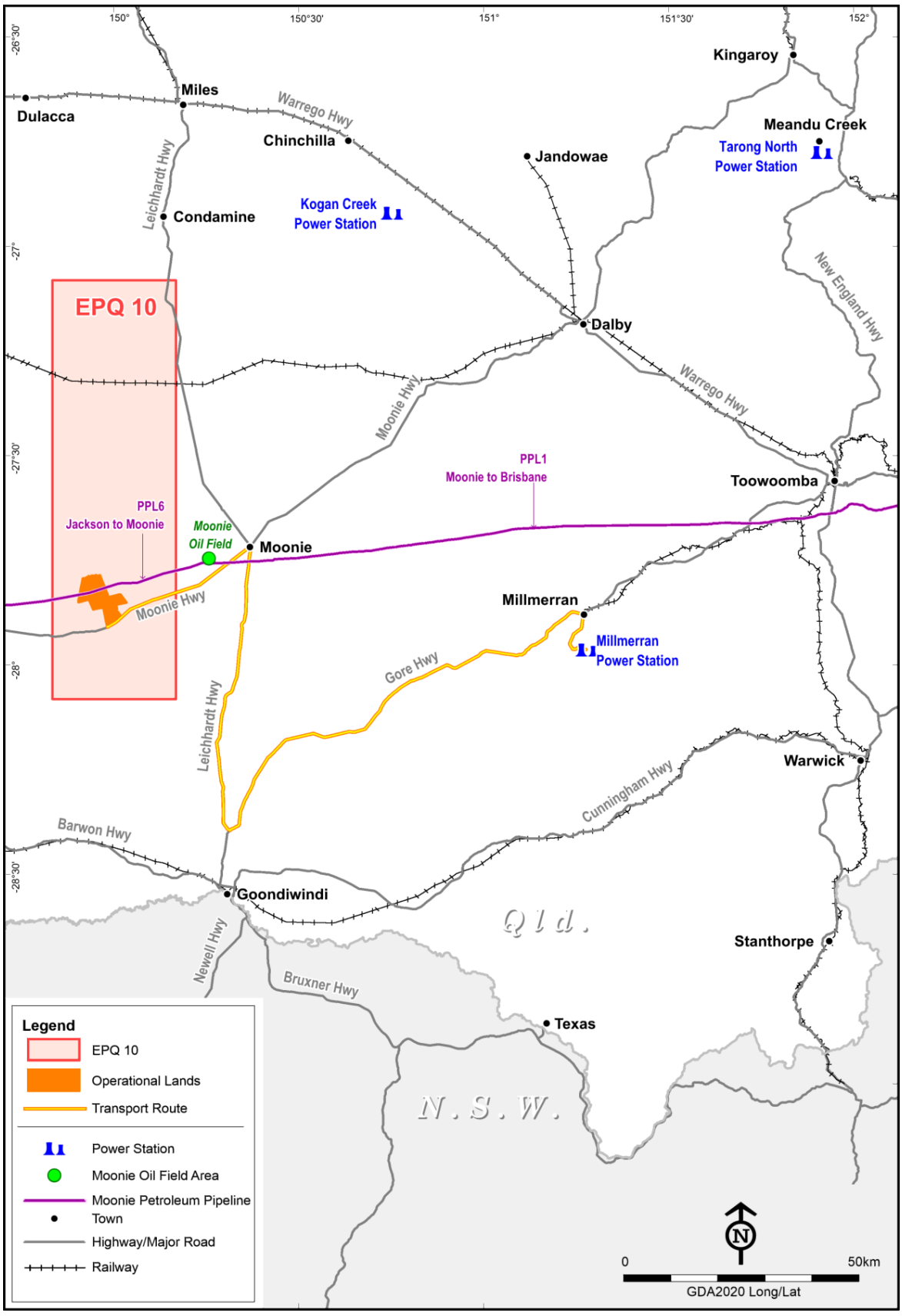
- transportation of the GHG stream by truck from the Millmerran Power Station (MPS) for 260 km to the test injection site using existing public roadways (see Map 1);
- within EPQ10 (see Map 2):
  - a transport facility to transfer the GHG stream from trucks to holding tanks via Tarawindi Road, adjacent 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 9 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, 2,250 m to 2,350 m below surface; and
- monitoring infrastructure including the West Moonie-2 monitoring well (drilled in 2021), a Gubberamunda aquifer monitoring bore (to be drilled in 2023), a shallow alluvium monitoring bore (drilled in 2021 to 48 m into the Griman 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 already permitted under EPQ10 and the current EA, and are not subject to EIS processes and assessment.

Map 3 shows the operational lands and land adjoining the operational lands. The operational lands cover 7,763 ha. However, the study area of the Project's activities within the operational lands covers 1,057 ha, while the disturbance area is anticipated to be approximately 4 ha, as shown in Map 2.

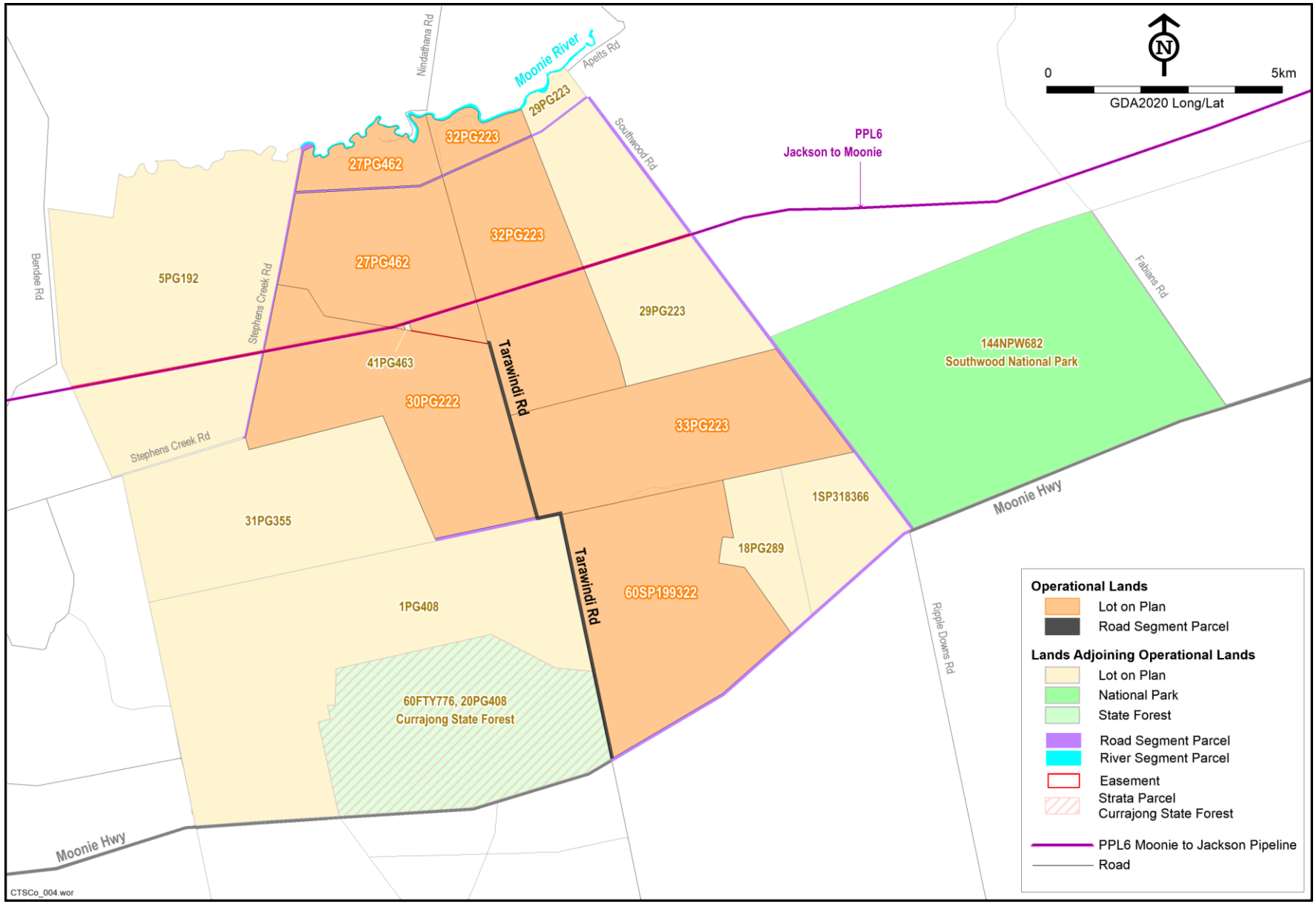
A construction workforce of approximately 30 full-time equivalent (FTE) persons in-field is anticipated, with operational workforce in-field of up to five FTE. CTSCo does not propose any fly-in, fly-out (FIFO) workforce, and where possible will engage local/regional people for the workforce that have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

CTSCo is of the view that the 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 *Environmental Protection Act 1994*, section 14.



Map 1 Locality of EPQ10 with Transport Route from Millmerran Power Station

Map 2 Key Elements of the Project in EPQ10



Map 3 Project Operational Lands and land adjoining Operational Lands

1. Introduction

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 3,664 km^2) and is currently the only active GHG exploration tenement in Queensland.

CTSCo is developing the Surat Basin Carbon Capture and Storage (CCS) Project in EPQ10, (the Project) and is seeking to progress to the next stage of feasibility assessment by conducting a GHG stream (predominately carbon dioxide (CO_2)) test injection of up to 110,000 tonnes per year for three years. The test injection will be into the Precipice Sandstone, between 2,250 m and 2,350 m 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 CO_2 injection tests on EPQ10*".

On 12 August 2021, CTSCo applied to amend the EA as a major amendment to include injection test via an "*Application for a decision on whether an environmental impact statement EIS would be required for an environmental authority (EA) application*".

On 10 September 2021, the appointed delegate for the Chief Executive of the *Environmental Protection Act 1994*, the Department of Environment and Science (DES) as the administering authority of the EA, provided the Notice of decision, advising that an EIS would be required.

To progress the Project to authorise the test injection of a GHG stream into EPQ10 under the existing EA (EPPG00646913), CTSCo is applying to undertake a major EA amendment by undertaking an EIS. As part of the EIS process, CTSCo submits:

- this Initial Advice Statement (IAS);
- a draft Terms of Reference (TOR) for public notification;
- details on the outcomes of referral under the *Environmental Protection and Biodiversity Conservation Act 1999* to the Commonwealth Government;
- relevant details and statements associated with interested and affected persons; and
- the prescribed fee.

This IAS provides a description of the Project, brief description of the existing features and characteristics of the areas involved with the Project, relationship to any other projects, potential impacts resulting in environmental harm or nuisance, and public interest. The technology proposed to be used in the Project is already proven and used globally.

At the time of writing this IAS and subject to the outcomes of studies required by the Terms of Reference, CTSCo is of the view that the 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 EP Act, section 14.

Public interest to date in the Project in EPQ10 has generated limited media coverage, and raised limited interest from members of the public, other than the affected persons (landowners) of the operational lands, peak industry bodies, and government departments or councils that are administering authorities.

2. Proponent

The proponent of the Surat Basin Carbon Capture and Storage (CCS) Project is summarised in Table 2-1, while details of the authorities the subject of the Project are given in Table 2-2.

Table 2-1 Summary of Proponent Details

Proponent Item	Details
Proponent	Carbon Transport and Storage Corporation (CTSCo) Pty Limited
Australian Business Number (ABN)	12 143 012 971
Registered Business Address	Level 10, 160 Ann Street, Brisbane QLD 4000
Postal Address	GPO Box 1433, Brisbane QLD 4001
Responsible Person	Mr Darren Greer
Position of Responsible Person	General Manager – CTSCo
Email Address	darren.greer@glencore.com.au
Phone Number	+61 419 669 198
Registered Suitable Operator	RSO 653365

Table 2-2 Summary of Authority Details

Authority Item	Details
Exploration Tenement	GHG Exploration Permit 10 (EPQ10)
Grant Date commenced	9 December 2019
Term of Grant	12 years
Expiry Date	8 December 2031
Current Holder	Carbon Transport and Storage Corporation (CTSCo) Pty Limited (100%)
Area of Authority	1,200 sub-blocks or 3,664 km^2
Environmental Authority (EA)	EPPG00646913
EA Issued Date	27 January 2011
Locality of Authority	See Figure 2-1
Overlapping or Adjacent Resource Authorities	See Figure 2-2

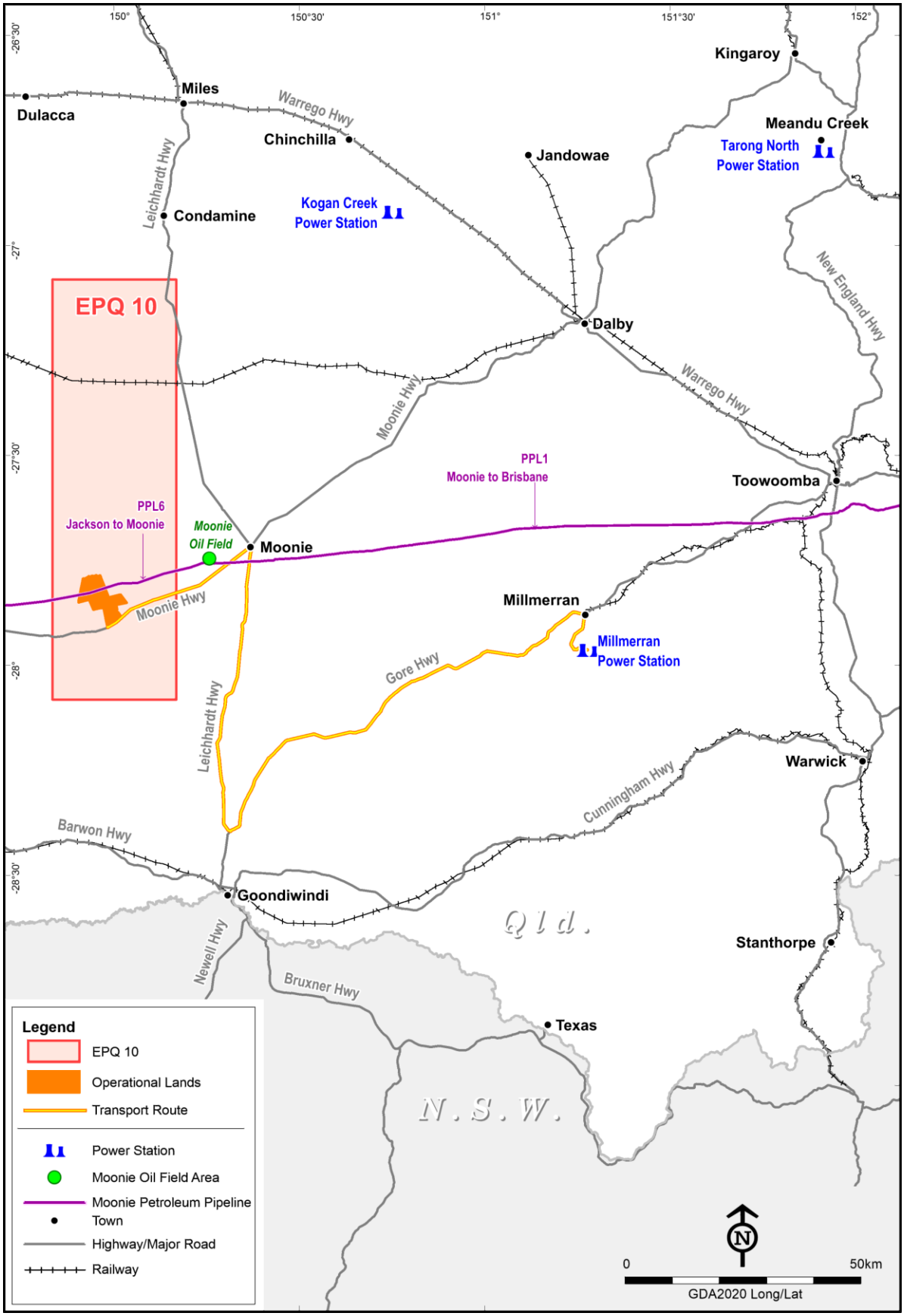


Figure 2-1 Locality of EPQ10 with Transport Route from Millmerran Power Station

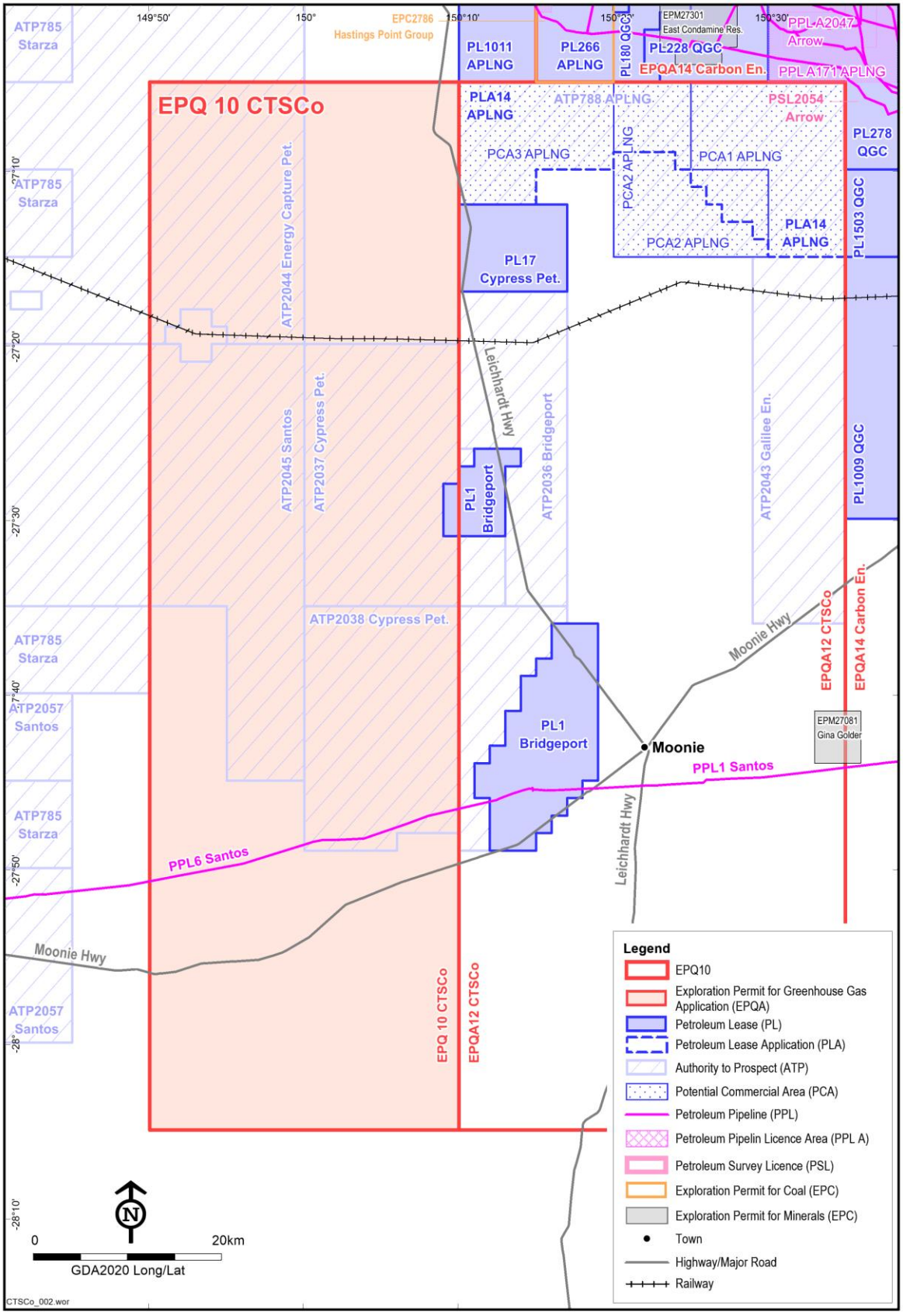


Figure 2-2 Overlapping or Adjacent Resource Authorities with EPQ10

Carbon Transport and Storage Corporation (CTSCo) Pty Limited 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 nature of CTSCo's business activities is in developing the Surat Basin Carbon Capture and Storage (CCS) Project (the Project), that aims to demonstrate the effective permanent storage of the captured CO_2. Outcomes of the 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 CO_2 supply chain, ultimately reducing CO_2 discharge to atmosphere.

In 2011, the Queensland Government published "*An assessment of Queensland's CO_2 geological storage prospectivity – The Queensland CO2 Geological Storage Atlas*" (Bradshaw et al 2011), identifying that the Surat Basin has the potential to store 2,962 million tonnes (Mt) of CO_2, as shown in Figure 2-3. CTSCo has subsequently explored both the northern Surat Basin (EPQ7) and the southern Surat Basin (EPQ10) for storage potential and holds the view that the southern Surat Basin is an area for safe and cost-effective permanent CO_2 storage at potentially full industrial-scale.

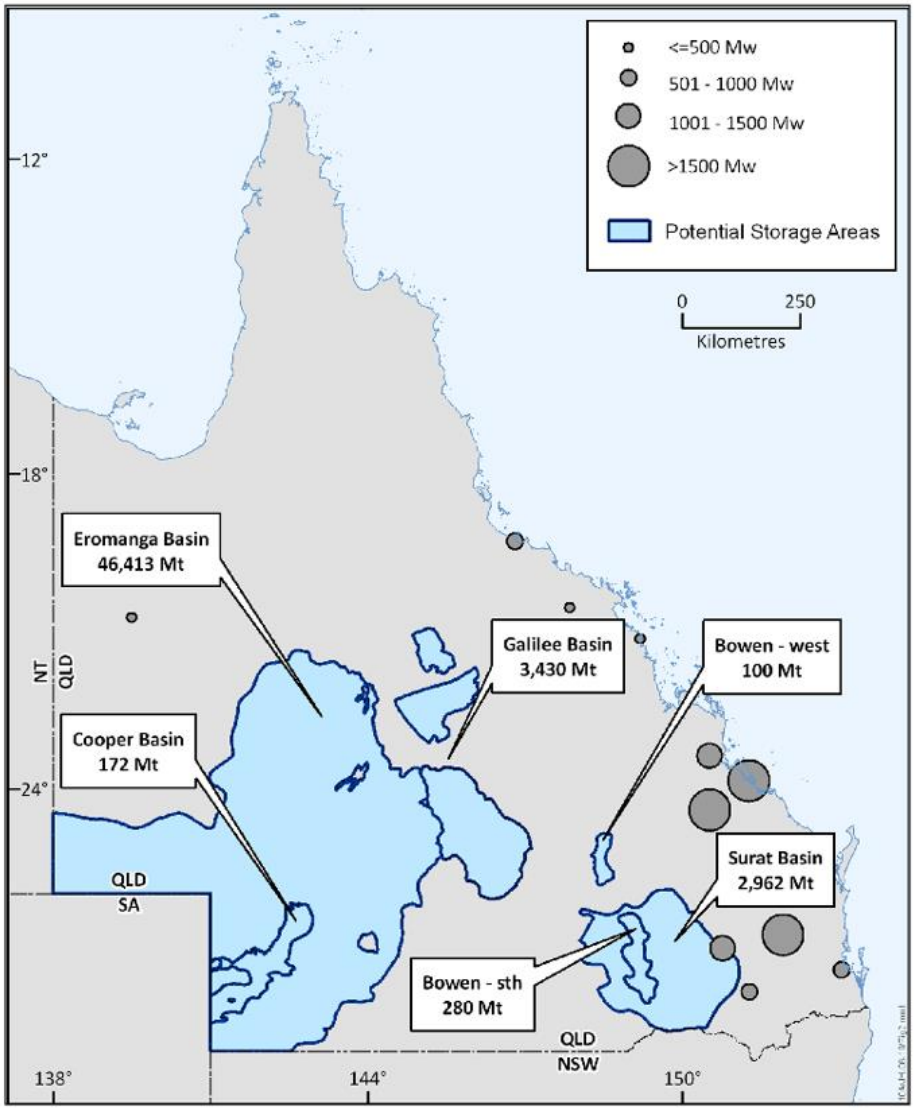


Figure 2-3 Potential Greenhouse Gas Storage areas in Queensland (Bradshaw *et al*, 2011, Figure 2)

CTSCo interfaces with a number of parties, which are discussed further in sections 4, 5 and 6.

Glencore plc's and Glencore Holdings Pty Limited's commercial, risk management, health, safety, environment, community, and human rights policies have been adopted by CTSCo for day-to-day management activities. For further information on Glencore's policies, see: https://www.glencore.com/sustainability.

Across Glencore's Australian businesses, Glencore depends on and supports local businesses, with about 80% of annual spend on goods and services sourced from suppliers with operations in the regions in which Glencore's mines and other facilities are located. Local suppliers provide key services to Glencore's business, including rehabilitation, equipment maintenance, facilities management and environmental monitoring.

CTSCo has not committed any serious breaches against the Acts and regulations of Queensland or Australia, and has not been prosecuted under any relevant Queensland or Australian environmental laws during the previous 10 years.

3. Project Approvals and EIS Process

Further to the details provided in section 1, and as per the EP Act, Chapter 3, Part 1, sections 37, 40 and 73C and the DES Guideline "*The environmental impact statement process for resource projects under the Environmental Protection Act 1994*" (ESR/2016/2171, Version 2.00, Last reviewed 23 April 2019), the Project is to undertake the EIS process for resource projects. CTSCo already holds EA EPPG00646913 and is seeking to amend this EA by an amendment application, with DES having decided that the Project is a major amendment requiring an EIS.

Following the decision by DES that the Project is to be subject to EIS processes, CTSCo referred the Project to the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)(Cth), to determine whether or not the Project is considered a controlled action. On 9 February 2022, the authorised person of the Australian Government gave notice of their decision that the Project is not a controlled action under the EPBC Act, s.75 (EPBC 2021/9122).

The purpose of this Initial Advice Statement (IAS) is to support the draft Terms of Reference (ToR) which will describe the format, structure and requirements of the EIS for the Project. DES will prepare and publish the ToR notice, with CTSCo to provide the draft ToR and IAS to interested and affected persons for the draft ToR comment period. The comment period is anticipated to be 30 business days, as per s. 42(3) of the EP Act. Once comments, if any, are received, CTSCo will respond to comments, amend the draft ToR if required, and submit to DES. DES will then finalise and publish the ToR.

Following receipt of the final ToR from DES and the completion of the relevant technical assessments as required by the ToR, CTSCo will submit the EIS to DES, anticipated to be in mid-2022. DES will assess the adequacy of the EIS and provide a decision on whether or not the EIS proceeds to public notification. Where deemed adequate, CTSCo will publish the EIS and notify interested and affected persons of the stipulated EIS submission period. The publication of the EIS will provide an opportunity for members of the public to provide input or comment. The EIS submission period is anticipated to be 30 business days, as per s. 49(5) of the EP Act.

Following receipt of submissions on the EIS, CTSCo will respond to submissions, and amend the EIS if required. The amended EIS will then be submitted to DES for assessment of adequacy. Where the EIS is determined to be adequate, DES prepares the EIS Assessment Report, giving CTSCo the report, and publicly publishing the report.

A number of other approval processes will also be undertaken either concurrently or subsequent to the EIS processes, depending on legislative requirements, interaction with the EIS processes, and/or CTSCo's or Glencore's internal requirements for progress of the Project through to Final Investment Decision (FID). The process for grant of an amended EA occurs after DES gives the EIS assessment report to CTSCo and publishes the assessment report. Table 3-1 provides a summary of key legislative requirements that CTSCo anticipates it will undertake, but the list is not exhaustive. Each of these requirements will be further explored and defined, with potentially additional requirements identified throughout the EIS process.

Table 3-1 Key Legislative Requirements for the Project, other than EIS Processes

Legislative Reference	Requirement
State of Queensland	
Aboriginal Cultural Heritage Act 2003	
s.87	CTSCo to negotiate a Cultural Heritage Management Plan (CHMP) or similar agreement with the Bigambul Native Title Aboriginal Corporation (BNTAC) as representatives of the traditional owners
Greenhouse Gas Storage Act 2009 and Greenhouse Gas Storage Regulation 2021	
Act s.24	CTSCo to prepare and submit a later work program for the Project
Act s.80 Reg s.6	CTSCo to prepare and submit an Injection Test Plan (ITP) for the Project to the Minister for Resources
Act s.145	CTSCo to prepare and submit a Monitoring and Verification Plan (MVP) for the Project to the Minister for Resources
Mineral and Energy Resources (Common Provisions) Act 2014 and Mineral and Energy Resources (Common Provisions) Regulation 2016	
Chapter 3, Part 7	CTSCo to provide notices, undertake negotiations and enter into Conduct and Compensation Agreements (CCAs) with landowners to conduct advanced activities on both private and public lands
Act, s.62 and 63 Reg, s26 and 27	Notifiable road use associated with construction and operational activities of the Project
Environmental Protection Act 1994 and the Environmental Protection Regulation 2019	
Reg, s.41	CTSCo to address interaction of waste and groundwater, as defined by the Regulation
Nature Conservation Act 1992	
Various sections of the Act and associated regulations	CTSCo's interaction with listed wildlife and plant species, and areas, during studies, and construction and operational activities
Strong and Sustainable Resource Communities Act 2017	
Various sections of the Act	Social impact assessment of the Project including operational workforce management
Transport Operations (Road Use Management) Act 1995	
Various sections of the Act and associated regulations and codes	Transport of the GHG stream and other materials during construction and/or operations that may be classified as dangerous goods
Vegetation Management Act 1999	
Various sections of the Act and associated regulation	CTSCo's interaction with listed or mapped areas, as categorised by the Act, during studies, and construction and operational activities
Waste Reduction and Recycling Act 2011 and Waste Reduction and Recycling Regulation 2011	
Various sections of the Act and associated regulation	CTSCo to address interaction of waste and groundwater, as defined by the Act
Commonwealth of Australia	
Environment Protection & Biodiversity Conservation Act 1999	

Legislative Reference	Requirement
Act s.75	An EPBC Act referral (2021/9122) was lodged with the Department of Agriculture, Water and the Environment (DAWE) on 7 January 2022. On 9 February 2022, the authorised person under the EPBC Act provided the referral decision for the Project as "not a controlled action".
Carbon Credits (Carbon Farming Initiative) Act 2011 and Carbon Credits (Carbon Farming Initiative – Carbon Capture and Storage) Methodology Determination 2021	
Act, s.53	CTSCo's Project to avoid emissions of greenhouse gases

4. Consultation Process, including Interested Persons and Affected Persons

4.1 Background

Consultation on a test injection of a GHG stream in the Surat Basin commenced in 2009, with CTSCo engaging with Commonwealth, State, and local governments; landowners; native title claimants and registered parties; non-government organisations (NGOs); industry; industry peak bodies; and community groups.

Initially consultation focused on parties associated with a potential test injection site in EPQ7, located 16 km west of Wandoan in the northern part of the Surat Basin. However, in 2019 CTSCo made the decision not to progress with test injection activities in that area, which is discussed further in section 5.7. In 2019, CTSCo was granted EPQ10, and following investigations of potential test injection areas within the tenement, the current Project operational lands were identified as having the greatest potential for a suitable test injection site with the fewest potential impacts on the environment and community. Consultation with affected persons and interested persons, collectively referred to as stakeholders, commenced in March 2020, and is ongoing, as described below.

4.2 Stakeholder and Community Engagement Principles

CTSCo has developed the stakeholder and community engagement strategy based on the:

- "*Quality Assurance Standard for Community and Stakeholder Engagement*" (IAP2, 2015);
- "*AA1000 Stakeholder Engagement Standard*" (AA1000SES, 2015); and
- "*Infrastructure Engagement Excellence Framework: A Framework for Optimal Community and Project Outcomes*" (Next Generation Engagement, 2019).

Engaging with host communities is key to Glencore's approach to stakeholder and community engagement. Glencore's key sustainability pillars are based on:

- Safety – becoming an industry leader in safety, eliminating injuries and fatalities;
- Health – improve the health and wellbeing of employees and the communities near operations;
- Environment – minimise impact on the environment, wherever Glencore operates;
- Community & Human Rights – support the long-term development of local communities;
- Our People – seek to provide a work environment where Glencore's people are welcome, supported, respected and heard; and
- Our People and Values – responsibly source the commodities that advance everyday life.

Glencore plc also follows the principles of the United Nations Global Compact, International Council on Mining & Metals (ICMM), United Nations Sustainable Development Goals. For more on Glencore plc's approach to sustainability, including stakeholder and community engagement, see: https://www.glencore.com/sustainability

4.3 Stakeholder and Community Engagement Strategy Overview

CTSCo's Stakeholder and Community Engagement Strategy builds on the foundation of previous strategies and considers key learnings from various carbon capture and storage (CCS) projects within Australia and overseas. These learnings have informed a program designed to understand and address stakeholder issues to ultimately secure and maintain a social license to operate. The strategy is based on:

- open interaction with all levels of government and industry directly involved or interested;
- application of facts-based information supported by scientific data and expert analysis;
- best-practice stakeholder engagement principles with all interested and affected persons; and
- continuous review and assessment of the engagement strategy and program to ensure that they are up-to-date and align with Project milestones and feedback from stakeholders.

Providing social value for the community where the Project will operate and maintaining this value is important for this Project. CTSCo is committed to working closely with local communities to investigate the potential economic, environmental, social, and cultural benefits and impacts of the Project.

CTSCo has applied the learnings from the four years of engagement with the Wandoan community associated with EPQ7. These learnings have helped shape the stakeholder engagement program for the test injection in EPQ10, where appropriate and relevant to both the local community around Moonie, and stakeholders within this region.

Over the last few years, CTSCo has worked to build trust and maintain relationships on the established and positive working relationships with Commonwealth, State and local governments, working openly and actively to ensure that any local or regional issues are managed directly to minimise Project risks.

CTSCo has planned a staged approach to stakeholder engagement at a community level that seeks to build understanding and knowledge of the Project and identify stakeholder or community issues throughout the process. CTSCo has commenced engagement with key regional Non-Government Organisations (NGOs) and community interest groups to help inform the engagement strategy at a local level.

Interested and Affected Persons, as defined by the EP Act, sections 38 and 41 are summarised in Table 4-1. As per the requirements of the EP Act, so as to maintain the privacy and confidentiality of the Persons, CTSCo has lodged the contact details of Interested and Affected Persons under separate cover to the administering authority. Note that at the time of preparation of the IAS, the list of Persons is not exhaustive, and may develop as the Project develops through the EIS process.

Table 4-1 Summary of Interested and Affected Persons

Parties		Grouping	Context
Interested	**Affected**		
√	√	Regional councils in the Project area • Western Downs • Toowoomba • Goondiwindi	Managers of operational lands, land adjoining operational land, reserves, road use, and interest in development in their region
√		State of Queensland as interested person, via: • Department of Environment & Science • Department of Resources • Office of Groundwater Impact Assessment • Queensland Great Artesian Basin (GAB) Advisory Council • Department of State Development, Infrastructure, Local Government and Planning • Department of the Premier and Cabinet • Queensland Treasury and Department of Trade and Investment • Department of Energy and Public Works • State Members for Warrego and Southern Downs	Managers of land adjoining operational land, road use, development approvals and/or interest in development in the region
√		Commonwealth of Australia as interested person, via: • Department of Agriculture, Water and Environment • Federal Member for Maranoa	Managers of development approvals and/or interest in development in the region
√		Non-government organisations: • AgForce • Wildlife Preservation Society • Toowoomba and Surat Basin Enterprise (TSBE)	Interest in development in the region
√		Local businesses in the Moonie area	Business owners or other seeking potential business opportunities
	√	Bigambul Native Title Aboriginal Corporation	Registered native title body corporate for the Project area
	√	Private landowners and/or occupiers	Five lot on plans of operational land, and three lot on plans of land adjoining operational land
	√	State of Queensland as affected person, via: • Department of Transport and Main Roads • Department of Environment & Science	Managers of land adjoining operational land including various reserves, leases, easements, and a national park. Interest in road use, and development in the region.
	√	Telecommunications	Telecommunications asset owner
	√	Overlapping or adjacent petroleum tenement holders: • Santos Limited • Cypress Petroleum Pty Ltd	Petroleum tenement holder of petroleum pipeline and petroleum exploration tenement

Key objectives of the consultation program are to:

- continue to build trust and maintain relationships at a local level;
- focus on people in the local community who are interested in where and how the GHG stream will be sourced and stored;
- introduce and improve technical knowledge of CCS by communicating scientific facts using plain English;
- foster understanding of the importance of the test injection in the context of a low carbon future for the region, Queensland, Australia and the planet; and
- outlining the broader context and opportunities for industrial-scale GHG stream injection development, based on the findings of the test injection.

The key objectives will be achieved by:

- entering into Conduct and Compensation Agreements (CCAs) with landowners and occupiers (as defined under the *Minerals and Energy Resources (Common Provisions) Act 2014*) of operational lands;
- fostering genuine relationships with owners of land adjoining operational lands, credible local influencers including community leaders, NGOs, government bodies, and those that have interest in the Project's activities; and
- engaging stakeholders with methods of communication that are direct, relevant, appropriate, credible, and COVID19 safe.

There has been consultation with the community and stakeholders via face-to-face meetings (including virtual meetings by web-based platforms), phone calls, and emails. All interactions have been recorded in the Project's stakeholder consultation management system (CMS) and will continue to be throughout the life of the Project, including public consultation of the draft ToR and the EIS.

Issues and concerns raised by stakeholders are recorded and addressed. As has been the process to date, where appropriate, this feedback will inform Project outcomes, both informally and formally as part of EIS processes. Where relevant, responses have and will continue to be provided to the person raising the issue or concern, and more broadly, included in reports and updates to stakeholders.

Ongoing consultation will involve various mechanisms, as summarised but not limited to, those listed in Table 4-2.

Table 4-2 Mechanisms for Consultation

Mechanism	Outcome
One-on-one sessions with stakeholders, including interested and affected persons, and the community at a local and regional level	Direct engagement with individuals and groups in formats designed to provide an opportunity for people to seek fact-based information and raise their concerns to formulate their own informed opinion. Examples include face-to-face meetings, web-based teleconferences, telephone calls and emails.
Project communication material – factsheets, videos, media statements	Fact-based information in an appropriate format ensures a clear understanding of scientific facts and processes involved in the context of the current environment in which we live.
CTSCo website	Centralised source of Project information and GHG stream industry information, including links to third-party independent information sources. www.ctsco.com.au
Direct contact and interaction with government personnel	Open book approach with the sharing of data and information to ensure robust processes and outcomes.
Interviews with journalists and media presenters	Providing relevant fact-based information on CCS to the broader public

5. Project Description

5.1 Project Need

5.1.1 Australia's Technology Challenges and Opportunities

Australia is endowed with significant energy resources, both fossil fuel and renewable. Fossil fuels have underpinned Australia's standard of living for generations via direct and indirect employment, domestic power generation and export earnings. Building on this prosperity, Australia is now well-positioned to further benefit from this energy abundance by using newer technologies, including renewables and hydrogen. However, fossil fuels will continue to play a vital part in Australia's energy mix for at least the short to medium-term. In addition, the associated CO_2 emissions from energy production and other industrial processes such as the production of cement, steel and fertiliser, present a challenge to Australia in meeting its emissions targets.

CCS presents a significant opportunity for Australia to reduce CO_2 emissions, and export emissions avoidance expertise to other countries, while simultaneously building our renewable energy and hydrogen economies.

The key advantages of CCS for GHG emissions reduction include:

- direct capture of emissions from a point source is more cost-effective than air capture and could be economically feasible with a potential future price mechanism;
- direct capture of emissions from a point source is recognised under the *Carbon Credits (Carbon Farming Initiative) Act 2011* (Cth);
- CTSCo's test injection seeks to demonstrate the viability for a larger-scale commercial development in the future;
- potential for a CCS Hub to facilitate a range of carbon capture projects within a geographical area; and
- potential for use in industries that generate CO_2 emissions with current technology, e.g. cement manufacturing.

5.1.2 Technology Investment for CO_2 Abatement

5.1.2.1 INTERNATIONAL

The IEA Report, "*Net Zero by 2050, A Roadmap for the Global Energy Sector*" (May 2021), states that for a net-zero scenario (NZE), carbon capture, utilisation and storage (CCUS) "*can facilitate the transition to net-zero CO_2 emissions by: tackling emissions from existing assets; providing a way to address emissions from some of the most challenging sectors; providing a cost-effective pathway to scale up low-carbon hydrogen production rapidly; and allowing for CO_2 removal from the atmosphere through* bioenergy equipped with CCUS *(BECCS) and* direct air capture with carbon capture and storage *(DACCS). … By 2030, 1.6 Gt CO_2 per year is captured globally, rising to 7.6 Gt CO_2 in 2050. Around 95% of total CO_2 captured in 2050 is stored in permanent geological storage and 5% is used to provide synthetic fuels. Estimates of global geological storage capacity are considerably above what is necessary to store the cumulative CO_2 captured and stored in the NZE.*" (IEA 2021, section 2.5.7).

Retrofitting coal and gas-fired power plants with CCS or co-firing with hydrogen-based fuels can enable existing fossil fuel fired power plants to contribute to the transition to a NZE economy.

Globally, the technology to capture, transport and inject a GHG stream into a deep reservoir is well proven. Table 5-1 summarises the commercial CCS facilities, as of September 2021 by number and total capacity (Global CCS Institute, 2021, Figure 6).

Table 5-1 Commercial CCS Facilities in September 2021 by Number and Total Capacity

	Operational	In Construction	Advanced Development	Early Development	Operation Suspended	Total
Number of facilities	27	4	58	44	2	135
Capture capacity (Mtpa)	36.6	3.1	46.7	60.9	2.1	149.3

An internationally analogous CCS project is Canada's SaskPower's Aquistore Boundary Dam Project, an industrial-scale development storing over 4.15 Mt of CO_2 since operational start-up commenced in 2015. The post combustion capture (PCC) plant was the world's first commercial-scale plant, with injection of CO_2 into saline sandstone aquifers of the Winnipeg and Deadwood formations, occurring at 3,200m underground, with each formation approximately 150 m thick. Monitoring of the CO_2 plume with regular seismic surveys and down-hole logs in the monitoring wells shows that CO_2 has been securely retained in the reservoir with no adverse environmental impacts or induced seismicity observed (SaskPower, July 2021).

5.1.2.2 AUSTRALIA

In 2021, the Australian Government published "*Australia's Long-Term Emissions Reduction Plan, A whole-of-economy Plan to achieve net zero emissions by 2050*" and the associated document "*Australia's Long-Term Emissions Reduction Plan: Modelling and Analysis*" (Commonwealth of Australia, 2021 a and b). The NZE Plan identifies CCS as part of "*unlocking the critical pathways to net zero by 2050 for Australia's economic sectors*" (CoA, 2021a, p.45). The Modelling and Analysis identifies CCS as one of six priority low emissions technologies, stating that the Surat Basin, in addition to other basins within the nation, "*host carbon storage sites at an advanced stage of development, and each have genuine industry interest and support*" (CoA, 2021b, p.25).

The Modelling and Analysis built upon the Australian Government's "*Low Emissions Technology Statement 2021*" (DISER, 2021) which includes a stretch goal for CCS to be available for under $20 per tonne of CO_2. The Australian Government is investing in CCS through the Carbon Capture Use and Storage Development Fund that includes investing over $250 million from 2021 to 2030 to establish CCUS hubs, and support research, development and commercialisation of CCUS technologies.

Australia's installations of CCS include:

- Western Australia: Chevron's Gorgon Carbon Dioxide Injection Project is an industrial-scale development which reported a total of 2.26 Mt of CO_2 injected for the period 1 July 2020 to 30 June 2021 from the Gorgon liquefied natural gas (LNG) facility, with capacity to inject up to 4 Mt per year of CO_2. CO_2 is injected into a sandstone formation over 2 km below surface of Barrow Island (Chevron Australia, 2021).
- Victoria: since 2003, CO2CRC has been operating the Otway International Test Centre in Nirranda South, designing and managing research in carbon capture, storage, utilisation and monitoring (CO2CRC, 2022).

5.1.2.3 QUEENSLAND

The Queensland Government's "*Pathways to a clean growth economy, Queensland Climate Transition Strategy*" (DEHP, 2017) provides the "*Queensland Government's three key climate commitments:*

- *powering Queensland with 50% renewable energy by 2030;*
- *doing our fair share in the global effort to arrest damaging climate change by achieving zero net emissions by 2050;*
- *demonstrating our commitment to reducing carbon pollution by setting an interim emissions reduction target of at least 30% below 2005 levels by 2030.*"

Queensland is Australia's highest CO_2 emitting state and the Project will assist Queensland in meeting its emissions reduction targets. Many decarbonisation actions may also produce co-benefits in areas such as health, amenity, and the environment (DEHP, 2017).

Queensland's Kogan Creek, Millmerran, and Tarong B coal-fired power stations are Australia's most efficient and lowest emitting supercritical coal-fired power stations and are also the youngest. Based on a 50-year nominal economic life, these power stations could still be operating in 2050. Retrofitting each with 90% CCS is possible, and all are within the region of the Project.

The GHG emission targets indicate that the Australian and Queensland Governments will rely on CCS projects during the transition phase to a low carbon economy, especially in the power sector.

5.1.3 Glencore's Pathway to Net Zero Emissions

Glencore's position on climate change:

- supports the global climate change goals outlined in the United National Framework Convention on Climate Change (UNFCCC) and the Paris Agreement to limit the rise in global temperature to well below 2°C by the second half of this century;
- that only through collective global action can the world achieve the goals of the Paris Agreement and limit the impact of climate change, as well as deliver the United Nations Sustainable Development Goals, including universal access to affordable energy;
- recognises its responsibility to contribute to the global effort to achieve the goals of the Paris Agreement by decarbonising the company's operational emissions footprint. Glencore's contribution should be based on a holistic approach considering the company's total emissions footprint; and
- has a well-positioned portfolio that supports the transition to a low-carbon economy, while also meeting the need for universal access to reliable energy. (Glencore, 2022)

Glencore plc's climate change commitments are "*in line with the ambitions of the 1.5°C scenarios set out by the Intergovernmental Panel on Climate Change (IPCC), we target a short-term reduction target of 15% by 2026 and a medium-term 50% reduction of our total (Scope 1, 2 and 3) emissions by 2035 on 2019 levels. Post-2035, our ambition is to achieve, with a supportive policy environment, net zero total emissions by 2050.*" (Glencore, 2022)

For Glencore plc, CTSCo's Project and CCS generally, align with its global sustainability and climate change aspirations, indicating the importance that it places on direct carbon capture technology for the transition to a low carbon future.

5.2 Purpose of the Test Injection

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 and for two years after injection has ceased, totalling 5 years of monitoring;
- 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 atmosphere; and
- provide critical data on GHG stream plume behaviour to assist in the EIS assessment processes for approvals for future CCS projects in Queensland beyond the GHG exploration permit stage under the GHG Storage Act.

CTSCo completed an initial report on the capacity of the target reservoir in the EPQ10 tenement (being the Precipice Sandstone) for GHG storage in July 2020. The report found that the potential GHG storage capacity within the target reservoir ranged from a low of 183 million metric tonnes to a high of 730 million metric tonnes, indicating its potential for a safe and cost-effective permanent CO_2 storage at potential future industrial-scale.

The Project is seeking approval for GHG stream test injection to demonstrate the viability of geosequestration of CO_2 in Queensland. The Project is supported with funding from the Australian Government, Low Emission Technology Australia (LETA) and Glencore plc.

5.3 Proposed Project

Under this Project, CTSCo proposes to conduct a test injection of up to 110,000 tonnes per year for three years of a GHG stream (predominately carbon dioxide (CO_2)). The test injection will be into the lower Precipice Sandstone, between 2,250 m and 2,350 m below surface.

The key elements of the Project, as shown in Figure 5-1 include:

- transportation of the GHG stream by truck from the Millmerran Power Station (MPS) for 260 km to the test injection site using existing public roadways (see Figure 2-1);
- within EPQ10:
  - a transport facility to transfer the GHG stream from trucks to holding tanks via Tarawindi 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 9 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, 2,250 m to 2,350 m below surface; and
  - monitoring infrastructure including the West Moonie-2 monitoring well (drilled in 2021), a Gubberamunda aquifer monitoring bore (to be drilled in 2023), a shallow alluvium monitoring bore (drilled in 2021 to 48 m into the Griman 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 already permitted under EPQ10 and the current EA, and are not subject to EIS processes and assessment.

The site and locality of the Project are further described in sections 5.4 and 6.

Interrelated activities located outside of the EPQ10 test inject site are described further in section 5.5.

Infrastructure associated with the Project, including workforce accommodation and transport are detailed further in section 5.6.

5.4 Site and Locality Description

Figure 5-2 shows operational land and land adjoining the operational land for activities within EPQ10. Moonie township is the closest population centre to the Project, approximately 44 km north-east of the Tarawindi Road entry to the test injection site along the Moonie Highway.

Figure 5-1 Key Elements of the Project

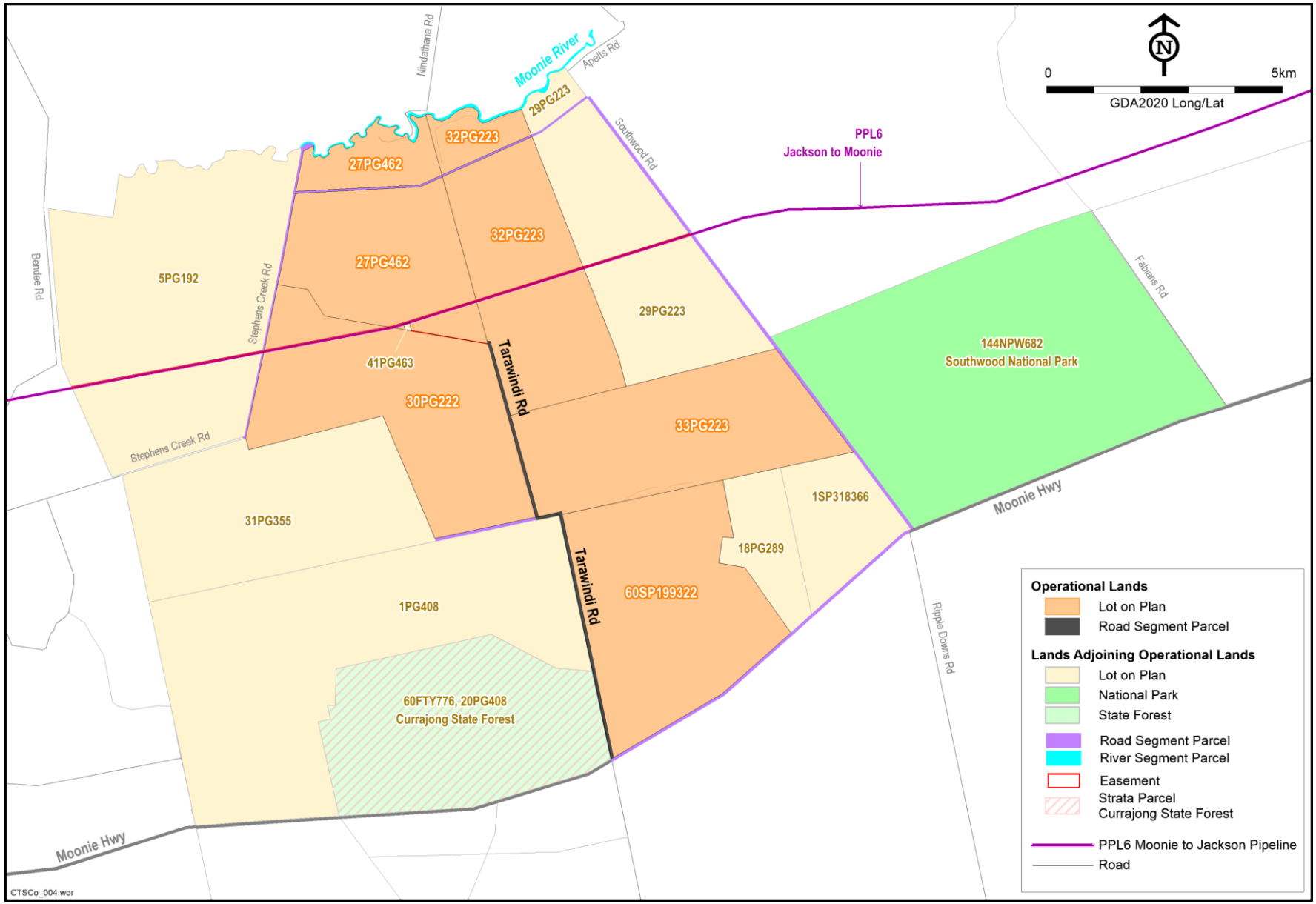


Figure 5-2 Project Operational Lands and land adjoining Operations Lands

As shown in Figure 5-2, Table 5-2 summarises the Project's operational lands and land adjoining operational lands within EPQ10. Note that the Moonie Highway is not considered as operational land, as it is a public road used only for the transport of the GHG stream.

Table 5-2 Summary of Operational Lands and Land Adjoining Operational Lands

Lands		Lot on Plan	Tenure
Operational	Adjoining Operational		
√		27 PG462	freehold
√		30 PG222	freehold
√		32 PG223	freehold
√		33 PG223	freehold
√		60 SP199322	freehold
√	√	Tarawindi Road	road reserve
	√	1 PG408	freehold
	√	1 SP318366	freehold
	√	5 PG192	freehold
	√	18 PG289	freehold
	√	29 PG223	freehold
	√	31 PG355	freehold
	√	41 PG463	lands lease for purposes of communications
	√	G PG463	easement
	√	P PG437	easement
	√	20 PG408	lands lease (special lease with 60 FTY776)
	√	60 FTY776	Currajong State Forest (special lease with 20 PG408)
	√	Moonie River	-
	√	Apelts Road	road reserve
	√	Southwood Road	road reserve
	√	Stephens Creek Road	road reserve
	√	Moonie Highway	state-controlled road reserve
	√	144 NPW682	Southwood National Park

The operational lands cover 7,763 ha. However, the study area of the Project's activities within the operational lands covers 1,057 ha, while the disturbance area is anticipated to be approximately 4 ha, as shown in Figure 5-1 and Figure 5-2.

As shown in Figure 2-2, EPQ10 overlaps or is adjacent to a number of resource tenements. However, for the Project footprint, only two overlapping resource tenements are applicable to the operational lands and land adjoining the operational lands, as shown in Figure 5-3, being:

- Petroleum Pipeline Licence (PPL) 6 – Jackson to Moonie Pipeline for the transmission of oil held by Santos Limited
- ATP2038 held by Cypress Petroleum Pty Ltd.

Access to the areas subject to EIS studies will be via existing public roads. Access within properties will be in accordance with the CCAs for each property, typically using existing farm tracks.

Infrastructure in the general locality of the Project footprint is shown on Figure 5-4 to a 50 km radius.

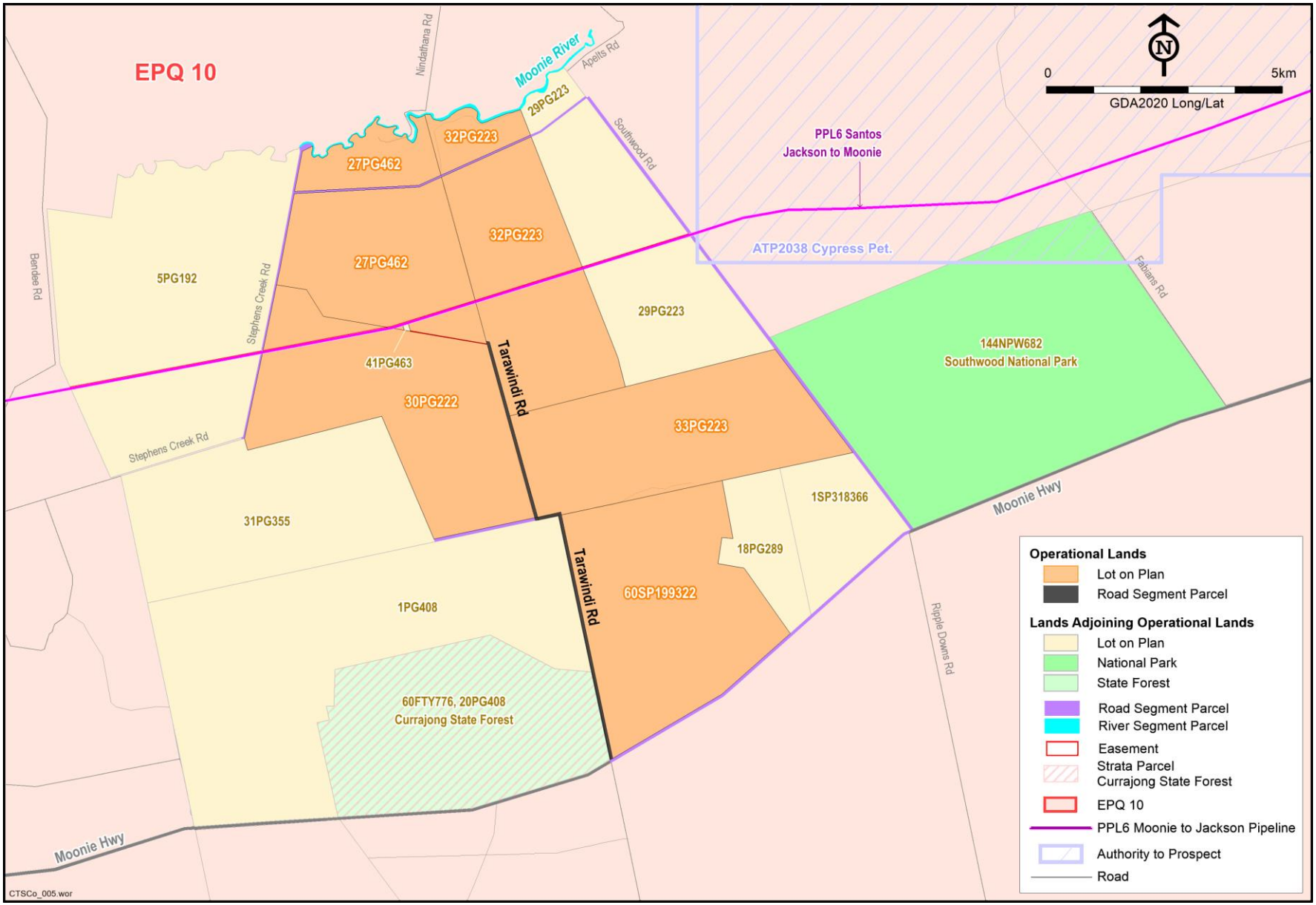


Figure 5-3 Overlapping Resource Tenements with Operational Lands or Land Adjoining Operational Lands

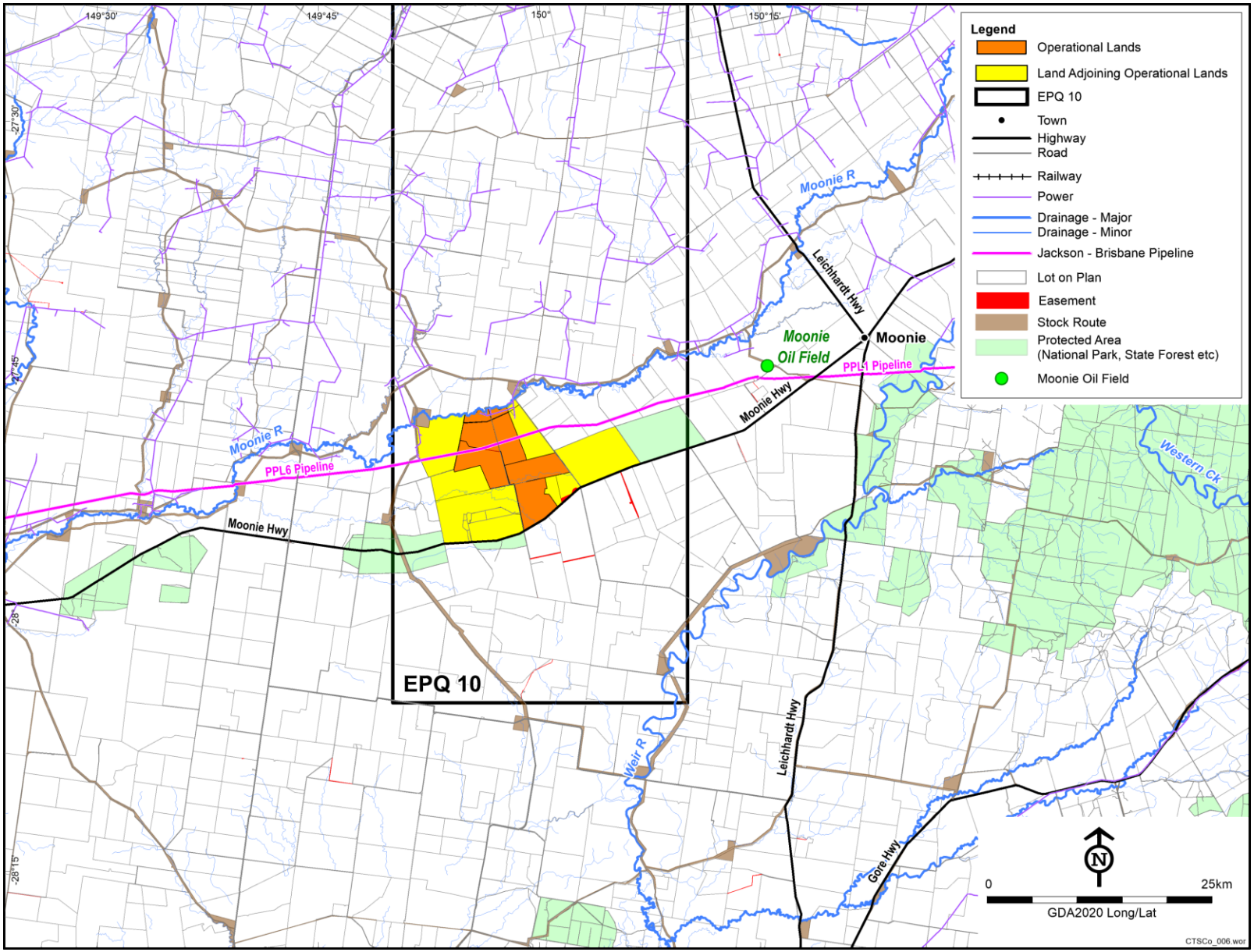


Figure 5-4 Surrounding Infrastructure to the Operational Lands

5.5 Interrelated Activities outside of EPQ10

5.5.1 GHG Stream Source

The GHG stream is to be sourced from a Post Combustion Capture (PCC) plant to be constructed in the Millmerran Power Station (MPS). The approvals associated with the PCC plant are being sought by Millmerran Power Partners, operated by InterGen, in conjunction with and supported by CTSCo. The Millmerran Power Station is a coal-fired power station, in operation for 17 years, and has an 850 MW capacity, typically supplying 6,300 GWh annually (InterGen, 2022). The PCC plant is anticipated to supply GHG stream and commercial CO_2 to multiple parties, including CTSCo and commercial CO_2 users.

The Clean Energy Research Institute (CERI) are designing the PCC plant, based on the Huaneng-CERI Shanghai (China) Shidongkou PCC plant. The Shindongkou PCC plant has operated since 2009, producing both food and industrial-grade CO_2 for the local Chinese market.

The main component of the GHG stream for the Project is CO_2, representing typically more than 98% of the volume.

5.6 Construction and Operation

The following sections describe the Project's key elements, as outlined in section 5.3.

5.6.1 GHG Stream Transportation

The GHG stream will be provided by MPS as a low-pressure, low-temperature cryogenic liquid at 332 psi and -20°C, in purpose built 20-foot-long CO_2 cryogenic iso tank containers (in accordance with UNT75). Each iso tank container holds 18 tonnes of GHG stream. One b-double truck can transport two iso tank containers, totalling 36 tonnes per truck. Transportation of the GHG stream in a cryogenic state in iso tank containers is the same method used by commercial CO_2 suppliers for food and industrial applications across Australia, and meets the relevant Australian National Transport laws, regulations, codes and guidelines.

CTSCo anticipates that dedicated B-double trucks will make a total of nine round-trips per day (two to three round-trips per truck), operating during daylight hours, up to 6 days a week (Monday to Saturday). This equates to 18 truck movements per day during daylight hours.

As depicted in Figure 2-1, trucks will transport the GHG stream on 260 km of public roads, from the MPS:

- 15 km along Moffatt Reserve Road and the Millmerran-Inglewood Road to Millmerran;
- turn left onto the Gore Highway (A39), heading west for 122 km;
- turn right onto the Leichhardt Highway (A5), heading north for 79 km;
- turn left onto the Moonie Highway at Moonie, heading west for 44 km; and
- then turn right at the Tarawindi Road intersection.

Depending upon further traffic impact assessments, intersection improvements for the Moonie Highway – Tarawindi Road intersection may be considered.

5.6.2 GHG Stream Transport Facility

The GHG stream transport facility allows for the delivery of GHG stream iso tank containers onto operational land into a defined and secure transport facility. The transport facility will be located on privately owned land, accessed from Tarawindi Road, and cover approximately 2.4 ha.

Figure 5-5 provides a general arrangement plan of the transport facility. Various features of the transport facility are proposed to include:

- separate truck entry and exit points with one-way traffic circulation, allowing for traffic flow management;
- secure, unmanned access entry and exit gates that provide restricted site access;
- site lighting, security and fencing;
- site facilities including control room, crib room and restrooms. Potable water will be captured rainwater or delivered by tanker to site, sewage will be treated by a septic system on site, and power supplied by solar panels with a battery or generator;
- site facilities carpark;
- GHG stream truck off-loading point into GHG stream storage tanks (as a cryogenic liquid) at approximately 35 tonnes per hour, with a up to six tanks holding around 50 tonnes each within the transport facility;
- LPG tankers with a total capacity of approximately 3,000 kg each with three LPG tanks to supply fuel for water bath heating;
- LPG burner to heat water in a water bath heater, which is a closed loop system;
- a water bath heater to heat the GHG stream, as detailed in section 5.6.2.1;
- two pumps (one in use, one as back-up) to pump the GHG stream (as a supercritical fluid) into the flowline with around 1,500 psi pressure to transfer the fluid the West Moonie-1 Injection Well; and
- flowline valves and connections from the pump.

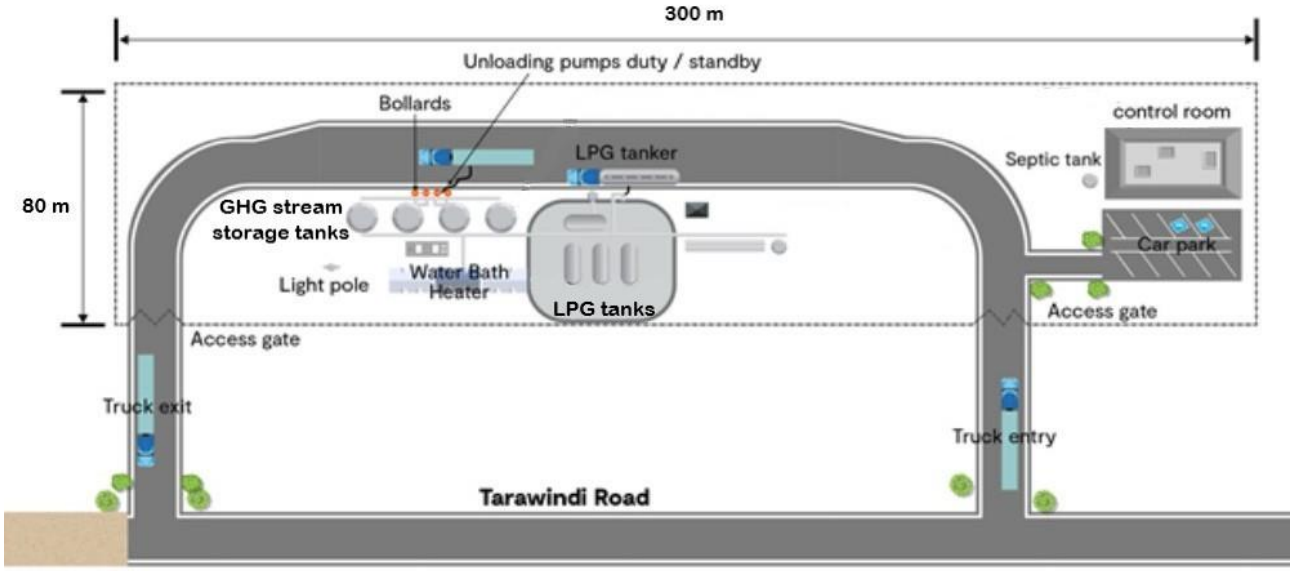


Figure 5-5 Transport Facility (general arrangement plan)

5.6.2.1 WATER BATH HEATER

The GHG stream will be delivered to the transport facility as a low-pressure, low-temperature cryogenic liquid at 332 psi and -20°C. To be suitable for the test injection process, the GHG stream as a cryogenic liquid requires that it be heated to be a supercritical fluid, being a high pressure, dense, liquid-like state of approximately 31°C and 1,500 psi.

The water bath heater allows for a controlled, steady, continuous and confined compression and heating of the GHG stream. The water in the water bath does not mix with the GHG stream but acts as a heat transfer medium from the LPG burner to the outside of the pressurised tank containing the GHG stream. The water bath heater is a closed loop system, that will only require small top-ups of water every few months.

After the GHG stream is heated to a supercritical fluid, it is transferred to the flowline.

5.6.2.2 CONSTRUCTION OF THE TRANSPORT FACILITY

Transport facility construction works will include establishment of fences and gates, minor earthworks to establish hardstands and concrete foundations, erection of prefabricated or demountable buildings, and installation of pumps, pipelines, and other equipment for the offloading and handling of the GHG stream. The transport facility area will be located on operational land being an already cleared farm paddock, immediately bordering Tarawindi Road.

Any quarried materials and concrete required will be sourced locally for existing licenced suppliers. No new quarries, batching plants or similar will be required for construction of the transport facility.

5.6.2.3 OPERATION OF THE TRANSPORT FACILITY

The transport facility is anticipated to be accessed by trucks for GHG stream offloading during daylight hours, Monday to Saturday. However, the operation of the water bath heater system, and pumping of the GHG stream to the West Moonie-1 Injection Well will occur 24 hours a day, 7 days a week.

The facility will typically be unsupervised, with monitoring of all equipment for the transport facility and test injection site from both the control room on site and remotely.

A crib room and amenities will be provided for all personnel, including truck drivers, to allow for personnel comfort and fatigue management.

5.6.3 Flowline

The flowline will be a 4-inch (100 mm) diameter pipeline, constructed to Australian Standard (AS) 2885, and consider the requirements of the Petroleum and Gas (Safety) Regulation 2018 for gathering networks.

As shown in Figure 5-1, the flowline corridor and right of way (ROW) is anticipated to be 9 km in length and 5 m wide, commencing at the transport facility, along the Tarawindi Road road reserve or adjacent private property, and crossing into private property to reach the West Moonie-1 Injection Well.

Construction of the flowline will be by standard open trench and pipe laying methods for a spool and reel system. No trees or shrubs are anticipated to be cleared along the flowline ROW, with construction likely to be immediately adjacent to the current running surface of the road or within already cleared private property.

For the construction across any watercourses, further site assessments will determine whether riverine protection permits or similar will be required.

5.6.4 Test Injection Well

5.6.4.1 APPRAISAL PROGRAM

In 2019, CTSCo identified that the most prospective locations for large-scale GHG stream geosequestration in the Surat Basin are likely to be within the area held as EPQ10. Appraisal of EPQ10 included desktop studies utilising existing two dimensional (2D) seismic and regional geological data.

CTSCo's prospectivity assessment, compared to the University of Queensland's "*Regional hydrogeology of the southern Surat Basin*" project (7-0918-C316) (Rodger *et al*, ongoing 2022) for Australian National Low Emissions Coal Research & Development (ANLEC R&D), identified that the Precipice Sandstone as the preferred stratigraphic interval to target for the test injection.

Following discussions and negotiations with a number of landowners, a CCA was entered into with a landowner that allowed for drilling of the West Moonie-1 Injection Well and the West Moonie-2 Monitoring Well using the same 100m x 100m well pad. The CCA also allows for drilling of additional monitoring wells, and seismic and other monitoring. All well drilling and monitoring is permitted under the current EPQ10 tenement and EA conditions.

The well design of both wells incorporates multiple barriers to isolate the wells from the surrounding aquifers and prevent well corrosion or leakage, and considers relevant Australian Standards, code and guidelines, including the

"*Code of Practice for the construction and abandonment of coal seam gas and petroleum wells and associated bores in Queensland*" (DNRME, 2018). The key design elements of the West Moonie-1 Injection Well are:

- a 14-inch diameter steel conductor casing, installed to 15.7 m below surface;
- a 12.25-inch diameter steel surface casing, installed to 1,616.6 m below surface;
- an 8.5-inch diameter steel production casing, installed to 2,697.1 m below surface;
- corrosion resistant alloy casing, with metal-to-metal gas tight connections, across flow-wet zones;
- regionally important aquifers, such as the Gubberamunda Sandstone have a second casing/cement barrier;
- GHG stream resistant cement used for cementing of steel casing, with cement integrity confirmed via cement bond logging; and
- steel production tubing, positioned within the production casing, will deliver the GHG stream to the Precipice Sandstone reservoir between 2,250 m to 2,350 m below surface.

CTSCo has completed the appraisal program for injection suitability, including:

- drilling and bore construction of the West Moonie-1 Injection Well in August and September 2020, to assess the Precipice Sandstone formation for injection suitability, specifically porosity and permeability, and the presence of a suitable geological seal above the Precipice Sandstone;
- drilling of West Moonie-2 Monitoring Well in July 2021 to further appraise the Precipice Sandstone and overlying sealing Evergreen formation. The well has been directionally drilled from the West Moonie-1 drill pad, with the bottom-of-hole location 170 m west of the West Moonie-1 Injection Well, and positioned to be within the predicted future GHG stream plume. The West Moonie-2 Monitoring Well has been suspended ready for fit-out of monitoring equipment prior to commencement of injection testing; and
- water quality sampling from West Moonie-1 Injection Well to further appraise the water properties of the Precipice Sandstone formation.

A seismic survey to demonstrate the absence of faulting around West Moonie-1 Injection Well and provide the baseline for future monitoring of the injected GHG stream using geophysical methods will be carried out prior to injection commencing.

A schematic diagram of the well layout is shown in Figure 5-6.

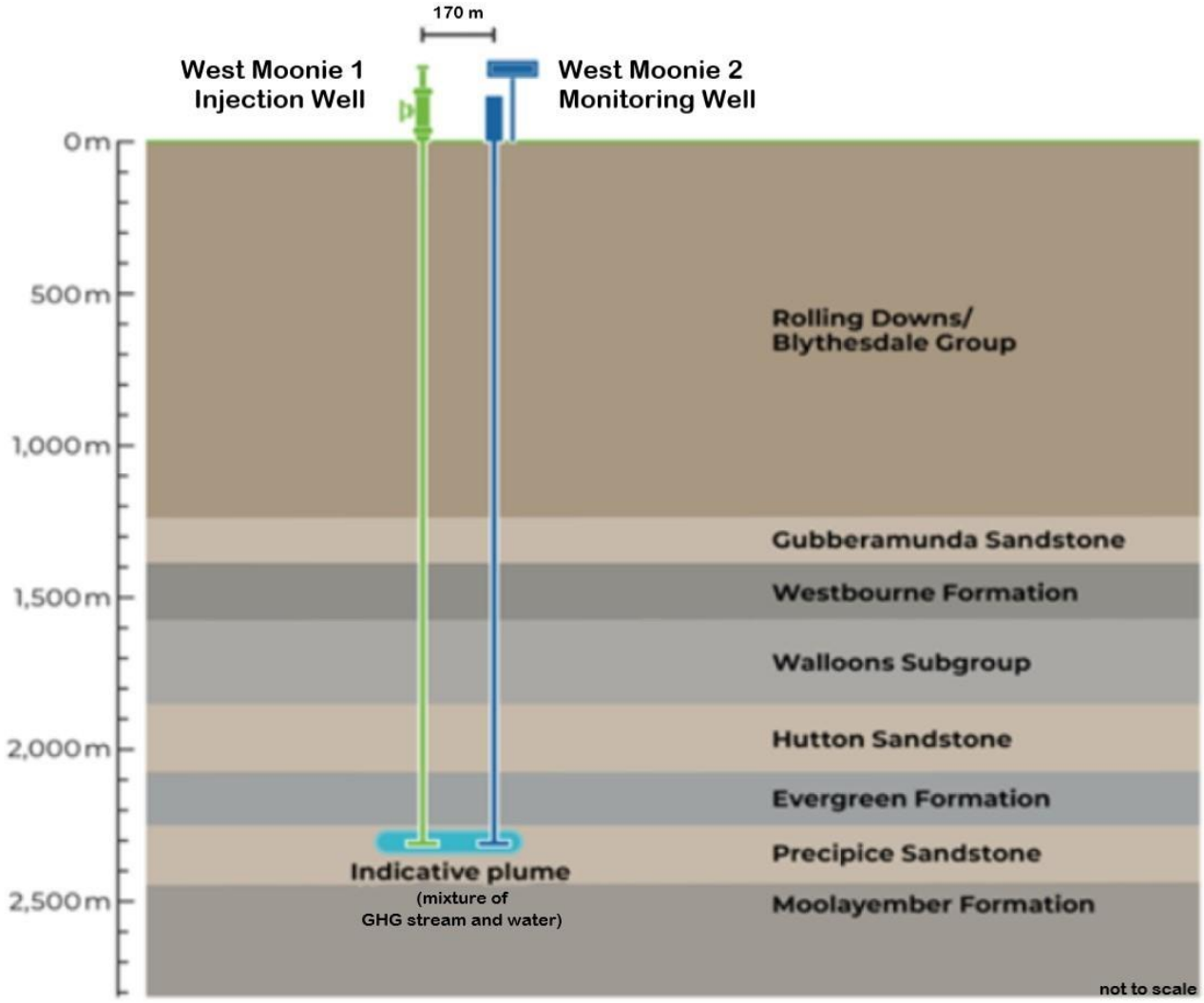


Figure 5-6 Well Layout Schematic Diagram

5.6.4.2 FINDINGS OF THE APPRAISAL PROGRAM

The Surat Basin is a sedimentary basin comprising Jurassic to Cretaceous aged strata, which overlie the older Permian and Triassic strata of the Bowen Basin. The Bowen Basin, and to a lesser extent the Surat Basin, rocks have been deformed and folded in the vicinity of the test injection site, forming broad synclines (valleys) and low-relief anticlines (hills). EPQ10 is located above the Mimosa Syncline and to the west of the Moonie Anticline. A veneer of more recent Quaternary alluvium typically covers the Surat Basin strata in the vicinity of watercourses.

Formations including aquifers and aquitards at the injection test site are shown in Table 5-3 below. West Moonie-1 and West Moonie-2 were drilled into the top of the Moolayember Formation.

The Precipice Sandstone unconformably overlies the Moolayember Formation of the Bowen Basin, which is interpreted as a tight aquitard. The Moolayember Formation will prevent groundwater interaction with the underlying Bowen Basin.

There are five recognised tight aquitards above the Precipice Sandstone in this part of the Surat Basin, each of which will provide significant vertical resistance to upwards migration of the GHG stream plume into the shallower aquifers. The primary regional seal for the Precipice Sandstone is the Upper Evergreen Formation above the Boxvale Sandstone Member and this aquitard separates the Precipice Sandstone from the overlying Hutton Sandstone.

Regional connection of the two aquifers through faults cannot be excluded at all locations across the basin. However, hydraulic connection between these two aquifers within the injection test well area is highly unlikely due to significant pressure head differences recorded during the West Moonie-1 and 2 drilling data acquisition activities.

Table 5-3 Generalised hydrostratigraphic classification in the Surat/Bowen Basins (OGIA, 2019, based on Figure 3-2)

Group	Formation	Regional Aquifer	Partial Aquifer	Tight Aquifer	Interbedded Aquitard	Tight Aquitard
	All alluvium and basalt (including Main Range Volcanics)		√			
Rolling Downs Group	Upper Cretaceous (Griman Creek Formation & Surat Siltstone) / Cenozoic Sediments (including the Condamine-Walloon transition zone)		√			
	Wallumbilla Formation					√
Blythesdale Group	Bungil Formation		√			
	Mooga Sandstone	√				
	Orallo Formation					√
	Gubberamunda Sandstone	√				
Injune Creek Group	Westbourne Formation					√
	Upper Springbok Sandstone			√		
	Lower Springbok Sandstone			√		
	Walloon Coal Measures				√	
	Durabilla Formation					√
Bundamba Group	Upper Hutton Sandstone		√			
	Lower Hutton Sandstone			√		
	Upper Evergreen Formation					√
	Boxvale Sandstone		√			
	Lower Evergreen Formation					√
	Precipice Sandstone	√				
	Moolayember Formation (top of Bowen Basin)					√

The Precipice Sandstone geological unit in the area of the injection well has to two layers:

- an upper Precipice Sandstone layer containing a range of reactive minerals at relatively high proportions, including muscovite, feldspar, kaolinite, chlorite and calcite; and
- a lower Precipice Sandstone layer having a very high quartz content (approximately 96%) and negligible reactive minerals. Hence, the lower Precipice Sandstone is relatively inert.

The lower Precipice Sandstone has relatively high porosity and permeability values making it a good target for GHG stream injection. The top of the lower Precipice Sandstone was encountered at 2,275.2 m below surface at the injection well location. The lower Precipice Sandstone outcrops approximately 240 km to the north near Taroom. OGIA (2019) studied the available groundwater level data for the Precipice Sandstone to assess the basin-scale potentiometrics and identified two dominant groundwater flow directions separated by a groundwater divide. Groundwater flow in the northern part of the Precipice Sandstone aquifer is most likely towards the north-east, with groundwater gradients generally very low, reinforcing the high aquifer transmissivity. The groundwater gradient south of the divide, where EPQ10 is located, is more uncertain due to limited available data, but groundwater flow, if at all, is likely to be the east or south.

In 2020 and 2021, sampling and testing of the water characteristics and quality of lower Precipice Sandstone target reservoir determined that water in the lower Precipice Sandstone aquifer has naturally elevated alkalinity (pH 8.35),

salinity, fluoride and chloride. The water quality parameters make the water unsuitable for irrigation, stock or domestic water use.

Further details of the geology and groundwater features and characteristics are provided in section 6.4.2.

5.6.4.3 GHG STREAM INJECTION

At depths below 800 m, CO_2 naturally increases in density and becomes a supercritical fluid. Supercritical fluids take up less space by increasing in density and diffuse better than either gases or ordinary liquids through the tiny pore spaces in storage rocks, such as sandstone.

Test injection of the GHG stream supercritical fluid will be in the West Moonie-1 Injection Well. The GHG stream will be injected into the top of the well at approximately 31°C and 1,500 psi. The GHG stream will take approximately 52 minutes to travel from the wellhead to the perforated injection zone in the Precipice Sandstone. During this process, the well is expected to act as an effective heat exchanger, warming the GHG stream as it travels between the surface and the injection depth. The relatively slow transport speed of the GHG stream within the well tubing results in the GHG stream being delivered to the injection zone at a temperature of 80°C and a pressure of 3,270 psi. Figure 5-7 demonstrates the expected changes in temperature, pressure and pH as the GHG stream moves through to the target formation.

The injection well infrastructure will have an operating capacity to inject 110,000 tonnes per year of the GHG stream, injecting for a three-year period. Injection is anticipated to be conducted continuously 24 hours a day, 7 days a week, with the site being unmanned, and the performance of all injection infrastructure remotely monitored and controlled from the control room in the Transport Facility and from Brisbane. Injection activities will be in accordance with the Injection Test Plan (ITP) to be approved by the Department of Resources (DoR).

Following completion of injection activities, West Moonie-1 Injection Well will be suspended, in accordance with the GHG Act, and any applicable provisions of the *Petroleum and Gas (Production and Safety) Act 2004* (P&G Act) and regulations. Monitoring will be ongoing, as described in section 5.6.5.

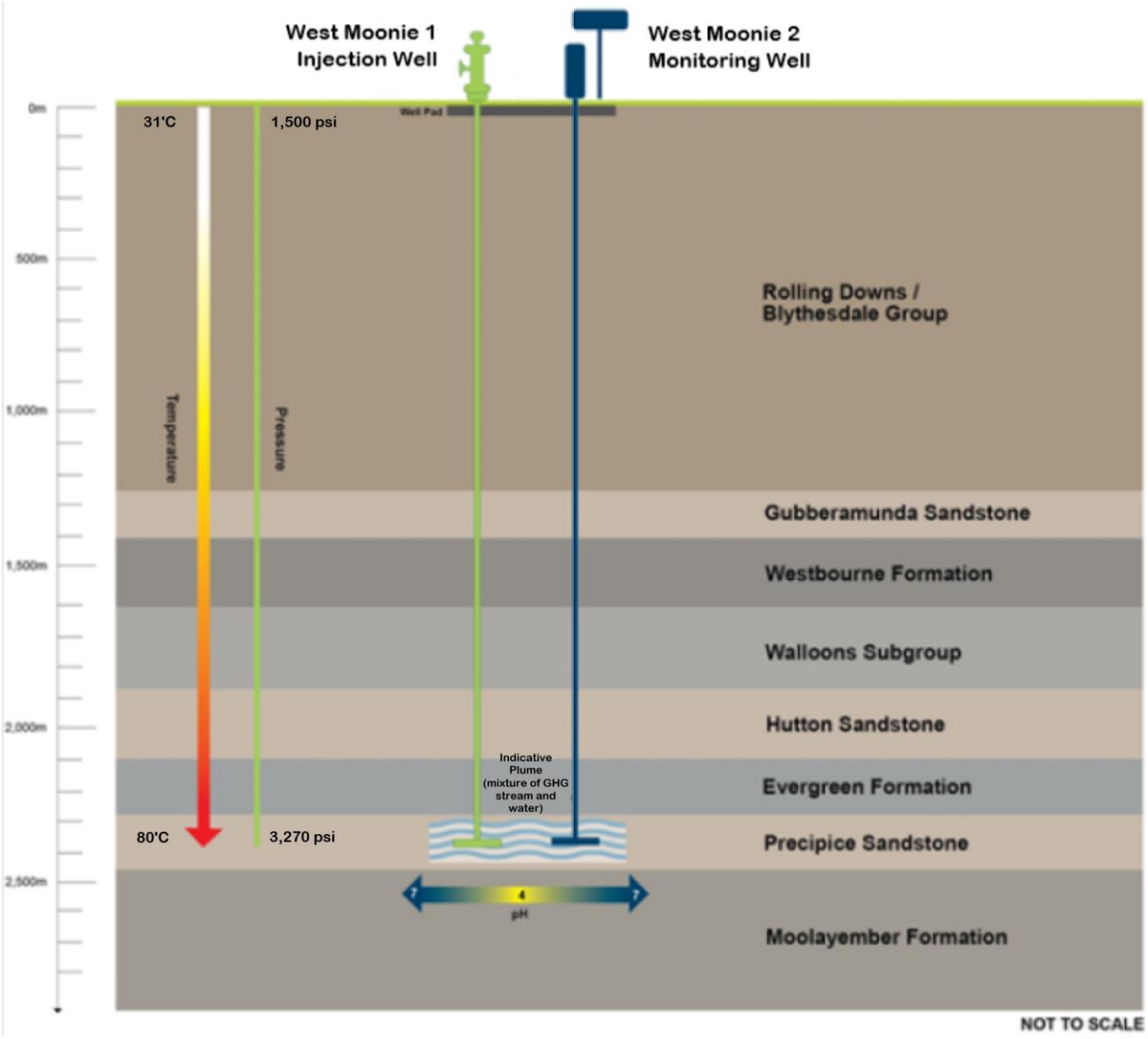


Figure 5-7 Temperature, Pressure and pH changes through GHG stream injection

5.6.5 Monitoring

5.6.5.1 ANTICIPATED PLUME BEHAVIOUR

Preliminary modelling using the data acquired in the West Moonie-1 and West Moonie-2 wells has been conducted to predict the potential GHG stream plume behaviour and associated impacts. The various aspects and attributes of the modelling undertaken include:

- geophysical: to provide a picture of the subsurface;
- static reservoir: to convert the geophysical model into a 3D structure and rock properties model;
- dynamic reservoir: a numeric finite element model using the static model to predict plume movement and reservoir pressures;
- sensitivity analysis and testing to confirm:
  - vertical versus horizontal permeability (kv:kh) to determine the maximum impact on plume size
  - that the plume stops moving vertically by the lower Precipice Sandstone / upper Precipice Sandstone interface
- geochemical: to predict the reaction on reservoir water and host rock with the pH of GHG stream;
- hydrogeological: to predict water pressure changes and potential impacts; and

- reactive transport modelling: to predict pH and trace metal changes and potential impacts.

Preliminary modelling results indicate that the maximum increase in the lower Precipice Sandstone pressure is less than 12 psi (equating to approximately 8 m head increase) adjacent to the injection well, and the maximum pressure increase at the upper/lower Precipice Sandstone interface is 2 psi. These changes are highly localised and dissipate rapidly with increasing distance from the injection well due to the high porosity and permeability of the lower Precipice Sandstone rock at this location. Groundwater pressure changes are typically less than 1 m of head increase, within the maximum extent of the plume.

With a GHG stream injection volume of 110,000 tonnes per year for 3 years, modelling results show that the plume extent will be approximately 500 m, with a maximum extent of 525 m. Preliminary plume modelling results are shown in Figure 5-8. The plume is expected to stop expanding within two years following the cessation of injection activities. The plume extent is expected to remain within the Project's operational lands. The plume is expected to remain present in perpetuity.

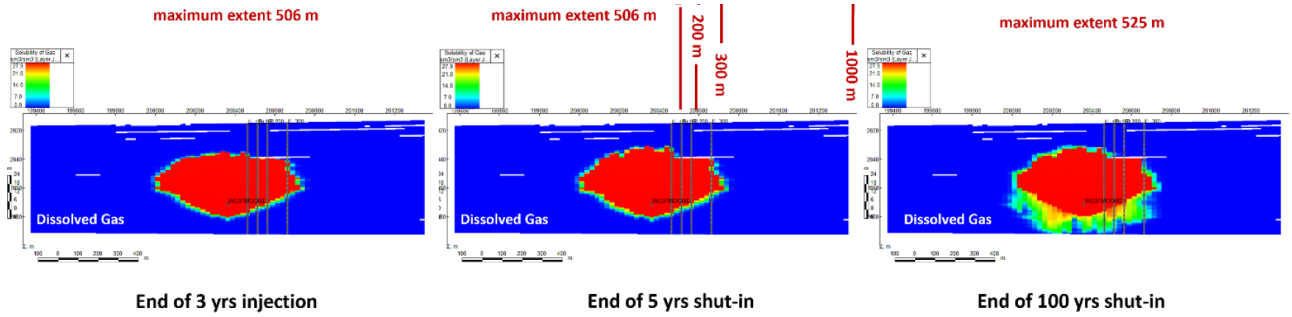


Figure 5-8 Plume extent at 3 years, 5 years and 100 years after shut-in based on preliminary modelling

A 1 m increase in groundwater pressure was adopted to define the limit of the affected zone as it is within the range of natural seasonal groundwater pressure fluctuations and represents the reasonable limit of precision that can be inferred from groundwater modelling. The groundwater pressure changes are anticipated to dissipate in the first 5 years following cessation of injection activities. Subsequently, modelling predicts no discernible change in the Precipice Sandstone groundwater pressure or groundwater levels surrounding the injection site. The test injection is predicted to not create a zone of increased pressure or changed groundwater levels in the overlying or underlying formations.

Geochemical modelling predicts that the GHG stream plume will be less dense than the Precipice Sandstone water and lower the pH of the groundwater to approximately pH 4. The plume will rise upwards from the lower Precipice Sandstone layer to the upper layer, reacting with calcite and feldspar minerals present within the upper Precipice Sandstone, including basic silicates (sodium and potassium), calcium, magnesium, magnesium iron carbonates, and silicates. The reactions will form bicarbonate ions that will react with salts to form solid carbonate minerals. The solid carbonate minerals will precipitate from the groundwater within the rock pores. The deposited carbonates will fill the rock pores of the upper Precipice Sandstone over time. This will reduce the porosity and permeability of the upper Precipice Sandstone, limiting the plume and groundwater movement. As a result, the upper Precipice Sandstone is predicted to become an effective reservoir seal between the lower Precipice Sandstone reservoir and the main Evergreen Formation reservoir seal.

Negligible mineral precipitation is predicted in the lower Precipice Sandstone. Hence, no significant changes to the porosity and permeability of the lower Precipice Sandstone are predicted. No pH or geochemical changes area expected outside the GHG plume.

5.6.5.2 PLUME MONITORING

During the three-year injection period, and for up to 2 years after injection ceases, monitoring of the injection well, Precipice Sandstone target reservoir, and other geological features in the area will be undertaken in accordance with a

Monitoring and Verification Plan (MVP), to be approved by the Department of Resources (DoR). The key objectives of the MVP are to:

- monitor plume movement within the Precipice Sandstone storage reservoir monitor to assess whether the GHG stream injected has behaved or is behaving as predicted (conformance monitoring); and
- detect if there is a risk of leakage, or leakage into other geological formations (leakage monitoring);
- obtain scientific data to demonstrate the performance of the predicted plume area and any associated impacts.

The main items of monitoring equipment to be or are constructed and installed in accordance with existing EPQ10 and EA conditions include:

- West Moonie-2 Monitoring Well, drilled in July 2021, as described in section 5.6.4.1;
- buried 2D seismic survey lines, scheduled for installation in 2023, surrounding the West Moonie-1 Injection Well to an approximate 4 km radius, allowing for seismic monitoring during and following the test injection, with monitoring every six months. The monitoring seismic will utilise the MicroVibe system to obtain seismic survey data. This system involves installing fixed signal source units and signal retrieval lines (also called seismic lines). The source units will emit a short duration (approximately 5 seconds) of ground-penetrating sound waves generated by a vibrating pad when a survey is required. Installation of the receiver lines will involve excavating a 0.1 m wide trench to a depth of 1 to 2 m. Unlike conventional seismic survey methods, the MicroVibe system does not require any clearance tracks. Receiver lines will be deviated to avoid mature trees, any cultural heritage sites, existing structures, and agricultural infrastructure. Topsoil will be left in place during trenching activities, and where possible, grassy areas and small shrubs will not be disturbed. The final locations of seismic lines are yet to be determined;
- a monitoring well drilled into the Gubberamunda Sandstone; and
- a shallow monitoring well installed in 2021 to 48 m below ground level into the shallow Griman Creek formation.

Figure 5-9 shows how the MVP has been designed to capture data from the surface and deep geological formations and monitor the vertical and lateral plume extent within the Precipice Sandstone reservoir.

Details of the MVP will be prepared in accordance with legislative requirements, as outlined in section 3, and also documented in the EIS. The MVP will address:

- monitoring measures to be undertaken in relation to the monitoring equipment installed or to be installed at the injection well site;
- frequency of the various types of monitoring;
- sampling and analysis of parameters and methods used;
- triggers that determine whether or not injection activities are temporarily halted, monitored in greater detail, or ceased during the scheduled three-year injection period; and
- measures of performance to determine the observed outcomes of the test injection compared to model predictions and recognised statistical measures.

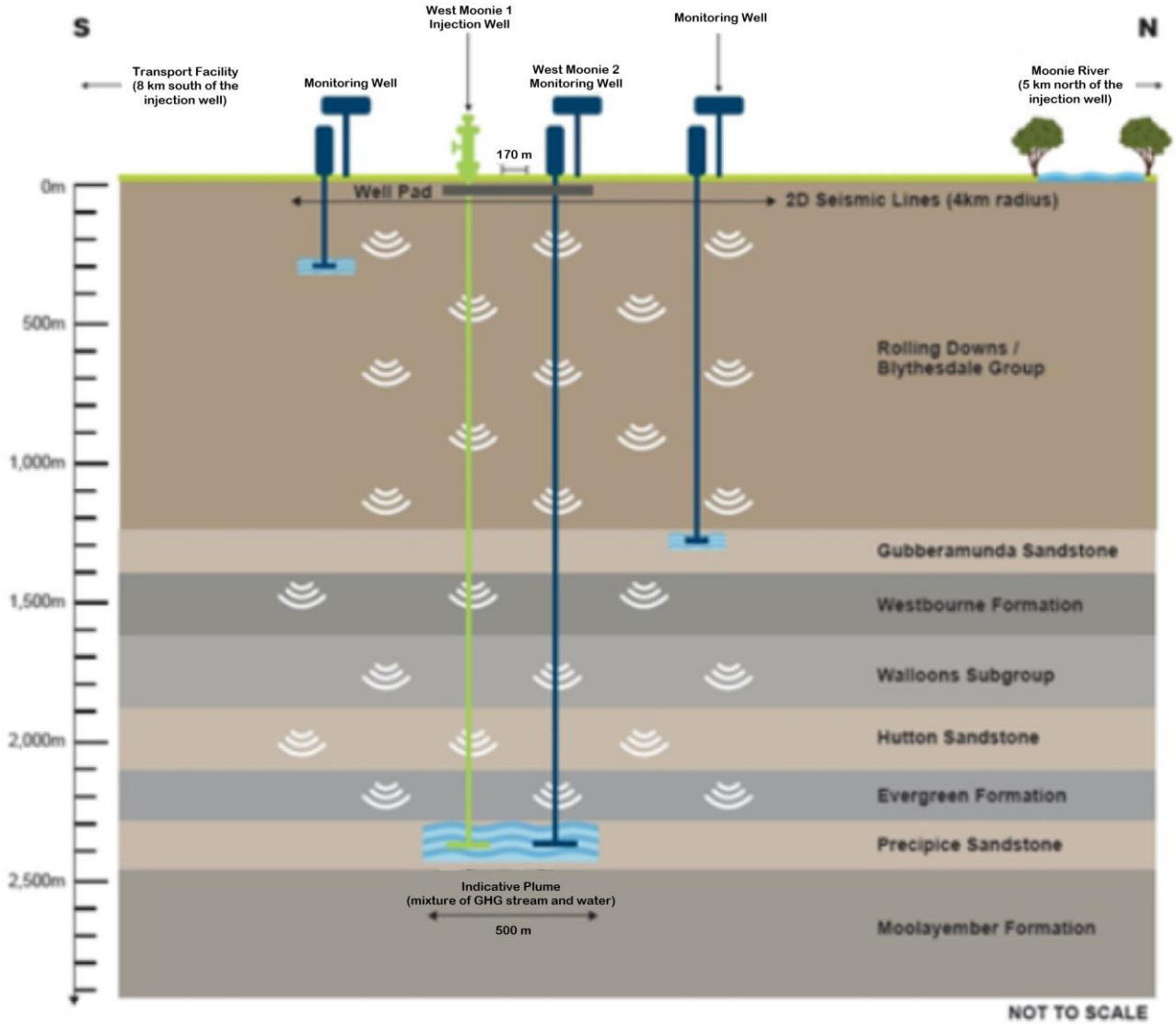


Figure 5-9 Monitoring and verification of indicative plume

5.6.6 Workforce

Construction of the Transport Facility and Flowline is anticipated to involve approximately 30 full-time equivalent (FTE) persons in-field, with up to 10 office-based technical persons. Accommodation of the construction workforce is anticipated to be housed in the existing local accommodation options in Moonie, St George, Dalby, and Goondiwindi.

Note that drilling of wells and installation of seismic equipment is not included in the construction workforce numbers, as these activities have been or will be undertaken under the current conditions of EPQ10 and the EA.

Operation of the Transport Facility and Test Injection Site is anticipated to involve up to five FTE persons in-field, being mostly locally based truck drivers delivering the GHG stream or other materials to the Transport Facility. Up to four office-based technical persons are anticipated, mostly associated with the remote monitoring and operations of equipment from Brisbane.

5.6.7 Rehabilitation

The findings of the Project will determine whether or not the Project is:

- immediately plugged, abandoned and rehabilitated following completion of the five-year period, or
- suspended and shut-in for future development, subject to further approvals.

Regardless of timeframe, final rehabilitation will be in accordance with EPQ10 conditions, EA conditions and legislative requirements, including the "*Code of Practice for the construction and abandonment of coal seam gas and petroleum wells and associated bores in Queensland*" (DNRME, 2018) or later version thereof.

Pursuant to the GHG Act, s.31, given the temporary nature of all structures in the Transport Facility, all structures will be removed from the area, with the operational lands rehabilitated to pasture consistent with the surrounding paddock.

5.7 Project Alternatives Considered

CTSCo previously held EPQ7 in the northern Surat Basin. At the preferred development site 16 km west of Wandoan township, CTSCo conducted extensive studies of the viability of a CCS test injection between 2009 and 2019, including the drilling of the West Wandoan-1 well to a depth of 1,293 m below surface into the Moolayember Formation, and the acquisition of the Glenhaven 3D Seismic Survey. The characteristics of the site included:

- the target reservoir for GHG stream storage was a shallower section of the Precipice Sandstone aquifer at approximately 1,200 m below surface;
- potable water quality of the Precipice Sandstone aquifer with useable environmental values for irrigation, stock and domestic use;
- existing industry and community bores draw water from the Precipice Sandstone aquifer for agriculture and community use, including the drinking water supply of Wandoan township; and
- potential for community opposition to CCS at this location due to the potable water drawn from the Precipice Sandstone aquifer.

Following a review of the Project within EPQ7, and in close consultation with DoR, CTSCo ceased activities in EPQ7, and in 2019 fully relinquished EPQ7.

6. Environmental, Social and Economic Values

Pursuant to the EP Act, s. 8, the following section provides a brief overview of the existing environmental, social and economic values associated with the Project, including potential adverse impacts or benefits, and the mitigation measures. Further details of values, impacts and mitigation measures will be provided in the EIS.

6.1 Climate

The climate of the operational lands is typical for southern Queensland, with rainfall predominately falling in summer months, with temperatures ranging from 45°C in summer and -2°C in winter, averaging 21°C.

Risks on and due to the Project associated with climate, climate change and greenhouse gases will be assessed in accordance with relevant DES guidelines, including "*Climate – EIS information guideline*" (2020), "*Air – EIS information guideline*" (2020), and if relevant the *National Greenhouse and Energy Reporting Act 2007*, and *Carbon Credits (Carbon Farming Initiative) Act 2011*, and the associated regulations.

6.2 Land

Further to sections 2.1 and 5.4, and Figures 5-2 and 5-4, the general locality of the Project is rural, typically dominated by cattle grazing on improved pastures, forestry, and national parks. The majority of the Project site is located on land that has been historically cleared for agricultural purposes.

Topographically, the operational lands are flat to gently undulating with Stephens Creek occurring within the Project operational lands, and the Moonie River located at the northern extent of the operational lands. The Moonie River catchment is part of the Barwon River catchment, which is part of the Murray-Darling Basin.

There is limited visual amenity or lookouts across the operational lands due to the flat topography.

Geology of the Project area is consistent with the southern extent of the Surat Basin. Further details on Project associated geology are given in section 5.6.4. Soils are gilgai, which are repeated mounds and depressions formed on shrink-swell and cracking clay soils (or vertosols), where water can accumulate seasonally in the depressions.

Stock routes exist within the broader landscape, as shown in Figure 5-4.

The operational lands as they relate to the *Regional Planning Interests Act 2014* (RPI Act), are not mapped as priority agricultural areas or priority living areas. Strategic cropping land is mapped as part of the operational lands. The impact on strategic cropping land will be further examined as part of the EIS.

No subsidence is apparent on the operational lands, and historic land uses indicate no likelihood of subsidence.

None of the operational lands are listed on the environmental or contaminated land registers.

The operational lands are within the Bigambul Native Title Aboriginal Corporation determination area. However, based on initial investigations, none of the operational lands are subject to native title. Potential impacts on native title will be investigated as part of the EIS.

6.3 Rehabilitation

The rehabilitation strategy will be as described in section 5.6.7.

6.4 Water

6.4.1 Surface Water

The Moonie River, Stephens Creek and South Branch Stephens Creek are within or immediately adjacent to operational lands of the Project, as shown in Figure 6-1.

Stephens Creek and South Branch Stephens Creek are ephemeral, draining into the Moonie River several kilometres to the west of the Project's operational lands. Sections of both the watercourses have mapped boundaries.

Extraction from, taking of, interference with or discharge to surface waters from operational lands or land adjoining operational lands are not proposed for the Project. Any activities associated with the crossing of watercourses would be undertaken at existing crossings or be conducted during dry conditions.

Outside of major rainfall events creating saturated alluviums, groundwater does not appear to provide baseflows to surface watercourses in the vicinity of the Project. Direct interconnection with deeper aquifers such as the Gubberamunda, Springbok, Hutton and Precipice is not apparent during appraisal activities, with further details to be provided in the EIS.

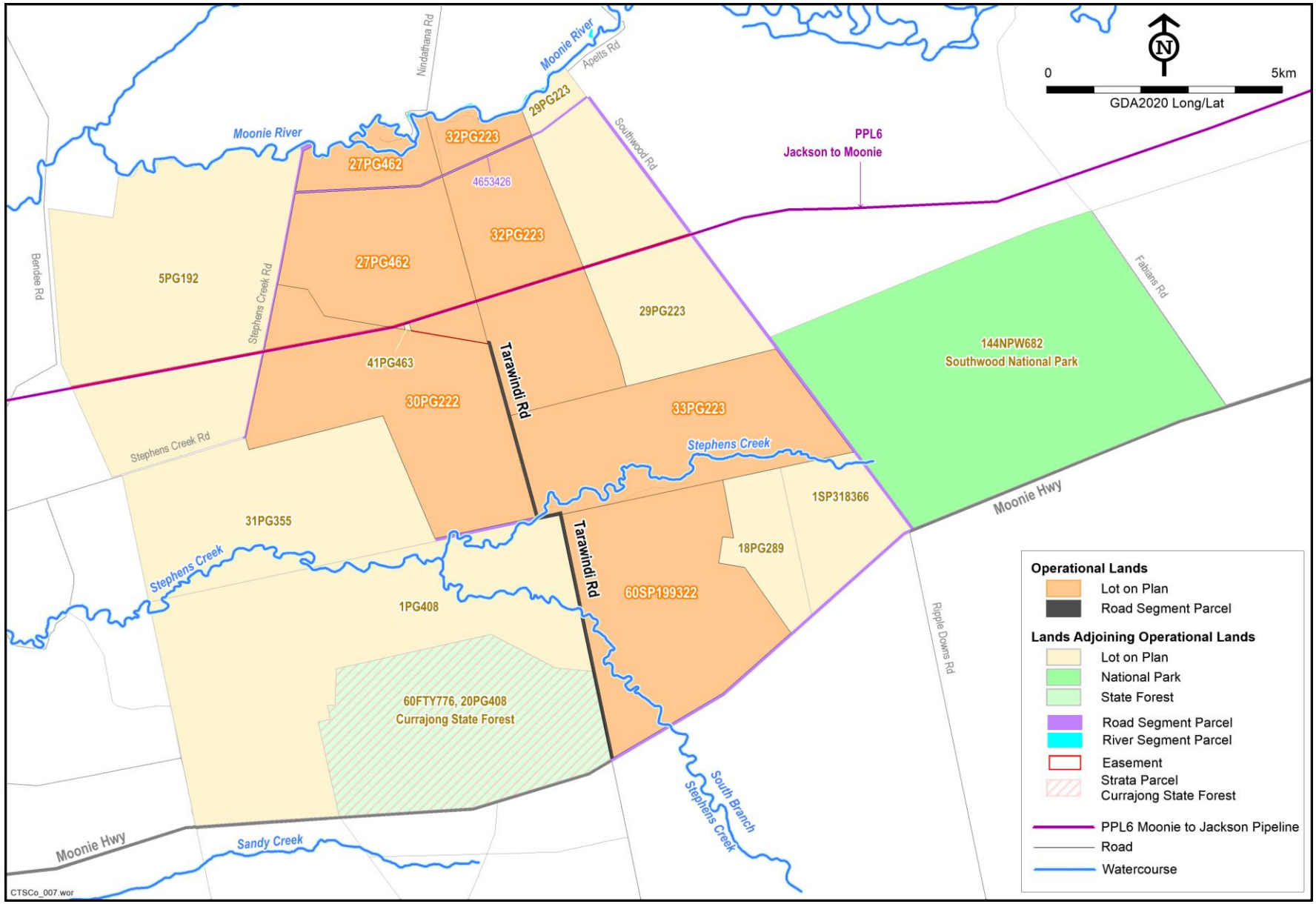


Figure 6-1 Watercourses of Project Operational Lands

6.4.2 Groundwater

Further to section 5.6.4.2, groundwater associated with the target reservoir in the lower Precipice Sandstone aquifer was sampled in November 2020 and July 2021, with water samples tested in accordance with the relevant NATA certified standards. Key water quality parameters from the July 2021 samples are summarised in Table 6-1.

Table 6-1 Summary of key water quality parameters from West Moonie-1 Test Injection Well, July 2021

Parameter	Units	Sample Result
pH	pH units	8.35
Electrical Conductivity (EC)	µS/cm	2,920
Total Dissolved Solids	mg/L	1,850
Dissolved Oxygen	mg/L	2.1
Ammonia	mg/L	0.70
Nitrate	mg/L	<0.01
Sodium	mg/L	611
Potassium	mg/L	150
Calcium	mg/L	6
Magnesium	mg/L	1
Chloride	mg/L	318
Sulphate	mg/L	8
Total Alkalinity	mg/L	1,080
Boron	mg/L	0.73
Fluoride	mg/L	6.3
Iron	mg/L	2.78
Manganese	mg/L	0.049

Water quality of the Precipice Sandstone aquifer sampled from the region surrounding the Project by the University of Queensland as part studies for ANLEC R&D (Rodger et al, ongoing 2022), compared to the water quality from the of West Moonie-1 Test Injection Well, indicates that groundwater quality parameters align with concentrations observed for the Precipice Sandstone across the south of the basin.

The West Moonie-1 Test Injection Well is located within the Moonie and Border Rivers drainage basin. Environmental values for this area are set out in the "*Environmental Protection (Water and Wetland Biodiversity) Policy 2019, Queensland Murray-Darling and Bulloo River Basins, Groundwater Environmental Values and Water Quality Objectives*" (DES, 2020). The Precipice Sandstone aquifer where the GHG stream is proposed for injection is within the Eastern Central Area of the Basal Zone of the Great Artesian Basin. The environmental values attributed to this zone are:

- aquatic ecosystems;
- water supply:
  - irrigation
  - farm supply / use
  - stock water
  - drinking water
  - industrial use
- cultural, spiritual and ceremonial values.

Water sampled from the Precipice Sandstone aquifer at the West Moonie-1 Test Injection Well indicates that the natural water quality is inconsistent with the environmental values and water quality objectives of the basin. The natural existing groundwater quality compared to water quality objectives for:

- aquatic ecosystems are more saline and alkaline, with high concentrations of sodium and chloride;

- irrigation and farm supply/use has high concentrations of sodium, chloride, fluoride, boron and iron;
- stock water shows high fluoride concentrations which are unsuitable for stock consumption;
- drinking water (for human consumption) has high concentrations of total dissolved solids and sodium; and
- cultural, spiritual and ceremonial values, indicates that the Precipice Sandstone aquifer in the Project area is not connected to any GDEs or waterways.

The depth of the Precipice Sandstone aquifer is also a limiting factor for most users, as shallower aquifers such as the Gubberamunda have better water quality and are preferentially accessed.

With consideration of the *Water Act 2000*, the Project:

- does not propose to extract or take groundwater;
- does not propose to affect recharge to aquifers of the Great Artesian Basin.

The EIS will provide further details and assessment of groundwater associated with the Project.

6.5 Flooding and Regulated Structures

The "Western Downs Planning Scheme" (WDRC, 2019) flood overlay mapping shows that the Project area and surrounds are mapped as potential flood hazard area for the 1% AEP (1 in 100 year) flood event as shown in Figure 6-2. The West Moonie-1 Test Injection Well site, and approximately 80% of the Flowline route are located within the potential flood hazard area. The Transport Facility is located outside of the potential flood hazard area.

The Project does not propose to construct any regulated structures, nor modify any existing regulated structures, such as dams or levees.

Flooding impacts and regulated structures will be discussed further in the EIS.

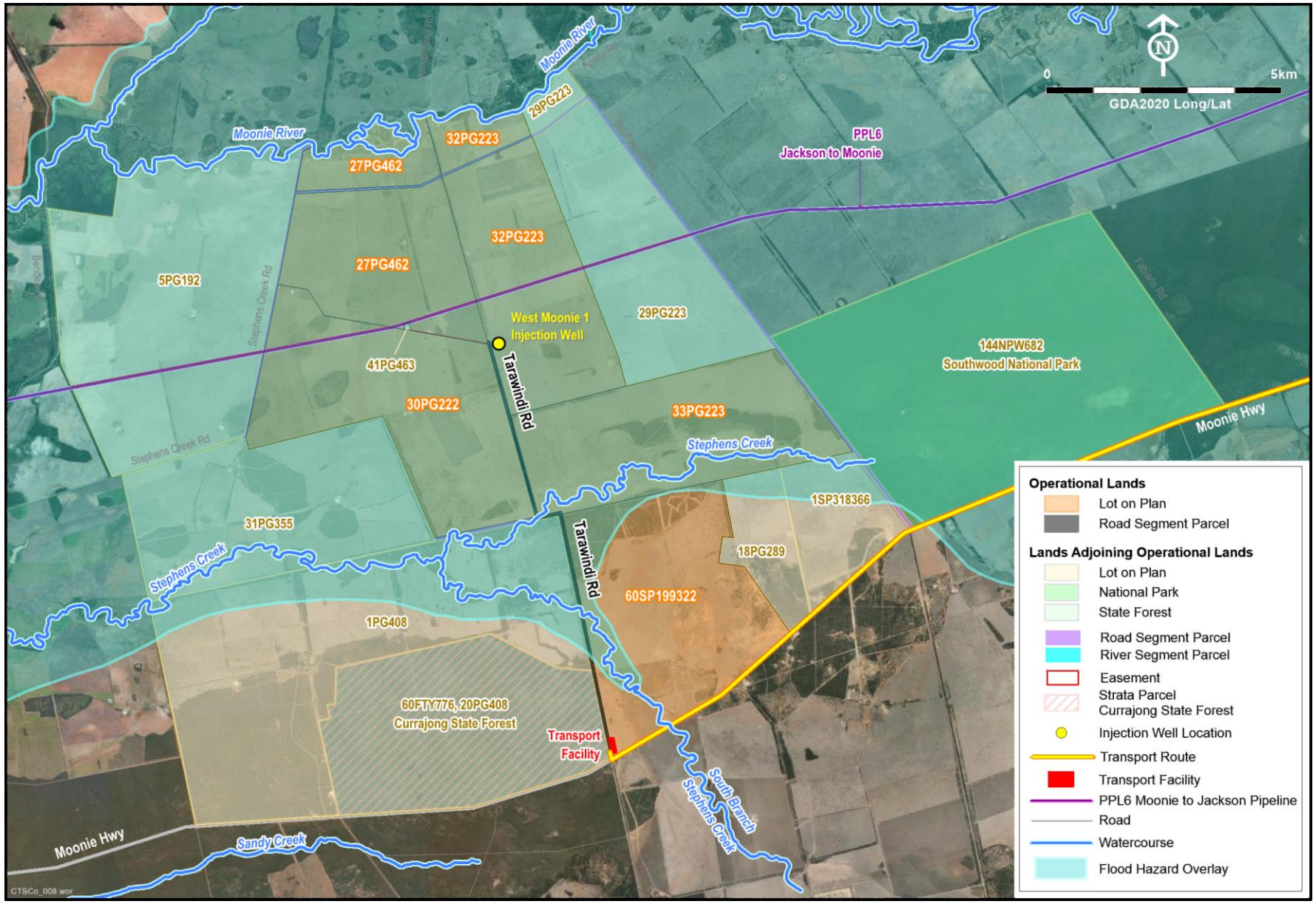


Figure 6-2 Western Downs Planning Scheme 1% AEP Flood Hazard Overlay Mapping of the Project Area

6.6 Flora and Fauna

Further to sections 1 and 3, flora and fauna associated with the Project have been subject to ecological field assessments for both terrestrial and aquatic ecology. Reporting of the ecological studies will be provided as part of the EIS. Summaries of findings are provided below.

6.6.1 Terrestrial Ecology

EPQ10 is located within the southern Brigalow Belt Bioregion, which is characterised by brigalow (*Acacia harpophylla*) that forms forests or woodlands on clay soils. The Project area is within the Moonie River – Commoron Creek Floodout sub-region. Field surveys in April 2021 determined that three regional ecosystems were present in the study area, as summarised in Table 6-2 and shown in Figure 6-3. The disturbance area is not anticipated to impact upon any remnant vegetation.

Most of the study area has been historically cleared for agriculture. Buffel grass (*Cenchrus ciliaris*) dominates the landscape, with other weeds including African Lovegrass (*Eragrotis curvula*), Guinea Grass (*Megathyrsus maximus*) and Red Natal Grass (*Melins repens*). Pest animals are also present in the study area, including feral cats, rabbits, brown hares, house mouse, European red fox, common myna and wild dogs.

Habitat for specific listed flora and fauna species under the *Nature Conservation Act 1992* has been identified in the Project's study area, including potential habitat of Squatter Pigeon (southern) (*Geophaps scripta scripta*), Koala (Phascolarctos cinereus), and Latham's Snipe (*Gallinago hardwickii*).

Table 6-2 Field verified Regional Ecosystems in the Project Study Area

Regional Ecosystem	VM Act Status	Description	Recorded in Study Area?
11.3.17	Of Concern	*Eucalyptus populnea woodland* with *Acacia harpophylla* and/or *Casuarina cristata* on alluvial plains	Yes, mapped along Stephen's Creek, but not present in the Tarawindi Road road reserve disturbance area
11.4.3	Endangered	*Acacia harpophylla* and/or *Casuarina cristata* shrubby open forest on Cainozoic clay plains	Yes, mapped in small patches near the disturbance area within the study area and in Tarawindi Road road reserve
11.5.1	Least Concern	*Eucalyptus crebra* and/or *E. populnea*, *Callitris glaucophylla*, *Angophora leiocarpa*, *Allocasuarina luehmannii* woodland on Cainozoic sand plains and/or remnant surfaces	Yes, mapped in the study area in Tarawindi Road road reserve near the disturbance area, including high value regrowth

As shown in Figures 5-2 and 6-3, the Currajong State Forest, located on land adjoining the operational lands the west of the Project, and Southwood National Park located on land adjoining the operational lands the east of the Project are respectively listed and managed under the *Forestry Act 1959* and Forestry (State Forests) Regulation 1987; and the *Nature Conservation Act 1992* and Nature Conservation (Protected Areas) Regulation 1994. The Project does not propose to enter or disturb either of these listed areas or change the current level of connectivity between these areas and the habitat they provide in the broader landscape.

As stated in section 3, the Project was referred to the Australian Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act)(Cth), to determine whether or not the Project is considered a controlled action. On 9 February 2022, the authorised person of the Australian Government gave notice of their decision that the Project is not a controlled action under the EPBC Act, s.75 (EPBC 2021/9122).

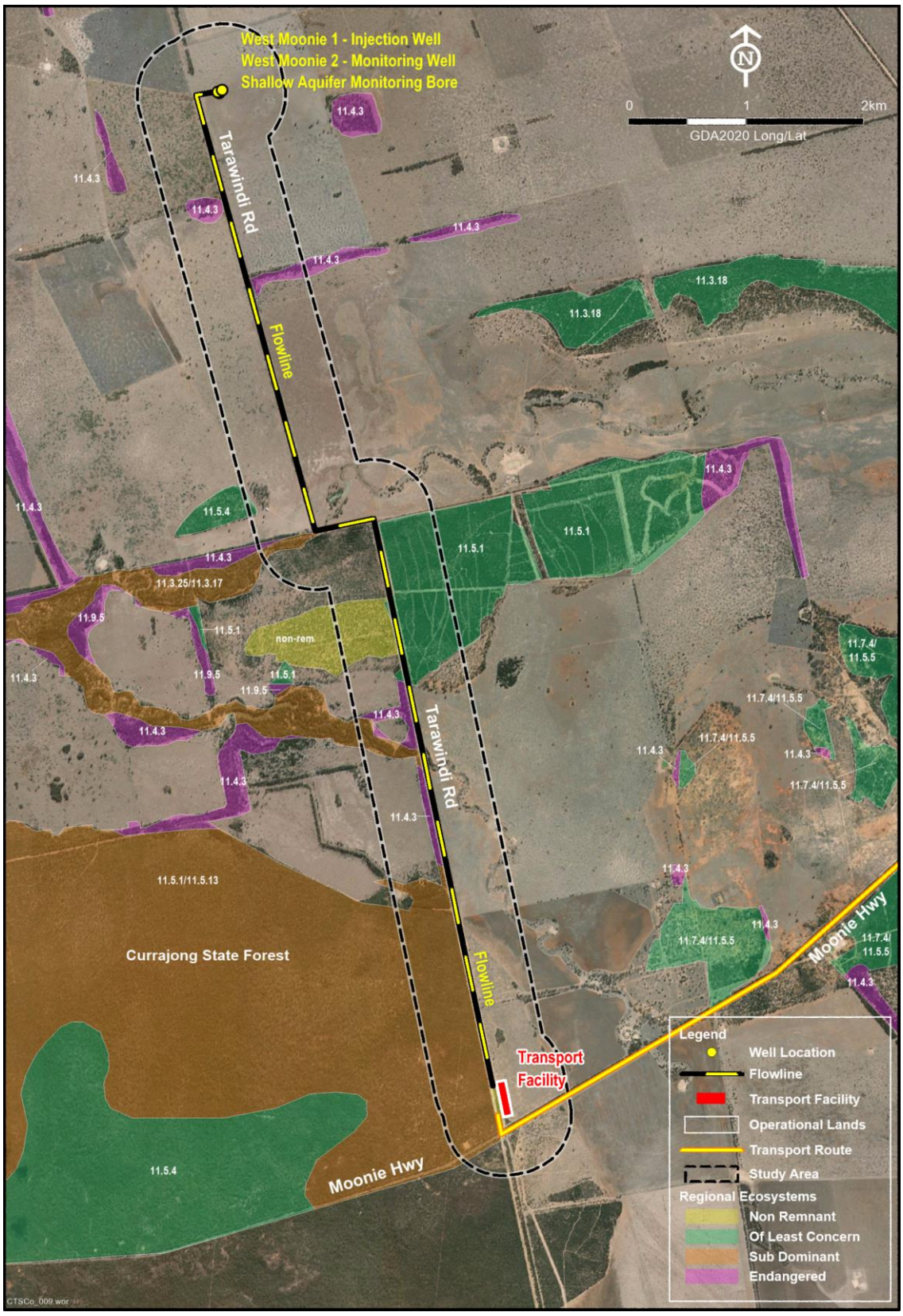


Figure 6-3 Field verified Regional Ecosystems in the Project Study Area

6.6.2 Aquatic Ecology

In the Project's study area, a summary of the aquatic ecology and biodiversity considerations and potential for stygofauna indicate:

- there are no declared fish habitat areas in or near the Project;
- the Moonie River is classified as having major importance for fish passage, while Stephen's Creek and the Southern Branch Stephen's Creek are mapped having moderate importance for fish passage;
- there are no aquatic species that are listed as threatened, vulnerable or endangered under the Nature Conservation (Animals) Regulation 2020;
- there are no mapped High Ecological Value (HEV) waterways or wetlands pursuant to the Environmental Protection (Water and Wetlands Biodiversity) Policy 2019;
- there are no High Ecological Significance (HES) wetlands pursuant to the State Planning Policy;
- wetlands of General Environmental Significance that are not matters of state environmental significance include:
  - small patches of riverine, lacustrine and palustrine wetlands along the Moonie River, north of the Project's study area
  - several lacustrine wetlands along Stephen's Creek
  - a palustrine wetland in land adjoining operational lands
- the Moonie River, Stephen's Creek and Southern Branch Stephen's Creek do not have flow regimes dependent on groundwater discharge to the watercourses, therefore are unlikely to have groundwater dependent ecosystems (GDEs); and
- stygofauna associated with the Precipice Sandstone in the Project area are unlikely due to the temperature and pressure of the aquifer. The closest Precipice Sandstone aquifer GDEs occur over 240 km to the north of the Project area.

6.7 Coastal Environment

The Project is not located in a coastal catchment of Queensland, and therefore no impacts upon Queensland's coastal environment are anticipated.

6.8 Air Quality

Air quality of the operational lands is typical of a rural environment in southern Queensland.

The closest sensitive receptor, being a dwelling (house), is approximately 1.3 km away from the Project construction and operational activities within EPQ10. Within a 5 km radius of the Project within EPQ10, there are a total of five sensitive receptors (dwellings) present.

Construction and operational impacts are likely to be negligible based on the small Project disturbance area, and during operations, most activities will be conducted on hardstand or sealed surfaces with little to no dust generated.

6.9 Noise and Vibration

Noise and vibration of the operational lands is typical of a rural environment in southern Queensland, with the main source of noise being traffic on the Moonie Highway.

The closest sensitive receptor, being a dwelling (house), is approximately 1.3 km away from the Project construction and operational activities within EPQ10. Within a 5 km radius of the Project within EPQ10, there are a total of five sensitive receptors (dwellings) present.

Construction and operational noise and vibration impacts are likely to be negligible based on the small Project disturbance area. Construction activities would be during daylight hours only. During operations, most activities will

be conducted on hardstand or sealed surfaces, and any noise generating equipment such as pumps, located in pump houses that include acoustic insulation.

6.10 Waste Management

6.10.1 Regulatory framework of waste products

The Environmental Protection Regulation 2019, s.41 places certain limitations on direct release of waste to groundwater. As part of the EIS processes and other approvals processes, CTSCo will identify the relationship between the GHG streams and any waste streams in the context of the regulatory framework under the EP Act, EP Reg and WRR Act, and the relationship of GHG streams and waste.

6.10.2 General and construction waste management

Small amounts of general municipal waste and construction wastes will be generated during construction activities within EPQ10. Minor volumes of general municipal waste are anticipated to be generated during operations. Both construction and operational solid wastes will be removed from site to existing third-party licenced waste facilities for reuse, recycling or disposal.

6.10.3 Sewage treatment

A small sewage treatment unit will be installed at the Transport Facility to manage sewage generated at the site facilities. Sizing of the treatment unit will be 21 equivalent persons (EPs) or less, which is consistent with the existing EA condition 55.

6.11 Hazards and Safety

The potential hazards and safety risks of the Project will be addressed in the EIS in accordance with, but not limited to, the requirements of the:

- *Greenhouse Gas Storage Act 2009* and Greenhouse Gas Storage Regulation 2021;
- Petroleum and Gas (Safety) Regulation 2018 where it relates to the GHG Act and regulation, and overlapping tenements;
- *Biosecurity Act 2014* in relation to weed and pest management;
- *Environmental Protection Act 1994* and associated regulations and policies in relation to EA conditions;
- *Minerals and Energy Resources (Common Provisions) Act 2014* in relation to landowner matters;
- *Nature Conservation Act 1992* and associated regulations in relation to listed wildlife and plant species, and areas;
- *Transport Operations (Road Use Management) Act 1995* and associated regulations and codes in relation to the transport of the GHG stream and other materials during construction and/or operations;
- *Work Health and Safety Act 2011* and regulations for safety matters outside the scope of the GHG Act, GHG Regulation and P&G (Safety) Regulation;
- relevant Australian Standards;
- relevant codes, such as the *"Code of Practice for the construction and abandonment of coal seam gas and petroleum wells and associated bores in Queensland"*, and the *"Australian Dangerous Goods Code*";
- relevant safety data sheets (SDSs) for materials and substances held on site for the Project;
- international standards where appropriate; and
- Queensland Government's *State Planning Policy* (July 2017) (DILGP, 2017) including relevant state interest policies such as those relating to bushfires and other natural catastrophic events.

6.12 Cultural Heritage

Aboriginal cultural heritage will be addressed in accordance with the *Aboriginal Cultural Heritage Act 2000*, and non-Indigenous cultural heritage addressed under the *Queensland Heritage Act 1992*.

The Bigambul Native Title Aboriginal Corporation (BNTAC) represent the traditional owners associated with the Project site, and engagement with the BNTAC is ongoing for the development of a cultural heritage management plan (CHMP).

The majority, if not all, of the Project site has been historically disturbed by agricultural activities, so the potential for new impacts by the Project on cultural heritage are considered low.

6.13 Social

As described in section 5.6.6 the workforce for the Project during construction is anticipated to be approximately 30 full-time equivalent (FTE) persons in-field, with up to 10 office-based technical persons. Accommodation of the construction workforce is anticipated to be housed in the existing local accommodation options in Moonie, St George, Dalby, or Goondiwindi which will provide a beneficial impact for local accommodation providers.

Operation of the Transport Facility and Test Injection Site is anticipated to involve up five FTE persons in-field, being mostly locally based truck drivers delivering the GHG stream or other materials to the Transport Facility. The work will provide certainty of work for contractors and a beneficial impact for these persons.

As described in sections 6.7 and 6.8, within a 5 km radius of the Project within EPQ10, there are a total of five sensitive receptors (dwellings) present.

Potential social impacts will be addressed further in the EIS in accordance with the Department of State Development, Infrastructure, Local Government and Planning's *"Social Impact Assessment Guideline, March 2018",* and the *Strong and Sustainable Resource Communities Act 2017.*

For the Project, CTSCo 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.

6.14 Economic

The potential adverse and beneficial economic impacts will be explored in the EIS, with particular focus on local and regional areas, Queensland, and more broadly.

For Project activities on the operational lands, as outlined in sections 3, 4.3, 5.4 and 5.6.4, landowners are compensated via Conduct and Compensation Agreement (CCA) processes, which consider impacts on the agricultural, recreational or commercial activities of the landowners.

6.15 Transport

Transport requirements associated with the Project during construction and operation, and the workforce are outlined in sections 5.6.1, 5.6.2 and 5.6.6.

Due to the low numbers of anticipated vehicle movements for construction and operation, negligible potential impacts on the traffic network are envisaged. Depending upon reviews of traffic movements during the course of EIS assessments, improvements to the Moonie Highway – Tarawindi Road intersection will be examined.

Transport and traffic requirements for decommissioning activities will be similar to construction activities.

7. Reference and Data Sources

AccountAbility, 2015, "*AA1000 Stakeholder Engagement Standard*" (AA1000SES), source link: https://www.accountability.org/standards/

Commonwealth of Australia, 2021a, "*Australia's Long-Term Emissions Reduction Plan, A whole-of-economy Plan to achieve net zero emissions by 2050*", source link: https://www.industry.gov.au/sites/default/files/October%202021/document/australias-long-term-emissions-reduction-plan.pdf

Commonwealth of Australia, 2021b, "*Australia's Long-Term Emissions Reduction Plan: Modelling and Analysis*", source link: https://www.industry.gov.au/sites/default/files/November%202021/document/australias-long-term-emissions-reduction-plan-modelling.pdf

Bradshaw, B.E, Lynton K.S, Lahtinen, A, Khider, K, Ryan, D.E, Colwell, J.B, Chirinos A, Bradshaw, J, Draper, J.J, Hodgkinson, J, and McKillop, M, 2011, "*An assessment of Queensland's CO2 geological storage prospectivity — the Queensland CO2 Geological Storage Atlas*", published in Energy Procedia 4 (2011) 4583-4590.

Chevron Australia, 2021, "*Fact Sheet: Gorgon Carbon Capture and Storage*", source link: https://australia.chevron.com/-/media/australia/publications/documents/gorgon-carbon-capture-and-storage--fact-sheet.pdf

CO2CRC, 2022, "*Who is CO2CRC*", source link: https://co2crc.com.au/

Department of Environment and Heritage Protection, 2017, "*Pathways to a clean growth economy, Queensland Climate Transition Strategy*", source link: https://www.qld.gov.au/__data/assets/pdf_file/0026/67283/qld-climate-transition-strategy.pdf

Department of Environment and Science, 2020, "*Environmental Protection (Water and Wetland Biodiversity) Policy 2019, Queensland Murray-Darling and Bulloo River Basins, Groundwater Environmental Values and Water Quality Objectives*", source link: https://environment.des.qld.gov.au/__data/assets/pdf_file/0019/214228/Qld-Murray-Darling-basin-Bulloo-River-basin.pdf#:~:text=Queensland%20Murray-Darling%20and%20Bulloo%20River%20basins%20Groundwater%20Environmental,Wetland%20Biodiversity%5D%29%2C%20which%20is%20subordinate%20legislation%20under%20the

Department of Industry, Science, Energy and Resources (DISER), 2021, "*Low Emissions Technology Statement 2021*", source link: https://www.industry.gov.au/sites/default/files/November%202021/document/low-emissions-technology-statement-2021.pdf

Department of Infrastructure, Local Government and Planning (DILGP), 2017, "*State Planning Policy, July 2017*", source link: https://dsdmipprd.blob.core.windows.net/general/spp-july-2017.pdf

Department of State Development, Infrastructure, Local Government and Planning, 2018 "*Social Impact Assessment Guideline, March 2018*", source link: https://www.statedevelopment.qld.gov.au/__data/assets/pdf_file/0017/17405/social-impact-assessment-guideline.pdf

Glencore plc, 2022, "Sustainability, Climate change", source link: https://www.glencore.com/sustainability/esg-a-z/climate-change

Global CCS Institute, 2021, "*The Global Status of CCS: 2021*", source link: https://www.globalccsinstitute.com/resources/global-status-report/

Intergen, 2022, "Millmerran", source link: https://www.intergen.com/our-assets/millmerran/

International Association for Public Participation Australasia (IAP2), 2015, "*Quality Assurance Standard for Community and Stakeholder Engagement*", source link: https://iap2.org.au/wp-content/uploads/2019/07/IAP2_Quality_Assurance_Standard_2015.pdf

International Energy Agency (IEA), May 2021, "*Net Zero by 2050 A Roadmap for the Global Energy Sector*", source link: https://iea.blob.core.windows.net/assets/4719e321-6d3d-41a2-bd6b-461ad2f850a8/NetZeroby2050-ARoadmapfortheGlobalEnergySector.pdf

Next Generation Engagement, October 2019, "*Infrastructure Engagement Excellence Framework: A Framework for Optimal Community and Project Outcomes*", source link: http://www.nextgenengagement.org/wp-content/uploads/2019/10/NextGen_Infrastructure_Engagement_Excellence_Framework_Executive_Summary_draft_as_at_31_Oct_2019.pdf

Office of Groundwater Impact Assessment (OGIA), 2019, Groundwater Modelling Report, Surat Cumulative Management Area, October 2019, source link: https://www.resources.qld.gov.au/__data/assets/pdf_file/0008/1460627/groundwater-modelling-report-surat-cma.pdf

Rodger, I, Pearce, JK, Hofmann, H, Golding, SD, and Hayes, P, ongoing 2022, "*Regional hydrogeology of the southern Surat Basin*" project (7-0918-C316), published by University of Queensland for Australian National Low Emissions Coal Research & Development (ANLEC R&D), source link: https://anlecrd.com.au/projects/regional-hydrogeology-of-the-southern-surat-basin/

SaskPower, July 15 2021, "*BD3 Status Update: June 2021*", source link: https://www.saskpower.com/about-us/our-company/blog/2021/bd3-status-update-june-2021

Western Downs Regional Council (WDRC), 2019, "*Western Downs Planning Scheme 2017 incorporating Amendment 1*", source link: https://www.wdrc.qld.gov.au/doing-business/planning-development/western-downs-planning-scheme-2017/

8. Glossary, Acronyms and Abbreviations

Term	Definition
AEP	Annual exceedance probability
ANLEC R&D	Australian National Low Emissions Coal Research & Development (ANLEC R&D)
CCS	Carbon Capture and Storage
CCUS	Carbon Capture Utilisation and Storage
CO_2	carbon dioxide
CO2CRC	The Cooperative Research Centre for carbon capture, utilisation and storage (CO2CRC Limited)
CTSCo	Carbon Transport and Storage Corporation Pty Limited
DAWE	Department of Agriculture, Water and Environment (Commonwealth)
DES	Department of Environment and Science
DISER	Department of Industry, Science, Energy and Resources (Commonwealth)
DoR	Department of Resources
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
DTMR	Department of Transport and Main Roads
EA	Environmental Authority
EIS	Environmental Impact Statement
EP Act	*Environmental Protection Act 1994*
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Commonwealth)
EP Reg	Environmental Protection Regulation 2019
EPQ	Exploration permit for greenhouse gas
IAS	Initial Advice Statement
IEA	International Energy Agency
FID	Final Investment Decision
GDE	Groundwater Dependent Ecosystem
GHG	Greenhouse Gas/es
Hub	a centre of an activity, region or network, with specific reference to CCS
IPCC	Intergovernmental Panel on Climate Change
LETA	Low Emission Technology Australia
MPP	Millmerran Power Partners
MPS	Millmerran Power Station
PCC	Post Combustion Capture
SBCCS	Surat Basin Carbon Capture and Storage Project
ToR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
WDRC	Western Downs Regional Council
WRR Act	*Waste Reduction and Recycling Act 2011*

CTSCo

Carbon Transport & Storage

A GLENCORE Company

160 Ann Street · Brisbane · QLD 4000 · Australia
Tel 1300 119 786 · Web www.ctsco.com.au

Carbon Transport and Storage Corporation (CTSCo) Pty Limited ABN 12 143 012 971