



QUEENSLAND
FARMERS'
FEDERATION

Senate Inquiry Glencore's proposed carbon capture and storage project

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The united voice of
Queensland agriculture

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This submission is provided to:

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Our members

- Canegrowers
- Cotton Australia
- Queensland Fruit & Vegetable Growers
- Nursery & Garden Industry Queensland
- eastAUSmilk
- Australian Cane Farmers Association
- Queensland United Egg Producers
- Turf Queensland
- Queensland Chicken Meat Council
- Pork Queensland
- Bundaberg Regional Irrigators Group
- Burdekin River Irrigation Area
- Central Downs Irrigators Ltd
- Fairburn Irrigation Network
- Mallowa Irrigation
- Pioneer Valley Water Co-operative Ltd
- Theodore Water Pty Ltd
- Eton Irrigation
- Queensland Oyster Growers Association
- Lockyer Water Users Forum

About the Queensland Farmers' Federation



The Queensland Farmers' Federation (QFF) is the united voice of agriculture in Queensland.

We are a member-based organisation representing the interests of peak agriculture industry organisations (both state and national). Through our members, QFF represents more than 13,000 primary producers across the cotton, cane, horticulture, dairy, nursery and garden, poultry, pork, and intensive animal industries.

We unite the sector to engage in a broad range of economic, social, environmental, and regional issues through advocacy, policy development, and project activity. We work with the government of the day on behalf of industry, farmers, and the community to provide powerful representation and contribution to the policy direction, sustainability, and future growth of Queensland's agriculture sector.

Our Council of member representatives and policy committees set the strategic priorities for policy development and advocacy, while our Executive Board ensures our corporate governance.

QFF draws on the expertise and industry knowledge of our members, and through our commitment to collaboration and considered policy development, we lead Queensland's agriculture sector towards a strong future, ensuring our members are ahead of the game and have a voice at the table on the issues that matter to their members.

Submission

Thank you for the opportunity to make a submission into this inquiry. Queensland Farmers' Federation along with many other organisations stand strenuously opposed to Glencore's carbon capture and storage (CCS) project which proposed to inject liquid CO₂ waste into the Great Artesian Basin. The Great Artesian Basin (GAB) is one of the largest underground freshwater resources in the world. It generates approximately \$13 billion in value to the national economy every year and is a vital resource for 180,000 people, 7,600 businesses and 120 towns.

This natural resource is not only heavily relied upon by agriculture but is also the lifeblood of multiple industries and rural communities. The biodiversity supported by the GAB is incredible and the environmental value of this natural asset immeasurable

Specific Comments

(a) the environmental impact assessment process and the adequacy of the project's approval by federal and state regulatory bodies, including the decision not to classify the project as a controlled action under national environment law;

QFF has concerns about the lack of scientific evidence and accuracy of statements in the EIS proposal to adequately protect the GAB. Even more concerning are the Government processes that accepted these inaccuracies in its approval process. Inaccuracies included:

- QFF notes that the CTSCo's EIS states that the Precipice Sandstone aquifer is 'unsuitable for irrigation water, stock water, and drinking water', however this aquifer is currently being used for

the production of livestock with a number of businesses having acquired licenses in this deeper but more secure aquifer in the last few years for future expansion purposes. CTSCo's statement in this regard is incorrect and simply not factual.

- CTSCo's EIS states water quality is poor and unsuitable for stock water. This statement is incorrect and simply not factual as industry has been using water of similar quality for many years. Water with fluoride concentrations above guidelines levels, has been used by agriculture for many years, without adverse impacts to livestock. QFF is advised that the salinity is slightly elevated but well below stock limits and the fluoride is high but those 'limits' are loose at best and water with this level of fluoride has been used for stock for many years. Regardless, intensive livestock and townships have no problem using reverse osmosis to remove any impurities. QFF believes that the EIS uses incorrect statements about the suitability of the water for stock use.
- QFF notes that CTSCo's groundwater modelling has not considered nearby extraction even though they were aware of the allocations. CTSCo have highlighted that residual impacts are predicted to be limited and highly localised, however have not accounted for existing and future bore wells for agricultural use, noting: *"The groundwater is not predicted to have a significant change in pressure. The injection testing of the GHG stream will have a negligible impact on the local groundwater quality of the Precipice Sandstone and will not compromise identified groundwater use. The groundwater EVs and WQOs of the vast majority of the Precipice Sandstone aquifer will remain unaffected by the Project, with the exception of changes to pressure and water quality within a highly localised extent, within the injected GHG stream plume."*²
- The design of the project is to target a low quality, and confined aquifer to avoid and minimise impacts to higher value and more frequently used aquifers in the area, however the information provided in the EIS doesn't reflect that statement, given there has been no allowances made for future agricultural expansion utilising water from the Precipice Sandstone aquifer of the GAB.
- Under the Queensland Environmental Protection Regulation 2019, section 41, that for an activity involving direct release of waste into groundwater must refuse to grant an application if the authority considers under S41(2)part (b) the release of the waste is affecting adversely, or may affect adversely, a surface ecological system; or (c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater. QFF notes that a clear avenue for GHG stream plume, which will mobilise within the aquifer via the extraction of bore water has not been evaluated in the EIS.
- Controlled actions: If, after receiving a referral, the Minister decides whether the action has, will have or is likely to have a significant impact on a matter of national environmental significance. The GAB is one of the largest underground freshwater resources in the world. It generates approximately \$13 billion in value to the national economy every year and is a vital resource for 180,000 people, 7,600 businesses and 120 towns.
- In summary, the potential catastrophic impacts and the inaccuracies and omissions in the EIS is a process that has gone wrong in the approval process. While there is a lot of work done in writing up a RIS, it would be better if left to an expert independent body to develop and review to remove bias and conflict of interest.

(b) the potential risks and impacts of the project on the groundwater quality within the Great Artesian Basin, especially concerning the findings related to the acidification of groundwater and mobilisation of heavy metals such as lead and arsenic;

The potential risks and impacts of the project are very high. What is at stake are the sustainability of Australia's agricultural industry, assessed at \$13 billion of industry that is dependent on the GAB¹. CTSCo's proposal to inject highly corrosive liquified carbon dioxide (CO₂) into a GAB aquifer represents a significant threat to one of Australia's greatest natural resources and subsequently the businesses and communities, which rely on it. It is imperative that valuable groundwater is not put at risk. This proposed trial is the first of its kind into the GAB and there is genuine concern regarding the lack of scientific evidence that underpins protection of the GAB. Following are some of these impacts.

- For CO₂ injection it is important the aquifer is saline (Sodium Chloride) due to the reactive properties of the CO₂ and NaCl which allow for a more alkaline water body, than adding CO₂ into a more neutral environment, which will increase the acidity of the aquifer. It is also vital that no CO₂ is injected into a water resource used for livestock or human consumption, which as stated, will contribute to acidification of the water body as the plume from the injection mobilises. In the CTSCo EIS Chapter 9: Groundwater, under section 9.7.4 residual impacts², CTSCo have highlighted that residual impacts are predicted to be limited and highly localised, however have not accounted for existing and future bore wells for agricultural use, noting:

*"The groundwater is not predicted to have a significant change in pressure. The injection testing of the GHG stream will have a negligible impact on the local groundwater quality of the Precipice Sandstone and will not compromise identified groundwater use. The groundwater EVs and WQOs of the vast majority of the Precipice Sandstone aquifer will remain unaffected by the Project, with the exception of changes to pressure and water quality within a highly localised extent, within the injected GHG stream plume."*³

- **Acidification of the water body:** By adding CO₂ into a neutral environment, the acidity of the aquifer will increase. It is also vital that no CO₂ is injected into a water resource used for livestock or human consumption, which as stated, will contribute to acidification of the water body as the plume from the injection mobilises. In the CTSCo EIS Chapter 9: Groundwater, under section 9.7.4 residual impacts¹, CTSCo have highlighted that residual impacts are predicted to be limited and highly localised, however have not accounted for existing and future bore wells for agricultural use.
- **Release of heavy metals:** Based on the flawed modelling completed for the EIS, CTSCo believe the CO₂ is not expected to leave from the injection point but does not factor in pumping as noted below. There are genuine concerns that it will acidify the surrounding water (pH from 7 to 4). There is concern that this acidification could result in the release of heavy metals and other contaminants from the surrounding rock. These contaminants will then move with the groundwater flow. There are concerns that the proposed monitoring program is too narrow to

¹ Great Artesian Basin - DCCEEW

² 09+Groundwater+(final+221108).pdf (ctsco.com.au)

³ 09+Groundwater+(final+221108).pdf (ctsco.com.au)p.86.

identify potential impacts to groundwater quality. Liquid CO₂ is highly corrosive and wherever the GHG plume moves there is a risk to water infrastructure and stock use of the water.

(c) the scientific basis and transparency of the data supporting the project's safety claims, including the robustness of fieldwork, data, and analysis presented by CTSCo and critiques by independent hydrogeologists and aqueous geochemists;

For what we understand to be a world first in a water resource aquifer, the conclusion that 'the vast majority' of the Precipice Sandstone aquifer will remain unaffected is not supported by data. The design of the project is to target a low quality, and confined aquifer to avoid and minimise impacts to higher value and more frequently used aquifers in the area, however the information provided in the EIS doesn't reflect that statement, given there has been no allowances made for future agricultural expansion utilising water from the Precipice Sandstone aquifer of the GAB.

The EIS has allowed for the combined use of hydrogeological and engineering data to evaluate the use of CCS for sequestration of superficial CO₂. However, the Precipice Sandstone is believed to represent high-energy braided river deposits, due to the geomorphological make-up of the cross-stratified sandstone. The implications for this, in relation to the utilisation as a continued water source are the orientation, size and connectivity of the geobodies that comprise the flow units, which are believed to have a more limited lateral extent, greater clay content and more limited hydraulic connectivity.⁶ From this, CTSCo cannot assure that no contamination of the water will occur in the flow units from the GHG stream plume.

(d) the potential socioeconomic impacts on agriculture and regional communities, relying on the Great Artesian Basin for water, including an assessment of the project's impact on existing and future water use rights;

As shown in other parts of the world, water plays a significant role in both the technical aspects of CCS and in the associated regulations, and CCS in general has significant topical interest in the field of hydrology and the impacts to water used for livestock and regional communities. Protecting water as a resource and not as an avenue to reduce GHG's, needs to be implemented in Australia. Economic, policy and regulatory changes will not be without challenges, however creating and adhering to a regulatory system that cannot be amended or challenged as a result of storing waste in groundwater requires immediate intervention. Implementing mandatory regulation that restricts the degradation of our most valued resource, also requires strict policy instruments that restrict and deter this avenue of waste disposal as a mitigation practice for fossil-fuel generated power plants.

Impact on rural towns: The Great Artesian basin is a vital water source for about 120 towns across the Great Artesian Basin which rely partly or solely on the basin for their water supply. If the water goes, the towns go. The fact that a resolution was passed at the Local Government Association of Queensland annual state conference opposing this project and CCS in the Great Artesian Basin, indicates the concerns Mayors have in relation to the potential risk and impact on rural towns and communities.

Impact on agriculture: Agriculture west of the Great Dividing range in Queensland is heavily reliant on access to the Great Artesian basin. In order to preserve it, the Great Artesian Basin and Other Regional Aquifers Water Plan requires states to have all stock and domestic bores watertight by 2031. It is one of the most significant artesian basins in the world, generating economic benefits around \$13 billion each year.⁴ Economically, the potential impacts on these economic benefits is a risk to far and with the potential release of heavy metals, the clean and green image of Australia's exports will be in question.

Impact on pig and poultry industries in the area of the planned CCS: The poultry industry in particular on the Darling Downs and Western Downs is at high risk if this proceeds. In order to mitigate against risks of exotic disease such as avian influenza being brought in by migratory birds, water supply is 100% from underground. This avoids the risk of migratory birds passing on this virus. There is evidence from government surveillance that Indonesian strains from migratory birds have been found in southeast Queensland⁵. While of low pathogenicity, this could quite easily be the high pathogenicity strain. If water becomes unsuitable for livestock to drink, this industry will be severely impacted. Two egg farms alone on the Darling Downs supply 20% of Australian eggs. The pig industry is also heavily reliant on the great artesian basin with existing water rights from the very bores that are planned for injection of the CO2 waste.

(e) the consultation processes undertaken with stakeholders, including farmers, Indigenous landholders, environmental groups, and the broader public, and the adequacy of these processes in addressing stakeholder concerns;

Initial consultation shows that some groups were contacted in 2019, but that there was no further communications until after the EPBC gave it's rubber-stamp - without the technical and water reports to give an informed approval to using the Great Artesian Basin as a testing site for industrial waste disposal. Engagement with the Queensland Farmers Federation had a single preliminary presentation to the CEO (Dr Georgina Davis) in May 2019 but subsequent engagement only occurred in 2023 and afterwards after being actively sought out by QFF and other peak industry bodies.

In the Glencore document Appendix + 03D + CSE + Selected + Engagement + Details + (final + 240327) pdf⁶, it states that a QFF submission on the draft EIS that *"the submission did not state QFF was opposed to the project."* This is not true. This is misrepresenting QFF's submission in which the QFF submission said:

The approval of this project is likely to set a precedent for future injection into water supply aquifers not only at this location, but other locations across the GAB in the future. The GAB is a highly valued natural resource that sustains both agriculture and regional communities and must be protected. It is

⁴ <https://www.abc.net.au/news/rural/2024-04-04/glencore-wastewater-great-artesian-basin-carbon-capture/103564954>

⁵ DAF presentation at Safe Food meeting 2024

⁶ Appendix+03D+CSE+Selected+Engagement+Details+(final+240327).pdf (ctsco.com.au)

currently. Injecting a regulated waste into a GAB aquifer is currently prohibited under existing regulation.

QFF recommends the following:

o QFF strongly encourages the government not to allow injecting waste into the GAB and does not amend legislation that would allow such an activity at any location in the GAB in the future.

and Conclusion:

QFF submits that ... the Surat Basin Carbon and Storage Project should not proceed

This statement by Glencore gravely and deliberately misconveys the truth and is indicative of the duplicitous approach by Glencore to convey to government and stakeholders what it plans to do and to misrepresent them in the process in official documents.

(f) the potential precedent set by allowing CCS projects within the Great Artesian Basin and its implications for future projects, considering Australia's strategic interests in preserving its largest groundwater system;

The Great Artesian Basin and Other Regional Aquifers Water Plan requires states to have all stock and domestic bores watertight by 2031. They are very conscious of the need to preserve the world's largest underground potable water source.

In contrast, Glencore are seeking approval to inject 300,000 tonnes of hypercritical CO₂ (carbon dioxide) fluid into the precipice aquifer of the GAB at a trial site at Moonie, western Darling Downs. Glencore states in the Executive Summary, page 6, that the GAB site has potential to store 730 Million metric tonnes of hypercritical CO₂ fluid.

Glencore have said this will lead to deterioration of environmental values of the receiving ground water. Again, Glencore have highlighted this in the Executive Summary, page 58, that the pH will be lowered from 8.4 to as low as 4 – creating an acidic environment.

Glencore said in their technical assessment report that nobody should be allowed to draw water in close proximity to their injection site nor in a zone around injection site. Effectively saying the water will be useless after injecting CO₂.

Glencore cannot meet current environment regulations. They are making application to the Qld Government to change the environmental regulations to allow them to put hypercritical fluid into any water aquifer in Queensland.

The Glencore website ([Website](#)) reflected quite clearly an agreement between a Chinese owned company and Glencore in relation to this project where the commentary talks about how the Great Artesian Basin providing both organisations with an inexpensive opportunity to develop CCS to industrial scale to assist in offsetting their emissions. This commentary was removed from the website at a date after the Landline feature on Sunday 7th April 2024. Commentary in relation to the project does however continue to include that the project “is intended as a first step toward large-scale CCS”. This is in stark contrast to the commentary Glencore representatives used when discussing the project with QFF and other industry stakeholders at which time, they assured

concerned stakeholders that this project was just a trial and the small-scale nature of the project would not impact the Great Artesian Basin. Stakeholders articulated their concerns regarding cumulative impacts to the Great Artesian Basin should this project proceed, and others follow. Glencore assured stakeholders that this would not be the case. This assurance is not reflected in the commentary on their website which is in fact, completely the opposite clearly pointing to the large-scale CCS opportunity both Glencore and partner companies are hoping to achieve in the Great Artesian Basin.

There are currently two companies with exploration permits for CCS in the Great Artesian Basin, Glencore and Origin Energy. It is clear that there is global interest in the Great Artesian Basin as an inexpensive way to conduct CCS as an emissions offsets strategy for a number of companies. Nowhere in the world has CCS been conducted in a usable water producing aquifer and in fact the science is still not entirely proven on CCS technology as an effective way to offset emissions. There is consensus, however, on how important water security is for the future of Australia from an economic, community and environmental perspective. It is critical that we prioritise water security for future generations and protecting a natural water producing asset as significant as the Great Artesian Basin is imperative.

(g) the role of CCS technology in Australia's broader climate change mitigation strategy, including an evaluation of its efficacy, risks and alternatives; and

Carbon capture and storage has been utilised as a strategy to mitigate the impacts of climate change by limiting CO₂ emissions from point sources such as coal-fired power stations, such as the one proposed in the CTSCo CCS project. However, various experts have differing views on the effectiveness of CCS and there is not yet general consensus on its effectiveness.

If carbon capture and storage is proven successful over time, whilst continuing to allow continued large-scale use of fossil fuels, it may be a significant way to mitigate carbon emissions. However injecting CO₂ into deep saline aquifers leads to a complex series of nonlinear issues that can significantly impact the water quality of the aquifer, and the underlying geomorphological formations. The most common examples of CCS around the world include the utilisation of disused mining infrastructure or the like, not water producing aquifers.

Various studies have been undertaken, that have identified two major issues associated with CCS, which are (1) the high energy demand and high cost of the capture process - approximately 30% of the energy from a power plant would be needed to perform the capture, with current technology; and (2) the logistics of injecting large volumes of CO₂ into deep underground formations and the potential for critical environmental consequences of such large-scale injection.

Not all CCS projects require an aquifer to store the CO₂ stream. In 2009 a report was issued that assessed Australia's future potential for CCS. In this report the National Carbon Storage taskforce noted that the simplest form of CCS involves depleted oil or gas fields¹. But for the CTSCo project, injection of the CO₂ stream will use a very deep part of the Precipice Sandstone aquifer. **Once the CO₂ is injected, the actual injection zone will become unusable as a water source.** The object for CO₂, is to be injected where it will remain underground. This means that the area of injection effectively becomes unusable as an aquifer.

Combining CCS, and climate change, it is understood that CCS may prove to be a useful mitigation factor that will help contribute to Australia's net zero emissions, and help reduce the impacts of climate change, but one factor that was failed to be considered in the EIS is the impacts to the aquifer with increased extraction under climate change. There is no data that can assure landholders that the injecting of a CO₂ stream will not cause environmental pollution within the aquifer, and more importantly the increased reliability of the aquifer to contain enough groundwater for extraction in periods of drought. **Regardless of what the current water quality is brought forward in this assessment, protecting our groundwater for the future is critical for the future of water security in Australia.** The IPCC has already indicated that the predicted impacts of climate change for Australia will see higher evaporation of surface water, longer periods of drought and increased flood events. A reliable groundwater source to maintain the water security of the GAB, needs to be held in higher regard than a place to dispose of unwanted industrial waste. Additionally, it is important to understand whether this project actually does have a benefit for Queensland and / or Australia in relation to contributing to reduced emission targets, or whether it stands to simply benefit just one company, whilst putting at risk the water security of 180,000 Australians, the economy and an environmental asset of significance.

(h) any other related matters.

The numerous inaccuracies shown in the Glencore EIS claims and the misreporting of QFF's submission to the Qld government in 2023 where they wrongly stated that QFF did not say they were opposed to the project has created a deep mistrust in Glencore's claims. This example alone, indicates that information made within Glencore's EIS at best cannot be relied upon and certainly no critical decision such as this one should be made on data that cannot be trusted. The Great Artesian Basin is an environmental asset of state and national significance, and the precautionary principle must apply.

Summary

There is increasing pressure on the global need to abate CO₂ which in turn is driving the development of innovative and new methods of doing so. QFF submits that innovation, technology, and best practice that is underpinned by sound, scientific data has an important role to play in CO₂ abatement targets being achieved in the future.

QFF is concerned, however, that this project has now become the poor "flagship" "first of its kind in QLD" trial for the Carbon Capture and Storage (CCS) Industry and the many industries that the technology aims to support. There is not enough scientific evidence to give comfort that the GAB will be safeguarded, and community, industry and environmental representatives are unified in their opposition to this project and to CCS in the Great Artesian Basin. The proposed aquifer is of national significance both from an environmental and economic perspective. This trial poses risks to the current and future of agriculture, rural communities and the environment across the regions supported by the Great Artesian Basin. This aquifer is too close to affected users and contains usable water which has the ability to support the future growth plans of the agricultural industry in that region.

Whilst QFF is well aware that CCS processes are emerging globally as a potential tool in contributing to reduced emission targets, research shows that the application of CCS within a usable water resource is unprecedented. Other global examples show CCS being used in conjunction with poor quality, heavily saline formations and depleted oil and gas reservoirs. This project is a highly unconventional CCS target in that it's not a depleted oil and gas reservoir, and it is a water resource. This would make it not just unconventional, but a world first, with its impact untested and unproven.

In the project environmental impact statement, CTSCo notes that once injected, the corrosive fluid will quickly cause a 10,000 fold increase in groundwater acidity which will dissolve the aquifer rock and result in the mobilisation of heavy metals such as arsenic and lead into the aquifer, with the potential to move towards other existing water users.

This proposed trial is the first of its kind involving the GAB and there are genuine concerns regarding the lack of scientific evidence underpinning the project along with the potential precedent this project will likely set for future interest in using the GAB for CCS purposes.

The idea of injecting what is essentially industrial waste into a usable water resource as valuable as the GAB is extremely alarming and QFF believes must evoke the precautionary principle as outlined in environmental law and requirements to protect future water contained within the Water Act 2000.

Specifically, under the Environmental Protection Regulation 2019, section 41, an activity involving direct release of waste into groundwater must be refused if the authority considers under S41(2) part (c) the waste is likely to result in a deterioration in the environmental values of the receiving groundwater.

The geological formation of the Precipice Sandstone is regionally significant and described by experts as a high-quality GAB aquifer. It is also the source aquifer for springs and supports numerous groundwater dependent ecosystems and the proponents themselves have identified the significant environmental values of the groundwater.

The revised EIS has not addressed serious concerns raised by independent experts regarding inadequate impact assessment modelling and the lack of Precipice Sandstone aquifer testing required to provide reliable modelling of potential outcomes coupled with poor community consultation throughout the process.

The revised EIS did not include any pump testing of the Precipice Sandstone aquifer hydraulic properties which are fundamental inputs required for accurate modelling. No further water quality testing of the CTSCo injection well have been undertaken to replace the previous water quality samples relied upon despite clear evidence of drilling mud contamination in the water samples.

In addition to these immediate concerns, industry and community stakeholders are also questioning the appropriateness or the need to use the GAB as a potential CCS site. In one of the world's driest continents, the protection of the nation's largest water producing assets should be the highest of priorities.

As community leaders, it is our collective responsibility to future generations, to ensure that CCS does not occur in parts of the state where the risk to valuable natural assets is too great and that CCS

is used for the right purposes to achieve meaningful environmental outcomes and not to simply serve the offset requirements of individual big businesses.

QFF strongly submits that consequently, the Surat Basin Carbon and Storage Project should not proceed, and that appropriate policy and regulations are urgently needed to protect the Great Artesian Basin from this and future CCS proposals.

We have a duty of care to protect environmental assets of national significance and preserve water security for future generations of Australian.

Yours sincerely

Jo Sheppard

Chief Executive Officer



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