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02 May 2024

Committee Secretary
Senate Standing Committees on Environment and Communications
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Committee Secretary

Re: Glencore's Carbon Capture and Storage Project

The SunPork Group wishes to make a submission in relation to the carbon capture and storage project in the Surat Basin proposed by Carbon Transport and Storage Corporation Pty Ltd (CTSCo) as a subsidiary of Glencore.

The SunPork Group is Australia's largest pork producer responsible for 20% of overall production. We also own and operate the Swickers Kingaroy Bacon Factory, the only export-accredited abattoir in Queensland that processes 95% of all pigs grown in Queensland. The SunPork Group farming operations in Queensland are predominantly located between Goondiwindi, Millmerran, Pittsworth, Toowoomba and Warra, so are not only in direct proximity to the proposed waste injection site but share a lot of the already stretched road infrastructure that will be used to relocate the regulated CO_2 waste from the Millmerran Power Station to the Moonie site.

SunPork wishes to address specific reference items b), c), d) and f) in this submission.

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 dification of groundwater and mobilisation of heavy metals such as lead and arsenic;

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;

In SunPork's Environmental Impact Statement Submission in relation to the Surat Basin Carbon Capture and Storage Project lodged with the Queensland EIS Coordinator on 22 February 2023, we rejected claims that the water in the proposed disposal site is unsuitable for stock use.

From a nutritional perspective, Table 1 shows outputs from routine analysis of water from the Gubbermunda aquifer in close proximity to the proposed CO_2 waste disposal site, two Precipice bores and a Hutton bore.

From Table 1, it is clear the water is more than suitable for pig consumption and meets standards higher than some of our other sites across Australia (information available on request). Most notable is the TDS level in water currently being used for livestock (6,000ppm+) versus the levels stated as "too saline" for livestock (1,850ppm) in the water samples from the proposed disposal site quoted in the EIS.

Fluoride is not routinely monitored for pig diets because the incidence of fluorosis is either limited to dental fluorosis, or the consequences do not manifest in any form of production loss or welfare compromise. Upper limits for fluoride in pig diets are very poorly defined, and it should be noted that acute lethal poisoning and many of the chronic effects of fluoride involve alterations in the chemical activity of calcium by the fluoride ion.

Natural calcium fluoride with low solubility and toxicity from ingestion is distinct from fully soluble toxic industrial fluorides. The toxicity of fluoride is determined by environmental conditions and the positive cations present. At a pH typical of gastric juice, fluoride is largely protonated as hydrofluoric acid HF. For these reasons, the initial EIS claims pertaining to fluoride levels rendering the water unsuitable for livestock were superficial at best.

In circumstances where certain constituents of water elevate to levels of concern, as nutritionists we are able to alter the overall composition of our formulated vitamin and mineral premixes included in all diets, in addition to major components of the diet such as salt and animal protein meals, to accommodate the elevations. It is also critical to note that most vitamins and minerals cannot be considered in isolation – many interact with others and must be considered together when examining potential for adverse production or health effects (eg. as described above, high calcium diets may suppress fluorine activity).

One aspect of water contamination that we are unable to mitigate nutritionally, and one that poses significant risk to livestock and consumers of livestock products, is the liberation of heavy metals. If local pumping activities near the disposal site degas and short circuit the stored CO_2 back into the atmosphere (making the entire project a waste of time), it would also result in acidification of the aquifer and dissolution and mobilisation of heavy metals that subsequently render the water unsuitable for human and stock consumption.

Glencore claims surrounding precipice water suitability for livestock were amended following the EIS submission process.

(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;

In 2016, the SunPork Group invested heavily to secure additional groundwater from the Precipice aquifer and bring our total entitlements to 780 ML from a combination of the Hutton and Precipice Sandstone aquifers. As an end-to-end value chain, our motivation was to protect our existing and planned production. With nearly all higher-level aquifers fully allocated, together with the potential impacts of coal-seam gas extraction from the Walloon Coal Measures and potential impacts on the Hutton aquifer, we took advantage of the purchased the final remaining Precipice Sandstone entitlement from the General Reserve available in the Water Plan.

If the SunPork Group water supply from the GAB was compromised, we risk the welfare of 250,000 pigs at any point in time, we potentially render useless more than $200 million in production infrastructure and the $170 million Swickers abattoir would not have sufficient volume to operate leaving more than 800 individuals unemployed and a 10% shortfall in national pork supply through all major retailers. Further, the bulk of our plans to increase Queensland production by 50% in the next 5 years depend on on-going access to water from the Precipice sandstone aquifer. With this much at stake from just one organisation, it beggars' belief that any Government would contemplate risking damage to such an irreplaceable water resource so a major emitter of carbon dioxide can reduce their costs of mitigating these emissions.

(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 CTSCo project is promoted as a mechanism to reduce carbon emissions through storage of CO_2 in the Great Artesian Basin. As a carbon abatement activity, this project will be eligible to earn Australian Carbon Credit Units (ACCUs). Once the ACCUs are earned, CTSCo have no restrictions on their capacity to trade them on the secondary market or to the Australian Government with the trial volume of 330,000 tonnes over three years equivalent to ~$12.5 million at the current spot market price. If the CTSCo activities were fully industrialised after the trial period, the potential ACCU earnings will be worth billions of dollars. As a general concept, SunPork's concern is that ACCUs could be traded to generate significant cash for expansion of new or existing high emission activities, potentially in regions with less stringent emission controls or reporting requirements, resulting in a net increase in emissions rather

than a reduction, while at the same time compromising the integrity of one of the most valuable water resources in the world. In the event ACCUs were not traded, they would still generate significant balance sheet equity that could be used as leverage for business expansion while offsetting emissions from other existing high liability carbon emission activities with no incentive to change practices to reduce carbon outputs.

SunPork cannot accept any risk to our priceless water resources associated with a world's first attempt to injected corrosive liquified CO_2 waste into a water aquifer that services significant agricultural enterprises and numerous rural communities.

Yours sincerely
SUNPORK PTY LTD

Dr Robert van Barneveld
Group CEO and Managing Director

Table 1. Routine analysis of water from the Precipice, Gubbermunda and Hutton aquifers being used for livestock.

Measure	*Unit*	*Gubberamunda Aug 2022*	*Precipice 1 Nov 2020*	*Precipice 2 Aug 2016*	*Precipice 2 Feb 2018*	*Hutton 1 July 2022*	*Known Risk level for Pigs Health & Production*	*Toxic Level in DM* [c]	*Nutritional Comments and Reference Notes.*
Conductivity	uS/cm	2440	2940	9470	9000	3410	4690 [a]		Using a multiplier of 0.65 to covert Conductivity to a Total Dissolved Solids measurement, it is clear Precipice water is still below levels that may because for concern (see TDS comments below).
pH	pH unit	8.6	7.6	7.39	7.2	8.37			Routine in-water acidifiers are used post-weaning to improve water pH, digestion and lower risk of pathogenic bacteria colonisation (product in current use is Selko by Trouw). Majority of samples fall between 6.5 and 8.5[b].
Total Hardness	mg/L $CaCO_3$	7	23	292			N/A [b]		No known reported health problems. Hardness has no impact on health, ... increases requirement for soap and detergent... and may calcify in pipes[b]. Levels between 60 and 200 pose no problem to equipment[a].
Total Alkalinity	mg/L $CaCO_3$	494	1390	5900	5600		N/A [b]		No known reported health problems[b].
Calcium	mg/L	2.84	6.73	71	67	3.51	N/A [b]		No known reported health problems[b].
Iron	mg/L	0.78	0.623		0.54	0.01	N/A [b]	5 g/kg	No known reported health problems. Above 0.3 mg/L iron can cause problems with management of water filters, drinker nipples, etc.[b] Iron levels in feed can be adjusted.
Potassium	mg/L	2.5	13.3	73	70	2.78	N/A [b]		No known reported health problems. Sodium and magnesium only form risks associated with the counter balancing anion. For magnesium and sodium if it combines with sulfate we have a laxative[b].
Magnesium	mg/L	0.091	1.43	28	29	0.515	N/A [b]		No known reported health problems[b].
Mangenese	mg/L	0.004	0.014			<0.001	N/A [b]	1 g/kg	No known reported health problems, above 0.05 mg/L it can cause problems with management of water filters, drinker nipples, etc[b]. Manganese levels in feed can be adjusted[b].
Sodium	mg/L	321	836	2680	2600	1038	variable [a,b]		Diet adjustment is made to ensure excess sodium is not consumed. A typical diet includes 780 to 1000 mg/kg of salt, in US and NZ where salinity is less of an issue, typical diets contain double this sodium content. 2% concentration of salt is considered toxic[c].
Chloride	mg/L	121	206	508	430	607			At greater than 400 mg/L, chloride will impart a metallic taste to the water[b]. In personal experience, high levels of chloride content can influence incidental water use and intake in sows and piglets.
Nitrate	mg/L	0.8	<1.0			0.008	> 10 [a,b,d]		Levels up to 2000 mg/L have been fed without deleterious effects[b].
Nitrites	mg/L						> 100 [a,b,d]		
Sulphate	mg/L	49	8	9	4	0.61	1000 [b]		Above 1000 mg/L some looseness may be an issue, but levels up to 2650 mg/L have caused no production issues. Pigs can tolerate high levels of sulphate and resulting osmotic diarrhoea without any impact on performance[b].
Molybdate Reactive Silica	mg/L	26	46						
Microbiological Assessment									More common with surface water, levels need to be monitored by a veterinarian.
Temporary Hardness	mg/L $CaCO_3$	7	23						

Bicarbonate Alkalinity	mg/L $CaCO_3$	470	1390	5900	6800				
Carbonate Alkalinity	mg/L $CaCO_3$	24	<2	<1	<5				
Hydroxide Alkalanity	mg/L $CaCO_3$	<2	<2	<1	<5				
Free Carbon Dioxide	mg/L	2.4	69.6						
Total Dissolved Ions	mg/L	1080	2760	1795					
Total Dissolved Solids	mg/L	820	1950	6160	6400		>3000 [a]		Levels up to 5000 mg/L are potentially still acceptable as long as the predominant anion in the water is not sulphate (noting Precipice bore water above this level is used for livestock with no adverse consequences). Osmotic diarrhoea may occur when excess sulphates are present[a]. Levels in excess of 7000 mg/L may be risky for breeding stock exposed to heat stress[d].
Figure of Merit		<0.1	<0.1						
Saturation Index		0.15	-0.03						
Residual Alkalinity	mg/L $CaCO_3$	10	27						
Sodium Adsorption Ratio		51.2	76.3	146					
Fluorine	mg/L			1.3	1.3	4.6	2 [d], 4 [c]	200 mg/kg (in feed)[d]	Poultry have the highest tolerance followed by swine[c]. With the lack of information on maximum fluorine concentration in water for swine, the NRC have used a recommendation from all livestock, which is also derived from human studies. Fluoride toxicity has not been reported below 4 mg/L. Feeding of calcium carbonate (routinely done in pig nutrition), or aluminium sulfate or oxide, reduces absorption of fluorine by approximately one-third[c], hence the influence of fluorine can be managed and is variable. Note Fluorine levels in the Hutton bore exceed the Precipice bores, with this level being common across the Hutton aquifer. No adverse effects noted in livestock receiving this water.

Important to note that a known risk level, does not suggest that the risk cannot be managed, but indicates that a higher understanding of the interactions between other minerals and diet is required to ensure performance and health is not compromised.

References:

[a]Australian Pork Limited (2017) Producers' Guide to Pig Production and Nutrition. (eds. Edwards M, Edwards A, Cameron C and Rashid H). Australian Pork Limited, Barton ACT, Australia https://www.australianpork.com.au/sites/default/files/2021-07/2017-APL-Producers-Guide-to-Pig-Production-and-Nutrition.pdf

[b]Patience JF (2011) Water quality issues in pork production. 2011 Allen D. Leman Swine Conference. The University of Minnesota. pp. 157-164. https://conservancy.umn.edu/bitstream/handle/11299/140899/Patience.pdf?sequence=1

[c]McDowell LR (1992) Minerals in animal and human nutrition: comparative aspects to human nutrition. Academic Press Inc., San Diego CA, USA.

[d]National Research Council (2012) Nutrient requirements of swine – 11th revised edition. The National Academies Press, Washington DC, USA. pp. 69-71.