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Inquiry into water use by the extractive industry

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The Conservation Council of South Australia (Conservation SA) welcomes the opportunity to provide comment on the Environment and Communications Committee Inquiry into water use by the extractive industry.

Conservation SA is an independent, non-profit and strictly non-party political organisation representing around 60 of South Australia's environment and conservation organisation and their 90,000 members. Conservation SA has developed a comprehensive view of environment policy in South Australia in a Changing Climate: A Blueprint for a Sustainable Future- Second Edition. This document sets out, at a strategic level, policy positions in six key environmental areas, including biodiversity, coast and marine, waste, planning and development, energy and water.

Conservation SA supports this inquiry, and takes the position that our use of water needs to:

a) be within sustainable limits,
b) maximise efficiency and,
c) maximise reuse.

To achieve this vision, it will be necessary to alleviate the current pressure on natural systems, minimise adverse environmental impacts, and recognise the environment as a priority stakeholder with rights to water[1]. Conservation SA believes that the intrinsic value of water for environmental and human use must be reflected in greater protection of water resources.[1]

In response to the specific terms of reference-

1) **the social, economic and environmental impacts of extractive projects' take and use of water;**

Often, the social, environmental and even economic costs of water use are not accounted for in extraction projects. The short term gains can be enormous, and occlude more long term environmental impacts on water availability[2]. Water systems within Australia, including The Murry Darling Basin, are already under significant pressures from water use and consumption. During 2015-16, an estimated 75,544 gigalitres of water was used from the environment to support the Australian

[1] https://www.conservationsa.org.au/blueprint
[2] https://novaojs.newcastle.edu.au/uonsbj/index.php/uonsbj/article/view/2

economy[3]. An increase in water use may therefore place more pressure on already vulnerable water systems. We must consider our national allocation of water carefully, and the associated social, economic and environmental impacts of industries that extract water.

Environmental impacts

Fracking is a thirsty technology. Each shale gas frack requires between 9 million and 29 million litres of water; an activity that occurs multiple times per well.[4]

The fracking liquid includes chemicals that are highly toxic, and other toxic metals in the fractured rock are mobilised by the fracturing process. A significant proportion of this toxic liquid remains underground where it can risk groundwater systems.

Each well penetrates the aquifer system. This system is already perforated with fractures, faults, sinkholes and other anomalies arising from its primary limestone form.

During 2001 to 2010, there were 120 leaking aquifer wells in the South East of South Australia that have required rehabilitation costing $5.5 million.[5]

There have been recent cases of old drill holes being found in poor repair following years of neglect.[6]

According to a report commissioned for the Australian Council of Learned Academies (ACOLA) assessing the risks from shale gas extraction, [7] the probability of 'well failure', and 'over extraction from aquifer resulting in reduced water availability for the environment or other users/aquifer interference' are both regarded as 'likely'.

The process of water extraction for mining, has many adverse environmental impacts. As noted by the CSIRO: 'much of the water is extracted to dewater mines or is a by-product of extraction and can be acidic and contain toxic amounts of metals or other pollutants. It is often discharged to the environment, with controls placed on its quality, but in arid regions the discharges may be sufficient to detrimentally alter the natural flow regime. Alternatively, extracted water is disposed of in evaporation ponds.'[8]

Water extraction during CSG developments can: increase leakage between aquifers (leading to a mixing of saline and fresh water aquifers); reduce flow to springs and streams; compact strata; reduce groundwater levels and decrease the connectivity between water systems (eg different parts of the same aquifer and between groundwater and surface water systems). [9]

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[3] http://www.abs.gov.au/ausstats/abs@.nsf/Latestproducts/4610.0Main%20Features22015-16?opendocument&tabname=Summary&prodno=4610.0&issue=2015-16&num=&view

[4] Wood Ruth, Gilbert Paul, Sharmina Maria, Anderson Kevin, Footit Anthony, Glynn Steven, Nicholls Fiona. Shale Gas : a provisional assessment of climate change and environmental impacts. Tyndall Center for Climate Change Research, 2011. Available at www.karooplaces.com/wpcontent/uploads/2011/06/coop_shale_gas_report_final_200111.pdf

[5] SE NRM Board, WATER ALLOCATION PLAN FOR THE LOWER LIMESTONE COAST PRESCRIBED WELLS AREA PREPARED. November 2013

[6] http://www.coastalleader.com.au/story/1766183/prepared-to-fight/

[7] http://www.acola.org.au/PDF/SAF06FINAL/Frogtech_Shale_Gas_Geology_and_Risks%20Jan2013.pdf

[8] http://www.publish.csiro.au/ebook/chapter/9780643103283_Chapter_10

[9] http://www.iesc.environment.gov.au/publications/connectivity-between-water-systems

According to ACOLA , there is limited or insufficient understanding of many environmental impacts and surface and subsurface physical, chemical and biological processes related to shale gas extraction. We simply do not know enough.

We have little detailed information about the natural interactions between groundwater systems and the underlying geology. If pollution incidents do occur, we have little understanding about the type or scale of damage to the environment, to farmland, and to public health that might flow from such incidents.

It is therefore critical to undertake detailed baseline surveys and monitoring to significantly improve knowledge of the potential environmental impacts of shale gas. These should include baseline information on human health, ecological systems, groundwater chemistry, methane emissions, landscape changes and seismic activity.

According to ACOLA[10]:

- because of the high potential for groundwater contamination from the wells, decommissioned wells need to be effectively sealed for hundreds if not thousands of years.
- well operators should face open-ended liability for failures into the future.
- Impartial inspection of the quality and fit of drilling casing during operation and after decommissioning is vital, with the results available publicly.

Social impacts

Doctors for the Environment (Australia) have highlighted the health concerns associated with unconventional gas development and water security. In a submission to the Scientific Inquiry into Hydraulic fracturing in the Northern Territory, they stated, 'it is not possible to conclude that small amounts of methane do not carry health and safety risks for this ignores the precautionary principle for long term adverse impacts in relation to the possibility that the escaping methane is accompanied by biologically toxic compounds derived from coal seams. They have called for 'an indefinite moratorium until health risk assessments of procedures and chemicals have been undertaken on an industry wide basis'.[11]

Farming communities will also be impacted, as they depend on high quality localised water sources for their livelihood. This could have potential economic flow on effects to the entire agricultural industry. Case studies including Pilliga, serve as an example of the impacts CSG projects can have on communities.[12]

Economic impacts

It is important to rethink the current water market and water allocation. As the continent with the lowest average rainfall, water is a crucial resource for the Australian economy, with the potential to place constraints on the future economic growth of Australia. Any long term or permanent damage to Australian water

[10] http://www.acola.org.au/PDF/SAF06FINAL/Frogtech_Shale_Gas_Geology_and_Risks%20Jan2013.pdf
[11] https://www.dea.org.au/supplementary-submission-to-the-scientific-inquiry-into-hydraulic-fracturing-in-the-northern-territory/
[12] https://www.theguardian.com/environment/2014/mar/10/pilliga-coal-seam-gas-operation-continues

systems, as a result of extractive projects, will have consequences for generations to come[13].

For example, the South East in South Australia is a target for extractive industries and is also home to a range of high value agricultural and tourism industries.

Unconventional gas threatens these established industries both directly, via groundwater impacts and pollution, and indirectly, through loss of the 'clean and green' status and tourism allure.

South Australia rightly celebrates and promotes its premium food and wine from a clean environment. This delivers real return for the state and can continue to do so for generations to come. Visitors are not attracted to country dotted with drill rigs and impacting on natural ecosystems. Our clean food reputation (much of it export driven) is at significant risk of a contamination incident. Once lost, this reputation will be impossible to recover.

Unconventional gas extraction is a short term, low job producing industry. It is essential we prioritise economic activity that creates long term, sustainable value.

(b) existing safeguards in place to prevent the damage, contamination or draining of Australia's aquifers and water systems;

Under future climate change scenarios, water quality, quantity and treatability will all be impacted, calling for careful and flexible planning by water utilities and governments[14].

Groundwater and surface water are often connected, and thus any impact on one, invites consideration to overall water system impacts. Current statistics on groundwater abstraction and use are difficult to monitor, and national reporting procedures are inconsistent. Therefore, the Conservation Council welcomes the Australian Water Resource Information System (AWRIS), which is being developed by the Bureau of Meteorology under the National Water Initiative.

(c) any gaps the regulatory framework which may lead to adverse social, economic or environmental outcomes, as a result of the take and use of water by extractive projects;
(d) any difference in the regulatory regime surrounding the extractive industry's water use, and that of other industries;

In regards to regulatory practice, it is important to clarify when unconventional resources are being produced under petroleum legislation or extracted as minerals under mining legislation. Policy deliberations have also neglected the significant volumes of saline water and quantities of salt generated in the process of dewatering large numbers of CSG[15].

In order to make decisions under the existing EPBC Act, regulators require baseline information and ongoing monitoring and the oversight of the Independent Expert

[13] https://treasury.gov.au/publication/economic-roundup-summer-2006/water-and-australias-future-economic-growth/
[14] Soh, YC, Roddick, F & Leeuwen, JV 2008, 'The future of water in Australia: The potential effects of climate change and ozone depletion on Australian water quality, quantity and treatability', Environmentalist, vol. 28, pp. 158-165.
[15] https://www.allens.com.au/med/insights/insightsnovXV-01.pdf

Scientific Committee (IESC). This includes understanding all potential risks as a result of an extractive project. Further research on the environmental, social and economic effects of CSG mining, specifically in regards to water use, are required, to ensure regulatory framework is sufficient to reduce or prevent adverse outcomes[16].

In regards to the ability of the EPBC to currently address adverse impacts, it is very concerning that the IESC found that most of the environmental impact assessments it was asked to advise on had major deficiencies, with the majority failing to adequately consider the projects' cumulative impacts on water[17].

(e) the effectiveness of the 'water trigger' under the *Environment Protection and Biodiversity Conservation Act 1999*, and the value in expanding the 'trigger' to include other projects, such as shale and tight gas;

Expansion of the water trigger

Conservation SA supports the expansion of the water trigger, to include extractive projects such as shale and tight gas. The impact of associated infrastructure that is not part of the extraction process, and changes to the discharge and treatment of water by the extractive industry should also be considered under the water trigger.[18] The precautionary principle should be emphasised, as there is considerable scientific uncertainty over the long-term impact of unconventional gas production on the environment and community health, future of water resources under climate change scenarios, and the impact of excessive water extraction on ecological systems.

(f) and any other related matters

Cultural significance of water

The cultural significance of water resources to indigenous communities is another very important consideration alongside ecogical impacts of extractive projects[19].

Matters of legacy should also be considered, as extractive projects may leave behind environmental scars that will take centuries to recover.

Yours sincerely,

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Chief Executive

[16] https://novaojs.newcastle.edu.au/uonsbj/index.php/uonsbj/article/view/2
[17] https://theconversation.com/coal-and-gas-fail-the-test-when-it-comes-to-environmental-impact-13746
[18] http://www.environment.gov.au/system/files/resources/d078caf3-3923-4416-a743-0988ac3f1ee1/files/sig-water-resources.pdf
[19] https://novaojs.newcastle.edu.au/uonsbj/index.php/uonsbj/article/view/2