

Underground Water Impact Report for the Surat Cumulative Management Area

Submission from Doctors for the Environment Australia

July 2019



67 Payneham Road
College Park SA 5069

P 0422 974 857

E admin@dea.org.au

W www.dea.org.au

Healthy planet, **healthy people.**

DEA Scientific Committee

Prof Colin Butler

Prof David de Kretser AC

Prof Robyn McDermott

Prof Emeritus Sir Gustav Nossal AC

Prof Fiona Stanley AC

Prof Stephen Boyden AM

Prof Peter Doherty AC

Prof Stephen Leeder AO

Prof Lidia Morawska

Prof Hugh Possingham

Dr Rosemary Stanton OAM

Prof Emeritus Chris Burrell AO

Prof Michael Kidd AM

Prof Ian Lowe AO

Prof Peter Newman AO

Prof Lawrie Powell AC

Dr Norman Swan

Doctors for the Environment Australia

Doctors for the Environment Australia (DEA) is an independent, self-funded, non-government organisation of medical doctors in all Australian States and Territories. Our members work across all specialties in community, hospital and private practices. We work to minimise public health impacts and address the diseases – local, national and global – caused by damage to our natural environment.

Recommendations

1. The Queensland government take note of current scientific findings in the climate emergency and the biodiversity crisis and review its policy for further expansion of mining in the Surat and related regions.
2. Accordingly, it would be prudent to have sustainability as the main objective with the pillars of human health, water and productive land, as the prime considerations.
3. Current water usage by mining is of concern and the evidence suggests the underground water system is becoming depleted; particular concern is expressed for the use of Great Artesian water usage and state-wide cumulative use studies should be initiated. Climate modelling must be done to aid further assessment.
4. In view of the Linc Energy development debacle, and the intensity of current gas mining, a program of assessment of bores for human and agricultural use must be considered to routinely assess for methane associated toxic chemicals particularly BTEX and PAH's.
5. The increasing evidence of serious health impacts in US gas fields should be noted and immediate appropriate studies instituted, for existing studies in Queensland are inadequate.
6. Assessment of biodiversity should be extended with identification of vulnerable species and longitudinal studies.

Submission

We agree with the comment from NPWA

"The work undertaken by OGIA, the data collected, its analysis, output and presentation is a lesson that needs be taken seriously by all other agencies (such as GISERA and UQ) in relation to the impacts of the CSG industry. It should be the standard by which all data that is collated, analysed and disseminated in relation to the CSG industry on impacts generally, but particularly emissions, atmospheric contaminants and health impact assessment specifically".²

Doctors for the Environment Australia believes that this report must be seen in the context of possible harm to the sustainability of Queensland and Australia, and in this regard we are concerned with sustainability of two pillars of human health; water resources and the maintenance of food producing land which in turn depends on its supporting biodiversity.

These essentials need to have priority over resource development, which can be transient, and result in lasting harms.

Consequently, note must be made of

1. Climate Change Emergency

Increasing international concern over gas industry emissions which increasingly threatens targets for 2 degree world temperature rise.

The recent IPCC report³ demands urgent and deep reductions in the emissions of methane, tropospheric ozone and black carbon. IPCC modelling shows that if emissions of these pollutants are not in rapid decline by 2030, we have little chance of limiting warming to 1.5°C or even 2°C.

"Limiting warming to 1.5°C implies reaching net zero CO₂ emissions globally around 2050 and concurrent deep reductions in emissions of non-CO₂ forcers, particularly methane (high confidence)".

The oil and gas industries are the main cause of rising methane levels.

The Special COP24 Report on *Health and Climate Change*⁴: the first recommendation was

To identify and promote actions to reduce both carbon emissions and air pollution, with specific commitments to reduce emissions of short-lived climate pollutants in Nationally Determined Contributions (NDCs) to the Paris Agreement".

2. Stranded Assets

The likely consequence that gas industry expansion will have to be curtailed if the international community keeps to the Paris agreement. This raises the possibility of stranded assets.⁵

3. The world and national biodiversity crisis

This parallels the climate crisis; they are related and augment each other. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) summarised this disaster and states:

*"The overwhelming evidence of the IPBES Global Assessment, from a wide range of different fields of knowledge, presents an ominous picture," said IPBES Chair, Sir Robert Watson. "The health of ecosystems on which we and all other species depend is deteriorating more rapidly than ever. We are eroding the very foundations of our economies, livelihoods, food security, health and quality of life worldwide."*⁶

In Australia, the Interim Report by the Senate Inquiry into Faunal Extinction, *Senate Environment and Communications References Committee Australia's faunal extinction crisis*⁷, provides a damning testimony of the appalling loss of wildlife and habitats facilitated by the failures of the Federal Government to protect the environment. The submission from Doctors for the Environment Australia explains these issues in terms of agreed Sustainability Goals and our findings are highly relevant to the Surat Basin.⁸

The importance of issues 1-3 to the Surat Basin relate to the need to retain and nurture its biodiversity to maintain sustainability as a viable food producing resource. Biodiversity loss resulting in deteriorating soil ecology will have a critical impact on food production as detailed by the report *"The State of the world's biodiversity for food and agriculture"* from the Commission on Genetic Resources for Food and Agriculture, organisation of the United Nations⁹ (summary¹⁰).

These issues are not within the remit of OGIA but we refer to them so that the Queensland Government recognises that the conditions that prevailed at the time of approval of these gas mines have changed greatly in the past year and there is a strong case for stopping further development.

Sustainability once gone cannot be retrieved.

Sustainability of Water Resources

The availability of water ground resources over the duration of oil and gas extraction must be related to precipitation, temperature and evaporation, in other words climate change which is accelerating and already having an impact over large parts of Queensland.

In the report we note the following references to climate:

1.4 The climate of the area is sub-tropical with most rainfall occurring in summer between November and February. Rainfall and runoff are highly variable and evaporation rates are high. Consequently, many of the rivers and streams in the area are ephemeral.

9.6.2 climate data continue to be critical contextual information for interpretation of any monitoring data collected in the field

9.6.4 Overall, monitoring indicates that spring form and discharge are significantly influenced by climate and land use activities within the immediate vicinity of the springs. Seasonal variation in discharge and wetland area has been observed through the mapping of the extent of wetland vegetation and discharge. Seasonal changes in evapo-transpiration and local groundwater inflows at some locations are plausible underlying causes of observed short-term variation.

Presumably the Queensland government has failed to provide climate modelling for its resource development regions or it would have been referred to. We remind the government that under the Murray Valley Management Plan water continued to be extracted from the Murray Darling system at rates inappropriate to climate change because modelling was never done; many scientists believe that the survival of the Murray is now in doubt.

It is essential that climate modelling is enacted by the government.

We note in the Key Summary;-

- *Current CSG water extraction is about 60,000 ML/year from 6,800 wells. Average CSG water extraction over the life of the industry is predicted to be around 51,000 ML/year.*
- *Estimated non-CSG groundwater extraction is about 164,000 ML/year, of which 41,000 ML/year is from the Great Artesian Basin and largely unmetered. This is a 20% reduction from the 2016 estimates.*
- *A total of 574 water bores are predicted to be impacted in the long term – an increase of about 10% compared to 2016 predictions. About 80% of those bores are in the CSG target formations and the remainder are in the surrounding aquifers*

The data provided suggests significant impacts to water resources are occurring which will affect the sustainability of the region.

It is of great concern that water is utilised from the GAB though indirectly via other aquifer systems. Clearly this is of consequence and yet is only estimated; measurement systems should be expedited. Although the GAB is a huge resource it is conceivable that it may be the sole water for human use in decades to come.

We also note its use for resource development in other parts of Queensland in some cases with reductions in bore flows. This matter is so important that an OGIA or IESC report of cumulative impacts should be sought by the Federal Government for the resource development regions of the state.

The issue of current cumulative modelling of water resources for the region arises because the current report does not cover the use of water by other developments such as current and future coal mining. The New Hope Acland mine was subjected to a recent judgement which, on review of all past and current evidence, is condemnatory of governmental and industry for the unsustainable use of water, far less than usage by the oil and gas industry

The words used in refusing a water Licence in Land Court judgment were:

"There is an important starting point with respect to groundwater; that is, that groundwater is a fundamental issue to those living and working in the Acland area. There is no doubt that legal access to groundwater is held by numerous land holders in the general vicinity of the New Acland Mine, and that the groundwater obtained by those landholders is essential to their rural businesses. Groundwater is not only used for irrigation; it is also used for stock watering purposes in the beef cattle sector and for both stock and production purposes by dairy farmers such as Mr Wieck. It is further beyond doubt, and accepted by NAC, that mining operations under the revised Stage 3 will impact on groundwater aquifers. The key issue is the nature and the extent of any such impact on groundwater supplies."

"I am satisfied, given the totality of the groundwater evidence before me in this case, that there is a real possibility of landholders proximate to Stage 3 suffering a loss or depletion of groundwater supplies because of the interaction between the revised Stage 3 mining operations and the aquifers. I am also convinced that the potential for that loss or interference with water continues at least hundreds of years into the future, if not indefinitely."

"In key areas NAC's own experts agreed with major shortcomings of the current model. I was also highly concerned regarding the modelling of faulting and other aspects of the groundwater studies undertaken to date. These issues have not been answered by the 2016 IESC Advice for reasons including the unfortunate fact that the IESC did not have the advantage of the material before the Court on groundwater. Groundwater considerations are such that the revised Stage 3 project should not proceed given the risks to the surrounding landholders and the poor state of the current model."¹¹

We note 4.3 Water extraction by mining

There are five operational mines (Cameby Downs, Commodore, Kogan Creek, New Acland and Wilkie Creek) and eight proposed mines that have development approval. All current and proposed coal mines in the Surat

Basin are surface mining operations within the outcrop of the Walloon Coal Measures and Springbok Sandstone. Extraction of groundwater is typically for dewatering of seepage into the mine pits. In most instances, the magnitude of drawdown caused by this seepage is in the order of tens of metres and decreases with distance away from the mine pit. The total reported associated water use by coal tenure holders in the CMA is approximately 8,500 ML for the 2016/17 reporting period.¹²

Clearly then there is a need for more detailed cumulative studies when coal water usage in the region has been legally questioned, when much greater oil and gas usage of water continues and will expand, when many water bores are being decommissioned.

Methane and hydrocarbon contaminants of water

Section 3.5.2 makes it clear that water contamination is not covered in this report. Nevertheless Doctors for the Environment Australia raises it because of the unacceptable past regulation and supervision by the Queensland government of other developments in the region, for example, the abandoned Linc Energy development and the New Hope coal mine; currently we find it difficult to comprehend how oil and gas activity could be allowed on land contaminated by the Linc Energy debacle.

Evidence accruing from US gas fields indicates an increased incidence of preterm birth, birth defects and some cancers in those living within 10k of wellheads; this information is detailed in an extensive review by Australian medical experts¹³ which has been referred to in a similar US study¹⁴.

It is essential that credible medical studies be conducted in Queensland and we make the point that these are best conducted by a statutory independent Environmental Protection Authority in the interest of public health and transparency.

Hazardous air pollutants have been identified in the environment around gas mines¹⁵ and some become released into ground water from technical failure of wells, inadequate treatment of returned water and inadequate monitoring of ponds. They include the BTEX compounds (which include the carcinogen benzene) and polycyclic aromatic compounds.

Methane present in water samples from bores indicates likely contamination with these naturally occurring chemicals. In the UWIR we ask for detail about decommissioning for methane leaks and what chemical identification studies are taken in these instances. Further, what routine chemical analyses are made on all bores in the region which would allow both health data and cross formational water flows to be assessed? The health data suggests that such monitoring of all bore water used for human and agricultural use is necessary.

Biodiversity

The importance of this issue has been put in context in the introduction.

In the Key Summary we note that

An assessment of the cumulative impacts on environmental values, such as terrestrial groundwater-dependent ecosystems, is included for the first time. Minor areas of risks are identified, mostly associated with impacts in the outcrop of the Walloon Coal Measures

We acknowledge and approve the commencement of this process. Surely there must be earlier assessments available from when gas mining commenced with which current findings can be assessed?

12.2 In the Surat CMA, areas of likely groundwater-dependent vegetation have been mapped by the Queensland Herbarium

This is a good start but much more needs to be done. In the high and moderate risk areas it could be that already some threatened species have disappeared from the area; it is thus vital that full assessments are made of both plant and animal species; in some other states this would have been part of the initial EIA process.

References

- ¹ https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0010/1445554/uwir-2019-report.pdf
- ² NWPA, Measuring the Impacts: the Chinchilla Meeting – Draft Underground Water Impact Report, June 27, 2019 <https://nwprotectionadvocacy.com/measuring-the-impacts-the-chinchilla-meeting-draft-underground-water-impact-report-22-june-2019/>
- ³ IPCC Special Report, Global Warming of 1.5 °C, October 2018 https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_Chapter2_Low_Res.pdf
- ⁴ WHO, COP24 Special Report: Health & Climate Change, 2018 <https://apps.who.int/iris/bitstream/handle/10665/276405/9789241514972-eng.pdf?ua=1>
- ⁵ Rotherham, D., Brown, J.D., & Suke, J., Stranded Oil and Gas Assets - Is the Wolf at the Door or Waiting in the Forest? ICF International 2014 https://www.ourenergypolicy.org/wp-content/uploads/2014/10/Stranded_Oil_and_Gas_Assets.pdf
- ⁶ IPBES Media Release: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating' <https://www.ipbes.net/news/Media-Release-Global-Assessment>
- ⁷ Parliament of Australia. Australia's faunal extinction crisis. Canberra; 2019. https://www.aph.gov.au/Parliamentary_Business/Committees/Senate/Environment_and_Communications/Faunalextingtion/Interim_report
- ⁸ Submission to the Senate Standing Committees on Environment and Communications - Australia's faunal extinction crisis, Doctors for the Environment Australia, 2018 <https://www.dea.org.au/wp-content/uploads/2018/09/Australia's-faunal-extinction-crisis-submission-08-18.pdf>
- ⁹ FAO. The State of the World's Biodiversity for Food and Agriculture. Rome; 2019. <http://www.fao.org/3/CA3129EN/CA3129EN.pdf>

-
- ¹⁰ FAO. The State of the World's Biodiversity for Food and Agriculture. Rome; 2019 [Summary] <http://www.fao.org/state-of-biodiversity-for-food-agriculture/en/>
- ¹¹ New Acland Coal Pty Ltd v Ashman & Ors and Chief Executive, Department of Environment and Heritage Protection (No. 4) [2017] QLC 24 <https://archive.sclqld.org.au/qjudgment/2017/QLC17-024.pdf>
- ¹² Consultation draft Underground Water Impact Report for the Surat Cumulative Management Area, Queensland Government, 2019 https://www.dnrme.qld.gov.au/_data/assets/pdf_file/0010/1445554/uwir-2019-report.pdf
- ¹³ Haswell, M and Shearman, D. The implications for human health and wellbeing of expanding gas mining in Australia: Onshore Oil and Gas Policy Background Paper. Doctors for the Environment Australia, 2019 <https://www.dea.org.au/wp-content/uploads/2018/12/DEA-Oil-and-Gas-final-28-11-18.pdf>
- ¹⁴ Compendium of Scientific, Medical, and Media Findings Demonstrating Risks and Harms of Fracking (Unconventional Gas and Oil Extraction), Concerned Health Professionals of New York & Physicians for Social Responsibility, 2019 https://concernedhealthny.org/wp-content/uploads/2019/06/Fracking-Science-Compendium_6.pdf
- ¹⁵ Hazardous Air Pollutants Associated with Upstream Oil and Natural Gas Development: A Critical Synthesis of Current Peer-Reviewed Literature, Annual Review of Public Health, Volume 40, https://www.annualreviews.org/doi/full/10.1146/annurev-publhealth-040218-043715#_i11