LOCK THE GATE ALLIANCE
AUSTRALIANS WORKING TOGETHER TO PROTECT OUR LAND, WATER, AND FUTURE

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Water Trigger Review
by email: wtreview@environment.gov.au

Submission: Independent water trigger review

Thank you for the opportunity to make this submission to the independent review of the water trigger.

The Lock the Gate Alliance is a national grassroots organisation made up of over 40,000 supporters and more than 250 local groups who are concerned about unsafe coal and gas mining. These groups are located in all parts of Australia and include farmers, traditional custodians, conservationists and urban residents. We appreciate the guidance the Issues Paper provided in asking specific questions about the purpose, effectiveness and implementation of the water trigger, and have tried to address these questions in the submission.

We would welcome the opportunity to speak with the review team and the Government in more detail about the importance of the water trigger and opportunities to make it more rigorous, consistent and effective in its application.

Summary

- It is well-established in Australia that water management is a matter of national concern, and that water resources like the Murray Darling Basin, the Lake Eyre Basin and the Great Artesian Basin are of fundamental importance to the continent, its people and natural landscapes.
- State Governments' assessment and approval regimes are not fit for the purpose of assessing the nationally significant risks and damage to these assets that coal and unconventional gas mining poses. They cannot be expected to assess, prevent and mitigate impacts that occur outside their jurisdiction.
- Similarly, cumulative impacts are not addressed by most states' processes, nor are cultural values, and the broader social and economic implications of damage to water resources. Coal and unconventional gas mining occurs intensively where the resource exists, and the impacts of individual projects are compounded by their proximity to others.
- The review should recommend that the IESC conduct a review of state and territory legislation and statutory arrangements for the management of water volumes and quality, and assessment and determination processes for the impact of coal and unconventional gas mining on water resources, and identify gaps and failures in those regulations.
- The water trigger should be expanded so that shale and tight gas are covered by it, and any other related fossil fuel developments, such as shale oil and underground coal gasification.

- In addition, related water developments for coal mining and unconventional gas are not triggering the law. If a borefield, dam or water pipeline are proposed in order to feed a coal mine with water, or a water treatment facility proposed for a CSG operation, they are water resources impacts of those activities and it should be triggered.
- The bioregional assessments are important groundwork for understanding the cumulative impacts of coal and unconventional gas projects, but will not be able to inform decisions about them if assessment and determination continues prior to the bioregional assessments being completed. There is no compelling public interest case for continuing project-by-project assessments prior to the bioregional assessments being completed, and arrangements for a moratorium should be made.
- In project determinations, IESC advice is often ignored. It needs to be given more weight, and consistent arrangements made for when and how advice is given, and the terms of that advice.
- Hard and clear triggers and thresholds should be established that ensure the Minister cannot approve coal and unconventional gas mining projects that have unacceptable impacts on nationally significant water resources. Most simply, this would mean exclusion areas for highly productive aquifers and nationally significant water resources, as well as threshold standards of mine design, such as the need for dams to withstand 1-in-1000 year average return interval floods, the need for all pits to be remediated, rather than left behind as voids, and the need to ensure that all surface water meets ANZECC guidelines.
- More broadly, there should be power for IESC to create binding guidelines, and require standards, such as for remediation of mine voids, standards for mine affected water dams, and enforcement of ANZECC water quality guidelines for creek discharges.

Impacts on these resources by large coal mining and coal seam gas are already occurring. Federal oversight of decision-making in this area was long-overdue and still requires far greater attention than it is currently getting.

Introduction

We are aware that mining companies are highly critical of sections 24D and 24E of the *EPBC Act*, introduced to make the impact of coal mining and coal seam gas on water resources a matter of national environmental significance. The Lock the Gate Alliance and our members are strongly supportive of the water trigger because we understand that water resources cross jurisdictional boundaries, and decisions about mining projects that have irreversible impacts on water require the perspective that only a Commonwealth trigger can provide.

According to the Issues Paper, 23 coal seam gas and large coal mine developments considered likely to have a significant impact on a water resource have been approved under the *EPBC Act* and a further 42 developments are undergoing assessment. No project has been refused approval under the EPBC Act because it would have clearly unacceptable impacts on water resources. All of these decisions have been made prior to the completion of the bioregional assessments, and the decision making and assessment process for these 23 developments has been uneven and at times, very poor.

Lock the Gate Alliance is very supportive of the water trigger, and we believe it fills a crucial gap in the regulatory landscape. Nevertheless, improvements could be made in its application and we hope this review takes the opportunity to make those improvements, to safeguard the future of Australia's most precious natural resource.

Why we need a water trigger

It is well-established in Australia that water management is a matter of national concern, and that water resources like the Murray Darling Basin, the Lake Eyre Basin and the Great Artesian Basin are of fundamental importance to the continent, its people and natural landscapes. Impacts on these resources by large coal mining and unconventional gas projects are already occurring. Federal oversight of decision-making in this area was long-overdue and still requires far greater attention than it is currently getting. Water resources that are not of obvious continental scope are equally in need of Federal oversight, because they support communities and industries that are of national importance. One example of these is the drinking water supply of Australia's largest city. Sydney's drinking water catchment already has several coal mines beneath it, which have led to cracking and pollution of major creeks feeding its storages. The threat to the water supply of such a large and important population from mining for coal or coal seam gas is certainly a matter of national significance. In a century where food security will increasing become one of the world's and the country's major strategic challenges, the water resources that support highly productive farming areas like the Darling Downs, Queensland Central Highlands and NSW Liverpool Plains are also of national significance. Similarly, a coastal catchment like the Fitzroy River basin drains into the Great Barrier Reef World Heritage Area, thus creating a broader national interest in ensuring downstream impacts by coal and unconventional gas on water resources are prevented and managed.

The issues paper asks what impacts of coal seam gas and large coal mining development on water resources the water trigger legislation was intended to address, and what previous policy or regulation had failed to address impacts of coal seam gas and large coal mining development on water resources. The impacts are myriad, but fall into broad categories:

- **Impacts on water supply**: the large volume of water used by coal and unconventional gas mining does itself mean water supplies for other uses are affected. Farming operations have lost water supplies as a result of coal and coal seam gas mining, ground and surface water loss changes soils, stresses vegetation and has an economic, social and cultural impact.
- **Impacts on water quality**: coal and unconventional gas mining bring salts and heavy metals to the surface that are then discharged. Reduction in water flows, too, intensifies pollution.
- **Impacts on hydrology**: the mining process, dewatering, fracturing by longwalls, alteration of catchment areas, all of these alter the flow direction and dynamics of ground and surface water. On a small scale, this can be managed, but where whole landscapes, like the Hunter or southern Queensland, are targeted by multiple proponents with multiple projects for large scale coal and unconventional gas, the cumulative effects are substantial.
- **Associated impacts**: each of the above has ecological, social, cultural and economic flow-on impacts and communities, natural processes, businesses and industries are affected by them individually and cumulatively.

Most of above impacts are addressed at the local and regional scale in project-by-project assessments undertaken by the states, but State-based regulation is uneven, and is not equipped to assess, prevent and manage impacts across jurisdictional boundaries. Neither do they address cumulative impacts, nor the flow-on impacts to the social and cultural values of water. This is part of the reason why it is crucial that the bilateral approval agreement clause is not changed: it will create the possibility that this gap in the process will return.

In the Hunter Valley, for example, there are large open cut coal mines in close proximity to each other that are significantly altering the groundwater hydrology of the Valley and fundamentally

altering the catchments of the creeks that feed the river system. The cumulative impact of the last ten years' of approval decisions by the New South Wales Government has not been properly assessed and understood, and is even now not really being addressed as the water trigger intended.

In Queensland's Surat Basin, the Walloon Coal Measures have been dewatered. This has affected adjacent Great Artesian Basin aquifers in Queensland, such as the Hutton Sandstone, and the broader and long term effects of this are poorly, if at all, understood. Important and hard win gains in capping bores and returning pressure to the GAB are being or are at risk of being undone because state government assessment processes were too narrow and compromised by budget interests to objectively weigh the interests and prevent them. The National Water Commission estimated in 2010, based on projections from information available at the time, that the coal seam gas industry could extract in the order of 7,500 gigalitres of groundwater over 25 years, or ~300 gigalitres per year. In comparison, the current total extraction from the Great Artesian Basin is approximately 540 gigalitres per year.[1] Later, these estimates were refined to look at different regions. The likely development scenario for CSG in Queensland would produce 7,025GL of water in total, or 306ML per year.[2] CSG production in Gloucester could result in of 200–700 ML/yr of produced water.[3] Based on estimates of the resource potential there, total produced water quantities from the Gunnedah Basin may range from 1.8 GL to 36.0 GL.[4]

Large volumes of groundwater are being brought to the surface in the Murray Darling Basin system with attendant salinity risks. Total dissolved solids levels in CSG produced water may vary from 200 to more than 10,000 milligrams per litre. Bringing the water to the surface, and storing it, can also concentrate other contaminants, like heavy metals.

Neither markets nor state Governments had the capacity or inclination to deal with these problems adequately. Project-based assessments externalise impacts on water resources and other water users, whole industries and the environment are degraded and jeopardised as a result.

Effectiveness of the water trigger

The terms of reference require the review to address the effectiveness of the regulation in protecting water resources from the impacts of coal seam gas and large coal mining projects, including the role and scope of work ascribed to the Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development (IESC). The Issues paper specifically asks, "Has the water trigger legislation been effective in protecting water resources potentially and actually affected by relevant developments?" Our answer to this us: partially. There is certainly evidence that gaps have been filled by the water trigger and the national interest has partially been served by the role it provides for the IESC and the Environment Minster in providing a kind of "house of review" and checking the mining enthusiasms of state governments. However, the legislation has been unevenly applied and some poor decisions have been made under it, indicating that there is

[1] National Water Commission. December 2010. "Coal seam gas and water position statement" http://nwc.gov.au/__data/assets/pdf_file/0003/9723/Coal_Seam_Gas.pdf
[2] National Water Commission. September 2011. *Onshore co-produced water: extent and management* Waterlines Report Series No 54
[3] National Water Commission. September 2011. *Onshore co-produced water: extent and management* Waterlines Report Series No 54
[4] National Water Commission. September 2011. *Onshore co-produced water: extent and management* Waterlines Report Series No 54

insufficient clarity about what constitutes, for example, an unacceptable impact and what management standards must be met for approval to be obtained.

We strongly recommend that in seeking information on the "costs and other burdens on those affected by the water trigger" the review will be looking at all costs, including the costs incurred by landholders and water users in lost water and associated productivity. Landholders in the Werris Creek area, for example, are have experienced record drops in bores in the alluvium of Quipolly Creek, attributed to the nearby Werris Creek coal mine. Some have had to destock as a result. Similarly, landholders in the Queensland gasfields have had great difficulty in securing replacement water from gas companies that have dewatered the Walloon Coal Measures, causing losses, stress and ongoing personal and business burden.

To improve the effectiveness of the water trigger, we believe the IESC bioregional assessments should review state and territory legislation and statutory arrangements for the management of water volumes and quality, and for the assessment of risk and damage to water resources by coal and gas mining and whether those measures are fit for the purpose of ensuring water resources are sustainably managed in areas where coal mining and unconventional gas are undertaken. In our experience, state-based water management regimes are uneven and this leads to inefficient and ineffective application of the water trigger, since mining assessments are led by state agencies.

The test of significance is applied by the proponent and a recommendation made to the Minister about whether to apply the water trigger as a controlling provision by Department staff with huge workloads. The Department has lost 25% of its operating budget in recent years, and must therefore have also lost capacity to attend to these referrals. In our experience, imposition of the water trigger and controlled action determinations can be capricious and significant impacts can occur without the trigger being applied at all. An expansion project for the largest coal mine in NSW, Mount Arthur in the Hunter Valley, was deemed a controlled action in 2015, but did not have the water trigger listed as a controlling provision. This was despite the significant impact the operation has already had on water resources in the Muswellbrook area. Mount Arthur's enormous open cut pits are just 150m from the main channel of the Hunter River at their nearest point and BHP propose to leave behind large and deep final voids when mining is finally complete. It is one of several open-cut super-pit complexes in close proximity to the Hunter River and its major tributaries and failure of the Environment Department to apply the water trigger to its latest expansion plan is baffling. There is, however, little to no recourse under the EPBC Act to review the merits of such decisions.

In January this year, dam walls collapsed at the Wambo and Mount Thorley Warkworth open cut mine in the Hunter Valley, and a third mine, Bengalla, had two of its dams overtop during the same heavy rainfall event. Having two dam collapses in a major tributary of the Hunter, Wollombi Brook, in the same week, and another overtop further upstream in the Hunter, highlights the failure of the water trigger to assess and prevent cumulative water quality impacts of high density coal mining in the Hunter. For example, it does not appear that recent expansions at Wambo were referred under the *EPBC Act* at all, despite the mine drawing water from the Wollombi Brook alluvium into its pits. Similarly, a coal rejects pile at the Clarence mine in the Blue Mountains collapsed last year sending black sludge down the Wollangambe River into the Blue Mountains World Heritage Area. The mine has struggled to deal with large volumes of reject coal, but in 2014, an application to create a sixth reject coal pile on the site was referred to the EPBC process and deemed not a controlled action. A year later, the mine had a major pollution event in a river that flows into a World Heritage Area and Sydney's drinking water catchment. An earlier referral for the mine made in 2012, prior to the water trigger coming into force, also deemed approval not required, under a "particular manner" decision. Clarence is an old mine. It predates the EPBC Act and so is saved by transitional arrangements. And

yet, the opportunity was not taken, in 2014 when a referral was made for a sixth spoil pile, to treat the application as a larger project and assess the mine's overall impact on water resources.

Overall, we would wish for more consistency and precaution in the decision-making for the water trigger, but there are certainly instances where it has led to outcomes that improve decisions made at the state level. The clearest example is Wollongong Coal's controversial Underground Expansion Project for its Russell Vale mine in Sydney's drinking water catchment (EPBC 2014/7268).

Wollongong Coal were severely delayed in preparing an EIS for the full Underground Expansion Project, a highly controversial "triple seam" longwall very close to the dam wall of the Cataract Reservoir. While grappling with the preparation of an assessment for the full project, they sought and obtained from the NSW Government a series of planning consents for smaller components of the project, in single and half longwall panels, incrementally mining the area while the larger project languished. One of these incremental approvals was for the project's Longwall 6 panel (EPBC 2014/7259). The NSW Government approved Longwall 6. Advice from the IESC informed the Federal Environment Minister that the risk to some of the upland swamps that filter and release clean water to the city's dams was too great, but that this risk could be managed if the mine plan was altered. The EPBC approval, which was granted on 24 December 2014, approved only for 365m of the longwall, not the 400m sought by the company, crucially avoiding undermining one of the at-risk swamps.[5]

The company has now applied for and been granted a modification of the larger project, which is still awaiting assessment and determination to include the 35m of Longwall 6 that had previously been excluded from the smaller project. This means that if the full Underground Expansion Project is subsequently approved under the EPBC Act, the previous precautionary action will be undone. Clearly the problem of inconsistency can have profound consequences.

Role of the IESC

Bioregional assessments

The IESC is conducting bioregional assessments, but no moratorium has been imposed on further approvals under the water trigger while they are underway. This is a serious problem. There is a significant amount of work to be done across multiple regions and subregions for the assessments.

So far, only the first of five components have actually been undertaken and made available, comprising the contextual background of the assessments. The products released by the IESC as part of this first component are very useful for members of the public seeking better understanding of the hydrological values of their region, the coal and gas resource, and the relevant data held by Governments. And yet, it is stages 2, 3 and 4 of the assessments that will generate the crucial information required by decisions makers before committing approvals for further coal and gas developments. The data analysis and modelling of stage 2, the impact assessment of stage 3, and the risk analysis of stage 4 should all be completed prior to the approval of large scale projects in close proximity to each other that will have cumulative and long-term consequences for nationally significant water resources. And yet, since this work began, as the Issues Paper outlines, 23 coal seam gas and large coal mine developments considered likely to have a significant impact on a water resource have been approved under the EPBC Act. A further 42 developments are undergoing

[5] The IESC's advice on the project is here: http://www.iesc.environment.gov.au/committee-advice/proposals/russell-vale-colliery-longwall-6-project-advice

assessment now, and it seems highly likely that they will gain their approval before the bioregional assessments are complete. This defeats a primary purpose of the assessments, which is to inform decisions makers of the risks and consequences of the decisions they're making *before* they make them. There is real risk that irreversible harm, or harm that can only be reversed by spending a great deal of public money over a long period of time, will result from the current suite of approvals being provided to large scale coal and gas mining projects. This could be foreseen and prevented if a moratorium on further approvals were put in place while the bioregional assessments are completed.

There does not seem to be any specific requirement for proponents or decision-makers to consider this information during the assessment and approval process. For example, the Santos GLNG Gas Fields Development Project (EPBC 2012/6615) did not appear to consider the study published by the IESC and the Department of Environment in September 2014, titled "Ecological and hydrogeological survey of the Great Artesian Basin springs." If important work such as this does not have any standing under the water trigger, and proponents' assessments do not improve to the extent that they include and refer to important works published by the IESC, then the objectives of the National Partnership Agreement are not being met.

Certainly, recent assessments of coal mines in the Hunter Valley, or gasfield expansions in the Surat Basin have not included reference or consideration of the bioregional assessments that are in preparation for those regions.

IESC project advice

The IESC's project advice has not been well utilised by state government decision makers and assessment procedures. The advice they provide has been at times ignored and the bland requirement that this advice be "considered" is all the loophole the minister needs to fail to heed warnings made by the committee. Without merits appeal rights, poor decisions can be made without correction and damage can be done that will not be easily rectified.

In general, advice from the Committee is not made publicly available in a timely manner. It is generally not released until after the relevant state government has already approved a development. This is not helpful in terms of informing communities and in fact, tends to undermine confidence in the process. The National Partnership Agreement should stipulate the Committee's advice on specific projects should be made available to the public at the same time that it is provided to either Government (state or federal). Such a step would markedly increase the timely provision of information to the community.

It seems to us, too, that the Committee often has insufficient time to conduct the analysis that is required of proposed coal and gas developments, and is asked for advice early on in the process at a time when little information is available to inform it. We believe that the rigour of the IESC's advice would be increased by ensuring that they can take up to six months to properly consider a project if required, and that there be, if needed a clear two stage process – advice from the Committee pre-assessment, about the terms of the assessment and the data that proponents must be required to gather in order for an assessment to be rigorous and thorough, and then further advice on the adequacy of the assessment and the advisability of the project proceeding on the terms the proponent proposes, or at all.

We are very concerned at the apparent failure of many of the state governments to actually act on the advice of the Committee. In our opinion and after reviewing numerous mining project proposals

in detail, it is apparent that the Committee's advice has been largely ignored by regulators. This is a grave cause of concern, and is severely undermining community confidence in the regulation of mining in Australia. For example, on numerous occasions we have seen the IESC advise that final void pits do not constitute best practice in water management and mine rehabilitation, but such advice has been, in all cases that we have reviewed, entirely ignored. We provide a case study below of the Arrow Surat Basin Gas Project which highlights the extraordinary failure by state governments and proponents to accept IESC advice, and the failure of the Federal Governments to make them do so prior to it approving the projects in question.

Documents obtained under Freedom of Information laws by Lock the Gate Alliance reveal that on the 26th August 2013, Arrow Energy wrote to the Federal Environment Department making the extraordinary claim that their proposed 6,500 coal seam gas wells, which will produce 2.3 million tonnes of salt and will discharge unknown quantities of coal seam gas water of unknown quality into rivers and creeks "is unlikely to have a significant impact on the water quality of water resources in the Surat Basin."[6] This letter was sent four days after the Department had received advice from the IESC advising the Government that more water quality testing was needed to understand what will be in the produced water that Arrow proposed to discharge, and the potential cumulative impacts with other developments within the catchments of watercourses that will receive produced water discharges. The IESC advice criticised Arrow's supplementary report to its Environmental Impact Statement (SEIS) for failing to address some serious potential impacts their project will have on water resources, including undisclosed plans to discharge polluted water into the Condamine River, failure to present a plan to deal with the salt the project will produce, and failure to adequately prepare for flooding.

The IESC was highly critical of Arrow's failure to address the management of the salt that will be brought to the surface with the huge volumes of groundwater that need to be removed to extract coal seam gas, saying: "The preferred location of the majority of infrastructure has also not been finalised, no final disposal option for co-produced water or brine is selected, and no discharge strategy is available. Therefore, the level of information contained within the proponent's assessment documentation is insufficient to provide a clear understanding of the potential risks associated with this project." Similarly, the assessment information provided in the Supplementary EIS "does not provide sufficient information on brine and salt management measures or disposal options to enable a scientifically based analysis of their adequacy to be undertaken."[7]

The documents released under Freedom of Information reveal that Arrow refused to assess the options they were proposing for salt disposal, saying instead that, "Conceptual information about selective salt recovery will be presented in the SREIS but these options will not be assessed" and that they would not be undertaking ecotoxicology testing unless the brine were to be disposed of at sea or by injection into an aquifer.[8] Both of these statements constitute direct refusal to comply with recommendations of the Independent Expert Scientific Committee, and yet the Federal approval was given for the project to go ahead despite that refusal and without the work recommended by the IESC having been done. Arrow also directly refused to undertake a risk assessment of potential well failure and the possibility that such failure would increase aquifer interconnectivity, despite a specific recommendation from the IESC that this occur.[9] No cumulative

[6] See Document 13 Letter dated 26 August 2013 and Document 17 Letter dated 10 October 2013.
[7] IESC Final Advice. August 2013.
[8] Document 15 in the FOI request, appended "Arrow Energy – Response to IESC Advice for discussion with SEWPaC" page 78 and 167 of the PDF.
[9] See page 165 of Document 15 "Response to IESC Advice on Surat Gas Project EIS"

impact assessment of current and approved discharges of coal seam gas produced water into the region's rivers was carried out for the EIS, despite the fact that the regulators and the company are aware that "numerous CSG developments in the region had indicated that CSG water could be released to watercourses during operations."[10]

The approval that was eventually granted to Arrow included the specific requirement that prior to commencing the project, the company submit a staged Coal Seam Gas Water Monitoring and Management Plan for approval by the Federal Environment Minister, including a detailed strategy for the management of the salt and brine that will be produced by the project. The IESC also recommended that a comprehensive flood study be undertaken modelling the effects of a one-in-one-thousand year scale flood, and that "project infrastructure with the potential to cause significant contamination, such as raw co-produced water and brine dams, should be protected from these events." This had not been done, and the Queensland Government Assessment Report for the project did not implement or even mention this crucial recommendation, instead noting that "The use of buffer zones to restrict project activities near watercourses, and location of facilities above the 1-in-100-year ARI flood event were highlighted as significant measures to limit residual impacts, although the width of buffers was not defined and the location of facilities above the 100 year ARI would only occur where this was considered by Arrow to be practicable."[11]

The Federal conditions of approval, using the water trigger at least attempted to address the gap it by requiring Arrow to undertake a flood risk assessment "which addresses potential impacts to the environment from the action in the case of a 1:1000 ARI event, and which will estimate the consequences if major project infrastructure is subject to such an event, including release of brine and chemicals into the environment."[12] Without the Federal oversight and approval power for the water trigger, even this minimalist this condition would not be imposed, with the associated risk that, over the 40 year life of this project, a greater than 1 in 100 year flood would occur which Arrow's infrastructure could not cope with, and a major pollution event would result.

This is one example, but there are many others, where the IESC has warned that insufficient information has been provided by the proponent to make a confident determination, and yet approval has been granted, on the promise that management plans will be produced to address gaps in knowledge and planning. This approach exposes the community to unforeseen risks like salinity outbreaks, dam collapses, lost creeks and groundwater supplies, and it can be very difficult afterwards to rectify this damage, or make the mining company accept responsibility.

Opportunities for improvement

The most significant gap in the water trigger is its application to only one form of unconventional gas mining. Mining techniques for coal seam gas, tight gas and shale gas are broadly similar and have comparable significant impacts on water resources. The fundamentals are the same: unlike conventional gas, coal seam gas, tight gas and shale gas must be removed using highly invasive techniques from where it is trapped in rock formations. We believe it was an oversight that the water trigger used the term "coal seam gas" rather than "unconventional gas" given the risks and

[10] Qld EHP Assessment Report. October 2013. p93.
[11] EHP Assessment Report. October 2013. 92
[12] EPBC Act Decision brief. Department of Environment. December 2013. http://www.environment.gov.au/epbc/notices/assessments/2010/5344/2010-5344-decision-brief.pdf

impacts are so similar. This review should take the opportunity to apply the water trigger to all forms of unconventional gas.

We are also concerned that related water developments for coal mining and unconventional gas are not triggering the law, such as an expanded borefield to supply the Boggabri mine and large dams in Central Qld proposed in order to supply water for coal mines. Similarly, a water treatment plant for Santos' CSG exploration in the Pilliga is currently under construction but has not been referred. This plant will process up to a million litres of CSG produced water a day, to be used in an experimental irrigation project and will produce large volumes of brine that will need to be disposed of. These are clearly all water resource impacts of coal mining and CSG and should be subject to assessment and determination under the water trigger.

More broadly, the water trigger is being applied on a project-by-project basis while at the same time bioregional assessments are underway and cumulative impacts are neither adequately understood, nor addressed.

Our immediate recommendations for improvement are:

- Shale and tight gas need to be covered, and any other related fossil fuel developments, such as shale oil and underground coal gasification.
- Related water developments for coal mining and unconventional gas are not triggering the law. If a borefield, dam or water pipeline are proposed in order to feed a coal mine with water, or a water treatment facility proposed for a CSG operation, they are water resources impacts of those activities and it should be triggered.
- Hard and clear triggers and thresholds that ensure the Minister cannot approve coal and unconventional gas mining projects that have unacceptable impacts on nationally significant water resources.
- Most simply, this would mean exclusion areas for highly productive aquifers and nationally significant water resources, as well as threshold standards of mine design, such as the need for dams to withstand 1-in-1000 year average return interval floods, the need for all pits to be remediated, rather than left behind as voids, and the need to ensure that all surface water meets ANZECC guidelines.
- Arrangements should be made so that any further project assessments are paused until the bioregional assessments are complete.
- This review should recommend that the IESC conduct a review of state and territory legislation and statutory arrangements for the management of water volumes and quality, and assessment and determination processes for the impact of coal and unconventional gas mining on water resources, and identify gaps and failures in those regulations.
- There should be power for IESC to create binding guidelines, and require standards, such as enforcing ANZECC water quality guidelines for creek discharges.

Thank you for the opportunity to make this submission. We look forward to reading the review's report.