

Regulatory review of coal seam gas-induced subsidence

Discussion Paper

May 2022





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Have your say

The GasFields Commission Queensland (the Commission) is seeking community, industry, government and key stakeholder input regarding the adequacy of existing regulatory frameworks to manage the potential impacts of CSG-induced subsidence on intensively farmed land.

How to make a submission

You can provide your written submission via email or post:

Email: enquiries@gfcq.org.au

Post: Regulatory review of CSG-induced subsidence
GasFields Commission Queensland
PO Box 15266
City East Qld 4002

Please indicate whether you would prefer any elements of your feedback to remain confidential. Submissions not marked as confidential may be published in full or quoted in public documents and may be available to applicants under the [Right to Information Act 2009](#).

For more information call: +61 7 3067 9400.

Submissions close 5.00 pm on Thursday, 30 June 2022.

Executive Summary

Over the past 18 months, coal seam gas-induced (CSG-induced) subsidence has emerged as a significant concern of landholders in areas of intensively farmed land located on the Condamine River floodplain near Dalby. Landholders and agricultural peak bodies have also raised concerns about the adequacy of the regulatory framework and the perceived lack of protections from the impacts of CSG-induced subsidence on intensive farming operations. Of particular concern, are those farming enterprises where slope is critically important for irrigation practices and maintaining overland flow.

The Office of Groundwater Impact Assessment (OGIA) has recently undertaken and published a comprehensive assessment of CSG-induced subsidence in their '[Underground Water Impact Report for the Surat Cumulative Management Area](#)'. The results of this assessment have confirmed that CSG-induced subsidence is currently occurring and is predicted to continue to occur as CSG development advances. However, the matter of assessing the materiality of the potential economic impacts to agricultural operations and management of the existing regulatory regime remains an outstanding issue.

In response to the concerns raised, the Commission committed to review the adequacy of the current regulatory framework with a view to identifying potential regulatory or other enhancements relating to subsidence. The review has focused on the issue of potential economic impact that may occur as a result of CSG-induced subsidence and how the current regulatory framework seeks to address this issue.

In addition to the regulatory review, the Commission is also leading a research project to test and develop a methodology for the assessment of on-farm consequences of subsidence and risk.

The review has been conducted with advice and input from the relevant government regulatory agencies including the Department of Resources (Resources), Department of Environment and Science (DES), Department of State Development, Infrastructure, Local Government and Planning (DSDILGP), Department of Regional Development, Manufacturing and Water (DRDMW) and OGIA.

The review has examined each of the relevant regulatory frameworks that may manage subsidence, including the [Environment Protection and Biodiversity Conservation Act 1999](#) (EPBC Act [Cth]), [Mineral and Energy Resources \(Common Provisions\) Act 2014](#) (MERC Act); [Water Act 2000](#) (Water Act); [Environmental Protection Act 1994](#) (EP Act); and the [Regional Planning Interests Act 2014](#) (RPI Act). Legislation has been examined in the context of the objects of the Act and the applicability of the Act in regulating subsidence.

A summary of the review findings are as follows:

- the regulatory framework that applies to CSG-induced subsidence is complex, multi-faceted and touches on a number of state and federal regulations. Due to these complexities, there is no clear jurisdictional responsibility to regulate and manage the impacts of CSG-induced subsidence;
- there are existing protections under the current regulatory framework, including for economic, environmental and land use impacts, however these remain generally untested;
- there is a current knowledge gap in relation to the potential on-farm consequence and economic impacts of current and predicted CSG-induced subsidence;
- depending on the circumstances, not all farming operations are afforded the same protections under the existing framework;
- there is no clear pathway for impact assessment, determination or dispute resolution for landholders who believe that they have been materially impacted by CSG-induced subsidence (other than the Land Court of Queensland); and

- there is an opportunity to enhance the existing regulatory regime to improve protections for landholders and provide greater certainty around regulatory obligations for the onshore gas industry.

The key to appropriate reform will be gaining a clearer understanding of the consequences and materiality of CSG-induced subsidence at a farm scale.

The outcomes being sought by the Commission are to ensure that there are appropriate protections for landholders materially impacted by CSG-induced subsidence, and that there is a clear process available to landholders to gain greater certainty around regulatory obligations for the onshore gas industry.

In considering the opportunities to enhance the existing regulatory framework, the Commission has developed a set of principles that will be used to inform the Commission's recommendations for regulatory reform. These principles are:

- provide a statutory framework that ensures appropriate protection for landholders where CSG-induced subsidence can be demonstrated to have an economic impact on-farm in areas where the agricultural land use (i.e. intensively farmed areas) is sensitive to potential subsidence impact;
- provide clear roles and responsibilities in relation to various entities involved in the assessment, monitoring and management of CSG-induced subsidence in high-value agricultural cropping areas;
- take a risk-based approach to the management response, informed by an assessment of the likelihood, consequence, and materiality of CSG-induced subsidence;
- where possible, include proactive management actions so that management arrangements are in place before impacts occur in high-risk areas;
- ensure that management actions are not limited by tenure boundaries;
- take an evidence-based approach, relying on independent monitoring, assessment and advice in assessing risks and resolving disputes using the best available science;
- provide a pathway to impact assessment and resolving disputes, including alternative dispute resolution with an ultimate determination through the Land Court as a last resort; and
- ensure reasonable and necessary costs are borne by the responsible tenure holder in relation to assessment and dispute resolution.

The Commission is seeking stakeholder views and input on the process for managing the potential impacts of CSG-induced subsidence. We are particularly interested in stakeholders' views and experiences of the regulatory frameworks; aspects of the frameworks where there is a lack of clarity; aspects of the frameworks which are working well; and aspects where stakeholders believe improvements could be made.

Context and Purpose of Review

The GasFields Commission Queensland is an independent statutory body established under the [Gasfields Commission Act 2013](#) to manage and improve the sustainable coexistence of landholders, regional communities and the onshore gas industry.

The Commission has 14 legislative functions which can be summarised as:

- facilitate effective stakeholder relationships, collaborations and partnerships to support information sharing related to the onshore gas industry;
- review the effectiveness of government entities in implementing regulatory frameworks related to the onshore gas industry; and
- advise agriculture and gas industry peak bodies, government ministers and regulators, and landholders and community groups on matters relating to sustainable coexistence, leading practice and management of the onshore gas industry.

In response to landholder concerns about CSG-induced subsidence, the Commission has reviewed the regulatory frameworks associated with CSG-induced subsidence consistent with [section 7\(1\)\(b\) and 7\(1\)\(e\)](#) of the *Gasfields Commission Act 2013*.

Background

The process of CSG production involves the extraction of groundwater to depressurise coal seams to allow gas to flow to the surface. In response to the depressurisation, some compaction of the coal seams in the target formation will occur. As a result of the compaction, overlying formations may subside, resulting in some subsidence at the ground surface.

The potential for CSG-induced subsidence has been identified in reports commissioned by the Australian Government related to the CSG industry in 2014¹. However there have been limited studies on the economic consequences of CSG-induced subsidence on farming enterprises.

Guidance material for the preparation of Underground Water Impact Reports (UWIRs) includes a requirement for risk-based assessment of impacts on environmental values (EVs) that may result from subsidence caused by [associated water extraction](#). The potential of CSG-induced subsidence was raised in OGIA's [2019 UWIR for the Surat Cumulative Management Area](#) (CMA).

OGIA has subsequently undertaken a comprehensive assessment of CSG-induced subsidence in the Surat CMA – the first of its kind in Queensland – which was [published in the 2021 UWIR](#). The key findings of OGIA's assessment include:

- hundreds of metres of CSG depressurisation will result in a few centimetres of subsidence at the ground surface;
- OGIA's modelling of subsidence predicts that most of the cropping area around the Condamine Alluvium is likely to experience less than 100 mm of subsidence, with a maximum change in slope for most areas of less than 0.001% (10 mm per km) and up to 0.004% (40 mm per km) for some areas; and

¹ [Background review – Subsidence from coal seam gas extraction in Australia \[June 2014\]](#)

- observations from satellite data indicate that about 100 mm of CSG-induced subsidence has occurred around the CSG fields near Condamine Alluvium. Natural movement of up to 25 mm/year is also observed away from CSG fields.

What has yet to be examined is the level of risk of impact to agricultural operations as a result of CSG-induced subsidence and the effectiveness of the current regulatory framework in managing subsidence risk and impact.

Agricultural peak bodies and landholders with farming operations on high-value agricultural land near Dalby and Cecil Plains on the Condamine River floodplain have raised concerns about the potential of CSG-induced subsidence impacting farming land and their farming operations.

Farming operations located on the floodplain rely on water allocation and/or harvested overland flow to irrigate crops. These properties are often laser-levelled to optimise overland flow and irrigation practices. According to landholders, any change in slope as a result of CSG-induced subsidence has the potential to have a material impact on the productivity and profitability of their farming operations. Landholders have stated that a change in slope would result in fields not draining properly as designed. Changes to drainage patterns would mean that fields would become waterlogged and/or water would drain away too quickly. Either of these effects would lead to a reduction of yield and would need to be remediated to maximise irrigation efficiencies.

Agricultural groups and landholders have also raised concerns around a lack of clarity in regulatory protections for landholders and requirements to monitor, assess and remedy potential subsidence-related impacts.

Whilst landholder concerns about subsidence have largely been related to gas development on the Condamine River floodplain near Dalby, it is acknowledged the potential impacts of CSG-induced subsidence could be experienced in other areas of CSG development where there is an interaction with intensively farmed land and agricultural practices that are highly slope dependent.

This paper provides:

- details of landholder concerns about subsidence on intensively farmed land and operations;
- an overview and analysis of the regulatory framework relating to subsidence; and
- findings and principles to inform potential future reform and recommendations to government.

Scope of review

The scope of this review includes:

- a review of the regulatory frameworks pertaining to the management of CSG-induced subsidence;
- a review of the effectiveness of the implementation of regulatory frameworks pertaining to the management of CSG-induced subsidence, specifically in relation to protections afforded to landholders for economic impacts resulting from CSG-induced subsidence under the current regulatory framework; and
- identifying potential enhancements to the regulatory framework to improve management of the economic impacts of CSG-induced subsidence on farming operations.

Landholder concerns regarding CSG-induced subsidence

As previously stated, agricultural peak bodies and landholders on the Condamine River floodplain have raised concerns about the potential production and economic impacts of CSG-induced subsidence on their farming practices, particularly those enterprises that operate laser-levelled irrigation properties. Landholders have stated that where subsidence occurs and changes the slope and drainage of irrigated fields, there is the potential of economic impacts including the reduction in yields and increased management costs.

Through engagement with landholders, the Commission has identified that the pathway to compensation for affected landholders is unclear. There is currently a lack of information or research about the risk of impact and consequence associated with CSG-induced subsidence and an appropriate assessment framework to validate slope changes on farming operations.

Further, stakeholders with concerns or complaints can be frustrated by the number of regulators and the complexity of the regulatory framework. The number of agencies involved in responding to landholder enquiries and complaints can cause confusion. It would be appropriate for the State Government to consider its internal arrangements, which is much broader than the issue of subsidence.

Consequence of impact

OGIA's [latest UWIR](#) prepared in 2021 provides a comprehensive evaluation of CSG-induced subsidence on the Condamine flood plain. OGIA's modelling and research work has revealed that CSG-induced subsidence is occurring and will continue to occur as CSG development continues to expand in the Surat Basin. It also provides a framework for ongoing independent monitoring of subsidence across the CMA.

However, there is limited information or research on whether CSG-induced subsidence will have a material economic impact on specific farming operations at a property, sub-regional and/or regional scale.

Understanding the potential consequences and materiality of subsidence on farming operations is key to understanding the risk associated with CSG development in intensive farming areas.

As assessing the consequence and materiality of subsidence at a farm scale is not currently within OGIA's legislative remit, the Commission is leading a research project to test and develop a methodology for the assessment of on-farm consequences of subsidence and risk. The Commission has convened a project team including OGIA and other technical experts to deliver this research project.

The research is focused on gaining an understanding of the impacts of subsidence at the farm scale in terms of the change in slope and what may be required to remediate the impacts. The research project will also focus on the farming management, such as an increased requirement for levelling, that would be required to adjust to a change in slope.

The research project seeks to develop a framework for assessing, at a farm scale, the risk to farming operations on intensively farmed land, arising from predicted CSG-induced subsidence. It is intended that the framework will assist in assessing the suitability of existing legislative frameworks for managing farm impacts. Outputs from the research project will inform any final report and potential recommendations by the Commission to enhance the regulatory framework.

Regulatory framework overview

The current regulatory framework related to CSG-induced subsidence is multi-faceted and touches on aspects of State and Federal regulation, including:

- [Environment Protection and Biodiversity Conservation Act 1999](#);
- [Mineral and Energy Resources \(Common Provisions\) Act 2014](#);
- [Water Act 2000](#);
- [Environmental Protection Act 1994](#); and
- [Regional Planning Interests Act 2014](#).

The purpose of this section is to outline the details of each regulatory framework along with its relevance, or potential relevance to the management of CSG-induced subsidence. Preliminary observations have also been made about each regulatory instrument for managing CSG-induced subsidence.

In the context of this paper, the purpose of each Act has been considered as to how the relevant regulatory provisions apply to subsidence. The legislation has been examined in the context of how it relates to or addresses economic impacts at a farm scale.

Environment Protection and Biodiversity Conservation Act 1999 (Cth)

The objectives of the EPBC Act are to provide for the protection of the environment, especially matters of national environmental significance, conserve Australian biodiversity and provide a streamlined national environmental assessment and approvals process. The Australian Government's Department of Agriculture, Water and Environment administers the EPBC Act.

The EPBC Act is a key regulatory framework for managing subsidence risk for major CSG projects that trigger the assessment and approval under the Act. Under the EPBC Act, a proponent for a CSG project that is likely to have a significant impact on a water resource (including a groundwater resource) needs to refer their project to the federal Minister for the Environment to decide whether it is a controlled action.

If it is deemed a controlled action by the Minister, then the project needs assessment and approval under the EPBC Act. The assessment and final approval decision would examine in detail the impacts on the water resource.

Some CSG proponents are conditioned to monitor subsidence under their EPBC Act approvals. For example, the resource company is required to submit a Water Monitoring and Management Plan for approval of the federal Minister that includes a program to monitor impacts.

Federal conditions may include the requirement for a resource company to have an approved baseline and monitoring program in place as well as trigger thresholds for reporting incidents of subsidence. Further, there is a requirement to develop an action plan to address impacts if trigger thresholds are exceeded.

Assessment of the EPBC Act

The EPBC Act's focus is around protecting environmental impacts and, in this context, provides a regulatory framework and condition for monitoring CSG-induced subsidence and the management of environmental impacts if they occur.

However, the EPBC Act only applies to projects that trigger a referral and assessment as a controlled action under the Act. This means that not all relevant projects will be covered by EPBC Act approvals and conditions relevant to CSG-induced subsidence.

For example, the Commission understands that the Water Management and Monitoring Plan and the conditions of the EPBC approvals for some projects do not apply to the entirety of the project area and that older or smaller scale approvals may fall outside this condition.

Further, the focus of the EPBC Act is around managing subsidence risk associated with matters of national environmental significance and does not overtly contemplate compensation or remedy provisions for impacts on farming operations.

Mineral and Energy Resources (Common Provisions) Act 2014

Resources administers the land access framework under Chapter 3 of the MERCP Act and subordinate legislation.

The purposes of the MERCP Act are to consolidate particular provisions common to each of the Resource Acts, provide for common processes that apply to resource authorities, manage overlapping coal and petroleum resource authorities for CSG, provide for the disqualification from grant or transfer of particular resource authorities and assist in achieving the purposes of each of the Resource Acts.

The purpose of Chapter 3 of the Act is to outline provisions for the access of private land for resource activities, including notification requirements and dealing with compensation for impact.

In general, the land access laws include the following requirements:

- a resource company cannot enter restricted land without the written consent of a landholder;
- a resource company must give an entry notice before trying to enter a landholder's property to undertake ['preliminary activities'](#) i.e. activities that will have no or low impact on the landholder's business or land use activities;
- a Conduct and Compensation Agreement (CCA), Deferral Agreement or Opt-Out Agreement must be negotiated before a resource company comes onto a landholder's property to undertake 'advanced activities', i.e. those likely to have more than a minor impact on a landholder's business or land use activities;
- a graduated process for negotiation and resolving disputes about CCAs, which ensures matters are only referred to the Land Court as a last resort;
- all resource companies must comply with the Land Access Code; and
- compliance and enforcement powers for government agencies where breaches of the land access framework occur.

[Under section 81 of the MERCP Act](#), a resource authority holder is liable to compensate an owner or occupier of private land (an eligible claimant) that is in the authorised area of the resource authority for each 'compensatable effect' suffered by the claimant because of the holder's activities on the eligible claimant's land.

A 'compensatable effect' is defined in section 81 (4) to mean:

- deprivation of possession of the land's surface;
- diminution of the land's value;
- diminution of the use made, or that may be made, of the land or any improvement on it;
- severance of any part of the land from other parts of the land or from other land that the eligible claimant owns;

- any cost, damage or loss arising from the carrying out of activities under the resource authority on the land; and
- consequential loss incurred by an eligible claimant arising out of a matter listed directly above.

Whilst the land access framework provides a compensation liability if activities lead to a compensatable impact on a landholder's business or land use, each set of specific circumstances would need to be considered when assessing compensatable effects associated with subsidence.

Generally, a CCA is required before any '[advanced activities](#)' (an activity having more than a minor impact on land) can be undertaken on private land. However, regardless of whether an activity is either preliminary or advanced, a resource authority holder is liable to compensate an owner or occupier of private land that is in the authorised area of the resource authority for each 'compensatable effect' that occurs because of the holder's activities undertaken on the eligible claimant's land.

This is particularly relevant to subsidence where the '[authorised activity](#)' would be considered the extraction of gas and water, which is likely to be the source of the CSG-induced subsidence.

Therefore, the definition of compensatable effect [s 81(4)(a)] "any of the following caused by the holder...., carrying out authorised activities on the eligible claimant's land" would apply here as the gas and water extraction relating to the subsidence impact would be occurring on the eligible claimant's land (subsurface land). Potential impacts that may or may not occur in the future are not compensatable at the time of drilling and would only be compensatable if realised.

In relation to compensation liability for a preliminary activity that results in a compensatable effect (i.e. where no CCA is required), a landholder would either have to resolve the impact directly with the resource authority holder or refer the matter to the Land Court for resolution.

In these instances, the landholder would generally be responsible for demonstrating the impact, including associated costs of producing relevant evidence. Any other costs would also be borne by the landholder (e.g. legal costs etc.). Therefore, resolution will depend on the landholder demonstrating impact and ultimately the Land Court process.

Analysis of MERC Act

Overall, the MERC Act has the most comprehensive existing protections for landholders from any compensation liability associated with the potential impacts of CSG-induced subsidence. The MERC Act provides for any demonstrable and material impacts associated with subsidence to be considered a 'compensatable effect' and dealt with within the land access and compensation framework.

While the MERC Act requires resource companies to compensate for impacts caused by CSG development in accordance with the 'compensatable effects' outlined in section 81(4), there is currently no statutory process (other than referral of the matter to the Land Court) that can be invoked in cases where a landholder believes that an impact has occurred that has resulted in a compensatable effect on the property.

This means that landholders would be required to demonstrate the impact of CSG-induced subsidence on their business or land use. Additionally, landholders have no access to alternative dispute resolution (ADR), as they would in the context of a CCA, and would be unable to access professional services. Therefore, landholders may have to spend a significant amount of money to prove if CSG-induced subsidence is having a material impact on their business or land use.

While authorised activities which cause CSG-induced subsidence to occur within the authorised area of the tenure, some impacts of CSG-induced subsidence may occur on properties off-tenure.

The Commission understands that under the current legislative framework if there is no eligible claimant (i.e. a landholder's property is not in the area of the authority) there cannot be a compensatable effect (s 81 of MERCPC) claimed.

It should be noted that civil remedies (i.e. damages etc.) would likely be available to the landholder in this instance where an impact occurs off tenure if the landholder could make the case for it.

Water Act 2000

The Water Act is administered by DRDMW, with the exception of [Chapter 3](#) which is administered by DES.

The Water Act provides for the sustainable management of water and the management of impacts on underground water. The purpose of Chapter 3 of the Water Act "*provides for the management of impacts on underground water caused by the exercise of underground water rights by resource tenure holders.*" The purpose of Chapter 3 is achieved by providing a regulatory framework for:

- monitoring and assessing the impacts on underground water take on water bores;
- the preparation of UWIRs that establish underground water obligations; and
- managing the cumulative impacts of underground water take by resource tenure holders.

Under Chapter 3, where a CMA is established, OGIA is responsible for independently undertaking assessments and establishing management arrangements in the UWIR, which is subsequently submitted to DES for approval. Currently, the only CMA in Queensland is the Surat CMA.

The UWIR for the Surat CMA is a statutory instrument under the Water Act. The UWIR describes the responsibilities of tenure holders to:

- undertake bore assessments in the immediately affected areas (IAA);
- enter into Make Good Agreements with bore owners; and
- implement Make Good Agreements.

An IAA is an area where the water level in an aquifer is predicted to decline by more than the bore trigger threshold, within three years of the release of the UWIR for consultation, due to the extraction of water associated with resource operations. [Maps of IAAs](#) must be included in an UWIR.

A long-term affected area (LAA) is an area where the water level in an aquifer is predicted to decline by more than the bore trigger threshold at any time (beyond three years) due to the extraction of water associated with resource operations. [Maps of LAAs](#) must be included in an UWIR.

Landholders who are bore owners in the Surat CMA have access to specific information about the predicted impacts at the location of their bore.

Make good measures are required for a Make Good Agreement where a bore has or is likely to have an impaired capacity.

OGIA was established under [Chapter 3A of the Water Act](#). OGIA is primarily responsible for assessing and managing the impacts of groundwater extraction from resource operations (petroleum and gas, and mining) in CMAs.

OGIA oversees the implementation of those arrangements and DES manages compliance. This represents a separation of OGIA's role of assessor (funded by an industry levy) and the regulator (DES).

OGIA's main functions are to:

- advise the chief executive of DRDMW on matters relating to impacts on underground water caused by the exercise of underground water rights by resource tenure holders;
- establish and maintain a database of information about underground water; and
- prepare UWIRs for CMAs.

Under Chapter 3A of the Water Act, OGIA's functions also include any other function given to the office under the *Water Act 2000* or another Act. The Commission is not aware of any other powers granted to OGIA under other legislation. The chief executive of DES may also direct OGIA to provide advice on any matter relating to impacts on underground water caused by the exercise of underground water rights.

A legislative change in 2016 extended the scope of the UWIR to include a description of impacts on EVs arising from the exercise of underground water rights. The 2019 UWIR was the first required to address impacts on EVs² and include an assessment of CSG-induced subsidence.

Guideline (Water Act 2000): Underground water impact reports and final reports (the guideline)

The purpose of [the guideline](#) is to provide guidance regarding the information required for inclusion in a UWIR and final report to meet the requirements of Chapter 3 of the Water Act.

The guideline outlines how the exercise of underground water rights may result in damage to the physical integrity of confining geological formations and may also result in surface subsidence. The guideline outlines that the responsible entity (i.e. OGIA for the CMA and responsible tenure holders outside the CMA) should consider factors such as topographic variations and geological complexities when determining if these impacts are likely.

According to the guideline, a risk-based approach is required for the assessment of impacts from subsidence. Where impacts are predicted, the following should be provided:

- a description of the potential impacts to the physical integrity of confining geological formations;
- surface subsidence predictions presented on maps with appropriate contour increments and a scale appropriate for assessment of surface subsidence impacts;
- a description of the methodology used to make the predictions, including an assessment of the accuracy and precision of the predictions;
- a description of the EVs of subsided land;
- an analysis of potential subsidence impacts on EVs;
- a description of the potential changes in the composition of vegetation communities due to areas of permanent ponding or changed drainage caused by subsidence; and
- a subsidence monitoring program including monitoring locations, rationale, methods and frequency.

² [Office of Groundwater Impact Assessment, Annual Report 2020 for the Surat Underground Water Impact Report 2019 \[December 2020\]](#).

As a result of implementation of this guideline, the 2021 UWIR incorporates the following in relation to subsidence:

- assessment and predictions of CSG-induced subsidence within the CMA; and
- a monitoring strategy including baseline slope, trend monitoring and other monitoring requirements.

Analysis of the Water Act

The purpose of the Act is the management of water resources. Surface impacts associated with depressurisation of the coal seams (associated with CSG production) are caused by both water take and gas production which does not currently fit within the jurisdiction of the Water Act.

While the Water Act requires resource companies to make good impacts caused by CSG development on affected water bores as a result of their statutory right to take underground water in accordance with Chapter 3, there is no parallel process under the Water Act for making good impacts on-farm, economic impacts that result from CSG-induced subsidence and no process for determining the consequence. This type of framework would not be possible under the current Water Act framework as it is incompatible with the purpose of the Act due to the focus on the surface impact and private, economic aspect to it.

The Commission understands that [Make Good Agreements](#) (MGAs) currently only apply where there is a decline in the water level of an aquifer at the location of the water bore (impaired capacity), not to any other impacts related to the exercise of underground water rights by resource tenure holders.

Whilst the UWIR provides a mechanism to assess and monitor CSG-induced subsidence, the management of impacts associated with subsidence are not within the scope of the UWIR or within OGIA's remit.

Environmental Protection Act 1994

The purpose of the EP Act is to protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends ('[ecologically sustainable development](#)').

Identifying and describing environmental values

As part of the regulatory framework, the EP Act identifies EVs which are to be integrated into decision-making frameworks to ensure that all reasonable and practical measures are taken to protect them from all sources of environmental harm. 'Environmental value' is defined in [section 9 of the EP Act](#) to be:

- a) a quality or physical characteristic of the environment that is conducive to ecological health or public amenity or safety; or
- b) another quality of the environment identified and declared to be an environmental value under an environmental protection policy or regulation.

While environmental protection policies (EPPs) have been made for Air, Noise and Water and Wetland Biodiversity, there is no EPP for land or soil impacts (e.g. landform changes). Neither the EP Act nor the EPPs protect an agricultural use itself, but the suitability of water for an agriculture purpose is protected, and land or soil EVs which are conducive to ecological health, or public amenity or safety are protected.

Environmental Authority requirements

Environmental Authority (EA) requirements with respect to EVs are stipulated under the following sections of the EP Act. However, it is noted that these assessment requirements are linked back to the purpose of the EP Act (outlined above).

125 Requirements for applications generally	<p>(l) if the application is a variation or site-specific application –</p> <p>(l) include an assessment of the likely impact of each relevant activity on the environmental values, including –</p> <p>(A) a description of the environmental values likely to be affected by each relevant activity; and</p> <p>(C) a description of the risk and likely magnitude of impacts on the environmental values.</p>
126 Requirements for site-specific applications – CSG activities	<p>(1) A site-specific application for a CSG activity must also state the following –</p> <p>(e) the measurable criteria (the management criteria) against which the applicant will monitor and assess the effectiveness of the management of the water, including, for example, criteria for each of the following –</p> <p>(ii) protection of the environmental values affected by each relevant CSG activity.</p>
126A Requirements for site-specific applications – particular resource projects and resource activities	<p>(2) The application must also state the following –</p> <p>(d) the environmental values that will, or may, be affected by the exercise of underground water rights and the nature and extent of the impacts on the environmental values;</p> <p>(f) strategies for avoiding, mitigating or managing the predicted impacts on the environmental values stated for paragraph (d) or the impacts on the quality of groundwater mentioned in paragraph (e).</p>

An economic impact on a landholder as a result of subsidence does not generally constitute an impact on an EV within the purposes of the EP Act. Typically, the EA places no obligation on the resource company to monitor subsidence and ground movement as a result of gas and water extraction that may result in economic impacts.

As a result, the EA offers no landholder protections nor compliance pathways to remedy potential economic impacts to agricultural enterprises as a result of CSG-induced subsidence.

Analysis of the EP Act

The Commission has been advised that under the Act, the economic viability of agricultural land is not an EV in its own right. The EVs of land (including soils, subsoils, landforms and associated flora and fauna) are considered as part of the environmental objectives assessment – this considers disturbance to EVs, not impacts to commercial value.

Consequently, where soil has been levelled for prime agricultural production and yield is impacted by a resource activity, this is not necessarily an impact on an EV, rather it may be considered a commercial or economic impact.

The Commission understands that it is not appropriate under the current purposes of the EP Act to regulate CSG-induced subsidence that relates to economic impact.

Regional Planning Interests Act 2014

The purpose of the RPI Act is to manage the impact of resource activities and other regulated activities on areas of the State that contribute, or are likely to contribute, to Queensland's economic, social and environmental prosperity.

Specifically, the RPI Act identifies areas of regional interests *'that are of regional interest because they contribute, or are likely to contribute, to Queensland's economic, social and environmental prosperity'*, and manages:

- the impacts of resource and regulated activities on these areas; and
- the coexistence of resource and regulated activities in these areas with other activities, for example, highly productive agricultural activities.

All resource and regulated activities in areas of regional interests require regional interests development approvals (RIDA) under the RPI Act unless they (the activities) are exempt activities.

The [Regional Planning Interests Regulation 2014](#) (RPI Regulation) supports the RPI Act and includes criteria against which the potential impacts of these activities are assessed and decided.

Under section 27 of the RPI Act, a resource or regulated activity has an impact on an area of regional interest if the impact:

- affects a feature, quality, characteristic or other attribute of the area; or
- affects the suitability of land in the area to be used for a particular purpose; and
- relates to an area of regional interest such as a priority agricultural area (PAA) or the strategic cropping area (SCA).

Potential impacts of subsidence are considered in the assessment of an application for a RIDA in the PAA and the SCA. For example, required outcomes (ROs) for the PAA include that the activities must not have a material impact on:

- the use of a property for a priority agricultural land use (PALU); or
- a region because of the impact on the use of land in the PAA for one or more PALUs

To achieve these ROs, applications must demonstrate that they can meet the relevant prescribed solutions (PS's) including, for example, that:

- *'The activity will not constrain, restrict or prevent the ongoing conduct on the property of a priority agricultural land use, including, for example, everyday farm practices and an activity or infrastructure essential to the operation of a priority agricultural land use on the property'* (PS (d) of RO1)

RPI Act Statutory Guideline 02/14 Carrying out resource activities in a Priority Agricultural Area provides guidance on how to demonstrate compliance with RO1 through, for example, addressing changes to farm inputs. Whether subsidence of laser-levelled paddocks is identified is a matter to be addressed in this regard:

- *'the activity will not result in widespread or irreversible impacts on the future use of an area in the region for 1 or more'* PALUs (PS(d) for RO2). Statutory Guideline 02/14 identifies that widespread or irreversible impacts may occur if subsidence occurs over a number of properties, and hence this is a matter that the application must address.

Similarly, to demonstrate that an activity in the SCA can meet the relevant required outcomes, an application may need to demonstrate, for example, the activity will not have a permanent impact on the strategic cropping land (SCL) in the area.

RPI Act Statutory Guideline 09/14 How to determine if an activity has a permanent impact on SCL provides guidance in this regard, including that an application will need to demonstrate that:

- a) *the land is able (without constraints) to be restored to its pre-activity condition following the undertaking of the proposed activity; and*
- b) *the impacted SCL has been restored to its pre-activity condition following the cessation of that activity.*

The potential impacts of subsidence may be considered when assessing whether the land can be restored to its pre-activity condition.

Even where the resource authority holder considers an activity to be an exempt resource activity under section 22 of the RPI Act (because a CCA or a voluntary written agreement is entered into with the landholder), the exemption only applies if the activity is not likely to have a significant impact on the PAA or SCA, and the activity is not likely to impact on land owned by a person other than the landholder e.g. a neighbour. Statutory Guidelines 02/14 and 03/14 both provide guidance as to what constitutes a significant impact.

One example of where an activity may be considered likely to have a significant impact on a PAA may be where the activity will result in a decrease in the particular agricultural product supplied from the PAA or region.

Analysis of the RPI Act

The purpose of the RPI Act is to protect certain areas because they contribute to Queensland's economic, social and environmental prosperity. Areas of regional interest (i.e. PAAs, SCAs) are identified due to their significance to the State and region, not to identify and protect individual landowner's financial interests (such as loss of property value or production losses).

The RPI Act does not deal specifically with compensation to individuals for any impacts on a landholder's business.

The assessment process under the RPI Act considers the impact of resource activities on PAAs and SCAs, in accordance with the assessment criteria. If an application is approved, conditions may be imposed if required. These conditions must meet the 'reasonable and relevant' test. That is:

A condition must either –

- (a) be relevant to, but not an unreasonable imposition on, the resource activity or regulated activity; or
- (b) be reasonably required to manage the impact of the activity on an area of regional interest.

A condition would be considered unreasonable if it was not able to be met, for example a condition on an approval for CSG activities that prohibited subsidence altogether.

In addition, the utilisation of the '[landholder agreement](#)' exemption means that in many cases no application is lodged, therefore there is no opportunity for the State to assess potential CSG-induced subsidence impacts.

Findings

The current regulatory framework for managing CSG-induced subsidence is complex and spans multiple jurisdictions and frameworks. There are a number of state-based regulatory levers in place, however their application and process with respect to landholders potentially impacted by CSG-induced subsidence are not clear or well understood. This means that there is confusion as to where regulatory requirements sit, how impacts are assessed and remedied, and who is ultimately responsible for compliance and enforcement. Due to these complexities, there is no clear jurisdictional responsibility to manage the potential impacts of CSG-induced subsidence.

Whilst there are existing protections under the MERCP Act, the ability for landholders to access compensation currently remains untested. This is likely due to the fact that there is no assessment framework to determine the causality and impact of the ground movement and as a result, the burden of proof falls to the landholder to demonstrate damages.

Further, there is no clear pathway for impact assessment, determination or dispute resolution for landholders who believe they have been materially impacted by CSG-induced subsidence other than the Land Court. Additionally, the State Government has limited regulatory levers for compliance and enforcement.

A critical knowledge gap has been identified in relation to the consequence and potential economic impacts of current and predicted CSG-induced subsidence. This limits the ability of the State to implement a risk-based approach to regulate the potential economic impacts of CSG-induced subsidence under the existing regulatory framework.

While the UWIR guideline includes the assessment of impacts to formation integrity and surface subsidence as part of considering the impacts on EVs, more explicit legislative arrangements would be required to give OGIA the function to determine a trigger threshold and establish affected areas at risk of impact from CSG-induced subsidence.

Depending on the circumstances, not all farming operations are afforded the same protections under the existing framework. For example, landholders with infrastructure on their property, those within the tenure area with no infrastructure on their property, and those outside a tenure boundary have different levels of protection under the current framework.

Based on these findings, the Commission's preliminary view is that there are opportunities to enhance the existing regulatory regime to improve protections for landholders and provide greater certainty around regulatory obligations for the onshore gas industry. The key to reform will be a clearer understanding of the consequences of CSG-induced subsidence on-farm and at a regional scale. Further research is required to inform stakeholders about the potential consequences of CSG-induced subsidence.

Principles for reform

The outcomes sought by the Commission are to ensure that landholders materially impacted by CSG-induced subsidence are compensated, there is a clear process available to landholders and greater certainty around regulatory obligations for the onshore gas industry.

In considering the opportunities to enhance the existing regulatory framework, the following set of principles and outcomes will inform the Commission's recommendations for regulatory reform:

- provide a statutory framework that ensures appropriate protection for landholders where CSG-induced subsidence can be demonstrated to have an economic impact on-farm in areas where the agricultural land use (i.e. intensively farmed areas) is sensitive to potential subsidence impact;
- provide clear roles and responsibilities in relation to various entities involved in the assessment, monitoring and management of CSG-induced subsidence in high-value agricultural cropping areas;
- take a risk-based approach to the management response, informed by an assessment of the likelihood, consequence, and materiality of CSG-induced subsidence;
- where possible, include proactive management actions so that management arrangements are in place before impacts occur in high-risk areas;
- ensure that management actions are not limited by tenure boundaries;
- take an evidence-based approach, relying on independent monitoring, assessment and advice in assessing risks and resolving disputes using the best available science;
- provide a pathway to resolve disputes, including alternative dispute resolution with an ultimate determination through the Land Court as a last resort; and
- ensure reasonable and necessary costs are borne by the responsible tenure holder in relation to assessment and dispute resolution.

Review questions

The Commission is seeking stakeholder views and input on the process for managing the potential impacts of CSG-induced subsidence. We are particularly interested in stakeholders' views and experiences of the regulatory frameworks; aspects of the frameworks where there is a lack of clarity; aspects of the frameworks which are working well; and aspects where stakeholders believe improvements could be made.

Below are a series of questions regarding the regulatory frameworks for managing CSG-induced subsidence and the Commission's preliminary review findings and principles for reform that are in the scope of this review. Please consider and answer each of the questions carefully from your perspective, or from the perspective of the group that you represent.

Regulatory frameworks for managing CSG-induced subsidence

1. Do you think the existing regulatory frameworks effectively manage CSG-induced subsidence?
If you do not think the existing frameworks effectively manage CSG-induced subsidence, in your opinion what enhancement should be made?
2. Do you think the existing regulatory frameworks are being implemented effectively?
If you do not think they are being implemented effectively, what improvements should be made?
3. Do you think that stakeholders are aware of the existing framework and the protections afforded to landholders?

What would be the most effective and efficient way to provide this information to stakeholders?

Commission’s preliminary review findings and principles for reform

4. What do you think of the Commission’s preliminary review findings and principles for reform?
5. Do you have any further suggestions for improvement or amendment to the review findings and/or principles for reform?

The Commission requests that you send your response to these questions, along with any other feedback in response to the items raised in this paper, via a written submission.

How to make a submission

You can provide your written submission via email or post:

Email: enquiries@gfcq.org.au

Post: Regulatory review of CSG-induced subsidence
GasFields Commission Queensland
PO Box 15266
City East Qld 4002

Please indicate whether you would prefer any elements of your feedback to remain confidential. Submissions not marked as confidential may be published in full or quoted in public documents and may be available to applicants under the [Right to Information Act 2009](#).

Submissions close 5.00 pm on Thursday, 30 June 2022.

For more information call: +61 7 3067 9400.

Next Steps

Once submissions are received, the Commission will analyse the feedback received from stakeholders and produce a report containing the review findings and recommendations. The Commission may then seek further engagement from stakeholders to provide further comment to inform the report.

The final report will be presented to the relevant Queensland Government Ministers, and the Commission will also make the final report available on its website (<https://www.gfcq.org.au/news/>).

Glossary

ADR	Alternative Dispute Resolution
CCA	Conduct and Compensation Agreement
CMA	Cumulative Management Area
Commission	GasFields Commission Queensland
CSG	Coal Seam Gas
CSG-Induced	Coal Seam Gas-Induced Subsidence
DES	Department of Environment and Science
DRDMW	Department of Regional Development, Manufacturing and Water
DSDILGP	Department of State Development, Infrastructure, Local Government and Planning
EA	Environmental Authority
EP Act	<i>Environmental Protection Act 1994</i>
EPBC Act	<i>Environment Protection and Biodiversity Conservation Act 1999</i>
EPPs	Environmental Protection Policies
EVs	Environmental Values
IAA	Immediately Affected Area
LAA	Long-Term Affected Area
MERCP Act	<i>Mineral and Energy Resources (Common Provisions) Act 2014</i>
MGAs	Make Good Agreements

OGIA	Office of Groundwater Impact Assessment
PAA	Priority Agricultural Area
PALU	Priority Agricultural Land Use
QAO	Queensland Audit Office
QFF	Queensland Farmers' Federation
Resources	Department of Resources
RIDA	Regional Interest Development Approval
ROs	Required Outcomes
RPI Act	<i>Regional Planning Interests Act 2014</i>
RPI Regulation	<i>Regional Planning Interests Regulation 2014</i>
SCA	Strategic Cropping Area
SCL	Strategic Cropping Land
The Guideline	<u>Guideline (Water Act 2000): Underground water impact reports and final reports</u>
UWIR	Underground Water Impact Report
Water Act	<u>Water Act 2000</u>

