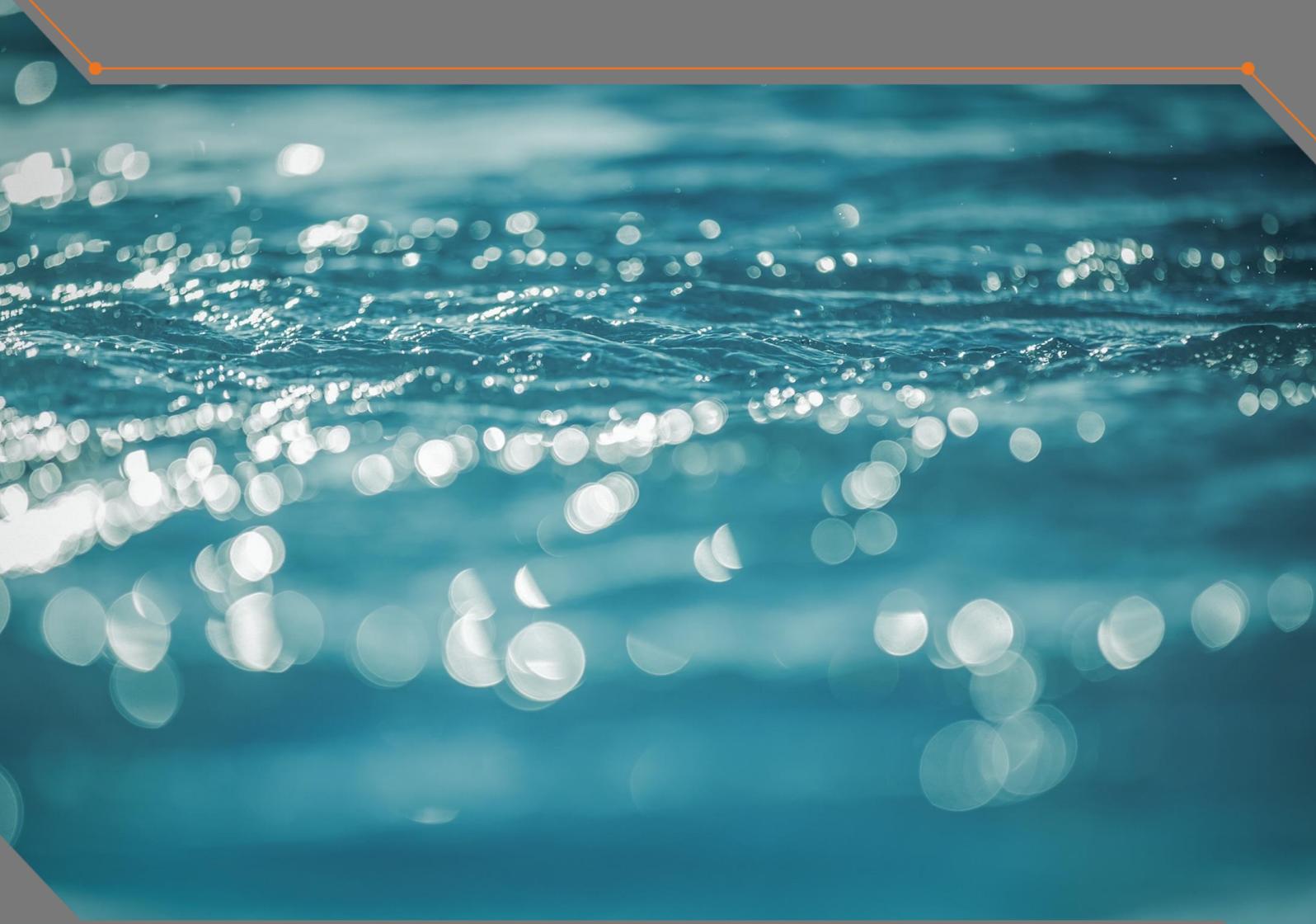


Submissions summary

Consultation on the draft Underground Water Impact Report
2021 for the Surat Cumulative Management Area



December 2021



Queensland
Government

Original version, authorised release on 17 December 2021 by Sanjeev Pandey, Executive Director, Office of Groundwater Impact Assessment.

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Summary

The Office of Groundwater Impact Assessment (OGIA) released the draft Underground Water Impact Report (draft UWIR) 2021 for the Surat Cumulative Management Area (CMA) for public consultation on 29 October 2021. After public consultation closed on 26 November, OGIA prepared the final UWIR, giving consideration to the submissions received. This Submissions Summary provides information about the consultation process, the issues raised during consultation and the way OGIA has dealt with the submissions in preparing the final UWIR.

Consultation process

A public notice, published in nine digital and traditional newspapers circulated within the Surat CMA, advised that the draft UWIR was available for consultation and provided details about the consultation process. A copy of the notice was sent to all water bore owners and tenure holders in the CMA, in accordance with statutory requirements.

Four public information sessions were held in regional centres to provide community members with further information and to answer questions about the draft UWIR. A total of 77 stakeholders attended these sessions. A fifth session was planned in Wandoan, but was cancelled due to inclement weather preventing access to the town. An online session was held the following week.

The OGIA website provided access to the draft UWIR, the submission form and details about the consultation process. The website also provided a bore search tool that enabled bore owners to access information about the predicted impacts on water levels in individual bores. During the consultation period, the website was accessed more than 3,000 times.

A total of 44 submissions were received by OGIA from landholders or landholder-based groups (26), industry or industry-based groups (7), general community members (5), environmental groups (3) and government agencies (3).

Issues raised

Across the stakeholder groups and primarily those representing bore owners, there is a general appreciation of, and satisfaction with: the availability of independent assessment; the quality of information presented; the readability of the UWIR for a general audience; and the work undertaken by OGIA in a short timeframe for the assessment of subsidence.

Despite overwhelming support for the UWIR findings, overall, there is a significant increase in concern from landholders and their representative groups in the Condamine Alluvium about impacts of the coal seam gas (CSG) development and particularly the implications and management of subsidence. Despite integrating the coal mining impacts, only a handful of submissions are made on this subject.

Bore owners, landholders, farmers and their representative groups raised issues on: how predicted subsidence will be managed by the government; the effect of both CSG and non-CSG groundwater take on the sustainability of the Condamine Alluvium and the Great Artesian Basin, particularly in the Hutton Sandstone; the impact of migrating gas in water bores; delays in finalising make-good arrangements; their rights to drill replacement bores; rationalisation of baseline assessment requirements; the indirect impact of make-good bores in the Hutton Sandstone; improved compliance and measuring effectiveness of CSG management arrangements; and seeking more clarity or details on various aspects of the technical analysis presented in the UWIR. In addition, a large number of out-of-scope issues are also raised and there is a general expectation that the UWIR scope should be enhanced to include some of those out-of-scope issues.

Industry and industry-based groups primarily have reaffirmed their support for the UWIR findings and management strategies but have requested minor amendments and updates of specific information relating to IAA bores and monitoring points. They have also sought clarification on some elements of the responsible tenure holder rules.

Environmental groups generally raised the issues of impacts on springs and ensuring that impacts are prevented and the effectiveness of proposed arrangements is assessed.

Response to submissions

Issues raised in submissions were categorised into themes for further analysis and development of appropriate responses. This approach was used because the issues varied in scope but tended to cluster around common themes.

In response to in-scope issues raised in submissions, various sections of the UWIR are amended and additional sections and figures are added to provide additional clarity and explanation. Issues raised did not warrant any change in impact predictions, conclusions, management strategies or tenure holders obligations stated in the draft UWIR. As a result of a correction of bore records, there is a change in the number of Immediately Affected Area (IAA) bores from 108 to 107 (and consequential changes to tables and other numbers). Post-submissions, this number was amended back to 108.

Overall, the amendments made to the UWIR are primarily around the following:

- more explanation and commentary about the conceptual framework relating to CSG-induced subsidence and monitoring
- additional commentary about groundwater recharge
- more details on implications of faulting and impact pathways
- more details on Condamine Alluvium connectivity and impact predictions
- further breakdown of IAA bores
- clarifying aspects of impacts on environmental values
- tenure holders' obligations.

Some submissions included suggestions relating to rephrasing some sentences or sections for additional clarity or correcting minor errors. These have been considered in finalising the UWIR as appropriate but are not listed as individual issues. Amendments to the UWIR are also made to rectify minor errors, update some figures, or provide further clarify without affecting the intent, analysis or conclusions that were presented in the draft UWIR.

In addition, a large number of issues raised were outside the scope of the UWIR. These are being referred to other agencies for further considerations, such as:

- provisions relating to well completion reports and audit of well integrity
- general compliance and assessment of effectiveness of management arrangements
- direct and indirect impacts of CSG development on the Hutton Sandstone and the Condamine Alluvium
- management of predicted subsidence
- call for a moratorium on development in the Condamine Alluvium
- clarification on water bore status for the purpose of make good, independent review of bore assessment reports, and alignment of baseline assessment requirements
- matters relating to assessment and monitoring of free gas
- expansion of UWIR scope.

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1 Introduction

In accordance with section 381 of the *Water Act 2000* (Water Act), the Office of Groundwater Impact Assessment (OGIA) prepared the fourth Underground Water Impact Report (UWIR) for the Surat Cumulative Management Area (CMA) and released a consultation draft for public consultation on 29 October 2021. All bore owners were notified of the availability of the report, public information sessions were held in November and written submissions were received. Consultation closed on 26 November 2021. OGIA then considered all submissions, including late submission up until 10 December in preparing the final UWIR.

This document summarises the consultation process, the feedback received, and the way OGIA has considered feedback in preparing the final UWIR. The UWIR 2019 remains in force until the draft UWIR is finalised following public consultation and approved by the Department of Environment and Science (DES).

2 Consultation process

2.1 Release of the draft UWIR

The draft UWIR was released on 29 October 2021 by publication on the OGIA website followed by a media announcement.

2.2 Public notification

In accordance with regulatory requirements and as endorsed by DES on 20 October 2021, OGIA published a notice in nine local newspapers (Table 1) and provided a copy of the notice to each owner of a water bore and each tenure holder within the Surat CMA. The notice contained: a description of the CMA; information about how to access the draft UWIR and the submission form; and details about public information sessions. A copy of the notice is provided as Appendix A.

Table 1: Newspapers in which the public notice was published

Newspaper	Publication day(s)	Publication date
Clifton Courier	Wednesday	Wednesday 27 October
Chinchilla News and Murilla Advertiser	Thursday	Thursday 28 October
Queensland Country Life	Thursday	Thursday 28 October
Central Queensland News	Wednesday and Friday	Friday 29 October
The Courier-Mail	Monday to Saturday	Friday 29 October
Daily News (Warwick)	Monday to Saturday	Friday 29 October
Dalby Herald	Tuesday and Friday	Friday 29 October
Toowoomba Chronicle	Monday to Saturday	Friday 29 October
The Western Star	Tuesday and Friday	Friday 29 October

The mailing list for the notice to water supply bore owners was developed from Department of Resources databases. The notice was sent to 11,134 bore owners and 25 tenure holders in the Surat CMA. The contents of the letters are provided as Appendices B and C respectively.

2.3 Notification and availability of the draft UWIR on the website

The OGIA website (www.business.qld.gov.au/ogia) provided the following:

- the draft UWIR
- companion documents related to the draft UWIR
- a bore search tool for bore owners to identify the predicted water level impact at the location of each bore
- details about public information sessions
- the submission form, including details on how to make a submission.

The bore search tool on the website could be interrogated using the registered number of a bore as stated in section 14.2 of the draft UWIR. For all registered bores in the CMA, the tool provides information about the Immediately Affected Area (IAA) and Long-term Affected Areas (LAA) for aquifers relevant to the bores. For bore owners unaware of the registered numbers for their bores, OGIA either assisted them to identify the bores, directed them to Water Services within the Department of Regional Development, Manufacturing and Water (DRDMW) if required to identify the bores, or advised them of the predicted impact at described locations. This assistance was provided at the public information sessions and by telephone and email enquiry to OGIA.

A phone line and email account were dedicated to receiving enquiries about the draft UWIR. The enquiries sometimes covered multiple topics, with the vast majority (72) of the 76 total enquiries (down 16% compared to the last UWIR) being general, asking for copies of the draft UWIR or seeking more information about the information sessions. Of the other four enquiries, two were about the predicted impacts to private bores and two were about change of address, licence renewal, water charges and other non-UWIR matters.

There were 3,056 total visits to the UWIR webpages during the consultation period – up 225% compared to the last UWIR.

2.4 Consultation meetings

Public information sessions were held during the consultation period to explain the content of the draft UWIR and provide responses to stakeholder questions. The sessions were presented on different aspects of the draft UWIR by Sanjeev Pandey (Executive Director, OGIA), Steven Flook (Director, Management Strategies and Implementation, OGIA) and Gerhard Schöning (Director, Assessment and Modelling, OGIA).

OGIA held four public information sessions in regional centres to provide community members with further information and to answer questions about the draft UWIR. A fifth session was planned in Wandoan, but was cancelled due to bad weather preventing access to the town. Bad weather also limited attendance at the Roma session. The following week, OGIA held an online information session, with those water supply bore owners in the Wandoan and Roma areas invited to participate. A total of 94 stakeholders attended the regional and online information sessions (Table 2) – down about 30% compared to the UWIR 2019.

Table 2: Public information sessions

City/Town	Date	Venue	Time	Number of attendees
Toowoomba	8 November	City Golf Club 254 South Street	2.00 to 4.00 pm	34
Dalby	9 November	Dalby Leagues Club Corner Orpen and Drayton streets	3.30 pm to 6.00 pm	22
Chinchilla	10 November	Chinchilla Club Hotel 131 Heeney Street	3.30 pm to 6.00 pm	12
Roma	11 November	Roma Explorers Inn 44778 Warrego Highway	4.00 pm to 6.00 pm	8
Wandoan and Roma	19 November	Online	10.00 am to 12.30 pm	22
TOTAL (some attendees attended multiple sessions)				94*

The sessions were conducted on a relatively informal basis with attendees invited to ask questions during the presentations, as well as allocated question time at the end of each session. OGIA staff operated an electronic database and mapping system following each information session to assist individual bore owners to determine predicted impacts on bores at specific locations.

2.5 Media coverage

Although no media interviews were carried out following the release of the draft UWIR, nine online and printed articles covered the release, which also received radio coverage on regional services. Most of the reporting was factual, welcoming the use of updated information, independent assessment and increased monitoring requirements. Some also raised concerns about the progress of make-good arrangements.

2.6 Written submissions

The period for written submissions closed on 26 November 2021 but late submissions until 10 December 2021 were received and considered in the evaluation process. A total of 44 submissions were received, up by about 90% compared to the last UWIR, and all of these were considered. Attendees of public information sessions requested that the issues raised in those sessions should be considered as verbal submissions. These are included in the total 44 submissions, including one for each of the public sessions.

Separately, DES also provided some informal feedback from a regulatory perspective, primarily seeking clarity on aspects of tenure holder obligations and environmental values assessment (Chapter 12 of the draft UWIR).

3 An overview OGIA's response to submissions

3.1 Submissions and issues

Submissions were received from a wide range of stakeholders. A total of 44 submissions were received by OGIA from landholders or landholder-based groups (26), industry or industry-based groups (7), general community members (5), environmental groups (3) and government agencies (3).

A characterisation of submitters is shown in Figure 1, wherein some individual submitters are identified as belonging to more than one category.

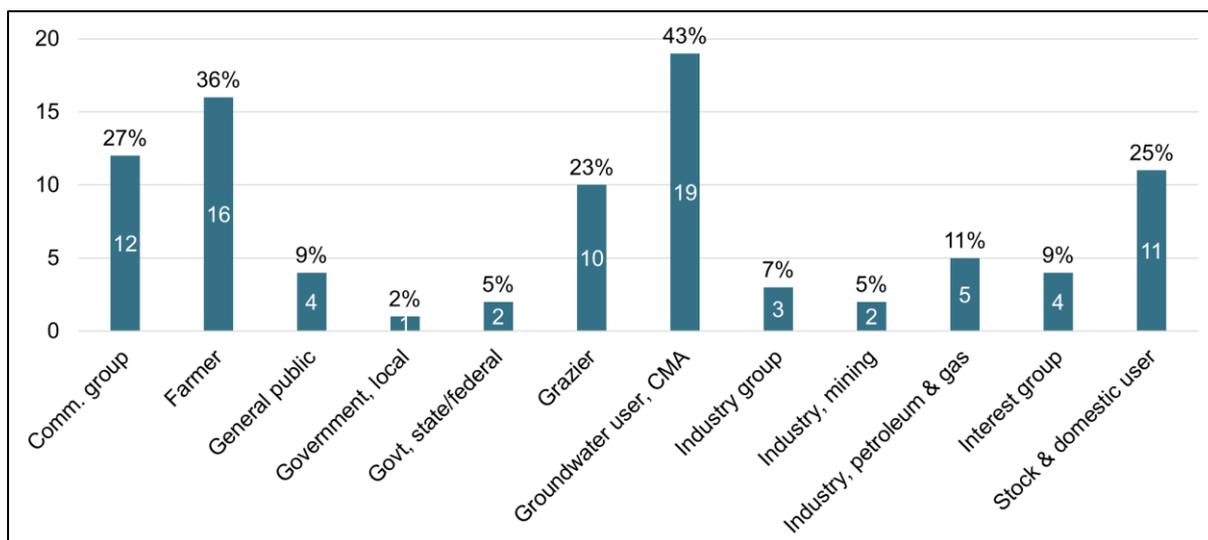


Figure 1: Characterisation of submitters

Across the stakeholder groups and primarily those representing bore owners, there is a general appreciation of, and satisfaction with: the availability of independent assessment; the quality of information presented; the readability of the UWIR for a general audience; and the work undertaken by OGIA in a short timeframe for the assessment of subsidence.

Despite overwhelming support for the UWIR findings, overall, there is a significant increase in concern from landholders and their representative groups in the Condamine Alluvium about impacts of the coal seam gas (CSG) development and particularly the implications and management of subsidence. Despite integrating the coal mining impacts, only a handful of submissions are made on this subject.

Bore owners, landholders, farmers and their representative groups raised issues on: how predicted subsidence will be managed by the government; the effect of both CSG and non-CSG groundwater take on the sustainability of the Condamine Alluvium and the Great Artesian Basin (GAB) particularly in the Hutton Sandstone; the impact of migrating gas in water bores; delays in finalising make-good arrangements; their rights to drill replacement bores; rationalisation of baseline assessment requirements; the indirect impact of make-good bores in the Hutton Sandstone; improved compliance and measuring effectiveness of CSG management arrangements; and seeking more clarity or details on various aspects of the technical analysis presented in the UWIR. In addition, a large number of out-of-scope issues are also raised and there is a general expectation that the UWIR scope should be enhanced to include some of those out-of-scope issues.

Industry and industry-based groups primarily have reaffirmed their support for the UWIR findings and management strategies but have requested minor amendments and updates of specific information relating to IAA bores and monitoring points. They have also sought clarification on some elements of the responsible tenure holder (RTH) rules.

The environmental groups generally raised the issues of impacts on springs and ensuring that impacts are prevented and the effectiveness of proposed arrangements is assessed.

3.2 OGIA's response

Issues raised in submissions were categorised into themes for further analysis and development of appropriate responses. This approach was used because the issues varied in scope but tended to cluster around common themes.

In response to in-scope issues raised in submissions, various sections of the UWIR are amended and additional sections and figures are added to provide additional clarity and explanation. Issues raised did not warrant any change in impact predictions, conclusions, management strategies or tenure holders obligations stated in the draft UWIR. As a result of a correction of bore records, there is a change in the number of IAA bores from 108 to 107 (and consequential changes to tables and other numbers). Post-submissions, this number was amended back to 108.

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- more details on Condamine Alluvium connectivity and impact predictions
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- clarifying aspects of impacts on environmental values
- tenure holders' obligations.

Some submissions included suggestions relating to rephrasing some sentences or sections for additional clarity or correcting minor errors. These have been considered in finalising the UWIR as appropriate but are not listed as individual issues. Amendments to the UWIR are also made to rectify minor errors, update some figures, or provide further clarify without affecting the intent, analysis or conclusions that were presented in the draft UWIR.

In addition, a large number of issues raised were outside the scope of the UWIR. These are being referred to other agencies for further considerations, such as:

- provisions relating to well completion reports and audit of well integrity
- general compliance and assessment of effectiveness of management arrangements
- direct and indirect impacts of CSG development on the Hutton Sandstone and the Condamine Alluvium
- management of predicted subsidence
- call for a moratorium on development in the Condamine Alluvium
- clarification on water bore status for the purpose of make good, independent review of bore assessment reports, and alignment of baseline assessment requirements
- matters relating to assessment and monitoring of free gas
- expansion of UWIR scope.

4 Detailed analysis of submissions

Issues raised in submissions were categorised into themes for further analysis and development of appropriate responses. This approach was used because the issues varied in scope but tended to cluster around common themes.

The following section provides issues grouped by themes and OGIA's response to those issues. For each theme, the following are provided: the range of issues raised; OGIA's response; and OGIA's actions – including any changes made to the UWIR. Issues raised that are outside of the scope of the UWIR are listed separately.

Some submissions included suggestions relating to rephrasing some sentences or sections for additional clarity or correcting minor errors. These have been considered in finalising the UWIR as appropriate but are not listed as individual issues. Amendments to the UWIR are also made to rectify minor errors, update some figures, or provide further clarity without affecting the intent, analysis or conclusions that were presented in the draft UWIR.

In this part of the report, unless specified otherwise, references to chapters, sections, figures, and tables refer to the final UWIR.

4.1 General

Issues raised

- Seeking extension of submission closing date because letters were not received in time and published notices were not seen by landholders.
- It is unclear how traditional owners were consulted.
- Seeking more clarity on scope of the public meetings in letters sent to bore owners.

Response

Earlier sections of this report provide a summary of how public notices were published and how the availability of report was communicated to bore owners – including notices in regional newspapers, a media release, website publication and letters to bore owners in the Surat CMA. In addition, all the late submissions until 10 December 2021 were considered and attendees at the public information sessions were invited to make verbal submissions. The overall approach and strategy for consultation also included consultation with traditional owners.

As per s. 382 of the Water Act, OGIA is required to send a copy of the public notice to bore owners in the Surat CMA. This includes approximately 11,000 bore owners of which a vast majority are in the peripheral areas where no impacts are predicted, and CSG development or tenure is more than 20 km away. This tends to create some confusion as those landholders perceive the report to be a general report on groundwater development, although links to the UWIR and summary documents are provided in the public notice.

Actions

- Recommend to DES to consider legislative amendments to remove the requirement for sending letters to bore owners that are not likely to be impacted.
- Consider revising the letter in future to provide further clarity on the scope of the report.
- Explore additional mechanisms for communicating the availability of the report in future.

4.2 Resource development

Issues raised

- In referring to ‘water triggers’ in the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act), the UWIR should clarify that those triggers only came into effect since 2013.
- The UWIR should provide a list of relevant tenures, similar to the previous UWIRs.

Response

It is correct that water triggers provisions in the EPBC Act came into effect in June 2013 and therefore, water triggers are only considered by the Australian Government in approvals from that point onward. This has now been corrected in the UWIR.

Details of the relevant tenures are available in a companion document (OGIA 2021a) on OGIA’s website. As detailed in section 1.8, some of the details are moving to companion documents to maintain a balance between the overall length and readability of the UWIR.

Actions

- Section 1.3 is amended to clarify EPBC water trigger provisions.

4.3 Groundwater extraction and use

Issues raised

- Support is expressed for OGIA’s effort and approach to stock and domestic (S&D) water use estimation, aquifer attribution and area of interest in reporting water supply bores.
- More details are sought on the method for S&D water use estimation and groundwater extraction by tenure holders – in terms of spatial and temporal distribution.
- There is support for OGIA’s approach to verifying bore information and status, but it should be acknowledged that it may not consider all information, and that instead of verbal verification of bore status, an on-ground survey should be undertaken.

Response

Overall support to various elements of the water bore information and water use estimation is noted. OGIA will continue to refine and make ongoing improvements in future.

As summarised in section 3.4.2.1, the underlying principle and details of OGIA’s water use estimation method are provided in a peer-reviewed journal (Singh et al. 2020) which is available on OGIA’s website. Further details on groundwater extraction by tenure holders are now also available in a separate companion document (OGIA 2021b).

OGIA acknowledges the importance of bore status verification and therefore will continue to verify and update bore information as stated in section 3.3.2, including field verification for priority bores in each UWIR cycle.

Actions

- No changes are made to the UWIR.

4.4 Impact pathways

4.4.1 General

Issues raised

- Seeking more explanation on recharge to the Walloon Coal Measures.

Response

Recharge in the GAB predominantly occurs along the zones of increased permeability in outcrop areas through fractures and permeable beds. High-rainfall events and high volume are required to provide sufficient saturation of the surficial sediments for effective diffuse recharge to occur. Similar to Kellett et al. (2003), OGIA has been using and updating a chloride mass balance approach to estimate surficial recharge for selected aquifers, which is then applied to groundwater flow model and further adjusted in the model calibration process to get estimates of deeper recharge. A large proportion of the surficial recharge discharges locally to streams and rivers, such that less than 10% of this recharge (about 18 GL per year) reaches the deeper confined aquifers.

Actions

- Section 1.5 is amended to provide commentary on recharge.

4.4.2 Faults

Issues raised

- Seeking more clarity on linkages of the UWIR to the 2020 fault report by OGIA, and implications of minor faults (which are referred to as 'other faults' in the UWIR).
- Calling for an in-depth study on the Horrane Fault and fault hydrogeology, particularly in relation to the potential effect of faulting on the Condamine Alluvium.
- Detailed analysis of Horrane Fault is acknowledged but a similar analysis of the Hutton–Wallumbilla Fault should also be included where more information on conceptualisations is also sought.
- A generalisation in the UWIR that the Walloon Coal Measures is clay-rich, and its influence on faulting, is contested.
- Some correction and clarifications on Figure 4-10 and about the displacement of the Horrane Fault across the Hutton Sandstone.
- Influence of faults on gas migration should also be considered.

Response

Ogia has been progressively improving the understanding of regional and local faults in the Surat CMA since 2013 (section 4.4.6), using seismic and other relevant data. Details and findings of this research are documented in a separate report by OGIA (OGIA 2020a), which is referred to as the 2020 report. However, since that report, OGIA has carried out targeted improvements to fault characterisation – including the remapping of the Horrane Fault and the mapping of faults around coal mines. Therefore, the high-level summary provided in the UWIR is more up-to-date compared to the 2020 report. OGIA is planning to continue the work on improving understanding of faults including the Horrane and the Hutton-Wallumbilla faults, as stated in section 14.5, which will be updated in a separate companion document.

In relation to the implication of the Walloon Coal Measures lithology on fault characteristics, the lithological composition of the Walloon Coal Measures is derived from high-resolution wireline logs for about 8,000 P&G wells in the Surat Basin. Based on this information, around 30% of the Walloon Coal Measures is composed of sandstone and 42% is made up of fine-grained rocks (siltstone and mudstone) – the remainder comprising heterolithic rocks. In the context of faulting, the lithological proportion of clay/shale in the entrained material can be described by the Shale Gouge Ratios (SGR), where values above 20% are usually considered to produce low-permeability fault cores. OGIA's fault seal analysis takes into account local variations of lithology around the fault in assessing the likely hydrogeological characteristics (OGIA 2020b). While most faults in the Walloon Coal measures are associated with higher SGR, there are some areas with a higher proportion of sand in the overlying Springbok Sandstone that is entrained into the fault core, which is associated with increased horizontal connectivity across fault zones (e.g. Kenya East).

While the impacts from gas migration are outside of the UWIR scope, an area of ongoing investigation by OGIA is understanding the influence of different processes on groundwater monitoring data. As discussed in the UWIR, there is evidence of the influence of gas migration in some monitoring data from the Springbok Sandstone. Additional evidence is also emerging from the interpretation of hydrochemistry data. OGIA will continue to analyse and interpret these signals, including where they may be related to faults.

Actions

- Section 4.4.6 is amended to clarify that high clay content in the Walloon Coal Measures occurs in most areas but not everywhere.
- Reference to the OGIA faults report has been corrected to (OGIA 2020) from (OGIA 2019).
- OGIA will continue to update fault studies and will provide regular and more detailed updates through a separate companion document.

4.4.3 Inter-formational connectivity

Issues raised

- Further details on the Condamine Alluvium connectivity study should be included in the UWIR, including investigation sites, a map showing thickness of the transition zone and locations where coal seams may come into contact with the Condamine Alluvium.
- Areas of direct contact between the Springbok Sandstone and the Walloon Coal Measures should be identified.
- The conclusion of low connectivity in the Hutton Sandstone is not supported by analyses and more clarification is required on the consequences to connectivity between the Walloon Coal Measures and the Hutton Sandstone where thickness of Durabilla Formation is less than the average thickness, which is stated to be 55 m.
- Bore permeability profile presented in Figure 4-1 is useful and should be repeated for other areas.

Response

As stated in section 4.4.5, OGIA led research into connectivity between the Condamine Alluvium and the Walloon Coal Measures, using the following multiple lines of investigation: reinterpreting geology with a particular focus on the contact between the two systems; mapping regional groundwater level

differences between the two systems; analysing the hydrochemistry of the two systems; drilling, coring and running pumping tests at representative sites; and numerically analysing the data. Arrow complemented the study by coring, pump testing and drilling of monitoring bores. Details of the investigations, approach and outcomes were compiled in an investigation report (OGIA 2016), available on OGIA's website, which provides a map of the thickness of the transition zone and details about coal seams. There is also a peer-reviewed journal published on the investigations (Pandey et al. 2020), which is available on OGIA's website.

Section 4.4.3 provides a summary of connectivity between the Springbok Sandstone and the Walloon Coal Measures. The contact between the two formations is erosional and there are areas where the productive coal seams are in direct contact with the Springbok Sandstone, leading to a relatively higher degree of connectivity in those areas, as shown in Figure 4-4.

Similarly, section 4.4.4 presents a summary of the connectivity between the Hutton Sandstone and the Walloon Coal Measures and how it is affected by the thickness and characteristics of the intervening Durabilla Formation, which is shown in Figure 4-5. The variable thickness of the Durabilla Formation, including where it is less than 55 m, is shown in that figure and is considered in modelling the impacts. The average thickness is quoted only to provide an overview.

The permeability profile presented in Figure 4-1 is from a water bore east of Chinchilla, commissioned by OGIA in 2018 to explore the usefulness of nuclear magnetic resonance – an emerging well logging method to obtain a continuous permeability profile. OGIA is intending to explore the method further in critical areas.

Actions

- No changes are made to the UWIR.
- OGIA to explore options for undertaking additional permeability profile in the Surat Basin.

4.4.4 Bore and well connectivity

Issues raised

- Locations of wells partially completed into the Springbok Sandstone should be shown, together with implications of wells partially completed into the Durabilla Formation.
- An audit on CSG well integrity should be carried out regularly, together with implications of well integrity and abandoned/non-operational conventional wells on interconnectivity.

Response

OGIA has undertaken a detailed assessment of wells partially completed into the Springbok Sandstone and the Durabilla Formation. Section 4.4.7 presents a summary of this assessment. Further details, including the locations of those wells in a map and quantitative analysis of connectivity, is available in a separate companion document (OGIA 2021c).

Matters relating to compliance on CSG and conventional oil and gas well construction are managed by Queensland's Petroleum and Gas Inspectorate (the Inspectorate). As stated in section 4.4.7, the Inspectorate undertook an audit in 2015 and found no evidence of subsurface leaks. Nevertheless, OGIA will refer this matter to the Inspectorate and will continue to assess this further.

Actions

- No changes are made to the UWIR.

- Matters related to well integrity will be referred to the Inspectorate.

4.5 Identified impacts from monitoring data

Issues raised

- More details are required on how water chemistry is considered in trend analysis.
- Conclusion that Springbok Sandstone does not show impact may be misleading because delayed response may still occur in future and available monitoring points may not capture the impacts.
- Locations should be shown on the map of faults where Springbok Sandstone is stated to be impacted.
- More details and locations of monitoring points in the Condamine Alluvium are also required, including clarity on Figure 5-12 which shows the pressure difference.
- General concerns around declining water levels in the Hutton Sandstone and fear that this may be because of the CSG impacts.
- Clarity is sought on why a 10 km range is applied in analysing monitoring data.

Response

Interpretation of monitoring data to unpack CSG impacts is based on a multiple-lines-of-evidence approach as summarised in section 5.5 – including consideration of water chemistry data. It is an area OGIA is increasingly putting more focus on as more data is becoming available. More details on hydrochemistry will be available in a separate companion document (OGIA 2021c).

In regard to the impacts on the Springbok Sandstone, OGIA acknowledges that there will be delayed response, as reflected in future predictions of impacts shown in Figures E-13 to E-16. The monitoring data shows responses observed so far, and the interpreted CSG impacts are reported as impacts that have occurred so far as summarised in section 5.1 and clarified further in the final report. Locations of faults in the Springbok Sandstone where impacts are observed are now shown in Figure 5-10.

There are a large number of monitoring points in the Condamine Alluvium and presenting them in Chapter 5 with the analysis of impacts will compromise the clarity in Figure 5-12. However, a separate figure is now added in Chapter 9 to show the monitoring points in the Condamine Alluvium.

Although the analysis presented in Chapter 5 concludes that there are no CSG-driven impacts in the Hutton Sandstone, concerns on the overall groundwater level trend and its implications on the sustainability of this aquifer is noted and referred to DRDMW.

Interpretation of monitoring data is not limited to 10 km. A reference to 10 km in section 5.6.1.1 is a reference to a general observation from all the monitoring data in the Walloon Coal Measures that little (less than 10 m) drawdown or impact is observed beyond 10 km from active CSG wells in the CSG target formations, as shown in Figure 5-2. To be conservative, various figures for different formations provide within-aquifer groundwater extraction up to 20 km from a monitoring point.

Actions

- Section 5.1 and Figure 5-10 are amended and an additional Figure 9-5 added in Chapter 9 as described above.

- Matters related to concerns about the sustainability of the Hutton Sandstone will be referred to DRDMW for further consideration.

4.6 Modelling and predictions of impacts

4.6.1 General

Issues raised

- General concerns are raised about long recovery time.
- Seeking comparison of results with the UWIR 2019 – particularly a comparison of groundwater extraction forecast.

Response

Concerns around the long recovery time are noted. As stated in section 6.5.2.8, the UWIR predicts that in areas located close to the edge of the predicted LAA in the Walloon Coal Measures, groundwater levels are expected to recover within five years. Groundwater levels within CSG production areas are predicted to take more than 1,000 years to fully recover.

Comparison of the impacts is referenced in various sections of Chapter 6 where applicable, and general statements about the comparison are made. This is deliberate to avoid confusion that could arise from quoting multiple numbers and reproducing predictions of impacts from previous reports. However, OGIA acknowledges the thrust of the issue raised and is considering providing such information through a web portal in 2022.

Actions

- Section 6.5.3 is amended to provide a comparison with the previous prediction on groundwater extraction.
- OGIA will consider presenting comparison with previous predictions on an ongoing basis through a web portal in the future.

4.6.2 Modelling approach

Issues raised

- Seeking more clarity on the 'customised modules' that are developed for modelling.
- A submitter made numerous assertions about the modelling:
 - representation of CSG wells as 'drains' will under-predict impacts compared to representing them simply as wells with groundwater extraction.
 - the submitter has provided information to DES in the past regarding deficiencies in modelling that should have been addressed by OGIA
 - monitoring in the Hutton Sandstone is not considered or reflected
 - gassy bores in the Hutton Sandstone are ignored
 - local-scale impacts may not be represented in the regional-scale model
 - the submitter had proposed a site visit to his farm, which was not accepted.

Response

Regarding the 'customised modules' in the UWIR – it is a reference to a number of modelling codes written by the OGIA team over the years to improve and supplement the standard MODFLOW-USG code for better representation of processes that are not otherwise represented in the standard code. Some examples are as follows: 1) representation of CSG wells through descending drains; 2) representation of CSG production from non-coal layers; 3) reinjection as a function of extracted water from selected gas wells; and 4) improved derating options of groundwater pumping to prevent head in a model cell from falling below the bottom of the cell and avoid convergence issues. Details of these and other changes to the MOD-FLOW USG code are available in the 2019 modelling report (OGIA 2019) and a separate companion document (OGIA 2021d).

Regarding the issues raised by a submitter on modelling, OGIA provides the following contextual information:

- OGIA's approach to modelling has been reported in separate modelling reports since 2012 and has been regularly endorsed by its technical advisory panel, which consists of Australia's leading modelling experts. The overall approach is also endorsed by the Australian Government's Independent Expert Scientific Committee on Coal Seam Gas and Large Coal Mining Development, and is widely acknowledged by experts in open forums as being world-leading.
- Similar issues have been raised by this submitter in the past and have been responded to through previous UWIR submission processes, as well as through various correspondence and meetings since 2012, including fulfilling ongoing requests from the submitter for various data sets over the past decade.
- A response to this submitter's issues and requests in recent years has also been coordinated through the Department of Resources' engagement unit, which has also sought unsuccessfully to reach a mutual arrangement for a field visit with the submitter.
- OGIA and the regulatory agencies have requested the submitter's stated approach to modelling, in order to attain more clarity. However, it has not been made available by the submitter as yet, except some selected figures and statements.

In the above context, specific response to the issues raised in the submission is as follows:

- OGIA's groundwater model is primarily an impact model and therefore CSG wells have been represented in such a way as to constrain the pressure changes associated with CSG extraction in a dual-phase environment (using the MODFLOW-DRN package) in order to most accurately predict pressure impacts. This is a more contemporary and better approach compared to the one used by the CSG industry in early stages of assessment in 2010 and by Cui et al. in 2013 (reported in 2018), which was primarily aimed at demonstrating new methods for uncertainty analysis rather than improved process representation.
- As stated in the UWIR, OGIA's groundwater model is a regional model developed for assessing regional cumulative impacts, however, significant volumes of local information have been brought together and assimilated in the construction of the model so as to best represent local information in an upscaled way. Despite this assimilation, given the very nature of regional assessment, some local features may not be represented.

- The model does take into account monitoring data in the Hutton Sandstone, whereby 105 transient monitoring points in the Hutton Sandstone are used in calibrating the model. A further 22 monitoring pairs are used for calibrating vertical head differences between the Hutton Sandstone and Walloon Coal Measures.
- It is to be noted that predicted impacts as reported in the UWIR are from CSG development alone. Groundwater levels in the Hutton Sandstone may continue to decline despite no impacts predicted from CSG development, as reported in section 5.6.2.1.

Actions

- No changes are made to the UWIR.
- The Department of Resources will continue to liaise with the submitter to organise a field trip.

4.6.3 Condamine Alluvium

Issues raised

- Impact patterns in the Condamine Alluvium should be included similar to the ones provided in previous UWIRs, including areas where loss of water from the Condamine Alluvium is predicted, together with timing of impacts.
- Conclusion that there is no IAA or LAA in the Condamine Alluvium should be supported by evidence from monitoring data – acknowledging the short monitoring period around the Plainview pilot.
- There is a general concern about the impact on the Condamine Alluvium and that long-term effects on the Condamine Alluvium from non-resource activities should also be considered in the report, including implications for the Murray-Darling Basin, of which the Condamine Alluvium is a part.

Response

As detailed in section 6.5.2, predicted long-term impacts continue to be less than the 2-m trigger threshold for unconsolidated aquifers and the magnitude of impact is less than 0.3 m for most of the area. Given the small magnitude of impacts predicted from a regional model, the pattern is susceptible to minor changes in production profile as well as model calibration. The net loss of water is therefore considered a more useful measure of impacts in the Condamine Alluvium.

There is a large amount of monitoring data available in the Condamine Alluvium and the number of monitoring points considered in the analysis are listed in Table 5-1: 762 monitoring points from the pre-CSG period and 73 from the post-CSG period. Analysis presented in section 5.6.2.3, which concludes that there is no impact observed at this point in time, is based on analysis of all available data – which has also been used for calibrating the model.

General concerns about the impacts in the Condamine Alluvium are noted. Consideration of non-CSG impact is outside the UWIR scope.

Actions

- Section 6.5.2.5 is amended to include a figure showing a time series of net loss of water from the Condamine Alluvium to the Walloon Coal Measures and a new figure showing the impact pattern is also added in Appendix E.

- Matters related to concerns about the sustainability of the Condamine Alluvium and its implications on the Murray Darling Basin are referred to DRDMW for further consideration.

4.6.4 Impact from coal mining

Issues raised

- Integration of coal mining impacts in the UWIR is welcomed by some submitters and the findings that coal impacts are relatively minor proportions of the overall cumulative impacts is also welcomed, but local impacts should be considered and avoided.
- One submitter has challenged the statement that coal mining impacts are 'minor'.

Response

Comments about the integration of coal mining impacts are noted and the importance of local impacts is acknowledged. Any local-scale impacts that may result in impacts on water supply bores or environmental assets will continue to be captured in the UWIR regardless of the level of impacts.

Reference to minor impacts from coal mining is relative to CSG impacts as presented in the UWIR.

Actions

- No changes are made to the UWIR.

4.7 Make-good arrangements

4.7.1 General

Issues raised

- There is overall support expressed in presenting the management of impacts on water bores and providing clarity on eligibility of water bores for make good purposes.
- OGIA should also secure make good data from the industry to inform assessment and provide some commentary around the effectiveness of make good arrangements.
- There is an overall concern around the number of impacted bores, slow progress on finalising make good agreements and lack of clarity on penalties associated with non-compliance.
- Further breakdown is sought on IAA bores inside and outside tenures and within existing and planned development areas.
- Specific details and enhancements are sought to the bore search tool and updates to the LAA.
- Correction to an IAA bore (RN 192195) which is stated to be a monitoring bore.

Response

Support for presenting a separate chapter on the management of impacts on water bores is noted.

There is no specific requirement for the tenure holders to provide make good data to OGIA. However, OGIA does seek some information on whether or not make good is completed. This information is provided in Table G-2. Assessment of the effectiveness of make good, its progress and compliance are outside the scope of the UWIR. Therefore, concerns around the progress on roll out of make good arrangement and compliance will be forwarded to DES for further consideration.

In relation to further breakdown of IAA bores, so far, about 340 effective IAA bores have been identified, of which about 80% are within relevant tenure area boundaries and the remainder are outside. Also, only about 25% of the IAA bores are within the existing production footprint where CSG wells are operating.

The bore search tool is a web-based tool that provides information about a water bore in the CMA – e.g. predicted impact, its status, etc. There are changes made to the bore search tool to address some of the issues raised by landholders in the past and to provide additional information such as:

- replacement bore information
- new bore identification
- status of the make good obligation process.

Improvements to the bore search tool will continue in response to the feedback received.

Water bore RN 192195 was called in as an IAA bore in the draft UWIR. This was in error as the bore is now established to be a monitoring bore. Consequently, this bore is removed from IAA bore list, resulting in the total number of IAA bores in the UWIR 2021 now being 107 instead of 108 that were listed in the draft UWIR. This also consequently changes LAA bore numbers from 702 to 701 and net IAA bores since UWIR 2012 (Table 8-2) from 341 to 340. Post-submissions, the number of IAA bores was amended back to 108, LAA bores back to 702 and net IAA bores back to 341.

Actions

- Section 8.5.3 and Figure 8-2 has been amended to include additional details and breakdown of the IAA bores.
- Various sections, Tables and Appendices are amended to reflect reduction of IAA bores from 108 to 107 and consequential changes to other bore numbers as described earlier. Post-submissions, this number was amended back to 108.
- Matters relating to the statutory scope of make good data provisions and assessment of efficiency are referred to DES for further consideration.

4.7.2 Bore status, eligibility and replacement bore

Issue raised

- Bores where a bore assessment is pending, or where bores could not be found during the baseline assessment, should be removed from the Table G-2 in the UWIR, which provides an update on IAA bores identified in the previous UWIR. Similarly, bores where bore assessments are completed should also be removed from the Table G-1.
- More clarity is required on matters relating to authorised bores, such as unregistered and unlicensed bores and their eligibility for make good, situations where authorisation is deemed to exist, what is meant by 'sufficient information' to demonstrate that bores are not authorised, and who is responsible for it.
- Several submissions are received expressing strong support for the criteria listed in the UWIR for a replacement bore:
 - A bore completed to replace a non-operational bore should not be considered a 'new bore' for the purpose of Chapter 3 of the Water Act.

- The provision must be retained as this is considered a 'right' by bore owners.
 - There is also a perception that Chapter 3 (Water Act) provisions have limited the rights of bore owners to drill replacement bores.
 - Conversely, one submitter has expressed the view that replacement bore provisions do not apply to Chapter 3 of the Water Act.
- Some submissions are made to correct records relating to specific bores.

Response

Bores identified as IAA bores require follow-up bore assessment to determine if their capacity to supply water would be impaired. Therefore, to provide transparency, an update is provided in Table G-2 for all bores that are identified as IAA bore at any stage in the past. The update includes information if bore assessment is completed or if the bore could not be found. Removing such bores from the list would reduce transparency and clarity.

It is acknowledged that the legislative provisions to define a water bore for the make good purposes under Chapter 3 of the Water Act, particularly in relation to a water bore's physical status, are open to interpretation. In this context, the UWIR is seeking to provide clarity on the physical status of a water bore and how it is applied in determining IAA bores – including replacement bores and authorised bores, while regulatory agencies consider the issue further.

As stated in section 8.3, construction requirements have evolved and changed over time. A water bore may not have held a development permit at the time of construction or may not have been required to comply with self-assessment code, but would still be 'deemed authorised' if it was constructed to the requirements of the time. In this context, the onus for demonstrating 'sufficient information' that a bore is not authorised, was dry when constructed, or has insufficient yield for at least stock purposes, is implied to lie with the tenure holder.

It should also be noted that a water bore's presence or absence in the Queensland Groundwater Database (GWDB) does not determine the legal status of the water bore – meaning that a bore not registered in the GWDB (often referred to as 'unregistered' bore) may still be a legal bore. This has been clarified further in the UWIR.

Actions

- Section 8.3 has been amended to provide clarity on 'unregistered' bores.
- Matters relating to ambiguities raised around the status of a water bore for the purpose of Chapter 3 of the Water Act are referred to DES for further consideration.

4.7.3 Baseline assessment

Issue raised

- Some of the baseline assessments by tenure holders are incorrect and are overly relied upon in make good negotiations.
- Timing of baseline assessments within tenure boundaries are based on approved Baseline Assessment Plans (BAP) – which do not consider activities in surrounding tenures. Therefore, a baseline assessment may not represent pre-development conditions. Also, separate requirements for baseline assessment under the BAP and the UWIR lead to inconsistencies and potential confusion.

Response

The legislation provides a link to make good agreements with assessment of impairment of a bore's capacity to provide water for the intended purpose. Details on how this should be conducted, and where the matters of disagreement should be referred to, are available in a guideline by DES (2021).

It is acknowledged that the timing of a baseline survey should be such that the survey is not affected by nearby CSG production or groundwater extraction as far as practicable. As stated in section 9.10, baseline assessments are conducted under ss. 397 and 402 of the Water Act within a tenure in accordance with tenure holders' BAPs. Separately, the UWIR is also required to specify a baseline assessment program for bores outside the tenures. OGIA acknowledges the potential for inconsistencies and is referring the matter the regulator (DES) for further consideration.

Actions

- Matters relating to alignment of bore baseline requirements and rationalisation of BAP are referred to DES for further consideration.

4.7.4 Bore assessment and establishing impairment

Issue raised

- In relation to establishing impairment, numerous submitters have made assertions that:
 - impairment is considered based on impacts resulting from existing activities alone, not including the planned activities or future impacts
 - the phrase 'tenure holder's right' is interpreted to exclude impacts from neighbouring tenures.
- A number of submitters raised concerns about the bore assessments conducted by tenure holders, such as:
 - there is a lack of independent checking and review of bore assessment reports which determine if a bore has an impaired capacity for the purpose of make good
 - bore assessment should include monitoring data from neighbouring monitoring points
 - approval of extensions on timing of bore assessment should include consultation with landholders who are affected
 - further clarity is needed as to whether bore assessment is still required where a make good agreement is completed.

Response

Identification of IAA bores for follow-up bore assessment and make good processes is based on the assessment of cumulative impacts in the UWIR from all existing and future extraction of associated water, regardless of which tenure holder is exercising this right. This is a core principle of the cumulative impact assessment and management framework. In this context, there is no ambiguity that assessment of impairment must be based on predicted impacts regardless of whether or not the RTH has exercised the underground water right. To provide further clarity, specific reference to 'tenure holder's right' is removed from the UWIR where applicable.

Matters relating to review of bore assessment, mandatory inclusion of monitoring data, and approval of extension on bore assessment are outside the UWIR scope and are referred to DES for further consideration.

Actions

- Various sections of the UWIR are amended to remove reference to ‘tenure holder’s right’ where applicable.
- Matters relating to bore assessment that are outside the UWIR scope are referred to DES for further consideration.

4.7.5 Make good process

Issues raised

- Several submitters have raised concerns about the direct and indirect impacts of CSG development on the Hutton Sandstone, which is an important aquifer of the GAB and is already under stress. These include:
 - indirect impacts from make good bores completed in the Hutton Sandstone causing further impact
 - lack of clarity on further eligibility for make good if CSG-induced impacts do occur in the Hutton Sandstone in the future
 - the UWIR under-reports the number of make good bores in the Hutton Sandstone.
- There is a perception of inconsistencies as some bores are made good without being identified as IAA bores, while others are put on hold until baseline or bore assessment is completed. There is also a perception that there is no provision for make good of non-IAA bores.
- A view is expressed that there should be no confidentiality clauses in a make good agreement.
- An independent review should be undertaken of the make good process involving the agricultural sector.
- The UWIR should also consider the impacts of free gas and how it affects make good.
- A number of submitters have raised the issue of financial implications for landholders where they disagree with the outcome of the bore assessment, and that any investigation-associated cost available for reimbursed to landholders is inadequate.
- The UWIR should include estimates on financial burden and cost of pumping for landholders due to a drop in water level.

Response

Potential implications of make good bores in the Hutton Sandstone are acknowledged. The provision relating to drilling of alternate make good water supply bores in the Hutton Sandstone under a make good arrangement is provided through the water planning process by DRDMW, including an assessment of implications on the sustainability of the aquifer. Therefore, this matter is referred to DRDMW for further consideration. Updated information about the make good bores completed in the

Hutton Sandstone indicates that there may be up to 16 such bores in the Hutton Sandstone. This is now updated in the UWIR.

A bore can be made good proactively by the tenure holder even if it is not an IAA bore. OGIA seeks this information directly from tenure holders and the numbers of proactive make good agreements and decommissioning processes are provided in section 8.5.3.

As stated in section 8.4.2.8, if a water bore is not located within an IAA but is experiencing impairment, including impairment due to the release of free gas derived from a resource tenure holder's activity, the chief executive of DES may direct the resource tenure holder to undertake a bore assessment, regardless of whether the water bore is identified as an IAA bore.

Matters relating to financial implications, independent review and assessment of gassy bores are outside the scope of the UWIR and are referred to DES for further consideration.

Actions

- Section 8.5.3 is updated for the number of make good bores in the Hutton Sandstone.
- Matters relating to potential implications of make good bores in the Hutton Sandstone are referred to DRDMW for further consideration.
- Matters relating to financial implications, independent review and assessment of gassy bores are referred to DES for further consideration.

4.8 Subsidence

4.8.1 General and conceptual framework

Issues raised

- There is strong support for including assessment of subsidence in the UWIR.
- A number of submitters have raised concerns that the narrative in the UWIR around uniformity of subsidence may be misleading and have asserted that subsidence will not be uniform and factors such as well density, coal percentage and directional drilling will also affect uniformity.
- More explanation is sought on higher rate of subsidence in the early stages of development as the rate of change would affect farming practices.
- Indicative extent of area affected by subsidence from a single well is sought, as well as a schematic showing how multiple wells may influence subsidence.
- Reference to 'tens of mm' should be changed to 'hundreds of mm'.
- More explanation on natural movement and what might be causing this.

Response

Support for the subsidence assessment is noted.

In the context of the Surat Basin, some of the primary factors that affect the magnitude of CSG-induced subsidence are: the magnitude and extent of depressurisation; geomechanical properties of the coal and overlying sediments; and the total thickness and distribution of coal where depressurisation occurs. Of these, the factor that has the greatest potential effect on CSG-induced

subsidence is the magnitude of depressurisation, its pattern and how it develops over time in a gas field. Therefore, the pattern of depressurisation also largely reflects the pattern of subsidence.

The use of the term 'uniform' is scale-dependent and hence open to different interpretations. OGIA acknowledges that depressurisation (and hence subsidence) will vary with distance, time and well spacing/density. The UWIR is amended to provide further explanation of this, together with depressurisation from a single well and the interference effect.

Reference to 'tens of mm' in the UWIR is changed to 'a few centimetres'.

There is natural ground movement – i.e. the ground movement caused by factors other than the CSG-induced subsidence – from the shrinking or expansion of high-clay-content soils due to changes in moisture content, depressurisation resulting from groundwater use in aquifers overlying the target coal formation and, land management practices, such as irrigation, tillage and land contouring. While substantial research will be required to individually characterise effects of all those factors, it is not essential for understanding CSG induced subsidence.

Actions

- Section 7.3.1 is amended to provide further explanation of uniformity, interference, influence of variability in coal thickness and causes of natural movement, supported by an additional schematic (Figure 7-2).

4.8.2 Monitoring

Issues raised

- A number of submitters have raised the issue that the statement of 'up to' 90 mm of subsidence is misleading as it only appears to be based on the monitoring data from 2015 onwards, and that monitoring data does not show stabilisation.
- General acknowledgement that it's the ground movement that is monitored and subsidence cannot be measured directly. This may, however, pose an additional challenge in establishing subsidence because farm slope rectifies itself in wet seasons.
- In relation to monitoring techniques, it is raised that:
 - LiDAR survey is not very effective in vegetative areas and where farms are wet or ponded and, therefore, terrestrial survey should also be considered
 - InSAR data has limitations in cultivated areas.
- There is strong support for the overall monitoring strategy and OGIA's role in implementing the strategy. However, some have suggested:
 - to make LiDAR data publicly available
 - to consider potential duplication of monitoring requirement with the environmental authority
 - to consider the use of a concrete slab at the CSG well head as a monitoring point
 - to include surveying of watercourses.
- Linkage to related work on subsidence by Geoscience Australia (GA) is unclear.

Response

InSAR data coverage over time is available since 2006, which corresponds to commencement of CSG operations in the Surat Basin. For the period 2006–2011, the data is available from the ALOS satellite at 46-day intervals, for 2012–2017 from Radarsat at 24-day intervals and from Sentinel for 2015 onward at 6–12-day intervals. To illustrate ground movement and subsidence in the draft UWIR, the data presented was from 2015 onwards, because of more frequent coverage and less noise.

This detail has now been further added in the UWIR as Figure 7-5, with complementary datasets – nearby CSG water production and groundwater pressure.

It is acknowledged that farm slopes may rectify naturally following wet events and may mask subsidence. However, analysis of ongoing LiDAR and InSAR survey data will likely enable identifying this effect and considered in determining CSG-induced subsidence.

Limitations associated with LiDAR and InSAR data are acknowledged and considered (as detailed in section 7.3.4). Despite the limitations, the InSAR data is still considered the best possible option at this stage for monitoring ground movement and drawing inferences on CSG-induced subsidence. OGIA is in discussions with TRE Altamira to explore extraction of additional ground movement data from the raw satellite data – including specific points of interest, such as the concrete slabs at CSG well heads.

OGIA also acknowledges the importance of the timing of LiDAR survey. The monitoring strategy required the survey in dry seasons, when leaf coverage is minimal and there is no ponding of water. This has been clarified further in the UWIR.

GA is currently exploring improved methods for the processing of InSAR data. This is still in development and not currently available for use. However, OGIA has engaged and will continue to engage with GA through representation on steering committees and collaboration on technical projects, to draw on the expertise from both organisations and ensure the best available data and science is utilised for future impact assessments.

Actions

- Section 7.3.4 is amended to provide further explanation of available data from 2006–2015 and how it is considered in the assessment – with an additional Figure 7-5.
- To avoid confusion, the statement about ‘up to’ 90 mm is also modified with additional commentary about flattening of subsidence over time.
- Section 7.5 is also amended to provide additional commentary on the limitation of the data, and to provide further clarity on timing of the LiDAR survey.

4.8.3 Predictions

Issues raised

- It appears that the model is not calibrated to ground movement data from 2006–2015, and also the model may not be accurate outside the Condamine Alluvium, where it is not calibrated.
- Subsidence predictions should include results of uncertainty analysis, as well as subsidence over time.

- Since the underlying groundwater model is at 1.5-km grid, the predictions may be inadequate to assess impacts at the farm scale.
- More explanation on why the greatest impacts are where they are and what is causing them, including correlation and location of the Horrane Fault.

Response

It is correct that the subsidence model is history-matched (i.e. calibrated) to observations between 2015 and 2020 because that data is more reliable. However, this does not imply that subsidence in the preceding years is ignored. It is a standard modelling practice to calibrate models from parts of high-confidence spatial or temporal data. Calibration from part of the data allows greater confidence in model parameters, which are then used in making predictions outside the calibration range. The model has the same predictive range as the numerical groundwater model starting in the year 1995.

Outputs from the uncertainty analysis are presented in the companion document, “Assessment of CSG-induced subsidence in the Surat CMA” (OGIA 2021e), in terms of the probability of a particular change in slope occurring – similar to the way rainfall probability is reported. The probability is presented for different slopes and magnitude. Results suggest that in a very small area north of Cecil Plains, there is about 80% probability of change in slope of 0.005%, while most of the area between Dalby and Cecil Plains is very likely to experience 0.001% change in slope. Similarly, in terms of the magnitude, some small areas west of Cecil Plains are predicted to have a 50% chance of 150 mm of subsidence occurring.

InSAR analysis of historical subsidence caused by CSG shows a relatively regional correlation between subsidence and the location of CSG fields. This also accords with the regional drawdown patterns predicted by OGIA’s groundwater model and indicates a more regional pattern, independent of the farm scale. However, OGIA will continue to explore scaling effects and work is currently underway to determine the effect of modelling scale and complexity on subsidence predictions.

The predicted impacts to change in land surface slope associated with CSG production are largely driven by the lateral distribution of drawdown. Where structural features such as the Horrane Fault are present, sharp contrasts in drawdown are observed across the fault zone. Within the Condamine Alluvium, the greatest change in slope is observed across the Horrane Fault. This is driven by differential drawdown patterns either side of the fault, facilitated by disconnection of layers through juxtaposition as well as the resistance to horizontal flow caused by the fault core.

Actions

- Section 7.4.2.3 is amended to provide further details on uncertainty analysis, some further commentary on predicted impacts and an additional map in the Appendix on uncertainty analysis.
- Location of Horrane Fault is added in prediction maps for context and additional commentary is added.

4.8.4 Consequences

Issues raised

A range of issues on matters relating to consequences of subsidence, mitigation measures and management are raised strongly by numerous submitters. The issues raised are synthesised as follows:

- General concerns and assertions about implications of predicted subsidence, particularly on irrigated and dryland cropping land – including potential for localised waterlogging.
- Subsidence has the potential to cause irreparable damage to prime agricultural land.
- Major impacts and consequences are already occurring around the Kupunn area where more than 100 mm subsidence is predicted, and land is relatively flat with a slope of less than 0.04%.
- Management of subsidence should be within the scope of the UWIR, and a make good type of framework should be considered.
- Land parcel slope presented in Figure 7-5 is misleading as the farms are divided and managed in parts. The method for slope calculation is also unclear.
- Flood modelling should be carried out to assess consequences for overland flow and watercourses.
- Thresholds should be developed to provide for stopping the development or production where exceedance occurs.

Response

Although the UWIR provides monitoring and modelling of CSG-induced subsidence, assessment of consequences of predicted subsidence and follow-up management actions are outside the statutory scope of the UWIR.

Presently, the GasFields Commission Queensland (GFCQ) is leading a review of the current regulatory framework for managing impacts of subsidence, with a view to better understanding current regulations and identifying opportunities for enhancements. Therefore, OGIA is referring the issues raised on consequences and management of subsidence to QGFC for further consideration.

A map (Figure 7-5 in the draft UWIR) showing the existing slope of farms in the Condamine Alluvium was presented in the draft UWIR for purely contextual purposes. However, OGIA acknowledges the issues raised on the method of estimating slope and the scaling issue and is therefore removing that particular map from the figure to avoid misinterpretation.

Actions

- OGIA has referred issues raised on the consequences and management of subsidence to GFCQ for further consideration.
- Figure 7-7 (Figure 7-5 in the draft UWIR) is amended to remove existing slope of the farms.
- OGIA commits to work with landholders to seek more clarity on methods for assessing farm slopes.

4.9 Water Monitoring Strategy

Issues raised

- There is general support across stakeholders for the water monitoring strategy (WMS) and some have requested that water quality data should be made available through a portal.
- Water production may be under-reported (section 9.7) and hence the model may be based on erroneous data.
- More monitoring is sought in the Hutton Sandstone and Precipice Sandstone.
- Monitoring of methane and fugitive gas or free gas should also be included.
- Submitters have sought further clarification on some specific elements of monitoring, such as:
 - whether monitoring data from in-use water bores is used in the assessment
 - background monitoring
 - lead time ahead of development
 - ‘practicality’ statement when referring to nested monitoring in the UWIR.
- Tenure holders support the acknowledgement of difficulties with off-tenure bores and have requested:
 - that DRDMW-owned bores be removed from RTH obligations
 - more clarity on RTH obligations relating to when they must notify OGIA of monitoring points’ failure and repair
 - updated information about specific monitoring points in the UWIR and the companion document.

Response

Support for the WMS is noted. As stated in section 9.13, OGIA has a statutory obligation to maintain a database of monitoring data. Data is received by OGIA every six months, reviewed and then made publicly available on the GWDB and the Queensland Globe.

In relation to the impact of any inaccuracies in reporting of CSG water production on modelling, as stated in section 6.5, there is no direct relationship between the volume of associated water extracted and the magnitude of groundwater level impacts. This is because CSG operations aim to maintain a close-to-constant groundwater level (or pressure) in the gas fields regardless of the volume of groundwater extracted. However, OGIA acknowledges the importance of water production data for verifying and interpreting monitoring data and has therefore proposed in section 9.7 to explore discrepancies between the volumes measured through metres at wells and the bulk volumes estimated from water balances at water-processing facilities. A more explicit commitment is now added in section 14.5, where OGIA’s future research direction is summarised.

The Hutton Sandstone and Precipice Sandstone are the two important aquifers of the GAB that underlie the CSG target formations and are accessible at greater depth (more than 1 km in some instances) in most of the Surat Basin. The groundwater level and water quality monitoring network for these two aquifers, as summarised in Table 9-1 and presented in a map in Figure 9-4, is very comprehensive and consistent with monitoring objectives. OGIA will continue to review the monitoring network and add further points, if necessary, in future UWIRs.

Monitoring of dissolved and free gas at monitoring points is included at water chemistry monitoring points in the WMS in the UWIR. This information is required to support the evaluation of groundwater level observations and as an additional line of evidence in identifying groundwater impacts from CSG.

In relation to submitters seeking further clarification on elements of the WMS:

- Monitoring data from in-use water bores has a number of limitations and can only be used in the assessment where sufficient contextual information is available, or in regional-scale model calibration with lower weighting.
- Background monitoring, as detailed in sections 9.4.2 and 5.4, allows separation of the impacts of resource development from other contributing factors and understanding of the functioning of groundwater systems.
- A lead time is a reference to the collection of monitoring data ahead of the resource development so that background trends in monitoring can be established.
- One of the WMS network design principles is to locate monitoring points in close proximity for multiple formations (nested installation), to allow assessing the vertical head difference and hydraulic gradient. However, in some instances, it may be more efficient and beneficial to use existing nearby monitoring points in some formations instead of constructing new points – and hence would be practical.

In relation to the issues raised by tenure holders:

- Difficulties associated with accessing and monitoring DRDMW bores are acknowledged and OGIA will continue to explore alternate mechanisms.
- Tenure holders must notify any failure of a monitoring point within three months of becoming aware of the failure – as clarified further in Tables 9-2 and 9-4.
- Details of some monitoring points are updated in the UWIR and the companion document, which do not change the intent, specifications or requirements of the monitoring points.

Actions

- Section 14.5 is amended to explicitly state a commitment on exploring the recording of CSG water production.
- Section 9.4.3 is amended to clarify lead time in monitoring.
- Tables 9-2 and 9-4 are amended to clarify notification by tenure holders of failure of monitoring points
- Matters relating to monitoring of free gas are referred to DES for further consideration.

4.10 Spring Impact Management Strategy

Issues raised

- Impacts on springs are not acceptable and there should be an obligation on RTHs to prevent impacts.
- Seeking more information on the effectiveness of Spring Impact Management Plans (SIMP) and clarity on obligations where an RTH surrenders a tenure.
- More clarity on actions to protect cultural values associated with springs, and low risk springs.

OGIA response

Legislation requires that UWIR includes ‘a strategy, including the actions to be taken, for preventing or mitigating the predicted impacts on the spring or, if a strategy for preventing or mitigating the predicted impacts ... is not included, the reason for not including the strategy’. In this context, the strategy and actions presented in section 10.7 are based on mitigation and not prevention. Prevention will require CSG production to cease. There are no identifiable at-risk springs where impacts cannot be mitigated. The UWIR incorrectly makes a reference to minimising impacts, which has now been removed.

Actions relating to the SIMP will be progressively rolled out as stated in section 10.7, and ongoing monitoring will continue as per section 10.8. OGIA will be reporting on the effectiveness of the actions and residual risk on an ongoing basis, through annual reporting and future UWIR cycles. There are also legislative provisions for notifying the surrendering of production tenures and a ‘final report’, which then lays out how the remaining obligations will be implemented. This situation has not yet occurred in the Surat CMA.

For the purposes of the risk assessment in the Spring Impact Management Strategy, it is assumed that all springs support cultural heritage values and that the maintenance of groundwater discharge is necessary to maintain those values. Understanding cultural heritage values associated with high-risk springs is an area identified for future research during the next UWIR cycle.

Actions

- Statements in section 10.7 are amended to better align with legislative requirements.
- Further details are provided on cultural heritage values in section 10.5.3, and an explicit commitment on OGIA’s future research direction in this area is now added in section 14.5.

4.11 Other environmental values**Issues raised**

- Terrestrial groundwater-dependent ecosystems (TGDEs) are not well researched and regional ecosystems (REs) are assessed as low-risk without field-based research and verification.
- Assessment of impacts to TGDEs should include management actions and more clarity is needed on ongoing monitoring of TGDEs.
- Seeking more clarity on when an impacted aquifer is not the source aquifer for a TGDE.
- Assertion that trees have died around the Kenya East area which may be linked to CSG development.

OGIA response

The assessment of impacts to TGDEs in the UWIR integrates the predictions of impact from the groundwater flow modelling and the Queensland Government’s dataset for TGDEs. The dataset was developed by the Queensland Herbarium (QH) in collaboration with technical experts and the latest available RE information. This represents the best available information. However, as acknowledged in section 11.6, the majority of TGDEs and their component REs are not field-verified. TGDE and RE mapping is periodically updated by QH.

Conceptually, TGDEs access the shallowest available groundwater and are therefore assumed to be accessing the shallowest formation within which they are located. The potential impacts on TGDEs are assessed based on this assumption. If the surficial aquifer is not impacted, it is unlikely that the TGDE will be impacted.

The legislative change in 2016 expanded the scope of the UWIR to include an assessment of impacts on environmental values, to ensure ongoing scrutiny of impacts during the operational phase of resource projects. However, the expanded scope includes only the assessment of impacts, with management implications to be considered by the regulator (DES) using other statutory instruments.

As discussed in section 11.6, confirmation of a TGDE's dependence on groundwater and therefore its likely response to a change will require investigation and ongoing monitoring. The UWIR identifies the areas and TGDEs at highest risk of impact. Investigation and monitoring are beyond the legislative scope of the UWIR.

There are a range of potential causes for vegetation dieback which may or may not be related to CSG-induced groundwater drawdown. The matter raised has been shared with the regulator (DES) for further consideration.

Actions

- Matters relating to monitoring and management of impacts on TGDEs are referred to DES for further consideration.

4.12 Responsible tenure holders

Issues raised

- There is overall support for the RTH rules in the UWIR.
- Clarification is sought on:
 - whether obligations are triggered after the approval of the UWIR or the consultation day
 - how extraction of associated water is linked to triggering monitoring and make good timing for coal mines
 - linkages of associated water licence (AWL) requirements with UWIR obligations
 - implications of outstanding approval of the New Acland Stage 3 project on UWIR obligations.

Response

All obligations are triggered from the day the UWIR takes effect. The take-effect day is advised by DES and the notice of approval of the report is made available on its website. OGIA then also informs tenure holders about the approval.

For the purpose of the UWIR obligations, provisions relating to mining tenure holders are separated between granted tenures where production is already occurring, and those where leases have been granted or are under application but production has not yet commenced. This is to avoid unnecessary burden ahead of production. The trigger used to separate the two categories is the commencement of exercising underground water rights, given its relationship with groundwater impacts. The trigger itself

is not specified in the Water Act but is part of the RTH rules which are required to be specified in the UWIR under the Water Act provisions.

In relation to linkages between AWL and UWIR obligations, the AWL requirement came into force following the amendment to the Water Act in December 2016, when underground water rights were extended to mining activities. The intent of AWL within a CMA has been to provide transitional arrangement until such time as a UWIR for the CMA takes effect. In this context, there are three potential scenarios within a CMA (subject to any requirement under the Coordinator-General's conditions in assessing the project to which the AWL may relate):

- If an AWL is already in place when the UWIR applicable to the mining activity comes into effect, then both obligations will coexist until AWL conditions relating to the management of groundwater impacts are aligned with the UWIR requirement and potentially removed from the AWL.
- If an AWL application is under consideration when the UWIR takes effect, then the decision on AWL will consider the UWIR findings and align obligations to avoid duplication.
- If an AWL application is lodged after the UWIR takes effect, then the proponent is expected to consider and reference UWIR findings in its application. Similar to previously, the AWL will then be aligned to UWIR obligations.

It is also acknowledged that there is uncertainty around the approvals relating to New Acland Stage 3 development. The cumulative impact predictions, and UWIR obligations emerging from that assessment, are based on Stage 3 scheduled production, which assumes commencement of production from 2021 onwards. Therefore, UWIR obligations relating to New Acland will require a review if the approval process materially affects the scheduled production.

Actions

- A new section (13.6) is added to clarify linkages between an AWL and the UWIR obligations and additional text in section 13.3 to clarify triggers of obligations.
- Section 13.5 is amended to clarify implications of the New Acland Stage 3 project approval on UWIR obligations.

4.13 General and report presentation

Issues raised

- There is general appreciation and support expressed for OGIA in:
 - providing independent scientific assessment and establishing credibility
 - undertaking good work and rigour applied in scientific assessment
 - undertaking the work in a short time frame with good stakeholder engagement.
- In terms of the underground water management framework, there is also strong support expressed for:
 - the importance of the UWIR and the underlying work in managing the CSG industry
 - OGIA's role as an independent broker and data custodian.

- In relation to the style of reporting, multiple submitters have expressed that:
 - the UWIR is user friendly, well-presented and comprehensive
 - the concept of companion documents and the ability to update in-between UWIR cycles is good, but the documents should be made available sooner
 - the UWIR provides a balanced data-driven view of the coal mining impacts.
- Communication videos are acknowledged as useful tools and support is expressed for further development of these and other videos.
- Encouragement and support for OGIA to publish its work in peer-reviewed journals.
- The future research program outlined in the UWIR is supported.

Response

Strong support for OGIA's roles, its functions and work undertaken is appreciated and noted. As stated in Chapter 14, OGIA will continue to undertake research and commit to report the findings on a regular basis through companion documents.

Actions

- OGIA will continue to report and implement research program as per Chapter 14.

4.14 Amendments made without formal submissions

As stated earlier, amendments to the UWIR are also made to rectify minor errors, update some figures, or provide further clarify without affecting the intent, analysis or conclusions that were presented in the draft UWIR. Some amendments are also made in response to feedback from DES on the draft report. These are listed below:

- Section 13.5 is amended to provide more specific details and cross-reference to clarify RTH obligations – without affecting or changing any obligations that were listed in the draft report.
- Figures are updated to reflect up-to-date data or make minor changes for clarity without affecting the content: Figure 2-10, Figure 4-9, Figure 5-3, Figure 5-6, Figure 5-8, Figure 5-10, Figure 5-12, Figure 5-13, Figure 5-14, Figure 5-15, Figure 6-2, Figure 9-3, Figure 9-4, Figure D-7, Figure D-8.
- Various sections of Chapter 12 are amended to provide further clarification on aspects of impacts on environmental values assessment in response to feedback received from DES.

5 Out of scope issues

A number of issues were raised by stakeholders during public information sessions and in written submissions that are general in nature and outside the scope of the UWIR. These issues are summarised in this section. OGIA will be referring these issues to relevant agencies for further consideration.

5.1.1 General concerns about impacts of CSG development

- Some submitters have called for a moratorium on CSG development in cropping areas and prime agricultural land, in line with the 'precautionary principle', until:
 - matters relating to subsidence are resolved

- further investigations relating to Arrow's development around the Plainview site is conducted.
- There should be a provision for a 'stop work' trigger where impacts are beyond a threshold and water bores are found to be impacted.
- A general concern by several submitters about impacts of CSG development on water resources in the Condamine Alluvium and the GAB, and an assertion that CSG is favoured over landholders' rights by giving them access to underground water rights.
- Clarity is sought on how findings in the UWIR are considered by the government in shaping policies – particularly in the context of increasing CSG development.
- Directional drilling should only be authorised under the properties where a Conduct and Compensation Agreement (CCA) is in place.
- A general call for more effective and visible compliance, cross-agency coordination, oversight of CSG activities, and reporting on the effectiveness of management strategies.
- The principle of adaptive management does not provide a strong incentive for in-depth comprehensive studies.
- General distrust of the CSG industry.
- Concerns about methane emission by the industry.
- Asking to remove the five-year confidentiality hold on availability of well completion reports.
- A perception that the UWIR may be used by the regulators for fast-tracking and continuing development rather than focusing on sustainable development.

5.1.2 Limitation on scope of the UWIR

- Several submitters have expressed that OGIA should be directed to investigate the cumulative effect of carbon sequestration proposal around the Moonie area and this should be included within the scope of the UWIR.
- Impact assessment should include CSG and non-CSG impacts – particularly on environmental values.
- There is no clarity on management of CSG-produced water and how brine is managed, hence it should be included in the UWIR.
- The UWIR scope should be expanded to make it a broader report on impacts on environment, industry and community. There are also suggestions of simultaneous reports on compliance, beneficial use and update on CCAs.
- Several submitters have called for inclusion in the UWIR of assessment of methane migration/fugitive gas.
- Matters relating to contamination of groundwater should also be included in the UWIR.
- The UWIR should also include OGIA's budget.

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Appendix A – Public notice

OFFICE OF GROUNDWATER IMPACT ASSESSMENT PUBLIC NOTICE

WATER ACT 2000 Section 382

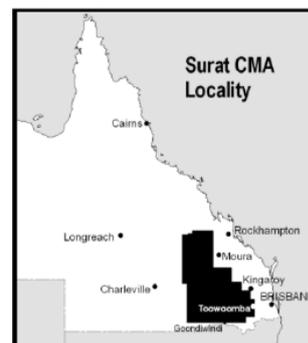
PUBLICATION OF THE DRAFT UNDERGROUND WATER IMPACT REPORT FOR THE SURAT CUMULATIVE MANAGEMENT AREA 2021

1. Purpose

The Office of Groundwater Impact Assessment (OGIA) gives notice that it has prepared the draft Underground Water Impact Report for the Surat Cumulative Management Area (CMA) 2021 which will be available for public consultation from Friday 29 October 2021.

2. Description of area

The draft report relates to the Surat CMA. The boundary of the area is identified in the adjacent map. A more detailed map is contained within the draft report and is available from the website: www.business.qld.gov.au/industries/mining-energy-water/resources/landholders/csg/surat-cma/location-geology



3. Availability of the draft report

A copy of the draft report can be obtained free of charge, requested by telephone on 3199 7321 or by email on suratUWIR@rdmw.qld.gov.au or from the website: www.business.qld.gov.au/ogia

4. Submissions

Written submissions may be sent by post or email. A submission form should be completed for each submission and will assist with the processing and consideration of all submissions. The submission form is available on request by telephone on 3199 7321 or email on suratUWIR@rdmw.qld.gov.au or from the website: www.business.qld.gov.au/industries/mining-energy-water/resources/landholders/csg/surat-cma/uwir

Submissions must be received by OGIA before 5.00 pm on 26 November 2021 and should be sent to the following:

Post:

Office of Groundwater Impact Assessment
Department of Regional Development, Manufacturing and Water
GPO Box 2247
Brisbane Qld 4001

Email: suratUWIR@rdmw.qld.gov.au

A copy of each submission must be given to the chief executive of the Department of Environment and Science (DES). OGIA will give the required copy of the submission to the chief executive of DES.

5. Enquiries

Enquiries should be directed to OGIA by telephone on 3199 7321 or email on suratUWIR@rdmw.qld.gov.au

6. Information sessions

OGIA will hold public information sessions about the draft report in the following locations:

Town / City	Date	Venue	Time
Toowoomba	8 November	City Golf Club 254 South Street	2.00 pm–4.30 pm
Dalby	9 November	Dalby Leagues Club Corner of Orpen and Drayton Streets	3.30 pm–6.00 pm
Chinchilla	10 November	Club Hotel Chinchilla 131 Heeney Street	3.30 pm–6.00 pm
Roma	11 November	Roma Explorers Inn 44778 Warrego Highway	4.00 pm–6.00 pm
Wandoan	12 November	Wandoan Cultural Centre 6 Henderson Road	10.00 am–12.00 pm

Sanjeev Pandey
Executive Director
Office of Groundwater Impact Assessment

Appendix B – Letters to bore owners

Our ref: EDOCS 16017373

29 October 2021

<Name>
<Address1>
<Address2>
<Address3>

Dear Sir/Madam

COMMUNITY CONSULTATION AND PUBLICATION OF THE DRAFT UNDERGROUND WATER IMPACT REPORT FOR THE SURAT CUMULATIVE MANAGEMENT AREA 2021

I am writing to advise that the community consultation period has commenced for the draft Underground Water Impact Report (draft report) 2021 for the Surat Cumulative Management Area.

The draft report has been prepared by the Office of Groundwater Impact Assessment (OGIA) and is now available for submissions. The draft report, when approved, will update and supersede the previous underground water impact report published in 2019.

Copies of the map of the Surat Cumulative Management Area, the draft report and submission form can be accessed at www.business.qld.gov.au/industries/mining-energy-water/resources/landholders/csg/surat-cma/uwir or can be requested by email at suratUWIR@rdmw.qld.gov.au or by telephone on 07 3199 7321.

A copy of the public notice about the release of the draft report for consultation, published in newspapers, is enclosed. The public notice also provides details about the information sessions that will be held in regional centres.

Written submissions may be made about the draft report and can be delivered by post or email. A separate submission form should be completed for each submission and will assist with the processing and consideration of submissions. Submissions must be received by OGIA before **5:00 pm on 26 November 2021** at the following address:

Email: suratUWIR@dnrme.qld.gov.au

Post: Office of Groundwater Impact Assessment
Department of Regional Development, Manufacturing and Water
GPO Box 2247
BRISBANE QLD 4001

If you own a bore in the area and would like specific information on predicted impacts at the location of your bore, visit the website where you can search details about the predicted impact by entering the registered number (RN) of your bore: www.resources.qld.gov.au/business/mining/surat-cma/bore-search. The RN is issued by the Department of Regional Development, Manufacturing and Water (DRDMW). If you do not know the RN of your bore, please contact your local DRDMW office.



**Queensland
Government**

Department of
**Regional Development,
Manufacturing and Water**

1 William Street
Brisbane QLD 4000
GPO Box 2247 Brisbane
Queensland 4001 Australia
Telephone 3199 7321
Website www.rdmw.qld.gov.au
ABN 51 242 471 577

If you require any further information, please contact OGIA on 07 3199 7321.

Yours sincerely

Signature
placeholder

Sanjeev Pandey
Executive Director
Office of Groundwater Impact Assessment

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Appendix C – Letter to tenure holders

Our ref: EDOCS 16017385

29 October 2021

<Company>
<Position>
<Address1>
<Address2>

Dear Sir/Madam

CONSULTATION AND PUBLICATION OF THE DRAFT UNDERGROUND WATER IMPACT REPORT 2021 FOR THE SURAT CUMULATIVE MANAGEMENT AREA

As per the requirement under section 382 (2) of the *Water Act 2000*, I am writing to you as an authorised tenure holder for one or more tenures in the Surat Cumulative Management Area (CMA) to advise that the consultation period has commenced for the draft Underground Water Impact Report (draft report) 2021 for the Surat CMA.

The draft report has been prepared by the Office of Groundwater Impact Assessment (OGIA) and is now available for submissions. The draft report, when approved, will update and supersede the previous underground water impact report published in 2019.

Copies of the map of the Surat Cumulative Management Area, the draft report and submission form can be accessed at www.business.qld.gov.au/industries/mining-energy-water/resources/landholders/csg/surat-cma/uwir or can be requested by email at suratUWIR@rdmw.qld.gov.au or by telephone on 07 3199 7321.

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Written submissions may be made about the draft report and can be delivered by post or email. A separate submission form should be completed for each submission and will assist with the processing and consideration of submissions. Submissions must be received by OGIA before **5:00 pm on 26 November 2021** at the following address:

Email: suratUWIR@dnrme.qld.gov.au

Post: Office of Groundwater Impact Assessment
Department of Regional Development, Manufacturing and Water
GPO Box 2247
BRISBANE QLD 4001



**Queensland
Government**

Department of
**Regional Development,
Manufacturing and Water**

1 William Street
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Queensland 4001 Australia
Telephone 3199 7321
Website www.rdmw.qld.gov.au
ABN 51 242 471 577

If you require any further information, please contact OGIA on 07 3199 7321.

Yours sincerely

Signature
placeholder

Sanjeev Pandey
Executive Director
Office of Groundwater Impact Assessment

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