

A SUMMARY

of

Underground Water Impact Report 2021 for the Surat Cumulative Management Area



December 2021

Office of Groundwater Impact Assessment



Queensland
Government

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About this document

This document provides a summary of the Underground Water Impact Report (**UWIR**) 2021 for the Surat cumulative management area (**CMA**). The summary should not be relied upon in isolation for informing opinions, nor as a basis for tenure holder obligations. The UWIR is the definitive document for those purposes and is available at www.business.qld.gov.au/ogia.

What is an underground water impact report?

A UWIR for a CMA is a statutory report that provides:

- an **assessment of cumulative impacts** from existing and proposed groundwater extraction by resource tenure holders (i.e. associated water)
- **proactive strategies for managing** those impacts i.e. make good of water bores, monitoring strategy and impact mitigation strategies for affected springs
- **assignment of responsibilities** to individual tenure holders to implement strategies.



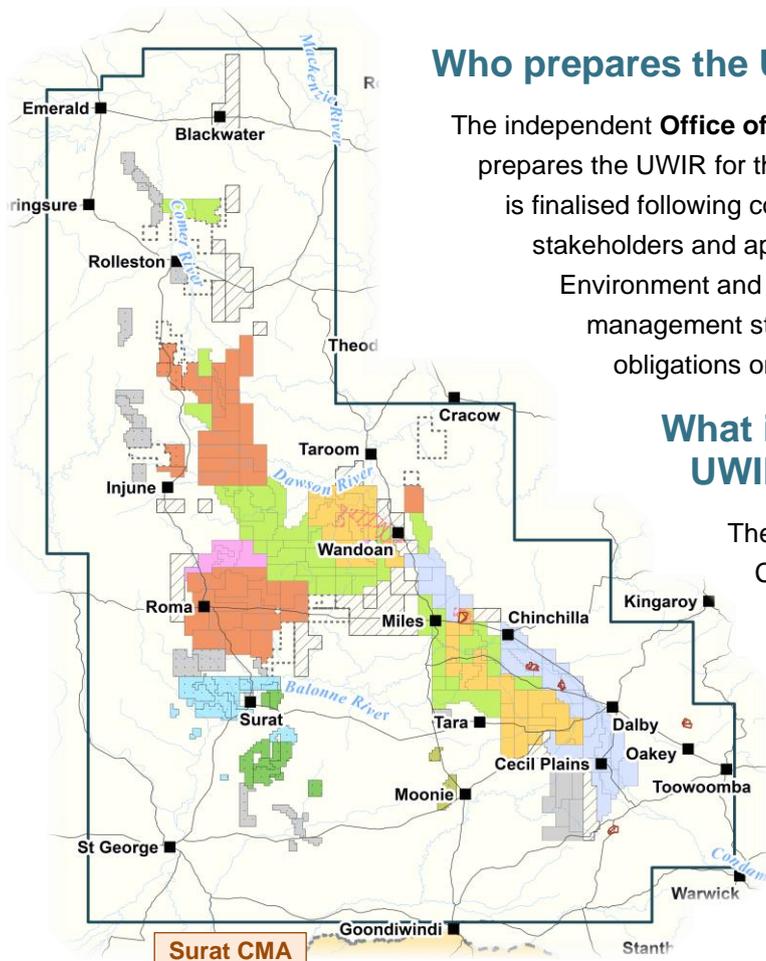
The relevant resource activities are depressurisation from coal seam gas (CSG), dewatering by coal mines and production of conventional oil and gas.

What is an underground water management framework?

In Queensland, the *Petroleum and Gas (Production and Safety) Act 2004*, the *Petroleum Act 1923* and the *Mineral Resource Act 1989* authorise resource tenure holders to take or interfere with underground water ('groundwater') in the process of resource extraction. The extracted water is referred to as **associated water**. This water access right is subject to several obligations for ongoing management of groundwater impacts arising from the extraction of associated water. Some of these obligations are set out in legislation, but most are stated in the UWIR. These responsibilities are collectively referred to as the **underground water obligations**. The statutory provisions providing for the rights, obligations and administrative arrangements are referred to as the **underground water management framework** as set out in Chapter 3 of the Queensland *Water Act 2000*. The framework complements overall environmental impact management under the Queensland's *Environmental Protection Act 1994* and the Australian Government's *Environment Protection and Biodiversity Conservation Act 1999*.

What is the Surat Cumulative Management Area (CMA)?

A **CMA** is established where impacts from two or more resource development activities may overlap. There is one CMA in Queensland – the Surat CMA – established in 2011 in response to extensive CSG development, but for completeness included conventional oil and gas development. Following amendments in early 2020, the Surat CMA now also includes coal mines in the Surat Basin because of the overlapping footprint with the CSG activities. Coal mines in the Bowen Basin are excluded from the CMA as impacts are isolated with little or no overlap.



Who prepares the UWIR?

The independent **Office of Groundwater Impact Assessment (OGIA)** prepares the UWIR for the Surat CMA **every three years**. The report is finalised following consideration of submissions from stakeholders and approved by the regulator – the Department of Environment and Science. Implementation of the management strategies in the approved report are statutory obligations on relevant tenure holders.

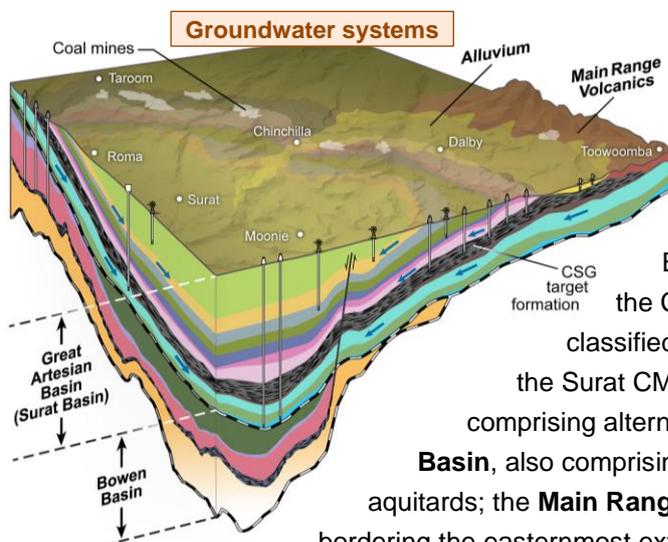
What is new and different in the UWIR 2021?

The UWIR 2021 is the 4th UWIR for the Surat CMA. In addition to a general **update of predictions** and management strategies from the previous iterations, the UWIR 2021 provides **two new assessments**:

1. **integration of coal mining** impacts in the Surat Basin; and
2. a **comprehensive assessment of subsidence**.

The first Surat UWIR was released in 2012, followed by two further iterations in

2016 and 2019. Those UWIRs related only to impacts from CSG and conventional oil and gas development. As a consequence of the amendments to the Surat CMA in early 2020, the UWIR 2021 is prepared within two years of the previous UWIR instead of the standard three-year cycle. It also details scientific assessments and research that OGIA has undertaken since the release of the previous UWIR in 2019, such as the refinement of geology and major geological structures (faults), improvements to the regional groundwater flow model, development of sub-regional groundwater flow models, and modelling and monitoring of CSG-induced subsidence.



Groundwater systems in the Surat CMA

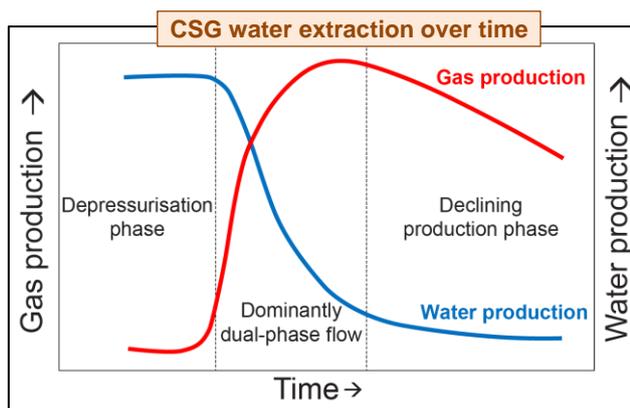
Geologically, the Surat CMA comprises sections of three large sedimentary basins: the southern part of the Bowen Basin, the Surat Basin and the western part of the Clarence-Moreton Basin. These are further

classified into four primary groundwater systems in the Surat CMA: the **Great Artesian Basin (GAB)**, comprising alternating aquifers and aquitards; the **Bowen Basin**, also comprising sedimentary sequences of aquifers and aquitards; the **Main Range Volcanics**, a surficial basalt aquifer bordering the easternmost extent of the Surat CMA; and the unconsolidated **Condamine Alluvium**.

CSG in the Surat CMA

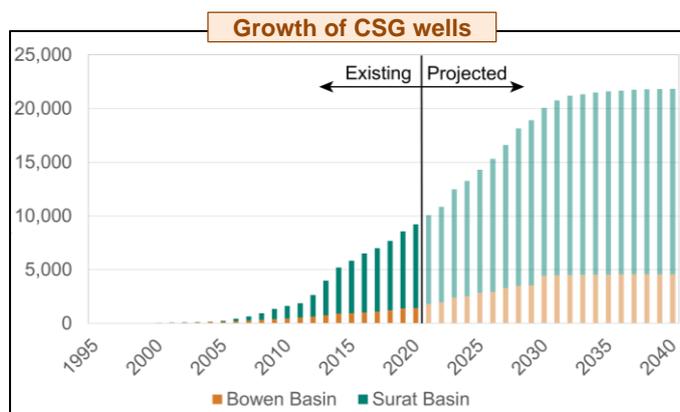
CSG is a natural gas held within the coal formations by groundwater pressure. There are two primary target formations for CSG production in the Surat CMA – the Walloon Coal Measures in the Surat Basin and the Bandanna Formation in the Bowen Basin.

The gas is extracted by drilling a well into the coal formation and extracting groundwater (associated water) to **depressurise** the formation by hundreds of metres. The rate of groundwater extraction is high in the early stages, then



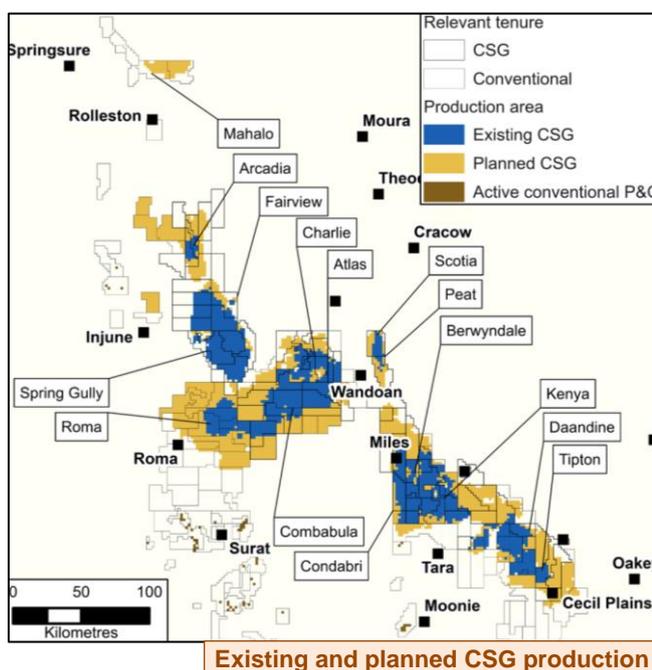
gradually declines as the target pressure is reached and maintained. Gas flow increases as the pressure reduces, until the gas reserves become depleted.

In a CSG field, multiple wells are constructed about 700–1,000 m apart from one another to depressurise large parts of the formation and to optimise gas recovery. The hundreds of metres of drop in groundwater pressure within the CSG



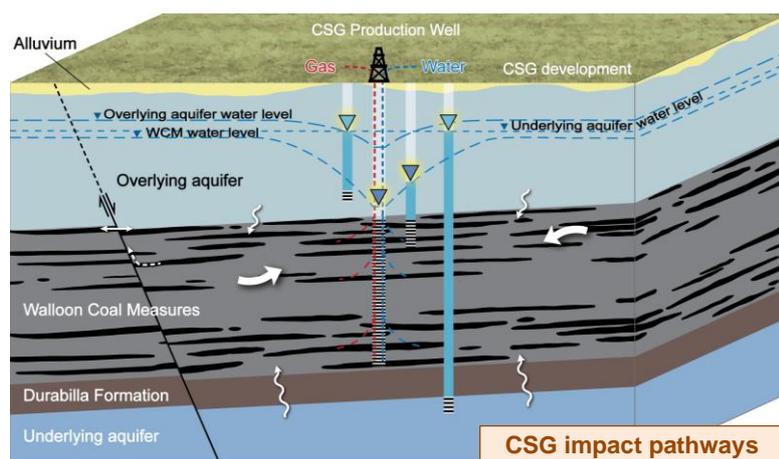
fields gradually reduces to just a few metres at about 10 to 15 km from the gas fields.

There are five main CSG operators: QGC, Santos, Origin, Arrow and Senex Energy. As of early 2021, there were approximately 8,600 CSG wells in the Surat CMA; this number is forecast to increase to about 22,000 wells over the next 15 to 20 years (about 5% higher than reported in the previous UWIR), based on the currently approved plans for development. About 680 wells are being completed every year. The total existing and planned production footprint has also increased by about 8% compared to the previous UWIR, but remains within the previously approved development footprint.



Groundwater impact pathways from CSG depressurisation

An **impact pathway** is the potential connection between the source of drawdown (depressurisation in the coal formations) and the location of receptors that rely on groundwater in the surrounding aquifers



e.g. water bores and springs. Understanding the impact pathway is therefore fundamental to understanding the potential for connection, and the prediction of impacts.

Hundreds of metres of CSG depressurisation in the coal seams in and around the gas fields creates a vertical pressure difference between the coal formations and the overlying and

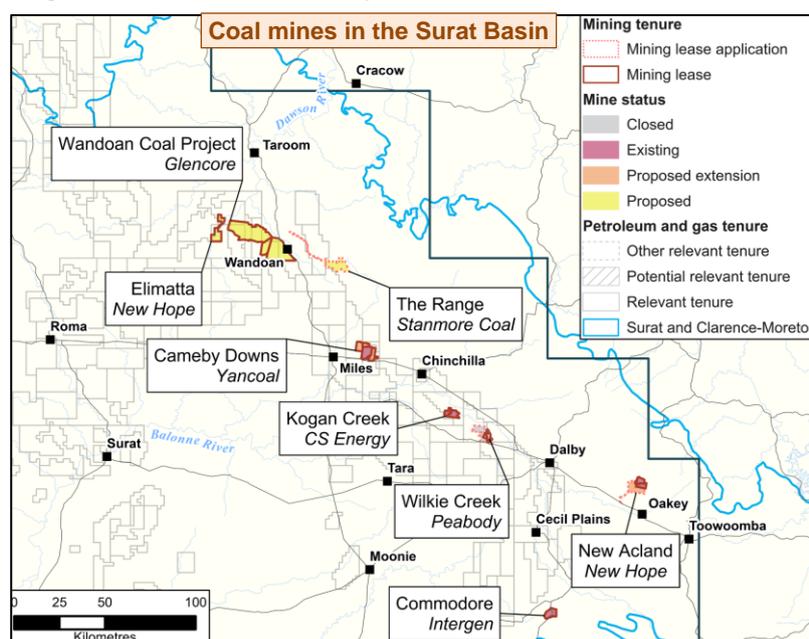
underlying aquifers. This results in the potential for groundwater to flow from those aquifers towards the coal formations as pressures attempt to re-equilibrate. The process however depends on the degree of connectivity between the coal formations and the surrounding aquifers, as the presence of highly impermeable and compacted material between them, or the layering of low-permeability material within the formations, may significantly reduce connectivity.

Impacts from CSG depressurisation will propagate laterally within the target coal formations. Impacts can also propagate vertically to the overlying Springbok Sandstone and Condamine Alluvium, although the degree of connectivity with the Condamine Alluvium is low. Similarly, the connectivity with the underlying Hutton Sandstone is also very low due to the presence of the intervening low-permeability Durabilla Formation.

Geological faults may also affect connectivity as they may act as conduits or barriers to flow. They have the potential to disconnect parts of the formations and connect normally separated formations through displacement (movement of formations up or down along the fault). OGIA has continued to update fault mapping to assess these potential flow pathways and has been representing them in the groundwater model for making predictions. The overall understanding of inter-aquifer connectivity and the mechanisms of impact pathways has also progressively been improved from the collective research by OGIA, other research organisations and the industry since the initial UWIR in 2012.

Coal mining in the Surat Basin

There are a total of eight existing and proposed open-cut coal mines in the Surat Basin targeting coal seams in the Walloon Coal Measures. Four of those are operational mines – New Acland (Stages 1 and 2), Cameby Downs, Kogan Creek and Commodore. Extensions are under consideration for two existing mines – New Acland (Stage 3) and Cameby Downs.

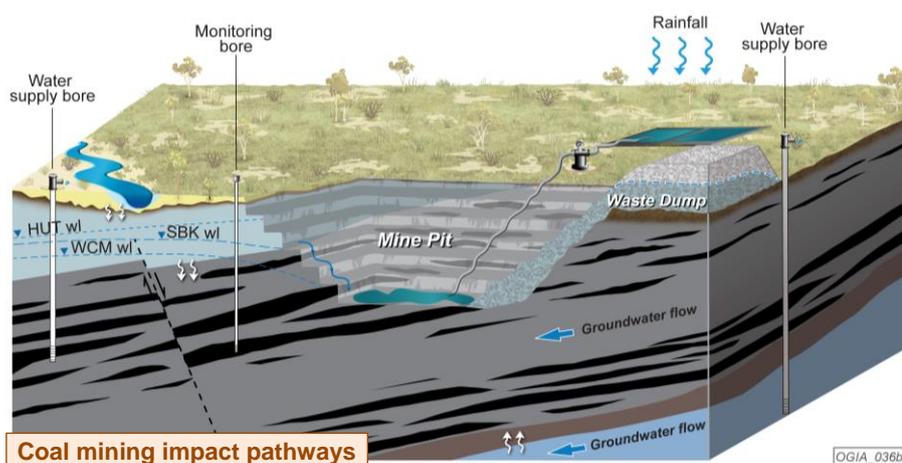


Approvals are also in place for the establishment of two new coal mines – Wandoan and Elimatta, and one is under consideration – The Range. The Wilkie Creek mine is currently closed.

Open-cut mining for coal extraction is a process involving the physical removal of overburden for direct access to coal seams. As the mine pit extends lower than the water table, this allows groundwater to seep into open pits, resulting in the lowering of the groundwater levels adjacent to the pit. Within the pit, the seepage is diverted via drains into artificial in-pit sumps for removal or use – a process referred to as **dewatering**. In other mining provinces, groundwater is pumped from areas surrounding the pit to reduce pit seepage. In the Surat Basin, however, groundwater seepage to the pits is small and hence only in-pit sump pumping is needed.

Impact pathways from coal mining

Coal mine pits create local sinks, towards which groundwater will flow because the exposed seams and formations intersect the water table. This creates a local groundwater drawdown or impact in the immediate vicinity of the coal mine. There is some interaction between coal mining and CSG production, as both target the same formation. Where CSG activity precedes mining, it has the potential to depressurise the coal seam in advance of mining and therefore reduce the need for dewatering.



Comparison between CSG operations and coal mining

The two fundamental differences between coal mining and CSG extraction that significantly influence the potential for groundwater impacts are (i) the resource extraction method, and (ii) the relative scale of operations.

CSG extraction does not require the physical removal of formation material but instead relies upon large-scale depressurisation to extract the gas resource from a field composed of multiple wells, over a relatively large area of operation. In comparison, coal mining involves the physical extraction of rock to permit direct access to coal seams, although at a much smaller scale.

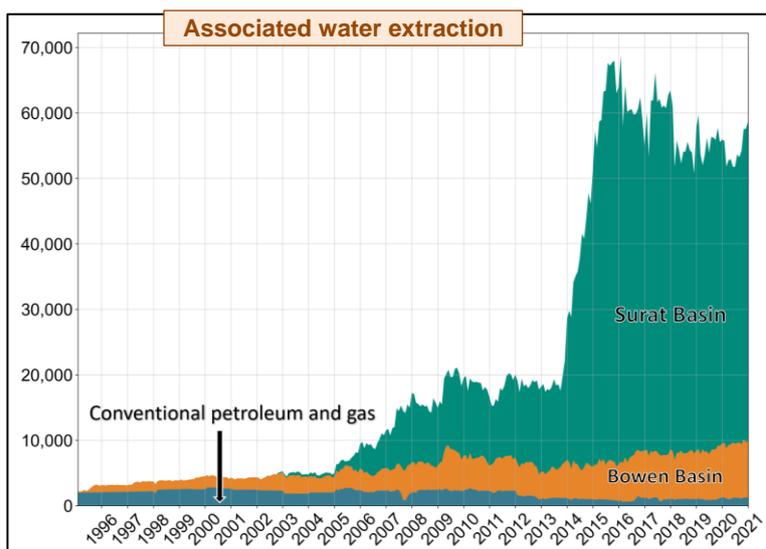
The coal mine footprint is only a small percentage of the CSG footprint and is also constrained to the much shallower depths in the Surat Basin. The volume of associated water extracted from dewatering is also much smaller compared to the broad-scale CSG depressurisation. As a result, impacts are typically much smaller in extent and magnitude when compared to CSG impacts.

Groundwater extraction by CSG and coal mines (associated water)

Associated water extraction from CSG depressurisation and conventional oil and gas production is metered. There was a significant increase in associated water extraction by CSG from 2014, peaking at 67,000 ML/year in 2015, followed by a slight reduction to the current level of extraction of about

54,000 ML/year. The majority (45,000 ML/year) of extracted water is from the Surat Basin. CSG water extraction in the Bowen Basin has remained relatively stable in recent years, at around 9,000 ML/year.

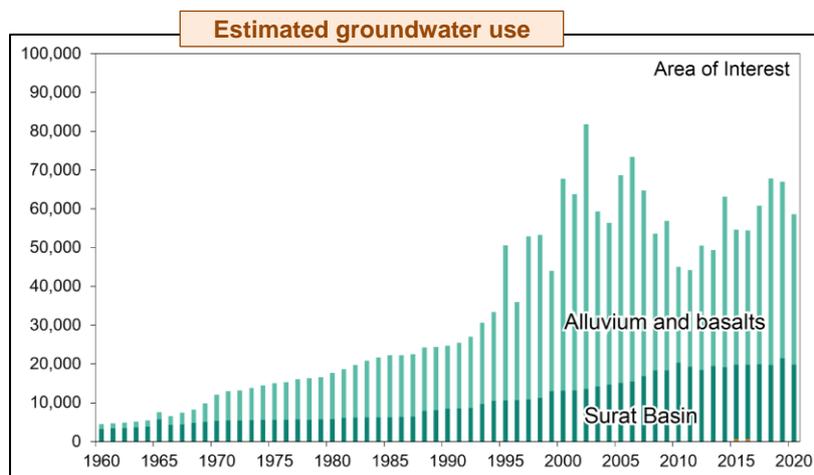
Total associated water extraction by coal mines in the Surat Basin in 2020 is less than 1,000 ML, which is less than two percent of the total associated water extraction in the Surat Basin.



Some associated water is reinjected back into aquifers under controlled conditions. Origin is currently reinjecting around 4,500 ML/year of treated CSG water back into the Precipice Sandstone.

Groundwater use by water bores

Within and in the immediate proximity of the CSG production areas (the area of interest), there are approximately 8,000 water bores for agricultural, irrigation, industrial, town water supply and, stock and domestic purposes. About 4,000 of these access water from formations in the GAB, with the remainder largely accessing water from the Condamine Alluvium and the Main Range Volcanics. There are only about 100 water bores in the Bowen Basin. There is limited metering outside of the Condamine Alluvium and therefore OGIA has developed methods to estimate groundwater use. The current estimated extraction from water bores in the area of interest, which is an area in and around the production tenures, is about 59,000 ML/year. About 20,000 ML/year (34%) of this is from the



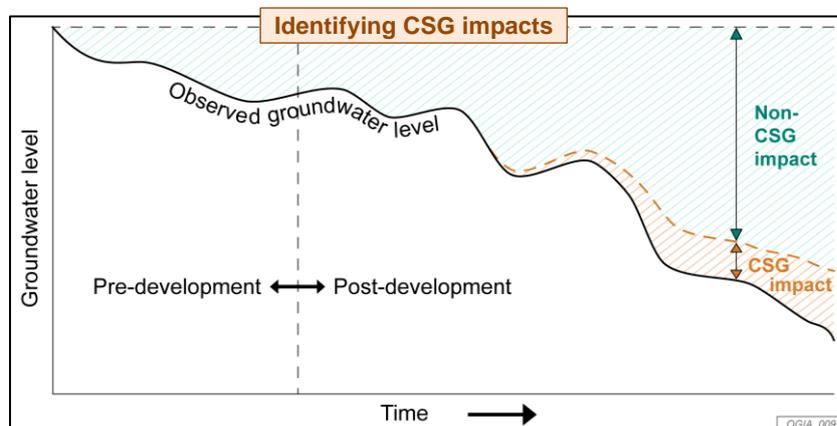
GAB. Two-thirds of the groundwater use within the area of interest is for purposes other than stock and domestic.

Water bore depths in the GAB are generally 200 to 500 m but can reach up to one kilometre in some instances. In comparison, water bores in other formations are less than 200 m deep. Most water bores in the area of interest are sub-

artesian, meaning that the groundwater level in the water bores is below the ground surface. In the CMA, the Hutton Sandstone is the most heavily used GAB aquifer, followed by the Gubberamunda and Precipice sandstones. Although the water quality in the Walloon Coal Measures is poor in some areas, it provides a useful water source at shallower depths. The most productive of all the GAB aquifers is the Precipice Sandstone, where average water bore yields about 12 ML/year.

Observed impacts from monitoring data

Monitored or observed trends over time in groundwater levels, water chemistry and groundwater extraction, together with contextual information, support the identification of impacts that have occurred from resource activities.



Impacts (i.e. declines in groundwater pressure or level) are generally not directly measurable because observed trends are influenced by a range of resource and non-resource activities. Detailed analysis is required to separate resource related trends (i.e. resulting from associated water

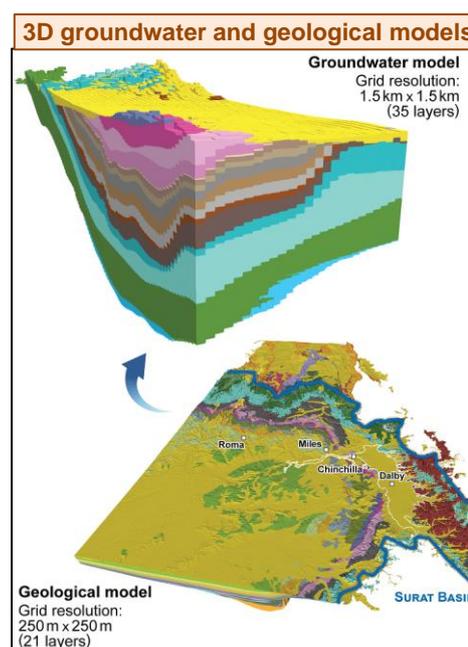
extraction) from other trends (i.e. resulting from groundwater extraction by water bores). OGIA has developed tools and techniques to support analysis of groundwater level trends.

Widespread CSG impacts are expected and identified in the Walloon Coal Measures and Bandanna Formation – as these are the two target formations for CSG production. Up to about 400 m of impacts are observed at some locations in the Walloon Coal Measures. In the Springbok Sandstone, trends are mixed, although there is evidence of CSG impact at some locations. Declining groundwater level trends in the underlying Hutton Sandstone are attributed to groundwater use from the formation (by water bores), rather than CSG depressurisation. No impacts are noted in the Precipice Sandstone, where a rising trend has instead resulted from the reinjection of treated CSG water by Origin.

At the coal mines, impacts of up to 30 m in the Walloon Coal Measures are evident short distances from operational mine pits. As some mines are rehabilitated, recovery in groundwater levels is also observed, although final mine landforms do generally create local long-term groundwater level lows.

Modelling for making predictions of impacts

Over the years, OGIA has developed a suite of innovative groundwater flow models to make predictions of groundwater level impacts in response to CSG, coal mining and conventional oil and gas development. The core model - the Regional Groundwater Flow model - comprises 35 layers at a 1.5x1.5 km grid resolution covering a domain of 650x450 km. It is one of the largest models of its kind in the world with many innovative features progressively developed and improved since 2011 by OGIA. The model incorporates unique and custom-built elements such as dual-phase flow approximation, representation of permeability enhancement through CSG wells, representation of multiple depressurisation targets within coal seams, and representation of geological faults.



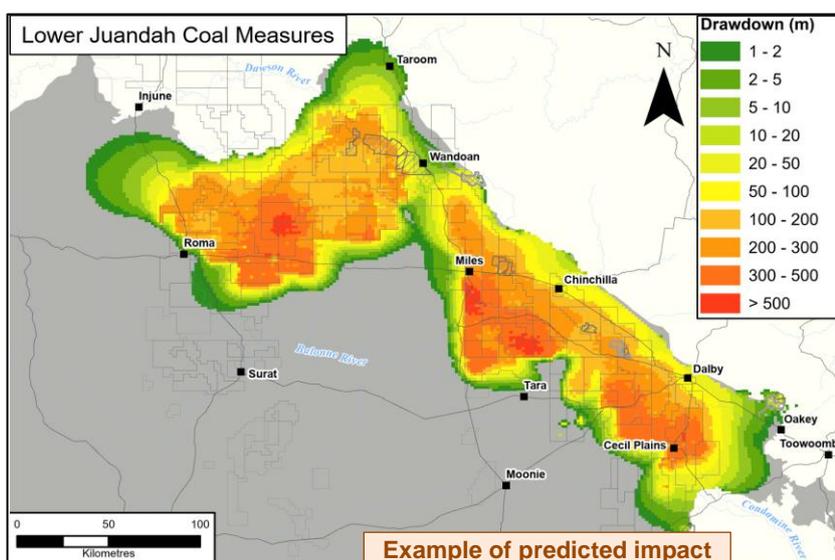
The model is calibrated using a range of historical data including up-to-date transient groundwater level data from more than 500 locations, associated water volumes from CSG and conventional oil and gas development, and estimates of groundwater use. Coal mines are now also represented in this model.

Predictions of impacts

Predictions of groundwater level impacts are made using the latest industry development profile as a key input which comprises of the footprint and timing of existing and proposed resource development.

Change to the development profile is the primary reason for changes to predicted impacts in progressive UWIRs.

Impacts are predicted for the short term as immediately affected areas (IAA), which are the areas where the impacts in the next three years (end of 2024) are predicted to exceed the trigger thresholds of five metres for consolidated



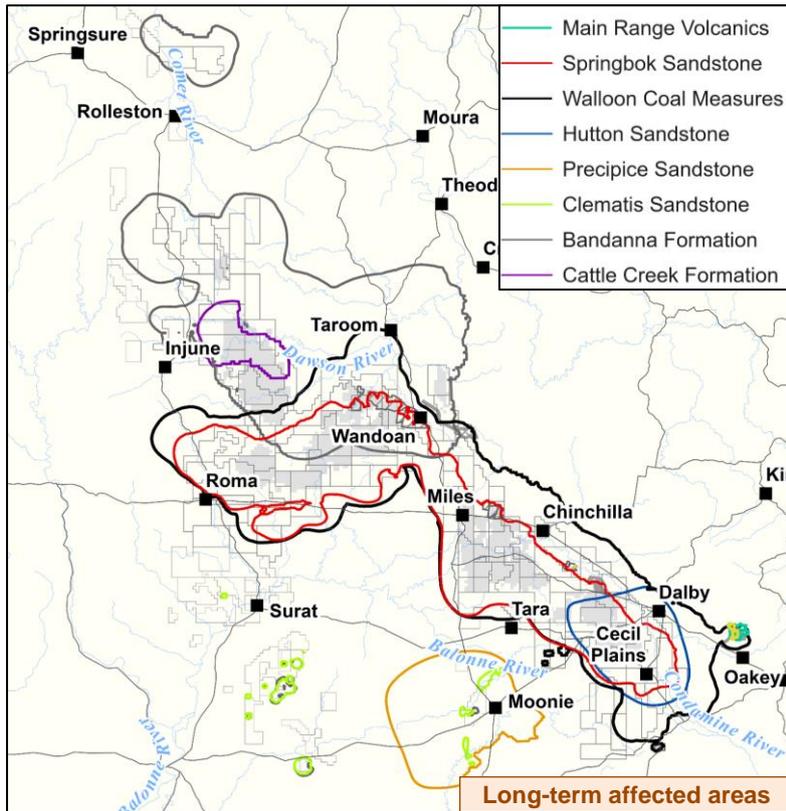
aquifers (such as sandstone) and two metres for unconsolidated aquifers (such as alluvium); and long-term impacts as long-term affected areas (LAA) where impacts are predicted to exceed the same trigger thresholds at any time in future.

Significant impacts are predicted in the CSG and coal target formations and the Springbok Sandstone. Most of the impact area in the Walloon Coal Measures will experience impacts of 450 m or less in the long term. The Springbok Sandstone will similarly experience 80 m of impacts in the long term. Only minor impacts are predicted in the Hutton Sandstone and Precipice Sandstone – less than 12 m in the long term within the impacted area. Impacts in the Condamine Alluvium will be less than one metre.

Compared to the previous UWIR 2019, the impacts predicted in the CSG target formations, and the surrounding aquifers are broadly similar, except for some marginal increases due to changes in the planned production footprint and integration of coal mining. The predicted loss of groundwater from the Condamine Alluvium to underlying formations has increased marginally to 1,270 ML/year. However, impacts on the groundwater level in the alluvium remain less than one metre, as previously predicted. Average predicted CSG associated water extraction has also increased marginally to 54,000 ML/year due to changes in the development profile since the UWIR 2019.

The impacts of coal mining are integrated into the cumulative assessment for the first time. A separate predictive run for coal mining alone (for information purposes only) suggests that impacts of up to 55 m are anticipated in the Walloon Coal Measures in some local areas around the mines, but most areas are predicted to experience less than 10 to 20 m. Impacts from the New Acland coal mine are not likely to overlap significantly with regional CSG impacts, due the nearest CSG development being more than 50 km away. Predicted long-term impacts extends up to 7 km further west from the mine. This is consistent with the previously reported predictions by the tenure holder.

Predicted impacts on water bores and make good arrangements



Predicted impacts account for all existing and proposed development over the life of the industry.

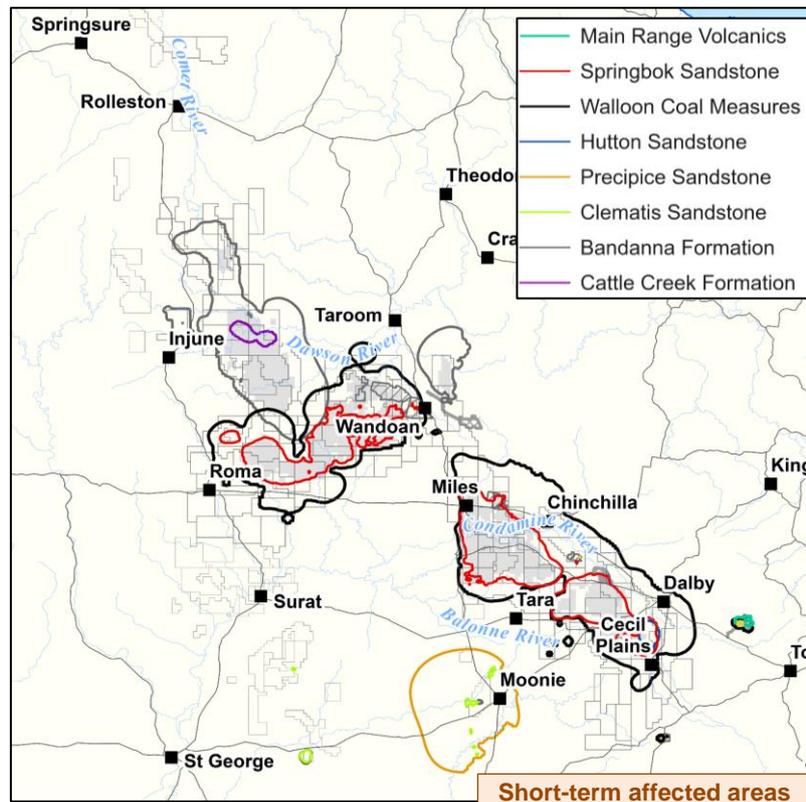
A total of 702 water bores are predicted to be impacted in the long term (LAA bores), including 187 that have already been decommissioned or made good. Of the LAA bores, there are 108 that are likely to be impacted in the next three years (IAA bores) and will require follow-up make good arrangements. In the previous UWIRs, collectively 233 water bores were identified as IAA bores, of which 135 have made good completed and the remainder are in the process.

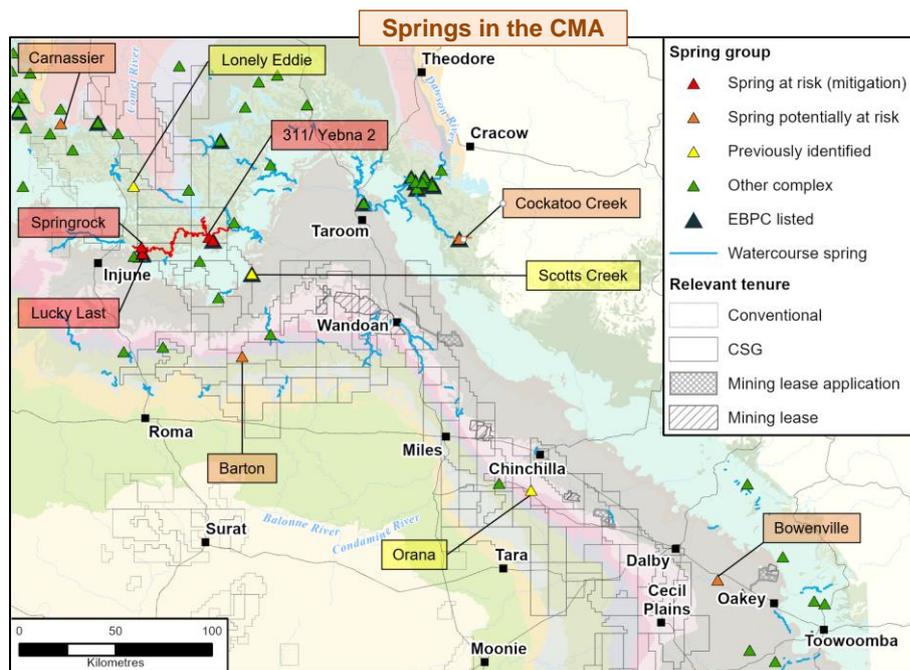
About 92% of the water bores predicted to be impacted are for

stock and domestic purposes. The majority are in the CSG target formations or the Springbok Sandstone. Fewer than one percent are in recognised aquifers of the GAB and none are in the Condamine Alluvium.

There is an increase in the number of LAA bores compared to the previous UWIR because of changes in the development profile, integration of coal mining impacts, changes in water bore information and additional water bores being identified that were not previously recorded in the groundwater database.

The UWIR assigns the responsible tenure holder for each of the IAA bores. On approval of the UWIR, those responsible tenure holders will be required to carry out a bore assessment and an





assessment of likely impaired capacity. If a bore's water supply is likely to be impaired, the tenure holder will negotiate with the water bore owner and implement appropriate proactive measures. IAA bores are progressively identified in each UWIR on a rolling basis for the next three years. The total number of IAA bores to date is now 341.

Groundwater monitoring strategy

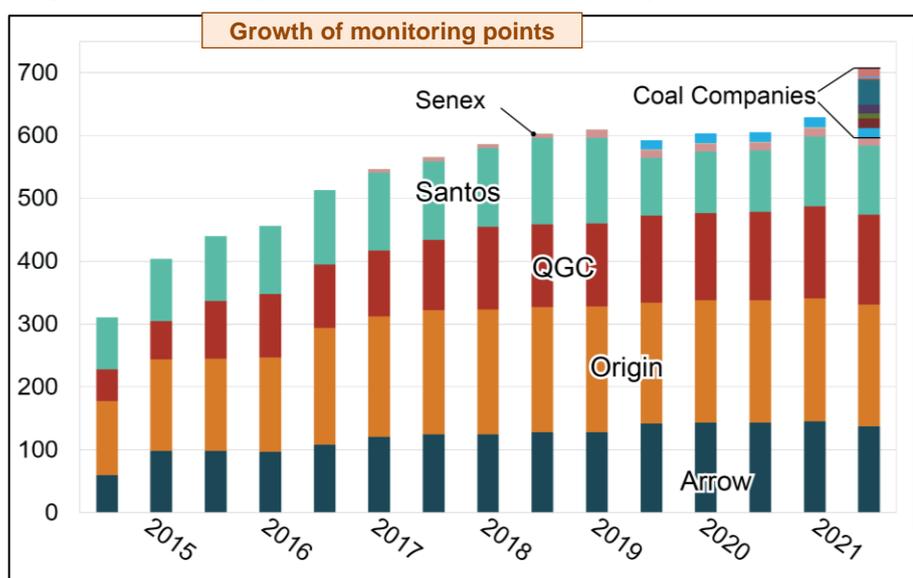
The Water Monitoring Strategy (WMS) is established to facilitate the collection of data used in identifying groundwater impacts from resource development, improve knowledge about the groundwater flow system, support future model calibration and evaluate the effectiveness of impact management strategies. The WMS includes a groundwater monitoring network, tenure holder obligations for implementation of the network, and reporting obligations.

Since 2012, the WMS has achieved the installation of 617 groundwater level monitoring points and 90 water chemistry monitoring points. The current UWIR proposes expansion of the network to 724 groundwater level monitoring points and 100 groundwater chemistry monitoring points. This

represents a net expansion of about 14%, coupled with ongoing metering of CSG water extraction. Another important part of the WMS is the progressive replacement and maintenance of monitoring points.

The result is an extensive regional monitoring network, established at the

complete and significant cost to tenure holders. Many of the monitoring points are a few hundred metres deep (some more than 1 km), clustered to measure vertical pressure differences across multiple formations and constructed for safe operations because of intercepted gas formations.



Impacts on springs and mitigation measures

Springs are locations in the landscape where groundwater is naturally discharged at the ground surface. They include sections of a watercourse where groundwater from an aquifer enters the stream through the streambed. OGIA has undertaken substantial research to improve understanding of springs' source aquifers and the mechanisms by which they occur. This has supported predictions of impacts at springs and development of mitigation actions.

There are a total of 88 spring groups and 96 watercourse springs in the Surat CMA. They are generally located around the edges of the Surat Basin and are fed by the Precipice, Hutton and Gubberamunda sandstones. Groundwater pressure impacts are predicted at seven of those spring groups, but they are less than one metre in most instances.

A follow-up risk assessment that accounts for consequences suggests that unmitigated risks for three of the spring groups – Springrock, Lucky Last and 311/Yebna 2 – are moderate to high. Santos is the responsible tenure holder for all three and has a statutory plan in place, resulting from the previous UWIR, to bring the residual risk to low. As a result, no further plans or updates to plans are required. There are other springs where risk was identified in the past but are no longer at risk due to updated investigations about their connectivity or revised predictions. OGIA will undertake investigations for other springs where some level of risk has been identified for the first time before assessing potential mitigation actions, if necessary.

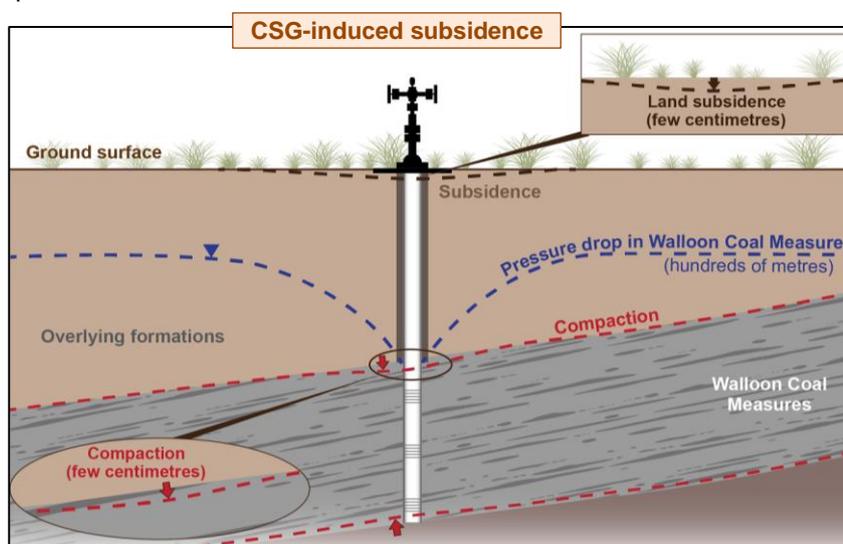
Impacts on terrestrial groundwater-dependent ecosystems

Terrestrial groundwater-dependent ecosystems (GDEs) occur where vegetation requires access to groundwater, either intermittently or permanently, to maintain ecological composition and function. Vegetation may use groundwater only for short periods or opportunistically during dry periods in response to fluctuating groundwater levels. Access to groundwater during dry periods may have a crucial role in the maintenance of aspects of plant life cycles. OGIA carried out a risk assessment by intersecting the area of 0.2 m of predicted impact in outcrop areas with mapped groundwater-dependent regional ecosystems and biodiversity status. The result is that only a very small area is identified as being at some risk, affecting 3.3 per cent of the total terrestrial GDEs of interest.

Assessment of CSG-induced subsidence

Hundreds of metres of CSG depressurisation will result in a few centimetres of subsidence at the ground surface. The rate of subsidence is higher in the initial development stages, before gradually stabilising after a few years. This may cause minor changes to the land slope and potentially affect farming practices and environmental values.

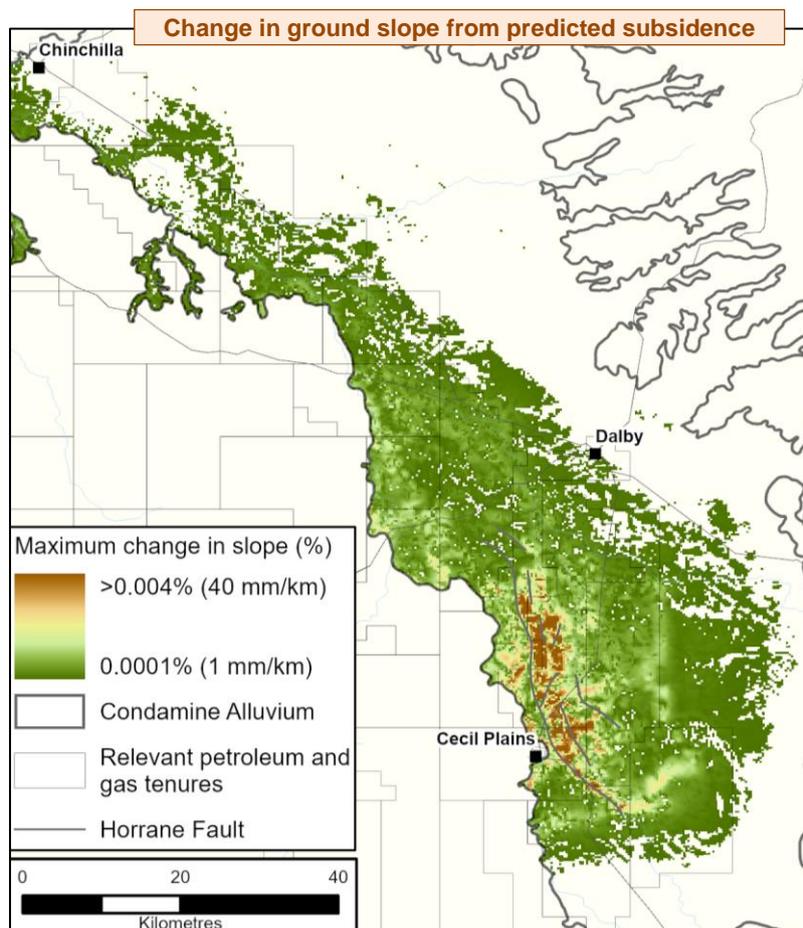
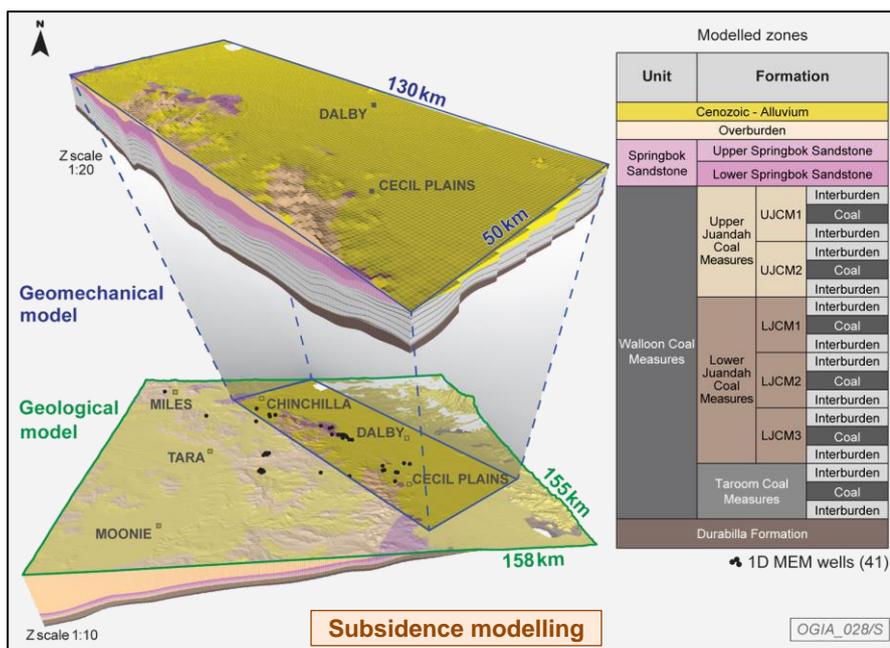
OGIA's predictions of subsidence are based on a combination of



geomechanical and groundwater flow modelling, which accounts for all existing and proposed development. The subsidence model is history-matched to ground movement data.

Predictions of subsidence within the Condamine Alluvium footprint suggest that most of the cropping area is likely to experience less than

100 mm of subsidence by the end of 2060. In comparison, natural or 'background' ground movement not affected by CSG development is in the order of ± 25 mm/year. The maximum all-time change in ground slope from CSG-induced subsidence in most areas is predicted to be less than 0.001% (10 mm over 1 km) but can be up to 0.004% (40 mm/km) in some areas.



Remote-sensing (InSAR) is the most effective tool for monitoring regional-scale ground movement over time, which is then used to assess subsidence. The available data indicates about 100 mm of CSG-induced subsidence has occurred in some mature gas field areas near the Condamine Alluvium. The subsidence monitoring strategy primarily comprises the establishment of baseline ground slope and trend monitoring. It requires tenure holders in the Condamine Alluvium area to undertake yearly airborne survey using LiDAR technique, while OGIA will continue to secure InSAR data for ongoing analysis of subsidence and reporting it annually.

Responsible tenure holder obligations

In a CMA, where impacts from more than one tenure holder may overlap, the responsibilities of an individual tenure holder (the responsible tenure holder) for specific obligations to implement management strategies are assigned in the UWIR. This provides clarity on responsibilities for specific management actions.

There are two types of underground water obligations: '**make good obligations**' for management of impairment of a bore's water supply – such as baseline assessment, bore assessment and make good agreement; and '**report obligations**' which are much broader and primarily relate to water monitoring obligations and spring impact management actions.

This is the first time that coal mining impacts are integrated with CSG impacts in the Surat UWIR. As a result, the rules for assigning obligations have been modified to accommodate this change.

The rules, in principle, require tenure holders to be responsible for the UWIR-identified obligations within their own tenures, and for obligations that are off-tenure based on the proximity to tenure boundaries. In some instances, specific coal mining obligations are called in and applied where mining tenures do not overlap with CSG or conventional oil and gas tenures. For coal mines that are yet to progress, obligations will not commence until the extraction of associated water commences. Tables showing the assigned tenure holder for each of the make good bores, monitoring points and other obligations are available in the UWIR.

Where to from here?

OGIA finalised the UWIR after considering the submissions on the consultation draft and submitted to the Department of Environment and Science (DES) for approval in December 2021. The report was approved on 17 March 2022 to take effect from 1 May 2022. It is now a statutory instrument and provides a basis for the ongoing management of groundwater impacts in line with the strategies specified in the UWIR until the next update in three years. Tenure holders will implement various parts of the obligations to implement management strategies including: make good arrangements relating to IAA bores such as the bore assessment, agreements, etc.; continued implementation of the monitoring network and data collection; spring mitigation actions; and reporting.

OGIA also prepares annual reports to provide updates on changes to circumstances that would materially impact the predictions reported in the UWIR, and to provide updates on the implementation of management strategies specified in the UWIR.

Ongoing reporting and next update

As required under the Queensland regulatory framework, the next update of the UWIR will be due in three years, i.e. late 2024.

OGIA's research and technical findings continue to evolve. Analysis, results and findings during the UWIR cycle are made available by updating companion documents published on the OGIA website. These are stand-alone documents on specific research themes to provide further details on scientific approaches and methods.

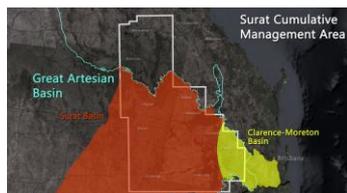
Communication material

The full version of the UWIR 2021 is available on OGIA's website at www.business.qld.gov.au/ogia.

Information about predicted impacts on individual water bores and water bore status at the time of preparing the UWIR is available through a 'Bore Search Tool' on OGIA's website (www.resources.qld.gov.au/business/mining/surat-cma/bore-search).

OGIA has also produced communication videos to support understanding of some fundamental elements of the impact assessment. These are available on OGIA's website:

www.business.qld.gov.au/ogia



Introduction to the Surat CMA

www.youtube.com/watch?v=DSZh_aXOly0

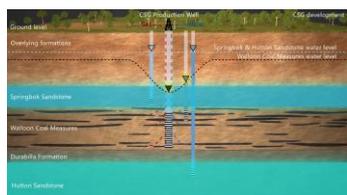
This video introduces the Surat CMA and some of the key groundwater assets in the CMA.



Geology of the Surat CMA

www.youtube.com/watch?v=0dhZPngCShc

This video shows the geological basins and formations, geological layers, groundwater systems, and what data OGIA has used to build this understanding.



Groundwater impact mechanism from CSG development

www.youtube.com/watch?v=pn8Ah03uB9E

This video explains how groundwater impacts may occur in aquifers surrounding the CSG formations in the Surat Basin.



Groundwater impact mechanism from coal mining

www.youtube.com/watch?v=QIVNkr6WdqM

This video explains how groundwater impacts may occur in aquifers surrounding the coal mines in the Surat Basin.

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