

Queensland Water Commission – Coal Seam Gas Groundwater Management

The Queensland Government has changed legislation to improve the management of water in the petroleum and gas industry. The changes, to the *Water Act 2000* and the *Water Supply (Safety and Reliability) Act 2008*, have been driven by the rapid expansion of the coal seam gas (CSG) industry.

The changes create a new role for the Queensland Water Commission (QWC) in managing the impacts of CSG water extraction on groundwater resources.

CSG and groundwater

The area of concentrated CSG development in Queensland is primarily in the Surat Basin and the Southern Bowen Basin, however, exploration and some production is also being carried out in other areas of the state.

The Surat Basin is a sub-basin of the Great Artesian Basin (GAB), an important water resource. Some of the rock layers in the Surat Basin are permeable sandstones (permeable means water can flow through the rock easily). These layers are called aquifers because a bore drilled into the layer can produce water. The aquifers provide water supply to bores, and to GAB springs of high ecological and cultural value.

While aquifers in the GAB are separated by low permeability rock layers, there will usually be some degree of interconnectivity between them. The degree of interconnectivity between these aquifers and coal seams will depend on the permeability and thickness of the separating layer.

To produce CSG, a large amount of water has to be pumped from the coal seams. A key issue is the need to better understand the extent to which water level reductions in the coal seams will affect water levels in overlying or underlying aquifers.

The QWC's role

The Surat Cumulative Management Area

In areas of concentrated CSG development, the impacts on water levels caused by individual petroleum and gas projects can overlap. The state government may declare these areas to be 'cumulative management areas' (CMAs). The area of planned concentrated CSG development in Queensland has been declared as the Surat CMA.

The QWC will prepare an underground water impact report (UWIR) for the Surat CMA. A regional groundwater flow model is being developed which will be used to predict future water level impacts in the coal seams as well as in adjacent aquifers in the Surat CMA. The model will be a key tool in the development of the UWIR.

The UWIR will include:

- maps showing predicted water level impacts
- an ongoing water monitoring program
- information about management of springs that could be affected by falls in water levels
- an assignment of responsibilities for individual petroleum and gas operators to carry out activities such as specific parts of the regional monitoring program.

The maps in the Surat UWIR that show predicted future water level impacts will define, for each aquifer, the areas where water levels are expected to fall by more than specified trigger thresholds within three years. These will be 'immediately affected areas'. When the Surat UWIR is approved, petroleum and gas companies will need to enter into agreements with bore owners about arrangements to maintain water supply in these areas. These arrangements are designed to ensure that the agreements will be in place before any potential impairment of water supply occurs.

If at any time a bore supply is impaired due to water extraction by a petroleum or gas company, the company must work out a solution to the problem with the bore owner. This applies regardless of whether the bore is inside or outside the immediately affected area. The Department of Environment and Resource Management (DERM) can assist with resolving any disagreements.

The QWC will update the Surat UWIR every three years. The groundwater flow model will be updated incorporating new information emerging from monitoring data and other sources. Through this process, predictions about future water levels will be progressively refined.

Other QWC responsibilities

Outside the CMA, individual petroleum tenure holders will need to prepare underground water impact reports for approval by DERM. QWC may advise DERM about the adequacy of these reports.

The QWC will maintain a database to store data collected under monitoring plans carried out in accordance with monitoring programs in approved UWIRs. The database will also store baseline data collected by petroleum and gas operators as a part of their obligations under the *Water Act 2000*.

The QWC will also provide evidence-based advice in relation to matters such as the need for additional CMAs in other parts of the State.

QWC resources

The QWC has appointed expert, technically skilled staff to carry out its new functions and work is well underway. Specialist technical services will also be engaged to support the staff as necessary. The cost of delivering the QWC's new functions will be met through an industry levy.

Environmental approval

The impacts of petroleum and gas activities are regulated through environmental approvals, which are the primary point of control over CSG projects. Environmental approvals are required at a State level and may also be required at a Commonwealth level.

DERM is responsible for environmental approvals in Queensland. Under the *Environmental Protection Act 1994* (EP Act), all petroleum and gas operators are required to apply for an environmental authority (EA) for their activities. There is also an environmental impact statement process under the EP Act for certain large scale petroleum and gas activities.

An EA regulates many aspects of a CSG project including the management of water after it is extracted, management of hydraulic fracturing (fracking) activities and injection of water into aquifers or other geological formations.

An EA is issued following consideration and assessment of the potential environmental impacts, including impacts on water levels, as understood at the time of approval. If new information emerges then the approval can be reassessed.

For more information about QWC's role in the impacts of water extraction in the petroleum and gas sector, phone 13 25 23 or email qwcenquiries@qwc.qld.gov.au.