Gloucester Coal Seam Gas Project

Community information fact sheet

Number 5
September 2008

Some questions we've been asked about water from the coal seam gas project

Water fact sheet

Why is water produced during coal seam gas extraction?

The coal seams deep within the Gloucester Basin contain water as well as methane gas. The gas is trapped within the coal seams by the pressure of the surrounding water, so to extract gas the water must first be pumped out.

This means that large quantities of water are normally an inevitable by-product of coal seam methane gas production.

What is the water quality like?

This water has been underground for a long time, particularly in the deeper seams. Since it's effectively trapped in layers of solid rock, very little fresh water has penetrated over time. As a result, the water has taken some of the chemical properties of its porous surroundings and is often quite salty.

Of the dissolved salts present in the water, sodium is the most prevalent. This has particular implications if using the water for agriculture. High levels of sodium can affect drainage, damage soil structure and potentially increase susceptibility to erosion.

Lucas continues to test the water produced at its Stratford Pilot Project to understand the likely water quality and quantity that can be expected across the project area.

How much water is there?

It's impossible to say with certainty how much water is present in the coal seams within the Gloucester Basin. The amount of water produced from the Stratford Pilot wells has varied, again depending on the particular seams. But as an indication, an individual well may produce between 5,000 to 20,000 litres per day on average.

If this level of production is extrapolated to the wells in the field, we anticipate that between 0.5 and 2 megalitres (ML) of water will be produced daily which is between 200 and 700 ML of water per year.

Why can't Lucas Energy confirm how much water is there?

The total water production will depend on the number of wells and their individual characteristics. The volume pumped from each well also varies over time. Typically, a well will produce more water when pumping first begins. This process of "dewatering" the coal seam to reduce water pressure and encourage gas to flow can take between three months and two years, depending on the volume of water present. With time, the flow reaches a peak then reduces to a more constant, stable level.

What will be done with the water?

At present, Lucas Energy collects the water produced by the wells at its Stratford Pilot Project in lined storage dams on site. Some has a high salt content (greater than 5000 parts per million). This is stored separately from the remainder, which has a lower salt content. Lucas has approval from the Department of Primary Industries (DPI) to use the low content salt water for irrigation under certain conditions which ensure that there is no detrimental impact on the condition of local soils and groundwater. The water is also used during daily operation for activities such as dust suppression and drilling.

This community information fact sheet has been produced by the Gloucester Coal Seam Gas Project:
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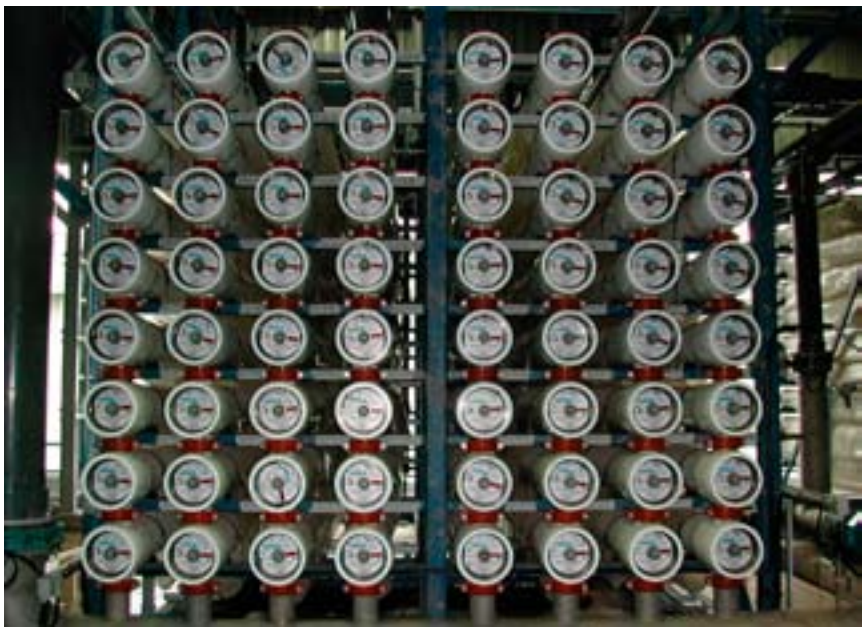
 Continued overleaf



A reverse osmosis filter

A common approach to dealing with the water produced with coal seam gas in many parts of the world, including Queensland, is to simply let it evaporate from large ponds. But the temperate climate of the Gloucester valley means this is not a feasible here. Moreover, in a country where water is such a precious resource, we believe it should be put to worthwhile use.

Although we are currently irrigating with water produced by some of the Stratford Pilot wells, this probably won't be a sustainable long-term and large-scale option without improving the quality of the water. There are many treatment options to do this, but the most common process is reverse osmosis (RO). RO involves pushing water through membranes with pores small enough to filter out most dissolved ions such as salt, resulting in a product that is suitable for almost any use.

Lucas intends to adopt a treatment process that will produce water that is fit for its intended final use. In a rural area like the Gloucester Valley, the most likely use is agricultural, such as irrigation of local dairy enterprises.

How will the water be treated?

Lucas Energy is looking into a number of methods for water treatment.

Reverse osmosis is currently the most likely treatment, though other emerging desalination technologies will also be evaluated.

One of the challenges of water treatment will be dealing with the waste stream. The likely approach will be to reduce this to as small a volume as possible and evaporate the remaining water. It may be feasible to harvest the resulting salt product, which could be sold locally for applications such as stock-feed.

The final design of the treatment facility will be determined by the quality of the produced water and the desired treated water output.

When will the water be available?

Lucas Energy plans to deliver gas from its proposed production field in the Gloucester Basin by 2010. From the moment the first well is on-line, water will be produced and will therefore need to be used.

The timing and availability of water will vary over time, but it is expected that a steady supply of water will be available for between 10 and 20 years.

How much will the water cost?

Desalination is a relatively expensive process, particularly for small-scale operations of less than 1-2 ML per day. Although Lucas does not expect to fully recoup the cost of water treatment, we anticipate a reasonable fee in line with current market value.

How does removing this water affect local groundwater resources?

The majority of the coal seams, particularly those at greater depth, are isolated aquifers that have limited or no connections to other water sources and would never be considered a source of water for agricultural or other use.

Studies will be undertaken as part of the environmental assessment to determine the level of impact and mitigation measures required, if any.

Don't the wells put a hole in the aquifers?

As we drill to the coal seams, typically several hundred metres down, we will certainly be crossing groundwater aquifers. To ensure there can be no mixing of groundwater with gas or water from the coal seam, well holes are permanently sealed from the surrounding ground with a steel lining. The gap, or annulus, between the lining and its surroundings is grouted by injecting concrete under pressure which positively isolates any ground water aquifers. The entire drill hole is then x-rayed to ensure there is adequate bonding and no gaps between the steel casing the outside of the drill hole. If adequate bonding has not occurred, the hole will be abandoned and filled with concrete.

What about the environmental impacts of drilling itself?

Lucas has one of the largest and most experienced drilling operations in Australia. We understand the importance of protecting the environment and operate in accordance with international best practice. Lucas are ISO 14000 accredited, which means they have an independently approved environmental management system which is continuously audited.

All activities are first approved by the DPI and other authorities as required and we adhere to a stringent environmental management plan.

Every aspect of the project – whether drilling, construction of a pipeline, or managing produced water – will be conducted to minimise any impact on the environment.