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21 September 2011

The Chairman  
Inquiry into Coal Seam Gas  
General Purpose Standing Committee 5  
Legislative Council  
Parliament House  
SYDNEY NSW 2001

Dear Sir,

**Re: Inquiry into Coal Seam Gas (CSG)  
Beneficial use of CSG Water for Agriculture**

We have prepared this brief submission in the hope that our company's experience in developing practical solutions for using CSG water to generate sustainable social, environmental and economic benefits will be of some interest and use to the Inquiry into Coal Seam Gas. As pathfinders in this area, we are demonstrating that we can devise cost-effective solutions for sustainably using CSG water that can mutually benefit both the agricultural and resources industries and their host communities.

**1. FK's experience in the coal and coal seam gas sectors**

Fodder King Ltd (FK) is a technically-oriented vertically-integrated specialist fodder production and marketing enterprise with our operations based principally in the NSW Riverina and, more recently, the Hunter Valley of NSW.

As an agribusiness with professional engineering expertise, FK is applying clean technology and a systems approach to integrate the production, processing and supply of high quality fodder using wastewater streams from municipal, industrial, mining and CSG sources.

Of relevance to this submission, FK provides professional advice and practical solutions for the beneficial use of wastewater: whether from municipal, industrial, mining, or energy project sources. FK's directors and key staff are engineers with management and finance training and an extensive professional background covering research and technology development, business strategy advice, materials handling, project management of coal mine and mining infrastructure and more recently wastewater advisory work in the Coal and Coal Seam Gas (CSG) industries.

Over the past three years, the company's advisory work has been concerned mainly with the challenge of treating and beneficially using CSG water, including:

- developing a proof-of-concept pilot CSG water utilisation project for a major CSG company in NSW;
- advising two CSG companies regarding practical options for beneficially using CSG water at both the exploration and production phases of their CSG projects in NSW and Queensland;
- proposals under consideration to advise a number of CSG companies in NSW & Qld on practical solutions to beneficially use their CSG water;
- a written submission regarding the NSW Coal and Gas Strategy Scoping Study;
- written submissions to assist the Queensland government with recent CSG policy formulation;
- providing commentaries to the Queensland government on the Environmental Impact Statements (EIS) submitted by three major export LNG proponents.

FK has found that there is only a narrow band of rural solutions that can deal practically with the CSG water challenge - addressing not only the technical issues of CSG water disposal but also maintaining or creating new agricultural landscapes for the benefit of local communities.

## **2. FK's CSG water plan reduces risk for government, the community and the CSG companies**

FK's CSG water plan reduces inherent risks in the disposal of large volumes of CSG water, that exist even after treatment. Failure or deterioration in performance of CSG water treatment plants could carry risks such as:

- contamination of aquifers;
- contamination of water supplies;
- contamination of soils; and
- potential health problems as a result.

Having developed relevant intellectual property over some 20 years, FK is ideally positioned to design and manage projects to utilise the CSG water in a cost-effective, low-risk sustainable way- thus removing a range of potential community issues, such as the following:

- Individual or class actions resulting from pollution of water or land. For example, a sole Riverina NSW irrigation farmer successfully claimed \$1.8 million for damages against the local water utility resulting from receiving polluted irrigation water through the Murrumbidgee Irrigation Area scheme.
- The government being forced to exercise shutdown directions on CSG fields because of compliance issues resulting in substantial losses and adverse publicity for the CSG company and with the potential for subsequent adverse publicity for the government.

FK has found that the major CSG proponent companies, in structuring their strategy for dealing with challenges such as disposal of CSG water, are very dependent on major international vertically-integrated engineering design-and-construct enterprises and on major engineering consulting firms. Unfortunately, however, all of these players have a general lack of knowledge of the CSG company's mainly rural host communities and a lack of knowledge of agricultural enterprise. As a result of this mismatch, they have been involved in expensive and time consuming evaluations of many inappropriate solutions for the rural host communities often involving imposing structures with large amounts of engineering hardware such as pipes and pumps. These often orthodox solutions, based on conventional thinking, can also be high cost and high risk and in some cases are now being implemented even though they may not produce a good strategic fit for the CSG water challenge at hand and for the host communities. These less than optimal outcomes are occurring because senior management of the major CSG companies are very dependent on conventional engineering solutions, often emanating from overseas, and have not made themselves aware of more appropriate local solutions, such as can be provided by FK. Indeed in many instances the senior management of the major CSG companies appear to be resistant to local solutions - in FK's experience.

On the other hand, FK's CSG water plan is visionary and although regarded by the engineering fraternity within the CSG companies (and their engineering advisers) as unconventional, unorthodox, even radical –our approach works very well and is an appropriate fit for the rural host communities. Some forward thinking CSG companies are now benefiting from implementing FK's entrepreneurial ideas and innovative designs.

## **3. CSG water policy trends**

FK's CSG water plan is adaptable and has accommodated the following government policy trends noted particularly in Qld:

- evaporation ponds no longer acceptable;
- buffer storages to be lined;
- must treat to EPA standards;
- if injected underground, must treat & monitor to show no leakage between layers;
- not to pollute local streams;
- not to alter natural periodicity of local streams;
- require a Water Management Plan – based on scientific data;
- need a Beneficial Use Approval - even at the exploration phase;
- regular monitoring of water volume, water quality & soil quality;

- CSG company remains responsible for fate of the CSG water; and
- no government subsidies for CSG companies.

FK's CSG water plan would enable CSG proponents to comply with these requirements.

#### **4. Broad-ranging benefits of FK's CSG water plan**

FK's CSG water plan works at a small scale appropriate for the exploration phase, or at a large scale appropriate for the production phase of CSG development. It is cost effective and sustainable and produces a broad range of social, environmental and economic benefits for the CSG companies, the local host communities and the government as follows:

- drought-proofing surrounding livestock industries;
- soil improvement;
- land rehabilitation;
- protecting good quality agricultural land (GQAL) status;
- significant agricultural employment generation as it is an intensive activity;
- no contamination of local streams, run-off or accession to groundwater;
- no alteration to the natural flows and periodicity of local streams;
- matches the scale of CSG water volumes and can beneficially use all the water;
- can limit CSG water application to the CSG company's land;
- limits any possible contamination to the CSG company's land;
- occupies the smallest possible land area, and is less complicated for monitoring and reporting.
- minimises risks to the CSG company, local community and government;
- is aligned with state and federal government policy; and

FK's enterprise, expertise and intellectual property such as its in-field processing technology and its soil amelioration techniques applied to the CSG water resource could generate an improved local agricultural economy, which in some selective cases could:

- leave a legacy of additional long-term irrigation capacity; and
- potentially reduce the capital investment required by tens of millions to hundreds of millions of dollars.

#### **5. Emerging community concerns regarding competing land use**

Clearly concerns have arisen about the compatibility of mining with other competing land uses, manifesting in:

- conflict between miners and food and fibre producers in farming areas including the Liverpool Plains;
- conflict between the mining and thoroughbred horse industries and vineyards in the Hunter Valley; and
- opposition to mining in certain towns or urban areas close to mining exploration tenements or leases.

The government needs to formalise acknowledgement and acceptance of the concept of Good Quality Agricultural Land (GQAL) with a systematic GQAL land classification recognising different classes of GQAL to be carried out to identify and appropriately protect the better classes of agricultural land.

The importance of GQAL for food production needs to be factored in to the assessment process for CSG operations so that rehabilitation restores the balance of land classes that existed prior to coal or CSG development.

Where mining or CSG development is proposed to occur on GQAL then different levels of land re-instatement may be required according to the original GQAL classification – so that, when mining is complete, there is no net loss of productive agricultural land. If GQAL cannot be protected then the CSG proponent should be required to develop and establish replacement land of similar quality so that an equivalent or improved amount of agricultural production can be maintained during mining and coal seam gas operations as well as when these industries have left the area.

Further, we recommend that policy should encourage the maintenance and operation of the better classes of GQAL on mining areas during mining operations.

There are compatible agricultural solutions that can be applied to areas where CSG operations are conducted such that there is a high degree of harmony between CSG operations and other local industries.

## **6. Emerging community concerns regarding the impact of the CSG industry on water resources**

There is growing community concern about the potential impacts from CSG operations on water resources in general and particularly in relation to aquifers, groundwater supplies, the treatment and disposal of waste water and chemical additives.

We recommend that the NSW government provide clear and prioritised direction to CSG proponents as to the state's preferred waste water solutions.

A degree of ambiguity has prevailed in Queensland and may be the case in NSW, partly as a result of old legislation covering conventional mining and oil and gas extraction, to the extent that even large companies appear to be confused as to which wastewater solutions are most likely to receive government approval. A major source of this confusion has been the historic mandating of underground injection in pre-existing statutes which, for the volumes of CSG water involved, appears completely impractical and a waste of energy and water resource in times of drought.

Whilst CSG water has a short lifespan at each well, the large number of progressively developed wells provides a medium term supply of water that could be beneficially used after treatment.

Where CSG exploration or production operations are clearly occurring within an arable landscape the government should state very clearly that it prefers sustainable beneficial agricultural use of treated CSG water.

Where CSG proponents choose to adopt a beneficial agricultural use approach it should be made clear that the ultimate responsibility for the wastewater always remains with the CSG proponent – that the responsibility cannot be imposed on third parties but remains with the CSG proponent for the duration of the CSG project and beyond. 'Out-sourcing' the use and/or responsibility for CSG waste water is a recipe for failure.

There are a small number of agricultural solutions that facilitate the beneficial use of treated CSG water and are compatible with surrounding land uses. We recommend that the NSW government place high priority on agricultural solutions that enable sustainable use of wastewater.

Fodder production, for example, is particularly relevant to all livestock industries.

FK has investigated a number of agricultural operating models in recent years and the model that best meets the likely range of compliance conditions is where the proponent owns the agricultural land and is wholly responsible for the beneficial re-use of the CSG water on that land.

In arable areas priority needs to be given to beneficial use of treated CSG water to grow appropriate food-chain crops – provided that those crops satisfy the technical requirements associated with water disposal.

## **7. Management of coal and CSG overlap with respect to water management plans**

Due to the nature of the coal resource being shared by Coal mining and CSG extraction there will be instances of overlap.

The NSW government should be prepared to develop policies that allow for integrated solutions to water management where coal mining and CSG operations are likely to occur in tandem or in close proximity and where there is clear proof of a desire by the respective industries to work co-operatively with their industry 'neighbour' to address water management problems.

In regard to coal mines, post-mining land-use is emerging as a significant issue and where applicable, GQAL needs to be protected, future agricultural productivity not compromised and landscapes fully restored after the mining has ceased. Like the CSG industry, coal mining also carries associated problems of water management, including management of effluent, groundwater and water licences attached to “buffer land”.

**8. Exploration-phase water management is different to production-phase water management**

We believe that government policy needs to be aware of, and take account of, the differences between finding a beneficial use for CSG water produced during the exploration phase as compared to water produced at the production phase of a CSG project largely due to the transitory nature of exploration operations.

**9. Government initiatives to address community concerns**

New rules for CSG exploration and production licences need to be introduced with application of relevant environmental controls during the approval process. Rigorous community consultation should also be included. Key government agencies need to be being involved from the beginning so that they are able to give clear and transparent guidance to CSG proponents so that confusion and delays to approval decisions are avoided. However, we note that the required environmental controls at the exploration phase may need to be quite different to what is required at the production phase due to the short term and transitory nature of exploration operations.

Should the Committee wish to discuss these matters further, we would be more than happy to assist.

Yours Sincerely,

Kim Campbell  
Managing Director