



Integrity Review of CSG Produced Water Ponds

Introduction

Following concerns raised by community regarding coal seam gas ponds, in 2013 the NSW Environment Protection Authority (EPA) led a review of the integrity of all produced water storage ponds in New South Wales to confirm whether the construction and management standards for each storage pond were consistent with national and international best practice.

Pond assessments

To confirm best practice for produced water storage pond construction and management, the EPA conducted a literature review of the rules and regulations for the management of produced water in 31 states of the USA. The literature review also considered the British Columbia Oil & Gas Commission's *Management of Saline Fluids for Hydraulic Fracturing Guideline* (May 2015) and the Alberta Energy Regulator's *Directive 055: Storage Requirements for the Upstream Petroleum Industry* (2001).

In parallel to the EPA's literature review, the NSW Department of Industry, Resources & Energy (DIRE) developed the "Exploration Code of Practice: Produced Water Management, Storage and Transfer" (NSW Code), which was released in July 2015. The NSW Code is based on an assessment of several national and international standards relevant to the construction and management of produced water storage ponds.

The EPA determined that the NSW Code is generally superior to the international standards reviewed by the EPA and used the NSW Code in conducting its assessment of the design, construction and management of produced water storage ponds in New South Wales.

In New South Wales, a total of 18 produced water storage ponds have been constructed:

- Six of the ponds have been decommissioned and their sites rehabilitated, with a further three returned to the landholders after testing and sign-off by the Office of Coal Seam Gas.
- Nine ponds were operational at the time of the review, comprising five ponds associated with the Santos operation in north western New South Wales and another four associated with AGL's operations at Camden and Gloucester. The EPA's review focused on these nine ponds.

Conclusions

The EPA's integrity review confirmed that the nine operational ponds were achieving an acceptable level of environmental performance.

The review confirmed that, generally, the operational ponds were well constructed and functioning appropriately. Most of these ponds were constructed prior to the introduction of the NSW Code and, therefore, cannot be expected to comply with the NSW Code. The review confirmed that, while the older ponds did not comply with the NSW Code, they did not present any operational or environmental risk. The review confirmed that the Santos Leewood Ponds do meet the requirements of the NSW Code.

In relation to the ponds which do not comply with the NSW Code, the review has recommended actions to ensure that appropriate leak detection systems were being implemented. In the short term, the general objective is to ensure that groundwater monitoring programs are sufficiently tailored to each site to ensure timely identification of any leaks from the ponds should one occur. The medium-term objective is to ensure that any ponds that will remain operational are upgraded in accordance with the NSW Code.

The EPA will be working with each of the licensees to implement the recommendations of the report.

Implementation of the recommendations

Since the completion of this review, the following actions were taken by the EPA to address the recommendations in the report and improve environmental performance of the produced water storage ponds.

AGL, Gloucester

Since completion of the review, AGL has commenced a comprehensive decommissioning and rehabilitation program for its well sites and other infrastructure, including its produced water storage ponds. The EPA is working with AGL during this process to ensure the decommissioning and rehabilitation works are completed in accordance with the NSW Government's requirements and any other relevant pre-negotiated landholder agreements.

Santos, Narrabri

In March 2016, the EPA varied Santos' Environment Protection Licence to require the implementation of a Liner Integrity Monitoring Program at the Tintfield 1 and 2 sites. The program will continue until the end of 2019 when the ponds will either be taken off line or upgraded to comply with the NSW Code. The EPA has also been actively monitoring the performance of the Leewood Ponds and has overseen various maintenance programs.

AGL, Camden

In June 2016, the EPA varied the AGL Environment Protection Licence to require the company to improve water storage facilities at the premises under the terms of an Environmental Improvement Program. As part of the program of works, the 5 megalitre clean produced water storage pond/flare pit at Rosalind Park Gas Plant was taken out of service and replaced by two above-ground double walled tanks. Leak detection and tank level sensors were also installed. This work was completed by 31 October 2016. The pond will remain in situ until the plant is fully decommissioned in 2023. AGL is required to continue to manage the pond to ensure no pollution of waters.