Regulating the Gorgon CO\textsubscript{2} Injection Project

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Abstract

The Gorgon Joint Venturers (GJV) are developing the Jansz-Io and Gorgon fields as part of the Greater Gorgon gas project. When fully developed, the project will have a capacity to export approximately 15.6 million tonnes per annum of liquefied natural gas (LNG) and provide Western Australia with 300 TJ per day of domestic gas. The gas in the Gorgon field has a high carbon dioxide (CO\textsubscript{2}) content (average 14 per cent). The CO\textsubscript{2} will be separated from the natural gas stream prior to the gas being processed through the facility.

The Gorgon Project’s gas processing facilities are located on Barrow Island and constructed within a 332 hectare ground disturbance limit, which represents 1.3 per cent of Barrow Island’s uncleared land. Over the next 40 years, the CO\textsubscript{2} Injection Project will inject the reservoir CO\textsubscript{2} into the Dupuy Formation at a depth of 2 km beneath Barrow Island at rates of about 2.7 – 3.2 million tonnes per annum. Approximately 80 – 120 million tonnes of reservoir CO\textsubscript{2} from the Gorgon field will be stored underground instead of being released into the atmosphere, reducing the overall greenhouse gas footprint of the Gorgon Project by around 40 per cent.


The Department of Mines, Industry Regulation and Safety (DMIRS) administers the Petroleum Pipelines Act 1969 and has a technical advisory role in the administration of the Barrow Island Act 2003. As a condition of the approval (the Section 13 Approval) granted to the project under the Barrow Island Act 2003, the GJV are required to comply with the approved Carbon Dioxide Disposal Management Plan (CDMP) for the carrying out injection operations and management of associated risks at Barrow Island.

In December 2016, the Gorgon Project began producing gas for the domestic market from the Jansz-Io gasfield. Production commenced from the Gorgon gasfield in February 2017. The Project produced its 50\textsuperscript{th} LNG cargo in March 2017. Chevron reached a milestone with start-up of the third LNG train on 28 March 2017. The Gorgon CO\textsubscript{2} separation plant is complete, with the compression facilities and pipelines for conveying of CO\textsubscript{2} to the injection wells mostly completed. The project is currently in the pre-commissioning stage. The consent of the Minister for Mines and Petroleum is required under the Petroleum Pipelines Act 1969 in order for injection of CO\textsubscript{2} to commence. The indicative timing for commencement of injection is no earlier than the fourth quarter of 2018.

The CO\textsubscript{2} Injection Project wells are covered by the Pipeline Licence PL93 issued under the Petroleum Pipelines Act 1969. Drilling and construction of the injection and pressure management wells have...
been completed. The drilling and construction of two reservoir surveillance wells have also been completed. Additional surveillance wells will be drilled if required (with locations dependent on the CO₂ plume movement). The baseline 3D seismic data has been acquired and the facilities for collection of passive microseismic, groundwater and soil gas monitoring data have been installed.

In the lead up to the final approval of the Gorgon CO₂ project in 2009 under *Barrow Island Act 2003*, the project underwent one of the most stringent scrutinies of its kind. DMIRS, on behalf of the Western Australian government, outsourced four phases of reviews for due diligence purposes. A fifth round of due diligence review to assess the degree of how previous recommendations were being addressed was completed by DNV Kema in 2013. Since then, DMIRS has been conducting all due-diligence studies of the Gorgon CO₂ injection project in-house. The last due-diligence of the project was conducted in 2015/16, which was peer reviewed by a team of experts from the Illinois State Geological Survey and Schlumberger.

There is a legislative requirement for the GJV to provide monitoring data enabling DMIRS to review the performance of the Gorgon CO₂ sequestration project over the long term whilst ensuring the GJV’s compliance with the approval conditions. DMIRS is ensuring appropriate data management systems are in place for storing the large-scale monitoring data to be supplied by the GJV and facilitating data sharing between the State and the Commonwealth Governments. DMIRS will undertake compliance activities and dissemination of data between government agencies particularly with the Western Australian Department of Jobs, Tourism, Science and Innovation (DJTSI) and the Commonwealth Department of Industry, Innovation and Science (DIIS).