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Stage 3 CSG water monitoring and management plan



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1.1 INTRODUCTION

Coal seam gas has been produced in Queensland for more than 10 years and accounts for about 80% of all gas consumed in the State. QGC is expanding its existing CSG operations through development of the Queensland Curtis LNG Project (the QCLNG Project).

The QCLNG Project is developing coal seam gas in the Surat Basin in southern Queensland to supply gas to export and domestic markets (refer Figure 1-1). QGC, a wholly-owned subsidiary of the BG Group, is drawing on its own extensive CSG expertise as well as the wider group's international Liquefied Natural Gas (LNG) experience to develop the world's first unconventional LNG facility.

The process of extracting coal seam gas from the Walloon Coal Measures (WCM) produces water which, when treated, can be beneficially used by local farmers, industry and communities.

Central to the project's success is ensuring that the integrity of the Great Artesian Basin (GAB), of which the Surat Basin is a part, is maintained. To this end, QGC has made a firm commitment to geological and hydrogeological data gathering, analysis, modelling and monitoring and the establishment of environmentally sustainable water management strategies around CSG operations.

This Stage 3 WMMP outlines QGC's approach and commitment to water monitoring and management for the QCLNG Project. It is based on existing and new scientific information and approaches.

The Stage 3 WMMP:

- Highlights those tasks completed and started since project approval (October 2010);
- Summarises key findings from data collected and interpreted to date; and
- Sets out a schedule of tasks, delivery mechanisms and target completion dates (i.e. a plan) for the Department to assess compliance against relevant approval conditions.

1.2 GOALS AND OBJECTIVES

QCLNG's success rests fundamentally on maintaining the long-term integrity of the GAB, ensuring minimal impact on the sustainability of local and regional ground and surface water resources and mitigating impacts on ecological systems considered to be MNES. To achieve these objectives, QGC's strategy is:

- Developing robust water management tools;
- Establishing an extensive monitoring network;
- Calculation of early warning signals and response actions;
- Quantifying and managing potential risks and developing response strategies; and
- Implementation of responsible CSG water management and beneficial use options.

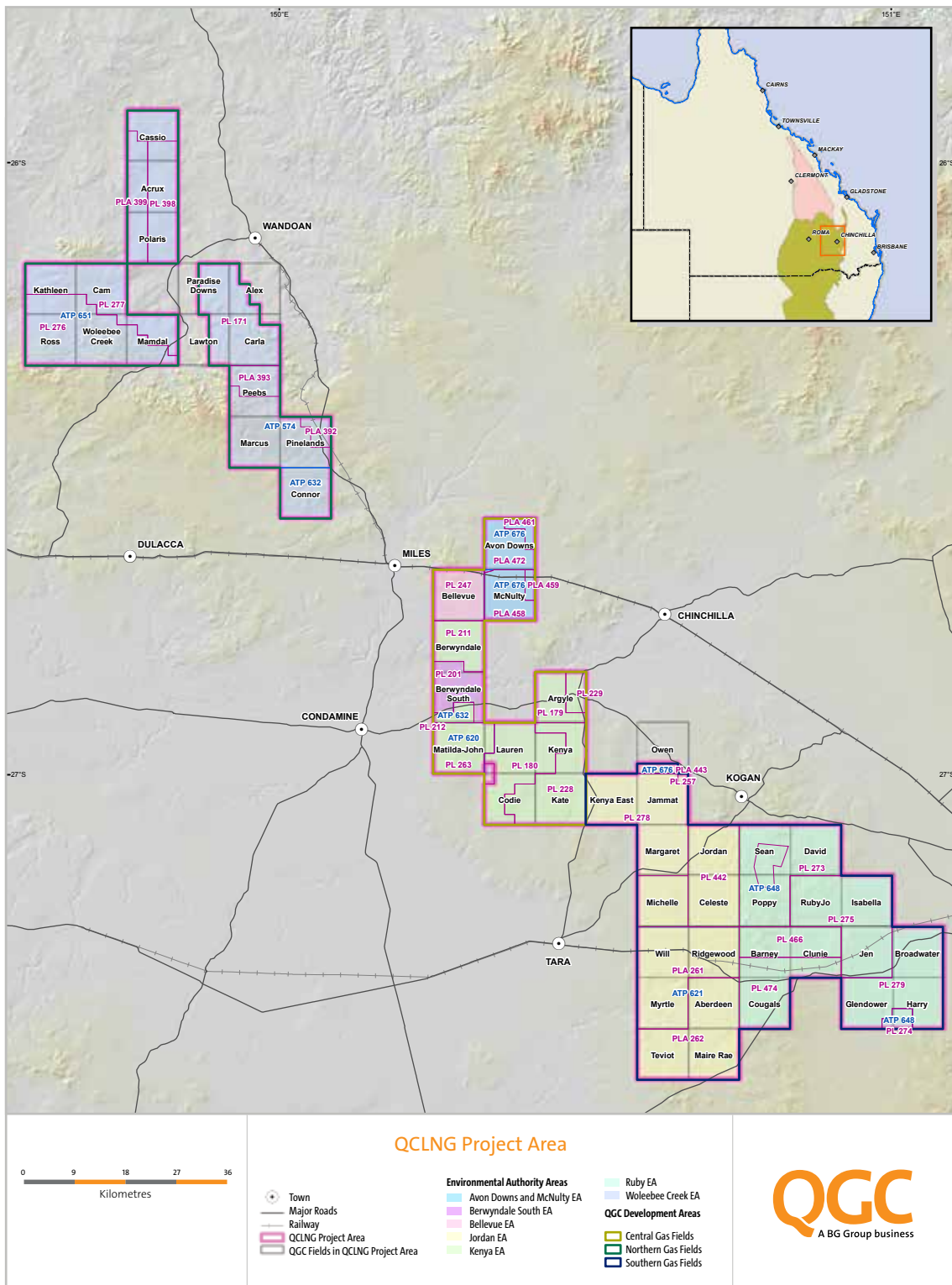


Figure 1-1 – The QCLNG gas field project area

Throughout this document, reference is made to results generated by QGC's GEN2 groundwater model. However, the Queensland Water Commission's (QWC) Underground Water Impact Report (UWIR) was formally released in December 2012 and included an updated groundwater model, which addresses cumulative impacts. Upon formal release of the UWIR and finalisation of associated legal arrangements regarding access to model results, QGC updated the predictions contained in the Stage 2 WMMP.

1.3 QCLNG SNAPSHOT

The QCLNG Gas Field Approval (EPBC 2008/4398) authorises the project area which includes the following petroleum tenures:

- Authority to Prospect (ATP): 574, 610, 621, 632 (portion of), 647, 648, 651, 676 and 768 (portion of);
- Petroleum Lease (PL): 179, 201, 228, 229, 171, 180, 211, 247; and
- Petroleum Lease Application (PLA): 212, 257, 259, 261, 262, 263, 273, 274, 275, 276, 277, 278, 279.

The QCLNG gas fields project area is shown at Figure 1-1.

The gas fields component of the project covers 468,000 ha within the Walloon Fairway of the Surat Basin. Project activity is located on land between the towns of Taroom, Wandoan, Condamine, Tara, Chinchilla and Dalby.

The application, granting and conversion of petroleum lease applications is an ongoing process with the Queensland Department of Natural Resources and Mines (DNRM).

The list below represents all changes that have occurred with QGC tenures within the overall approved QCLNG Gas Field Approval (EPBC 2008/4398) to 17 September 2012 and includes:

- ATPs converted to PLs and thereby no longer exist: ATP 610 (covered by PL 247), ATP 651 (covered by PLs 276 and 277);
- PLAs granted to PL: 212, 257, 263, 273, 274, 275, 276, 277, 278, 279, 398, 442, 466, 474;
- PLAs withdrawn: 259 (covered by grant of PL 273);
- PLAs applied for over ATP areas held by QGC (PLA): 392 and 393 (portion of ATP 574), 398 and 399 (portion of ATP 768), 443, 458, 459, 461 and 472 (portion of ATP 676) 442, 466 and 474 (portion of ATP 648);
- Petroleum Facility Licence Applications (PFL): PFL 19, PFL 22; and
- Petroleum Facility Licence Grants (PFL): PFL 19, PFL 22.

The approval conditions allow for the development of up to a maximum of 6,000 production wells and gas field development over a 50-year period to 31 October 2060. It should be noted that approximately 5,000 wells will be in production at any one time, with new wells progressively brought on-line to replace maturing wells, which will be decommissioned.

Works carried out will comprise:

- Up to 6,000 gas production wells with around 2,000 wells scheduled by mid-2014. The balance of wells will be phased in to replace declining wells over the life of the project;
- Installation of wells and associated well pad surface equipment including wellhead separators, wellhead pumps, wellhead flares, telemetry devices and metering stations;
- Installation of gas gathering systems (High Density Polyethylene (HDPE) and steel pipes);
- Completion of field compressor stations and central processing plants, including dehydration facilities, substations and power lines;
- Development of access tracks, borrow pits, warehouses, construction and operations camps, offices and telecommunications;
- Construction of water gathering lines, trunklines, ponds, treatment facilities and brine storage ponds;
- Preparation of the necessary infrastructure for the beneficial use of treated CSG water;
- Installation of above-ground 132 kv power lines to connect the new central processing plants to third party substations. Also, installation of underground and above-ground 33 kv power lines connecting central processing plant substations to field compressor stations and Water Treatment Plant substations; and
- Development of accommodation camps for construction and operations people, along with warehouses, lay down areas, communication towers and fibre optic cabling.

QGC will develop the acreage outlined in Figure 1.1 with 24 blocks contributing to QCLNG production in 2014. Therefore, QGC has developed an holistic water monitoring and management plan for the entire project life to responsibly monitor and manage CSG water for the whole acreage. For all key activities a base plan has been selected and each base plan is described in the Stage 3 WMMP. If alternative strategies with better outcomes are proven over time, QGC will apply for revision of the plan.

This Stage 3 WMMP will be reviewed at the earlier of:

- The release of an update to the 2012 Surat Basin Underground Water Impact Report (UWIR); and
- The exceedance of a trigger monitoring value due to CSG operations.

QGC will provide a fully-updated Stage 3 WMMP by July 2016 which will incorporate the data and findings of two operational years and the updated UWIR (QWC 2012) (expected by December 2015). In line with Condition 49(i), annual reports will be provided to the Department in October of each year.

1.4 ADDRESSING REGULATORY REQUIREMENTS

QGC submitted its Stage 1 WMMP (QGC 2011) on 21 April 2011 and updated in October 2011 and the Stage 2 CSG Water Monitoring and Management Plan on 23 April 2012, which was approved on 22 December 2012. The Stage 2 WMMP comprised both the hydrogeological findings to date and provided an extensive study and research programs captured as firm commitments. This Stage 3 WMMP provides a comprehensive overview of the findings and results of QGC's studies in fulfillment of these commitments with a focus on Condition 53B. The Stage 2 WMMP approval and Stage 3 WMMP variation are presented in Appendix A.



QGC is using proven Reverse Osmosis technology to treat produced CSG water for use by irrigators, industry and municipalities.

NG POINT