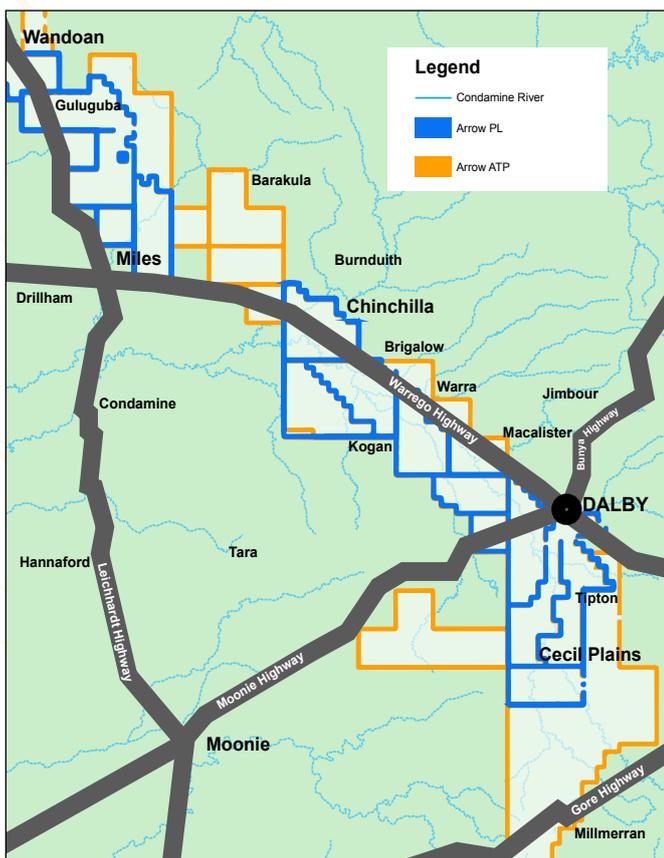


# Ecology and groundwater surveys

July 2016

**Arrow Energy prepared an Environmental Impact Statement (EIS) for the Surat Gas Project development area, which received Queensland and Federal Government approvals on 25 October 2013 and 20 December 2013 respectively.**

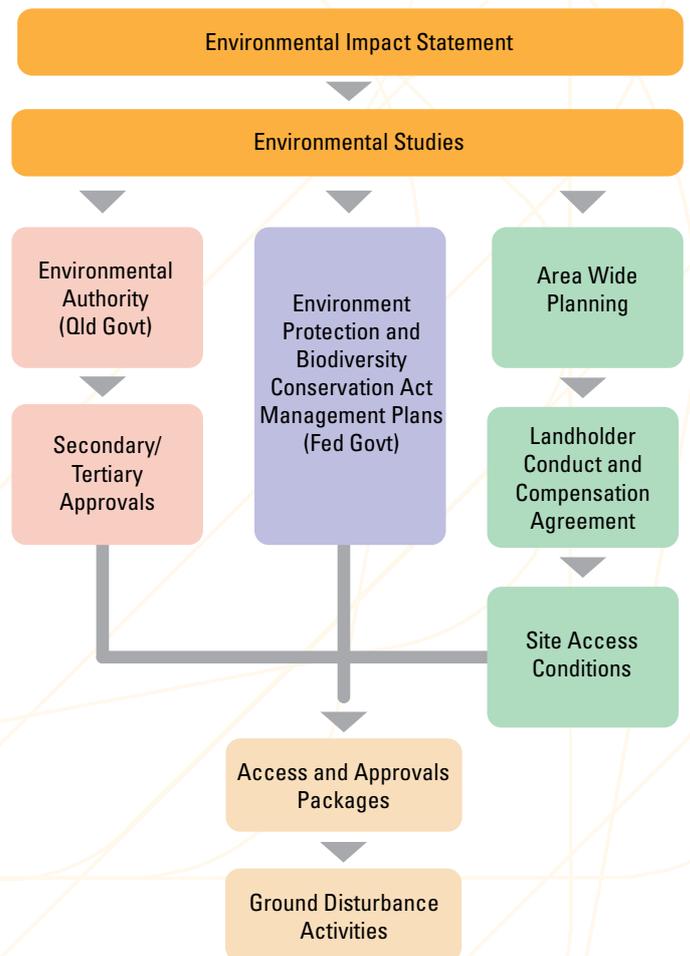
The development area assessed in the EIS extends in an arc from Wandoan in the north, through to Dalby in the east, to near Goondiwindi in the south.



While the EIS is the primary approval for the project, Arrow is progressing planning for secondary approvals, specifically:

- Environmental Authority - provided by the Queensland Government and
- management plans - required by the Federal Government under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The key activities required to progress these approvals for the Surat Gas Project are ecology and groundwater surveys. These activities will be run in tandem to minimise access to landholder properties.



## Environmental studies

These studies include ecology surveys and surveys for Groundwater Dependent Ecosystems (GDE).

### Ecology surveys

Survey activities will include searches for threatened animals and plants, verification of vegetation community mapping, small animal trapping and release, and night-time spotlighting for nocturnal animals.

Ecology surveys are required to comply with conditions imposed through the approval of the EIS, and to progress State-required Environmental Approvals. They will also support Arrow's ongoing project planning by identifying potential ecological constraints so that field development can avoid and/or minimise disturbance to ecologically significant areas.

Under the Queensland Government's *Environmental Offsets Act 2014*, an environmental offset may be required as a condition of approval if, following consideration of avoidance and mitigation measures, the activity is likely to result in a significant residual impact on certain fauna and flora species or habitats.

The surveys will be used to inform an EPBC Act *Species Impact Management Plan* and *Offsets Management Plan*. Data collected from the ecology surveys will improve Arrow's knowledge of fauna and flora species and habitats within our core Surat tenure.

### Ecology survey logistics

Arrow's ecology surveys will be conducted by small teams of independent specialists during September and October 2016 and again in February and March 2017, to enable the collection of dry and wet season data.

The surveys will target areas that have been identified through the EIS studies as:

- containing threatened ecological communities and/or core habitat for threatened species
- where limited ecological information is available and
- areas that may be appropriate to fulfil Arrow's environmental commitments.

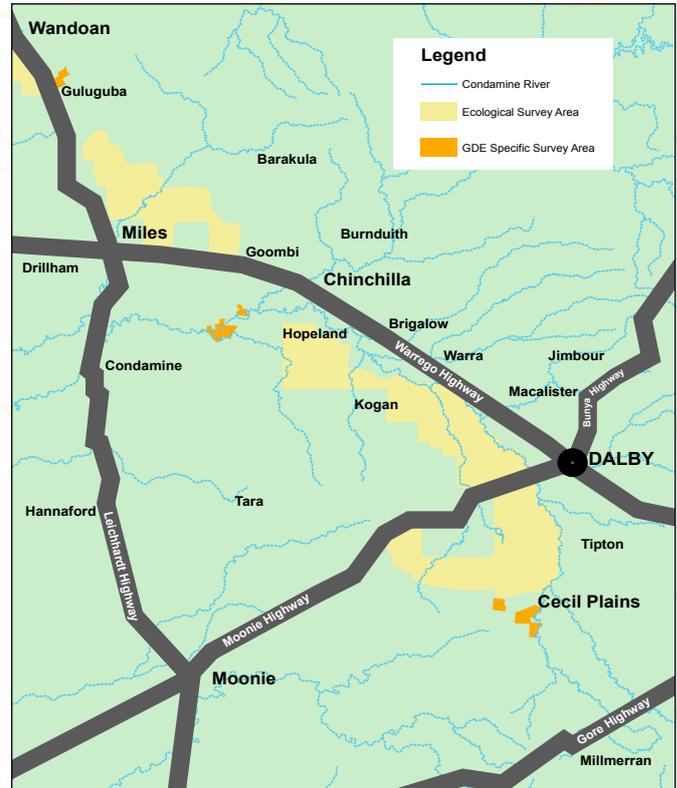
Depending on the survey requirements, small teams of ecologists and Cultural Heritage monitors will be in any given area from a few hours up to five days.

### Groundwater Dependent Ecosystems surveys

Arrow's Federal Government EIS approval included conditions under the EPBC Act which require Arrow to prepare Water Monitoring and Management Plans (WMMP).

As part of a WMMP, Arrow must evaluate the potential for impacts within Arrow's core Surat tenure. The GDE surveys will

assess ecosystems reliant on the sub-surface presence of water, and identify if they are likely to be impacted by the project. They will also assess the hydraulic connectivity between surface water and groundwater in two locations within Arrow's Surat tenure, Long Swamp and Lake Broadwater (located on PL260).



Through the collection of data, Arrow will determine early warning indicators and triggers to ensure early detection of any potential impacts (during future development) to groundwater dependent ecosystems.

### Groundwater survey logistics

Groundwater surveys will be conducted by small teams of independent specialists during September and October 2016, in conjunction with the ecological surveys.

Survey activities will include a hydrogeological assessment, which may include activities such as identification of flora, composition of GDE and ecological assessment.

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