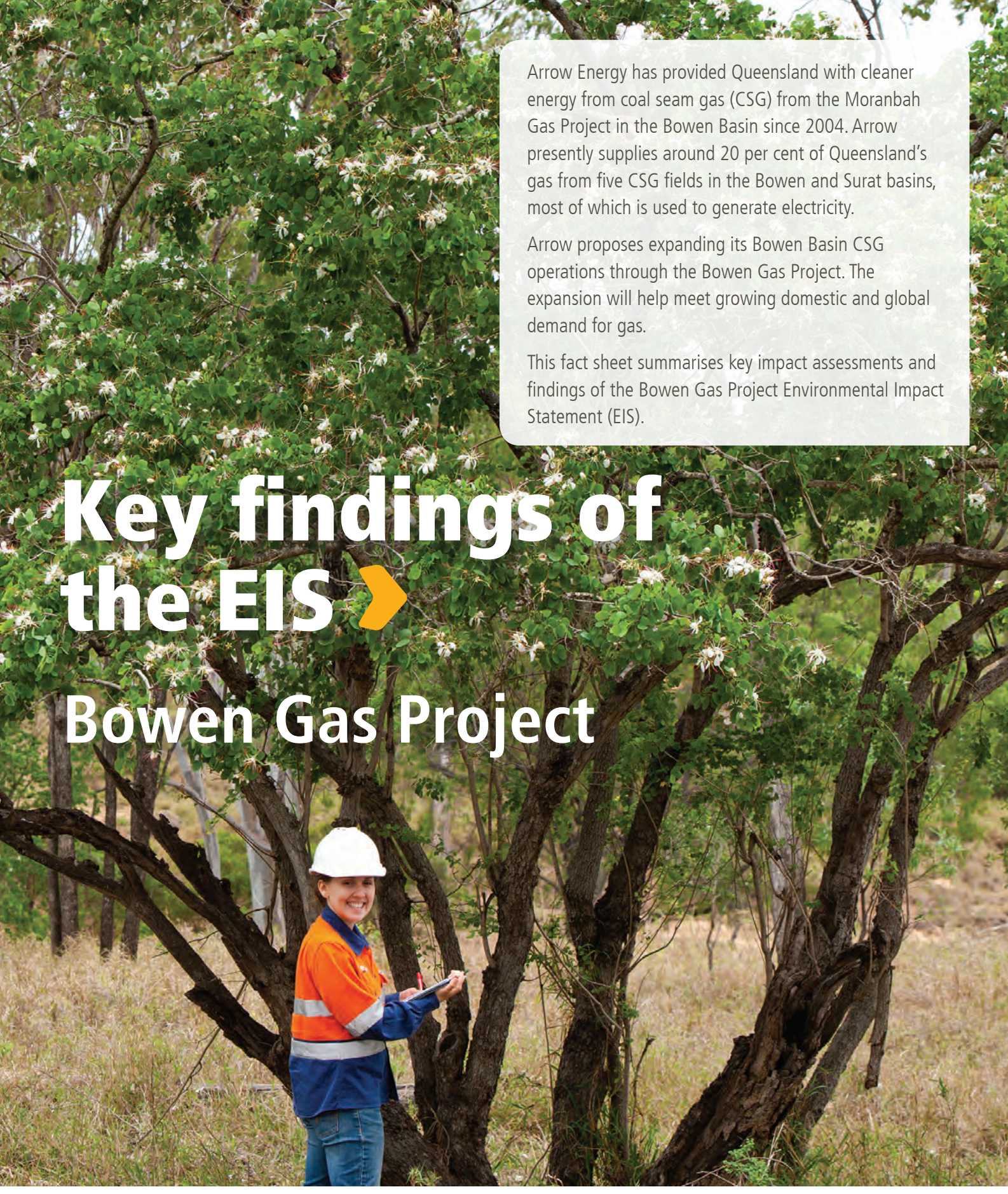

Arrow Energy has provided Queensland with cleaner energy from coal seam gas (CSG) from the Moranbah Gas Project in the Bowen Basin since 2004. Arrow presently supplies around 20 per cent of Queensland's gas from five CSG fields in the Bowen and Surat basins, most of which is used to generate electricity.

Arrow proposes expanding its Bowen Basin CSG operations through the Bowen Gas Project. The expansion will help meet growing domestic and global demand for gas.

This fact sheet summarises key impact assessments and findings of the Bowen Gas Project Environmental Impact Statement (EIS).

Key findings of the EIS

Bowen Gas Project

arrow energy
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March 2013

Introduction ›

The Bowen Gas Project EIS identified and assessed potential environmental and social impacts from the project's construction, operation, maintenance and eventual decommissioning. Based on this assessment, Arrow committed to reducing those impacts through avoidance, mitigation and management.

Impacts that remain following mitigation and management are called residual impacts. In some areas, residual impacts will be accurately qualified only after infrastructure and facility locations are known, after the EIS process. In these cases, they will be quantified as the project develops over time. Potential impacts in such areas have been assessed and their management measures are identified in the EIS and are broadly discussed below.

Groundwater

Extracting CSG involves depressurising target coal seams; in this case, in the Blackwater Group coal measures. There are limited groundwater resources associated with these coal seams and the interbedded Bowen Basin sediments.

Depressurisation has potential to reduce some groundwater supply to users across the project area. Arrow's CSG water management strategy, adaptive management framework and a hierarchy of mitigation measures will be implemented to manage potential impacts.

The management and mitigation process will allow for control systems or design responses such as optimum well field development and correct associated water production and infrastructure. This will ensure any potential negative impacts either:

- do not arise
- are minor
- or, where unavoidable, are reversible over time and can be offset by make-good provisions in the interim.

Arrow will also minimise impacts to groundwater quantity and quality by:

- investigations that reduce the uncertainty of depressurisation impacts and show whether landholder bore assessments and potential make good agreements are needed
- installing wells, surface storage and subsurface infrastructure to industry standards
- routinely inspecting and monitoring integrity and compliance throughout the project's life
- designing and constructing new regulated dams (raw water, treated water or brine) under qualified supervision and to Department of Environment and Heritage Protection conditions for design, construction, inspection and mandatory reporting.

Arrow recognises there are uncertainties about potential impacts to groundwater and commits to further studies to improve understanding and predictability. Ongoing work includes:

- a strategy for a regional groundwater monitoring network, to monitor groundwater levels and quality in key aquifer formations
- using groundwater monitoring data to validate and update the numerical groundwater model. The model will be recalibrated to reduce uncertainty in predictions and provide information for improving monitoring, management and mitigation.

Land use and agriculture

The predominant land uses within the project area are agricultural. Pastoral areas (cattle grazing) cover 90.2 per cent of the project area (approximately 722,306ha) and horticulture (irrigated and dry land cropping) 2.7 per cent (approximately 22,347ha).

Other important land uses include:

- the urban community of Blackwater
- residences and homesteads throughout rural areas
- twenty-two operational coal mines and a larger number of mining, petroleum and exploratory leases and permits
- areas of conservation, tourism and recreational land use, including Homevale National Park and Conservation Park as well as native refuges and state forest.

Areas for sustaining current and future agricultural land uses in the project area have been designated under state planning policies and legislation as either good quality agricultural land (GQAL) or strategic cropping land (SCL).

The potential impacts of unmitigated project activities include reduced land use productivity (reduced crop yields and greater losses), disturbing farm animals, degraded soil structure and fertility, and increased management overheads.

Planning and design has been identified as the most effective way of mitigating the impacts of CSG infrastructure and activities on agricultural enterprises and production. The location and layout of production wells and their gathering systems will be designed with landowners to minimise impacts to their properties. Activities will be integrated with farm plans and will consider cropping cycles, withholding periods, crop rotations and farm development.

Arrow's key environmental protection objectives for agriculture are to avoid or reduce adverse impacts to agricultural infrastructure, agricultural production (cropping and breeding) and farming practices (day-to-day agricultural activities), and to maintain and/or restore soil to support the intended land use.

These objectives will be achieved through:

- infrastructure placement that reduces potential impacts on agricultural land and agricultural enterprises
- construction and operation methods that integrate project activities with farm activities
- proven environmental management methods and techniques
- progressively rehabilitating disturbed areas and protecting it against weeds after construction.

The type of CSG infrastructure (production wells, gathering systems, pipelines, production facilities) will determine the correct rehabilitation techniques, effort and investment.

Co-development with mining

Arrow has a demonstrated capacity to work with mining companies to maximise the value of gas and coal. Arrow's experience with open cut mining means that it can place surface and sub-surface infrastructure to avoid impacts on other mining activities.

The same is true of underground mining. Deep surface to inseam degassing of coal can deliver large benefits to mining like improved health and safety and reduced costs. The coal and gas sectors have strategies to work together to ensure commercial certainty and viable co-development.

Roads and transport

A significant assessment approach has been adopted for the project, which includes a strategic evaluation of the road impacts.

Within the project area, a low impact is anticipated on the Suttor Developmental Road between Elphinstone and Red Hill Road. This is predominately due to the number of project vehicles predicted to travel along this road in 2045 (peak project traffic generating year) compared to the relatively low existing and future 2045 background traffic volumes. There was a negligible magnitude and significance of impact on all other assessed roads.

Predicted project traffic volumes will not significantly increase existing traffic levels. Provided there are specific measures for localised heavy construction traffic, the impacts are not considered likely to unduly affect efficiency, safety or amenity.

The safety of the community and Arrow's workforce is paramount. Potential impacts on road safety and road network efficiency will be minimised through:

- works to manage the increased traffic volumes and project road safety issues, to be included in road use management plans that will be prepared and regularly reviewed with councils and the Department of Transport and Main Roads
- road upgrades where project activities and traffic could potentially impact road safety
- journey management plans for high-risk roads
- limiting project traffic on school bus routes during school day pick-up and drop-off times, and installing school bus infrastructure like signage and pullover areas, where necessary
- Arrow's 12 Life Saving Rules, which embed safe practices in the workforce's day-to-day activities
- in-vehicle systems that continually monitor Arrow's compliance with the project's road safety requirements.

Social

The study area for the project assessment primarily comprises Moranbah and Dysart, with regional consideration of Glenden, Nebo, Middlemount and Blackwater.

Arrow's understanding of the social impact issues in the Bowen Basin is based on the attitudes and opinions of community members, expressed in ongoing community engagement. Engagement activities included project briefings, focus groups, interviews, telephone surveys, community meetings, discussions with government agencies and councils, and feedback in various forms. During successive stages of consultation, stakeholders were asked to contribute their knowledge and preferences on the management of potential impacts.

Project-related social impacts will be managed through Arrow's social impact management plan (SIMP). The SIMP details Arrow's commitments to address identified issues and impacts through incorporated action plans. The SIMP will be updated when the EIS is complete to incorporate further information, particularly the outcomes of programs and initiatives implemented by Arrow.

Identified potential social impacts relate to the affordability and availability of housing and accommodation, increased demand for health services and medical facilities, uncertainty for landowners and community members, heightened road safety risk from increased traffic, and the impact of higher wages on local business viability.

While the anticipated social impact is not large, a relatively rapid establishment of a new economic driver and the cumulative effect of simultaneous projects could exacerbate impacts, at least in the short term.

Not all impacts are negative. The project will deliver positive social benefits like direct and indirect employment, enhanced training and skill development prospects, additional local business opportunities and an injection of wealth and vitality into communities.

Industry diversification may also improve the economic and social resilience of both communities and agricultural enterprises, particularly as agricultural enterprises are exposed to seasonal variations and international trading conditions.

To ensure opportunities are realised and potential adverse impacts are minimised, Arrow will:

- invest in community programs
- engage other proponents, government and community on solutions to regional issues and improve community wellbeing
- minimise additional demands on existing services and social infrastructure
- make an ongoing commitment to the Brighter Futures program which includes community funding, sponsorship, partnership and social mitigation funding
- support community values and lifestyles to make a positive contribution to community wellbeing and liveability.

Arrow will continue to actively engage the community during the project's subsequent phases.

Terrestrial ecology

EIS field surveys have supplemented previous mapping surveys, published studies and conservation databases to determine which ecological values are sensitive to project impacts.

The general condition of the project area's habitat ranges from poor to well preserved, largely depending on landscape position and geology. Habitats on elevated sandstone escarpments, largely inaccessible to grazing activities, are typically well preserved. Habitats on alluvial and clay plains are generally heavily impacted by prior land use and their preservation tends to be poor.

Identified, threatened ecological communities include brigalow woodland, semi-evergreen vine thickets and natural grasslands. Brigalow (woodland or individual trees) is widely distributed throughout the project area, whereas semi-evergreen vine thickets exist only as degraded isolated remnants, predominantly in the north. The natural grasslands community is distributed across the project area, commonly occurring between Glenden and Moranbah.

A number of state and federally protected flora and fauna species were identified. Known, endangered flora species in the project area include king bluegrass, black ironbox and finger panic grass. Some other threatened flora species are considered to have a high likelihood of presence within the project area. Known endangered fauna species in the project area include reptiles like the ornamental snake and brigalow scaly-foot. Notable mammal species include the koala and little pied bat. EIS-developed information was used to prepare constraints maps for avoiding the above values, and establish buffers and management requirements for project facilities.

Arrow will actively protect terrestrial ecological values through:

- pre-construction/pre-clearance surveys to identify values that require on site management or avoidance
- avoidance of Category A environmentally sensitive areas
- minimising impacts to Category B and C environmentally sensitive areas with management buffers
- demarcating sensitive areas and educating workers onsite access protocols and requirements
- implementing a weed control and pest management plan
- implementing a biodiversity offsets program for any impacted values, that meets state and federal legislative requirements.

For more information

People with special communication needs or requiring further information about the Bowen Gas Project EIS may contact Arrow Energy:

Telephone: 1800 038 856 (freecall)

Email: bowengas@arrowenergy.com.au

Visit: www.arrowenergy.com.au

EIS documentation is available via a download or as an online book on Arrow's website. It may also be ordered as a hard copy (extra cost) or on DVD by phone or email.

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