

Rehabilitation

The proposed coal-to-liquids project, ambreCTL, is located on a 2,000ha site on the Felton North Coal deposit near Pittsworth on Queensland's Darling Downs.

The project comprises a high-tech coal gasification facility for the production of liquid transportation fuels and an adjoining open-cut coal mine which will provide the feed coal for the facility.

Ambre Energy is conducting extensive studies into the environmental, social and economic impacts of ambreCTL in order to meet Queensland and Commonwealth government legislative and regulative requirements. The project cannot proceed until a complex range of approvals are in place.

More than \$10 million has been invested in project development to date, including more than \$1 million in surrounding towns such as Pittsworth and Toowoomba, which will continue as environmental studies progress.

Ambre Energy will ensure that ambreCTL is designed and operated in the most efficient way possible and that its impacts are minimised wherever possible.

Recent demand for Queensland's mineral and gas resources has helped sustain regional economic development, particularly through times of drought. However the agricultural sector has been the backbone of the state's development since its inception and continues to be a source of food, employment and prosperity.

While only 2.2 per cent of Queensland is currently utilised for crops, less than 0.1 per cent of the state is utilised by mining operations.

Ambre Energy maintains that mining and agriculture, two pivotal industries, can co-exist and continue to make an important contribution to the state.

Strategic cropping land policy

Rehabilitation of the land within the site, roughly defined by Hodgson Creek to the east and the Pittsworth-Felton Road to the north west, is receiving heightened community interest due to the Queensland Government's pending *Strategic cropping land policy* and legislation, which aim to conserve and protect the state's best cropping land.

At this stage, the criteria for determining 'strategic cropping land' and guidelines for development assessment are still to be finalised.



The proposed ambreCTL site

Based on high-level government trigger maps of potentially impacted areas and Ambre Energy's own assessments, there may be parcels of land within the project site specifically impacted by the policy. Under current project plans, not all of this land would be directly affected.

Until the criteria are available, Ambre Energy is unable to provide a definitive statement on the policy's likely impacts.

The site

Mining activities will commence on the western side of Hodgson Creek and head progressively west, following the coal seam. Not all of the 2,000ha site will be mined. Only 300 to 400ha will be mined at any one time, with a total life-of-mine footprint of 1200ha.

A conventional open-cut mining method will be followed, in which the area to be disturbed will be cleared of all vegetation and the topsoil removed and stockpiled for use in rehabilitation. The pit will be dug and operated, and then filled behind as the pit progresses west.

Areas used for mining and associated infrastructure will be progressively rehabilitated as the operation advances. This is the most effective and cost-beneficial way to contain and minimise disturbance to the site and enable rehabilitation to commence as early as possible.

Predominant land use patterns of the area are cash and forage cropping in addition to grazing of natural and improved pastures. Approximately 60% of the area has been cleared of original vegetation for agricultural production and significant areas of remnant Mountain Coolibah remain in upland areas.

Ambre Energy has recently undertaken a soil survey and land suitability assessment for the site. Samples were taken at 255 sites from both hand auger borings and backhoe excavations. A detailed soil analysis was conducted to isolate any chemical problems in the use of deeper subsoils for future mine rehabilitation.

The soil survey has identified eight classes of soil. While these are generally suited to intensive agricultural production, this activity is limited in most areas of the site due to a number of factors including slope gradient (susceptibility to erosion and stability), variable soil depth (soil moisture availability), nutrient availability and the presence of soluble salts within the soil profile.

The site has extensive reserves of high quality topsoil and effective management programs will be implemented to ensure that this resource is fully utilised. The soil report recommends the separate stripping and management of 'topsoil' (i.e. 0 to 30cm depth) and 'subsoil' material to maximise post-mining land suitability potential.

Given the significant quantities of high quality topsoil available for rehabilitation, it is expected that post-mine cropping land suitability will be improved by returning lands with more reduced slope gradients than currently exist in the upland soils.

International experiences

Ambre Energy is investigating methods to avoid permanent alienation by fully reinstating the land to its previous productive capacity, as has been done in some parts of Australia and in other countries, including Germany and the US.

It is working with Australian and US soil scientists and rehabilitation experts to identify successful experiences and learnings.

Australia has limited agricultural resources where both climate and soils are suitable for crop production. Ambre Energy is acutely aware of its social and environmental responsibility to avoid permanent alienation of these limited resources.

As a demonstration of this awareness, Ambre Energy has investigated the rehabilitation of prime farmland first-hand in US Midwest states of Illinois, Indiana and Kentucky.

In the 1970s, the US faced a similar debate on the effective rehabilitation of mined land. Today, US federal and state legislation have proved successful in allowing both mining and agriculture to co-exist without permanent alienation of the land.



Rehabilitated mined land in southern Illinois

This required the US coal industry to thoroughly define soil physical and chemical properties, determine the best mining equipment to selectively load and replace the soil horizons on reclaimed areas, and apply good agronomic management to bring the soils into their full crop potential.

A series of detailed articles detailing these experiences and outcomes is available from www.ambreenergy.com

The US Midwest experiences cannot be automatically transposed to Queensland. However, the challenges unique to Kentucky, Illinois and Indiana were overcome through painstaking work around soil characterisation, appropriate soil handling and storage, considering rainfall patterns, rehabilitation scheduling, and continued nurturing of cropping land back to productive capacity.

The lessons learned in the US are valuable and can be applied to addressing the challenges that Australia faces in mining cropland soils.

Soils in the ambreCTL site have different physical parameters (texture, bulk density, structure and compaction) and chemical composition.

In comparison with the US Midwest, the Felton soils are about a third as thick, have clay contents generally higher than 40% with a dominance of expanding clay, have free carbonates and are much older in their development (and therefore less fertile). Felton soils also receive around 60% less annual rainfall.

Effective rehabilitation will not be achieved through simply placing the topsoil back on the mined area. Ambre Energy is continuing to invest in research to ensure rehabilitation technologies and methods are refined and precise throughout the project for the process to be successful.

Developing appropriate strategies prior to construction and mining will ensure that land acquired by ambreCTL is managed correctly and that the return of appropriate land suitability classes is an integral part of rehabilitation and decommissioning activities.

How to get involved

Ambre Energy welcomes stakeholder input throughout the EIS and beyond.

If you would like to receive project updates, raise questions and issues, contribute to EIS studies, register to attend community information sessions, or request a briefing for your stakeholder group, please note the following contacts:

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