# Vegetation and Biodiversity Offset Strategy

## Queensland Curtis LNG

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## GLOSSARY

**Bioregion** – Regions based on broad landscape patterns that reflect the major structural geologies, climate and major changes in flora and fauna attributes.

**Biodiversity** – The existence and interaction of a wide variety of plant and animal species in their natural environments.

**Covenant** – A legally binding contract and agreement secured on an area of vegetation to protect it until returned to remnant vegetation status which is then protected under State legislation.

**DERM** – Queensland Department of Environment & Resource Management.

**DEWHA** – Commonwealth Department of Environment Water Heritage and the Arts.

**DIP** – Queensland Department of Infrastructure and Planning.

**DPI&F** – Queensland Department of Primary Industry and Fisheries.

**Ecological function** – How organisms interact with each other and in each physical environment and function as a holistic living ecosystem.

**Ecologically dominant layer** – Relating to the vegetative layer in a vegetation community with the highest biomass and the higher ecological role that layer plays. In most communities, the species that form the most significant canopy layer (higher species, structure and diversity) is the ecologically dominant layer.

**Edge effects** – The impact of external influences (wind, grazing, weeds, spray drift, predation, insects, noise, pollution, etc.) on a vegetation community. The narrower a patch of vegetation, the higher the potential for edge effects to extend throughout a remnant.

**Endangered Regional Ecosystem (ERE)** – <10% of pre-European extent remains in an intact condition across the bioregion.

**EPBC Act** – *Environment Protection and Biodiversity Conservation Act 1999 (Cth)*.

**Essential Habitat** – Habitat mapped by DERM and considered vital for the ongoing survival of a species.

**EVR** – Flora and fauna which are listed as Threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* or as Endangered, Vulnerable, Rare or Near Threatened under the Queensland *Nature Conservation Act* 1992.

**Floristic diversity** – The variety and diversity of flora species within an ecosystem or vegetation community.

**Impact** – the impression or result of an action. In the context of this document, impact refers to environmental damage, loss of habitat, reduction in habitat values, loss of plants and animals, loss or reduction in environmental values or an action that is detrimental to the short and / or long term ecology of an area or region.

**Landholder compensation** – Land value and income potential is usually reduced or eliminated where a landholder offers land as an offset. In this situation, the landholder will require compensation for the loss of value, loss of productivity and potential income.

**Landscape connectivity** – Interconnecting remnant vegetation remnants across a landscape is referred to as landscape connectivity. Landscape connectivity has a high bearing on how a landscape functions as an ecologically sustainable system and overall biodiversity.

**Landscape fragmentation** – a condition where the remaining remnant vegetation across a region is fragmented into many smaller, non-connected remnants. Increased landscape fragmentation degrades ecological function of a region.

**Loss of production** – When an offset is offered on any land, there will be a corresponding loss of production (ability to graze, fatten stock, breeding, etc.) due to changed management regimes and restrictions imposed by the offset.

**Monitoring and reporting** – All offsets will require the implementation of Monitoring and Reporting program to determine the effectiveness of the offsets ability to regenerate. Also used define if the proposed management is successful or will require alterations.

**Moratorium on regrowth** – Early in 2009, the State Government introduced a moratorium on clearing or control of all mapped regrowth of Endangered vegetation on freehold properties. This was defined on the Regional Ecosystem mapping as dark blue shading. This effectively reduced the potential for offsets quite significantly, as any vegetation offered as an offset could not be protected under the VMA 1999. The moratorium effectively protected all mapped regrowth and removed its potential as an offset.

**Multipliers/Multiplier ratios** – Area multipliers are applied to many offsets to help maintain or enhance the current extent of significant remnant vegetation cover or critical habitat. Area multipliers can range from 1:1.5 – 1:5 depending on a range of variables relating to Environmental Outcomes, sought ecological values, location, offset type and characteristic.

**NC Act** – *Nature Conservation Act 1992 (Qld)*

**Not of Concern (NoC)** – >30% of pre-European extent remains in an intact condition in that bioregion.

**Non Remnant** – Vegetation shown on a regional ecosystem map as “white” or vegetation that is at any stage of regrowth, but which has not reached remnant status by having 50% of original canopy cover and or 70% of original canopy height.

**Of Concern (OC)** – 10-30% of pre-European extent remains in an intact condition in that bioregion.

**Offset management** – In order to assist an offset attain remnant status and provide the best possible conditions for the regrowth to return to remnant status, management is often recommended for duration of 5-20 years. The management duration will depend on climatic conditions, how advanced the regrowth is, type of vegetation, topography, soil types, etc.

**PMAV** – Property Map of Assessable Vegetation. A property that has a secured PMAV has security in the knowledge that the regrowth can never be remapped as remnant, irrespective of how advanced that regrowth becomes. A property that has been issued a PMAV also avoids the moratorium mapping.

**Potential offsets** – Offsets that have the potential to be offered as an offset. While these potential offsets may contain all the attributes of an offset (structure, diversity, composition etc), there is never complete certainty that agencies will approve them as an offset, hence the term "potential".

**Property Management Plan (PMP)** – all offsets and / or properties offered as an offset must have a property management plan that defines natural attributes, landscape function and connectivity and provide a plan for natural resource management.

**Regional Ecosystem (RE)** – is a vegetation community in a bioregion that is consistently associated with a particular combination of geology, landform and soil. Often expressed as a series of 3 or more numerals (i.e. RE 11.3.4)

**Remnant vegetation** – Native vegetation that achieves more than 50% of the undisturbed predominant canopy, 70% of the vegetations undisturbed height, composed of species characteristic of the vegetation undisturbed predominant canopy and marked as remnant on a RE map.

**Resource attributes** – Means the physical abiotic and biotic attributes of any naturally occurring resource that improves the ecological integrity of an ecosystem.

**Riparian zone** – The area of land contained between the high banks of a stream or watercourse.

**SF** – State Forest

**Stock carry capacity** – Refers to the number of hectares required to sustainably support (carry) a single animal unit.

**Stock exclusion** – The total and permanent exclusion of livestock from a site.

**Stock management** – The partial exclusion of stock within a site, often controlled by the addition of fencing.

**Sub-region** – An area that is contained within a bioregion that is associated with finer detail of climatic patterns, ecological processes and natural values.

**Trust Fund** – a DERM approved fund established to deposit offset management funds for distribution to on-ground management and monitoring teams. Provides an effective means of protecting the client and the offset provider from the effects of a catastrophic event that might destroy the offset.

**Unimproved rate** – refers to land value where no buildings, infrastructure or improved pasture practices have been implemented to raise the value of the land above its naturally occurring condition and associated value.

**Vegetation structure** – refers to the relationships between layers in a vegetation community (i.e. leaf litter, ground cover, understory, mid story, upper mid story and canopy)

**VM Act** – *Vegetation Management Act 1999 (Qld)*

**Yearling** – refers to cattle of one to two years of age.

## EXECUTIVE SUMMARY

The Environmental Impact Statement (EIS) for the Queensland Curtis LNG Project (QCLNG) was submitted in August 2009. The EIS confirmed that QCLNG requires vegetation and biodiversity offsets to compensate for unavoidable impacts associated with the construction and operation of the Project infrastructure.

General requirements for project proponents to compensate for clearing of vegetation are indicated within State and Commonwealth policies.

Environmental design and planning has been incorporated into the QCLNG Project in an effort to avoid and minimise adverse impacts on the environment wherever possible. None-the-less, the assessment undertaken for the QCLNG EIS and the Supplementary EIS information predicted that unavoidable impacts could potentially occur to Ecological Communities listed as Threatened under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (*EPBC Act*), Regional Ecosystems (REs) listed as Endangered and Of Concern, Essential Habitats, a number of EVR flora and fauna species, as well as terrestrial and marine environments.

It is estimated that the Project could require offsets for clearing of in the vicinity of 917 ha of significant vegetation.

The purpose of this document is to provide the Government and the community with adequate confidence that the proposed offset methodology will deliver the appropriate offsets. The proposed methodology is based on the existing Government offset policies and will facilitate delivery of appropriate offsets to adequately compensate for the predicted unavoidable impacts. The submission also identifies the objectives for the Project's offsets and the proposed principles for achieving those objectives.

Preliminary assessments and past experience with local landholders indicates that suitable terrestrial offset sites are likely to be available.

The offset commitments proposed in this submission are both practical and substantial. As an organisation which recognises the importance of contributing to the protection of the environment, QGC is proposing to apply offsetting principles for the QCLNG Project that should not only help to compensate for unavoidable impacts associated with the Project but which at the same time should also contribute to the long-term protection and enhancement of environmental values within the Project area.

## 1.0 PURPOSE

The Terms of Reference for the QCLNG Project (the Project) identified requirements for QGC to consider the provision of vegetation and biodiversity offsets (including marine offsets) for any unavoidable impacts associated with the Project. It is an anticipated condition of approval, that where construction or operation of the Project will have an unavoidable impact on biodiversity and Ecological Communities listed as Threatened under the Commonwealth EPBC Act, as well as REs and Essential Habitat identified under the Vegetation Management Codes for the *Queensland Vegetation Management Act 1999 (VM Act)* or EVR species listed under the EPBC or Nature Conservation Act, a vegetation and biodiversity offset will be required.

This submission considers the estimated unavoidable impacts in relation to anticipated Government offset expectations and details the offsetting principles and methodology to which QGC propose to commit for the Project.

This document contemplates offset requirements from a Project-wide perspective. However, in practical terms individual site based offset commitments will be made when each proposed individual offset initiative is developed and presented to the relevant approvals agencies (i.e. actual commitments will be made and negotiated with the agencies in relation to each area where vegetation is cleared or is proposed to be cleared as part of the offset approval process). Due to the Project timeframes, these commitments will, by necessity, need to be made after the initial Government approval of the Project. Therefore, this submission is intended to provide the Government and the community with adequate confidence that the proposed offset methodology will deliver the appropriate offsets to adequately compensate for unavoidable impacts likely to be associated with the Project. The offsetting approach also needs to accommodate the incremental and long-term nature of coal seam gas developments.

# 2.0 BACKGROUND

## 2.1 QCLNG Project

The Project will be one of Australia's largest capital projects and will have significant economic benefits for Australia and in particular for Queensland. The Project will supply up to 12 million tonnes per annum (mtpa) of LNG through the development of up to three LNG trains.

The first LNG train is expected to be producing LNG in Q3 2013, with the second train in operation six to twelve months later, with the third train commissioned in subsequent years, depending on identification of adequate gas reserves.

The Project will comprise three principal Components:

- Gas Field Component – the expansion of QGC's coal seam gas (CSG) operations in the Surat Basin to provide gas for two of the three LNG trains and gas for domestic markets
- Pipeline Component – the development, construction and operation of a gas Export Header of approximately 380 km, capable of supplying gas for three LNG trains, together with a Collection Header (a network of gas connection pipelines), to link the QGC gas fields to the LNG plant
- LNG Component – the development, construction and operation of an LNG processing plant and export facility, to be located in the Gladstone area, with an ultimate capacity of up to 12 mtpa.

The infrastructure that is proposed to be constructed and operated is described in detail in the QCLNG EIS and supplementary EIS information. The Project will extend over a 20 year or longer period and detailed design is yet to be undertaken for most of the proposed gas field components.

## 2.2 Location

The CSG Field is located within the Surat Basin, a resource region in southern Queensland. The tenures are within the Western Downs Regional Council and in the vicinity of Miles, Chinchilla, Condamine and Tara townships. The Condamine River bisects the tenure areas and the predominant land use is rural for grazing and dry land cropping. Rural residential blocks occur through central portions of the CSG Field, particularly in the vicinity of Tara.

In its entirety, the QCLNG project passes through nine Southern Brigalow Belt sub-regions (Inglewood Sandstones, Eastern Darling Downs, Barakula, Dulacca Downs, Southern Downs, Taroom Downs, Banana – Auburn Ranges, Callide Creek Downs, Mount Morgan Ranges) and one South-East QLD Sub-region (Burnett – Curtis Coastal Lowlands) which encompasses Curtis Island.

## 2.3 Associated Studies

Detailed ecological studies have been undertaken for the Project and are presented in the EIS and supplementary EIS information. Those studies have made estimates of the potential vegetation and biodiversity impacts associated with the Project. Those estimates have been used in the development of this submission.

## 2.4 What are Vegetation and Biodiversity Offsets

An environmental offset according to the Commonwealth Department of Environment Water Heritage and the Arts (DEWHA) are "actions taken outside a development site that compensate for the impacts of that development – including direct, indirect or consequential impacts". The Queensland Government's Environmental Offsets Policy (QGEOP) describes offsets as an action taken "to counterbalance unavoidable, negative environmental impacts that result from an activity or a development. An offset may be located within or outside the geographic site of the impact. Environmental Offsets are only applicable when the impacts cannot be avoided or minimized, and if all other Government environmental standards have been met".

Vegetation and biodiversity offsets are usually the setting aside and management of areas of regrowth vegetation and / or degraded remnant habitat in order to compensate for unavoidable clearing of areas of high ecological value.

Vegetation and biodiversity offsets may be required for both terrestrial (including freshwater aquatic and marine edge) impacts as well as marine impacts.

## 2.5 QGC's Vegetation and Biodiversity Offsets

In the case of the Project, vegetation and biodiversity offsets will be provided for unavoidable impacts associated with the development of:

- The CSG Field, which is proposed to occur across QGC's 468,700 ha of tenements in the Surat Basin
- Major gas transmission pipelines across the CSG Field and from near Miles to Curtis Island (north of Gladstone)
- A LNG Plant and associated infrastructure on Curtis Island

The QCLNG EIS indicates the Project's CSG Field, Collection Header, Export Pipeline, LNG Plant and associated infrastructure transects or is located within:

- 2 Bioregions (Southern Brigalow Belt (SBB), Southeast Queensland (SEQ))
- 10 Subregions (9 in SBB, 1 in SEQ)
- Approximately 44 Regional Ecosystems (34 in SBB, 10 in SEQ)

## 2.6 Nature of Coal Seam Gas Developments

Approved offsets will be provided wherever impacts to significant vegetation and habitat features are unavoidable in order to meet the intent of the Queensland Government's and Australian Government's offset policies. Offsets will be proposed early in the project for those locations where the impacts associated with the construction of the Project are already known (e.g. export header and LNG plant).

However, the impacts associated with the development of the gas field (and the collection header) will continue to be determined on an incremental basis during the life of the project. This is necessary because the location of infrastructure will be determined based on the gas productivity of the various parts of the CSG field during the earlier phases of production. Therefore, it is not practicable to

estimate (and compensate in advance) the offsetting requirements for the entire life of the gas field development (greater than 20 years). *Section 8* details a staged approach for forecasting and implementing offset requirements. The staged approach will facilitate provision of suitable offsets in a manner that meets the timing requirements of the project while also incorporating the incremental and long-term nature of coal seam gas field developments.

# 3.0 AUSTRALIAN AND QUEENSLAND GOVERNMENT OFFSET REQUIREMENTS

## 3.1 QCLNG EIS Terms of Reference

The TOR for the QCLNG EIS specified that offsetting requirements should be considered in relation to unavoidable impacts and that, the proposed mitigation measures should refer to "if appropriate, the Queensland Policy for Vegetation Management Offsets 2007". This requirement was specified within Section 3.3 (Nature Conservation), Section 3.4 (Environmentally Sensitive Areas) and Section 3.3.5 (Marine Flora and Fauna).

## 3.2 Policies

The Queensland Government, under the banner of The Queensland Government Environmental Offsets Policy (QGEOP) has several specific issue offsets policies that indicate where particular environmental offsets are required, and the form they should take. The specific-issue offset policies and their regulating agencies are:

1. **Policy for Biodiversity Offsets (Consultation Draft)** (Department of Environment and Resource Management, DERM).

2. **Policy for Vegetation Management Offsets, September 2007** and / or **Policy for Vegetation Management Offsets October 2009 (DERM)**. Under these policies, offsets are a means of meeting relevant performance requirements of the applicable Regional Vegetation Management Code. (e.g. Section 8 of the Brigalow Belt Bioregion Vegetation Management Code).

3. Marine Fish Habitat Policy – The policy is titled **Mitigation and Compensation for Works or Activities Causing Marine Fish Habitat Loss, 2002**, Department of Primary Industries and Fisheries (DPIF). The guiding principles used for marine offsets is the Offset measures – Marine Fish Habitat which is an assessment and decision making process under the Fisheries Act 1994 Section 76L. For specific offset detail/requirements, reference must also be made to the document noted in the Offset measures – Marine Fish Habitat titled Fish Habitat Management Operational Policy FHMOP 005 (2002) which defines procedures and requirements for marine offsets.

4. **Koala Habitat – Offsets for Net Benefits to Koalas and Koala Habitat, 2006** (previously Environmental Protection Agency, now DERM). This policy is generally applicable to the South-East corner of the South-East QLD Bioregion. As such, this policy does not apply to the Project.

The Commonwealth Government has a draft biodiversity offsets policy titled ***Draft Policy: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999*** (DEWHA). This policy identifies the characteristics of acceptable offsets in relation to compensating for unavoidable impacts to Matters of National Environmental Significance. The EPBC Act is triggered when impacts occur on regional ecosystems, habitat and flora / fauna that have been identified within the EPBC Act. The Draft Policy provides eight broad principles for the use of environmental offsets under the EPBC Act. The eight principles are used to assess any proposed environmental offsets to ensure consistency, transparency, and equity under the EPBC Act. The principles are:

1. Environmental offsets should be targeted to the matter protected by the EPBC Act that is being impacted.

2. A flexible approach should be taken to the design and use of environmental offsets to achieve long-term and certain conservation outcomes which are cost effective for proponents.

3. Environmental offsets should deliver a real conservation outcome.

4. Environmental offsets should be developed as a package of actions - which may include both direct and indirect offsets.

5. Environmental offsets should, as a minimum, be commensurate with the magnitude of the impacts of the development and ideally deliver outcomes that are 'like for like'.

6. Environmental offsets should be located within the same general area as the development activity.

7. Environmental offsets should be delivered in a timely manner and be long lasting.

8. Environmental offsets should be enforceable, monitored and audited.

### 3.3 Terrestrial Offset Requirements

This section identifies some of the principal characteristics which DERM generally expect in vegetation and biodiversity offsets. However, it must be noted that there are exceptions to the rule with negotiation possible in varying circumstances. Generally, DERM expectations for vegetation and biodiversity offsets include:

- Offsets must be legally secured (e.g. via a Nature Refuge or other covenant on land title or as protected area tenure via an agreement with DERM)
- Area multipliers may apply (typically 1:1.5 – 1:5)
- Offset should, where appropriate, be in the area where the disturbance occurred
- When more remote from original disturbance, offsets may require additional area multipliers
- An offset will most often be advanced non-remnant re-growth, but may be degraded remnant habitat
- Offsets should have limited weed cover in the ecologically dominant layer
- Offsets generally require management for 5 – 20 years
- All offsets must have a monitoring and reporting plan.

### 3.4 Marine Offset Requirements

Marine offsets are negotiated in the development application / development approval process. As the Project has been designated Significant Project Status by the Department of Infrastructure and Planning (DIP), the DIP are coordinating the approvals process. During the development application, DPIF will review the proposed marine impacts and options that may offer lesser impacts or suggest various direct / indirect offsets. These offsets are established and agreed during the application approval process. QCLNG representatives had discussions with DPIF on the 24th July 2009 and the

week of 21st September 2009. DPIF have confirmed that it prefers a like-for-like offset in a similar locality or restoration of degraded areas. If offset locations are difficult to find, a monetary payment may be considered (as a last resort) which would be used to fund relevant research programs. QGC will continue to liaise with DPIF to determine appropriate offset for unavoidable impacts on the marine environment.

# 4.0 METHODOLOGY

## 4.1 Methodology used to Develop the QCLNG Offset Objectives and Proposed Offsetting Principles

The methods used for development of the objectives and proposed principles within this document were:

- Review the requirements of State and Commonwealth vegetation and biodiversity offset policies
- Discuss and define potential offsets options / requirements with DERM, DPIF and State Forests
- Access GIS and spatial information on vegetation in the project area
- Review known and potential infrastructure locations and potential impacts on vegetation and biodiversity
- Review the EIS and supplementary EIS to ascertain the likely type, size and locality of potential impacts to vegetated area
- Review databases to identify the likely availability of best-fit options for offset sites
- Define suitable objectives for the offsets program
- Propose effective principles to enable the objectives to be achieved.

The following offset approvals flowchart shows the sequence of information provision and agency approvals from identification of initial impact predictions through to agency approvals of individual offset sites and ongoing monitoring and reporting.

| Offset Approvals Flowchart | Achieved to Date | Where / When |
|---|---|---|
| Identify and predict unavoidable impacts | Completed | EIS |
| Describe broad offset commitments | Completed | EIS |
| Receive and respond to Community and agency comment on broad commitments | Completed (sEIS) | This Draft Offsets Strategy |
| Estimate potential quantum of offset requirements | Completed | This Draft Offsets Strategy (**Section 9**) |
| Identify objectives and propose principles | Completed | This Draft Offsets Strategy (**Sections 7 and 8**) |
| Receive agency endorsement of objectives, principles and conditions | Up to here | Project EA conditions |
| Find and Assess Potential Offsets and Apply to agencies for approval of individual (or grouped) offsets | In Progress | Prior to and during construction |
| Annual monitoring and reporting on offset performance | | Ongoing until remnant vegetation status achieved |

## 4.2 Methods Proposed to Establish Individual Offsets

Successfully finding, securing and seeking approval for individual vegetation offsets (on a site by site basis) requires a specific process, associated procedures and assessment criteria. Individual offset establishment will occur in four general stages as outlined below:

- Stage 1 – Selection of suitable sites which will involve:
  - Regional database review and spatial analysis
  - Review of potential site attributes (against site assessment criteria) to select appropriate sites
  - Negotiation of preliminary land-use loss compensation with landholder.
  - Agency negotiations
  - Comprehensive property assessment for vegetation structure, floristic diversity, re-growth status, landscape function, shade-lines / corridor connectivity, condition, resource attributes, riparian zone condition, grazing practices, pasture condition, weeds, existing remnants
  - Development of a draft Property Vegetation Management Plan in accordance with agency standards
  - Development of a draft offset proposal for submission to relevant Government agencies. This may require submission to both Commonwealth (DEWHA) and State (DERM) agencies and negotiation between the two agencies
- Stage 2 – Seek and obtain agency approvals and legally secure offset sites
- Stage 3 – Establishment of landholder, State and Commonwealth management agreements (occurs following Government approval of the offset). It involves:
  - Collection and collation of reference data (collected in the field and via desktop) pertinent to the offset
  - Facilitation of the registered survey plan
  - Securing the offset via a covenant or some form of mechanism that allows the site to regenerate to remnant status. This requires that each site approved is surveyed and legal representatives consulted
  - Preparation of a final Property Vegetation Management Plan which must be agency approved
  - Development of a final offset proposal for submission to Commonwealth and/or State agencies
  - Signing landholders covenant and associated contract including compensation payment to the landholder.
- Stage 4 – Ongoing offset management

It is recognised that it is a DERM has a preference for an Agency approved Trust Fund to be utilised to devolve offset management funds and that the Trust Fund may also provide the agencies, landholder and QGC with risk protection in the event the offset site is destroyed or impacted by unexpected events (such as wildfire).

Offset management will usually be ongoing for a term of up to 20 years or until the offset attains remnant status. Remnant status is determined when the ecosystem reaches 50% of original canopy cover and 70% of original canopy height with floristic diversity and structure similar to the original

ecosystem represented. An audit of the offset is conducted yearly by external auditors (usually DERM Senior Vegetation Management Officers).

Upon approval and establishment of covenants, the following will generally occur:

- Field works will be commissioned
- Operational field works will be conducted in accordance with the approved Management Plan
- A pre-approved Monitoring and Reporting Program will be implemented. The program will have been designed and approved in the management planning phase and will be conducted every year until the offset re-growth is determined to have reached remnant status
- Provision of Annual Reports to the agencies
- Ongoing management for 20 years or until the relevant agency deems the offset has reached remnant status.

# 5.0 QCLNG OFFSETTING GOALS AND OBJECTIVES

## 5.1 QCLNG Biodiversity Conservation Priorities

QCLNG biodiversity conservation priorities and commitments (as described in the EIS) include:

- Infrastructure will be located away from remnant vegetation areas whenever possible. The clearing or disturbance of all EPBC-listed Ecological Communities, VM Act listed Endangered and Of Concern REs, Not of Concern RE's on Watercourses, Threshold RE's, Significant Wetlands, EVR species, Essential Habitats and other environmentally significant areas will be avoided whenever possible.
- Stringent environmental conditions will be applied to areas of high conservation value (project specific ecological constraints mapping has been developed where required to facilitate appropriate controls).
- QGC will assess the environmental value of each area that may be potentially disturbed and implement the conditions applicable to that area to avoid and minimise impacts on those environmental values to the greatest practicable extent.
- Offsets will be developed and implemented which compensate for all unavoidable impacts on EPBC-listed Ecological Communities, VM Act listed Endangered, Of Concern and Not Of Concern REs (on watercourses), EVR species, Essential Habitats, threshold communities, significant wetlands and other environmentally significant areas.

## 5.2 Goal

In accordance with the BG Business Principle of making a positive contribution to the protection of the environment, the goal of the QCLNG offset program is to provide appropriate offsets to compensate for any unavoidable loss of environmental values whilst also recognising that the QCLNG projects needs to create outstanding and durable value for shareholders.

## 5.3 Offsetting Objectives

In order to achieve this goal, the following Project offset objectives have been developed. They are based on the objectives identified within the Draft Policy: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999 (DEWHA) and are:

1. Provide suitable offsets for unavoidable loss of environmental values in a manner that accommodates the incremental nature of CSG development.
2. Provide offsets which are targeted to the protected matters that are being impacted.
3. Achieve long-term and certain conservation outcomes which are cost effective.
4. Deliver real conservation outcomes.
5. Provide offsets that, as a minimum, will be commensurate with the magnitude of the unavoidable impacts of the development and ideally deliver outcomes that are 'like for like'.
6. Locate offsets within the same general area as the development activity wherever practicable.
7. Deliver long lasting offsets in a timely manner.
8. Monitor, audit and implement corrective actions as required.

# 6.0 PROPOSED QCLNG OFFSETTING PRINCIPLES

This section outlines the offsetting principles which QGC have developed in order to meet the Project's offsetting objectives.

## 6.1 QGCs Environmental Commitments in General

As an organisation which recognises the importance of supporting and contributing to the local community and environment, QGC has made a number of significant commitments to protect and enhance environmental values within the Project area, for e.g. making a significant funding contribution to the Environmental Management Precinct on Curtis Island.

## 6.2 Multi-Agency Offsets

Offset requirements of DEWHA and the State agencies are sometimes concurrent (i.e. one offset may satisfy requirements to compensate for impacts under both Commonwealth and State policies). Wherever possible, QGC will aim to meet the offset expectations of all agencies with a common offset. The ability for this to occur and any additional agency specific requirements will be confirmed in consultation with each agency on a case by case basis.

## 6.3 Direct and Indirect Offsets

Direct offsets are an exchange of ecological services or environmental resources in one area to compensate for the loss of those services elsewhere. For example, if remnant vegetation was cleared in Site A, it may be re-instated in Site B, providing certain guidelines are met. Direct offsets are about securing, protecting and managing advanced regrowth or remnant native vegetation/habitat systems for their environmental values. QGC propose to provide direct offsets for clearing of Endangered and Of Concern REs in both the Southern Brigalow Belt and Southeast Queensland Bioregions.

Indirect offsets are actions that provide environmental benefit that is not a direct exchange of ecological services or resources. Examples include funding research, public education programs or provision of infrastructure. Indirect Offsets are often difficult to demonstrate and do not always have a high approval rate unless all avenues with direct offsets are exhausted. Indirect offsets are occasionally accepted as part of marine offset packages, but only as a last resort when direct offsets are not considered to be a viable option.

QGC offset initiatives will primarily be direct offsets. However, QGC is willing to consider options for providing indirect offsets where appropriate (e.g. a combination of direct and appropriate indirect offsets based on agency advice during the offset development and approval process). Some of the other environmental commitments undertaken by QGC (e.g. those described in *Section 8.1*) are indirect offsets.

## 6.4 Long-term Versus Temporary Impacts

QGC propose to provide offsets where impacts are considered likely to be long term impacts. For example, in areas required to be cleared for construction (but not required for operations) which are considered likely to be substantially rehabilitated within the short term (e.g. twenty years) efforts may be focussed on rehabilitation only; and vegetation and biodiversity offsets may not be proposed.

## 6.5 Approach to Offsetting Numerous Smaller Scale Impacts

The LNG Facility (spoil sites and marine inclusive) on Curtis Island is likely to require the largest individual clearing footprint for the Project. However, the vast majority of the vegetation clearing requirements are relatively small areas (e.g. 0.5-1 ha for each of several thousand well sites) or linear (e.g. 10-40m wide for the Export Pipeline and up to 100m wide for the Collection Header).

Individual offsets for each impact location would often result in offsets that were quite small and subject to edge effects, fragmentation, weed infestations and poor landscape function. To negate these issues, the offsets will, where possible and approved by the agencies, be grouped together to provide offsets that are:

- Linked to existing vegetation and Reserves or Protected areas
- Able to provide positive landscape function
- Maximise habitat value.

Offsets which are reasonably advanced in structure and floristic diversity and contain seed / habitat trees will be preferentially selected to maximise the potential for them to become self-sustaining ecosystems within relatively short periods.

Offsets will be located within close proximity of the impact where possible, however, it is also recognised this may not be possible given the effect of linear operations. Provisions are made in the various offset policies for offsets to be located, if required, in other Bioregions and sub-regions, and it is anticipated additional area multipliers will be required in these instances.

## 6.6 Approach to Offsetting Over the Life of the Project

The approach to providing offsets will vary between terrestrial and marine offsets. Each approach is described below.

### Terrestrial Offsets

*Phased Offset Program to Accommodate the Incremental Nature of Coal Seam Gas Development*

Approved offsets will be provided wherever impacts to significant vegetation and habitat features are unavoidable in order to meet the intent of the Queensland Government's and Australian Government's offset policies. Offsets will be proposed early in the project for those locations where the impacts associated with the construction of the Project are already known (e.g. export header and LNG plant).

However, the impacts associated with the development of the gas field (and the collection header) will continue to be determined on an incremental basis during the life of the project. Therefore, it is not proposed to try to estimate (and compensate in advance) the offsetting requirements for the entire life of the gas field development (greater than 20 years) as accurate determination of life-of-project impacts and appropriate offsets would not be possible at this early stage. Instead, it is proposed that a phased offset program be developed and implemented. It is suggested that the program be reviewed and updated on a periodic basis (e.g. annual or project phase). It is suggested that an estimate of likely unavoidable impacts be made prior to the commencement of each period and that suitable "Proposed Offsets" be pre-approved[1] by the agencies and 'set aside'. This would allow the agencies

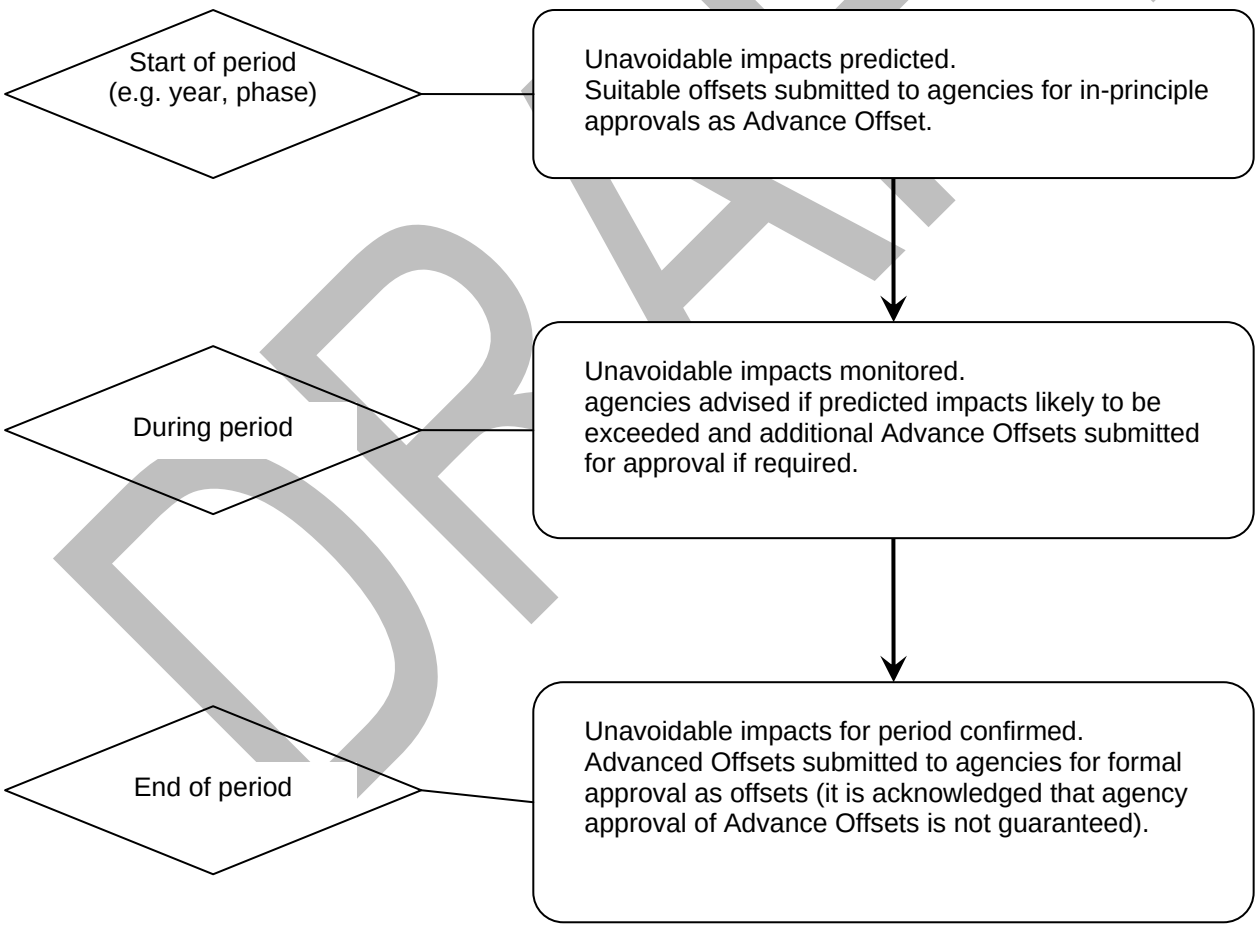
1 Agency pre-approval may just be confirmation that the site is generally appropriate for the provision of offsets

and QGC to have an increased level of confidence that suitable offsets will be available once details of the actual gas field development impacts are known.

During the life of the Project QGC propose to maintain a geographic information system database of areas actually cleared across the Project so that offset requirements are identified and recorded on an ongoing basis. It is proposed that this information be provided to DERM within a consolidated QCLNG Vegetation and Biodiversity Offset Report on a periodic (e.g. annual or phase) basis. It is proposed the Report would identify clearing that has occurred in the previous year as well as provide a schedule of offset activities for the coming 12 months. If during the recording period it becomes apparent that the pre-approved offsets will be insufficient to meet the needs of the current term, additional offsets will be sought and nominated for pre-approval.

At the end of the period, the actual clearance footprints could be confirmed and QGC would then seek formal agency approval to use each previously pre-approved offset as compensation. *Figure 6.1* shows the suggested sequence.

***Figure 6.1: Proposed Phased Offset Program***



The State Government offset policies indicate that offsets can be developed prior to the commencement of a Project when resource extraction is involved. Clauses may allow the development to proceed (to a certain extent) even if an offset is not currently available or the specific impact identified. The EPBC Act also makes reference and provision for negotiation to occur in those situations where a development could not otherwise proceed because of the inability to secure offsets or clearly identify future potential vegetation impacts.

In an effort to allow for pre-approval of offsets based on estimated likely future impacts, initial discussions have been held with DERM personnel which indicated a preparedness on the part of DERM to negotiate to potentially "allow larger offsets for Endangered, Of Concern, Not Of Concern watercourse vegetation and threshold RE's to be offered in advance".

**Multipliers Applied to Terrestrial Offset Requirements**

Agency terrestrial offset policies describe a multiplier expectation of between 1:1.5 and 1:5. The policies identify that lower multipliers are appropriate where offsets are (among other things) similar or higher in conservation values and close to the impacted values. Higher multipliers apply where offsets are dissimilar, of lower quality or remote.

The multipliers proposed with each individual (or grouped) offset application will be in the range suggested in the agencies policies and agreed through negotiation with the agencies based on the values impacted in comparison to those provided in available offset sites.

**Marine Offsets**

Marine offsets will be negotiated in the development application and development approval process. As the Project has been designated State Significant Project Status by the DIP, the DIP is coordinating the approvals process. During the development application, DPIF will review the proposed marine impacts and identify options which they believe may result in lesser impacts or suggest various direct / indirect offsets. Such offsets are developed and agreed to during the application approval process with a focus on:

- Disturbance to mudflats and intertidal areas
- Disturbance to mangrove swamps
- Disturbance to seagrass areas and fisheries.

Marine environmental offset requirements are less defined and the characteristics, including area multipliers will be subject to negotiation on a case by case basis through:

- A condition of the DPIF approval letter
- A letter of obligation (with other State Government agencies)
- Through a Deed of Agreement between the proponent and DPIF, or
- A secondary Deed of Agreement between DPIF and an offset provider.

Discussions with DPIF on the 24th July 2009 and 21st September 2009 (Simpson, pers. comm.) indicated that a negotiation process directly with staff of the DPIF was the preferred process.

### 6.7 Obtaining Agency Approval to Commence Works Prior to Final Offset Signoff

Project construction is currently scheduled to commence in July 2010. It is recognised that agency approval of the proposed offsets can take several months and may not be received within this timeframe. QGC propose to identify and organise preliminary on-ground agency inspections of the potential offset sites prior to the commencement of Project works. The purpose of these inspections is to provide the agencies with sufficient confidence (that adequate suitable offsets will be able to be established) to allow them to approve the commencement of works prior to the proposed offsets having received final agency sign-off.

### 6.8 Offsetting On QGC Owned Land

QGC propose to provide offsets on QGC owned land where appropriate and approved by the relevant agencies. Offsets will be also be sought on non-QGC land where available and appropriate.

## 7.0 INDICATIVE ESTIMATE OF VEGETATION AND BIODIVERSITY OFFSET REQUIREMENTS

Based on the information in the QCLNG EIS and the supplementary EIS information, and with consideration to the current policy requirements as detailed in *Section 5*, it is anticipated that over the life of the Project, QCLNG could potentially require offsets for:

- Unavoidable clearing of approximately 70 ha EPBC Act Threatened Ecological Communities (consisting of five Community types)[2]
- Unavoidable clearing of approximately 175 ha of Endangered Regional Ecosystems (ERE)
- Unavoidable clearing of approximately 374 ha of Of Concern Regional Ecosystems (OCRE) (consisting of nine OCRE types)
- Unavoidable clearing of Koala Essential Habitat and habitat for the Powerful Owl and possibly the Glossy-black Cockatoo that occurs within the LNG Facility footprint on Curtis Island[3]. Included in ERE offsets but also potentially includes an additional 120 ha of Not of Concern REs.
- Potential unavoidable clearing of 207 ha within Essential Habitats in the CSG Field (150 ha) and Pipeline (57 ha) components
- Unavoidable clearing of approximately 28 ha of terrestrial marine environments (18 ha Samphire forbland and 10 ha Mangrove Forest[4])
- Unavoidable clearing of three populations of *Cycas megacarpa* (3 ha)
- Potential unavoidable impacts to a number of *Philotheca sporadica* populations (Potentially 10 ha)
- Potential disturbance of approximately 7 ha of submarine ocean floor

It is estimated that in total the Project could be required to offset for clearing of approximately 917 ha as described in *Table 7.1*. *Table 7.1* provides a generalised breakdown of the quantum of offset areas potentially required to be offset.



2 EPBC Act Threatened Ecological Communities impacted by QCLNG are largely included within the VM Act Endangered REs and in almost all cases are not additional to them.

3 Correlated with the ERE on Curtis Island and not additional to it.

4 The marine environments that are proposed to be traversed by the pipeline:

- Start near the eastern side of Phillipies Landing Road
- Extend east to “The Narrows” (affecting RE 11.1.2 and RE 11.1.4a)
- Crosses the “The Narrows”
- Joins Curtis Island approximately 500m south of Graham Creek (affecting RE 12.1.2 and RE 12.1.3).

## *Table 7.1 Estimate of Potential Offset Requirements*

| Vegetation Status | Estimated Area to be cleared (Ha) | Location | Bioregion |
|---|---|---|---|
| Endangered[5] | 142 | CSG Fields, Pipelines & Curtis Island (but not LNG Facility), | Southern Brigalow Belt & SEQ |
| Endangered (inclusive of Essential Habitat for Koala)<br>LNG Facility | 33 | On LNG Facility. Inclusive of Essential Habitat for Koala's on Curtis Island | SEQ |
| **Total ERE** | 175 ha | | |
| Of Concern | 367 | CSG Fields, Pipelines & Curtis Island (but not LNG Facility) | Southern Brigalow Belt & SEQ |
| Of Concern<br>LNG Facility | 6.5 | On LNG Facility | SEQ |
| **Total Of Concern RE** | 373.5 ha | | |
| Additional potential Powerful Owl and Glossy-black Cockatoo Habitat<br>LNG Facility | 120 | On LNG Facility | SEQ |
| **Total Powerful Owl/Glossy-black Cockatoo Habitat** | 120 ha | | |
| Essential Habitat | 207 | CSG Fields, Pipelines & Curtis Island (but not LNG Facility) | Southern Brigalow Belt & SEQ |
| **Total Essential Habitat (not LNG Facility)** | 207 ha | | |
| EVR Flora Species - *Cycas megacapa*[6] & *Philotheca sporadica*[7] | 13 | Pipeline and CSG Fields | Southern Brigalow Belt |
| Marine | 12<br>7 ocean bed | Inclusive of Mainland and Curtis Island (but not LNG Facility) | SEQ |
| Marine<br>LNG Facility | 16 | On LNG Facility | SEQ |
| **Total Marine and EVR** | 28 ha (Marine), 7 ha (unvegetated ocean bed) | | |
| **Total Estimated Area of Impact** | 917 ha | | |



5 EPBC Threatened Ecological Communities are a subset of the EREs impacted by the Project

6 *Cycas megacarpa* impacts - To be determined based on final pipeline footprint. The final figure is expected to be determined during the development of the Threatened Species Management Plan and throughout the permit application process.

7 *Philotheca sporadica* impacts- Unavoidable impacts to be determined progressively during the life of the Project. Detailed costing will be able to be determined during the development of the Threatened Species Management Plan and throughout the permit application process.

# 8.0 AVAILABILITY OF SUITABLE OFFSETTING PROPERTIES

The likely availability of suitable offsetting properties for the project has been assessed for three separate areas, namely the:

- CSG Field
- Pipeline Components to The Narrows
- Curtis Island.

## 8.1 CSG Field

A number of potential offset sites for Endangered and Of Concern REs occur in close proximity to the estimated impact areas including a number with landscape linkages to the riparian zones of Wilkie Creek, Moonie River, Dogwood Creek, Sixteen Mile Creek and the Condamine River.

In relation to a number of EVR species that may be impacted through infrastructure development, suitable offset sites and species re-establishment sites have been identified for Philotheca sporadica (around Beelbee Road east of Kogan).

Initial analysis of regrowth areas and QGC's experience in these areas indicates that a significant number of landholders are likely to be willing to provide suitable offset sites.

## 8.2 Pipeline Components to the Narrows

In addition to Endangered, Of Concern REs, Not Of Concern watercourses and Threshold REs, the QCLNG EIS and supplementary EIS information indicated that there are a number EVR flora species in the vicinity of the Collection Header and Export Pipeline. While most of the species can be avoided, there are a number of situations where EVR flora and Essential Habitat cannot be avoided.

Offsets for the pipeline components are proposed to be provided as a number of larger areas as close as possible to where identified EVR's and Essential Habitat will be impacted. EVR's and Essential Habitat areas have been identified at, or in close proximity to:

- Collection Header at KP 31 (One Vulnerable flora species and Essential Habitat)
- Collection Header at KP 46 (One Vulnerable flora species and Essential Habitat)
- Export Pipeline at KP 295 – 300 (One Endangered flora species).

A number of potential vegetation offset sites have been identified as suitable to offset the predicted unavoidable impacts on Endangered, Of Concern, Not of Concern Threshold REs and watercourses, EVR species and Essential Habitat on both QGC owned land and private properties. QGC's experience in these areas indicates that a significant number of landholders are likely to offer potentially suitable offset sites.

Marine environment impacts extend from KP 377-KP 382 and total 12 ha (comprising 7 ha Samphire forbland (RE 11.1.2) and 5 ha Mangrove forest on Clay Plains (RE 11.1.4) as well as 7 ha of ocean bed floor (Benthic).

## 8.3 Curtis Island

Suitable offset sites for any of the vegetation impacts on Curtis Island are difficult to find on the Island due to the large proportion of the Island that already contains mature remnant vegetation. For this reason, offset sites will most likely be proposed on the mainland, however; QGC has, as an indirect offset, made a significant funding contribution to the Environmental Management Precinct on Curtis Island with the purpose of facilitating improved environmental outcomes on the Island.

The LNG Plant Infrastructure is likely to impact approximately 15 ha Marine vegetation (consisting of 5 ha Mangrove forest (RE 12.1.3) and 10 ha Samphire forbland (RE 12.1.2)), Powerful Owl / Glossy Black Cockatoo habitat including 33 ha Endangered RE, 6.5 ha Of Concern RE and 120 ha Not Of Concern (inclusive of watercourse Not Of Concern), while the linear infrastructure on Curtis Island will impact Powerful Owl habitat including a further 1 ha Endangered RE, 0.6 ha Of Concern RE, 17.6 Not Of Concern (inclusive of watercourse Not Of Concern) and 0.4 ha of Marine vegetation (Samphire forbland RE 12.1.2).

Essential Habitat for Koala has also been identified within the proposed clearing footprint for the LNG Plant site in the ERE 12.3.3.

Initial research indicates that, in addition to the contribution to the Environmental Management Precinct on Curtis Island, there are suitable offset sites available on the mainland to enable all unavoidable impacts on Curtis Island to be offset.

## 9.0 CONCLUSION

Environmental considerations and design have been integral to planning the QCLNG Project in an effort to avoid and minimise impacts on the environment. It is not possible, however, for a project the scale and complexity of QCLNG to absolutely avoid all such impacts.

It is expected that a condition for approval of the Project will be that vegetation and biodiversity offsets will be required where there will be unavoidable impacts on Ecological Communities listed as Threatened under the EPBC Act, REs listed as Endangered, Of Concern REs under the VM Act, Not of Concern REs where these are Threshold REs, watercourses or Essential Habitat and/or EVR species.

As outlined in this submission, QGC propose an offsetting methodology that will help compensate for the unavoidable impacts. This submission has been developed in accordance with the Commonwealth Government's Draft Policy Statement: Use of Environmental Offsets under the Environment Protection and Biodiversity Conservation Act 1999, the Queensland Governments Environmental Offset Policy and all applicable Queensland specific-issue offset policies available at October 2009.

The offset commitments proposed in this submission are both practical and substantial. As an organisation which recognises the importance of contributing to the protection of the environment, application of the principles proposed for the QCLNG offsets should not only help to compensate for unavoidable impacts but will also contribute to the long-term protection and enhancement of environmental values within the Project area.

Throughout the development of this submission spatial analysis studies were conducted and a number of property owner and stakeholder groups were consulted. This consultation indicates that suitable offset sites are likely to be available.

## 10.0 REFERENCES

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