



11 | EIS Coal Seam Gas  
Field Environmental  
Management Plan



## Section 11

# EIS Coal Seam Gas Field Environmental Management Plan

The respondent comments provided in this section have been collated from all stakeholder submission comments relating to EIS Section 11 Coal Seam Gas Field Environmental Management Plan. Please refer to **Attachment A** for copies of all submissions received.

## 11.1 Introduction

### Respondent Comment

*Department of Environment Water Heritage and the Arts requested further explanation on Phase 2 studies and potential need for further Qld or EPBC approval. As a result of the two phase approach in the EIS, and the subsequent lack of information regarding (Phase 2) development related impacts, we will be unable to consider approval for the project as described in the referral as we do not have sufficient information to assess the impacts of the development phase of the project.*

### Santos Response

Although the full extent and precise location of the wells and associated infrastructure cannot be known at this time, in response to the public submissions, Santos has undertaken a supplementary assessment of the potential impact of the development of the CSG fields on ecological values of the area (**Attachment D5**). This assessment provides detail of impact analysis and field management protocols for the development of the CSG fields. The approach for this assessment has been developed in consultation with DEWHA and includes a number of key elements as follows:

- **Constraints mapping** – a detailed analysis of the ecological values of the Reasonably Foreseeable Development Area (RFDA) within the CSG fields having regard to augmented desktop and field datasets;
- **Constraints classes** – identification and mapping of five classes of land within the RFDA with graduated levels of ecological sensitivity based on the constraints mapping;
- **Field Management Protocol** – development of a field management protocol which describes the nature of development which may be undertaken within each of the constraints classes, the process to settle the specific location of the development within each constraints class having regard to the ecological values of the area and mitigation measures;
- **Indicative Field Development Plan** – identification of an indicative field development plan (FDP) for the RFDA with preliminary locations for the wells and associated infrastructure;
- **Supplementary Impact Assessment** - an evaluation of potential impacts on ecological values of the development of the CSG fields based on three scenarios derived from implementation of the field management protocol to the field development plan;
- **Mitigation Measures** – identification of mitigation measures additional to measures outlined in the EIS; and
- **Offset Strategy** – outlining the basis of an Environmental Offset Management Strategy to offset ecological values impacted by the GLNG Project by offsite measures (such as property acquisition, covenants and reserve dedications).

### Respondent Comment

*Department of Environment and Resource Management state that waste from the drilling operation should not be spread over the soil surface.*

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### Santos Response

Waste from the drilling operation will not be spread over the soil surface. All waste fluids and muds resulting from drilling and exploration activities will be contained in a dam or containment structure for disposal, remediation or reuse where applicable.

To reflect this commitment the CSG field EMP has been updated with the following text:

#### **Waste Management**

- Ensure that any general waste from drilling activities is not spread over the soil.

Refer to **Attachment B** for all revised EMPs.

### Respondent Comment

*Department of Environment and Resource Management states that an associated water management plan should be included in the Supplementary EIS and EM plans.*

### Santos Response

An associated water management plan has been developed and is included in **Attachment D3**. Associated water management objectives, performance criteria and implementation strategy are listed in section 11.16.12 of the Coal Seam Gas Fields EMP (**Attachment B1**).

### Respondent Comment

*Department of Environment and Resource Management states that the proponent should provide additional information detailing exactly how potential water management options will manage the forecast quantities and qualities of associated water (acknowledging that these estimates may vary).*

### Santos Response

An associated water management plan has been developed and includes management options for associated water and forecast quantities and qualities. Refer to **Attachment D3** for details.

### Respondent Comment

*Department of Environment and Resource Management states that the transfer of reverse osmosis concentrate containment ponds to landholders should only take place following safe removal of reverse osmosis concentrate and other contaminants from the ponds.*

### Santos Response

The CSG field EMP has been updated with the following text:

#### **Associated Water Management**

- Water management ponds will only be transferred to landholders once contaminants of concern have been removed.

Refer to **Attachment B** for all revised EMPs.

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### Respondent Comment

*Department of Environment and Resource Management state that the EM plan should detail how erosion control measures will be implemented and how on-farm runoff control works re-instated.*

### Santos Response

The CSG field EMP has been updated with the following text:

#### **Soil and Erosion Management**

- Install, maintain and monitor erosion and sediment control devices (e.g. berms, silt fences, jute matting) so that ground is stable and vegetation cover is maintained.
- Ensure that runoff control devices (e.g. whoaboys) are maintained to prevent erosion.
- Carry out excavation works in conformity with the provisions of the construction EMP.
- Install sediment fencing around active erosion adjacent to watercourses as needed to keep areas stable.
- Remove and stockpile topsoil where excavation or subsidence remediation is to occur. Replace topsoil as soon as practicable after works have finished.
- Empty sediment control devices after heavy rain.
- Contain any slurry leaks as soon as practicable. Consider erosion potential, sedimentation and land contamination issues when formulating incident specific emergency responses.
- Repair replaced or ineffective erosion and sediment controls as soon as practicable.
- Containment devices (e.g. sediment) will be used to preserve stockpiled soils to prevent siltation of any land surface water or blockage of any existing drainage channels.
- Where erosion management structures are impacted they will be reinstated as quickly as practicable or alternative structures erected to retain an adequate level of erosion control.

Refer to **Attachment B** for all revised EMPs.

## **11.2 Objectives**

No submissions were received for this section.

## **11.3 Links to EIS**

No submissions were received for this section.

## **11.4 Legislation**

No submissions were received for this section.

## **11.5 Santos Environmental, Health and Safety Management System (EHSMS)**

No submissions were received for this section.

## **11.6 Responsibilities**

No submissions were received for this section.

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### 11.7 Monitoring Programs

No submissions were received for this section.

### 11.8 Reporting and Auditing

No submissions were received for this section.

### 11.9 Training and Communications

No submissions were received for this section.

### 11.10 Review

No submissions were received for this section.

### 11.11 Description of Relevant Petroleum Tenures

No submissions were received for this section.

### 11.12 Description of Relevant Petroleum Activities

#### Respondent Comment

*Department of Environment and Resource Management states that erosion control measures such as 'whoa boys' (also known as check, cross or roll-over banks) should be implemented to reduce concentration of water flow along the pipeline and access tracks.*

#### Santos Response

The CSG field EMP in section 11.16.8 of **Attachment B1** has been updated with the following text:

#### **Clearing and Grading**

- Ensure that runoff control devices (e.g. whoaboys) are maintained to reduce the concentration of water flow along the pipeline and access tracks and to prevent erosion.

Refer to **Attachment B** for all revised EMPs.

#### Respondent Comment

*Department of Environment and Resource Management state that the proponent should adopt the following mitigation measures:*

- *Clearing should be by hand, or lopped, to protect the bank of the watercourse.*
- *Retaining the root mass is especially important for sodic soils, to minimise the risk of tunnel erosion.*
- *Where cleared vegetation is stockpiled, measures should be taken to avoid concentration of overland flows.*

#### Santos Response

All trench spoil will be re-used as backfill after the pipeline is laid, covered with top soil and rehabilitated.

The CSG field and gas transmission pipeline EMPs have been updated with the following text:



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### Clearing and Grading

- Clearing for pipelines in riparian vegetation will be kept to a minimum to safely construct the pipeline and meet other environmental requirements by the following measures:
  - Where practicable, clearing of watercourses will be conducted by hand if required to protect the bank of the watercourses;
  - Retain the root mass, especially in sodic soil areas; and
  - Where cleared vegetation is stockpiled, measures should be taken to avoid concentration of overland flows.

Refer to **Attachment B** for all revised EMPs.

### Respondent Comment

*Department of Environment and Resource Management states that the proponent should ensure trench spoil that contains sodic material will not be spread on the land surface.*

### Santos Response

Trench spoil that contains sodic material will not be spread on the land surface. Any sodic material will be incorporated with material used to backfill the trench after the pipeline is laid, covered with topsoil and rehabilitated.

The CSG field and gas transmission pipeline EMPs have been updated with the following text:

### Trenching

- Trench spoil containing sodic material will not be spread onto land.

Refer to **Attachment B** for all revised EMPs.

## 11.13 Description of Environmental Values, Potential Impacts and Proposed Management Strategies

No submissions were received for this section.

## 11.14 Rehabilitation Program and Financial Assurance

No submissions were received for this section.

## 11.15 CSG Fields Environmental Plan Overview

### Respondent Comment

*Department of Environment and Resource Management requested to amend the EM plans to include sufficient information to meet section 310D of the EP Act.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure they are in compliance with section 310D of the EP Act. Refer to **Attachment B** for all revised EMPs.

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### Respondent Comment

*Department of Environment and Resource Management states that environmental management commitments and processes should be taken from the EHSMS and incorporated into the Supplementary EIS and EM plans.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure that, where applicable, environmental management commitments and processes from Santos' EHSMS have been incorporated into the revised EMPs. Refer to **Attachment B** for all revised EMPs.

### Respondent Comment

*Department of Environment and Resource Management states that the EM plans should be reviewed to ensure that all performance criteria and actions that contain qualifiers are re-written to clarify the performance standards expected of contractors and others given the responsibility to implement the plan.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure they outline expected performance standards of contractors and note appropriate responsibilities. The EMPs are designed to be dynamic documents, which will be reviewed and revised as the project progresses. Refer to **Attachment B** for all revised EMPs.

### Respondent Comment

*Department of Environment and Resource Management states that the EM plans should be amended to provide the planned additional detail to allow preparation of appropriate approval conditions.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure they are appropriate for approval conditions. It is envisaged that the final EMPs for each component of the project will provide additional, more detailed guidance for construction and operational personnel, regulators and stakeholders prior to the application for the necessary authorities. Refer to **Attachment B** for all revised EMPs.

### Respondent Comment

*Department of Environment and Resource Management states that the EM plans should be revised to provide a clear distinction between various legislative requirements and approvals sought, including those relating to the IPA, P&G Act, EP Act and the Dangerous Goods Safety Management Act 2001.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure they provide a clear distinction between various legislative requirements and approvals sought. Refer to **Attachment B** for all revised EMPs.

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### Respondent Comment

*Department of Environment and Resource Management states that the project EM plans should commit to establishing Biodiversity Offset Strategy and Management Plans based on the policy, principles and requirements of the draft Queensland Government Policy for Biodiversity Offsets.*

### Santos Response

All of the EMPs have been updated with the following text:

- A Environmental Offsets Management Plan will be developed and implemented for significant vegetation communities over an appropriate time frame to accomplish the following specific aims:
  - Identification of suitable potential offset areas with ecological values analogous to impacted ecological communities;
  - Assessment of the ecological value and equivalence of offsets to ensure suitable offset extent, species assemblage, floristic structure and ecological integrity utilising an appropriate biometric field methodology;
  - Development of appropriate management prescriptions to ensure long term viability of offsets (such as pest control, livestock management, access exclusion, ameliorative plantings and fire regime management);
  - Placement of appropriate covenants for future conservation and management of offsets;
  - Development of appropriate monitoring, maintenance activities and performance review processes to ensure long term viability of the offsets; and
  - The process of developing a suitable environmental offset management plan will be an iterative process with State and Commonwealth regulatory bodies.

Refer to **Attachment B** for all revised EMPs.

Ecofund has been engaged by Santos to provide advice on offsets identification and implementation.

### Respondent Comment

*Department of Environment and Resource Management states that the EM plans should be reviewed to ensure that all performance criteria and actions that contain qualifiers are re-written to clarify the performance standards expected of contractors and others given the responsibility to implement the plan. The performance standards should be clear, unambiguous and auditable. This should also ensure that any subsequent EM plan revisions are equally clear.*

### Santos Response

Santos has reviewed and revised the EMPs for the EIS to ensure that performance standards expected are clearly stated. Refer to **Attachment B** for all revised EMPs.

## 11.16 Environmental Management Plans

### 11.16.1 Planning and Approval Processes

#### Respondent Comment

*Department of Environment Water Heritage and the Arts requested that the planning section needs to emphasise the avoiding of sensitive or listed communities or species.*



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*As a result of the two phase approach in the EIS, and the subsequent lack of information regarding (Phase 2) development related impacts, insufficient information has been provided to assess the impacts of the development phase of the project.*

### Santos Response

Although the full extent and precise location of the wells and associated infrastructure cannot be known at this time, in response to the public submissions, Santos has undertaken a supplementary assessment of the potential impact of the development of the CSG fields on ecological values of the area (**Attachment D5**). This assessment provides detail of impact analysis and field management protocols for the development of the CSG fields. The approach for this assessment has been developed in consultation with DEWHA and includes a number of key elements as follows:

- **Constraints mapping** – a detailed analysis of the ecological values of the RFDA within the CSG fields having regard to augmented desktop and field datasets;
- **Constraints classes** – identification and mapping of five classes of land within the RFDA with graduated levels of ecological sensitivity based on the constraints mapping;
- **Field Management Protocol** – development of a field management protocol which describes the nature of development which may be undertaken within each of the constraints classes, the process to settle the specific location of the development within each constraints class having regard to the ecological values of the area and mitigation measures;
- **Indicative Field Development Plan** – identification of a FDP for the RFDA with preliminary locations for the wells and associated infrastructure;
- **Supplementary Impact Assessment** - an evaluation of potential impacts on ecological values of the development of the CSG fields based on three scenarios derived from implementation of the field management protocol to the field development plan;
- **Mitigation Measures** – identification of mitigation measures additional to measures outlined in the EIS; and
- **Offset Strategy** – outlining the basis of an Environmental Offset Management Strategy to offset ecological values impacted by the GLNG Project by offsite measures (such as property acquisition, covenants and reserve dedications).

## 11.16.10 Rehabilitation

### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) requested that the restoration of Class A - GQAL should be completed to the best standard possible. QPIF recommends that the proponent provide existing examples (in their Santos projects) or undertake pilot studies to demonstrate to the affected landholder that the proposed rehabilitation measures will be effective before soil disturbance/excavation from the laying of pipelines, construction of access roads, drilling pads and water storages has occurred where Class A - GQAL areas are impacted. Careful consideration should be given to effective classification of soil structure and soil capability before and after operations and turnaround times to re-establish this prior condition as the Operational Policy or Management Objective in Section 11.16.10 stipulates.*

### Santos Response

Santos is committed to working in partnership with landholders to ensure that Class A GQAL is rehabilitated to an acceptable level. All landholders are consulted prior to disturbance on their land. The consultation includes; a description of the proposed activities, the footprint of disturbance, the preferred location of the disturbance and the appropriate rehabilitation measures to be undertaken progressively as works are completed.

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Additionally the CSG field EMP makes the following commitments:

- Representative rehabilitation sites will be established and monitored to assess the success of rehabilitation and provide benchmarks for future rehabilitation works;
- Imported topsoil, of an appropriate quality and weed free, may be required for repairs, and will only be used with landholder approval;
- A reseeding plan based on soil types, existing local vegetation characteristics and landholder preferences will be developed;
- Where disturbed areas are to be re-planted or reseeded, preference will be given to local native species. However, non-native and non-invasive grass seed stock may be used where approved by the landholders to provide environmentally acceptable short term surface stability;
- Fertilisers and soil supplements will be used only as necessary with the agreement of landholders and authorities;
- Fences or other barriers will be installed where appropriate and where approved by the landholder to minimise unauthorised access; and
- Any sites not displaying stability (after 12 months) will undergo additional rehabilitation using a method approved by the relevant authority or landholder.

Refer to **Attachment B** for all revised EMPs.

### 11.16.11 Associated Water Management

#### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) states that in addition to the points in Section 11.16.11 of the EIS, QPIF recommends that large water storages are required, such as those at water aggregation points, that the proponents avoid Class A - GQAL, and areas with a high connectivity with groundwater. This can be achieved both through field development planning using GQAL and aquifer mapping, but also through early engagement with landholders to negotiate suitable sites.*

#### Santos Response

Santos will identify with landholders who will be specifically affected by the development of wells and associated infrastructure and liaise with them directly to discuss the placement of project infrastructure.

The Associated Water Management Section of the Coal Seam Gas EMP has been updated to ensure that water storage areas will be located where practicable to avoid Class A GQAL and areas with high connectivity with groundwater. Refer to **Attachment B** for all revised EMPs.

#### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) states that where associated water will be used to irrigate agricultural land for the purposes of disposal, the proponents should comply with an Associated Water Management Plan that includes monitoring and compliance requirements, and which will contain and adaptive management plan as information on the impact of the associated water on resources is monitored.*

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### Santos Response

Where associated water will be used to irrigate agricultural land for the purposes of disposal, Santos will comply with its Associated Water Management Plan. The plan includes monitoring and compliance requirements and has the following objectives:

- Develop a viable long term plan that provides the best net environmental, social and economic outcomes for the region, whilst considering Santos' operational requirements;
- Develop an adaptive AWMP that can be updated periodically and continually improved with new AW production rates, new monitoring data and with advances in science and technology (e.g. water treatment); and
- Promote and adopt Department of Environment Resources Management (DERM) preferred uses of AW and, where ever possible, add value to the local environment and economy.

The CSG field EMP has been updated with the following text:

#### **Associated Water Management**

- Associated water which is to be used to irrigate agricultural land will comply with Santos' Associate Water Management Plan.

Refer to **Attachment D3** for the AWMP and **Attachment B** for all revised EMPs.

### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) states that where water is used in operations such as dust suppression (both public and private access roads or along the transmission pipeline corridor) it is recommended that the water be treated and applied in such a way to minimise the accumulation and concentration of runoff in adjacent areas to avoid the contamination of farm soil and nearby water storages.*

### Santos Response

The CSG field EMP has been updated with the following text:

#### **Associated Water Management**

- Water of an appropriate standard as determined by DERM will be used in operations for dust suppression. Alternatively, water will be treated and applied in such a way to minimise the accumulation and concentration of runoff in adjacent areas to avoid the contamination of farm soil and nearby water storages.

Refer to **Attachment B** for all revised EMPs.

The revised Associated Water Management Plan is in **Attachment D3**.

### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) states that as a condition of its provision to landholders by the proponent, any associated water supplied for agricultural activities must be accompanied by a complete water quality analysis (which must include an evaluation of sodicity and salinity risks for locally prevailing soil types as well as other relevant water quality information) and an evaluation of the expected quantity of this water and the duration of its availability.*

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### Santos Response

The CSG field EMP has been updated with the following text:

#### **Associated Water Management**

- Associated water which is supplied to landholders for agricultural purposes is to be accompanied by a complete water quality analysis and information with respect to the expected water quantity and duration water will be made available.

Refer to **Attachment B** for all revised EMPs.

### 11.16.15 Weed Management Plan

#### Respondent Comment

*Banana Shire Council recommends the proponent develop strategies for regular monitoring and control of weeds during the operation phase of the pipeline.*

*Banana Shire Council states the proponent should clarify the meaning of 'designated weed wash down area'. If the wash down facilities are to be constructed by the proponent onsite, Council advises that all vehicles, equipment and portable infrastructure, will still be required to washdown at established Shire facilities located in Taroom, Biloela, Theodore and Moura, by a trained Weed Inspector prior to arrival and leaving the Shire.*

*Banana Shire Council states that the Weed Certification needs to be issued by an authorized officer, under the Land Protection Act 2002 Part 2 section 244.*

*Banana Shire Council states that under the LPA all local government areas required to have pest management plans. The plans are to be developed in consultation with the community and with input from government agencies about lands they manage. The plans must be consistent with state strategies, principles of pest management and guidelines for pest management. Plans remain valid for four years and must be reviewed at least three months before the start of each financial year.*

#### Santos Response

Santos remains committed to proactive management of weeds and feral animals. All of the EMPs have been updated with our weed management protocols. Refer to Section 11.16.15 of the CSG field EMP (**Attachment B1**).

### 11.16.25 Social and Community

#### Respondent Comment

*Queensland Primary Industries and Fisheries (Department of Employment, Economic Development and Innovation) comments that there are a number of potentially positive and negative flow-on effects from cumulative impacts of the potential CSG industry beyond the GLNG Project on rural and regional communities, but of most relevance to primary industries is:*

- *The increased strain on services available to primary producers (particularly freight);*
- *Reductions in labour availability to primary industries as the CSG industry partially absorbs the local workforce if labour is sourced locally. Importantly, this can be a positive impact on the community by offsetting losses in agricultural enterprises in challenging economic or climatic conditions; and*

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- *The higher salaries paid by CSG companies will place pressure on producers to match those salaries to retain or attract skilled workers, further impinging on the economic viability of agricultural enterprises.*

*Mechanisms to address these issues should be included in the proposed Social Management Plan as per Section 11.16.25 of the EIS.*

### Santos Response

Santos will work closely with the QPIF to ensure their concerns are addressed and incorporated into the social management plan which is being developed. A supplementary CSG Fields Social Impact Study is in **Attachment D1**.

## 11.16.27 Incidents and Complaints

### Respondent Comment

*Queensland Police Service requested that the proponent should engage with the Queensland Police Service in the development of the Transport and Traffic Management Plan. The appropriate member to provide input is the Officer in Charge, Gladstone District Traffic Branch through the District Officer, Gladstone Police District.*

*Incidents and complaints regarding traffic and transport movements should be forwarded to the Officer in Charge, Gladstone District Traffic Branch to ensure the appropriate strategies are developed for prevention, consultation and enforcement where necessary.*

### Santos Response

All of the EMPs transportation sections have been updated with the following text:

- Santos will work closely with QPS (and in particular with the Officer in Charge, Gladstone District Traffic Branch) when developing the Transport and Traffic Management Plan.

Refer to **Attachment B** for all revised EMPs.