

## 1. INTRODUCTION

Arrow CSG (Australia) Pty Ltd (Arrow Energy) proposes to develop a liquefied natural gas (LNG) plant on Curtis Island off the central Queensland coast, near Gladstone (Figure 1.1). The project, known as the Arrow LNG Plant, is a component of the larger Arrow LNG Project.

An environmental impact statement (EIS) has been prepared for the project under Part 4 of the *State Development and Public Works Organisation Act 1971* (Qld) (SDPWO Act) and s. 133 of the *Environment Protection and Biodiversity Conservation Act 1999* (Cwlth) (EPBC Act). Coffey Environments Australia Pty Ltd (Coffey Environments) was commissioned to assist Arrow Energy in preparing the Arrow LNG Plant EIS (Coffey Environments, 2012). The EIS will inform a decision on whether the project should proceed and, if so, under what conditions.

The EIS was submitted to the Queensland Coordinator-General in December 2011 and finalised in March 2012. The EIS placed on public exhibition from 14 April 2012 to 28 May 2012. Twenty-nine submissions relating to the EIS were received from government agencies and the public by the Coordinator-General during this time.

Under s. 35 the SDPWO Act, following the receipt of public submissions and prior to preparing an EIS evaluation report, the Coordinator-General may ask a project proponent to provide additional information or comment about the EIS or the project. The Arrow LNG Plant Supplementary Report to the Environmental Impact Statement (SREIS) has been prepared for this purpose.

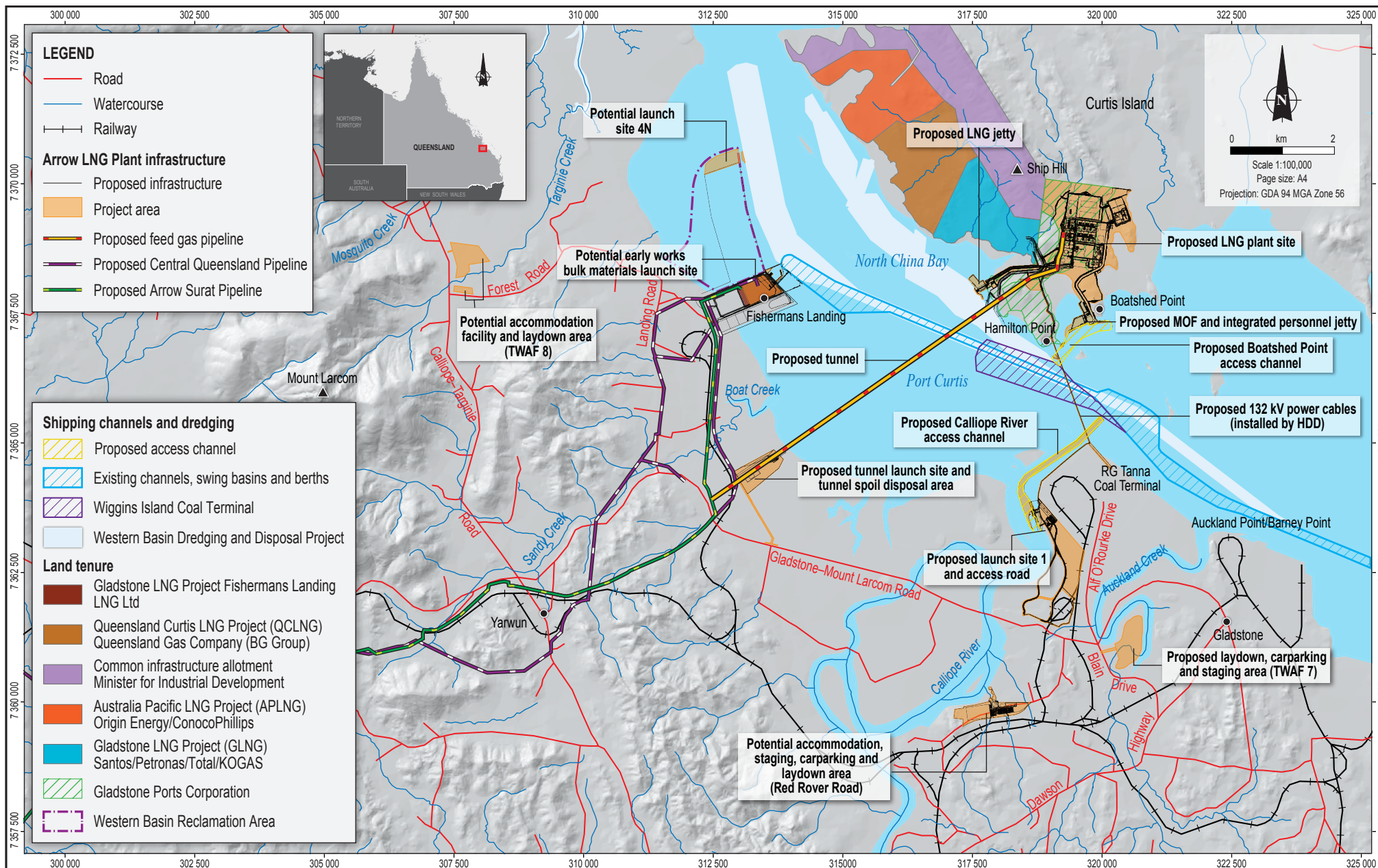
This chapter provides a brief description of the project and sets out the objectives and structure of the SREIS.

### 1.1 Project Background

Key elements of the project include the LNG plant, a feed gas pipeline, dredging and disposal works, and ancillary facilities. Ancillary facilities include options for power generation; marine facilities, such as the LNG jetty for receiving LNG carriers, a materials offloading facility (MOF) and integrated personnel jetty for receiving supplies; and large construction modules to build the plant.

Front-end engineering design (FEED) for the project was completed in July 2012. This resulted in a number of changes to the project as it was described in chapters 6, 7 and 8 of the Arrow LNG Plant EIS (Coffey Environments, 2012).

An overview of each component of the project is provided below. A fuller description of the design changes for each element is presented in Chapter 4, Project Description: LNG Plant; Chapter 5, Project Description: Feed Gas Pipeline; and Chapter 6, Project Description: Dredging. In addition, Chapter 7, Project Description: Logistics, has been included as a consolidated description of logistical arrangements for personnel accommodation and transport and for materials and equipment transport during the construction and operation phases of the project.



Source:  
Place names and roads from DME. Watercourses from Alluvium.  
Project area from Coffey Environments, pipelines, proposed auxiliary facilities and marine infrastructure from Arrow Energy.  
Launch site 1 access route, proposed feed gas pipeline, proponents and DEM from Coffey Environments.  
Western Basin Dredging Master Plan from Gladstone Ports Corporation.

**coffey**  
environments

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**Arrow Energy**

**Arrow LNG Plant**

**arrow**  
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**Site locality**

Figure No:

**1.1**

### 1.1.1 LNG Plant and Ancillary Facilities

The LNG plant will be developed in two stages, with a total capacity of four LNG trains producing up to 18 million tonnes per annum (Mtpa). Each LNG train will have a nominal capacity of 4 to 4.5 Mtpa. Major infrastructure and plant components that will form a part of the project development include the four LNG trains, three LNG storage tanks, LNG loading lines, marine infrastructure, feed gas pipeline and tunnel crossing of Port Curtis, construction camp, a 115-m-high flare stack, power generators and auxiliary power import, administrative buildings and workshops.

Stage 1 of the development will involve the construction and operation of the first two LNG trains (trains 1 and 2), associated utilities, two LNG storage tanks and ancillary facilities. Site preparation during stage 1 will include development of cut benches for all four LNG trains. The cut benches for trains 3 and 4 will commence during stage 1 only so far as fill material is required for stage 1 and then will be completed during stage 2 of the development.

LNG trains 3 and 4, additional utilities and a third LNG tank will be constructed in stage 2, bringing the LNG plant to a total capacity of up to 18 Mtpa. First LNG from train 1 is planned for 2017, with train 2 commencing operations approximately 6 to 12 months later. Market conditions will determine the timing of the construction of stage 2, with a similar offset expected between trains 3 and 4 commencing operations.

### 1.1.2 Feed Gas Pipeline and Tunnel

An high-pressure feed gas pipeline, approximately 9.5 km long with a 48-inch (1,219-mm) outer diameter, will supply gas to the LNG plant from the pipeline's connection to the proposed Arrow Surat Pipeline on the mainland, near Rio Tinto's Yarwun alumina refinery. The feed gas pipeline will be constructed in three sections:

- A short length of feed gas pipeline will run from the proposed Arrow Surat Pipeline to the tunnel launch shaft, which will be located on a mudflat south of Fishermans Landing, just south of Boat Creek. This section of pipeline will be constructed using conventional trenching methods within an approximately 40-m-wide construction right of way to a point adjacent to the shoreline. A small tunnel boring machine will then excavate an inclined tunnel from the surface to the base of the tunnel launch shaft to allow installation of the gas pipeline into the tunnel.
- The second section of the feed gas pipeline will traverse Port Curtis in a tunnel (known as the Curtis Island Link) to be bored under the harbour from the launch shaft on the mainland to a receival shaft on Hamilton Point. The tunnel under Port Curtis will have an excavated diameter of up to approximately 6 m and will be constructed by a tunnel boring machine that will commence boring at the mainland launch shaft. Tunnel spoil material will be processed through a desanding plant to remove bentonite and water. The spoil will comprise mainly a finely graded fill material, which will be deposited in a spoil placement area established adjacent to the launch shaft.
- From the tunnel reception shaft on Hamilton Point, the third section of the feed gas pipeline will cross the LNG loading lines to run up the western side of the proposed LNG plant to the gas inlet station, which will be located west of trains 1 and 2. This section will be constructed using conventional trenching methods within an approximately 40-m-wide construction right of way.

### 1.1.3 Power Generation and Supply

Two power options are being considered for the LNG plant. The base case, referred to as 'power island mode', is for all power for site operations to be generated using gas turbine generators onsite. The second option, referred to as 'partial auxiliary import power mode', is for the gas turbine generators to be supplemented by importing auxiliary electrical power to the Arrow LNG Plant site during both construction and operations. Under this option, a permanent electrical connection would be established from the LNG Plant on Curtis Island to the Gladstone North Substation on the mainland via ducts installed by separate horizontal directional drilling (HDD) under Port Curtis from a point adjacent to RG Tanna Coal Terminal to the southern end of Hamilton Point. The preferred option will be determined closer to commencement of construction.

### 1.1.4 Dredging

Dredging to facilitate construction and operation of the project will be required at the materials offloading facility (MOF) and personnel jetty at Boatshed Point, at the LNG jetty at Hamilton Point and within the Calliope River or Port Curtis for launch site 1 or 4N, respectively. Of all potential sites, the majority of the dredging would be associated with launch site 1 and would occur in the Calliope River to facilitate vessel access. Dredging required for LNG shipping access to Port Curtis has been assessed under the approved Gladstone Ports Corporation Western Basin Dredging and Disposal (WBDD) Project EIS (GHD, 2009a). Maintenance dredging may be required in the Calliope River to provide access to launch site 1 and, to a lesser extent, at the MOF and personnel jetty on Curtis Island (see Figure 1.1).

The preferred dredge spoil disposal option is to place the dredge spoil in a combination of existing, approved disposal areas and facilities, in consultation with Gladstone Ports Corporation. Options presently under discussion include the disposal of:

- Boatshed Point MOF and personnel jetty dredge spoil to the East Banks Sea Disposal Site.
- LNG jetty and launch site 4N dredge spoil to the East Banks Sea Disposal Site or the Western Basin Reclamation Area.
- Launch site 1 dredge spoil to the East Banks Sea Disposal Site or the Wiggins Island Coal Terminal reclamation areas.

### 1.1.5 Logistics

Construction and operation of the project will involve a range of logistical considerations, including accommodation and daily transport of the workforce and the delivery of equipment and materials to Curtis Island via road and sea.

To facilitate transport to the island, a mainland launch site will be built on the mainland. Existing mainland marine facilities will be utilised during early works until such time that the new launch site is completed. On Curtis Island, the MOF will be capable of receiving passenger ferries and barges from the mainland, as well as ships carrying goods and LNG plant modules direct from overseas. Existing or temporary materials offloading facilities will also be utilised on Curtis Island while the Arrow Energy MOF is under construction.

The majority of the fly-in, fly-out construction workforce will be housed in a 2,500-person construction camp at Boatshed Point on Curtis Island. Early works personnel and peak construction workforce personnel unable to be accommodated on Curtis Island will be housed on

the mainland, preferably in third-party workers' accommodation facilities. Workers housed in mainland camps or based locally (including Arrow Energy and EPC contractor management) will travel daily to Curtis Island.

## 1.2 Objectives of the SREIS

The objectives of the SREIS are to:

- Update the government and the public on changes to the project description that have occurred since the publication of the EIS.
- Address terms of reference requirements for which information was unavailable at the time of publishing the EIS.
- Provide an update on the consultation undertaken for the project.
- Provide technical responses to issues raised in submissions.
- Review and confirm Arrow Energy's project commitments.
- Provide recommendations to the Coordinator-General in relation to the Arrow LNG Plant.

## 1.3 Structure of the SREIS

The SREIS comprises three parts. **Part A** is structured similarly to the Arrow LNG Plant EIS Main Report and presents:

- An update on consultation undertaken for the project (Chapter 2).
- Further assessment of alternatives (Chapter 3).
- An updated project description (chapters 4, 5 and 6), which details changes to the LNG plant, ancillary facilities and pipeline design and to dredging requirements. Details of logistics arrangements that were unavailable at the time of preparing the EIS are also supplied (Chapter 7).
- Changes to potential environmental impacts arising from the revised project description (chapters 8 to 21). In some instances, this includes the results of additional, targeted technical studies, with the full studies presented in appendices 1 to 16.
- Updates to legislation, matters of national environmental significance, management plans, offsets strategy and project commitments are presented in attachments 1 to 7.

**Part B** relates to submissions and presents:

- The register of submissions and issues (private names have been withheld).
- A summary of issues raised in submissions.
- Arrow Energy's response to submissions.

In the case of Arrow Energy's response to submissions, cross-reference is provided either to the EIS or to the SREIS, Part A. Alternatively, issues are noted or responses are grouped by topic and provided in Part B.

**Part C** presents conclusions and supporting sections that are relevant to the entire SREIS (i.e., study team, references and glossary).