VOLUME C

DREDGING AND DREDGE MOVEMENTS

C1

DREDGING AND DREDGE MOVEMENTS

INTRODUCTION

CONTENTS

FIGURES

1.1 DREDGING AND RECLAMATION INTRODUCTION

The proposed Sunshine Coast Airport (SCA) Expansion Project (the Project) requires approximately 1.1 M m^3 of fill material for construction of the new runway. It is proposed to source sand from the Spitfire Realignment Channel using a dredger and transporting to a pump-out site located offshore of the SCA. The sand will be hydraulically pumped ashore via a delivery pipeline to the sand placement area.

The dredging activities are detailed in Chapter A5, and summarised in Section 1.1.1. The planning and approvals associated with dredging are described in Chapter A6.

This part of the Environmental Impact Statement (EIS) reports on the investigations and environmental issues involving the extraction of sand from the Spitfire Realignment Channel in northern Moreton Bay, which is to be used as the source of fill for the Project. It addresses the operation of the dredger at the proposed extraction site as well as general vessel operations associated with the construction phase.

Investigations and environmental issues related to the dredge pump-out operations that are to be located offshore from Marcoola Beach and the associated sand delivery pipeline are addressed in Volume B of the EIS: Airport and Surrounds.

Part C includes the following chapters:

- **Chapter C2 – Marine Geology and Soils:** Describes the geology of the northern Moreton Bay tidal delta and characteristics of material to be extracted from the Spitfire Realignment Channel area.
- **Chapter C3 – Coastal Processes and Water Quality:** Describes the baseline conditions in northern Moreton Bay where sand extraction is proposed. This includes a review of relevant coastal processes (including hydrodynamics, sedimentation patterns and shoreline processes) as well as ambient water quality. Numerical modelling, as outlined in this chapter, examines the potential impacts from sand extraction on these coastal processes including the extent and duration of sediment plumes generated by the operation of the dredger.
- **Chapter C4 – Marine Ecology:** Describes the ecological baseline conditions in northern Moreton Bay where sand extraction is proposed. This includes a desktop review based on previous studies in the bay, as well as results of field surveys undertaken as part of the current study. Impacts are assessed on marine ecology based on the direct impacts of dredging on the seabed as well as indirect impacts identified in the coastal and water quality modelling presented in Chapter C3.
- **Chapter C5 – Shipping Traffic:** Provides an overview of the current shipping traffic and recreational boating in the area of interest and the potential implications of dredger movements during sand extraction and when travelling to and from the pump-out location at Marcoola.
- **Chapter C6 – Other Considerations:** This chapter addresses a range of other considerations relevant to the proposed sand dredging, including cultural heritage, social impacts, landscape and visual impacts, noise impacts and maritime safety and navigation issues.

  Mitigation measures and monitoring recommended within the chapters of this part are addressed in Volume E in the context of the Dredge Management Plan (Chapter E3) and in the context of the Risk Management Plan (Chapter E5).

1.1.1 Summary of proposed dredging activities

The preferred sand extraction area for the Project is the Spitfire Realignment Channel, located in Moreton Bay east of Woorim. **Figure 1.1a** shows the location of the proposed dredging site. Port of Brisbane Pty Ltd (PBPL) currently has a 15 M m^3 allocation over this area, and the dredging for the Project would occur within the same footprint. Additional details of PBPL's proposed dredging is provided in Chapter A5.

Based on the interpretation of the information available at the time of the EIS, the Spitfire Realignment Channel was assessed as likely to yield sufficient quantity of sand (1.1 M m^3) that will be suitable for the Project. The dredged material will comprise predominantly fine to medium-grained sand. Chapter C2 describes the baseline geotechnical conditions of the Spitfire Realignment Channel, and the engineering qualities of the material in the extraction area based on existing geotechnical information.

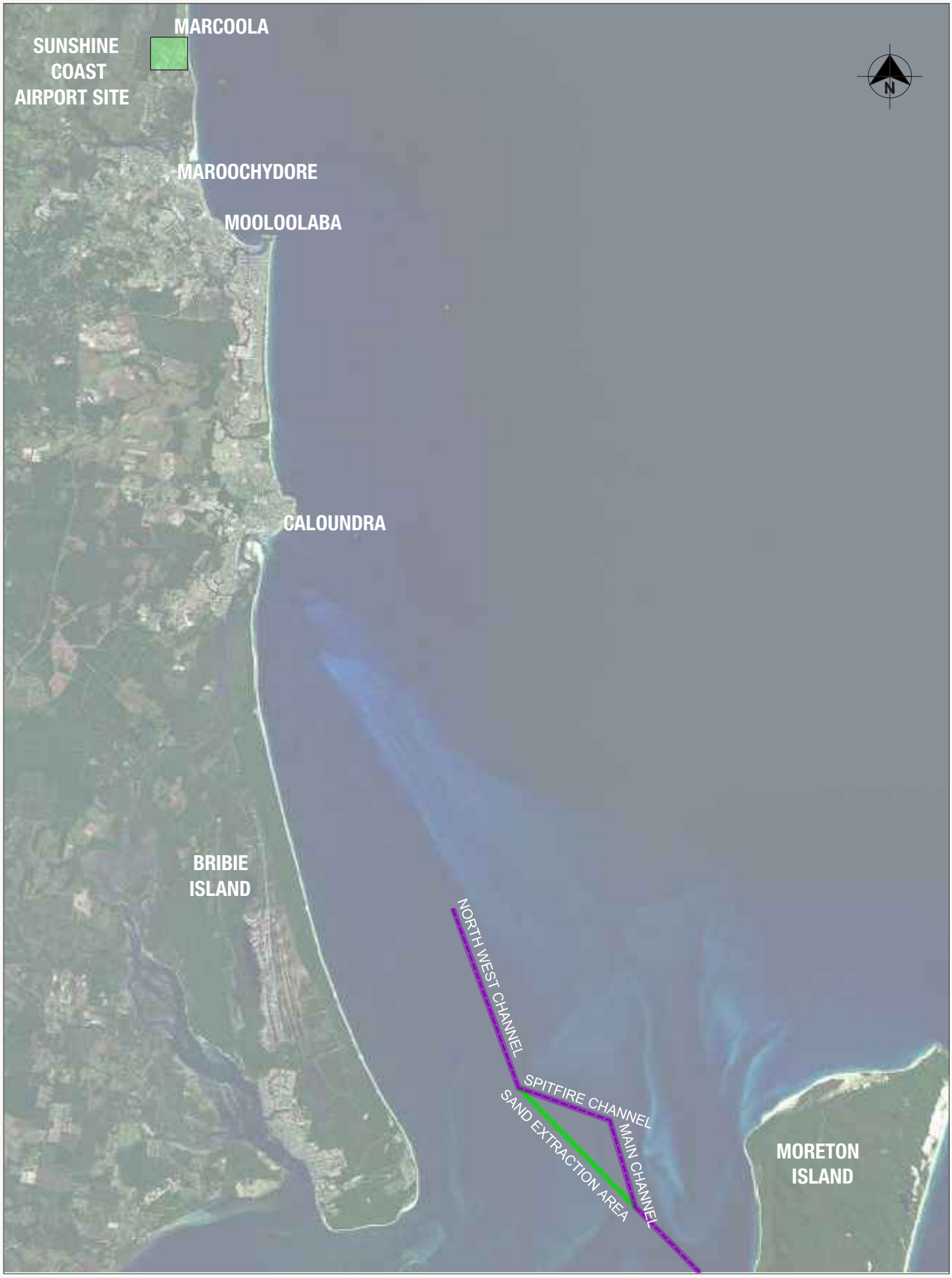
It is anticipated that the dredging will be undertaken using a trailing suction hopper dredger (TSHD). The dredger uses a trailing suction drag head connected to inboard pumps by a suspended suction pipe to extract sand from the seabed. The dredged sand will be stored in the on-board hopper to be transported to the pump-out site at Marcoola. From the pump-out site, sand will be pumped to the new runway site as a sand-water mixture through a large diameter (1,000 mm) steel pipeline.

Given the volume of sand, travelling distance between the sand extraction area and Project site, and the distance from the pump-out site to the runway location, it is anticipated that a small to medium-sized TSHD is most likely to be used for the Project.

Based on an assessment of vessel efficiency (refer Chapter A5), the reference vessel has a hopper capacity of 8,000 m^3 to 10,000 m^3, length up to 180 m, beam of up to 30 m and draught of up to 12.5 m. A vessel this size may require a land-based booster pump station, as discussed in Chapter A5. Nevertheless, the final selection of the dredger will depend on:

- Market conditions and the location of available dredgers at the time of the works
- The seabed bathymetry in the Spitfire Realignment Channel at the time of dredging operations

Figure 1.1a: Sand extraction area: Spitfire Realignment Channel



- The distance from the pump-out site to the reclamation area, sand characteristics (coarser sand requires greater pumping power) and whether a booster pump will be used, and
- Any environmental constraints to the duration and timing of the works.

The dredging operations will be undertaken by a TSHD working on a 24-hour basis and working during most weather conditions. It is anticipated that works would stop for a 12 to 24 hour period every fortnight to refuel, undertake maintenance, and take on supplies. It is estimated that a cycle of sand extraction and delivery would take 7 to 10 hours, indicating that 2 to 3.5 cycles would be completed each day, as detailed in Chapter A5.

The TSHD will follow the existing shipping channels in port-controlled waters to the Fairway Beacon at Point Cartwright. From there, it would typically take the shortest route with the available depth of water, with the final navigation route to be determined through consultation between the dredging contractor and Marine Safety Queensland/Regional Harbour Master. An indicative navigation path is shown in **Figure 1.1b**.

It can be expected that the dredger will experience some delays navigating to and from the site because of interactions with shipping traffic at the port. Should a deep draught TSHD be deployed, there may be some additional minor delays from channel depth constraints.

The dredger used for the works will need to comply with the environmental requirements of the Project, which are outlined in the Dredge Management Plan in Chapter E4.

Figure 1.1b: Indicative navigation route for the dredger