Gold Coast Airport Pty Ltd

Major Development Plan

Part A | February 2016

Gold Coast Airport

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Key Contacts

Gold Coast Airport Pty Ltd

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Department of Infrastructure and Regional Development

Airport Building Controller	(07) 3216 3040
Airport Environment Officer	(07) 5536 8426

Airservices Australia

Noise Complaints and Information Service

1800 802 584 or 1300 302 240 (free call)

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Resource Coordination Partnership

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Glossary

Term	Definition
Airport Activities	Activity or activities undertaken by airport operator(s).
Air Traffic Control	Air traffic control service provided by Airservices Australia.
Airport Building Controller (ABC)	Position appointed by the Secretary of the Federal Department of Infrastructure and Regional Development to administer regulatory functions in relation to airport building control matters.
Airport Operator	A person or organisation operating a business; carrying out an activity, dealing, operation, process or work; and operation of any facility, plant, machine or equipment on Gold Coast Airport. Includes Gold Coast Airport Pty Ltd staff, all tenants and contractors.
Airside	The movement area of an airport, adjacent terrain and buildings or portions thereof, access to which is controlled.
Apron	The part of an airport used: → For the purpose of enabling passengers to board, or disembark from aircraft; → For loading cargo onto, or unloading cargo from, aircraft; and/or → For refuelling, parking or carrying out maintenance on aircraft.
Code C Aircraft	A Code C aircraft is an aircraft that has a wingspan of 24 metres up to but not including 36 metres and an outer main gear span of six metres up to but not including nine metres, For example, a Boeing 737 or Airbus A320.
Code E Aircraft	A Code E aircraft is an aircraft that has a wingspan 52 metres up to but not including 65 metres and an outer main gear span of 9 metres up to but not including 14 metres. An example is a Boeing 747 or 777 or Airbus A330 or A340.
Contractor	A person or organisation engaged by Gold Coast Airport Pty Ltd or by a tenant of Gold Coast Airport Pty Ltd, to undertake an activity at Gold Coast Airport.
Control Tower	A unit established to provide air traffic control service to airport traffic.
Environmental Impact	Any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's activities, products or services.
Future Development Area	The part of the project footprint that contains elements of the master plan 20-year aviation development that do not form part of the Project LIFT scope of work. Work to be carried out within the future development area as part of Project LIFT includes site clearing and earthworks.
Gold Coast Airport	The extent of land leased by Gold Coast Airport Pty Ltd. This encompasses all operators at Gold Coast Airport, including staff, tenants and contractors.

Term	Definition
Gold Coast Airport Pty Ltd (GCAPL)	The airport lessee company (as defined under the *Airports Act 1996*) for Gold Coast Airport.
Major Development Plan (MDP)	A major development plan is required for each major development at an airport and is prepared by the airport-lessee company taking into account public comments. Part 5, Division 4 of the *Airports Act 1996* provides a full definition.
Master Plan	The Gold Coast Airport 2011 Master Plan.
Movement Area	That part of an airport used for the surface movement of aircraft, including manoeuvring areas and aprons.
Regular Public Transport	A service consisting of Regular Public Transport aircraft operations, as prescribed in the Civil Aviation Regulations.
Stand	Refers to the position on the apron where an aircraft is parked. One Code E aircraft or two Code C aircraft at a time.
Tenant	A sub-lessee or licensee or the airport lessee company.

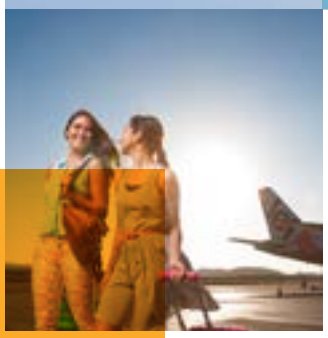
Abbreviations

Phrase/Acronym	Definition
ABC	Airport Building Controller
ACS	Australian Customs and Border Protection Service
AEPR	Airports (Environment Protection) Regulations 1997
AFP	Australian Federal Police
AHD	Australian Height Datum
Airports Act	*Airports Act 1996*
ALC	Airport-Lessee Company
ANEF	Australian Noise Exposure Forecast
AQIS	Australian Quarantine and Inspection Service
ARI	Average Recurrence Interval
CAGR	Compound Average Growth Rate
CASA	Civil Aviation Safety Authority
CIQ	Customs, Immigration and Quarantine
CEMP	Construction Environment Management Plan
DIRD	Federal Department of Infrastructure and Regional Development
DoE	Federal Department of Environment
EECs	Endangered Ecological Communities
EMS	Environmental Management System
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999*
ESA	Environmentally Significant Area
FOD	Foreign Object Debris
GCAPL	Gold Coast Airport Pty Ltd
GFA	Gross Floor Area
GPS	Global Positioning System
GSE	Ground Support Equipment
IATA	International Air Transport Association
ICAO	International Civil Aviation Organisation

Phrase/Acronym	Definition
ISO 14001	International Standards Organisation – Standard for Environment Management Systems (AS/NZS ISO 14001)
JUHI	Joint User Hydrant Installation
LAGS	Liquids, Aerosols and Gels Screening
LCC	Low Cost Carrier Airlines
LCCT	Low Cost Carrier Terminal
LEP 2014	*Tweed Local Environment Plan 2014*
LEP	Local Environment Plan
LUX	Luminous Flux
MDP	Major Development Plan
Minister	Minister for the Federal Department of Infrastructure and Regional Development
MNES	Matters of National Environmental Significance
MOS	Manual of Standards
MOWP	Method of Working Plan
NASF	National Airports Safeguarding Framework
NC Act	*Nature Conservation Act 1992*
NFPA	National Fire Protection Association
OLS	Obstacle Limitation Surface
OTS	Office of Transport Security
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations
QAL	Queensland Airports Limited
the Airport	Gold Coast Airport
the project	Gold Coast Airport Project LIFT
RPT	Regular Passenger Transport
SPP	Queensland State Planning Policy
T1	Terminal 1, Gold Coast Airport
T2	Terminal 2, Gold Coast Airport
TSC Act	*Threatened Species Conservation Act 1995*

project LIFT

Let's Invest for Tomorrow



Part A

Project Description and Justification

1.0 Introduction

1.0 Introduction

Gold Coast Airport (the Airport) is leased by Gold Coast Airport Pty Ltd (GCAPL) which is wholly owned and operated by Queensland Airports Limited (QAL), a non-listed public company. GCAPL operates the Airport under a Federal Government awarded 50-year lease with a further 49-year option. As a Commonwealth leased Airport, the Airport is regulated under the *Airports Act 1996* (Airports Act) by the Federal Department of Infrastructure and Regional Development (DIRD).

The Airport lease straddles the border between New South Wales and Queensland within the local government areas of Tweed Shire Council and the City of Gold Coast respectively as shown in **Figure 1.1.**

Currently the Airport is the sixth busiest international airport in Australia and the sixth busiest airport overall. The Airport's catchment area extends from Beenleigh in the north to Ballina in the south. The Airport primarily serves the south east Queensland/northern New South Wales tourism industry with leisure-based travel accounting for an estimated 75 per cent of all regular public transport (RPT) traffic. The Airport's passenger mix is spread between business and leisure, providing year round market stability.

GCAPL will enhance its existing facilities to address current capacity issues and cater for aviation forecasts as outlined in the Gold Coast Airport 2011 Master Plan (the Master Plan). The project, the subject of this Major Development Plan (MDP), is for the expansion of the existing terminal (T1) building, addition of RPT apron parking stands, a consolidated ground transport facility and realignment of the Airport's main drainage reserve. The development represents the first stage of aviation development in the southern portion of the airport lease and is in alignment with the long term planning objectives and development concepts outlined in the Master Plan.

The Gold Coast will host the Commonwealth Games in 2018 (the Games) which has provided the impetus to achieve completion of the terminal expansion, ground transport facility and first stage of apron expansion by the end of 2017 in time for this event. The provision of additional RPT apron stands and departure gates within this timeframe is consistent with commitments made in the Gold Coast's bid for the Games. This MDP also details a second stage of apron expansion following the Games to provide capacity to a design year of FY2023. This project marks a significant investment by GCAPL intended to provide the capacity for the next phase of the Airport's growth and more easily facilitate other future stages of expansion as described in the Master Plan. As such the project is named "Gold Coast Airport Project LIFT" which stands for **L**et's **I**nvest **f**or **T**omorrow (referred to in this MDP as "the project". Note that Project LIFT was previously referred to by the Airport as Project 2018).

The key aspects of the project include:

- Expansion of the existing T1 building including four aerobridges;
- Five additional aircraft parking stands up to a Code E standard (to be constructed in two stages) with associated taxiways;
- A consolidated ground transport facility
- Realignment of the Airport drainage reserve;
- Site preparation including earthworks and clearing.

The project is required to accommodate the current and future needs of civil aviation users of the Airport. Recent investigations have found that currently, the apron peak hour capacity is exceeded with a shortfall of two stands in the busy hour. By 2018, if no action were taken, this would have increased to a shortfall of three stands. An example of associated impacts in 2018 is that either two international aircraft or four domestic aircraft would not have been able to be accommodated in the busy hour impacting up to 374,000 passengers annually.

In addition to the shortfall in apron capacity, T1 is currently experiencing capacity issues during peak hour in the areas of check-in, international arrivals, international departure lounge, baggage handling and domestic baggage reclaim. Expansion of T1 and internal redevelopment of the building was required to allow it to function more efficiently and effectively, particularly during peak travel times.

1.1 Assessment of Impacts

Potential impacts associated with the project have been assessed in terms of both construction impacts and operational impacts. This assessment includes consideration of aviation operations, consistency with the Master Plan, state and local planning provisions and impacts to the environment. The environmental assessment includes geology and soils (including acid sulfate soils and contaminated land), groundwater, surface water quality, air quality, hydrology and flooding, terrestrial and aquatic flora and fauna, cultural heritage, noise and vibration, social and economic, climate change, visual impact, traffic and waste management.

Impacts across the broad range of environmental matters are generally able to be mitigated through the project design and management approaches such that the residual, adverse impacts are reduced to very low to low levels. Key exceptions to this situation are noted for the following areas:

Terrestrial Flora and Fauna: Significant residual impacts are likely to occur as a result of the clearing of Swamp sclerophyll forest Endangered Ecological Community (listed as endangered under the *New South Wales Threatened Species Conservation Act 1995)* in the project footprint. The project is also considered likely to have a significant impact on the following conservation significant fauna species and/or their habitat:

- Wallum Sedge Frog *(Litoria olongburensis)*;
- Wallum froglet *(Crinia tinnula)*;
- Common planigale *(Planigale maculata).*

Therefore direct and indirect offsets are being provided to mitigate residual, adverse impacts on conservation significant flora communities and fauna species present within the project footprint.

Indigenous Cultural Heritage: The Airport is situated within a broader area of high cultural significance to the Aboriginal people of the region. Vegetation clearing and ground disturbance for the project are likely to impact upon cultural heritage values in the project footprint.

The airport lease requires that GCAPL develops the Airport, having regard to anticipated future growth in, and pattern of, traffic demand to a standard reasonably expected of such an airport and to "good business practice," which amongst other matters requires GCAPL to provide facilities for the expeditious movement of passengers and other users. In order to meet this requirement of the airport lease, GCAPL has obtained approval to construct the project outlined in this MDP. This MDP demonstrates the project will achieve an acceptable balance between mitigation and offsetting of residual adverse impacts and the delivery of significant regional economic benefits.

1.2 The Major Development Plan Approval

The development is considered to be a "major airport development" as defined in s.89 of the *Airports Act 1996*. The triggers from the Airports Act which define the project as a major airport development are:

(d) Extending a building that is wholly or principally for use as a passenger terminal, where the extension increases the building's gross floor space by more than 10%;

(m) a development of a kind that is likely to have significant environmental or ecological impact;

(n) a development which affects an area identified as environmentally significant in the environment strategy.

A major airport development requires the preparation of a Major Development Plan (MDP) under s.90 of the Airports Act and requires approval by the Minister for Infrastructure and Regional Development.

Approval of the MDP allowed this development to continue through to design and construction approvals.

In addition, a referral under s.68 of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was lodged to the Department of Environment (DoE) to determine if the project was a controlled action. DoE determined that the proposed action was a controlled action and accredited the MDP assessment process. The MDP assessment process and the accreditation under the EPBC Act is discussed in more detail in **Chapter 5** Regulatory Framework.

This MDP addresses all of the required matters in accordance with s.91 of the Airports Act as demonstrated in **Table 1.1.**

Table 1.2 outlines the matters that require consideration by the Minister in the determination for approval of a MDP pursuant to s.94 of the Airports Act and where these matters are addressed within this MDP.

Figure 1.1: Project Location

Table 1.1: Major Development Plan Requirements

Act Ref	Major Development Plan Requirements	Addressed in the MDP
91(1A)	The purpose of a major development plan in relation to an airport is to establish the details of a major airport development that:	
	(a) relates to the airport	Chapter 1
	(b) is consistent with the airport lease for the airport and the final master plan for the airport	Section 5.3 and 5.4
91(1)(a)	The proponents objectives for the development	Section 2.2
91(1)(b)	The extent to which the development will meet the future needs of civil aviation uses of the Airport and other users of the Airport	Section 2.1
91(1)(c)	A detailed outline of the development	Chapter 3
91(1)(ca)	Whether or not the development is consistent with the Airport's lease for the airport	Section 5.2
91(1)(d)	Whether or not the development is consistent with the final master plan for Gold Coast Airport	Section 5.3
91(1)(e)	If the development could affect noise exposure levels at the airport and the effect the development would have on noise exposure levels	Chapter 15
91(1)(ea)	If the development could affect flight paths at the airport— the effect that the development would be likely to have on those flight paths	Not applicable
91(1)(f)	The airport-lessee company's plans, developed following consultations with the airlines that use the airport, local government bodies in the vicinity of the airport for managing aircraft noise intrusion in areas forecast to be subject to exposure above the significant ANEF levels	Not applicable
91(1)(g)	An outline of the approvals that the proponent has sought, is seeking or proposes to seek under Division 5 or Part 12 in respect of elements of the development	Section 3.8.2, 5.6
91(1)(ga)	The likely affect the proposed development would have on:	
	Traffic flows at the airport and surrounding the airport	Chapter 16
	Employment levels at the airport	Chapter 18
	The local and regional economy and community, including an analysis of how the proposed developments fit within the local planning schemes for commercial and retail development in the adjacent area	Chapter 18
91(1)(h)	An assessment of environmental impacts that might reasonably be expected to be associated with the development	Chapter 8 to 22
91(1)(j)	The proponents plans for ameliorating or preventing identified environmental impacts	Chapter 8 to 22
91(1)(k)	If the plan relates to a sensitive development—the exceptional circumstances that the airport lessee company claims will justify the development of the sensitive development at the airport	N/A the proposal is not for a sensitive development
91(1)(l)	Such other matters (if any) as are specified in the regulations	Section 5.2
91(3)	The regulations may provide that, in specifying a particular objective, assessment, outline or other matter covered by subsection (1)	Section 5.2
91(4)	The proponents plan must demonstrate the extent of the consistency with planning schemes in force under a law of the State where the Airport is location; and identity and justify any inconsistencies	5.5.2, 5.5.3
91(6)	In developing plans referred to in paragraph (l)(f), an airport lessee company must have regard to Australian Standard AS 2021—2015 ("Acoustics—Aircraft noise intrusion—Building siting and construction") as in force or existing at that time.	Not Applicable

Table 1.2: Ministerial Considerations

Ministerial Considerations	Addressed in the MDP
The extent to which carrying out the plan would meet the future needs of civil aviation users of the airport, and other users of the airport, for services and facilities relating to the airport.	Section 2.1
The effect that carrying out the plan would be likely to have on the future operating capacity of the airport.	Section 2.1
The impact that carrying out the plan would be likely to have on the environment.	Chapter 8 to 22
The consultations undertaken in preparing the plan (including the outcome of the consultations).	Chapter 4
The views of the Civil Aviation Safety Authority (CASA) and Airservices Australia, in so far as they relate to safety aspects and operational aspects of the plan.	Section 3.8
The Minister must not approve the draft major development plan unless it is consistent with the final master plan.	Section 5.3

1.3 Project Proponent

The proponent for this "major airport development" as defined under the Airports Act is:

Gold Coast Airport Pty Ltd
Level 1, Airport Central
1 Eastern Ave
Bilinga QLD 4225

GCAPL as an "airport lessee company" under the Airports Act has the following responsibilities:

- Provide and maintain infrastructure for safe and efficient aircraft operations;
- Manage and maintain the airport terminal and other airport assets, including utilities and services;
- Plan and implement development of the site in accordance with the requirements of the Airports Act;
- Plan and manage commercial and retail development of the site;
- Implement environmental management of the site.

1.4 Structure for the Major Development Plan

To address each of the MDP requirements under the Airports Act, this report is structured as detailed in **Table 1.3.**

Table 1.3: Structure of the Major Development Plan

Part A: Project Description and Justification
Chapter 1 – Introduction
Chapter 2 – Project Justification and Objectives
Chapter 3 – Airport Context and Project Description
Chapter 4 – Consultation and Approval Process
Chapter 5 – Regulatory Framework
Chapter 6 – Assessment Methodology
Chapter 7 – Conclusion and Impact Summary

Part B: Impact Assessment
Chapter 8 – Geology, Soils and Groundwater
Chapter 9 – Surface Water Quality
Chapter 10 – Hydrology and Flooding
Chapter 11 – Terrestrial and Aquatic Flora
Chapter 12 – Terrestrial and Aquatic Fauna
Chapter 13 – Cultural Heritage
Chapter 14 – Air Quality and Greenhouse Gases
Chapter 15 – Noise and Vibration
Chapter 16 – Traffic and Transport
Chapter 17 – Landscape and Visual
Chapter 18 – Social and Economic
Chapter 19 – Waste Management
Chapter 20 – Climate Change
Chapter 21 – Cumulative Impacts
Chapter 22 – Environmental Management Framework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2.0

Project Justification and Objectives

2.0 Project Justification and Objectives

2.1 Project Justification

2.1.1 Forecasting

Currently the Airport is the sixth busiest international airport in Australia and the sixth busiest Australian airport overall. Over the years 2005/06 to 2013/14, the Airport has experienced a compounding average growth rate (CAGR) of 6.7 per cent due to the increase in low cost and full service carrier airlines both domestically and internationally within the South East Asia region. During that time the CAGR for international passengers alone was 15.3 per cent.

In preparing the Master Plan, GCAPL completed investigations and planning studies to identify options for airport development to accommodate the future needs of civil aviation users. As part of the master planning process, 20-year aviation traffic forecasts were prepared to determine the extent of facilities required to accommodate projected demand. These forecasts are represented in five year increments in **Table 2.1.**

In preparation for the project, forecasts were updated based on actual traffic to the end of 2014, to include annual increments for years 2014 to 2023. These updated forecasts are represented in terms of busy hour passengers and stand demand in **Table 2.2** and were used to assess short to medium term capacity issues driving the expansion.

As depicted in the tables growth in passenger numbers has been less than forecast whilst current stand demand exceeds the Master Plan requirements. This is because the Airport has experienced higher than expected growth of domestic and international flights during peak periods.

2.1.2 Apron Facilities

The existing apron facilities have a capacity for 11 stands catering for three Code E and eight Code C aircraft. An alternative arrangement of four Code E and six Code C Aircraft can also be applied. These existing apron arrangements are depicted in **Figure 2.1.**

To improve the capacity of the apron, the Airport is currently (under a separate project) planning works to reconfigure the aircraft stands and realign fuel hydrants for stands in front of the terminal. This will allow all aircraft to park perpendicular to the building line (i.e. nose-in parking), with adequate clearance for unhindered Code E aircraft manoeuvring on Taxiway Echo. Once completed, these works will increase capacity of the apron to 12 stands catering for three Code E and nine Code C aircraft, refer **Figure 2.2.**

The 2015 forecast demand for the Airport is 13 apron stands, meaning that even after the realignment works depicted in **Figure 2.2** are complete, the capacity will be exceeded with a shortfall of one stand. By 2018, it is forecast that the apron capacity will be exceeded by two stands and by 2021, the apron capacity will be exceeded by four stands.

The need to expand the Airport is influenced by a growing city that is connected to key Australian cities and important Asian economies. The goal of the Airport is to service the demand from Asia and the growing need for businesses, leisure travellers and the general public to travel.

The Airport actively pursues scheduling that spreads flight services while meeting demand. However, airports cannot control the periods of high demand as these are driven by the travelling public, business and government travel and regulatory requirements (such as curfews).

Flight times of eight to ten hours between North Asia and Gold Coast dictate the windows of opportunity in which airlines can operate to allow them to make the most commercially viable scheduling decisions. International flight schedules are determined by the airlines and arrival and departure times at Gold Coast Airport are driven by the airline using the flight windows to meet curfew at Gold Coast and return to their home port eight to ten hours later. This typically means that there is a large international peak early in the morning. The morning peak time is common across the major east coast Australian airports. Each airport has expanded and grown its infrastructure to meet the demand.

The Airport has minimal scope to vary the scheduled times for domestic flights and in order for the routes to remain viable for the airlines, the flights need to be scheduled close to the peak periods. Therefore growth in both domestic and international traffic would have been constrained if sufficient apron capacity was not provided to cater for the peak period.

As an example if no action were taken by 2018, a possible outcome would be that two Code E international aircraft would not have been able to be accommodated in the busy hour per day resulting in an impact to approximately 314,000 international passengers annually. Alternatively accommodating these international services would have come at the expense of four domestic services impacting approximately 375,000 domestic passengers annually. Under a similar scenario by 2023, five Code E international aircraft would not have been able to be accommodated, resulting in an impact to 750,000 international passengers annually. Alternatively 11 domestic services would have to be dropped from the peak hour schedule to accommodate

a maximum of four of the five international services. In total, this scenario would have impacted 1,050,000 passengers annually through the loss of the 11 domestic and one international service.

If action were not taken to further develop aviation facilities at the Airport by 2018, it would have significantly limited the Airport's ability to service the future domestic and international passenger demand and address the current capacity issues.

Figure 2.3 depicts the terminal expansion and apron required to satisfy demand of nine Code C and five Code E aircraft in 2018. The footprint of the terminal expansion is also depicted adjacent to the new RPT apron stands.

Figure 2.4 depicts the terminal expansion and apron required to satisfy demand of ten Code C and seven Code E aircraft to 2023.

Table 2.1: 2011 Master Plan 20-Year Busy Hour Forecasting

Year	2011/12	2016/17	2021/22	2026/27	2031/32
RPT Apron Stand Requirements (Combination of Code E and Code C aircraft)	10	12	15	18	23
Domestic passenger busy hour	1044	1336	1730	2207	2817
International passenger busy hour	934	1067	1219	1393	1599

Table 2.2: Project Annual Busy Hour Forecasting

Financial Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023
Apron Stand Requirements (Code E and Code C aircraft)	12	13	13	13	**14**	14	16	16	16	17
Domestic passenger busy hour	1270	1370	1440	1530	**1590**	1640	1700	1760	1810	1860
International passenger busy hour	680	730	820	870	**920**	960	1010	1050	1050	1120

Figure 2.1: Existing Apron Facilities

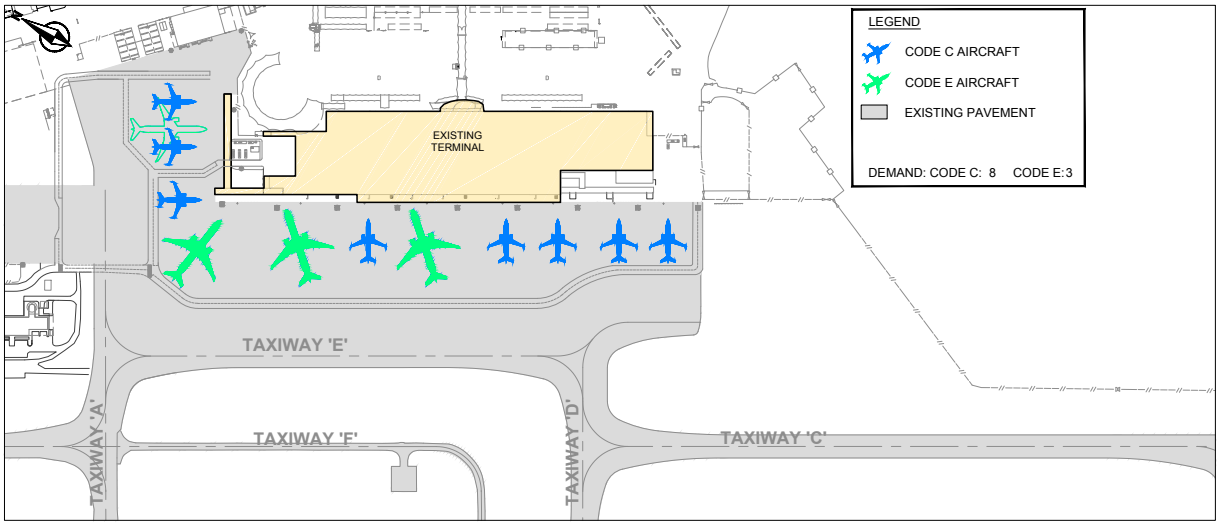


Figure 2.2: Reconfigured Apron Facilities

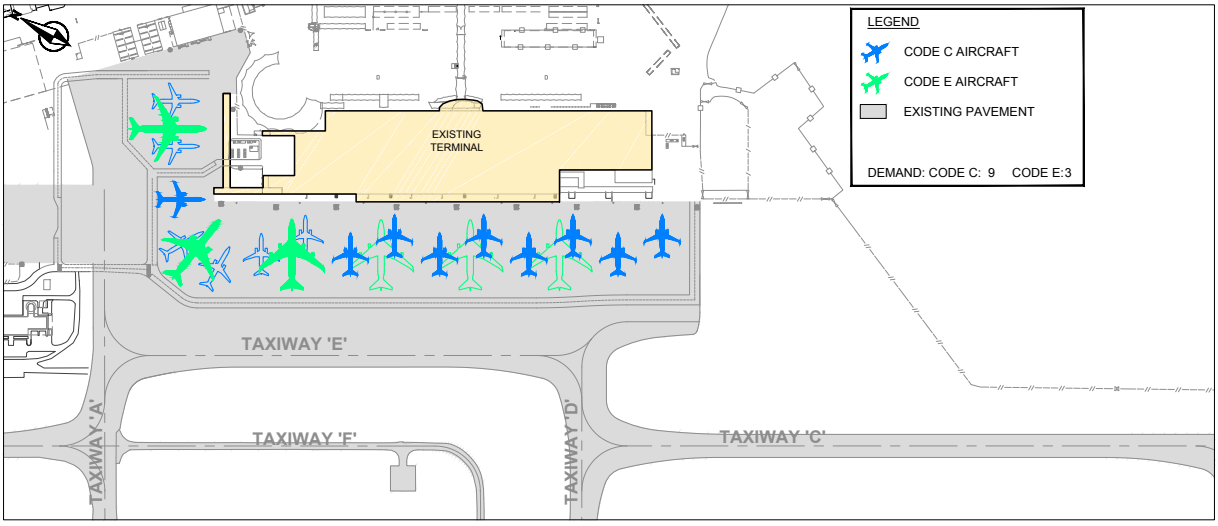


Figure 2.3: 2018 Apron Demand

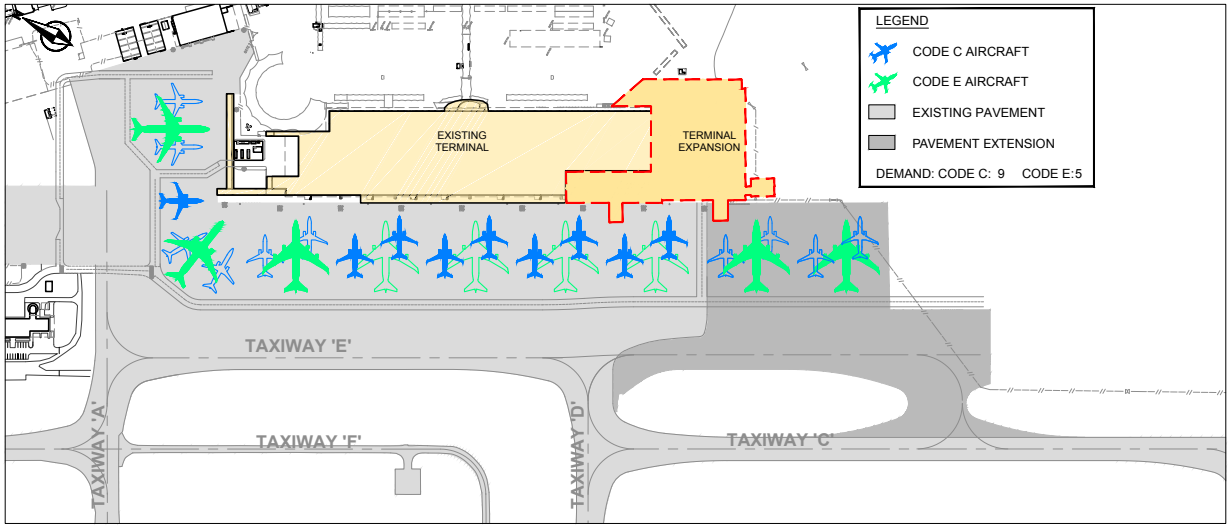
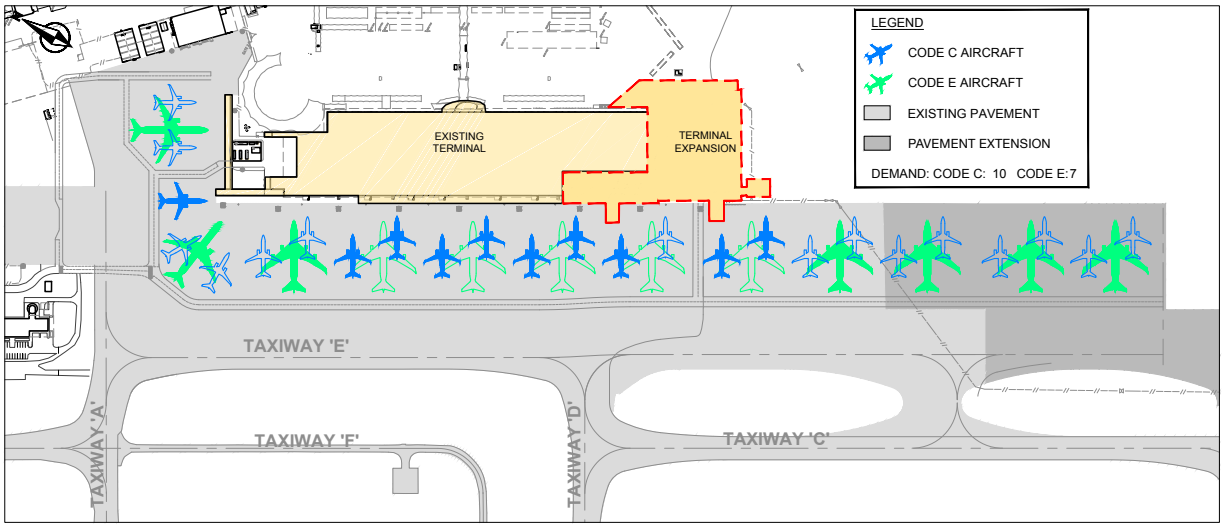


Figure 2.4: 2023 Apron Demand



2.1.3 Terminal Capacity

Preparation of this MDP included an investigation to determine the existing T1 capacity and busy hour passenger numbers for the Airport. Findings of this investigation are depicted in **Figure 2.5.**

The investigation found that T1 is currently at capacity during peak hour in the areas of:

- Check-in;
- International and domestic departure lounge;
- Baggage handling; and
- Domestic baggage reclaim.

In addition, it is forecast that before 2018 T1 will reach capacity in the following areas:

- International baggage reclaim;
- Processing areas for government agencies (Department of Immigration and Border Protection (known as Border Force) and Department of Agriculture and Water Resources);
- Liquids, aerosols and gels (LAGS) screening.

An expansion of T1 and an internal redevelopment of the building is required to allow it to function more efficiently and effectively, particularly during peak travel times. The terminal redevelopment as described in this MDP will rationalise passenger flows and reduce congestion by improving utilisation across both the domestic and international areas of the terminal. This will be achieved through the expansion of the terminal building and reconfiguration of parts of the existing floor layouts.

If no action were taken, it was forecast that the terminal would have experienced a deterioration in the level of customer service and would have ultimately limited the Airport's capacity to accommodate expected growth of domestic and international visitors to Gold Coast.

2.1.4 Commonwealth Games

The 2018 Gold Coast Commonwealth Games will be the biggest event that the City of Gold Coast has ever hosted. It is expected that the Games will attract more than 117,000 domestic and international visitors to the city in addition to more than 5,000 athletes, 2,000 officials and 2,700 members of the media (source: Gold Coast 2018 Commonwealth Games Corporation). It is anticipated that a large number of these visitors will be arriving through the Airport.

In addition to the visitors, the Games have a potential audience in excess of 1.5 billion watching over 1,000 hours of television coverage. The Games represent a significant opportunity for the Gold Coast to showcase itself to the world and both *"strengthen and redefine its tourism brand"* (Gold Coast Destination Tourism Management Plan 2014 – 2020). For a large number of the visitors and the media, the Airport will be the gateway to the Gold Coast and will form an integral part in showcasing the city to the world.

The redevelopment of the terminal building is being designed to capture the essence of Gold Coast and create a memorable passenger experience. In addition to the look and feel, the expansion is being designed to accommodate aerobridges and provide for advancements in outbound processing technologies.

2.1.5 Economic Benefits of the Project

The economic benefits generated by the project will be wide and varied. There will be creation of jobs through construction and development as well as significant employment opportunities for the ongoing operation of the facilities in the future. It is anticipated that the construction stage of the project in 2016-17 will create approximately

Figure 2.5: Current Airport Terminal Capacity

230 full-time jobs. Over the remainder of the period to 2034-35 employment is projected to remain positive at around 180 full-time workers. In addition, from 2015-16 to 2034-35 the project will contribute to over $426 million in Gross Regional Product (GRP). It is predicted that the additional tourism expenditure facilitated by the project is forecast to grow by $62 million per year over the modelling period to 2033-34.

2.1.6 Consideration of Alternative Locations

In the preparation of the Master Plan three alternative airport layout arrangements were tested to determine options to meet the 20-year forecast. These alternative arrangements are development to the north, west and south as shown in **Figure 2.6.**

Development to the North

This area spans the General Aviation Precinct and the Runway Precinct identified in the current Master Plan. This area is situated to the north of the terminal buildings and incorporates land in the north of the Airport, south to the control tower and aviation refueling facility.

Options for development to the north featured new and expanded remote apron stands (accessed from the terminal by bus) and northern expansion to T1. This option was found to be unacceptable as it was not possible to cater for the 20-year Master Plan aviation forecast and beyond within the available development footprint in this area of the Airport. Therefore apron development to the south would still be required in order to cater for forecast future demand. Development in this area would also limit the ability to accommodate general aviation (GA) at the Airport unless it were relocated to the South of T1 within the project footprint.

The Master Plan development footprint in the south is able to accommodate more than twice the number of aircraft stands compared with the northern area, assuming the retention of the control tower and aviation refueling facility in their current locations. A larger apron footprint could be achieved in the north if the control tower and refueling facility were relocated. However the only alternative location for these facilities would be within the project footprint to the south of T1.

Development of RPT aprons within the General Aviation Precinct is also inconsistent with the permitted land uses for this precinct as defined in the current Master Plan.

In order to avoid the southern expansion of the terminal, conversion of the existing T1 building to a multi-level structure could be carried out but not without significant disruption to airport operations and available processing capacity during construction. However this would not avoid the requirement to impact the area to the south of T1, as the southern expansion of the apron would still be required in all future development scenarios.

Development to the West

The land in the west of the Airport between the runway and the Tugun Bypass is referred to as the Western Enterprise Precinct within the Master Plan. Currently this area cannot be developed because of clearance requirements for navigation aids that support the Airport. These navigational aids are expected to be retained by Airservices Australia within the Western Enterprise Precinct to beyond 2018.

For longer term master planning purposes, options for development within the Western Enterprise Precinct were considered. Options that were explored include a new terminal and apron precinct on the western side of the runway to augment the existing terminal and apron operations on the eastern side. The location of the Tugun Bypass corridor limits the available site depth and presents a constraint for all options to develop the western precinct for RPT aviation purposes. Whilst it would be possible to develop some apron facilities in this area, there is not sufficient space for the development of a parallel taxiway. Therefore any apron development in this location would require the use of the runway for taxiing which would impact the available runway capacity.

Additionally, there is insufficient space in this location to develop sufficient terminal and apron facilities that could cater to either the forecast domestic or international traffic for the Master Plan period and beyond. This therefore means that domestic and international activity would be split between facilities on either side of the runway. The inherent inefficiencies with this arrangement would be further exacerbated by the fact that it would not be possible to establish ground transport linkages between the facilities on either side of the runway within the Airport lease. This would result in the need for ground transport linkages (e.g. for the transfer of passengers, baggage, goods and staff) between the two precincts to be made via the Gold Coast Highway and Pacific Motorway thereby impacting the capacity of the local road network.

Development to the South (the project)

The expansion of aviation facilities within the southern portion of the Airport lease (the project footprint) was identified as the only feasible option to meet the 20-year forecast apron busy hour demand and beyond. Consolidation of all aviation activities within the existing Terminal Precinct is efficient in terms of required apron and building footprint and will also encourage mode splits to public transport, particularly when future heavy and light rail networks are extended into the Terminal Precinct.

Development to the south includes expansion of the existing terminal and apron over the current location of the Airport drainage reserve, necessitating the realignment of this drain to divert flows around the expansion. Several options were investigated for the reconfiguration, with consideration of impacts to Airport operations, the environment and hydrology and flooding both on Airport

and downstream. The options that were considered included:

- Upstream diversion;
- Provision of culverts under the apron and terminal expansion; and
- Realignment of drainage reserve and extension to the south east (the project).

The upstream diversion option required creation of a new outlet to Bilinga beach using trenchless installation of pipes under the Gold Coast Highway and the residential strip in Bilinga. This option required reaching agreements with the local and state government agencies, obtaining relevant permits, as well as acquiring private properties. This is a time consuming process and is considered unachievable in the timeframe of this project. The option was also deferred in consideration of the difficulty that existing services in the Gold Coast Highway would pose to achieving the required culvert grade between the Airport and the beach outlet as well as the high cost of trenchless construction work.

The option to retain the existing alignment of the drain within culverts beneath the apron and terminal expansion option was considered unsuitable. This was due to the risk that the apron and terminal could become flooded if a blockage occurred at the inlet. Additionally the significant length of buried culverts would present difficulties in terms of their ongoing maintenance.

The realignment of drainage reserve was selected as the most suitable option. It will cause the least impact of the three options on land surrounding the Airport through avoiding the disturbance of existing infrastructure and residential properties and improving current downstream flood conditions. This option also presents less of a flood risk to the aviation infrastructure with the Airport and the catchment upstream of the Airport. As the project will construct the drainage realignment in accordance with the Master Plan's 20-year development plan layout, this option will facilitate all future aviation development at the Airport. Furthermore construction of the drainage realignment has been assessed as being achievable within the timeframe of this project.

2.2 Project Objectives

The vision that Gold Coast Airport holds is one that positions the Airport as a major economic generator for the communities in the south east Queensland and northern New South Wales regions.

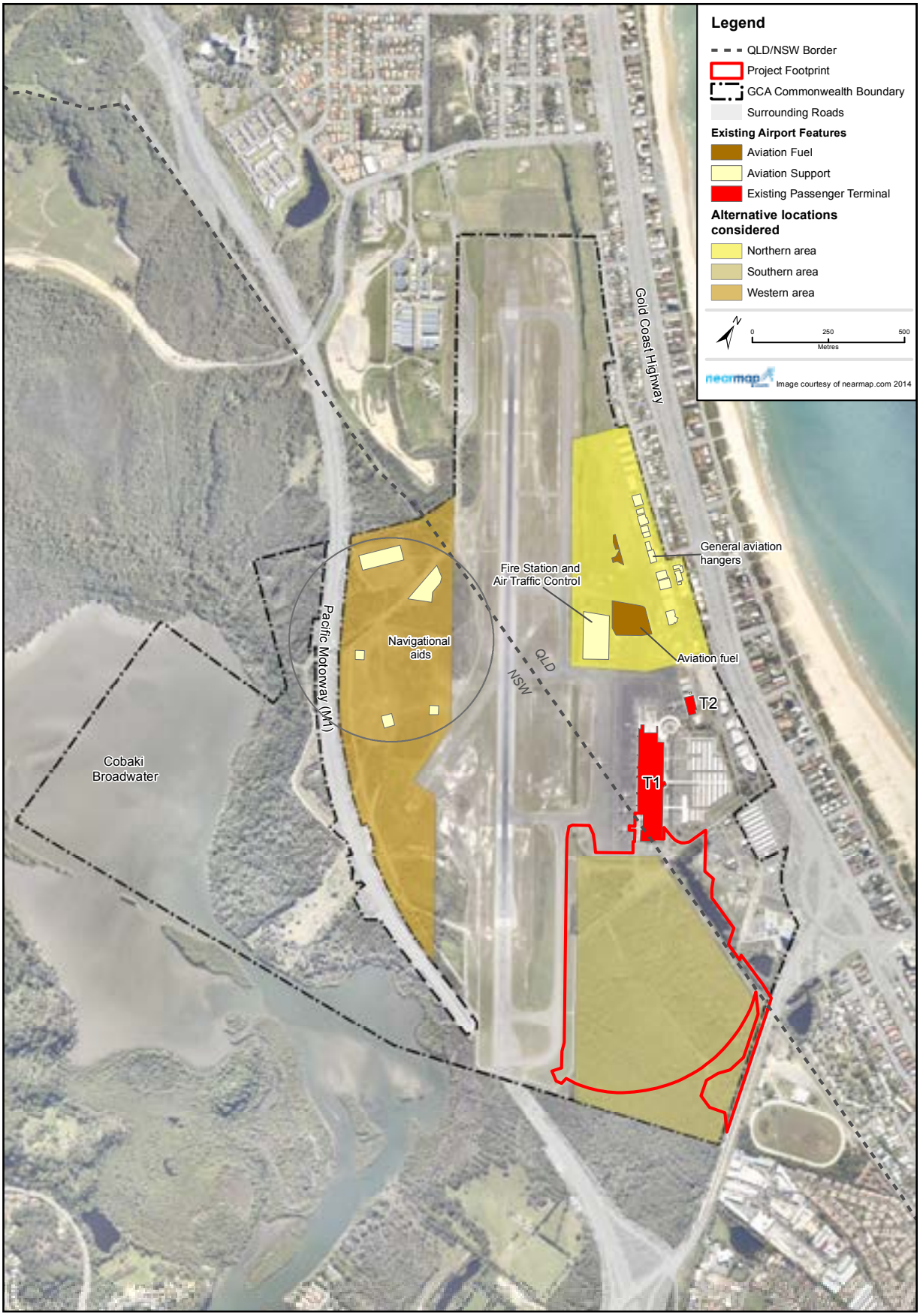
The short-term development objectives for the project are to:

- Deliver expanded terminal and first stage of expanded apron facilities which are operational by the end of the 2017 calendar year in time for the 2018 Gold Coast Commonwealth Games;
- To facilitate the staged development of the Master Plan's 20-year development footprint;
- To cater for future demand at the Airport for domestic and international services and both full service and Low Cost Carrier (LCC) airlines;
- To rectify current capacity issues at the terminal and RPT apron.

The long term development objectives of the project are consistent with a number of GCAPL's development objectives outlined in the Master Plan, including:

- Ensure the long-term capacity and provision of Gold Coast Airport's infrastructure is commensurate with the forecast growth in passenger and aircraft movements;
- Ensure the safe, secure and efficient movement of passengers and aircraft;
- Achieve an acceptable balance between the development of the Airport and the mitigation of environmental impacts including aircraft noise;
- Deliver high levels of service, quality and facilities and maintain its commitment of quality of service monitoring;
- Maintain a commitment to developing facilities suitable for both full service and LCC airlines;
- Grow the aviation market and network of domestic and international services to and from Gold Coast Airport;
- Provide services and infrastructure that demonstrate a multi-use, flexible and integrated planning approach;
- Facilitate the implementation of a road/rail corridor west and north of the Airport that is acceptable to all major stakeholders, thereby creating a transport hub for the region;
- Ensure development is consistent with state and local planning schemes and policies, and maximise compatibility with the surrounding area;
- Meet its obligations under the Airports Act;
- Manage the business responsibly to develop the Airport site for future growth; to an appropriate quality through good business practices as required under the airport lease with the Federal Government.

Figure 2.6: Alternative Project Locations




GOLD COAST AIRPO

3.0

Airport Context and Project Description

3.0 Airport Context & Project Description

This chapter describes the following:

- Location and history of the Airport;
- Existing infrastructure at and surrounding the Airport;
- Project overview and footprint;
- Existing environment at the Airport;
- Design considerations;
- Project elements;
- Project construction;
- Hazards and risks that may arise from construction or operation of the project;
- Building sustainability considerations for the terminal expansion.

3.1 Location and History of Gold Coast Airport

3.1.1 Location

Gold Coast Airport occupies Commonwealth land held under a long-term lease by Gold Coast Airport Pty Ltd (GCAPL). The Airport lease straddles the border between New South Wales and Queensland within the local government areas of Tweed Shire Council and the City of Gold Coast respectively (refer **Figure 1.1** in **Chapter 1**).

The Airport is located on a coastal plain that includes the Cobaki Broadwater to the south and west, part of which falls within the Airport boundary. Suburbs directly adjacent to the Airport include Tugun, Bilinga, Kirra, Coolangatta and Tweed Heads.

Major roads surrounding the Airport include the Gold Coast Highway to the north and east and the Tugun Bypass section of the Pacific Motorway which traverses the western portion of the Airport and includes a tunnel section under the southern portion of the Airport's runway. The main access to the Airport is via Terminal Drive at a signalised intersection off the Gold Coast Highway.

Betty Diamond Sporting Complex and the Gold Coast Desalination Plant are located to the north and north west of the Airport.

The project is located within the southern portion of the Commonwealth airport lease, refer **Figure 1.1**. This area contains the footprint of the Master Plan 20-year aviation development within the Terminal and Runway Precincts. The project footprint is bound by the existing terminal and apron to the north, the existing parallel taxiway to the west, the future heavy rail corridor to the south and various Terminal Precinct commercial lease areas to the east. To the south of the heavy rail corridor adjoining the Airport is the NSW Crown Reserve which has been leased by the Airport with permitted land uses under the lease agreement being airport infrastructure and land management.

3.1.2 History

The Airport site was first used in 1936 as an emergency landing ground for aircraft flying between Sydney and Brisbane. In 1939, the first RPT services commenced and were conducted by Queensland Airlines and Butler Air Transport.

In the 1980s, the current terminal building (T1) was constructed and the main runway was upgraded for wide-bodied aircraft. In 1998 the Airport was privatised with Queensland Airports Limited (QAL) becoming the airport-lessee company (ALC) after a successful tender. The next year in 1999, the Airport officially changed name from Coolangatta Airport to Gold Coast Airport and in 2006, GCAPL became the airport-lessee company wholly owned by QAL.

From 2006 to 2011, GCAPL committed more than $163 million in capital expenditure for developments including the T1 redevelopment, the Southern Cross University development, Terminal 2 (T2) redevelopment, main runway extension and overlay and a new long term car park.

The current Master Plan for the Airport was approved in 2012 and included the 20-year development plan that depicted the realignment of the Airport's drainage reserve and the expansion of T1 and the RPT apron within the southern portion of the Airport lease. Developments completed since the approval of the Master Plan have included various car park enhancements, northern apron and Taxiway Echo enhancements, Southern Cross University Building B and the Australian Federal Police (AFP) building which represents approximately $28 million dollars of capital investment by the Airport.

In the past the project footprint has been subject to significant ground disturbance through large scale vegetation clearing, sand mining and at one point contained a number of dog racing tracks. The drainage reserve has also been substantially modified through historic land use activities and is piped or channelised along most of its length. Historic aerial photographs of the Airport, including the project footprint, show the changes at the Airport over time, including variations to the alignment and outfall of the drainage reserve, as shown in **Figure 3.1a** and **3.1b.**

The Airport acknowledges that some stakeholders are of the view that given the historic presence of a creek/wetland area on and neighboring the Airport that the current drainage reserve should be referred to as

Coolangatta Creek. Whilst GCAPL acknowledges the presence of the original wetland area, which likely held significant cultural heritage and ecological values, the current drainage reserve has been diverted and heavily modified from the natural watercourse that originally existed into what is now referred to as a drainage feature by the Airport. Notwithstanding this, GCAPL has assessed the heritage and ecological values of the present day drainage reserve being impacted by Project LIFT and identified appropriate mitigation measures as detailed in Part B of the MDP.

A more detailed history of previous ground disturbances in the project footprint is provided in **Chapter 13** Cultural Heritage.

3.2 Existing Infrastructure

Existing infrastructure at the Airport has been developed for both aviation related and commercial purposes, refer **Figure 3.2**. The total area of the Airport lease is 371 hectares, and of this only a small portion is designated for non-aviation purposes.

Existing aviation related infrastructure on the Airport includes:

- The main 14/32 runway (2,492 metres long and 45 metres wide) which handles the majority of aircraft movements;
- A partial parallel taxiway to Runway 14/32 with stub taxiway connections to the runway at various locations. Taxiways A, B, C and D service the primary runway;
- A secondary (cross) 17/35 runway (582 metres long and 18 metres wide) which is used for GA movements;
- One common user terminal (T1) facilitating both domestic and international services;
- A separate domestic terminal (T2) which was in operation between 2007 and 2011 for domestic flights;
- A RPT apron adjoining both T1 and T2 which currently provides 11 aircraft stands accommodating up to eight Code C and three Code E Aircraft;
- 3.7 hectares of sealed aprons located north of T2 which service both fixed wing and rotary GA;
- GA facilities including Airport maintenance workshop, flying schools, hangars and charter operators;
- Freight handling buildings located to the north of T2;
- Other aviation support facilities including a fire station, air traffic control building and Joint User Hydrant Installation (JUHI); and
- Public and staff car parking and facilities for taxis, public busses, tour coaches and car rentals.

Existing commercial infrastructure at the Airport includes:

- Southern Cross University which occupies 1.4 hectares within the Airport lease area; and
- Airport Central which occupies 1.7 hectares within the Airport lease area and includes car parking and minor commercial facilities serving Airport users, nearby residents and highway motorists.

Figure 3.1a: Airport History

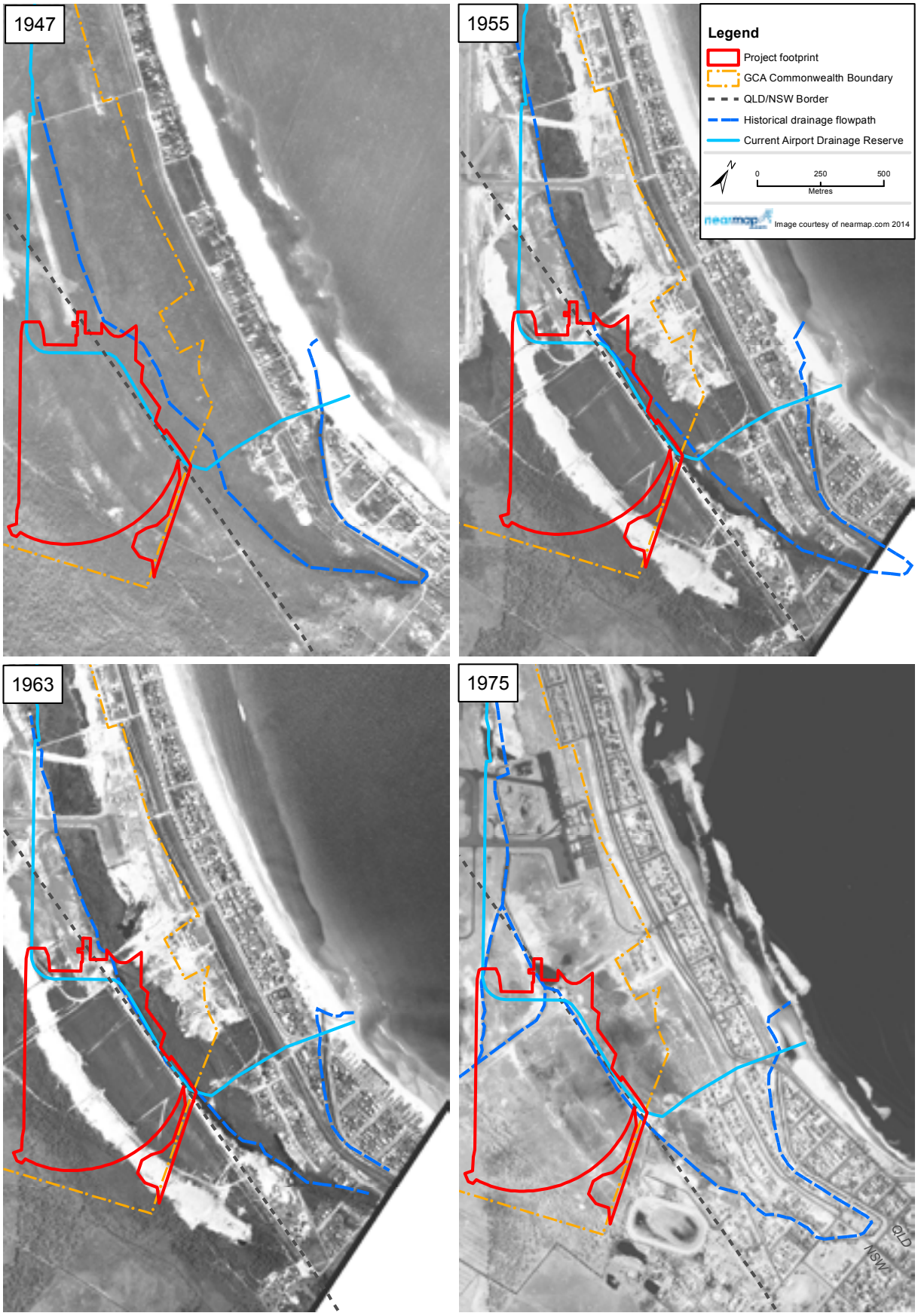


Figure 3.1b: Airport History

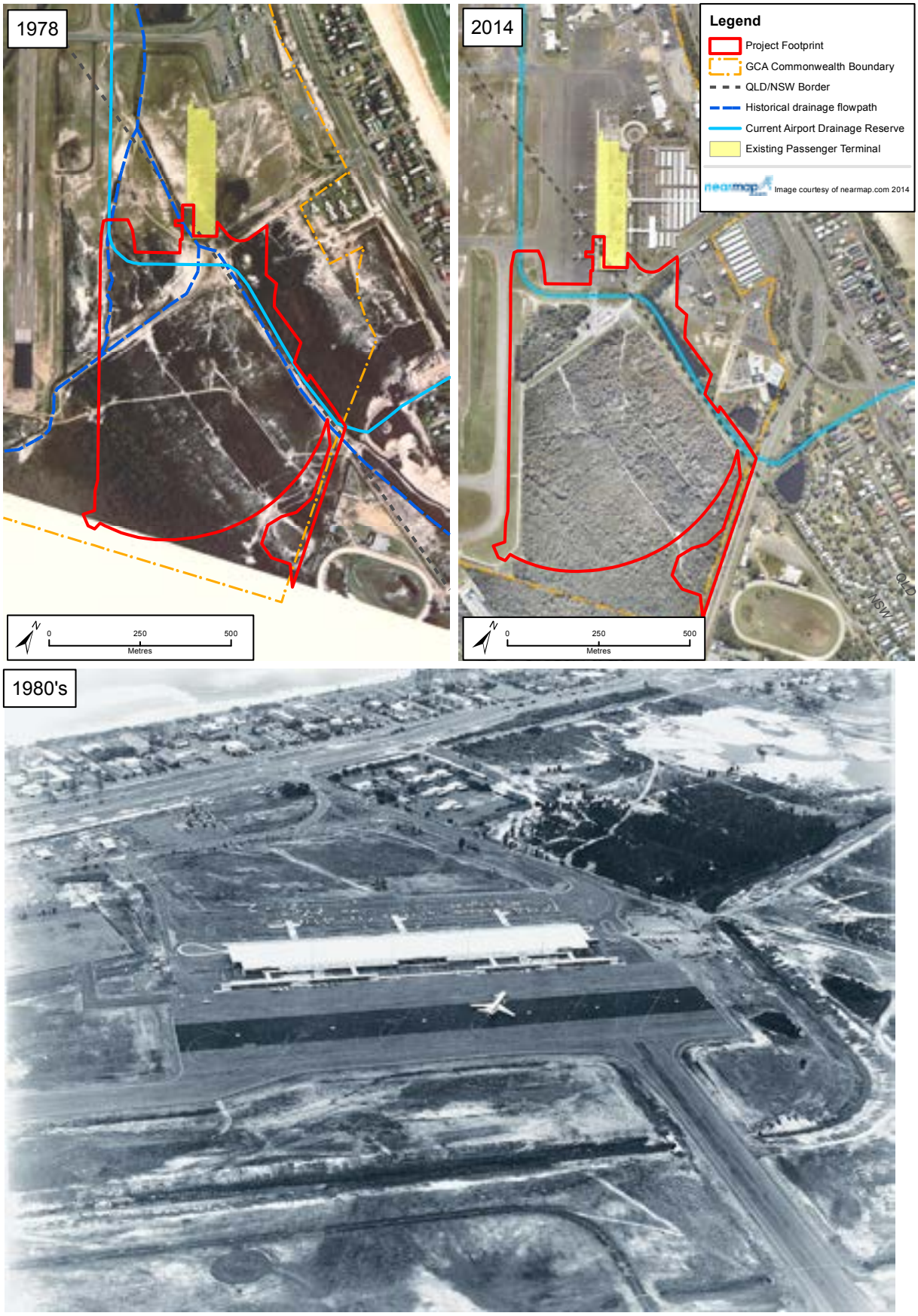
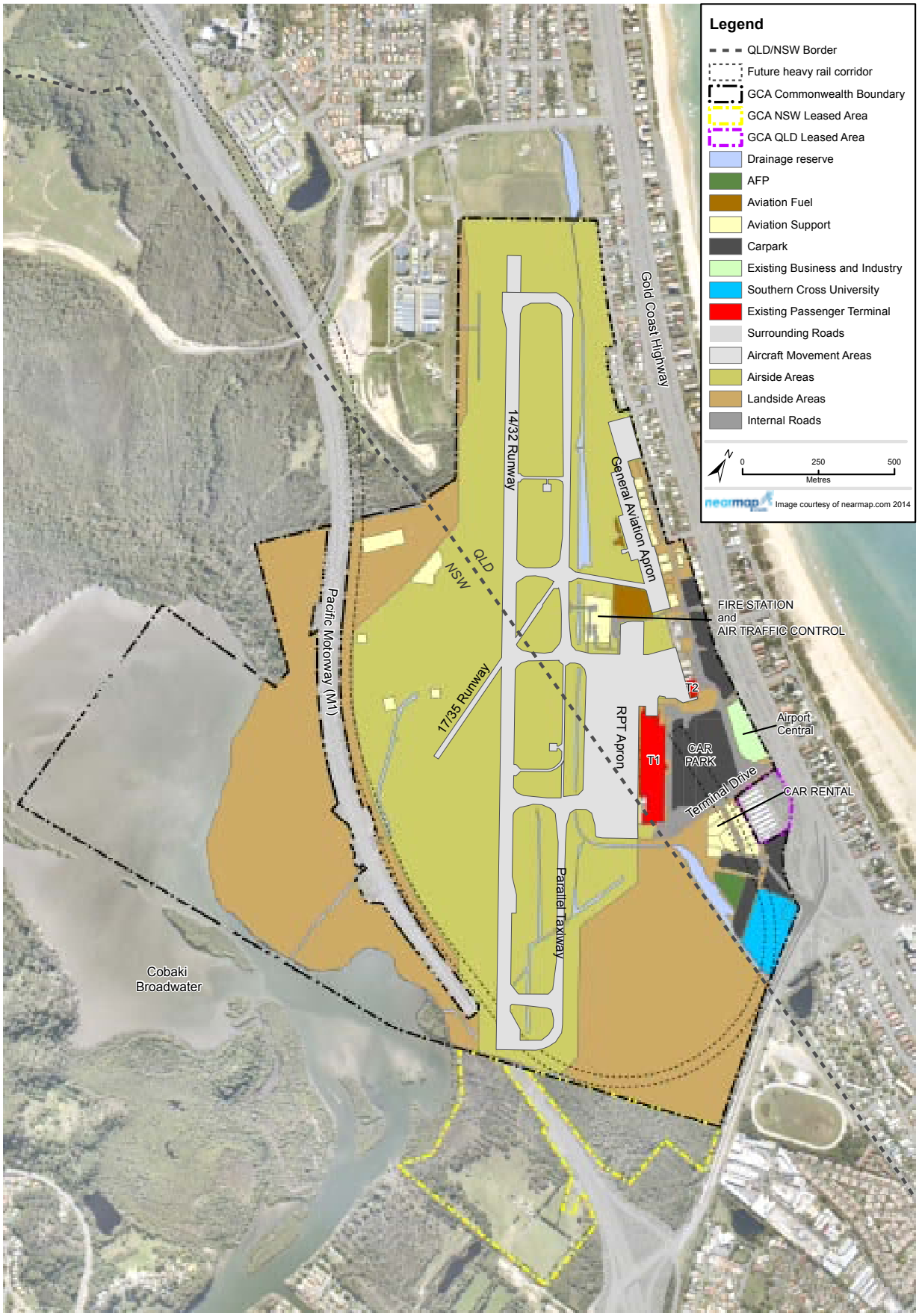


Figure 3.2: Existing Airport Infrastructure



3.3 Project Overview and Footprint

Expansion and redevelopment of T1 was completed in 2010 and resulted in the creation of an integrated international/domestic common use low cost carrier terminal with capacity for six million arriving and departing passengers per annum.

Future aviation development in the Master Plan is planned to occur within the southern portion of the Airport lease which is currently a largely undeveloped, vegetated area straddling the Terminal and Runway Precincts. The 20-year strategic development plan described in the Master Plan (terminal, apron development and ground transport infrastructure) will be delivered incrementally over the coming decades in line with demand.

The project is the first part of the Master Plan 20-year aviation development and broadly comprises a terminal expansion and staged apron expansion, a consolidated ground transport facility, realignment of the existing airport drainage reserve, and clearing of the Master Plan 20-year aviation development footprint. The project's key elements are shown in **Figure 3.3** and are described in detail in **Section 3.7.**

The elements of the Master Plan 20-year aviation development that are not part of the project (i.e. further apron and terminal expansion) will occur within the Future Development Area and will be subject to separate building and airport planning approvals, which will be sought prior to the construction of those elements.

The project footprint is approximately 45 hectares as shown in **Figure 3.3** and comprises areas of native vegetation, non-native managed grassland and hardstand. The area of native vegetation to be cleared as part of the project (approximately 32.5 hectares) is generally bounded by the drainage channel realignment but also includes the construction access from the Gold Coast Highway.

The apron and terminal expansions will be located over the current position of the Airport's main drainage reserve. Realignment of the drainage reserve around the footprint of the Master Plan 20-year aviation development, is therefore required as part of the project. Whilst the apron, terminal and ground transport infrastructure will grow to their ultimate footprint in stages, the relocation of the drainage reserve to its ultimate alignment will occur in one stage, as part of the project, to minimise impacts to airport operations and to prepare the site for future development.

3.4 Existing Environment of the Project Footprint

The project footprint is generally flat but has a slightly raised ridge running north-west to south-east. Natural ground levels within the project footprint grade from three metres Australian Height Datum (AHD) to less than one metre AHD from north to south. Imported fill is present under the existing runway, taxiways and built up areas where ground level is currently 4 - 5metres AHD (nominally 4.6 metres AHD).

The project footprint contains the following vegetation types:

- Broad-leaved paperbark with Eucalyptus species;
- Swamp box closed forest to woodland;
- Coastal swamp mahogany open forest to woodland;
- Broad-leaved paperbark closed forest to woodland;
- Dry heathland to shrubland; and
- Wet heathland to shrubland.

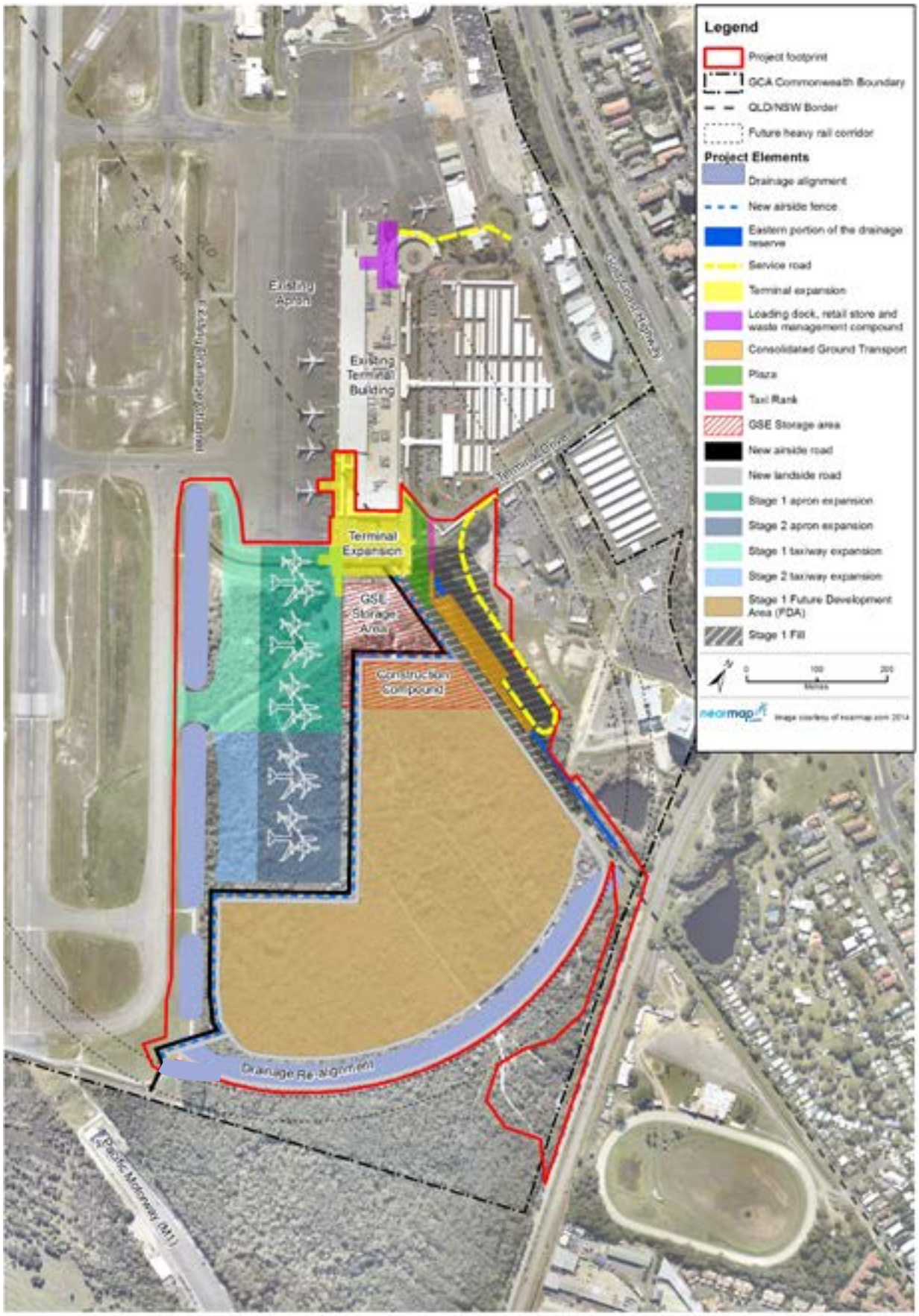
Most of the project footprint comprises Environmentally Significant Areas (ESA) due to the presence of ecological communities and threatened species listed under Federal and state legislation. ESAs at the Airport are shown in **Chapter 11** Terrestrial and Aquatic Flora. The project footprint contains approximately 32.5 hectares of native vegetation of which approximately 30.1 hectares is classified as ESA. The majority of the native vegetation is regrowth with some being remnant vegetation.

ESAs at the Airport were first defined in 2009 in consultation with relevant federal and state conservation bodies, and updated in 2011. Further work was carried out using GPS technologies to ground truth the boundaries of the ESAs within the project footprint in 2013. The method to determine environmental significance involved dividing the Airport lease into units of homogenous land use and vegetation communities. Each unit was then assessed based on:

- Whether it was known habitat for legislatively significant species (both Commonwealth and state);
- The legislative status of vegetation communities (both Commonwealth and state); and
- The size, condition and connectivity of the vegetation community.

Developments at the Airport that affect ESAs triggered the need for an MDP as described in **Chapter 1** Introduction.

Figure 3.3: Project Elements



Species listed under the EPBC Act and state legislation are known or likely to occur in the project footprint, including the Wallum Sedge Frog *(Litoria olongburensis)*, listed as Vulnerable under the EPBC Act, the Grey-headed Flying Fox *(Pteropus poliocephalus)*, listed as Vulnerable under the EPBC Act, and the Lesser Swamp-orchid *(Phaius australis)*, listed as Endangered under the EPBC Act. **Chapter 11** Terrestrial and Aquatic Flora and **Chapter 12** Terrestrial and Aquatic Fauna detail the species known or likely to occur in the project footprint.

The existing drainage reserve is a channelised, 2.9 kilometre stretch of water that flows through the Airport from north to south and connects to the discharge at Kirra Beach outfall. The drainage reserve will be realigned around the project footprint as part of the project.

3.5 Design Considerations

3.5.1 Concept Design Process

The development concepts in the Master Plan were used to prepare a concept design which formed the basis for the assessment of impacts in this MDP.

The concept design for the project included the optimisation of the general terminal and apron layout proposed in the Master Plan in accordance with aerodrome design standards and operating procedures.

Field investigations were undertaken during the MDP preparation which have informed the development of the design and assessment of project impacts. These have included surveys and investigations for geotechnical, acid sulfate soil, contaminated land, groundwater, surface water, ecology, cultural heritage, traffic, noise and vibration and landscape and visual amenity.

With respect to the drainage reserve, flood modelling was completed and the concept design refined in parallel with earthworks calculations and concept design of the apron.

The preparation of the MDP occurred in parallel with the concept design development, allowing for information from the MDP investigations and assessments to inform the design of the project.

3.5.2 Design Requirements

Airfield

Aerodrome design standards and operating procedures are in accordance with *Civil Aviation Safety Regulations Manual of Standards Part 139* (MOS) as prescribed and administered by CASA under the *Civil Aviation Act 1988, and the Civil Aviation Regulation 1988.* These standards generally follow the International Civil Aviation Organization (ICAO) standards and recommended practices for the safe and orderly development of international civil aviation. The design principals adopted are to ensure the safety, efficiency and regularity of the airfield and airspace are maintained.

MOS Part 139 provides geometric constraints that have been incorporated into the design. These standards provide the required airfield characteristics such as the dimensions and gradients of the apron, taxiways and related facilities. Apron and taxiway flood immunity has been based on CASA guidelines.

Terminal

The design philosophy for the terminal expansion has been to continue to ensure safe, secure and efficient operations whilst minimising operating costs to the airlines. Terminal planning has been based on the International Air Transport Association (IATA) Level of Service C which provides a good level of service and comfort. Design principles accord with the IATA design standards, building control regulations, Customs Immigration and Quarantine (CIQ) processing requirements, Office of Transport Security (OTS) requirements, disability access requirements and other regulatory requirements.

3.5.3 Aircraft and Operational Considerations

The types of aircraft and aircraft movements on the apron and taxiways will result in varying loads and have a bearing on the pavement design. Flexible or rigid pavement design may be suitable in different parts of the apron or taxiway, depending on these factors.

Aircraft fleet mix and movement assumptions based on current and forecast schedules were utilised to inform the determination of pavement strength and thickness. The schematic apron designs have assumed a concrete pavement with the taxiway and taxi-lane designed as flexible pavements.

3.5.4 Geotechnical Considerations

Existing ground conditions have been identified through geotechnical testing in the project footprint and are described below (from the surface down):

- Fine to medium grained sand with some silt, consistency variable from very loose to dense (in some cases this is fill material);
- Variably Indurated Sand – comprising sand, fine to medium grained, dense to very dense with lenses of medium dense sand;
- Alluvial Sand – comprising fine to medium grained sand with some gravel in lenses, generally dense and medium dense.

Fill and alluvial sand materials noted within the project footprint are expected to be highly permeable. **Chapter 8** Geology, Soils and Groundwater describes the findings of field investigations in the study area with respect to contaminated land, acid sulfate soils and groundwater.

Soil testing did not identify contaminated land in the project footprint. Generally low to moderate levels of net acidity were identified in the project footprint, with higher levels in parts of the drainage realignment that will require treatment with lime during construction. The groundwater monitoring data indicates the groundwater level varies across the study area from around 1 metre AHD to 3 metres AHD.

3.6 Project Elements

3.6.1 Airport Drainage

The existing drainage network through the Airport was constructed during airport development, sand mining and construction of community infrastructure since the mid-1900's. It collects and conveys all of the runoff from the upstream urbanised catchments of Tugun and Bilinga. The airport drainage system consists of grass-lined and concrete-lined channels, with pipe and box culverts under pavement crossings.

The drainage reserve is the main surface water feature on the Airport. This commences at the north of the Airport and flows in an open channel, approximately 2.9 kilometres in length, through the Airport from north to south-east. The drain leaves the Airport via culverts beneath the Gold Coast Highway, and downstream it discharges to the Pacific Ocean at Kirra Beach.

The drainage reserve collects runoff from the northern and eastern parts of the Airport, including the Terminal and Runway Precincts. Runoff enters the drainage reserve via both overland flow over managed grasslands and through piped stormwater networks. Runoff which discharges from piped stormwater networks is processed via water quality devices prior to entering the drainage reserve.

A second drainage network collects runoff from the southern part of the Runway Precinct, and drains to the Cobaki Broadwater via a culvert and open drain above the Tugun Bypass tunnel. In major storm events (50 year average recurrence interval (ARI) and above) there is an overflow from the main drainage reserve into this catchment with all discharge received by the Cobaki Broadwater.

Expansion of the terminal building and aprons requires the diversion of the drainage reserve. The concept layout of the realigned drainage reserve is shown in **Figure 3.3.**

The drainage reserve will be extended southwards parallel to the existing taxiway, and around the southern boundary of the Master Plan 20-year aviation development. The eastern portion of the drainage reserve will be retained, with some modifications, to continue to service the piped stormwater drainage network within the long term car park, ground transport areas and the Australian Federal Police and Southern Cross University sites. The drainage reserve will continue to discharge to the existing culverts beneath the Gold Coast Highway.

The realigned portion of the drainage reserve will be approximately 1500 metres long. It will typically be an open channel that will be grass-lined above the normal water level, with erosion protection in the base of the drain, where required, e.g. for maintenance, scour protection etc. Reinforced concrete pipe culverts will be used to convey the drain beneath the taxiways and perimeter roads.

To maintain the existing point of discharge at the Gold Coast Highway the open channel will have an invert level of approximately 0.7 metres AHD. This is below existing ground level in the northern and eastern sections of the diversion, but above existing ground level in the southern section. The ground in this area is to be built up as part of the earthworks to allow for future extension of the apron and taxiway, and an impervious earth bund will be constructed on the southern side of the realigned drainage channel to contain the flows. The exact invert level of the drainage channel will be determined during detailed design, with due consideration of water depth in the channel and the need to avoid encouraging bird life in close proximity to aircraft operations.

Surface runoff from the new apron and parts of the apron taxiways will flow to grated drains at the rear of the stands and then be conveyed to the drainage reserve through a network of flame traps and pipes via the proprietary stormwater treatment devices. Surface runoff from the remainder of the taxiways will flow overland towards the drainage reserve via a grassed area which provides a level of pre-treatment. The stormwater treatment devices have been sized to treat a three month ARI storm event and will have some capacity to contain fuel spills on the apron. Emergency management of fuel spills will be the subject of a detailed risk assessment to be conducted by the Airport and JUHI. The outcome of the risk assessment will inform the requirements for the detailed design of the apron infrastructure to manage the risk of fuel spills. This treatment approach is in line with existing airport industry practise as described further in **Chapter 9** Surface Water Quality.

In the future when the full extent of terminal and apron expansion occurs in the Future Development Area, runoff from approximately one half of the new apron will initially be collected via grated trench drains and flow towards a bioretention basin adjacent to the apron prior to joining the realigned drainage channel. The purpose of the bioretention basis will be the treatment of runoff or for spills to be captured. The detailed design of future aviation developments, including the bioretention basin, will be carried out as part of future projects and will confirm the stormwater treatment required as development at the site progresses.

Flood modelling has been undertaken to assess the effects of both the current project and the Master Plan 20-year aviation development on flood risk within and adjacent to the Airport. This has demonstrated that the project and Master Plan 20-year aviation development in the Future Development Area will not increase peak flow rates downstream of the site. Whilst the construction of the future apron areas will increase the impervious area

within catchment, the increased length and containment volume of the realigned drainage reserve detains the flow and avoids increasing downstream peak flow rate.

Realignment of the drainage reserve encompasses part of the existing catchment of the Cobaki Broadwater. The existing bank of culverts beneath Taxiway Charlie and the overflow from the main drainage reserve into the Cobaki Broadwater catchment will continue to operate, but flood modelling has demonstrated that flow rates and volumes will be no worse than for the existing arrangement.

Hydrology and flooding baseline conditions and the assessment of potential project impacts are provided in **Chapter 10** Hydrology and Flooding.

3.6.2 Waste Transfer Area, Permanent Loading Dock, Plaza and Ground Transport Facility

The terminal expansion footprint extends over an existing hardstand area that currently accommodates the taxi waiting area, waste transfer area, loading dock and GSE storage area. These facilities will therefore be permanently relocated as part of the project.

The loading dock, waste transfer area and retail storage facilities will be relocated to the northern end of T1, taking up part of the existing coach terminal area as well as an existing hardstand area and part of the existing international arrivals area. A new building to house the retail storage (approximately 750 m2) will be constructed within the existing coach terminal area.

An indicative location of the loading dock, waste transfer and retail storage is shown in **Figure 3.3**, however the exact location is being determined in detailed design and will ensure that the facilities are sufficient. Relocating these facilities to the northern end of the terminal means that there will be no requirement to relocate them again during future terminal expansions to the south as detailed in the Master Plan. A new access road will be created between Eastern Avenue at T2 and the loading dock which will require a relocation of the airside boundary fence in this area of the site.

A pedestrian plaza will be constructed external to the new arrivals hall at the southern end of the terminal. The plaza will provide a welcoming arrival experience at the Airport whilst also serving as an orientation and circulation space for visitors moving between the terminal, car parks and ground transport.

A consolidated ground transport facility will be constructed adjoining the pedestrian plaza to the south east of the terminal expansion. The facility will be located over the eastern portion of the drainage reserve that will be infilled following the main drainage realignment. The consolidated transport facility will include the relocated taxi staging area, covered boarding areas for coaches, mini-buses and limousines, covered pedestrian walkways and circulation roads for all ground transport modes. The relocation of these ground transport modes to the southern end of the site has been driven by the need to maintain adjacency of the tour coach and mini-bus facilities to the International arrivals area. The new location also brings these facilities closer to the Domestic arrivals area. Short-term drop off areas for all ground transport modes will be retained at the northern end of the terminal to maintain acceptable walking distances for departing passengers.

In order to provide appropriate circulation and minimize congestion at the front of the terminal, the existing taxi rank will also be relocated along the edge of the pedestrian plaza adjacent to the arrivals hall. The location of the new taxi rank has been chosen to coincide with the future alignment of the face roads when the plaza is extended along the face of the terminal, as depicted in the Master Plan.

3.6.3 Terminal Expansion

The terminal expansion will increase terminal capacity to meet forecast demand up to 2023. Planning for the terminal expansion has occurred in parallel with consideration of the reconfiguration and upgrade of areas inside the existing terminal building which will be delivered as part of other projects.

The expansion will occur to the south of the existing terminal into an area which is currently partially hardstand. Part of the hardstand area is landside and is used for delivery of goods (loading dock), waste transfer and taxi staging. The airside portion of the hardstand area is currently used for ground handling equipment storage. The remainder of the expansion footprint extends over the existing drainage reserve therefore requires the temporary works diversion to take place early in the construction phase, as described in **Section 3.7.3.**

Design Intent

The design intent for the terminal expansion is to:

- Provide an enhanced level of service for terminal users through streamlined passenger processing and terminal connectivity;
- Facilitate long term flexibility and future incremental terminal expansion;
- Provide excellent passenger facilitation outcomes and a memorable passenger/customer experience;
- Provide flexible and scalable working space for terminal operators;
- Provide terminal facilities that cater for a range of passenger groups (e.g. domestic and international, low cost and full service carrier passengers, leisure and business travellers);
- Incorporate smart technology and environmental sustainability that has proven performance outcomes;
- Facilitate integration of the terminal with the wider precinct urban form and create an environment with an identity intrinsic to the Gold Coast.

Terminal Design

The terminal expansion will be three levels with a gross floor area (GFA) of approximately 25,000 m2. The expansion area will provide for international departures and arrivals facilities at the south end of the terminal whilst also servicing domestic functions through the inclusion of swing departure gates and baggage reclaim belts. Relocating the international processing to the southern end of T1 will enable the vacated international facilities at the northern end of T1 to be repurposed for domestic and back of house uses.

The terminal expansion will accommodate the following facilities:

- Domestic/international swing gates including four aerobridges;
- Circulation areas;
- International security and liquids, aerosols and gels (LAGS) screening with footprint area which has been sized to cater for the FY23 design year capacity;
- Departure emigration processing;
- Departure lounge including duty free store, food and beverage and specialty retail concessions;
- Arrivals duty free store;
- Arrivals immigration processing;
- Office accommodation for border agencies;
- Baggage claim;
- Quarantine inspection facilities;
- Arrivals hall including commercial concessions.

3.6.4 Apron and Taxiway Expansion

The apron and taxiway expansion required for the project has been determined on the basis of forecast air traffic demand (described in **Chapter 2** Project Justification and Objectives) and comprises five Code E stands and taxiway to be completed in two stages:

- Stage 1: the construction of two Code E stands and taxiway access to the parallel taxiway by the end of 2017;
- Stage 2: the construction of three additional Code E stands and access to the parallel taxiway, to be substantially completed by early 2021.

Each Code E stand can be utilised by either one Code E aircraft or two Code C aircraft at a time.

Planning parameters for the apron layout, based on MOS Part 139, allow aircraft up to 76 metres long which accommodates the B777 300ER and the A340-600.

In order to accommodate the new aerobridges and create the required apron grading for drainage, most of the southernmost existing stand will require reconstruction.

The airside road will traverse the head and rear of the bays of the expanded apron. At the schematic design stage the apron, taxiway and taxi-lane has been designed as a concrete pavement, with the taxiway and taxi-lane designed as flexible pavements.

The key features of the apron and taxiway layout are shown in **Figure 3.3.**

3.6.5 Apron Lighting

A conceptual apron lighting design has been prepared for the ultimate apron expansion and includes 20 lux lighting to aircraft parking locations, compliant with MOS Part 139. Light masts will be located between the stands at an offset from the head of stand road, to achieve the required light levels.

3.6.6 Airside Perimeter Road

An extension to the current airside perimeter road will be needed to provide access to the perimeter of the Airport. Currently the airside perimeter road traverses the northern and western edge of the project footprint and around the end of the runway. The route of the airside perimeter road will be modified as part of the project and will follow the perimeter of the terminal and apron expansion and cross the drainage diversion as indicated in **Figure 3.3.** The road will be approximately six metres in width and will connect to the new access road for the Instrument Landing System (a separate project).

Future staged aviation development (i.e further terminal and apron expansion) is planned to occur in the Future Development Area as necessitated by forecast demand. The airside road and associated fencing will be modified as necessary in the future to accommodate future developments. The details of these changes will be determined as planning is undertaken for staging of Master Plan developments which are not part of this project.

3.6.7 Fencing

All airports in Australia are required to address specific aviation security regulations. A security restricted area applies to the apron and separates airside areas from publicly accessible landside areas. The security fence constructed for the project will follow the new portion of the airside road and will connect to the existing airport security fencing which is continuous around the airside area, refer **Figure 3.3**. The fence will conform to Australian Standard AS1725-1 2010 Galvanised Rail-less Chain-wire Security Fences and Gates, with a minimum height of 2.13 metres and topped with an outwards crank with at least three strands of barbed wire, therefore a total minimum height of 2.44 metres. Any gates installed in the new fence will be to the same standard. Fences and gates at the Airport are inspected daily as part of Airport operations and a clearance zone on either side of the fence is maintained. Where a security fence crosses drains, culverts or other depressions likely to enable unauthorised entry, the opening will be secured in such a manner (mesh, bars) to stop unauthorised access to airside.

In addition to the above security fence, a fauna-proof fence will be constructed around the entire project footprint to prevent fauna entering the site. This reduces the risk of fauna mortality on the Airport and the risk

associated with aircraft strike. The fauna fence will consist of a chain wire fence 1.8 to 2.0 metres in height, without barbed wire. The design of the fence will consider the need to allow one-way fauna movement so that fauna are able to exit the development footprint, but not re-enter.

3.6.8 Services

The construction and operation of the project will require existing services to be relocated and both temporary and new permanent services to be installed.

Existing Services

A City of Gold Coast rising sewer main is located within the project footprint and runs along the Queensland and New South Wales border before connecting into the Terminal Precinct under the terminal expansion footprint. This is an ageing piece of infrastructure that is being relocated out of the zone of influence of a number of projects defined within the Airport's Master Plan. Gold Coast Water and the Department of Transport and Main Roads have approved the relocation of the sewer rising main which will be completed within 2016.

The Airport is currently serviced by an Energex power feed from Kirra. A second feed is proposed to the Airport and will connect to the new Network Intake Substation which is scheduled for completion within 2016. The substation is located adjacent to the staff car park at Eastern Avenue. Discussions between GCAPL and Energex continue to occur regarding the installation of the second feed following completion of the Network Intake Substation.

There are currently a range of services supplying the existing terminal building and apron including:

- A substation and power feed;
- Sewer pump station;
- Water feed;
- Air conditioning;
- Smoke exhaust units;
- Fire water tank;
- Apron lighting;
- Information and communications technology.

The sewer pump station and water feed are sufficient to accommodate the project, however the other services listed above will be augmented or duplicated for the project as required.

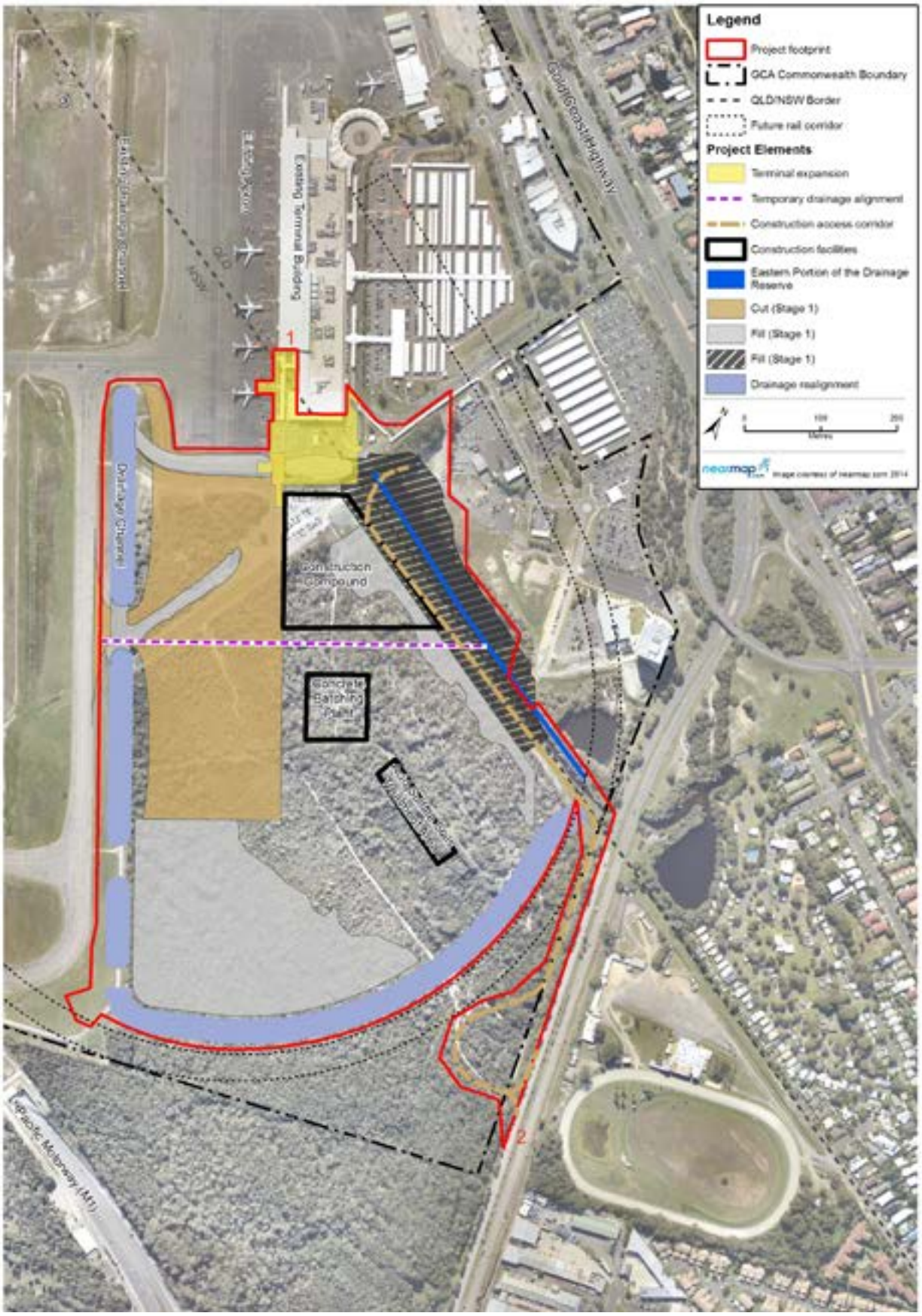
3.6.9 Landscaping

The project footprint is currently a largely vegetated area that will be cleared during the works. Parts of the project footprint will become hardstand areas for the apron expansion, terminal expansion and associated infrastructure such as roads. A portion of the site will become the drainage reserve which will be turfed above the normal water level to stabilise the slope against local erosion.

The remainder of the cleared area, (approximately 17 hectares), is the Future Development Area, which will be used during Stage 1 for construction activities (including a construction compound and contractor parking, concrete batching plant, acid sulfate treatment area, material stockpiles placement of fill material and construction access roads) and then seeded or turfed with appropriate grass species until future development occurs (i.e. progressive expansion of the apron and terminal for the ultimate development scenario or other interim uses such as ground transport which are not part of the MDP). Grassing of the site will prevent erosion and allow for stormwater infiltration. Grassed areas will be maintained as part of normal airport operations.

The landscape assessment and mitigation techniques is discussed in **Chapter 17** Landscape and Visual.

Figure 3.4: Construction Facilities and Earthworks Staging



3.7 Project Construction

3.7.1 Introduction

The main steps in the construction of the project are described in the following sections and include:

- Site preparation - including site access and construction compound facilities;
- Temporary diversion of part of the drainage reserve to the immediate south of the terminal expansion site;
- Vegetation clearing and environmental protections;
- Earthworks;
- Permanent drainage reserve realignment;
- Infilling of redundant sections of the existing drainage reserve and optimisation of the channel cross section along the remaining eastern portion of the drain;
- Apron and taxiway construction;
- Terminal expansion;
- Site disestablishment and landscaping.

Construction facilities and earthworks are shown in **Figure 3.4.** The final construction method including procurement and staging is being determined by GCAPL during detailed design.

Construction Timeframes

Estimated project timeframes for the main project elements are shown in **Figure 3.5.**

Workforce

The project will create employment opportunities for both skilled and unskilled construction workers and professional staff. The estimated workforce requirements for the main components of the project are shown in **Table 3.1**. Given the overlap of timeframes for the various project components the peak site presence between mid-2016 and mid-2017 is expected to be in excess of 400 personnel. Where possible the workforce will be local therefore no on-site worker accommodation is proposed. However construction facilities including site offices, mess facilities, amenities, storage areas and contractor parking will be provided within the project footprint as described in **Section 3.7.2.**

Figure 3.5: Construction Timeframes

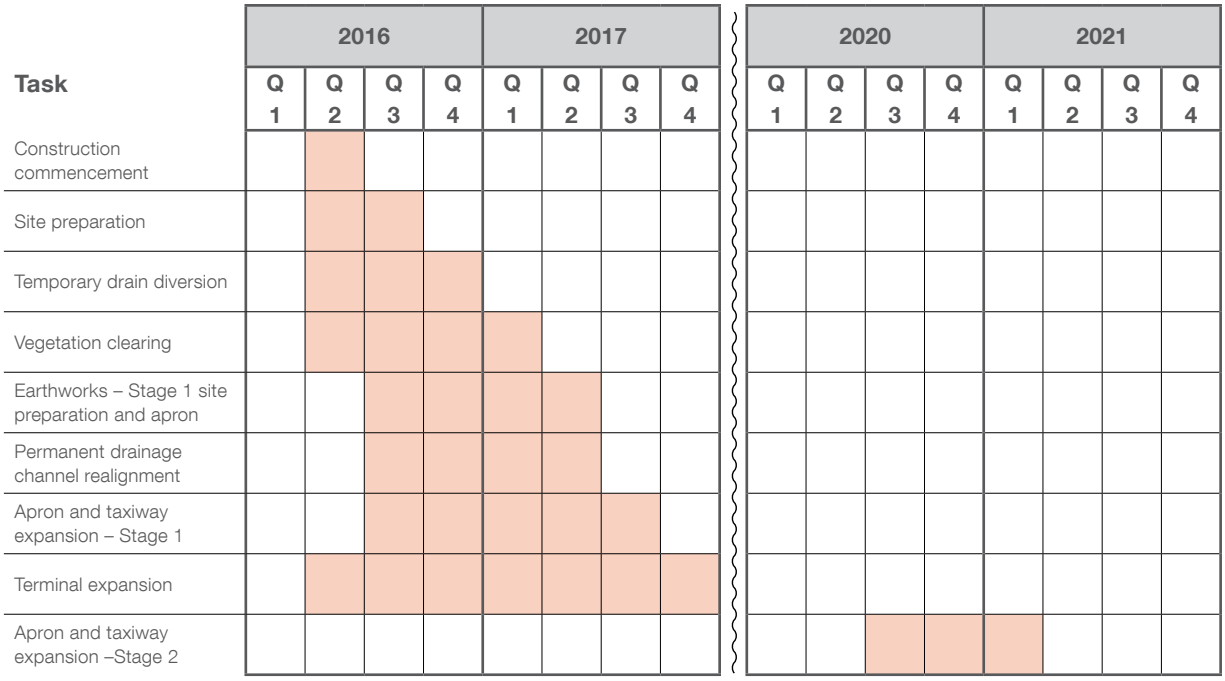


Table 3.1: Estimated Workforce during Construction of the Project

Workforce	Labour	Supervision and Professionals
Site preparation and temporary drain diversion	50	10
Vegetation clearing and permanent drainage channel realignment	50	10
Terminal and apron expansion (including earthworks)	350	30

Hours of Work

Normal construction hours for the project will be between 6.00 am and 7.00 pm Monday to Saturday.

There may be a requirement for out of normal hours construction at times during the construction schedule where activities may impact the safe operation of the Airport. An example of this would be installation and commissioning of airfield lighting and line marking and modification to refuelling hydrants. In the event of night works, GCAPL's normal procedure is to send letters to the surrounding residential community advising them of the date and time of proposed works and provide contact details for the reporting of any issues associated with the works.

Maintenance of Airport Operations

During construction of the project, normal airport operations will continue. Various management strategies will be included in the project construction planning to ensure that safe and secure airport operations are maintained during the works. This includes:

- Construction of airside elements of the project in accordance with approved method of working plans (MOWP) as required;
- Security control measures established and adopted as required which are compliant with OTS, CASA and GCAPL's regulations, standards and recommended practices;
- Traffic management planning to minimise impacts to the Airport's road network;
- Relocation of airside boundaries as approved by the OTS to maximise the landside extent of the site;
- Temporary security fencing where required to restrict access to airside areas;
- Maintenance of emergency areas and fire egress paths throughout construction staging.

3.7.2 Site Preparation

Construction Site Access

The construction of the project will require access for delivery and removal of materials and equipment from the site as well as access for the construction crews. A new construction access will be provided from the Gold Coast Highway to minimise the impact of construction related traffic to the existing Airport road network and create efficient access to the project footprint.

Construction traffic will access the site by exiting the northbound Gold Coast Highway via a new left in slip lane situated opposite Border Park raceway. The access is shown in **Figure 3.4**. Construction traffic will then follow the route of the existing access track that follows the Queensland/ New South Wales border, which will be formalised into a construction access road. Construction traffic will exit the site via a left turn out onto the Gold Coast Highway at the new access point.

Construction Facilities

Temporary facilities will be required for the construction phase, as shown in **Figure 3.4.** These comprise:

- Construction compound to the south of the existing terminal and existing drain. Construction facilities in this area would include site offices, mess facilities and amenities, storage containers and contractor car parking. The size of the construction facilities will change through the life of the project and is expected to increase in preparation for the terminal expansion works which will have the largest workforce. The approximate footprint of the construction compound is shown in **Figure 3.4.** The area used for the construction compound will become a GSE storage area once construction is complete;
- Concrete batching plant adjacent to the construction compound. It is expected that pavement materials will be delivered to stockpiles in this area;
- Acid sulfate soil treatment area in the southern portion of the project footprint which will be used for treatment of acid sulfate soils with lime. Treatment areas will be lined with compacted fill material and a lime guard layer;
- Various temporary haul roads will be established within the project footprint to facilitate the movement of materials during the earthworks and drainage realignment construction.

Temporary Fencing

Temporary fencing will be provided around works areas to prevent public access to the construction site and manage site security. Temporary barriers will also be utilised as required to screen the site from Airport users and surrounding public access areas such as the Gold Coast Highway.

3.7.3 Temporary Diversion of Existing Drain

The existing east-west portion of the drainage reserve that is directly south of the existing terminal will be diverted during the early part of the construction phase, as it is within the footprint of the terminal expansion. The diversion is shown in **Figure 3.4.** The proposed steps in the construction of the temporary drain include:

- Construction of a new bridge or culvert crossing of the existing drainage reserve, to the east of the current crossing point, to allow continued access to the site accommodation and ultimately the terminal expansion area. This crossing is expected to be in place until the main drainage diversion is completed and the temporary diversion backfilled;
- Excavation of the temporary drain channel to the south of the existing drain, including erosion and sediment control measures to minimise water quality impacts,

and stockpiling of material for reuse in infilling the existing drain;

- Connection of the new temporary channel to the existing channel, upstream and downstream of the realignment;
- Filling and compaction of the existing drain using material excavated from the new temporary channel;
- Infilling of the temporary channel following completion of the main drainage diversion around the Master Plan 20-year aviation development footprint.

3.7.4 Vegetation Clearing and Environmental Protections

The project footprint is approximately 45 hectares and comprises vegetated areas and existing hardstand. Vegetation clearing (approximately 32.5 hectares) will occur progressively from the southern end of the site adjacent to the site access from the Gold Coast Highway. Priority will be given to clearing the area required for the apron, taxiway and permanent drain construction.

The area to be cleared is generally bounded by the drainage channel realignment but also includes the slip lane access from the Gold Coast Highway as described in **Section 3.7.2**. Cleared vegetation will be chipped onsite and reused at the Airport where possible. Vegetation that cannot be reused at the Airport will be reused elsewhere or removed for disposal.

Prior to and during vegetation clearing the following and other environmental management measures will be implemented, as described further in **Part B** Impact Assessment:

- Pre-clearing fauna survey and relocation of fauna by a licensed and experienced spotter catcher(s) to reduce the overall risk of injury or fatality to local fauna inhabitants during clearing activities;
- Progressive establishment of erosion and sediment controls to prevent erosion of exposed surfaces by wind or water and to protect the water quality of the existing drainage reserve on the Airport and downstream;
- Stockpile storage areas will be designated within the project footprint at least 30 metres from drainage lines. This will include specific areas for the stockpile and treatment of acid sulfate soils, as described in **Section 3.7.2**, if required during the works.

3.7.5 Earthworks

The following earthworks will be performed as part of the project:

- Temporary diversion of the east west section of the existing drain around the terminal expansion footprint and infilling of the existing drain in this area;
- Excavation for the drainage channel realignment;
- Earthworks for the five Code E stands and taxiway;
- Fill of the southern portion of the site (**Figure 3.4)** in order to provide an effective overland drainage path to the realigned drainage channel;
- Fill of the north eastern part of the site adjacent to and south of the existing drain (**Figure 3.4**); and
- Infill the redundant sections of the existing drainage reserve and optimisation of the channel cross section along the remaining eastern portion of the drain.

The majority of the filling within the project footprint will be completed through the placement of earth materials won from within the apron and drainage reserve realignment footprints. The cut to fill operation will generate a surplus of earth material in excess of 10,000 m3 which will be placed in other parts of the project footprint (for example **Figure 3.4** shows this material being placed in the north eastern part of the site adjacent to and south of the existing drain) to facilitate the construction of the project and commence the formation of the master grading for the Master Plan 20-year aviation development footprint.

Earthworks will also be carried out to complete the infilling of the majority of the eastern portion of the existing drainage reserve, as described in **Section 3.7.6**.

Unsuitable materials (including materials with silt content exceeding 10 per cent, 3 per cent organics, or in excess of the optimum moisture content range) are likely to be encountered by excavation works, particularly in low-lying areas and existing drains. All such materials will be treated if required and then stockpiled for use on the site. Where there is no appropriate use for the materials they will be disposed of offsite at a licensed landfill.

The southern part of the site is low-lying and boggy. It is expected that a rock fill platform will be required in this area in order to provide a stable working surface from which to construct the fill platform. All ground surfaces will be required to be subject to a proof roll test prior to filling, except where rock fill is required.

Filling is to be undertaken as far as possible using clean sand won from site. Suitable sand for use as fill shall be tested and confirmed to meet the required specification. This would include being free of contamination, complying with *Airports (Environment Protection) Regulations 1997* (AEPR) requirements and meeting the required bearing capacity, plasticity and particle size.

Settlement in the order of 50 – 100 millimetres in areas of fill is expected to occur during construction.

3.7.6 Drainage Construction

Excavation of the new permanent drain will progress in parallel with the earthworks for the apron area. The drain excavation will commence at the northern part of the site and progress southwards. The existing drainage reserve (including the temporary drain diversion around the terminal expansion footprint) will continue to function during construction of the new permanent drain.

The excavated material from the apron and the new permanent drain will provide the fill material for the southern portion of the site in order to provide an effective overland drainage path to the realigned drainage channel. This material will also be utilised for construction of embankments around the outside bend of the southern part of the drain where the invert level of the drain is above existing ground level.

As each stage of the drainage channel is constructed, grass seed or spray will be applied to the surface of the channel, with erosion protection in the base of the drain, where required, e.g. for maintenance, scour protection etc.

The final step in completion of the drain construction will be the connection of the southern and northern ends to the existing drainage reserve, allowing water flows to be directed into the new channel.

The existing east-west portion of the drainage reserve including the temporary drain diversion will then be in-filled and compacted in preparation for apron construction in that area. Additionally the majority of the eastern portion of the drainage reserve will be in-filled, with the existing-piped stormwater network in the terminal precinct extended below the new consolidated ground transport facility to the site discharge point below the Gold Coast Highway. Material may need to be imported to complete the infilling of this section of the drain. In this case, the materials will be delivered to the site via the construction site access from the Gold Coast Highway.

3.7.7 Construction of Waste Transfer Area, Permanent Loading Dock, Plaza and Ground Transport Facility

The taxi waiting area will be temporarily located in a new tarmac hardstand area adjacent to the AFP building with entry via Tom Norris Drive. The pedestrian plaza location and service road accessing the consolidated ground transport facility sit partly over a vegetated area to the side of Terminal Drive which will require clearing. This area is not an ESA within the Master Plan. The potential impacts to flora and fauna in this area are described in **Chapter 11** Terrestrial and Aquatic Flora and **Chapter 12** Terrestrial and Aquatic Fauna.

The consolidated ground transport infrastructure will be constructed following the filling of the eastern portion of the drainage reserve.

Following the closure of the existing international arrivals baggage handling area and the coach terminal at the northern end of the terminal, the area will be converted into the new waste transfer area, permanent loading dock and retail storage area. This will replace the existing facilities at the southern end of T1 which are situated within the footprint of the terminal expansion.

3.7.8 Terminal Expansion

This component of the construction is expected to require the largest workforce and therefore the construction compound established at the start of the works will be expanded to accommodate the required facilities.

Once the existing facilities south of the terminal have been relocated (as described above), construction of the terminal expansion will commence. The exact construction methodology will be determined during later stages of the project, however a typical construction methodology may be as follows

- Removal of the existing hardstand area and construction of foundations for the structural steel frames;
- Installation of under-slab drainage and incoming services including electricity, water and communications. Lift pits will also be formed and poured;
- Erection of steel frame will be completed using a mobile crane. The construction sequence is likely to be from west to east with the crane completing the erection sequence at the landside façade of the building. This sequence allows for efficient delivery of materials to the site;
- The mobile crane is likely to be a 50 tonne telescopic crane with outriggers capable of lifting structural steel members, composite decking and roof sheeting. Whilst the maximum height of the extended boom could reach 60 metres, during operation it would not be expected to exceed 40 metres. As the structure is expected to be erected from west to east it is expected that the crane will initially be situated at the western end of the site within the footprint of the new building area and work back towards the eastern end of the site as the work progresses;
- Once the main steel frame members have been installed the metal deck flooring will be laid in place for levels one and two. These will be lifted into position by the mobile crane;
- Roof coverings will commence following the completion of the metal deck flooring and once again will work from west to east with roof sheets lifted into place by mobile crane;
- Floor slabs will commence once the roof coverings are in place and a degree of watertightness is provided. The ground slab will be laid first and will be laid from west to east. The slabs will be poured using a static concrete pump at a rate of approximately 1000 m2 per week requiring 30 concrete delivery trucks each week or an equivalent number of truck movements to site for material delivery to the batching plant;
- High level services will be installed once the floor slab has been poured gaining the benefit of being able to use scissor lifts on a flat slab to install. Partition walls will be erected once the main service runs have been installed with a single side of board installed initially to allow in wall services to be fitted. Floor finishes will follow the wall erection and protection will be laid immediately after. Ceiling finishes followed by services fit off and wall services fit off will be installed prior to decoration, defecting and cleaning;

- It is envisaged that once the new terminal expansion is completed, the wall that divides the new terminal from the existing terminal will be removed;
- The foundations for the fixed links to aerobridges will be constructed prior to the completion of the apron slab. Structural fixed link elements such as the nodes and the fixed link itself will be lifted into place by mobile crane. The aerobridge can then be installed following completion of the fixed link.

3.7.9 Apron and Taxiway Expansion

The Stage 1 earthworks described in **Section 3.7.5** will reduce the existing surface level within the apron footprint to the required levels, before installation of drainage and in-ground services reticulation. A sub-base layer will then be laid using imported pavement construction material. This will require approximately 47,000 m3 of material, equating to three truck deliveries per hour over the course of four to five months.

For the purposes of the conceptual design concrete apron pavements have been adopted. Allowance has been made in the MDP for the use of a concrete batching plant on the site. The need for the concrete batching plant would be determined during construction planning and would only be required where the local supply was unreliable or insufficient to meet demand. If required, the plant would be situated adjacent to the apron expansion and beside the construction compound, refer **Figure 3.5**. Alternatively if utilising offsite batching, the apron construction would require approximately 35 concrete delivery trucks per day for six months. A mobile concrete pump will also be used. Both scenarios have been considered in the noise and traffic assessments.

3.7.10 Site Disestablishment

Site disestablishment will occur at the end of the Stage 1 works (terminal expansion, two-bay apron expansion and permanent realignment of the drainage channel) – including removal of all temporary infrastructure and construction equipment. Once site stabilisation measures are established, erosion and sediment control measures will also be removed.

Subsequent to the clearing and preparation of the project footprint described in this MDP, parts of the future development area within the Terminal Precinct may be utilised for interim uses prior to their development as either apron or terminal. These interim uses will be compatible with the permitted uses within the Terminal Precinct, such as ground transport and car parking. For this reason areas of sealed at grade contractor car parking constructed as part of the project will be retained post construction.

3.7.11 Landscaping

As construction or clearing is progressively completed in different parts of the site, areas that are not part of the project infrastructure will be grassed with appropriate species as described in **Section 3.6.9.**

3.8 Hazard and Risk

The operation of airports encompasses a diverse range of risks, and airport and aviation safety is fundamental to the operation of the Airport. Hazard and risk management is an ongoing process at the Airport, and includes tracking and documenting of risks, development and continuous updating of preventative and responsive procedures, and the testing and drilling of action plans and procedures to ensure their effectiveness.

The construction and operation of the project is likely to encompass many of the same hazards and risks that are currently managed during standard airport operations and will also involve new hazards and risks that are specific to the project. **Section 3.8.2** identifies the key categories of hazards and risks to people, property and airport operations that may arise during planning and design, construction and operation of the project and identifies how they are addressed.

Environmental risks are addressed in **Part B** of the MDP.

Following review of the Exposure Draft version of this MDP, The Civil Aviation Safety Authority (CASA) has advised that it has no objections to the proposal provided its design, construction and continued operational management is consistent with the requirements of the Civil Aviation Act 1988 and regulations under the Act, principally Part 139 of the Civil Aviation Safety Regulations 1998 and the Manual of Standards for Part 139.

Airservices Australia's submission during the public consultation period for the project states that the project will not adversely impact the performance of communication, navigation and surveillance facilities. At a maximum height of 18 metres above ground level, the terminal expansion will not affect any circling altitude, nor any instrument approach or departure procedure designed by Airservices at Gold Coast Airport. Any new structures, including light poles, as well as associated plant and crane operations to be utilized in the construction of the project will need to be assessed separately prior to construction commencing.

3.8.1 Legislation and Policy

Legislation and policy that is relevant to the assessment and management of risks at the Airport are summarised below.

Work Health and Safety Act 2011 (Commonwealth, Queensland, New South Wales)

These Acts set out requirements and obligations for health and safety risk minimisation at workplaces. The Acts specify the duties of designers to ensure that designed plant substance or structure is without risk to health and safety of persons who use the product, who construct the product, who decommission the product and who maintain the product.

The Acts also establish a duty of care, which obligates GCAPL (and its subcontractors) to ensure, as far as

reasonably practicable, the health and safety of its workers as well as other persons put at risk from work carried out.

Australian/New Zealand Standard International Standards Organisation (ISO) 31000:2009 Risk Management Principles and Guidelines

The standard provides principles and generic guidelines on risk management, including the identification, analysis, evaluation and treatment of risks. The standard is not specific to any industry or sector. The Airport operates under the Queensland Airports Limited Risk Management Policy and Framework, which are consistent with the principles of *Australian/New Zealand Standard International Standards Organisation 31000:2009 Risk Management Principles and Guidelines.* The risk management framework identifies responsibilities for risk management across QAL and defines the process for the ongoing identification, analysis, evaluation and treatment of strategic and operational risks.

Airports Act 1996 and Airports (Protection of Airspace) Regulations 1996

The Act and Regulations establish a framework for the protection of airspace at and around airports. Protected airspace is the airspace above the Obstacle Limitation Surface (OLS) and Procedures for Air Navigation Service – Aircraft Operations (PANS-OPS) surface. The OLS is a conceptual surface associated with a runway, which identifies the lower limits of the airspace at which objects become obstacles to aircraft operations, and must be reported to CASA. PANS-OPS is a term denoting rules for published approach and departure procedures utilised by pilots at airports.

Civil Aviation Act 1988, Civil Aviation Regulations 1988, Civil Aviation Safety Regulations 1998, and the Manual of Standards (MOS) – Part 139 Aerodromes

Part 139 of the Regulations prescribes the requirements for aerodromes used in air transport operations. MOS sets out the standards and operating procedures for certified, registered aerodromes and other aerodromes used in air transport operations.

MOS Part 139 provides geometric constraints that have been incorporated into the apron and taxiway design. These standards provide the required airfield characteristics such as the dimensions and gradients of the apron, taxiways and related facilities.

National Fire Protection Association (NFPA) 415 Standard on Airport Terminal Buildings, Fuelling Ramp Drainage and Loading Walkways

The NFPA 415 Standard on Airport Terminal Buildings, Fuelling Ramp Drainage and Loading Walkways specifies the minimum fire protection requirements for the construction and protection of airport terminal buildings.

The NFPA 415 standard provides design requirements for fire protection of:

- Airport terminal buildings;
- Aircraft loading walkways;
- Aircraft fuelling ramp drainage.

National Airports Safeguarding Framework

The National Airports Safeguarding Framework (NASF) provides guidance on planning requirements for development that affects aviation operations.

The NASF consists of a set of guiding principles with six guidelines relating to aircraft noise, wind shear and turbulence, wildlife strikes, wind turbines, lighting distractions and protected airspace. The framework applies at all airports in Australia and affects planning and development around airports.

3.8.2 Project LIFT Risk Review

The following sections describe the types of risks that may arise during planning and design, construction and operation of the project and how they are addressed.

Health and Safety

Health and safety risks may arise during the construction and operation of the project and may affect people (including construction personnel, airport operations personnel or the general public), property and airport operations. Examples of hazards and risks that may arise during the project include:

- Slips, trips or falls during construction or operation are a common source of workplace injury. Construction workers, airport operations personnel or the general public could be subject to this risk;
- Working in confined spaces – access to shafts or trenches may be required by construction personnel during construction of the terminal and apron. The risks associated with working in confined spaces include lack of oxygen resulting in suffocation or loss of consciousness due to airborne contaminants;
- Excessive construction noise generated during the use of construction machinery and equipment may result in short or long term hearing loss to construction workers;
- Vehicle/equipment accidents – there is a risk of accidents arising from construction vehicles and/or moving equipment onsite during construction or operation of the project. Injuries arising from these types of accidents are common on work sites and can have serious consequences;
- Hazardous substances – project construction and operation is likely to require the handling and storage of hazardous materials such as fuels and chemicals;
- Emergency management – emergencies at the Airport

may arise during construction or operation of the project, for example from natural disasters (storm, flooding, fire), aircraft crash, security incidents, or hazardous material incidents;

- Exposure – weather conditions during outdoor construction work can pose a hazard to worker safety. Potential hazards include sun exposure, dehydration, heatstroke or heat stress;
- Wildlife incidents – snakes, spiders and biting insects may be present within the project footprint and may be encountered by construction personnel during construction, particularly during vegetation clearing;
- Security incidents – the majority of the project footprint is outside the current airside boundary and there is the potential risk that the integrity of the airside/landside boundary could be compromised during construction. Temporary fencing will be in place during construction to prevent public access to the construction site, and the airside fence will be relocated to encompass the terminal and apron expansion.

Mitigation and management of health and safety risks such as those outlined above will be implemented through the following measures:

- Regular stakeholder meetings during construction to brief airport users on changes occurring that could impact operational processes and which may require revised Safety procedures;
- Safety in design has been considered through the concept design process and a Safety in Design Register will be maintained throughout all project phases;
- Construction Safety Plan – Principal Contractors are required by legislation to prepare a Construction Safety Plan to identify the risks associated with the work, proposed controls and prevention measures to minimise the level of risk. Principal Contractors are also responsible for preparing Safe Work Method Statements for high risk construction activities to identify the specific hazards associated with the work and describe the measures to be implemented to control the risks;
- Gold Coast Airport Safety Management System – the Airport has a Safety Management System in place for the operation of the Airport, which is part of the Airport's risk management framework. Construction and operation of the project would be subject to the requirements of the Safety Management System;
- Gold Coast Airport Emergency Plan – this plan is in place at the Airport and aims to provide a timely and coordinated response to and recovery from an emergency at the Airport, to minimise the risk of injury to people or damage to property at the Airport. Management of emergencies during construction or operation of the project would be managed through this plan;
- Gold Coast Airport Environmental Management System (EMS) – environmental risks at the Airport are managed through the procedures in the EMS. This would be relevant to the storage, handling and transport of hazardous substances during project construction or operation;
- Method of Working Plan (MOWP) - Construction of all airside elements of the project will be in accordance with all acts, regulations, and standards as stipulated by CASA and OTS. This includes the development and implementation of an approved Method of Working Plan following consultation with CASA, Airservices Australia, and relevant airport stakeholders.

National Fire Protection Association (NFPA) 415 Standard Compliance

Where required, airside developments are to comply with the NFPA standard as described in **Section 3.8.1.**

Airport Terminal Building

The initial investigation as part of this MDP indicates that the terminal building is more than 30.48 metres (100 feet) from the fuel spill point (NFPA Clearance Line). A risk assessment is being undertaken as part of the detailed design process to establish compliance with the NFPA 415. The risk assessment will determine if the building will require a fire resistance solution to be incorporated in its design.

Aircraft Loading Walkways - Aircraft Fuelling Ramp Drainage

A risk assessment is being undertaken as part of the detailed design process for aircraft loading walkways to establish compliance and determine the manner in which it will be achieved. Apron grading has been designed to fall away from the Terminal Building for the first 15.2m and drainage has been designed to incorporate flame traps in compliance with NFPA 415 requirements.

National Airports Safeguarding Framework

It is considered that the development satisfies the various components of the NASF guidelines as outlined below:

Managing Impacts of Aircraft Noise

The NASF guidelines provides guidance on management of impacts of noise around airports including assessing the suitability of developments (sensitive and residential). This guideline is therefore more applicable to the planning of developments in the vicinity of the Airport. Obligations for airport lessees under the guideline are to publish an endorsed Australian Noise Exposure Forecast (ANEF) as part of the Master Plan. The Gold Coast Airport ANEF is provided in the current Master Plan and will not be changed as a result of the project.

Australian Standard AS2021 Acoustics – Aircraft Noise Intrusion – Building Siting and Construction is also relevant with respect to managing aircraft noise intrusion in the vicinity of airports. AS2021 applies to building sites within the 20 ANEF contour that are not associated with

the aerodrome. The terminal expansion is within the 20 ANEF contour however is associated with the aerodrome, therefore AS2021 is not specifically relevant to the construction of the terminal expansion. Nevertheless, the design of the terminal includes measures to appropriately insulate the building against the effects of aircraft noise.

Managing the Risk of Building - Generated Windshear and Turbulence at Airports

The NASF guideline presents a layered risk approach to the siting and design of buildings near airport runways to assist land use planners and airport operators to reduce the risk of building generated windshear and turbulence.

A quantitative assessment was undertaken based on Computational Fluid Dynamics analysis in accordance with NASF criteria to determine if any wind turbulence might be created by the terminal expansion which could affect aviation activities.

The assessment concluded that terminal expansion does not cause wind shear and it would require a wind speed in excess of the operational limit to meet the criteria level for Runway 32.

Managing the Risk of Wildlife Strikes in the Vicinity of Airports

The drainage reserve realignment has been designed to minimise standing water depth to reduce the attractiveness to birds, and non-bird attracting plant species are to be used in accordance with the Airport planting guidelines.

Managing the Risk of Wind Turbine Farms as Physical Obstacles to Air Navigation

This aspect of the NASF is not relevant to the project.

Managing the Risk of Distractions to Pilots from Lighting in the Vicinity of Airports

The guidelines apply to new sources of significant lighting in the vicinity of airports. In the context of the project, construction and operation lighting have been considered.

Project construction is not expected to occur at night, except in specific circumstances where night construction is required to minimise impacts to airport operations. In this case construction lighting will be planned to comply with airport safety requirements, including lighting intensity and the degree of light spill above the horizontal.

During operation, the terminal and apron will have some external lighting, including apron floodlights, and main entrance signage and flood lighting. The design of lighting for the terminal building and apron expansion will comply with the relevant CASA standards for aerodrome lighting and will be consistent with existing lighting at the Airport.

The guideline identifies that the glare from reflected sunlight from buildings tends to be momentary and is therefore unlikely to be a source of risk. Nevertheless, the terminal design is considering appropriate external cladding to minimise reflection and glare.

Managing the Risk of Intrusions into the Protected Airspace of Airports

Under the provisions of the Airports Act and the Airport Regulations, the airspace around airports may be declared "Prescribed Airspace" to protect the airspace for safe arrival and departure of aircraft using the airport. These Regulations apply to both on-airport and off-airport developments. Prescribed airspace is the airspace above the OLS and PANS-OPS.

The OLS at the terminal is at a height of 44 metres above ground level. The building envelope for the terminal expansion extends to a total height of 18 metres above ground level. Therefore, the development will have a minimum clearance of 26 metres and will not impact on the Airport's OLS.

A mobile crane is proposed to be used during construction of the terminal. Whilst the maximum height of the extended boom could reach 60 metres, during operation it would not be expected to exceed 40 metres. Should the crane penetrate the OLS an assessment and approval under the *Commonwealth's Airports (Protection of Airspace) Regulations 1996* will be required. At the location of the terminal the existing PANS-OPS surface for the two runway configuration is higher than the OLS at 69 metres AHD, therefore is also unaffected by the construction or operation of the project.

Sufficient information will be provided to Airservices Australia regarding building details (e.g. building coordinates, heights, lighting, external cladding and building materials used) to enable an assessment of impact to the operation of current and future navigational aids at the Airport.

Other Risks to Airport Operations

Foreign Object Debris

During construction there is a risk that construction materials will create Foreign Object Debris (FOD) which poses a hazard to aircraft operations. This risk will be managed during construction through stringent housekeeping rules to be implemented as part of the Construction Environmental Management Plan and Construction Safety Plan. This is standard practice for works at the airport that are adjacent to airside operational areas, and would include dust suppression and debris containment measures.

Plume Rise

The Civil Aviation Safety Authority has identified that there is a need to assess the potential hazard to aviation posed by vertical exhaust plumes in excess of 4.3 metres per second velocity at the level of the OLS. Minor

plume-generating activities in the terminal expansion may include exhausts from food and beverage kitchens, air conditioning units or fire smoke systems. It is unlikely that these plumes would be in excess of 4.3 metres per second at the level of the OLS, however measures will be implemented in the design of the terminal to assess and minimise the risks from plume rise and comply with CASA requirements. This may include horizontal discharge of exhaust instead of vertical discharge.

3.9 Building Sustainability

This section discusses the building sustainability measures that will be incorporated into the terminal expansion and focuses on resource use including energy consumption, water consumption and material usage. Waste minimisation and diversion from landfill is discussed in **Chapter 19** Waste and Hazardous Materials.

The building sustainability measures described here will be further developed as the terminal design progresses. A sustainability report will be prepared during the design development stage of the project to identify further building sustainability opportunities and to document how they are to be achieved through the design, construction and operation.

Currently the Airport Development Guidelines detail GCAPL's planning objectives for the Airport, including sustainability criteria for implementation in building design. GCAPL also maintains an EMS, certified to the ISO14001:2004 standard, to manage environmental aspects and impacts at the Airport, including resource use. Through the EMS and environment strategy, various measures are already in place to prevent, control or reduce energy and water use at the Airport.

The terminal building and surrounding landscaping will incorporate the following measures to minimise the use of resources:

Energy

- Installation of energy efficient lighting and equipment;
- Zonal control of air conditioning and lighting;
- Installation of energy efficient mechanical plant;
- Sub-metering of energy and water use;
- Use of building management systems to schedule and monitor building services;
- Optimise the use of natural light;
- The use of glazing, shading and insulation to optimise energy efficiency.

Water

- Installation of water efficient fittings and fixtures;
- Rainwater harvesting to enable capture and reuse of rainwater for landscaping;
- The use of non-potable water for toilet flushing.

Materials

- Source fit out materials with preference to materials with a high recycled content and low embodied energy;
- Low volatile organic compound (VOC) paints and floor coverings.

Landscaping

- Use of native species in the landscape design;
- Water sensitive urban design;
- Use of rainwater (as identified above).

4.0

Consultation and Approval Process

4.0 Consultation and Approval Process

4.1 Consultation Objectives

GCAPL is committed to ongoing and proactive communication and engagement with local communities and stakeholders as well as meeting the requirements under the Airports Act. GCAPL regularly holds community forums and presents project updates to local community groups. This commitment is reaffirmed by working closely with Airservices to monitor local aircraft noise complaints and maintaining extensive public information on the website relating to airport operations, activities and complaint handling processes.

The objectives for consultation of this MDP are to:

- Establish positive relationships with stakeholders;
- Engage and inform stakeholders about projects;
- Obtain stakeholder input into the development;
- Identify concerns and develop appropriate management strategies; and
- Discuss and confirm the approach being taken by GCAPL.

4.2 MDP Consultation

Consultation for the project started in 2011 during the preparation of the Master Plan. This involved detailed discussions of the 20-year development plan that incorporates the ultimate development of the project footprint. The Master Plan and the ultimate development of the terminal building and apron was approved by the Minister in 2012.

Consultation for the project intensified during the preparation of the MDP in 2014 and 2015 and involved discussions with a range of regulatory bodies, members of the local, state and Federal Government, community groups and indigenous groups.

Specifically the stakeholders that have been consulted with during the development of the MDP include:

- Federal Department of Infrastructure and Regional Development;
- Federal Department of the Environment;
- New South Wales Department of Planning and Environment;
- New South Wales Roads and Maritime Services;
- New South Wales Crown Land.
- Federal Government Ministers and Members of Parliament:
  - The Hon Justine Elliott MP - Federal Member for Richmond;
  - The Hon Steven Ciobo MP - Federal Member for Moncrieff;
  - Karen Andrews MP - Federal Member for McPherson.
- Queensland State Government Ministers and Members of Parliament:
  - The Hon Jann Stuckey MP – State Member for Currumbin;
  - Michael Hart MP – State Member for Burleigh;
  - Ray Stevens MP – State Member for Mermaid.
  - The Hon John-Paul Langbroek MP – State Member for Surfers Paradise.
- New South Wales State Government Ministers and Members of Parliament:
  - Geoff Provest MP – State Member for Tweed.
- City of Gold Coast Councillors;
- Mayor Tom Tate – Gold Coast Mayor;
- Tweed Shire Councillors;
- Mayor Gary Bagnall – Mayor Tweed Shire;
- Community Aviation Consultation Group;
- Airport Noise Abatement Consultative Committee;
- Department of Immigration and Border Protection (known as Border Force) and Department of Agriculture and Water Resources
- Tweed Heads Pony club;
- Indigenous groups;
- Airlines.
- Chamber of Commerce and Industry Queensland
- Inter Airports Environment Forum
- Joint User Hydrant Installation (JUHI)
- Kingscliff ratepayers and Progress Association
- Friends of Currumbin
- Robert Quirk – local sugarcane farmer experienced in acid sulfate soil management.
- Jean Marc Hero Professor – Professor, School of Environment, Environment Futures Research Institute, Griffith University.

4.3 Activities During Public Notification

Pursuant to s.92(1) of the Airports Act, the draft MDP was subject to a formal period of consultation of 60 business days. During the public notification period, the following consultation activities were carried out;

- the identification of key stakeholders who have an interest in, or are impacted by airport development and growth;

- the release of information to the community in a timely manner;
- the provision to provide stakeholders an opportunity the express their opinions on information contained in the draft MDP;
- the engagement with identified community, industry and government stakeholders and the provision for stakeholder feedback; and
- the capturing of community feedback for consideration in the preparation of the draft MDP for submission to the Minister.

4.4 Engagement Tools

A range of stakeholders were identified and several methods of communication were planned, for example:

- Letters to key stakeholders including state and local government representatives, community groups and on-airport stakeholders;
- Briefing sessions to individuals or groups;
- Presentations to community and industry forums;
- Media releases and fact sheets;
- Information on the GCAPL website.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5.0

Regulatory Framework

5.0 Regulatory Framework

This chapter provides details of the consistency of the project with relevant Commonwealth, State and local planning provisions.

Key legislation, planning instruments, guidelines and reference documents addressed as part of the project includes the following:

- *Airports Act 1996;*
- *Airports Regulations 1997;*
- *Airports (Environment Protection) Regulations 1997;*
- *Airports (Building Control) Regulations 1996;*
- *Airports (Control of On-Airport Activities) Regulations 1997;*
- *Airport (Protection of Airspace) Regulations 1996;*
- *Environment Protection and Biodiversity Conservation Act 1999;*
- *Sustainable Planning Act 2009 (Queensland);*
- *Environmental Planning and Assessment Act 1979 (New South Wales);*
- *Gold Coast Airport 2011 Master Plan (Commonwealth);*
- *City of Gold Coast – Draft City Plan 2015 (Queensland);*
- *Tweed Shire Council - Local Environmental Plan 2014 (New South Wales);*
- *The State Planning Policy (Queensland);*
- *SEQ Regional Plan 2009-2031 (Queensland);and*
- *Far North Coast Regional Strategy (New South Wales).*

The impact assessment chapters in **Part B** of the MDP describe other legislation specific to the assessment topic.

5.1 Consistency with Commonwealth Legislation

5.1.1 *Airports Act 1996*

The Airports Act and associated Regulations are the statutory controls for ongoing regulation of activities on airport land for both aeronautical and non-aeronautical purposes. Part 5 of the Airports Act prescribes a number of controls over land use, planning and building at Commonwealth leased airports.

Under Part 5, s.89 of the Airports Act a MDP is required for each major development at a Commonwealth leased airport. The project outlined in this MDP is defined as a 'major airport development' by virtue of s.89(1):

"(d) extending a building that is wholly or principally for use as a passenger terminal, where the extension increases the building's gross floor space by more than 10%;

(m) a development of a kind that is likely to have significant environmental or ecological impact; and

(n) a development which affects an area identified as environmentally significant in the environment strategy;"

Section 91 of the Airports Act specifies elements that are to be addressed in the preparation of a MDP. Among the matters that must be addressed in an MDP (s.91(l)(h)) are:

"… the airport lessee company's assessment of the environmental impacts that might reasonably be expected to be associated with the development."

The environmental impacts and proposed mitigation measures of the development are presented in **Part B** of this MDP in accordance with the Airports Act, in particular s.91. An MDP checklist is provided in **Chapter 1** Introduction of this MDP to demonstrate the compliance of this project with s.91 of the Airports Act.

The key steps in the approval process for this MDP under the Airports Act are presented in **Figure 5.1.**

5.1.2 *Environment Protection and Biodiversity Conservation Act 1999*

As the Airport is situated on Commonwealth land, it is subject to the provisions of the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act).

The EPBC Act is administered by the Department of Environment (DoE), and contains provisions in relation to environmental impact assessment of proposed projects on Commonwealth land and/or which may have a significant impact on the whole of the environment and on matters of national environmental significance.

Section 160 of the EPBC Act is relevant to development on airport land as it provides a requirement for the Minister for Infrastructure and Regional Development to take into account advice from the Environment Minister on the MDP. The draft MDP was referred to the DoE under s.161 of the EPBC Act to determine if advice by the Environment Minister under s.160 is required. Under s.161A of the EPBC Act, it was determined by DoE that advice was required.

In addition, a referral was submitted by GCAPL to DoE under s.68 of the EPBC Act on the 10th of July 2014. A response was issued by DoE on 26 September 2014 stating that the proposed action is a controlled action with regards to the following controlling provisions:

- *Listed threatened species and communities* (s.18 and s.18A);

- *Listed migratory species* (s.20 and s.20A);
- *Commonwealth land* (s.26 and 27A).

A correction notice was issued by DoE on the 3rd November 2014 stating *"the project will be assessed by an accredited assessment process using a Major Development Plan under the Airports Act 1996"*. The key steps in the approval process for an MDP under the Airports Act and the EPBC Act are presented in **Figure 5.1.**

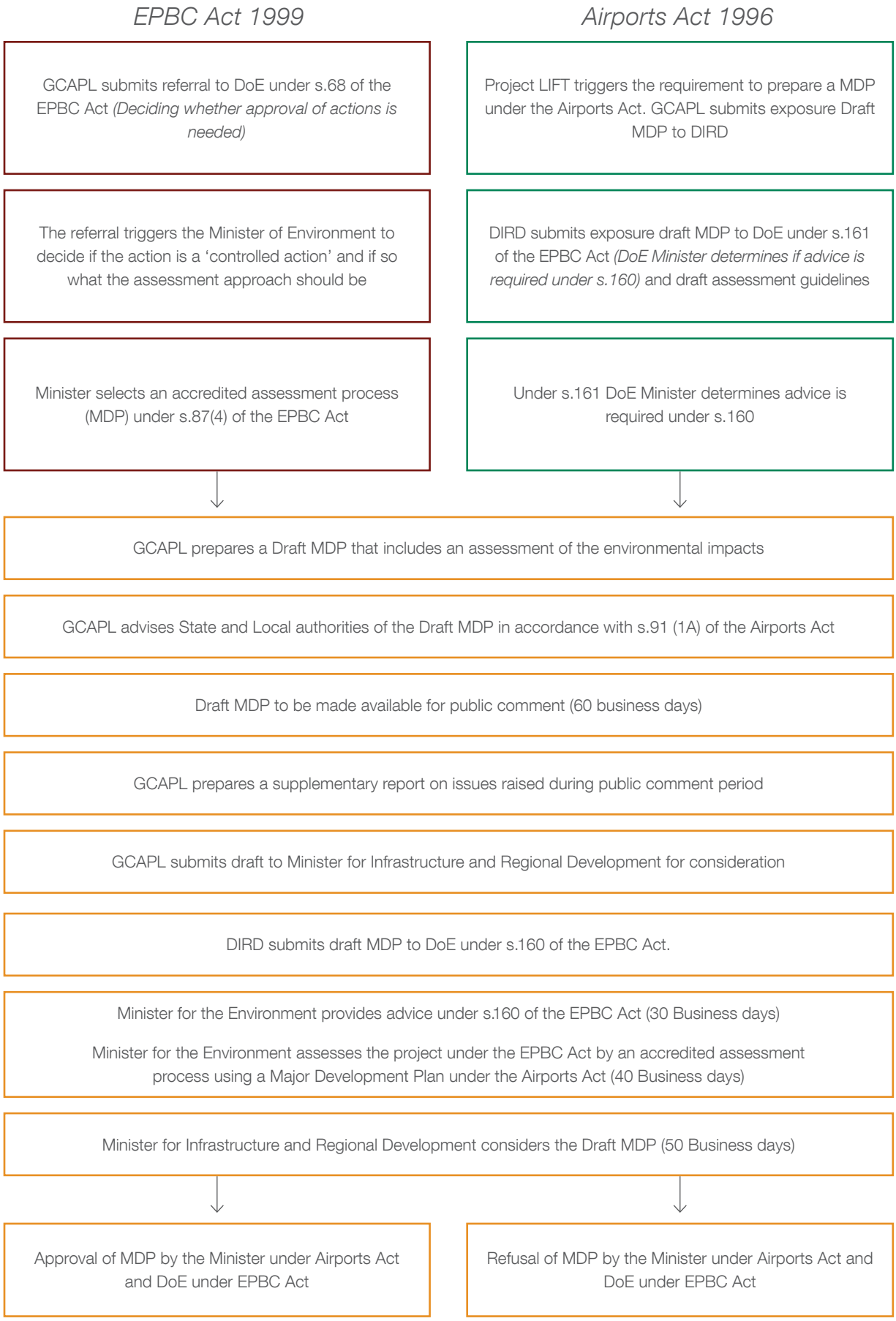
As the Airport is on Commonwealth land, and the project potentially affects Matters of National Environmental Significance (MNES) as defined under the EPBC Act, DoE *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance* and *Significant Impact Guidelines 1.2 – Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies*, are relevant to the assessment of environmental impacts.

Part B of this MDP outlines the potential impacts from the project on the whole of the environment and relevant MNES including:

- Listed threatened species and ecological communities; and
- Migratory species protected under the international agreements.

Part B of this MDP also provides the environmental assessment component of the report, with each chapter providing baseline, impact assessment and mitigation for each environmental aspect.

Figure 5.1: MDP Approvals Pathway



5.2 Pre-Existing Interests

In preparing this MDP, GCAPL has considered all interests in the land existing at the time the airport lease was created, including leases, sub-leases, licences and easements. These pre-existing lessor obligations under various leases are listed in **Table 5.1**. There are no conflicts or inconsistencies existing between these interests and the project in this MDP.

Table 5.1: Pre-Existing Interests

Lease	Easement
Lease No. 2247659	Easement No. 601285565
Lease No. 702577849	Easement No. 601999459
Lease No. 702839463	Easement No. 60185565
Lease No. 702784976	
Lease No. 702500558	
Lease No. 702482286	
Lease No. 602364682	
Lease No. 701904902	

5.2.1 Consistency with the Airport Lease

Section 91(1A)(b) of the Airports Act requires that a major development is consistent with the airport lease for the Airport.

GCAPL, as the Airport Lessee Company has an obligation to develop the Gold Coast Airport ensuring consistency with the legislation. In particular, development must be consistent with the final Master Plan for the airport and any approved MDP.

In addition, the airport lease for the Airport requires that GCAPL develops the Airport, having regard to anticipated future growth in, and pattern of, traffic demand to a standard reasonably expected of such an airport and to "good business practice," which amongst other matters requires GCAPL to provide facilities for the expeditious movement of passengers and other users. The airport lease also specifies that the Lessee must maintain the environment of the Airport site in accordance with any obligation imposed on it by legislation.

The project is consistent with the airport lease as it provides a facility that improves the movement of passengers and aircraft catering for anticipated future growth. In addition, the assessment and management of the environmental impacts of the project in this MDP are consistent with the Airports Act and other relevant legislation, and therefore consistent with this provision of the lease.

5.3 Consistency with Airport Master Plan

Regulation of land use on the Airport is achieved via the Master Plan prepared in accordance with the Airports Act and approved in May 2012 by the Federal Minister for Infrastructure and Regional Development.

The Master Plan reflects approved land use strategy and considers the surrounding local and state government planning objectives. This strategic document details development for the 20-year horizon to the year 2031 and includes a 20-year development plan, as well as one for the immediate 5 year period. All development works at the Airport are required to be undertaken in accordance with the Master Plan.

The Master Plan identifies five precincts as described in **Table 5.2** and depicted in **Figure 5.2.**

The project is consistent with the Master Plan Land Use Plan that represents the intended land use of the Airport for a period of 20 years. The project complies with the land use development objectives identified in the Master Plan for the Terminal Precinct including:

- To accommodate facilities for the safe, efficient and economic handling of aircraft, passengers and freight and related services and support facilities;
- To provide sufficient capacity for terminal facilities and related infrastructure development of international and domestic services;
- To cater for the airport's role as a key tourist and business gateway to the region;
- To develop in a way which recognises existing infrastructure and operating conditions and is sufficiently flexible to cater for future changes brought about by the dynamic and evolving nature and growth of the airport's operations.

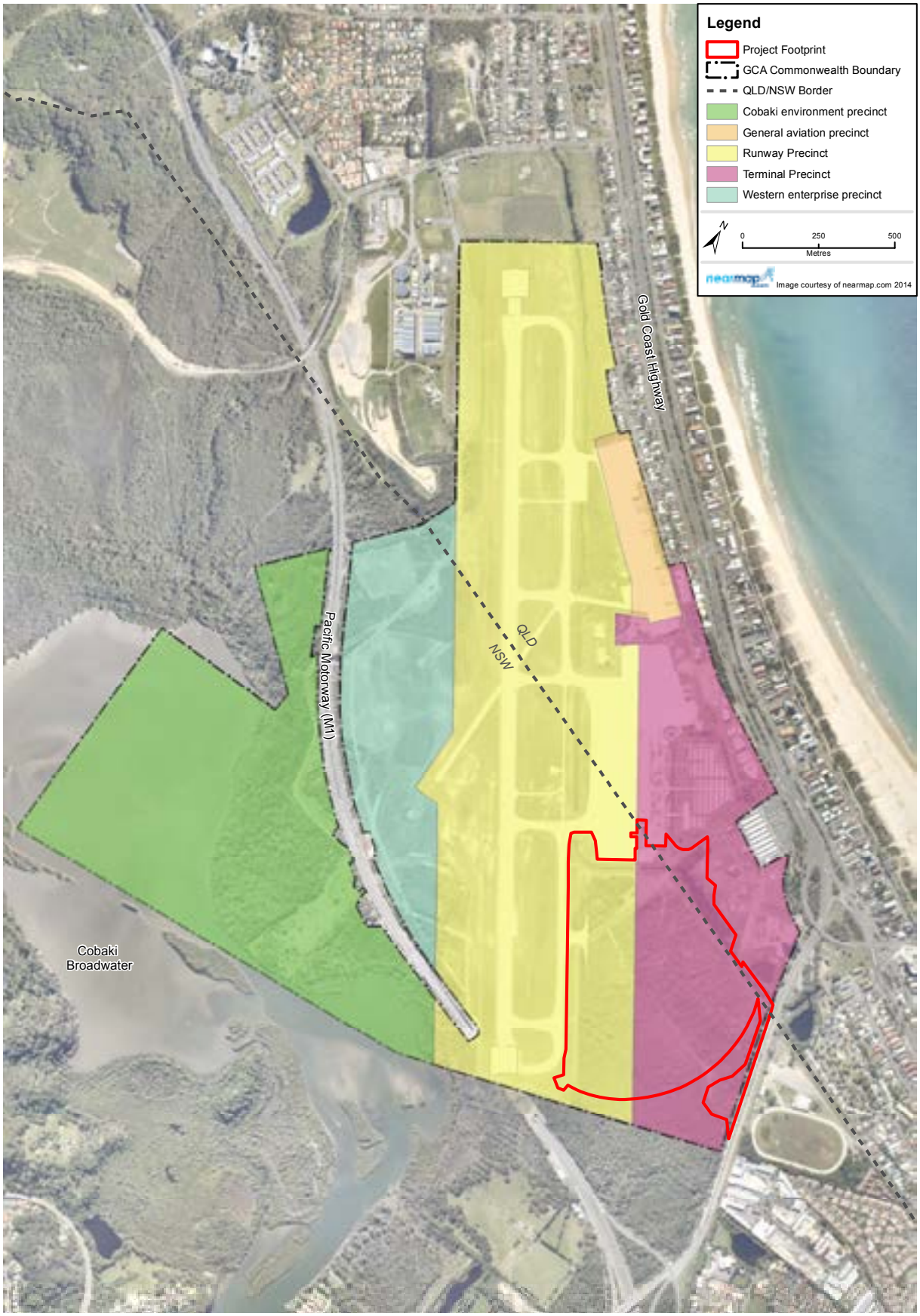
In addition, the project is consistent with the objectives identified in the Master Plan for the Runway Precinct, including:

- Provision of safe aircraft landing, take off and taxiing operations;
- To cater for aircraft navigation aids, radar and communications equipment; air traffic control, aviation rescue and firefighting and meteorological services;
- To provide facilities to ensure safe operation of aircraft;
- Accommodate future development of the heavy rail line between Varsity Lakes and Coolangatta.

Table 5.2: Airport Precincts and Development Objectives

Airport Precinct	Development Objectives
Runway Precinct	Approximately a third of the project footprint is located within the Runway Precinct. The key development objectives for this precinct include the provision of safe aircraft landing, take off and taxiing operations and aircraft navigation aids, radar and communications equipment; air traffic control, aviation rescue and firefighting and meteorological services.
Terminal Precinct	Approximately two thirds of the project footprint is located within the Terminal Precinct. The key development objectives for this precinct are to provide sufficient capacity for terminal facilities and related infrastructure development for international and domestic services; and to develop in a way which recognises existing infrastructure and operating conditions and is sufficiently flexible to cater for future changes brought about by the dynamic and evolving nature and growth of the airport's operations. The objective of this precinct is also to provide efficient, diverse and responsive ground transportation facilities, and to ensure that adequate provision is made for parking of vehicles for airport users.
General Aviation Precinct	The general aviation precinct's development objectives are to accommodate general aviation and related service and support activities, flight training schools, aviation support facilities, flight training schools, tourist related aviation, and provide aviation related administrative and commercial facilities.
Western Enterprise Precinct	The Western Enterprise Precinct is largely undeveloped except for navigation and communications equipment and some ancillary airport activities such as the fire training area. The precinct's development objectives are to provide additional area for general aviation if required and feasible, and potentially to accommodate future industrial development.
Cobaki Environment Precinct	The Cobaki Environment Precinct is a conservation area consisting of areas of remnant vegetation, cultural heritage significance and former sand dredging operation. The key objectives of the precinct are to retain an area free from urban development and to protect the area's ecology and cultural heritage.

Figure 5.2: Airport Precincts



5.4 Consistency with the Environment Strategy

The Environment Strategy, contained within Chapter 13 of the Master Plan, outlines GCAPL's objectives for environmental management of the Airport, including management of potential environmental impacts associated with airport operations and details environmental objectives and targets and monitoring requirements. The strategy also identifies Environmentally Significant Areas (ESAs) on the Airport, which includes the majority of the project footprint.

The strategy identifies that potential modification of these areas may occur within the life of the strategy, through the MDP process. Impacts to ESAs, through the clearing of vegetation and construction, is one of the triggers requiring the preparation of a MDP for the project. The potential impact to ESAs, along with other environmental impacts from the project and proposed mitigation measures are detailed in **Part B** of this MDP.

5.5 Consistency with State and Local Government Planning

5.5.1 Surrounding Land Use

The Airport is situated within two local authority areas and two state jurisdictions, being Tweed Shire in New South Wales and City of Gold Coast in Queensland making it unique among Australia's major airports. The project footprint is mainly located in the New South Wales part of the Airport.

Land uses in close proximity to the project footprint to the east include the Gold Coast Highway (directly adjoining), Kirra Beach Tourist Park, single-unit dwelling residential properties, an industrial estate on Ourimbah Road and the Border Park Raceway complex which operates greyhound racing and betting auditorium. The nearest sensitive receptors to the project footprint are the Kirra Beach Tourist Park (approximately 180 metres) and the single-unit dwelling residential properties (approximately 245 metres). The nearest school is the Coolangatta State School located approximately 855 metres east of the project footprint.

The Border Park Raceway site is the closest adjacent land use to the project footprint and is currently subject to a preliminary proposal to the Tweed Shire Council for a redevelopment to reduce the size of the race track and include retail development consisting of a Bunnings warehouse and associated facilities. The application also proposes a new all-movements intersection with the Gold Coast Highway. A future, subsequent stage would involve the expansion of retail facilities to the area initially occupied by the relocated race track.

The industrial estate on Ourimbah Road contains a number of businesses including:

- A bus depot;
- A food processing company;
- A number of vehicle mechanics, automotive spray painting, clothing manufacture;
- A timber yard;
- Long term vehicle parking;
- A battery business.

The suburb of Bilinga is located north of the Airport and is within the jurisdiction of the City of Gold Coast. The principal land uses in this area include a range of beachfront apartments located a minimum of 500 metres from the project footprint and separated by the airport car park and the Gold Coast Highway.

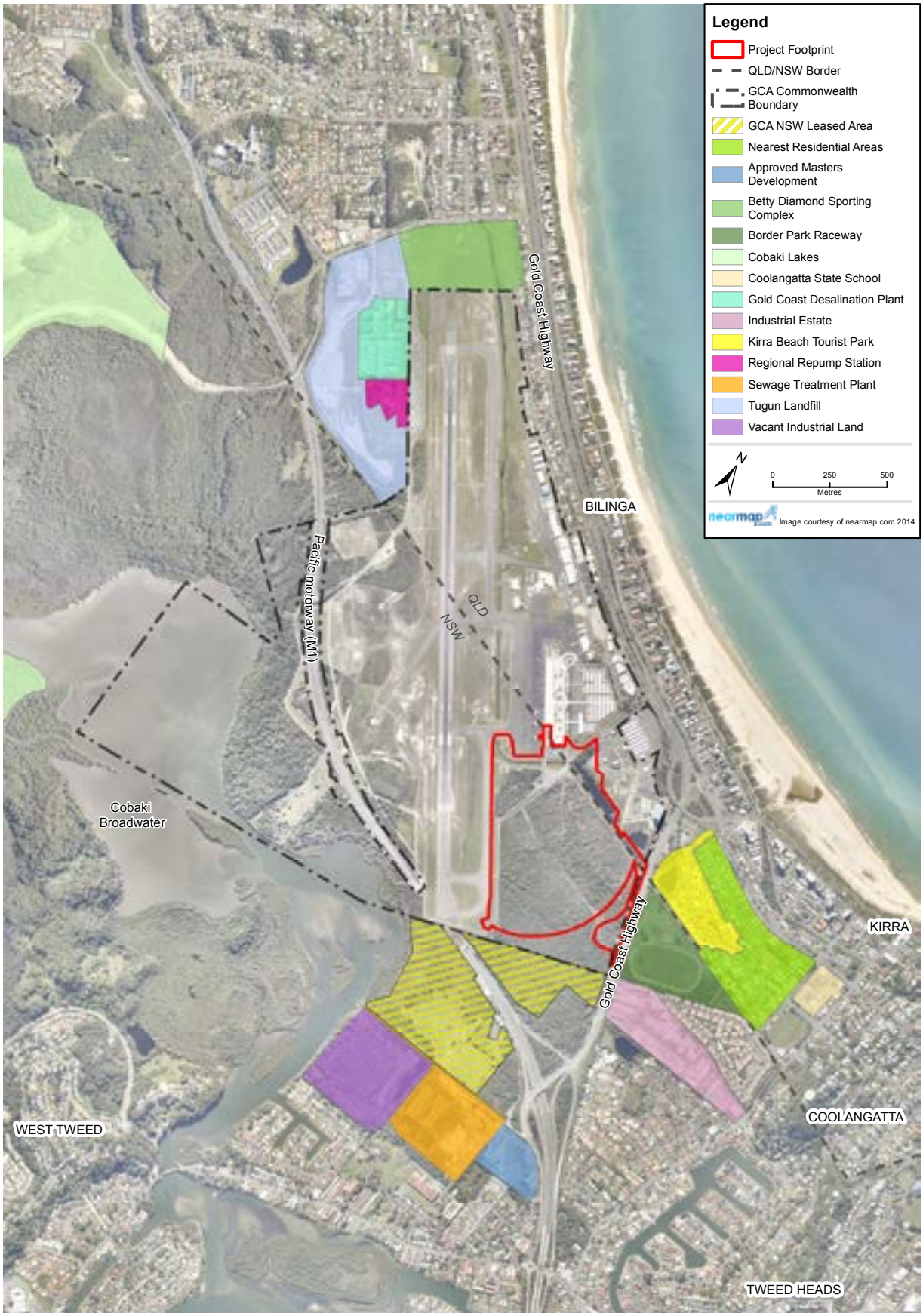
Further to the south, directly adjoining the project footprint is crown land (leased by GCAPL) and the M1 Pacific Motorway (Tugun Bypass). Areas adjoining the crown land to the south include a sewage treatment plant, and a vacant, undeveloped industrial property. An outlet for bulky goods has also been approved for development in this area.

Adjoining the Airport to the west and approximately 900 metres from the project footprint separated by the Pacific Motorway is the Cobaki Broadwater, a large proportion of which forms part of the Airport lease. Beyond the Broadwater and approximately 2.3 kilometres from the project footprint is the proposed residential master planned community of Cobaki Lakes. The concept plan for the master planned community of some 600 hectares in area was approved by the New South Wales state government, and will ultimately consist of 5,500 lots and house between 10,000 and 12,000 people.

Further to the north-west is the Tugun Commercial and Domestic Waste Land Fill and Desalination Plant and the Betty Diamond Sporting Complex.

Land use surrounding the airport is shown in **Figure 5.3.**

Figure 5.3: Land Uses Surrounding the Airport



5.5.2 Tweed Shire

Regulation of land use and development within the Tweed Shire (New South Wales) is achieved via the *Tweed Local Environmental Plan 2014* (LEP 2014) that reflects the state government planning objectives as set out in the *Environmental Planning and Assessment Act 1979* and is consistent with the state-wide standard instrument LEP.

The key aim of the LEP 2014 is to "encourage a sustainable local economy and small business, employment, agriculture, affordable housing, recreational, arts, social, cultural, tourism and sustainable industry opportunities appropriate to Tweed".

To a large extent, zoning of land surrounding the Airport within the Tweed Shire is reflective of the current land use pattern and consists of:

- A Natural Waterways Zone (Cobaki Reserve);
- Private Recreation Zone (Border Park Raceway);
- General Industry Zone (Industrial Estate);
- Infrastructure (Sewage Treatment Plant;
- Gold Coast Highway and Pacific Motorway);
- General Residential Zone (Cobaki Lakes).

The Airport is zoned Special Purpose - SP1 Special Activities. The key objective of the SP1 zone is to "provide for special land uses that are not provided for in other zones". Although the airport land use is not regulated by the LEP 2014, the zoning does nevertheless specifically designate the Airport as the intended usage.

Adjacent to the Airport to the south and west, significant areas are classified as "Deferred Matter," in which there is no specified zoning. For these areas, the previous zones in the superseded LEP 2000 will continue to apply. For most of the affected land, this is due to deferral by the state government of formerly proposed Environmental Protection Zones. In the case of the land leased by GCAPL immediately south of the Airport, it is so as to not preclude development of aeronautical facilities.

The Tweed Shire Council in preparation of the LEP 2014 has considered the 20-year development plan and relevant aviation overlays within the Master Plan. The LEP contains zonings and overlays that reflect the nature of existing land uses and impacts from the Airport, both in its current form and form developed in accordance with this MDP, has on the surrounding land. The proposed project is consistent with the intent of the LEP 2014 and will not impact on zoning at and in the vicinity of the Airport.

Zoning within the Tweed Shire is shown in **Figure 5.4.**

5.5.3 City of Gold Coast

Regulation of planning and land use within the City of Gold Coast (Queensland) is currently under the *Gold Coast Planning Scheme 2003*. However the Council's new planning scheme, *City Plan 2015*, is at an advanced stage of preparation and expected to be in place prior to commencement of the project. Therefore, the following description is based on the forthcoming new planning scheme, rather than the current, effectively superseded one.

The Airport is zoned "Special Purpose" under *City Plan 2015*, which relates to activities regulated by other legislation (in this case, the Airports Act), or otherwise not subject to planning and development control under the local planning scheme.

The *City Plan 2015* identifies the Airport as providing key transport infrastructure that will contribute to developing Gold Coast as a world-class city. In addition, the *City Plan 2015* envisages growth in airport support services and tourist accommodation in close proximity to the Airport to further advance economic productivity and prosperity.

Zoning near the Airport within the *City Plan 2015* is reflective of the current land use pattern, and includes:

- Special Purpose (Tugun Land Fill and Desalination plant);
- Open Space (Betty Diamond Sporting Complex);
- Low and Medium Density Residential;
- Community Facilities; and
- Low Impact Industry.

A specific outcome of the *City Plan 2015* is that existing or planned noise-sensitive uses surrounding the Airport manage aircraft noise through appropriate design and location of new development, including appropriate noise mitigation techniques. A comprehensive Overlay Code is included in the City Plan dealing with all relevant airport and aircraft-related topics, including avoidance of adverse impacts of aircraft noise, protection against intrusions into the Airport's airspace in the form of buildings or otherwise, as well as other potential effects on pilots of aircraft operating in the airspace. The code is modelled on the mandatory requirements of the Queensland State Planning Policy (SPP).

The project will have no impacts on zoning at and in the vicinity of the Airport and will not result in a change to the existing ANEF contours, Bird and Bat Strike Zone, Light intensity, OLS, and Public Safety Areas that impact the surrounding land use.

Zoning within the City of Gold Coast is shown in **Figure 5.5.**

Figure 5.4: Zoning in Tweed Shire

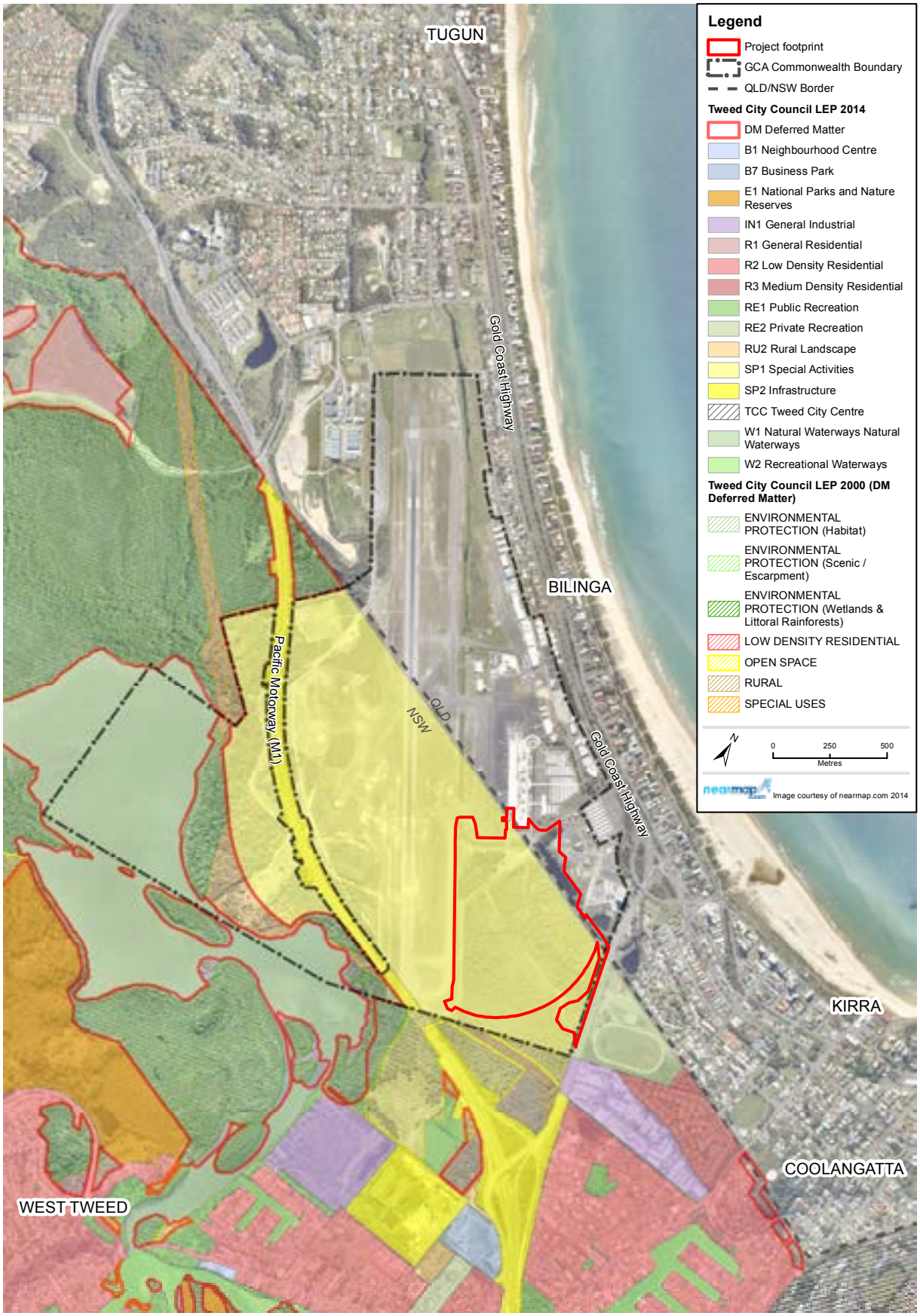
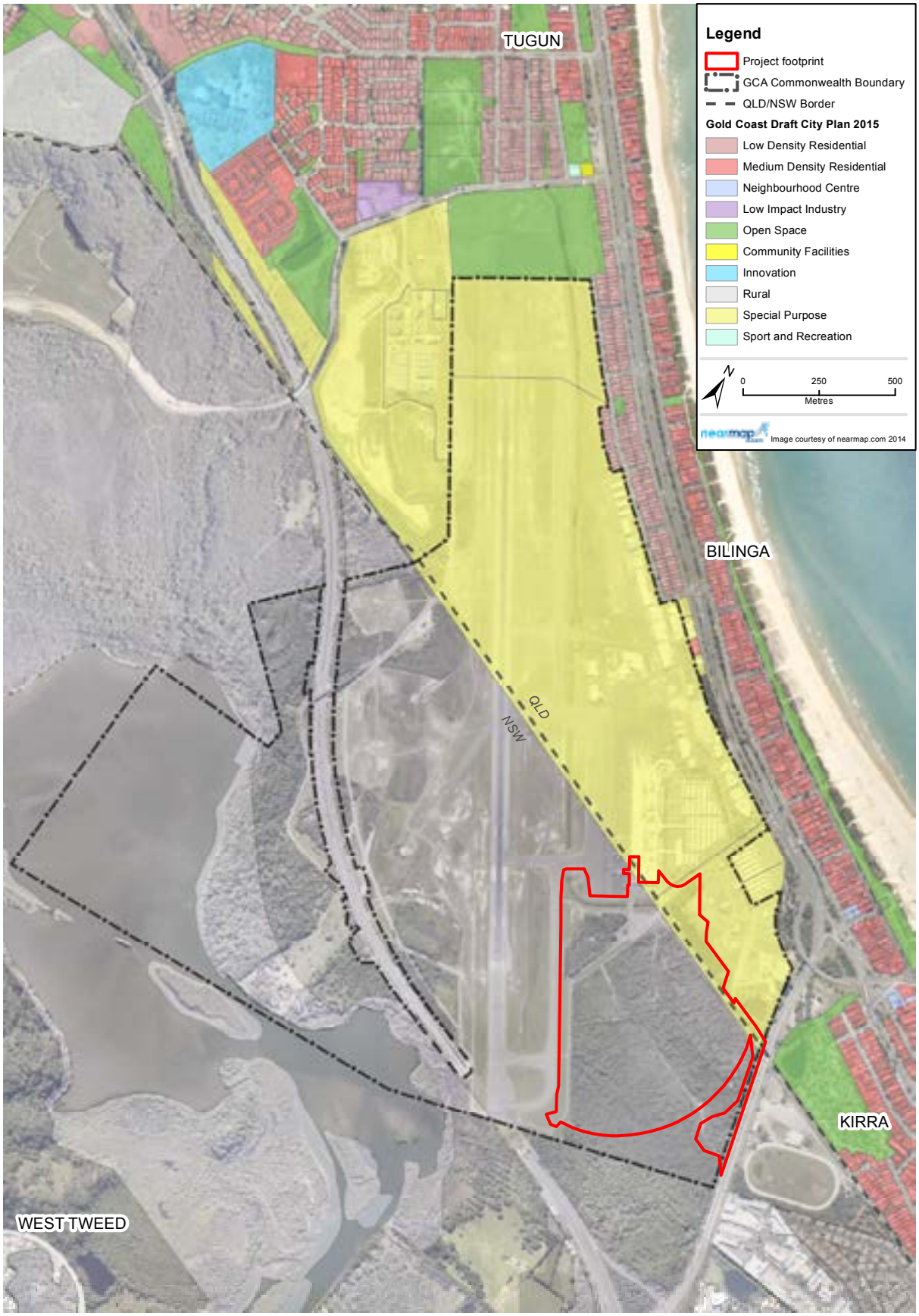


Figure 5.5: Zoning in City of Gold Coast



5.5.4 State Planning

Queensland

The state significance of the Gold Coast Airport is acknowledged by the Queensland Government through the SPP and the south east Queensland Regional Plan.

State Planning Policy

Gold Coast Airport is classified as a Strategic Airport under the SPP, and is thus protected by, and subject to, the provisions of the policy, in terms of local authority planning.

The SPP sets out the state interest concerning strategic airports and aviation facilities considered essential for the state's transport infrastructure and playing a key role in facilitating economic growth in Queensland.

The SPP provides direction for local governments preparing planning schemes to appropriately identify strategic airports and to facilitate development surrounding these airports, and includes a prototype code with which local authority planning schemes are required to be consistent, and very comprehensive guidance material concerning strategic airports and aviation facilities for the assistance of local government.

The SPP applies to off airport developments that could:

(i) Encroach into the operational airspace of a strategic airport;

(ii) Encroach into the building restricted area of an aviation facility;

(iii) Increase the number of people that could work or live in areas affected by aircraft noise;

(iv) Increase the number of people or lead to the presence of dangerous materials within the public safety area; or

(v) Involve other potential hazards to aircraft operating in the airport's airspace.

As required, the City Plan 2015 reflects the provisions of the SPP by inclusion of a comprehensive airport code with the following overlays:

- ANEF contours;
- Bird and Bat Strike Zone;
- Light intensity,
- Obstacle Limitation Surface,
- PANS-OPS; and
- Public Safety Areas.

South East Queensland Regional Plan 2009-2031

The South East Queensland Regional Plan recognises that the Airport provides for economic and employment diversification on the Gold Coast and facilitates the growth of tourism, manufacturing, logistics, and freight distribution. The Regional Plan supports the Airport in terms of economic and employment growth, and supports the protection of the Airport from incompatible development.

The Airport is recognised as a key element of the region's transport system servicing the regional population and business/industry.

New South Wales

Far North Coast Regional Strategy

The Far North Coast Regional Strategy applies to the six local government areas of Ballina, Byron, Kyogle, Lismore, Richmond Valley and Tweed, and is one of a number of regional strategies that have been prepared by the New South Wales Department of Planning and Environment. The strategy's purpose is to manage the region's expected high growth rate in a sustainable manner and to protect the unique environmental assets, cultural values and natural resources of the region while ensuring that future planning maintains the character of the region and provides for economic opportunities.

The strategy identified a number of planning objectives, these are:

- Environmental (protecting land with environmental, agricultural, vegetation, habitat, waterway, wetland or coastline values);
- Population and housing (managing population and providing a variety of housing);
- Economic (strengthen economic activity by promoting sectors in infrastructure, transport, and construction).

The project is keeping with these aims.

5.6 Airport Development and Building Approvals

Section 99 of the Airports Act identifies that an airport lessee company for an airport must not carry out building activity on the airport site except in accordance with approval under the Act. Building activities that are relevant to this project include constructing buildings or structures, altering buildings or structures, earthworks, engineering works, hydraulic works and land clearing. Building approval would therefore be required from the Airport Building Controller (ABC) subject to the development being consistent with the Master Plan and this approved MDP.


GOLD COAST AIR

6.0

Assessment Methodology

6.0 Assessment Methodology

6.1 Introduction

This chapter describes the scope of the assessments undertaken for the MDP and the assessment methodology applied to enable a consistent approach across each of the technical disciplines.

6.1.1 Scope of Assessment

This MDP has been prepared in accordance with the requirements of the Airports Act and the EPBC Act. The approval process under these Acts is described in **Chapter 5** Regulatory Framework.

Chapters 8 to 22 in **Part B** of the MDP present the impact assessment for each of the following technical disciplines:

- Geology, Soils and Groundwater;
- Surface Water Quality;
- Hydrology and Flooding;
- Terrestrial and Aquatic Flora;
- Terrestrial and Aquatic Fauna;
- Cultural Heritage;
- Air Quality and Greenhouse Gases;
- Noise and Vibration;
- Traffic and Transport;
- Landscape and Visual;
- Social and Economic;
- Waste Management;
- Climate Change;
- Cumulative Impacts;
- Environmental Management Framework.

Each impact assessment chapter in **Part B** is generally structured as follows:

- Introduction;
  - Methodology;
  - Assumptions and Technical Limitations;
  - Policy Context and Legislative Framework;
- Baseline Conditions;
- Significance Criteria;
- Impact Assessment;
- Additional Mitigation Measures;
- Residual Impacts.

6.1.2 Study Area

The study area for the assessment of impacts is generally the project footprint as this is the area within which impacts from the project are expected to arise. However where impacts are likely to extend beyond the project footprint, the study area for that element has been expanded. The study area for each element is defined in the relevant MDP chapter.

6.2 Assessment Method

The assessment of impacts was conducted in accordance with the steps shown in **Figure 6.1.**

6.2.1 Baseline Conditions

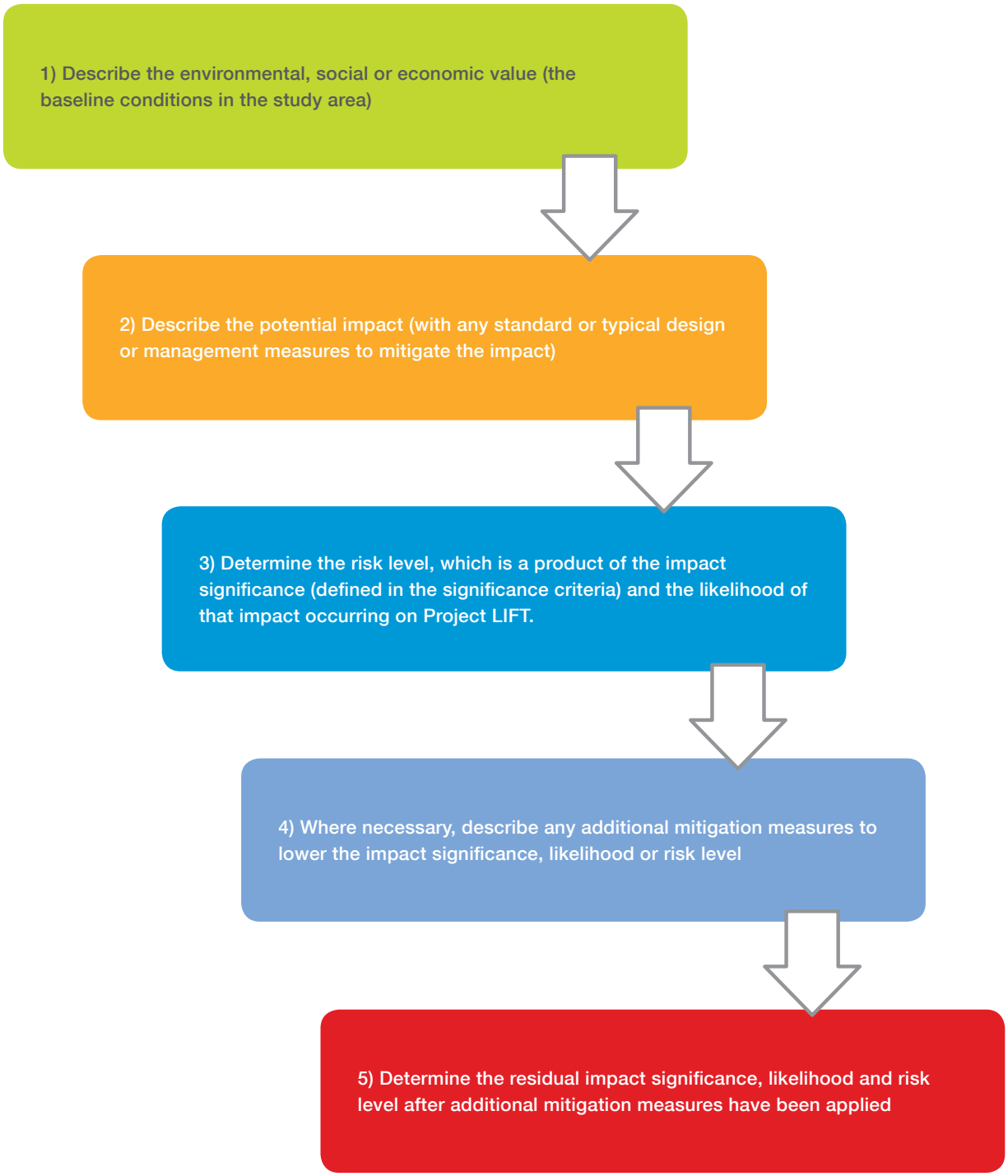
A range of desktop studies, field investigations and modelling were undertaken to identify the baseline environmental and social values in the study area. The methodology for each specialist study, including information sources and field surveys, is described in the chapters in **Part B.**

6.2.2 Identification of Impacts

Chapter 3 Airport Context and Project Description, provides a detailed description of how the project will be undertaken during the construction and operation stages and provides the basis for the identification of impacting processes and assessment of potential impacts.

The identification of potential impacts arising from the project has been conducted on the basis that standard or typical design or management measures would be implemented. For example measures that achieve compliance with industry standards.

Figure 6.1: Assessment Process



6.2.3 Risk Level

The risk level is a product of the impact significance, as defined by assessment criteria, and the likelihood of occurrence, as shown in the risk matrix in **Table 6.1.**

6.2.4 Significance Criteria

The assessment of impacts in Steps 3 and 5 in **Figure 6.1** (initial and residual impact) has used significance criteria tailored to the assessment topic, but based on the generic criteria in **Table 6.2**, in order to define the significance of the impacts using a consistent methodology. Where possible, the tailored significance criteria in each chapter are based on established standards or legislation specific to the topic area.

The MDP has been prepared under the environmental planning and management framework in the Airports Act and regulations. The significance criteria have been developed to assess the significance of potential environmental impacts at the Airport.

As the Airport is on Commonwealth land, and potentially affects MNES as defined under the EPBC Act, DoE *Significant Impact Guidelines 1.1 – Matters of National Environmental Significance and 1.2 – Actions on, or impacting upon, Commonwealth land, and actions by Commonwealth agencies*, are relevant to the assessment of environmental impacts. These guidelines provide the Commonwealth framework for assessing the significance of impacts upon MNES and the whole of environment on Commonwealth land. The discipline-specific assessment criteria have therefore been developed with reference to these guidelines where relevant.

Note that **Chapter 13** Cultural Heritage has not used impact significance criteria as they are considered inappropriate for application in a cultural heritage context. The reasons for this are:

- The significance of heritage items, including places, are gained by the sum of the whole and removal of part of a place will often have a disproportionately impact on heritage values (Burra Charter 2013: 6-8);
- Environmental impact criteria often rely on quantitative data, something that is not applicable to many aspects to heritage significance, most notably cultural significance (Godwin 2011);
- The subjective nature of assessing cultural significance (and to a lesser degree scientific significance) is such that impacts to heritage can simultaneously be high for one group of stakeholders and low for another. Lack of universal heritage value in this context means that impact criteria can have an inadvertent effect of over simplifying of what are typically far more complex and dynamic issues.

Best practice in heritage management is to provide a concise statement of heritage significance and then provide an equally precise statement on heritage impacts as they relate to significance (Burra Charter 2013: 10).

The impact assessment criteria incorporate the following considerations:

- The scale of the impact (small, medium or large scale);
- The duration of the impact, as defined for the project in **Table 6.3;**
- The sensitivity and significance of the values being impacted, for example regional, state or national significance.

Table 6.1: Risk Matrix

		Impact Significance (with reference to assessment criteria)				
		Negligible	**Minor**	**Moderate**	**High**	**Very High**
Likelihood	**Highly unlikely**	Very low	Very low	Low	Low	Medium
	Unlikely	Very low	Low	Low	Medium	Medium
	Possible	Low	Low	Medium	Medium	High
	Likely	Low	Medium	Medium	High	Very High
	Almost certain	Low	Medium	High	High	Very High

Table 6.2: Generic Impact Significance Criteria

Impact Significance	Definition
Very High	These impacts are considered critical to the decision making process. They tend to be permanent, or irreversible, or otherwise long term, and/or can occur over large scale areas. Environmental receptors are extremely sensitive, and/or the impacts are of national significance.
High	These impacts are likely to be of importance in the decision making process. They tend to be permanent, or otherwise long to medium term, and /or can occur over large or medium scale areas. Environmental receptors are high to moderately sensitive, and/or the impacts are of state significance.
Moderate	These impacts are relevant to decision making, particularly for determination of environmental management requirements. These impacts tend to range from long to short term, and/or occur over medium scale areas or focused within a localised area. Environmental receptors are moderately sensitive, and/or the impacts are of regional or local significance.
Minor	These impacts are recognisable, but acceptable within the decision making process. They are still important in the determination of environmental management requirements. These impacts tend to be short term, or temporary and at the local scale.
Negligible	Minimal change to the existing situation. This could include for example impacts which are beneath levels of detection, impacts that are within the normal bounds of variation or impacts that are within the margin of forecasting error.
Beneficial	The project results in an improvement in the baseline situation, for example, improved downstream water quality.

Table 6.3: Duration of Environmental Impacts

Relative Duration of Environmental Impacts	
Temporary	Days to months
Short Term	Up to 1 year
Medium Term	From 1 to 5 years
Long Term	From 5 to 50 years
Permanent/Irreversible	In excess of 50 years

6.2.5 Likelihood of Impact

Once potential impacts have been identified and classified using the topic-specific assessment criteria, the likelihood of an identified impact occurring is identified. **Table 6.4** classifies the likelihood of an identified impact arising as a result of the project.

6.2.6 Mitigation and Monitoring

Where possible, identified impacts have been avoided or minimised through the design, or through implementation of standard mitigation measures.

Where necessary for medium, high or very high risks, additional mitigation measures have been provided to lower the impact significance or likelihood, and therefore overall risk level. Additional mitigation measures are those that have been developed specifically for the project and result in a meaningful reduction in the residual risk level for a particular impact. Ongoing management and monitoring commitments are also identified.

The mitigation and monitoring measures provided in each chapter have been used to develop the Environmental Management Framework in **Chapter 22.**

Where impacts cannot be adequately mitigated and there is likely to be a residual impact, offsets or compensation are provided.

6.2.7 Assessment Summary

At the end of each assessment chapter there is an assessment summary matrix which summarises each of the impacts described in the assessment, and provides an assessment of the residual risk level once standard and additional mitigation measures (where required) have been applied. An example is shown in **Table 6.5**.

6.2.8 Cumulative and Interactive Impacts

Cumulative and interactive impacts have been considered in the MDP. Cumulative impacts are described in **Chapter 21** Cumulative Impacts.

Interactive impacts are described within each assessment chapter where relevant. Interactive impacts occur within the project and arise where effects from one environmental element bring about changes in another environmental element. For example in the context of this project, impacts on water quality may arise as a result of potential disturbance of acid sulfate soils.

Table 6.4: Likelihood of Impact

Likelihood of Impacts	Risk Probability Categories
Highly Unlikely	May occur only in exceptional circumstances - can be assumed not to occur during period of the project (Probability <10%)
Unlikely	Event is unlikely to occur, but it is possible during period of the project (Probability 10-30%)
Possible	Event could occur during period of the project (Probability 30 - 70%)
Likely	Event likely to occur once or more during period of the project (Probability 70 - 90%)
Almost Certain	Very likely to occur as a result of the project construction and/or operations; could occur multiple times during relevant impacting period (Probability >90%)

Table 6.5: Impact Assessment Summary Matrix

Initial Assessment with Standard Mitigation in Place						Residual Assessment with Additional Mitigation in Place			
Impacting Process	**Impact Detail**	**Standard Mitigation Measures Required**	**Significance of Impact**	**Likelihood of Impact**	**Risk Rating**	**Additional Mitigation Measures**	**Significance of Impact**	**Likelihood of Impact**	**Residual Risk Rating**
A description of the project activity that is likely to cause the impact	A description of the impact and value impacted	Mitigation measures that are incorporated into the design or are industry standard mitigation	Significance as defined by the assessment criteria	Likelihood of the impact occurring	The assessed risk level using the risk matrix	Where applicable, any additional mitigation required to reduce the risk level	Significance of the residual impact	Likelihood of the residual impact occurring	Residual risk rating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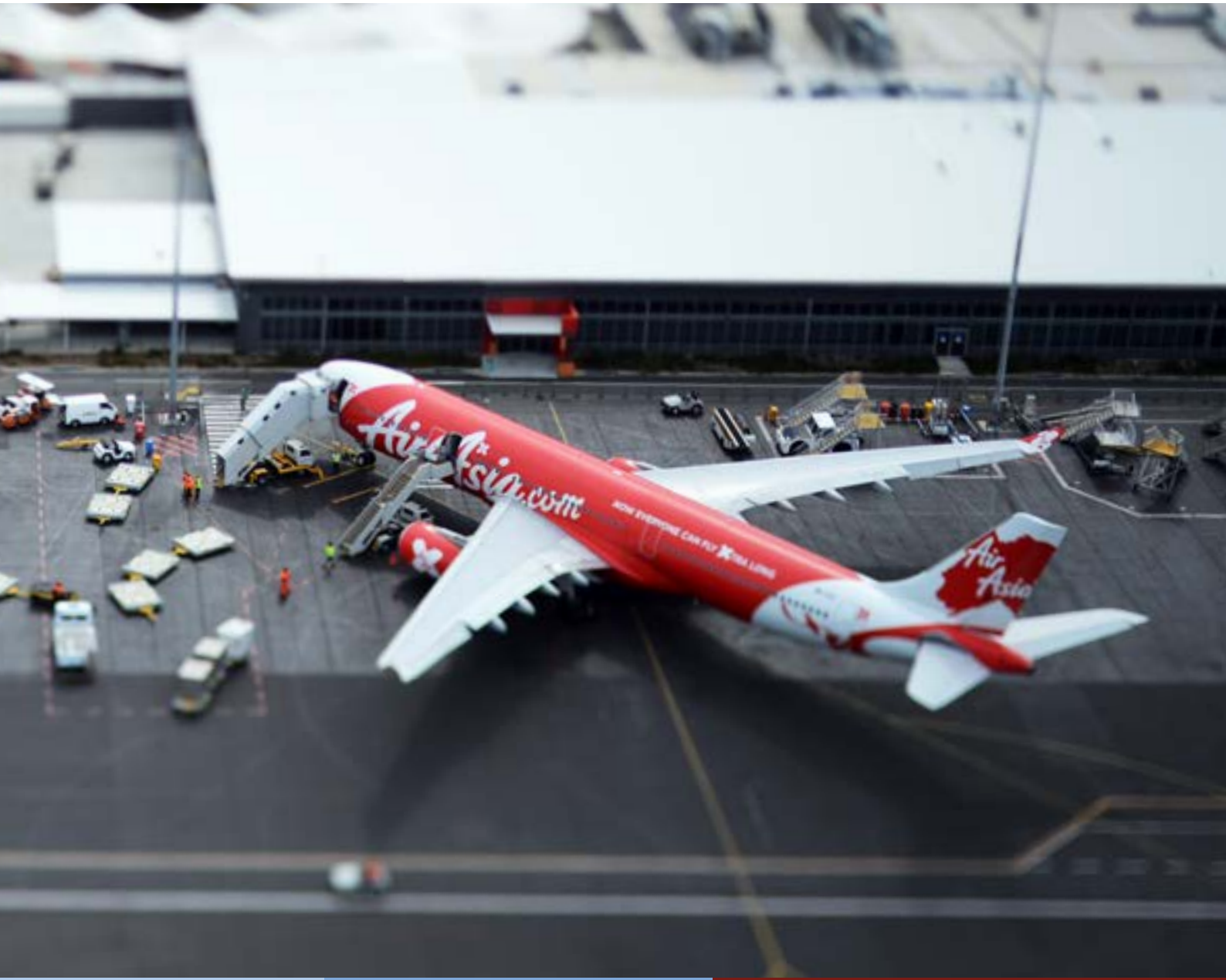
7.0

Conclusion and Impact Summary



7.0 Conclusion and Impact Summary

This impact summary provides an overview of the key findings of the technical Chapters in **Part B** of this MDP. A generally consistent approach was adopted for each of the technical Chapters, as described in **Chapter 6** Assessment Methodology. This included a review of baseline conditions and the identification of impacts that may arise during construction and operation of the project. Standard, and where necessary, additional mitigation measures are identified for each technical chapter and the residual impact significance and risk level are assessed.

Chapter 8 - Geology, Soils and Groundwater

The assessments undertaken for this Chapter included geology and soil (including acid sulfate soils), contamination and groundwater. The methodology for the assessments included a desktop study and field investigations. The project footprint has been previously disturbed in some areas due to sand mining, and generally comprises a sand layer underlain by variably indurated sand (coffee rock) and alluvial sands. Key findings of the assessment include:

- Erosion potential of the sandy soils within the project footprint during and post construction is low and can be managed during construction with standard mitigation measures such as the implementation of an Erosion and Sediment Control Plan;
- The groundwater monitoring data indicates the groundwater level varies across the study area from around 1 metre AHD to 3 metres AHD (generally 0.5 metres to 3 metres below ground level) and is mounded near the centre of the site;
- The construction of the new drainage channel (invert of 0.7 metres AHD) will cause the groundwater table to drawdown, which may extend laterally up to 270 metres from the drain;
- Concentrations of dissolved metals in groundwater are generally low although some results are above AEPR trigger values for iron, aluminium and zinc;
- Acid sulfate soils testing at the site indicates that generally low to moderate levels of net acidity occur within the project footprint, except for a portion of the drainage reserve which has higher net acidity. Impacts from acid sulfate soils will be managed through the implementation of Acid Sulfate Soils Management Plan during construction;
- Soil testing did not identify contamination within the project footprint and no radiation risk was identified from former sand mining activities.

With the implementation of standard mitigation measures, the residual risks associated with geology, soils and groundwater have been assessed as very low to low.

Chapter 9 – Surface Water Quality

This Chapter assesses the surface water quality impacts that may arise from construction and operation of the project. The methodology for the assessment involved a review of relevant legislation and policy, water quality data, water quality sampling and data analysis. The assessment also identified the relevant surface water quality limits and guidelines to be applied to the project.

The assessment focused on the potential surface water quality impacts from:

- Downstream sedimentation caused by erosion;
- Potential for chemical/fuel spill during construction and/or operation;
- Discharges during construction and/or operation;
- Increase in waste material in downstream receiving waters;
- Disturbance of acid sulfate soils.

A risk assessment of the potential surface water quality impacts from the project identified that with the implementation of mitigation measures, such as development of a Construction Environmental Management Plan (CEMP) during construction that includes specific management plans, and early installation of permanent water treatment devices during operation, the residual risk to the surface water quality as a result of the project is assessed as low.

Chapter 10 – Hydrology and Flooding

The study area for the hydrology and flood assessment included the surface drainage on the Airport and downstream, within the Coolangatta Creek and Cobaki Catchments. The assessment included modelling of the current flood regime at the Airport for a range of flood events (0.2 per cent, 1 per cent, 2 per cent and 5 per cent Annual Exceedance Probability [AEP]) and scenarios, including a storm surge scenario. A set of assumptions with respect to model parameters was developed in conjunction with Tweed Shire Council and City of Gold Coast.

The Chapter assesses the flood impacts that may arise from the project, in particular the realigned drainage channel and apron expansion. With the incorporation of standard mitigation measures into the design of the drainage channel and apron, the assessment found that flood and stormwater impacts arising from the project, both on and off-Airport, are expected to be negligible. Standard mitigation measures include the appropriate sizing of the drainage channel, reducing the inlet capacity of existing culverts which currently discharge to the Cobaki Broadwater and optimisation of the eastern

portion of the drainage reserve. The addition of further bio-retention areas in future (but not as part of this project) have been investigated as flood and stormwater quality modelling has developed and these are now considered unlikely to be necessary. However, this issue will continue to be considered during the design stages of further apron expansion areas.

Chapter 11 – Terrestrial and Aquatic Flora

The flora assessment included desktop review of government databases and a number of previous studies that have been conducted at the Airport to identify ecological values in the project footprint. The assessment also included targeted fieldwork to identify flora species present within the project footprint. Key findings of the baseline and impact assessment include:

- The majority of the project footprint is identified as an Environmentally Significant Area (ESA) under the *Airports Act 1996*;
- Swamp sclerophyll forest, classified as an Endangered Ecological Community (EEC) under the New South Wales *Threatened Species Conservation Act 1995* (TSC Act) occurs within the project footprint;
- Three EPBC Act listed conservation significant flora species are considered to have moderate likelihood of occurrence within the project footprint, including the Lesser Swamp Orchid which has previously been identified to the south of the project footprint within the Airport boundary;
- Seven state listed flora species are considered to have a moderate likelihood of occurrence within the project footprint, of these, Christmas Bells (perennial herb, only flowering in December, listed as endangered under the Queensland NC Act) is the most likely to occur, though it has not been confirmed within the project footprint;
- Two regionally significant flora species are known to occur within the project footprint (i.e. Fringed baeckea and Lemon-scented baeckea);
- Three declared weed species were recorded within the project footprint;
- The key impact to flora arising from the project is the clearing of approximately 32.5 hectares of native vegetation, of which approximately 30.14 hectares is ESA and 15.9 hectares is Swamp sclerophyll forest EEC.
- Clearing will also result in the loss of habitat for the conservation significant species that are known or likely to occur within the project footprint.

A range of mitigation measures have been provided for implementation during construction, however there is still predicted to be residual impacts of high significance due to the clearing of EEC. Direct and indirect offsets are to replace and secure the habitat values that are to be lost.

Chapter 12 – Terrestrial and Aquatic Fauna

The fauna assessment included desktop review of government databases and a number of previous studies that have been conducted at the Airport to identify ecological values in the project footprint. The assessment also included targeted fieldwork to identify fauna species and fauna habitat present within the project footprint. The key findings of the baseline and impact assessment include:

- Seven species of migratory birds listed under the EPBC Act are known to occur within the project footprint, with five species considered to have a moderate likelihood of occurrence;
- Two conservation significant fauna species listed under the EPBC Act are known to occur within the project footprint (Wallum Sedge Frog and Grey-headed Flying Fox), with nine species considered to have a moderate likelihood of occurrence;
- Nine state-listed conservation significant fauna species are known to occur within the project footprint, with five species considered to have a moderate likelihood of occurrence;
- Two declared pest species were confirmed within the project footprint (Fox and European hare);
- Aquatic survey results indicate that the macroinvertebrate communities inhabiting the Airport waterways were dominated by pollution tolerant taxa, with only a few sensitive families present;
- Both native and non-native fish species are known to occur in drainage channels within the project footprint, with the dominant species being those that are tolerant of a wide range of water quality parameters;
- The key impact to fauna from the project is the loss of habitat for conservation significant species due to clearing. This includes approximately 3.8 hectares of suitable habitat or the Wallum Sedge Frog, 26 hectares of suitable habitat for the Wallum froglet and 30.4 hectares of suitable habitat for the Common Planigale;
- Other impacts identified include reduction in the connectivity of fauna corridors, edge effects, and the potential introduction of weed and/or pest species to surrounding habitat areas.

A range of mitigation measures have been provided for implementation during construction, however there is still predicted to be residual impacts of high significance to the Wallum Sedge Frog, Wallum froglet and Common Planigale.

Therefore direct and indirect offsets will be provided to mitigate residual impacts on the above conservation significant fauna species.

Chapter 13 – Cultural Heritage

This Chapter examines both Indigenous and non-Indigenous cultural heritage values within the project footprint and immediate surrounds. The methodology for the cultural heritage chapter included desktop review (database searches, aerial photography and previous reports), consultation with Aboriginal stakeholders

and archaeological survey of the project footprint. Geomorphological testing was also undertaken to determine the extent of previous ground disturbance in the project footprint. An archaeological test excavation was undertaken across the project footprint to determine the presence and extent of subsurface heritage deposits.

Consultation with Aboriginal stakeholders included public notification to allow formal registration of stakeholders, distribution of information by mail, a presentation to stakeholders, and a site survey attended by Aboriginal stakeholder representatives. The Aboriginal stakeholder representatives also took part in the archaeological test excavation.

Searches of Commonwealth, state and local heritage registers returned no listings of non-Indigenous heritage within the project footprint. Some heritage database results are pending for Indigenous Heritage. During field surveys, two artefact scatters and one isolated artefact were found in the project footprint.

Parts of the project footprint have been subject to substantial ground disturbance from sand mining, however geomorphological testing indicates that parts of the project footprint retain relatively intact Pleistocene sand deposits below a depth of 700 – 900 millimetres. If remnant structure of original dunes remain in the project footprint, it has the potential to contain Aboriginal cultural materials. The Airport is situated within a broader area of high cultural significance to the Aboriginal people of the region. The significance of this region is in part derived from local oral tradition, where it was known as an important camping and meeting ground.

The project will have an impact on the archaeological significance of surface Indigenous cultural heritage located within the project footprint. Any heritage situated within the upper 500 millimetres of the project footprint, including the identified artefact scatters and subsurface archaeological deposits can be reasonably assumed to be either disturbed or destroyed as a result of the construction activities. On the information available, the project will only impact on archaeological objects of low scientific significance.

The project will have an impact on the cultural significance of all surface Indigenous cultural heritage located within the project footprint. Additionally, although subsurface cultural deposits may remain in parts, the construction of a built landscape is considered detrimental to the cultural significance of the project footprint and the surrounding cultural landscape. Modification of the landscape through cut and fill, as has previously occurred within the project footprint, removes the ability of Indigenous persons to interpret their landscape in a traditional manner. The removal of native flora and fauna, albeit already disturbed, further impacts on the cultural significance of the project footprint.

A range of mitigation measures for impacts to Indigenous cultural heritage are provided for implementation during the construction and operational stages of the project. These include pre-disturbance collection of artefacts, cultural monitoring, Indigenous materials finds and curation procedures, Indigenous human remains procedure, defined keeping place and a strategy for cultural interpretation in the design of the project.

Potential non-Indigenous heritage within the project footprint is limited to the wreckage of a Lockhead Lodestar plane that crashed at the Airport in 1949. The wreckage is understood to be buried in the north west of the project footprint and a magnetometer survey indicated a large metal body in this location surrounded by a scatter of smaller metal objects. The wreckage is understood to have been destroyed by burning following the crash, burial and subsequent disturbance during sand mining. No particularly strong associations between the local residents and events of the crash were recorded in the process of completing the assessment. Therefore the remains are not considered to meet the threshold for local heritage significance and are not considered to be culturally significant.

Chapter 14 – Air Quality and Greenhouse Gases

The air quality assessment included a review of Commonwealth and state air quality legislation and policy to identify air quality goals and objectives that are relevant to the Airport. Baseline air quality and meteorological data for the study area was reviewed to establish the baseline air environment surrounding the Airport. Data from the closest Queensland Government air quality monitoring stations (Arundel and Springwood) indicate that the average maximum ground level pollutant concentrations are typically less than 50 per cent of the ambient air quality objectives for all criteria pollutants.

The air quality impact assessment was qualitative and identified the key potential impacts to air quality that may arise from the project. This includes an increase in dust levels due to vegetation clearing and bulk earthworks, an increase in air pollutants from construction plant, vehicle emissions and operational traffic and an increase in aircraft emissions due to forecast growth in air traffic at the Airport. With standard mitigation in place, all potential air quality impacts were identified as a negligible to minor significance, with residual risk levels of very low to low.

The baseline greenhouse gas assessment identified that in the 2013/2014 financial year, the greatest source of greenhouse gas emissions at the Airport was from the consumption of purchased electricity (approximately 92 per cent) followed by emissions associated with the disposal of waste from the terminal and then consumption of diesel.

The assessment found that while an increase in greenhouse gas emissions is likely during construction and operation of the project, the impact significance has

been assessed as minor to negligible and the residual risk is assessed as low to very low.

Based on the findings of the baseline, construction and operational greenhouse gas assessments, no exceedances of the reporting thresholds under the *National Greenhouse and Energy Reporting Act 2007* (NGER Act) were identified.

Chapter 15 – Noise and Vibration

This Chapter assesses the likely noise and vibration impacts that may arise from the project. The Chapter presents the results of a baseline noise survey, derives criteria for assessment of noise impacts, identifies relevant sensitive receivers (residential areas surrounding the Airport) and assesses noise impacts from construction of the project and Airport operations following implementation of the project. Noise sources considered in the assessment included aircraft idling at the aprons, aircraft ground support vehicles and construction equipment and machinery. Noise impacts from airborne aircraft are captured by the Aircraft Noise Exposure Forecast (ANEF) mapping in the Master Plan, and are therefore not included in the noise assessment for the project.

The noise assessment found that with standard mitigation in place, the residual risk of noise impacts from aircraft operation on-ground is low. Day time construction activities were also assessed as having a negligible impact significance and a low residual risk level. For a small number of occasions where construction works have the potential to interfere with airside operations, out of hours work may occur. For certain construction activities, out of hours work may result in exceedance of noise criteria at the nearest sensitive receivers. This would require implementation of additional noise mitigation measures (such as the use of mufflers for tools or equipment), which would reduce the residual risk to low or medium depending on the activity.

Chapter 16 – Traffic and Transport

This Chapter assesses the traffic impacts caused by the construction and operation of the project. The baseline investigations included a review of the Master Plan, traffic counts of existing transport network and traffic volumes, surrounding future transport network proposals, passenger demands and mode share.

The assessment investigated the impacts associated with the demand on the internal (on-Airport) and external road network from the construction and operation of the project. In addition, the assessment investigated creation of a new construction access from the Gold Coast Highway. A risk assessment of the potential traffic impacts from the project identified that even without the implementation of mitigation measures the residual risk of traffic impacts as a result of the project is considered to be low.

Chapter 17 – Landscape and Visual

The landscape and visual impact assessment describes and assesses the visual and landscape impact of the project. The methodology used in the assessment aligns with local and international guidance on the assessment of landscape and visual impact. The study area for the assessment included an area which extends generally to Bilinga in the east, Kirra Hill in the south, Tweed Heads West and Piggabeen in the west, and Currumbin in the north.

The landscape and visual impact assessment was undertaken in the following steps:

- Identification of existing landscape and visual conditions and key viewpoints;
- Identification of the project landscape character;
- Assessment of landscape character impact;
- Assessment of visual impact;
- Risk assessment including opportunities for standard and additional mitigation;
- Identification of cumulative landscape and visual impact.

The assessment concluded that the project does not adversely impact on the landscape character of the Airport, which has a high visual absorption capacity, and a compatibility with the project, resulting in a negligible landscape impact. The assessment predicted that the project would create minor adverse to negligible visual impacts during construction and operation. The visual influence of the project footprint is limited by landform and intervening vegetation and built form.

Chapter 18 – Social and Economic

The social and economic Chapter describes the demographic and socio-economic attributes of the region that may be affected by the project. The Chapter also describes the current economic contribution of the Airport and the estimated direct and indirect economic impact of the project. The study area for the assessment was the local government areas of Tweed and Gold Coast.

The Airport contributes to the region's employment and Gross Regional Product (GRP) both directly through the core operations of the Airport, and indirectly by purchasing inputs from other sectors of the economy, for example utilities and maintenance services. In addition the Airport contributes to employment through commercial leases within the Terminal Precinct for other aeronautical and non-aeronautical tenants.

The development of the project will have a positive economic outcome by way of creating additional employment opportunities and generating additional economic activities for the region and providing capacity for future growth. The construction and operation of the project is projected to have a positive impact on the employment and Gross Regional Product of the Tweed - Gold Coast region.

Without further development, the Gold Coast Airport will be limited in its ability to facilitate future domestic and international passenger demand and address the current capacity issues. If no action is taken by 2018, a possible outcome is that two Code E international aircraft or four domestic services will not be able to be accommodated in the busy hour per day. The project would allow the Airport to increase its busy hour international passenger intake by approximately 314,000 per year or 375,000 domestic passengers. These additional passengers will have a positive impact on the operations of the Airport and the tourism benefits it facilitates. The project will have no impacts on zoning at and in the vicinity of the Airport.

The Social and Economic assessment concludes that the project will have beneficial impacts to tourism, employment and GRP, and negligible impacts to demographics, the housing and land markets, community values and lifestyle.

Chapter 19 – Waste Management

The baseline assessment of waste included a desktop review of the Master Plan, Airport Environmental Management System (EMS), annual environmental reports, and analysis of previous Airport audit findings and waste data. This established the baseline waste volumes for the Airport, categorised by waste stream (e.g. general waste, airside and compactor waste, cardboard recycling and Terminal 1 public place recycling).

Major sources of waste at the Airport include terminal operations, including retail and food and beverage outlets, aircraft waste, construction and demolition activities, tenant operations and maintenance activities. There are also a number of hazardous and regulated wastes that are generated at the Airport such as aviation and automotive fuel, pesticides and herbicides, plants and solvents, batteries, asbestos and cleaning chemicals.

During construction of the project, it is anticipated that waste volumes will increase. Predicted operational waste volumes have been estimated based on projected passenger numbers for the first year of the project's operation (i.e. 2018). This has indicated an approximate 26 per cent increase in waste volumes based on the projected passenger numbers for 2018. With the implementation of mitigation measures, including recycling and appropriate waste storage and disposal, the potential residual impacts of waste generation and disposal during the project have been assessed as a minor level of impact significance with a low risk level.

Existing operational waste management practices outlined in the Airport EMS will be continued at the Airport.

Chapter 20 – Climate Change

The climate change assessment involved a review of the current climate change legislative and policy framework from a Commonwealth, state and local government perspective. The assessment identified potential natural hazards and changing climate patterns that may impact on the construction and operation of the project.

The assessment focused on the effects of climate change on the project. It considered the potential for sea level rise and extreme weather events, such as intense rainfall and thunderstorms, heatwaves, flooding and associated events to impact on the construction and operation of the project. A risk assessment of the potential climate change impacts on the project identified that with the implementation of mitigation measures, such as accounting for sea level rise and storm surge in the detailed design of the project, and the adoption of the existing Airport operational emergency management, health and safety and standard environmental controls, the level of impact significance and risk to the project due to climate change effects is considered to be low.

Gold Coast Airport