Sunshine Coast Airport
Master Plan Implementation Project

Initial Advice Statement | September 2011

ARUP

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Initial Advice Statement

ISSUE September 2011

Arup
Arup Pty Ltd ABN 18 000 966 165

Arup
Level 4 108 Wickham Street
Fortitude Valley
QLD 4006
GPO Box 685 Brisbane QLD 4001
Australia
arup.com.au

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		Signature			

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Contents

Executive Summary

The Project

The Sunshine Coast Airport (SCA), owned and operated by Sunshine Coast Council (SCC), plans to implement its Master Plan as endorsed and formally adopted by Council in September 2007.

The subject of this Initial Advice Statement (IAS) is the construction and operation of the proposed new 13/31 runway and associated infrastructure, as part of the airport's Master Plan Implementation Project (the Project). The Project will:

- Provide additional passenger capacity;
- Provide access to growing markets, including new domestic and international destinations;
- Increase the freight capacity offered from the Sunshine Coast;
- Further stimulate the Sunshine Coast's tourism and commerce base;
- Assist in diversifying the Sunshine Coast's economic and jobs base, creating approximately 5,000 new jobs;
- Add around $1.6 billion in regional economic benefit between 2016 and 2050;
- Improve safety; and
- Reduce existing noise impacts on local communities.

The Project will be undertaken in stages over a 15 year period, with the current stage focusing on preliminary approvals and design.

As a result of the preliminary design process, which has taken into account the key social, economic and environmental constraints identified on the airport site, there have been changes to the layout of the runway and associated infrastructure compared with the 2007 Master Plan.

Investigations are currently underway to identify a suitable fill source for the Project. Approximately 2,700,000m^3 of select fill (to be applied to the prepared in-situ natural surface) and approximately 300,000m^3 of pavement fill are required for the Project. Fill is required due to the underlying alluvial soils at the airport site, which are expected to have unacceptable levels of settlement without prior treatment with fill. A combination of both marine and terrestrial fill sources is likely to be required to meet the Project's needs.

Works on the airport site is referred to in this IAS as 'On-Airport', the procurement and transport of fill from terrestrial and marine sources is referred to as 'Off-Airport', and the changes to airspace, resulting from the new east/west runway orientation, is referred to as 'Airspace'.

The Need

Increased passenger traffic, combined with the increasing demands of tourism and general aviation, as well as the growing Sunshine Coast population, mean that SCA is fast reaching its operating capacity.

The existing north/south runway (18/36) is unable to accommodate any aircraft larger than the A320 and B737 that currently operate from the airport. The size of the aircraft apron and terminal also limit the airport's ability to operate to its full potential.

These constraints were identified during the preparation of the 2007 SCA Master Plan. Following extensive consultation with the airline industry, airport tenants, Commonwealth, State and local government agencies, as well as the local community, construction of a new east/west runway (13/31) was identified as the preferred option.

The Benefits

The proposed new runway and associated Project elements have several major advantages including accommodation of larger aircraft, allowing more passengers to travel into and out of the Sunshine Coast, reduction in safety and noise concerns experienced by the community and stimulation of employment and economic flow-on effects.

SCA is a major commercial aviation hub in South East Queensland (SEQ), and as a regional airport, services not only the immediate Sunshine Coast, but also populations further afield.

SCA is recognised in the South East Queensland Regional Plan, South East Queensland Infrastructure Plan and Program (SEQIPP) and Council's Economic Development Strategy as a key element in the strategy for diversifying the Region's economy by building upon the existing cluster of aviation related businesses and providing continuing support to the Coast's tourism industry.

Significant Project Declaration

SCC is seeking designation of the Project as a 'significant project requiring an Environmental Impact Statement (EIS)' under the *State Development and Public Works Organisation Act 1971* (SDPWO Act). This Act sets out the requirements for environmental assessment and public review of the EIS.

The Project has the potential to trigger a number of the provisions in Section 27 of the SDPWO Act. These triggers include the potential environmental effects of the Project, the level of investment required and the Project's strategic local, regional and state significance.

Referrals have also be submitted to the Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) under the *Environmental Protection and Biodiversity Conservation Act 1999* (EPBC Act) as the Project could potentially impact on Matters of National Environmental Significance (MNES) and will result in a change to airspace.

Should the Project be declared a 'significant project' under the SDPWO Act, the EIS is likely be undertaken through the SDPWO Act process, using the bilateral agreement between the State and Commonwealth Governments.

It will be prepared in accordance with Terms of Reference (ToR) prepared by the Queensland Government with input from SEWPaC.

The scoping and preliminary works phase of the Project has been completed, and work is now underway to secure the necessary approvals and finalise design with a view to commence construction by 2014.

Baseline Environment

For the purposes of this IAS, as well as the accompanying EPBC Act Referrals, preliminary investigations have been undertaken (between April and July 2010) into the baseline environment of the study area. This has included:

- Desktop review of relevant information;
- Preliminary terrestrial and aquatic ecological fieldwork;
- More detailed ecological fieldwork on selected species; and
- Preliminary geotechnical and Acid Sulphate Soils (ASS) fieldwork.

The preliminary investigations identified that there are a number of threatened flora and fauna species listed under State and Commonwealth Legislation that either occur or are likely to occur on the airport site. Key species include:

- Emu Mountain She-Oak *(Allocasuarina emuina)* is listed as Endangered under the EPBC Act as well as the *Nature Conservation (Wildlife) Regulation 1994* (subordinate legislation to the *Queensland Nature Conservation Act 1992)*. Preliminary ecological fieldwork at the site identified that the airport population of this species is significantly larger than thought. Approximately 5.3 ha of core habitat for the species would be impacted by the Project.
- Grey-headed Flying Fox (*Pteropus poliocephalus)* is listed as Vulnerable under the EPBC Act. Foraging habitat for this species exists on the airport site. Approximately 34 ha would be impacted by the Project.
- Wallum Sedgefrog (*Litoria olongburensis*) is known to occur within the airport site. This species is listed as Vulnerable under the EPBC Act as well as Vulnerable under the Queensland *Nature Conservation Act 1992* (NC Act).
- State-listed fauna of particular significance, being known or likely to occur on the airport site are the Ground Parrot (*Pezoporus wallicus),* and Wallum Frogs - Wallum Froglet *(Crinia tinnula)* and Wallum Rocketfrog *(Litoria freycineti).*
- While not yet identified on the site, several state-listed flora species may occur on the airport site on the basis that they have been recorded in areas immediately adjacent to the site that are identical in terms of community composition and underlying geomorphology.

The baseline environment in Moreton Bay is also discussed in this document as it is relevant to the potential dredging activities.

Impacts and Mitigation Measures

The potential environmental and social impacts of the Project are identified in this document. Key impacts identified include:

- The removal of native vegetation and habitat on the airport site for threatened species listed under State and Commonwealth legislation;
- Potential disturbance of ASS on the airport site;
- Modification to drainages and overland flow paths on the site as a result of filling of the site;
- Potential impacts to ground and surface water from saline discharges arising from the placement of marine fill on site;
- Temporary impacts to air quality during construction due to construction machinery onsite and the potential for associated dust generation;
- Temporary impacts to air quality and ambient noise levels offsite due to the trucking of fill from the point of extraction to the airport site; and
- A reduction in the number of aircraft-noise affected properties, but with some previously unaffected areas experiencing an increase in aircraft-noise.

Also, there will be changes to airspace surrounding the airport as a result of the new flight tracks required for the new runway.

A range of measures are proposed in this document to mitigate the potential impacts of the Project. The key management documents for the construction phase would be the Construction Environmental Management Plan and the Dredge Management Plan for works within Moreton Bay. These will form chapters to the overall EIS for the Project.

It should be acknowledged that the EIS will cover potential impacts for both marine and terrestrial fill options (ie. dredging and trucking the fill) and identify appropriate mitigation measures associated with each option.

An offsets strategy is also being prepared to address the requirements of State and Commonwealth offsets policies.

1 Introduction

1.1 Background

SCA currently operates the existing north/south runway (18/36), which is 1,797 metres long and 30 metres wide and is responsible for managing the terminal building, public car parking, all internal access roads, taxiways and aprons, visual aids and all serviced land at the airport. It also manages on-airport concessions and leasing activities to all airport customers and stakeholders.

The airport operates 24 hours a day and handles aircraft movements of around 87,000 per annum. The terminal has a capacity of over 1 million passengers per annum.

The original runway was opened in 1961. It has been extended several times to support the operation of increasingly larger aircraft. Its size and width limits operations to narrow body aircraft types (B737 and A320), thus restricting the number and type of aircraft able to use the airport.

The proposed new east/west runway (13/31) will provide a take-off distance of at least 2,430 metres in each direction and a runway width of 45 metres, opening up the airport to a range of wide-bodied aircraft servicing more distant national and international destinations.

Council aims to commence construction of the new runway in 2014, in order that it is operational by 2020 or shortly thereafter.

The total cost of the Project is estimated to be in the order of $420 million (ie. $418.6 million in 2010 AUD terms). A breakdown of Project costs is provided below:

- $201.4 million for the new runway (includes associated fill costs and is based on preliminary design cost estimates);
- $53.2 million for associated regular public transport (RPT) projects;
- $153.6 million for other Project elements including a new terminal, car parking and commercial precincts; and
- $10.4 million for planning and land acquisitions.

SCC is seeking funding assistance from Infrastructure Australia to cover part of the total Project cost. This funding is yet to be secured by SCC.

1.2 The Proponent

As previously mentioned, SCA is owned, operated and managed by SCC.

Contact details for the proponent are as follows:

John Knaggs

CEO, Sunshine Coast Regional Council

Locked Bag 72 SCMC QLD 4560

P: (61 7) 5441 8240 F: (61 7) 5441 8275

E: John.Knaggs@sunshinecoast.qld.gov.au

1.3 Purpose and Scope of the Document

This IAS aims to provide information on the proposed Project for the following reasons:

- To assist the Coordinator General (CoG) to make a decision on 'significant project' declaration, or other potential declarations of project status under the *State Development and Public Works Organisation Act 1971* (SDPWO Act);
- To enable stakeholders to determine the nature and level of their interest in the proposal; and
- To enable the preparation of ToR for an EIS for the Project.

In considering whether a project should be declared significant, the CoG must have regard to one or more of the following (see Section 27, SDPWO Act):

a) detailed information about the project via an IAS;

b) relevant planning schemes or policy frameworks (including those of relevant local government or of the State or Commonwealth);

c) the Project's potential effect on relevant infrastructure;

d) the employment opportunities that will be provided by the Project;

e) the potential environmental effects of the Project;

f) the complexity of local, State and Commonwealth requirements for the Project;

g) the level of investment necessary for the proponent to carry out the Project; and

h) the strategic significance of the Project to the locality, region or State.

At the time of writing this IAS, the Project boundary has been split between On-Airport, Off-airport and Airspace elements.

It should be noted that while preliminary design work has been undertaken, detailed design has not yet commenced and so Project elements may be modified to improve social, economic and environmental outcomes.

Field investigations and further research would be undertaken during preparation of the EIS.

A detailed Construction Environmental Management Plan (CEMP) and Dredge Management Plan would also be developed as part of the EIS.

1.4 Legislative Context and Approvals Requirements

SCC will be seeking designation of the Project, pursuant to the IAS, as a 'significant project' requiring an EIS under the SDPWO Act. This Acts sets out the requirements for environmental assessment and public review of the EIS.

Referrals will also be submitted to SEWPaC under the EPBC Act as the Project has the potential to impact on matters of National Environmental Significance and will result in a change to airspace.

It is envisaged that the EIS will be undertaken through the SDPWO Act process through the bilateral agreement between the Queensland and Commonwealth Governments, and will be in accordance with ToR to be prepared by the State Government with input from the Commonwealth Government.

Legislation likely to be applicable to the Project as a whole, as well as the On-Airport, Off-Airport and Airspace aspects of the Project, is outlined in **Table 1**. Note that this list is subject to change as the Project progresses.

Table 1 Legislation Potentially Relevant to the Project

Overarching Project Approvals

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Commonwealth				
Environmental Protection and Biodiversity Conservation Act 1999	Department of Sustainability, Environment, Water, Population and Communities (SEWPaC)	Significant impact on the environment of Commonwealth Land and/or a matter of National Environmental Significance.	Controlled Action Approval	Significant impact on the following matters of National Environmental Significance: – Sections 18 and 18A (Listed threatened species and communities); and/or – Sections 20 and 20A (Listed Migratory Species).
		Changes to airspace	Ministerial approval for changes to airspace	Changes to airspace as a result of the new runway that could have a significant impact to the environment: Section 160 of the EPBC Act
Civil Aviation Act 1988 & Civil Aviation Regulations 1988 & Civil Aviation Safety Regulations 1998	Civil Aviation Safety Authority (CASA)	New runway operational safety requirements	CASA review and assessment	This includes such issues as runway separation as well as the location of navigational aids and other infrastructure essential to runway operations. The Office of Airspace Regulation (OAR) is also required to assess whether any proposal for airspace change is likely to affect the environment to a significant extent.

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Air Navigation Act 1920 and Air Navigation (Aircraft Engine Emissions) Regulation	Department of Infrastructure and Transport	Changes to aircraft operations at the airport	This legislation regulates aircraft emissions.	There will be changes to aircraft operations at the airport, requiring review and assessment.
Air Services Act 1995 and Air Services Regulations	Department of Infrastructure and Transport	Changes to aircraft operations at the airport	The Air Services Act governs the activities of Airservices Australia with respect to functions relating to aviation.	There will be changes to aircraft operations at the airport, requiring review and assessment.
State/Local				
State Development and Public Works Organisation Act 1971	Coordinator-General (CG) / Department of Infrastructure and Planning (DIP)	Declaration as 'significant project'	Coordinator-General's Report	EIS process under the Act is an accredited environmental assessment process under the Bilateral Agreement between the Australian Government and the State of Queensland relating to Environmental Assessment
Aboriginal Cultural Heritage Act 2003	Department of Environment and Resource Management (DERM)	Conducting an activity that may harm Aboriginal Cultural Heritage	Cultural Heritage Management Plan (CHMP) or alternative Agreement	Project requires an EIS. Cultural Heritage Management Plans are required for certain high-level impact activities (e.g. where an EIS is required under other legislation).

On-Airport Approvals

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009	Minister for Infrastructure and Planning (MIP)	If SCA determines to seek a Community Infrastructure Designation (CID) rather than approval of works under the *Maroochy Plan 2000*	Designation of Land for Community Infrastructure	If SCA determines to seek CID rather than approval of works under the *Maroochy Plan 2000*
		OR		
Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009	Sunshine Coast Council (SCC)	Making a Material Change of Use (MCU) of land that is identified as assessable by the *Maroochy Plan 2000*	Development Permit for MCU	Under the Maroochy Plan 2000, the SCA site is located within Planning Area No. 9 – North Shore and is zoned Special Purpose. Some of the planned expansion boundaries for the Airport are located within Planning Area No. 23 – Maroochy River Plains and are zoned Sustainable Cane Lands. The development of the new 13/31 runway and taxiways and other elements specified in Section 9 of the SCA Master Plan (September 2007) reflects a MCU (as defined in Section 10 of the *Sustainable Planning Act 2009*). From our review of the Interpretation Section of the *Maroochy Plan 2000*, it would appear that the new runway etc (excluding terminal expansion and heliport) may fit within the ambit of the use definition for "Local Utility" as it will be for (c) public transport facilities other than transport stations, vehicle depots, vehicle repair workshops or offices. It appears that the proposed terminal expansion and

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
				heliport will fit within the ambit of the use definition of "Transport Station". Interpretation of the relevant Tables of Development Assessment in Volume 1, Part 4 of the Maroochy Plan 2000 (particularly Table 4.1 for the Sustainable Cane Lands Precinct and Tables 4.7 and 4.8 for the Special Purpose Precinct and Supplementary Table of Development Assessment for the Special Purpose Precinct) identifies that the MCU for "Local Utility" will be code assessable by virtue that it is on land which abuts a State-controlled road (i.e., Sunshine Motorway). The MCU for "Transport Station" will be code assessable (as per Table 4.8 - Supplementary Table of Development Assessment for the Special Purpose Precinct) as it will be for aviation and airport terminal services only.
AND				
Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009	Sunshine Coast Council (SCC)	Conducting filling and excavation that is identified as assessable by the *Maroochy Plan 2000*	Development Permit for Operational Works	Placement of fill within the SCA for the new runway will be assessable given that the *Maroochy Plan 2000* is applicable to the airport
PLUS				

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Environmental Protection Act 1994 and Environmental Protection Regulation 2008	Department of Environment and Resource Management (DERM) or Sunshine Coast Council (SCC)	Conducting an 'environmentally relevant activity' (ERA)	Development Permit for Material Change of Use Registration Certificate (to carry out an ERA)	ERA 6 - Asphalt Manufacturing ERA 16 - Extractive and Screening Industries ERA 43 - Concrete Batching ERA 50 - Bulk Material Handling
Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009	Department of Environment and Resource Management (DERM)	Removal and disposal of contaminated soil from sites listed on the Contaminated Land Register (CLR) or Environmental Management Register (EMR)	Disposal Permit	Any contaminated soil that is required to be excavated and removed from the site associated with the proposed development in accordance with the Master Plan.
Nature Conservation Act 1992	Department of Environment and Resource Management (DERM)	Taking of or interfering with protected plants and/or removal of wildlife listed as protected in the *Nature Conservation (Wildlife) Regulation 2006* (ss 88-89)	Approval to take, keep or use protected animals or plants	Permit, licence or authority likely to be required for Project to remove protected flora and to take native fauna during construction phase.
Transport Infrastructure Act 1994	Department of Transport and Main Roads (DTMR)	Works within a State controlled road corridor	Section 33 applies to the need for approval to either (i) carry out road works on a State-controlled road; or (ii) interfere with a State-controlled road or its operation	Construction access from Sunshine Motorway

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
			Section 62 applies to the need to obtain approval of a vehicle access between an individual property and a State-controlled road. This is relevant for new accesses or relocation of existing accesses.	
Vegetation Management Act 1999 *Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009*	Department of Environment and Resource Management (DERM)	Clearing of any remnant regional ecosystem will require an application to clear vegetation. Offsetting of vegetation would be required to satisfy the assessment codes	Development Permit for Operational Works (being for the clearing of remnant native vegetation)	Clearing of native vegetation subject to the *Vegetation Management Act 1999*
Land Act 1994	Department of Environment and Resource Management (DERM)	Permanent closure of any existing road to enable use of the land for some other purpose	Permanent Road Closure	Closure of section of Finland Road (and any other unmade roads) to enable development of the new runway

Off-Airport Approvals

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Coastal Protection and Management Act 1995 and Coastal Protection and Management Regulation 2003 *Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009*	Department of Environment and Resource Management (DERM)	Entitlement to quarry material below high water mark.	Approved Dredge Management Plan	Will be required for any dredging proposed within Queensland tidal waters
	Department of Environment and Resource Management (DERM) or Sunshine Coast Council (SCC)	Tidal Works/Prescribed Tidal Works	Development Permit for Operational Works (that is tidal works or prescribed tidal works).	Applies to the works involved in constructing a mooring dolphin, all its components and the pump-out pipeline. These works will be under tidal waters and therefore tidal works unless prescribed. This application could relate to "prescribed tidal works" if the works are located within the tidal area for the Sunshine Coast Regional Council.
	Department of Environment and Resource Management (DERM)	Works in a Coastal Management District	Development Permit for Operational Works (that is works in a coastal management district)	The works within a coastal management district which might trigger the need for this permit are contained in Schedule 3 Table 4 Item 5 Part (b) of the *Sustainable Planning Regulation 2009*. It is possible that the following specific works might be triggered: • *interfering with quarry material as defined under the Coastal Protection and Management Act 1995 on State coastal land above high water mark* (this could apply

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
				if any quarry material on a road, unallocated State land or a reserve above high water mark and within the coastal management district, is affected by construction of the pump-out pipeline); • *disposing of dredge spoil or other solid waste material in tidal water* (this may occur in carrying out the works associated with the mooring dolphin and the pump-out pipeline); • *removing or interfering with coastal dunes on land, other than State coastal land) that is in an erosion prone area as defined under the Coastal Protection and Management Act 1995 and above high water mark* (this may be possible given proximity of airport to coastline - coastal dunes likely to be crossed by the pipeline which are on freehold land).

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Environmental Protection Act 1994 and Environmental Protection Regulation 2008 *Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009*	Department of Environment and Resource Management (DERM)	Conducting an ERA	Development Permit for MCU Registration Certificate (to carry out an ERA)	ERA 16 – Extractive and Screening Activities
Fisheries Act 1994 *Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009*	Department of Employment, Economic Development and Innovation (DEEDI)	Development related activities that require a fisheries development approval	Development Permit for Operational Works	Required for any disturbance, damage or removal of marine plants. If dredging is proposed within the Maroochy River Fish Habitat Area (FHA), also triggers need for approval of works in a declared fish habitat area.
Local Government Act 2009 *Sunshine Coast Regional Council Local Laws*	Sunshine Coast Council (SCC)	Works on or interfering with a local road	Permit to change or interfere with a local road	Where pump-out pipeline crosses any local road (including unmade roads)
Nature Conservation Act 1992	Department of Environment and Resource Management (DERM)	Taking of or interfering with protected plants and/or removal of wildlife listed as protected in the *Nature Conservation (Wildlife) Regulation 2006* (ss 88-89)	Approval to take, keep or use protected animals or plants	Removal of protected flora and/or taking native fauna to facilitate construction of pump-out pipeline

Legislation	Administering Authority	Trigger for Approval	Type of Approval/Action Required	Relevance to Project
Transport Infrastructure Act 1994	Department of Transport and Main Roads (DTMR)	This Act is triggered if there are any works within a State controlled road corridors. Approval would be required from the Chief Executive.	Section 33 applies to the need for approval to either (i) carry out road works on a State-controlled road; or (ii) interfere with a State-controlled road or its operation.	Development of discharge pipeline under David Low Way
Vegetation Management Act 1999 *Sustainable Planning Act 2009 and Sustainable Planning Regulation 2009*	Department of Environment and Resource Management (DERM)	This Act regulates the clearing of remnant native vegetation throughout the State. Removal of any remnant regional ecosystem will require an application to clear vegetation. Offsetting of vegetation would be required to satisfy the assessment codes.	Permit to Clear	The proposed facility should be sited to reduce impact on regional ecosystems
Land Act 1994	Department of Environment and Resource Management (DERM)	Short term occupation of Unallocated State Land, Reserve or Road (excl. State-controlled Roads)	Permit to Occupy	The pump-out pipeline corridor traverses both Reserve and Road land

1.5 Stakeholder Engagement

Engagement with government, community and industry stakeholders about this Project commenced in 2007, coinciding with the development of the SCA's Master Plan. This engagement has continued through presentations to established community and industry forums.

A Stakeholder Engagement Plan has been developed for the Project, which is designed to:

- Inform stakeholders about the Project;
- Enable stakeholders to provide feedback; and
- Facilitate contact with government stakeholders.

Government, community, special interest and business stakeholders have been identified and they are grouped by:

- Their proximity to the airport and its operations;
- Their involvement with the airport and its operations, and
- Their level of interest in a particular aspect of the Project, eg. environment.

Engagement is planned throughout the Project, with a focus on the EIS preparation and public display phase.

Several methods of communication are planned, for example:

- Briefing sessions (individual and group);
- Presentations to established community and industry forums;
- Individual letters to key stakeholders;
- Free call information line;
- Enquiry email;
- Newsletters;
- Fact sheets;
- Website;
- Media releases; and
- Public displays.

Information about the commencement of work on the preparation of the IAS was also made public through a media release and the airport has actively engaged with individuals and groups as opportunities have arisen, including formal presentations on Project progress to Sunshine Coast Councillors, Council, State and Australian Government officers and local interest groups.

Indigenous stakeholders have not been specifically consulted at this point in the Project, however it is expected that a CHMP will be required for the Project under the *Aboriginal Cultural Heritage Act 2003*.

This will commence with public notification during the EIS phase of the Project to determine the relevant traditional owner group/s. There is no current Native Title Claim for the airport site, however the Gubbi Gubbi people previously had a Native Title claim over the site, which has been discontinued.

2 The Proposal

2.1 Description of Study Area

SCA is located on SEQ's Sunshine Coast, at Marcoola Beach, mid-way between Caloundra and Noosa. SCA is approximately 110 kms north of Brisbane and a one hour drive from Brisbane's northern suburbs.

Existing infrastructure on the airport site includes:

- The main runway (Runway 18/36);
- A second runway (Runway 12/30); and
- Associated taxiways, apron, terminal and access roads.

There is also existing commercial land and general aviation support facilities at the airport site.

The airport site is surrounded by a mix of land uses including residential, agricultural, National Park and light industrial.

The Project study area is comprised of three parts, namely:

1. On-Airport
2. Off-Airport
3. Airspace

The On-Airport boundary, as shown in **Figure 2.1a and b,** includes the existing SCA Master Plan boundary and a strip of land to north of the proposed new runway.

The Off-Airport boundary includes the potential terrestrial and marine dredge fill sources that are being considered as shown in **Figure 2.1c**. The dredge-mooring point and pipeline to the airport site are shown in **Figure 2.1d.**

Changes to airspace and aircraft flight paths will be required to accommodate the new runway configuration. The changes will influence noise profiles and aircraft emissions applicable to the Project's scope.

2.2 Elements that Constitute the Project

SCA's 2007 Master Plan identifies a new runway (13/31) and associated infrastructure as part of the forward planning for the airport. The preliminary design phase of the Project commenced in 2010, and has been informed by desktop environmental assessment and preliminary ecological and geotechnical fieldwork, also undertaken in 2010.

As a result of the preliminary design process, which has taken into account the environmental constraints identified on the airport site, changes have been made to the layout of the runway and associated infrastructure compared with the 2007 Master Plan. This has enabled the impact on sensitive environmental areas to be minimised.

Airport masterplan boundary

Preliminary design outline

Cadastral boundaries (August 2010)

Airservices_land

Data Source:
DCDB: QDERM, August 2010.
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metre

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement
Project Locality: On-Airport

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 2.1a**

J:\220000\220372 - SCA New Runway\GIS\Workspaces\REF_and_IAS\IAS\IAS_Figure2.1a_Project_Locality_On_Airport.mxd


Image Flat Quarry
Boral Coolum Quarry
Moy Pocket Quarry
Sunshine Coast Airport
Dulong Quarry Nambour
Holcim Quarry Nambour
Boral Narangba Quarry
Boral Petrie Quarry
Terrestrial Fill Sites
Airport Masterplan Boundary
Bella Creek
Brooloo
Lake Borumba
Imbil State Forest 1
Kingaham
Kenilworth
Little Yabba Creek
Yabba Creek
Jumna State Forest
Six Mile Creek
Jimna
Mapleton
Curramore
Obi Obi
Burnside
Image Flat
Kiamba
Cooloolabin
Gheerulla
Yandina
Kulangoor
North Arm
Coolum Beach
Nambour
Bli Bli
Pacific Paradise
Maroochydore
Woombye
Flaxton
Montville
Palmwoods
Tanawha
Witta
Eudlo
Elaman Creek
North Maleny
Maleny
Bald Knob
Mount Mellum
Mooloolah Valley
Ilkley
Meridan Plains
Parrearra
Bokarina
Wurtulla
Arcona
Glenview
Caloundra
Golden Beach
Sunshine Coast Regional
Landsborough
Booroobin
Mount Kilcoy
Sheep Station Creek
Bellthorpe
Cedarton
Commissioners Flat
Beerwah
Bells Creek
Glass House Mountains
Stanmore
Stony Creek
Royston
Woodford
Beerburrum West State Forest
Beerburrum
Spring Creek
Kilcoy Creek
Sandy Creek
Kilcoy
Glenfern
Villeneuve
Neurum
Gregors Creek
Mount Archer
D'Aguilar
Bracalba
Elimbah
Donnybrook
Bribie Island
Toorbul
White Patch
Banksia Beach
Bongaree
Ningi
Godwin Beach
Scrub Creek
Westvale
Mount Delaney
Hazeldean
Wamuran
Fulham
Yimbun
Campbells Pocket
Caboolture
Upper Caboolture
Morayfield
Rocksberg
Cooeeimbardi
Mount Beppo
Caboonbah
Mount Pleasant
Moorina
Burpengary
Beachmere
Deception Bay
Moreton Island
Moreton Bay
Mount Byron
Crossdale
King Scrub
Dayboro
Narangba
Deception Bay
Biarra
Murrumba
Sandy Creek
Dakabin
Redcliffe
Rush Creek
Mango Hill
Margate
Esk
Glen Esk
Whiteside
Clontarf
Joyner
Petrie
Woody Point
Moombra
Lawnton
Bramble Bay
Strathpine
Dundas
Mount Samson
Sandgate
Bald Hills
Lake
Data Source:
Imagery - Microsoft Virtual Earth, 2010
Issue | Date | By | Chkd | Appd
1 | 14-02-11 | MJD | KC | CC
Kilometre
0 5 10 15 20 25
ARUP
Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com
Client
Sunshine Coast Regional Council
Job Title
SCA Masterplan Implementation Project
Map Title
Initial Advice Statement
Project Locality: Terrestrial Fill Source
Scale at A4
1:500,000
Map Status
Final
Coordinate System
GDA94, MGA94 - Zone 56
Job No
220372
Map No
Figure 2.1b
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© Arup

Data Source:
Imagery - Microsoft Virtual Earth, 2010

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Kilometers

0 5 10 15

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client
Sunshine Coast Regional Council

Job Title
SCA Masterplan Implementation Project

Map Title
Initial Advice Statement
Project Locality: Marine Fill Source

Scale at A4	Map Status
1:300,000	Final

Coordinate System
GDA94, MGA94 - Zone 56

Job No	Map No
220372	Figure 2.1c

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Approximate Pipeline Path

Area of Possible Dredge Mooring Location

Airport masterplan boundary

Preliminary design outline

Data Source:
DCDB: QDERM, August 2010.
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	01-10-10	MJD	KC	CC

Metre

0 500 1,000 1,500 2,000 2,500

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client
Sunshine Coast Regional Council

Job Title
SCA Masterplan Implementation Project

Map Title
Initial Advice Statement Dredge Mooring Location and Pipeline

Scale at A4	Map Status
1:60,000	**Final**

Coordinate System
GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 2.1d**

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The design changes have also meant that the Project will not have an impact on the section of Mt Coolum National Park located to the south of the airport, which was identified in the 2007 Master Plan as being within the Master Plan boundary.

The Project includes the following elements, as shown in **Figure 2.1a**, presented roughly in sequential order of construction:

- Site preparation and construction access;
- Fill extraction, transport, placement and surcharging;
- Runway pavement Stage 1 - runway construction;
- Access road to the air traffic control tower;
- Full access road to new terminal precinct;
- Services to all development areas;
- A new terminal;
- Runway pavement Stage 2 - rapid exits and apron;
- A new car park;
- Additional infrastructure to support airport aviation businesses;
- Ground support equipment (GSE) parking;
- Airside operations building;
- A new fuel farm;
- Security building; and
- Existing terminal area redevelopment – including existing terminal refurbishment, aviation education campus, commercial development, experience centre, air museum.

2.2.1 Description of Key Project Elements

2.2.1.1 New East/West Runway

Fundamental to the Project is the development of a new east/west runway 2,430 m in length. The new runway will offer significant operational benefits over the existing 1,797 m long north/south runway currently in operation at SCA, including:

- Reducing the number of dwellings currently affected by aircraft noise;
- Significantly reducing the number of dwellings within the public safety areas;
- Increased safety for passengers and aircraft, and remove the need for Sunshine Coast Airport to operate under a Civil Aviation Safety Authority dispensation;
- Improving access to domestic and international destinations and markets for Sunshine Coast residents and businesses;
- Providing operational benefits with respect to reducing the effects of cross winds on aircraft operations; and

- Providing the essential infrastructure to support the growth of the aviation and aviation related sectors of the economy for the foreseeable future.

The total runway footprint will be in the order of 100 ha.

2.2.1.2 Associated Runway Infrastructure

In addition to the taxiways referred to above, the Project will necessitate the expansion of the existing Regular Public Transport (RPT) apron to facilitate access to the existing terminal for Code 'E' aircraft such as the Boeing 787. A new apron to accommodate the simultaneous operation of six Code 'C' (Boeing 737) and two Code 'E' (e.g. Boeing 787) aircraft will be constructed at the new terminal site as a later stage of this project.

2.2.1.3 New Passenger Terminal

The current SCA terminal is unlikely to meet passenger demand beyond 2030. A new terminal is proposed to provide for an annual international and domestic demand of 4 million passengers. The new terminal precinct will accommodate the entire necessary support infrastructure including:

- Land side access, public transport and car parking;
- Air traffic control, aviation rescue and fire fighting service;
- Engineering facilities;
- Freight handling; and
- Ground equipment storage and fuel storage / distribution facilities.

2.2.1.4 Aviation Business Precincts

The Project generates significant opportunity for aviation and aviation-related business to operate in support of both RPT and general aviation activities at SCA. Accordingly, the commercial and general aviation aprons, taxiways and hanger sites are to be expanded with a view to providing an additional approximately 25ha of land for aviation business. It is projected that the airport will directly employ about 3,000 people when fully developed.

2.2.1.5 Current Runways

The current 12/30 runway (secondary general aviation runway) will be closed to enable the construction of the proposed 13/31 runway.

The future use of the current main runway (18/36) will be determined as part of the EIS process. It should be noted however that the 18/36 runway will no longer be subject to the CASA exemption that allows the operation of Code C (B737, A320) aircraft once the 13/31 runway is constructed.

2.2.1.6 Site Access

Depending upon the outcome of ongoing investigations with respect to construction methodologies, access to the construction site may be sought from

the Sunshine Motorway or Finland Road. Access to the new terminal site, once operational, will occur via a 2.5 km extension to the existing Airport Drive.

2.2.1.7 Fill

The construction of the runway will require two major types of fill:

- Select Fill – applied to the prepared in-situ natural surface; includes the basal sand layer and the surcharge fill, which when trimmed back following consolidation, will become the sub grade fill. The amount of select fill required for the runway is approximately 1.5 million m^3 (placed) plus around 50,000 m3 for the access road. As previously mentioned, the total amount of select fill required for the Project is 2.7 million m^3; and
- Pavement Fill – includes fine crushed rock (FCR), asphaltic concrete (AC) and unreinforced Portland Cement (UPC) concrete pavements. The amount of pavement fill required is approximately 300,000 m^3.

Due to the volumes required for construction of the runway (as well as the taxiway and rapid exits) a number of fill sources - both terrestrial and marine based – have been considered for the Project, with the likely options described below.

Terrestrial Sources

There are a number of options currently being considered for the sourcing of terrestrial pavement fill for the Project. Terrestrial fill required for the Project would be sourced from quarries in the Sunshine Coast region and transported by road (truck transport) to the airport site. While the preferred quarry location/s has not been confirmed, the potential quarry sites that are able to provide the required amount and quality of fill include the following:

- **Boral Narangba Quarry** - The Narangba Quarry is located on Raynbird Road, Narangba, approximately 65 km south of the SCA. Approximately 50 ha is occupied by quarry operations and 420 ha is buffer land. The existing operation is contained within Lot 139 on SL10320 and Lot 1 on RP167435 with the other parcels owned by Boral acting as a buffer to the quarry's operation.

  The site is included in the Rural Zone under the Caboolture Shire Plan and is designated as Regional Landscape and Rural Production Area in the South East Queensland Regional Plan 2005-2026. The entire site is identified as a Key Resource Area (KRA46) under the State Planning Policy for the Protection of Extractive Resources. Access for vehicles transporting materials to and from the quarry is via the haulage route of Raynbird Road, Oakey Flat Road and New Settlement Road to the Bruce Highway. The material would then be transported on the Bruce Highway and Sunshine Motorway to the airport site.
- **Boral Petrie Quarry** – The Petrie Quarry is located approximately 70km south of the SCA, on Dayboro Road in the Pine Rivers Shire (now Moreton Bay Regional Council area).

The quarry is situated on a 134 ha freehold property, of which around 35 ha has been disturbed for quarry pit and infrastructure development. The balance of the site is currently used as buffer zone. The quarry is located within the Whiteside Key Resource Area KRA 58 as defined under the State Planning Policy. The transport of materials from the eastern quarry is onto Dunlop Lane and then Dayboro Road. Transport from the western quarry is directly onto Dayboro Road. From Dayboro Road the material would be transported on the Bruce Highway and Sunshine Motorway to the airport site.

- **Moy Pocket Quarry**- The Moy Pocket Quarry is owned by Sunshine Coast Quarries and is located on Moy Pocket Road in Kenilworth, in the Gympie Regional Council Local Government Area. It is located within the Moy Pocket Key Resource Area approximately 40 km west of the SCA. Transport of fill to the airport would be via Moy Pocket Road, Eumundi Kenilworth Road, the Bruce Highway, Yandina Coolum Road and the Sunshine Motorway.
- **Boral Coolum Quarry**- this quarry is located on Toolborough Road in Coolum, approximately 8km northeast of the airport. Access to the airport site would be via Toolborough Road, Yandina Coolum Road and the Sunshine Motorway.
- **Image Flat Quarry –** this quarry occupies approximately 37 ha and is located on Image Flat Road, Image Flat, approximately 9 km west of the airport site. Access to the airport would be via Image Flat Road, Nambour Mapleton Road, Bli Bli Road and David Low Way.
- **Holcim Quarry, Nambour –** this quarry is located on Cooney Road, Nambour, approximately 5 km west of the airport. Access to the site would be via Cooney Road, Bli Bli Road and David Low Way.
- **Dulong Quarry** – this quarry occupies approximately 4.9 ha and is located on Dulong School Road in Nambour. Transport of material to the airport site would be via Dulong Road, Nambour Mapleton Road, Bli Bli Road and David Low Way.

All the quarries above have relevant state and/or local approvals in place, including development approvals and/or environmentally relevant activity approvals.

In addition to the above quarries, consideration has also been given to extraction of sand from the Maroochy River Coastal Basin which is located west of the airport site and east of the Maroochy River. The extraction of sand from this area is no longer being considered for the Project as the timeframes for extraction are not likely to suit the Project and there are potential environmental risks associated with the extraction of sand from this area.

Marine Sources

There are two main options currently being considered for the sourcing of marine fill for the Project as outlined below. For either option, sand would be sourced from within the Northern Tidal Delta of Moreton Bay, and would form part of the 60 million m^3 of sand that has been allocated by the Queensland Government for extraction as a result of the Moreton Bay Sand Extraction Study (MBSES).

The MBSES was initiated by the Queensland Government and undertaken between 2002 and 2004. It involved a detailed investigation of the physical processes, water quality, ecological processes, indigenous cultural heritage and economic impacts associated with increasing sand extraction in Moreton Bay. The study also provided a comparative analysis of the availability and associated impacts of land-based sand extraction.

Overall, the scientific reports that formed part of the MBSES found that impacts associated with sand extraction in Moreton Bay would be relatively minor, even for very large sand extraction scenarios, with marine-based sand extraction having significantly fewer environmental, social and economic impacts than land-based extraction (Brisbane Airport Corporation, 2006).

The total available sand resource in Moreton Bay is estimated to be approximately 3,770 million m^3. As a result of the MBSES, the Queensland Government has made a decision that over the next 20 years it will support:

- Extraction of up to 40 million m^3 (less than 1.1 percent of the total sand resource) of sand for development of Australia TradeCoast projects, including the expansion of the Brisbane Airport and the Port of Brisbane;
- Extraction of up to 20 million m^3 (less than 0.6 percent of the total sand resource) of sand for use within the construction sector; and
- The majority of future sand extraction being located to supplement a major shipping channel straightening project in the northern part of Moreton Bay. In addition to sand extraction to supplement channel straightening, increased sand extraction will be allowed in the Middle Banks area of the bay (subject to environmental impact assessment), with priority to be given to the Brisbane Airport Corporation (BAC) for its New Parallel Runway Project.

At this stage of the Project there are two potential options for sand extraction in Moreton Bay:

1. **Sand sourced from a site in Moreton Bay with existing approvals (i.e. Middle Banks)** Middle Banks was identified in the MBSES as a potential location for sand extraction. In 2006, BAC sought approval through the preparation of a combined EIS and Major Development Plan (MDP), for extraction of 18 million m^3 of sand from Middle Banks for its new runway project. This proposal was approved in 2007. SCA is exploring the opportunity to extract sand from this allocation in accordance with the existing BAC approvals and conditions for sand extraction. SCA would comply with all relevant conditions and required mitigation measures in dredging sand from this location. This would include an approved Dredge Management Plan.

   Middle Banks is located in Moreton Bay approximately 20 km northeast of the mouth of the Brisbane River and 4 km due west of Tangalooma Point on Moreton Island. Moreton Bay is part of Queensland's coastal waters and generally all of the Bay's tidal waters/areas are included within the Moreton Bay Marine Park, declared under the *Marine Parks Act 2004.*

   The sand dredged from Middle Banks would be transported by dredge to a point offshore from the airport at Sunshine Coast, where the dredge would moor prior to transportation of the sand by pipeline to the construction site.

2. **Sand sourced from Moreton Bay from a site requiring additional approvals (i.e. Spitfire Channel or the allocation for construction projects).** Another option is that sand may be sourced from Spitfire Channel, which is currently being dredged as part of a channel straightening and maintenance project. Spitfire Channel is also located within the northern delta banks of Moreton Bay and was identified in the MBSES.

   The extraction of sand from Spitfire Channel was assessed in the MBSES and was found not to have a significant environmental impact. A subsequent referral to the Australian Government for the extraction of 15 million m^3 of sand from the channel was submitted by the Port of Brisbane (PoB) in August 2005. It was declared a non-controlled action in September 2005.

   If sand was extracted from Spitfire Channel, the volumes required by SCA would be in addition to the 15 million m^3 allocated to PoB. Therefore, it is expected that SCA would seek an additional approval as part of an overall EIS for the Project. However, SCA would seek to comply and be consistent with existing conditions and mitigation measures currently being applied to PoB. This would include an approved Dredge Management Plan. Similarly sand may be sourced from the allocation in the MBSES for construction projects, which would also require additional approval as part of the EIS.

   As described earlier for Middle Banks, the fill material would then be transported by dredge to a point offshore from the airport, where the dredge would moor prior to transportation of the sand by pipeline to the construction site.

Fill Process

The points below outline the likely process to be undertaken for the placement of fill on the site:

- Land clearing and site preparation activities (drainage) within the Project footprint to prepare the site for the placement of fill material. This includes a dredge pipeline, detention ponds for supernatant water, bunding and access;
- Importation of fill material to the site via dredge initially so sand placement can commence;
- Piping sand from dredge to the site;
- A period of settling and then reworking of fill material across the site;
- Import of pavement fill via truck; and
- Removal of detention ponds once construction is completed followed by rehabilitation of the areas not within the Project footprint (ie. those areas within which permanent infrastructure is to be located).

2.3 Construction Processes

This section describes the main activities that would occur for the preparation of the site, placement of fill and runway pavement construction.

2.3.1 Site preparation and fill placement

An initial works package would be required to prepare the site and provide access. Major elements of the works package would include site survey and set out, service relocations and any required external road upgrades. Site clearing/ stripping would occur in phases, just prior to construction in each area and would include drainage works.

It is assumed the existing topsoil would need to be stripped as a part of the earthworks. Any ASS would be treated in accordance with Queensland Acid Sulfate Soils Investigation Team (QASSIT) guidelines.

Major elements of the site preparation would include the establishment of a construction compound, internal site access roads, ASS and storm water treatment areas, sediment controls, diversion of drainage channels and establishment of groundwater monitoring stations.

Establishment of earthworks platforms would include fill placement to surcharge heights, installation of wick drains if required, installation of settlement plates, monitoring of settlement and stabilisation measures and erosion and sediment control measures.

For terrestrial fill, placement would be by truck and compaction would be achieved by using a dozer or compactor, with appropriate use of construction water to achieve required moisture content.

For marine fill, dredged sand would typically be placed directly from the dredge to its final location via pipeline to the site with the minimum of manual or machine handling. For the majority of the Project, hydraulic placement in this manner is likely. For machine handling of the sand, potential equipment that may be used includes swamp dozers, scrapers, loaders and body trucks.

Marine fill would require a series of settlement ponds and tail water would be discharged into the tidal salt water creek at the western end of the site, via a retention/sedimentation pond.

Marine fill could be transported from Moreton Bay in a large or small dredge. For a large dredge the received volumes of sand and water would be significantly higher than a small dredge. While similar in general concept, the larger volumes of sand and water would mean changes to the process. The required sizing of the sedimentation pond/s would likely be the limiting factor for sand acceptance from a large dredge. Pond sizing depends on the selected sand source, and would be a priority for the next phase of design work.

During the consolidation period, settlement levels would be monitored, erosion and sediment controls maintained and runoff water managed.

During the surcharge fill re-handling period, the remaining runway area would be cleared and grubbed, environmental controls installed, unsuitable material removed and re-handling of fill to final locations and levels along the runway.

Re-handling would be by dozers/trucks, with additional imported fill placement by truck dumping and compaction using a dozer/compactor, with appropriate use of construction water to achieve required moisture content.

2.3.2 Management of Groundwater Infiltration

If seawater infiltration to local groundwater is identified as a significant concern through the EIS, then further management may be required. While further study and design will be required before formulating a solution, possible methods may include:

- Installation of a physical underground barrier around the perimeter of the site to prevent lateral water flows from under the reclamation site;
- Ground water injection that artificially charges the water table below the reclamation reducing further infiltration;
- The construction of a raised perimeter drain that could be filled before dredging and maintained during dredging to charge the water table under the reclamation site in combination with a perimeter barrier; and
- Lining of the reclamation bunds and floor.

2.3.3 Runway Pavement Construction

Major elements of the runway pavement construction would include (Aecom, 2010):

- Establishment of Contractor's office and site security;
- Construction of access road and hardstands;
- Construction of lay down area for materials storage;
- Establishment of pavers, batch plant and concrete plant;
- Mobilisation of Super Compactor (optional);
- Construction and establishment of water purification plant;
- Demolition of runway 12/30 pavement and recovery where possible;
- Drainage works;
- Trim and compact sub grade;
- Placement and compaction of pavement fill;
- Asphalt surfacing to runway and taxiways; and
- Installation of airfield lighting and conduits.

2.4 Hazard, Risk and Safety

Safety and emergency response have both social and environmental implications and require management to reduce the level of risk. A risk assessment, at all relevant stages of the project, will be conducted in accordance with AS/NZS ISO 31000:2009 *Risk management – Principles and guidelines*, and appropriate management measures implemented.

The *Queensland Workplace Health and Safety Act 1995* is the relevant workplace health and safety legislation. This legislation specifies the responsibilities of principals, designers and contractors to ensure a safe work environment. To ensure compliance with the legislation during construction and operation, a Contractor would be required to complete a Job Safety Assessment and Safety Plan prior to commencement of construction.

SCA takes security very seriously and safety of the airport precinct is of the highest priority. SCA works closely with all government agencies relating to aviation safety and security.

SCA is a security controlled airport. The requirements of the *Aviation Transport Security Act and Regulations* apply to airside activities.

2.5 Employment During Construction and Operation

Pricewaterhouse Coopers was commissioned by SCA in 2010 to prepare a Business Case for the SCAMPIP (please refer to the Infrastructure Australia website: http://www.infrastructureaustralia.gov.au/2011_coag/submissions.aspx). The Business Case identified that with all runway and RPT projects, as well as all new commercial precincts, the project offers a Benefit Cost Ration (BCR) (National) of 2.21, with Net Present Value (NPV) benefits of $247.7 million and an internal rate of return of 13.49 per cent.

In addition to the benefits calculated for inclusion in the Benefit Cost Ratio (BCR), employment as a commonly-reported economic indicator has been considered for the Project. The total employment (wage impact) generated by the runway and wider master plan is not included in the calculation of the BCR, NPV or IRR as it is typically included within other categories such as incremental expenditure (a portion of which goes towards employee wages).

2.5.1 Direct Employment

Based on a bottom-up calculation of expected employment generated through construction and operation of the new runway, terminal and commercial precincts, the expected additional employment to be generated by the Master Plan is approximately 5,047 (FTE equivalent at peak operations, including employment during construction). This includes an additional 25 employees per 100,000 passengers for RPT activities, on top of employment created by each of the commercial precincts.

This estimate is broadly consistent with employment statistics published for other airport infrastructure developments and SCA's current operations, though it includes a full take-up assumption for proposed commercial operations. For example, the Economic Impact Statement for the Brisbane Airport New Parallel Runway reported an expected increase in employment during construction of 2,700 in 2009 (the peak year for construction) and ongoing additional employment of 7,800. This can be compared to the SCA's estimate of total additional employment during runway construction of approximately 1,397 (peak employment during construction is estimated at 419 FTE in 2016) for Runway/RPT projects only (2,357 for total Master Plan construction).

Indicative employment estimates are presented over page.

Project elements	Estimated employment numbers (FTE)
Employment during construction	
Runway projects	1,397
SCA project	559
Commercial precincts	401
TOTAL	**2,357**
Employment during operation	
Runway/RPT operations	1,000
SCA precincts	210
Commercial precincts	1,480
TOTAL	**2,690**
Total employment Master Plan (excluding northern & other precincts)	**= 5,047**

Based on ABS data in relation to construction industry wages and Queensland wages, the present value of additional direct employment generated by the Master Plan is approximately $1,192.5 million.

Further work will be undertaken in future to refine estimates of total direct employment under the Master Plan.

2.5.2 Indirect employment

Based on a benchmark ratio of $0.33 of wages generated per $1 spent in the Sunshine Coast region, the present value indirect employment impact of the Master Plan over the model period to 2050 is $1,084.0m. This reflects additional employment of approximately 2,805 FTE, or 1.57 employees per thousand passengers.

The ratio of indirect employment per thousand passengers is broadly consistent at comparison airports (e.g. Gold coast airport - 1.716 employees per thousand passengers; Sydney Airport – 2.44 employees per thousand passengers).

2.6 Project Timeframes

SCA aims to commence construction of the new runway (13/31) during 2014, in order that it is operational by 2020. It is envisaged that other infrastructure, associated with airport expansion, will be operational by 2030.

2.6.1 Staging Philosophy

Operational requirements, funding limitations and other considerations usually dictate that provision of expanded or new facilities is undertaken in a staged manner. Development of facilities is driven by passenger volumes or other

triggers that can be defined as part of the planning process ahead of the time the facilities are likely to be required.

Thus, the desired airport developments will be achieved in a series of stages that are tailored to match passenger volume growth and required service levels, with the basic philosophy being to optimise use of existing infrastructure ahead of additional development.

2.6.2 Staged Development Plan

Taking the current approved Master Plan objectives, and factoring recent preliminary design considerations, the stages for development of the SCA are described as follows:

Stage 1 – to 2020

The first phase in the construction process would be the preparation of the site and placement of fill on the site. This would commence in 2014, with the surcharging process being completed in 2018. Once this process was completed, construction of runway pavement would commence. The runway would then be operational in 2020.

A new air traffic control tower and aviation rescue and fire fighting services facility are also planned to be built in 2019, with the view that both would be operational at the same time the new runway is open.

Stages 2 and 3 – post 2020

Construction of the new terminal precinct is likely to commence in 2030 for completion in 2033. This would include access road and services, rapid exit taxiways and apron, car parking, airside operations building, security building, services and aviation fuel storage facility.

The extension of the access road would enable further expansion of the commercial aviation precincts. These would be developed to meet demand.

Investigations are underway with respect to the adaptive re-use of the existing terminal / apron / car parking facilities to follow the move to the new terminal in 2033. Options being considered include corporate aviation facilities and an aviation educational campus.

Stage 4

The preliminary design for the new terminal allows for expansion beyond the 4 million passenger annual capacity proposed to be provided in 2033. Any expansion would reflect ongoing growth and demand.

2.7 Additional Studies Needed

The information in this document is based mainly on desktop research and previous studies. Some preliminary ecological and geotechnical field investigations have been undertaken, the results of which are summarised in Section 3 below. As the approvals phase progresses, further detailed field investigation will be completed during the EIS that would include, but not necessarily be limited to:

- Engineering detailed design (including further fill studies);
- Detailed ecological field surveys;
- Detailed geotechnical investigations;
- Visual/landscape impact assessment;
- Cultural heritage studies – Indigenous and Non indigenous Heritage;
- Social Impact Assessment;
- Noise and air emissions assessment;
- Economic analysis; and
- Other environmental assessments – e.g. contaminated land.

3 Existing Environment

The Project footprint has been defined according to environmental, social and economic criteria and is predominantly located within the existing SCA Master Plan boundary. The On-Airport boundary is shown in **Figure 2.1a**.

The exact Project footprint will be confirmed during the detailed design and EIS phases of the project, however key features of the preferred runway design and precinct development option include:

- A runway and taxiway preliminary design and orientation that is operationally efficient while avoiding existing development in the public safety areas;
- A design that avoids Mt Coolum National Park located to the north and south of the airport;
- A design that avoids impacts on significant species and associated habitat of ecological significance where possible;
- On a physically and environmentally constrained site, delivering a highly flexible strategic planning framework that is cost efficient, practical and do-able;
- Reserving areas of land for intended uses to allow for a viable and prosperous airport business and low stress terminal precinct; and
- Flood mitigation and recognising the potential for climate change.

3.1 Environmental Considerations

3.1.1 Terrain

The airport occupies approximately 460 ha of relatively flat, low-lying land just north of the Maroochy River and is located approximately 5 km north of the regional centre of Maroochydore. The north-eastern boundary of the airport is approximately parallel to the coastline of the Coral Sea. The airport is surrounded by a mixture of residential and national park land to the north, east and south. Sugar cane farming land and undeveloped remnant bush land lie to the west and north-west and a section of industrial land adjoins the airport's south-western boundary.

While the airport itself is located on relatively flat and low-lying land, the location of the new runway is constrained by Mount Coolum to the north and Mt Ninderry to the west.

3.1.2 Soils and Geology

The geology of the airport site is described by Geoscience Australia as Pleistocene coastal deposits and unconsolidated sediments. The soil type in the Queensland Soils Atlas is 'sands'.

A limited geotechnical investigation has been undertaken for the site, focusing on the proposed new runway location.

Testing included 12 boreholes to approximately 6 m in depth, cone penetrometer tests (CPT) to depths of 8 to 24 m and four deeper boreholes to approximately 10 m where insufficient data was obtained from CPTs. The findings of the geotechnical testing indicate that most of the proposed new runway alignment is underlain by alluvial sand, dense indurated sand or 'coffee rock', and interbedded medium-dense/dense sand and stiff/very stiff clay.

The western part of the site is underlain by loose clayey sand, very soft alluvial clay and loose clayey sand, with coffee rock at depths greater than 6.5 m.

SCA is in a low-lying coastal area there is a high potential for acid sulphate soils (ASS). Potential ASS contains naturally occurring iron sulphides. When disturbed, or exposed to air, these sulphides react with oxygen to release sulphuric acid, which can have an adverse effect on nearby waterways.

The geotechnical investigation identified that acidic soils are distributed uniformly laterally and vertically across the proposed runway corridor to about 1 m in depth, and can therefore be expected to extend across other areas of the airport site.

The site will require preloading and surcharging to reduce settlement of the runway after pavement construction. This will require the importation of fill to the site as described in 2.2.1.7

3.1.3 Air Quality

Air quality is measured by DERM in various locations across the Sunshine Coast and indicates the air quality is good to very good for all parameters. The nearest air quality monitoring location to the airport is at Mountain Creek approximately 10 km south of the site, with indicators for nitrogen dioxide, ozone, particles as PM_{10} and visibility being 'very good'.

The air quality surrounding the airport is expected to be largely influenced by road traffic on the nearby Sunshine Motorway and the local road network. Other adjacent land uses are largely residential, agricultural or commercial and are not expected to have a significant impact to air quality.

Existing operations On-Airport would result in minimal impact to air quality predominantly through aircraft movement, passenger travel to and from the airport and routine airport operation and maintenance activities.

3.1.4 Flora

3.1.4.1 On-Airport

SCA is situated on the low lying coastal fringe of the Maroochy Estuary Catchment and contains a mosaic of coastal vegetation communities and habitats, with coastal heath dominating. It is located in Biodiversity Profile Three, which is defined by SCC's Biodiversity Strategy as Noosa-Maroochy Wallum Area (SCC 2010).

Remnant Vegetation

Regional Ecosystems (RE) are the classification for remnant vegetation in Queensland, protected under the *Vegetation Management Act 1999* (VM Act).

Areas of remnant vegetation occur on the site, as shown in **Figure 3.1a.** This remnant vegetation is comprised mostly of coastal heath and paperbark forest. Areas of palustrine wetland and she-oak forest are also present. Areas of high value regrowth vegetation are mapped as present within the airport site, while the north-western region of the site is predominantly cleared.

Regional Ecosystem (RE) mapping identifies four types of remnant vegetation communities within the airport site as shown in **Table 2** below. Their locations are also shown in **Figure 3.1a**.

Table 2 Regional Ecosystems Within the Airport Site

RE Code	*Short Description (from REDD)*	*VM Act Status*	*Biodiversity Status*
12.1.1	*Casuarina glauca* open forest on margins of marine clay plains.	Of Concern	Endangered
12.2.7	*Melaleuca quinquenervia* or *M. viridiflora* open forest to woodland on sand plains.	Least Concern	Of Concern
12.2.12	Closed heath on seasonally waterlogged sand plains.	Least Concern	No Concern at Present
12.2.15	Swamps with *Baumea* spp., *Juncus* spp. and *Lepironia articulata*	Least Concern	No Concern at Present

Notes to Table:
RE: Regional Ecosystem
REDD: Regional Ecosystem Description Database (see Queensland Herbarium 2009)
VM Act Status: Status of the RE under the Queensland Vegetation Management Act 1999, as based on the proportion of the pre-clearing extent that remains
Biodiversity Status: Status of the RE as scheduled in the Vegetation Management Regulation 2000, based on the proportion of pre-clearing extent that remains unaffected by moderate degradation and/or biodiversity loss.

Closed heath (RE 12.2.12) and Paperbark forest (RE 12.2.7) are both extensively represented within the airport site, while palustrine swamp (RE 12.2.15) has a more limited representation within the airport site and a relatively small patch of she-oak open forest (RE 12.1.1) is present. Additionally, areas of high value regrowth vegetation are mapped as present within the airport site, while the north-western region of the footprint is predominantly cleared.

The she-oak open forest (RE 12.1.1) has a conservation status of 'Of Concern' under the Queensland *Vegetation M anagement A ct 1999* (VM Act), and the remaining three REs have a conservation status of 'Least Concern' under the VM Act. In terms of the Biodiversity Status, the she-oak open forest is classified as 'Endangered', the Paperbark forest is classified as 'Of Concern', and the two remaining REs are 'No Concern at Present'.

Airport masterplan boundary

Preliminary Design Outline

Cadastral boundaries (August 2010)

Remnant Vegetation (v6):

Endangered (dominant)

Endangered (sub dominant)

Of Concern (dominant)

Of Concern (sub dominant)

Not of Concern

Data Source:
Remnant Vegetation (v6): QDERM, 2010.
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	09-02-11	MJD	KC	CC

Metre

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client
Sunshine Coast Regional Council

Job Title
SCA Masterplan Implementation Project

Map Title
Initial Advice Statement Regional Ecosystems

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System
GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1a**

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Nationally Listed Flora Species

An EPBC Act Protected Matters Search has been undertaken for the airport site to identify Commonwealth-listed threatened species that occur or are likely to occur within the study area. In addition, preliminary ecological fieldwork was undertaken in May 2010, focusing on significant species likely to occur on the site. Table 3 outlines the EPBC Act listed flora species identified through the EPBC Act Protected Matters Search (supplemented by fieldwork) and their likelihood of occurrence on the airport site.

Table 3 Nationally Listed Flora Species and Likelihood of Occurrence Within the Airport Site

Scientific Name	*Common Name*	*EPBC Act Status*	*Type of Presence (SEWPaC 2010)*	*Known distribution*	*Habitat preference*	*Likelihood of occurrence as assessed by this study (known, possible or unlikely)*
Allocasuarina emuina	Mt Emu She-oak	Endangered (E)	Species or species habitat may occur within area	Restricted geographic range between Beerburrum and Noosa on Queensland's Sunshine Coast	Heathland environments	Known
Allocasuarina defungens	Dwarf Heath Casuarina	E	Species or species habitat may occur within area	Northern and Hunter−Central Rivers (NSW) (TSSC 2008a)	Coastal areas of wet to dry heathland (TSSC 2008a)	Unlikely – not within or close proximity to known distribution (although RE 12.2.12 and RE 12.2.15 represent suitable habitat within the study footprint)
Bosistoa selwynii	Heart-leaved Bosistoa	Vulnerable (V)	Species or species habitat likely to occur within area	Richmond River to near Gladstone (TSSC 2008b)	Inhabits sclerophyll forest and rainforest (TSSC 2008b)	Unlikely - no suitable habitat is present within the study footprint
Bosistoa transversa	Three-leaved Bosistoa	V	Species or species habitat likely to occur within area	Richmond River to near Gladstone (TSSC 2008b)	Inhabits sclerophyll forest and rainforest (SGAP 2005, TSSC 2008b)	Unlikely - no suitable habitat is present within the study footprint
Bulbophyllum globuliforme	Miniature Moss-orchid	V	Species or species habitat likely to occur within area	North-east NSW and south-east QLD (including Wide Bay district) (Stanley and Ross 1989); Calliope Range inland from Gladstone (Harrison 2002)	Grows only on Hoop Pines (*Araucaria cunninghamii*) (Harrison 2002)	Unlikely - no suitable habitat is present within the study footprint
Cryptocarya foetida	Stinking Cryptocarya	V	Species or species habitat may occur within area	Northern NSW to Fraser Island and east of Gympie. (TSSC 2008c)	Inhabits littoral rainforest (TSSC 2008c)	Unlikely - no suitable habitat is present within the study footprint

Eucalyptus conglomerata	Swamp Stringybark	E	Species or species habitat likely to occur within area	Ten locations in southern QLD between Kin Kin and Beerwah (TSSC 2008d). Total number of individual plants estimated as 1,100 (Drake 1995)	Wallum heath (Drake 1995) and coastal heathlands/sedgelands (Barry 2005)	Possible – RE 12.2.12 and RE 12.2.15 within the study footprint represent ideal habitat for this species and is within the known distribution
Phaius australis	Lesser Swamp-orchid	E	Species or species habitat likely to occur within area	Southern QLD and northern NSW; mainland populations are small and scattered (Benwell 1994)	Coastal heath, sedgelands and *Melaleuca* swamp (Barry 2005, Joyce 2006, Searle and Maden 2006)	Possible – RE 12.2.7, RE 12.2.12 and RE 12.2.15 within the study footprint represent ideal habitat for this species and is within the known distribution
Phebalium distans	Mount Berryman Phebalium	Critically Endangered (CE)	Species or species habitat may occur within area	Lockyer Valley, South Burnett and North Burnett (TSSC 2008d). 175 mature individuals known from ten populations (TSSC 2008e)	Inhabits semi-evergreen vine thicket on red volcanic soils or communities adjacent to this vegetation type (TSSC 2008e)	Unlikely - no suitable habitat is present within the study footprint and it is not within known distribution
Prasophyllum wallum	Wallum Leek Orchid	V	Species or species habitat likely to occur within area	Coastal areas in Moreton and Wide Bay districts (Stanley and Ross 1989)	Wallum communities (Jones 1991) and *Melaleuca* swamp (Joyce 2006)	Possible – RE 12.2.7, RE 12.2.12 and RE 12.2.15 within the study footprint represent ideal habitat for this species and is within the known distribution
Taeniophyllum muelleri	Minute Orchid	V	Species or species habitat may occur within area	Coastal areas from northern NSW to north QLD (AVH 2010)	Grows on rainforest trees (SGAP 2005)	Unlikely –no suitable habitat is present within the study footprint

Of the species identified in **Table 3** above, only *Allocasuarina e muina* (Emu Mountain She-oak) is known to occur on the site (Ecosmart Ecology, 2010), with the other species being possible or unlikely. Further fieldwork is required to confirm their presence on the site.

Allocasuarina emuina is listed as Endangered under the EPBC Act as well as the *Nature C onservation (Wildlife) R egulation 1994* (subordinate legislation to the *Queensland Nature Conservation Act 1992)*. *Allocasuarina emuina* has a distinct niche preference for heathland environments and has a highly restricted and patchy geographic distribution throughout its restricted geographic range. The area of suitable habitat, number of populations and number of reproducing individuals has undergone dramatic declines over recent times as a result of habitat loss and fragmentation associated with urbanisation. This species is known from 11 populations over a range of 35 km between Beerburrum and Noosa on the Sunshine Coast (Environmental Protection Agency 2007). One of the known populations is on Finland Road, occurring within the SCA boundary and the adjacent South Marcoola section of the Mt Coolum National Park. Based on 2003 estimates, approximately 1,000 plants occur at this site with an estimated total population of 14,521 plants across the species known range.

During the preliminary ecological fieldwork, several traverses across the known Finland Road population of *Allocasuarina e muina* were undertaken to establish the spatial extent of the species on the site. Individual trees were marked with GPS and traverses extended beyond the point at which the species did not form a component of the traversed vegetation community. Plot sampling at representative locations recorded individual counts for the species within a 20 m x 20 m measured plot. Subsequently, the major variations in habitat structure and *Allocasuarina e muina* population density were mapped using available aerial photography. This provided a means to estimate the maximum total population for the species on the site.

Figure 3.1b provides representation of the determined extent of the *Allocasuarina emuina* population within the airport site. Individual point locations for the species recorded during traverse are also provided. The mapping provides a representation of 'core habitat areas', being those areas where the species is considered to form an ecologically viable population. Habitats where the species is moribund and in low density, typically due to site disturbance and the resultant dramatic changes in ecology are indicated as 'sub-optimal habitat'. The southern portion of the core habitat area is adjacent and continuous with the Mt Coolum National Park to the south.

The results of the preliminary fieldwork show that the 2003 census of the Finland Road *Allocasuarina e muina* population significantly under represents the size of the population. Fieldwork results estimate the maximum population of the species at this site is over approximately 19,000 plants. This is based on extrapolation from plot survey and is therefore an estimate only, however does indicate the significance of the population in the context of the species overall distribution. This would make the Finland Road *Allocasuarina emuina* population the largest extant population of the species, surpassing the Emu Mountain population and is approximately 19 times larger than originally thought.

Airport masterplan boundary

Preliminary Design Outline

Cadastral boundaries (August 2010)

Allocasuarina

Cleared areas

Core population/ habitat area

Sub-optimal/ marginal habitat affected by secondary shrubby thickening (< 5 trees / ha)

Suitable habitat - not assessed during field traverse and population unknown

Suitable habitat - species not recorded

Individual Allocasuarina Plants

Data Source:
Allocasuarina: Ecosmart Ecology, 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metre

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Allocasuarina Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1b**

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Fieldwork evidence on site suggests that *Allocasuarina e muina* will gradually senesce as vegetation thickens in the absence of fire. Fieldwork has identified that without appropriate management intervention, the population in the northern core habitat area (**Figure 3.1b**) may gradually lose viability. Existing table drains on the site have resulted in loss of viable *Allocasuarina emuina* habitat, potentially as a result of draw down of the perched water table adjacent to the drain.

State Listed Flora Species

While not yet identified on the site, several State-listed flora species possibly occur on the airport site on the basis that they have been recorded in areas immediately adjacent to the site that are identical in terms of community composition and underlying geomorphology. These species include *Blandifordia grandiflora* (Christmas Bells), *Gompholobium v irgatum* var. *emarginatum* (Wallum Wedge Pea) and *Schoenus s cabripes* (Rough Bog Rush). Further fieldwork would be required to confirm the presence of these species on the site.

3.1.4.2 Off-Airport

In relation to Moreton Bay, where SCA is investigating marine sand extraction opportunities, reference has been made to the ecological investigations for the BAC EIS/MDP (BAC 2006), which identified that no mangroves or salt marsh occur in the area of Middle Banks due to unsuitable growing conditions. The nearest noteworthy areas of mangrove and salt marsh to Middle Banks are located approximately 13 - 14 km away towards the south-western coast of Moreton Island, at Crab Island, and in central Moreton Bay at Mud Island.

The BAC EIS/MDP found that two species of seagrass (*Halophila ov alis* and *Halophila s pinulosa*) have been recorded at Middle Banks, growing exclusively on shallow (between ~4 and 10 m) sub-tidal sand banks. Adjacent (unsurveyed) sand banks are also likely to contain similar seagrass communities in a similar depth stratum. The nearest previously mapped seagrass meadows occur approximately 2 - 3 km to the east of Middle Banks in the intertidal and shallow sub-tidal areas adjacent to Moreton Island.

The extensive seagrass beds at Moreton Banks to the south of Middle Banks form important feeding areas for turtles and dugong. The sparse (and possibly ephemeral) seagrass beds at Middle Banks are not recognised as an important foraging area for turtles and dugongs. Nonetheless, these seagrass communities would provide other ecosystem functions, including bed stabilisation and sediment nutrient turnover.

Similarly, the work PoB undertook for Spitfire Channel and the MBSES, identified that there is no known significant marine vegetation located in the Spitfire Channel area, or immediately adjacent areas.

3.1.5 Terrestrial Fauna

3.1.5.1 On-Airport

Essential Habitat for Fauna

Essential habitat, which is vegetation in which a species that is endangered, vulnerable, rare or near threatened has been known to occur, is mapped by the Queensland Department of Environment and Resource Management (**Figure 3.1c**). Essential habitat maps help to determine the habitat status of the vegetation when assessing applications to clear.

Essential habitat is mapped for a number of significant fauna species within or adjacent to the airport site. This includes:

- Wallum Froglet (*Crinia tinnula*) within RE's 12.2.7, 12.2.12 and 12.2.15,
- Wallum Rocket Frog (*Litoria fr eycineti*) within RE's 12.2.7, 12.2.12, and 12.2.15,
- Wallum Sedgefrog (*Litoria olongburensis*) within RE's 12.2.7, 12.2.12 and RE 12.2.15, and
- Ground Parrot (*Pezoporus wallicus*) within RE's 12.2.12 and RE 12.2.15

In addition to the above species, Essential Habitat for Tusked Frog occurs immediately to the south of the study footprint, in RE types that are also present within the study footprint (RE 12.2.7, 12.2.12).

Nationally Listed Fauna Species

Table 4 below outlines EPBC Act listed terrestrial fauna identified through the EPBC Act Protected Matters Search (supplemented by fieldwork) and their likelihood of occurrence on the airport site.

Airport masterplan boundary

Preliminary Design Outline

Cadastral boundaries (August 2010)

Essential habitat - remnant

Data Source:
Essential Habitat: QDERM 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Essential Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1c**

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Table 4 Nationally Listed Fauna Species Identified in EPBC Protected Matters Search (excluding turtles and aquatic species)

Common Name ***Scientific Name***	**EPBC Status**	**Preferred Habitat**	**Local Record relevance**	**Likelihood of occurrence**
Regent Honeyeater (*Anthochaera phrygia*)	E	Predominantly box-ironbark woodlands. Infrequent recorded in *E. tereticornis* and *E. robusta*	Only one record within local area from 1910	Highly Unlikely – no recent records and limited marginal habitat
Coxen's Fig-parrot *Cyclopsitta diophthalma coxeni*	E	Rainforests. Some records from isolated large fig-trees in open habitats	Most recent local record from 1974. Records restricted to mountainous terrain over 15 km to the west	None – no suitable habitat
Red Goshawk *Erythrotriorchis radiatus*	V	Inhabits a variety of woodland and forest habitats. Most records restricted to very large contiguous vegetated areas	Most recent record from 1977	Highly Unlikely – lack of recent records and marginal habitat
Swift Parrot *Lathamus discolour*	E	Predominantly box-ironbark woodlands, but may also be recorded from *E. tereticornis* forest	Recorded from 1974 well south of the airport	Highly Unlikely – lack of recent records and very marginal habitat
Southern Giant Petrel (*Macronectes giganteus*)	E	Pelagic species inhabiting deep oceanic waters and offshore Antarctic islands	N/A	None – no suitable habitat
Northern Giant Petrel (*Macronectes halli*)	V	Pelagic species inhabiting deep oceanic waters and offshore Antarctic islands	N/A	None – no suitable habitat
Kermadec Petrel (western) *Pterodroma neglecta*	V	Pelagic species inhabiting deep oceanic waters and offshore Antarctic islands	N/A	None – no suitable habitat
Australian Painted Snipe (*Rostratula australis*)	V	A variety of water-bodies, but typically those with a mosaic of open mud and aquatic vegetation. Most often recorded from ephemeral (seasonally flooded) water-bodies	Records pre 1975 and over 16 km from airport	Highly Unlikely – lack of recent records and very marginal habitat

Common Name ***Scientific Name***	**EPBC Status**	**Preferred Habitat**	**Local Record relevance**	**Likelihood of occurrence**
Campbell Albatross *Thalassarche melanophrys impavida*	V	Pelagic species inhabiting deep oceanic waters and offshore Antarctic islands	N/A	None – no suitable habitat
Black-breasted Button-qual (*Turnix melanogaster*)	V	Typically inhabits dry vine forests. Coastal populations predominantly north of the Noosa River inhabit dense coastal heathland	Most southerly record from near Lake Weyba, 2003	Unlikely – limited habitat value
Wallum Sedgefrog (*Litoria olongburensis*)	V	Coastal low-nutrient acidic waters, particularly permanent water with abundant emergent sedges	Recent records from adjacent National Park	Known – recorded in recent fieldwork and suitable habitat present
Large Pied Bat (*Chalinolobus dwyeri*)	V	Rainforest and wet sclerophyll forests, particularly along edges between the two	No recent or local records	None – no recent or local records and no suitable habitat
Northern Quoll (*Dasyurus hallucatus*)	E	A wide variety of habitats. Most records now restricted to large contiguous vegetation with abundant rock outcrops containing suitable den/retreat sites	Only pre-1980 records over 14 km in distance from the airport	None – no recent local records. Suitable habitats highly fragmented and subject to severe mortality pressure (e.g. dogs, cats, vehicle strike)
Spotted-tail Quoll (*Dasyurus maculatus*)	E	A wide variety of habitats. Within south-eastern Queensland the species is now restricted to large contiguous mesic (rainforest/wet sclerophyll) vegetation	No recent or local records	None – no recent or local records. Very marginal habitat and high mortality pressures (e.g. dogs, cats, vehicle strike)
Long-nosed Potoroo (*Potorous tridactylus*)	E	Habitats with a dense understorey. Very rare in semi-urban areas.	One recent (2003) record over 18 km from the airport	Very Unlikely – few nearby records. Suitable habitat is highly fragmented and subject to severe mortality pressures (e.g. dogs, vehicle strike)

Common Name ***Scientific Name***	**EPBC Status**	**Preferred Habitat**	**Local Record relevance**	**Likelihood of occurrence**
Grey-headed Flying Fox (*Pteropus poliocephalus*)	V	Most habitat types including urban landscapes	A number of recent records are scattered within 4-6 km of the airport	Likely – a highly mobile species that will seek out suitable foraging resources. Stands of *E. robusta* and *M. quinquenervia* may attract this species when flowering
Water Mouse (*Xeromys myoides*)	V	Mangroves immediately adjacent to Sporobolus communities	No recent or local records	None – no recent or local records. No suitable habitat
Three-toed Snake-tooth Skink (*Coeranoscincus reticulatus*)	V	Rainforest habitats and sometimes adjacent wet sclerophyll habitats	No recent or local records	None – no recent or local records. No suitable habitat

Of the fauna species listed above in **Table 4**, only the Wallum Sedgefrog and Grey-headed Flying Fox are known or likely to occur on the site. These species, and their association with the site, are described below.

Wallum Sedgefrog

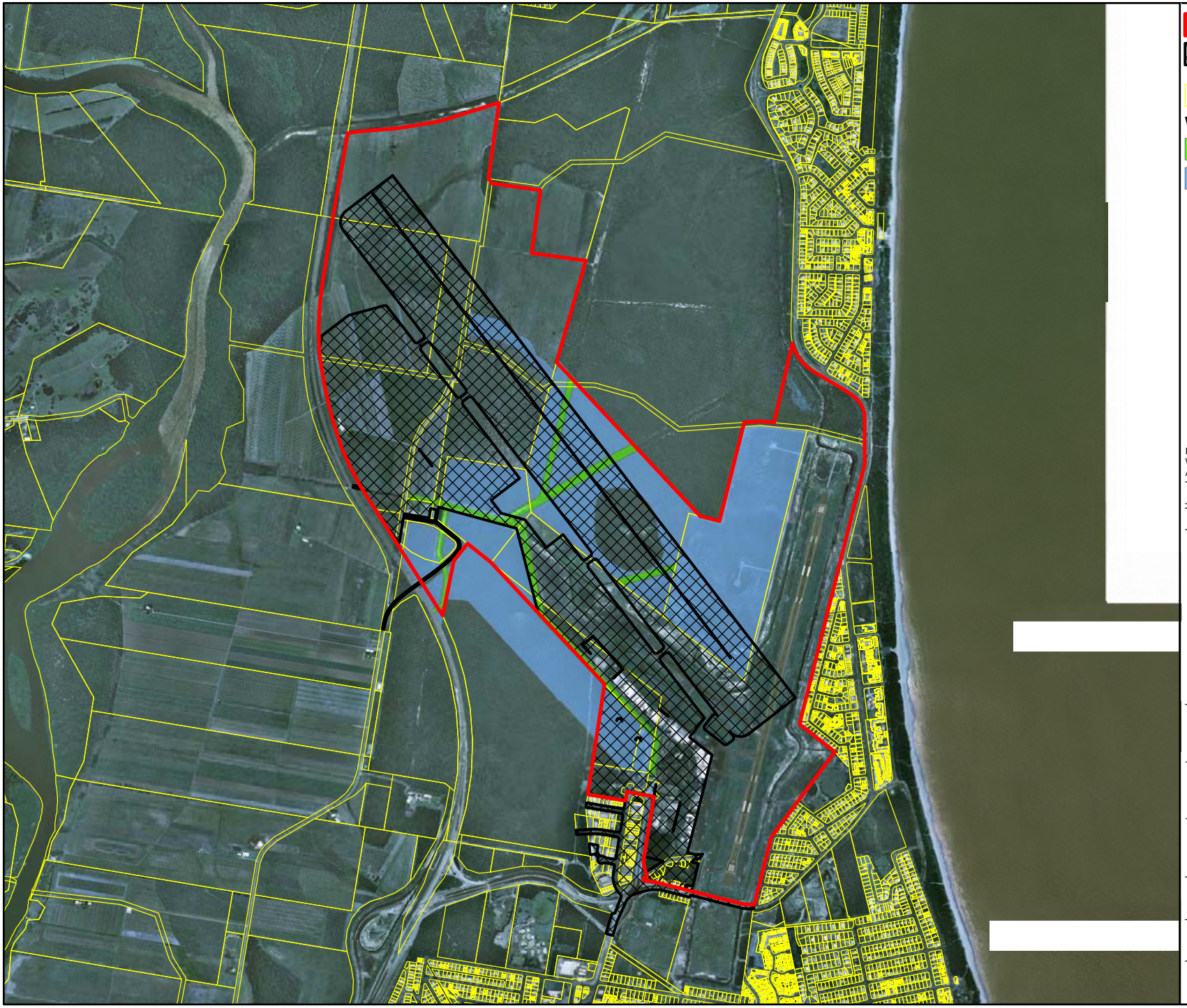
The nationally threatened Wallum Sedgefrog (*Litoria olongburensis*) is known to occur within the airport site (**Table 3**). This species is listed as Vulnerable under the EPBC Act as well as Vulnerable under the Queensland *Nature Conservation Act 1992* (NC Act). It occurs in nutrient deficient habitats with acid waters, typically in association with permanent water dominated by reed growth. These habitats have become increasingly rare within the local area and many remaining habitats are threatened by expanding urbanisation and associated infrastructure. 'Acid frogs' (which include the Wallum Sedgefrog) occur south from Bundaberg and Fraser Island into NSW. Their distribution is closely linked to coastal sandy lowland areas and offshore islands supporting 'wallum' habitat. They therefore have a patchy distribution along the east coast.

Suitable breeding habitats for the Wallum Sedgefrog are largely restricted to artificial drains with emergent sedges surrounded by remnant vegetation on the airport site (**Figure 3.1d**). While the species is unlikely to frequently occur in areas of remnant vegetation away from these drains, these areas may be important for local populations by providing movement/dispersal opportunities. Suitable habitat also occurs along the drains within the wallum management area of the SCA (Airservices land), and recent fieldwork has recorded the species in this location.

Grey-headed Flying Fox

Grey-headed Flying Foxes are listed as Vulnerable under the EPBC Act and Least Concern under the NC Act. Prior to the recent fieldwork at the site, no confirmed records of the species were known from the airport or its surrounds, the nearest record occurring 4 km to the south. Field investigations identified a number of Grey-headed Flying Foxes foraging within remnant vegetation adjacent to the airport site. These individuals were foraging with Black-headedFlyingFoxes on flowering *Melaleuca Quinquenervia*. It is estimated, based on limited initial investigations, that the ratio of Grey-headed Flying Foxes to Black-headed FlyingFoxes is approximately 3:1. At least 30 Grey-headed Flying Foxes were observed along one linear track bordering the northern portion of the study area.

Suitable habitat for the species on the airport site is restricted to foraging areas (**Figure 3.1e**); no camps (roosts) were located. The species feeds on a variety of resources including fruiting bodies, blossom and nectar. Resources around the airport include remnant vegetation dominated by *Eucalyptus robusta* and *M. quinquenervia*. *M. quinquenervia* flowers in late winter while *E. robusta* is a prolific winter flowering tree. These species provide an important flowering resource during periods when other resources are scarce.



Airport masterplan boundary

Preliminary Design Outline

Cadastral boundaries (August 2010)

Wallum Sedgefrog Habitat

Category 1 Habitat

Category 2 Habitat

Data Source:
Wallum Sedgefrog Habitat: Ecosmart Ecology, 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

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Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Wallum Sedgefrog Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1d**

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Airport masterplan boundary

Preliminary design outline

Cadastral boundaries (August 2010)

Flying Fox foraging habitat

Data Source:
Flying Fox Habitat: Ecosmart Ecology, 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Grey-Headed Flying Fox Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1e**

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Migratory Fauna

A large number of migratory species are known from the local area, many being coastal species restricted to foreshore, mudflat or estuary habitats. Many of these species will not occur due to the lack of suitable habitat within the study area. Nine migratory species listed under the EPBC Act have been identified within the airport area during regular bird monitoring between 1996 and 2009 (Avisure 2009). These species include:

- Eastern Great Egret (*Ardea modesta*),
- Cattle Egret (*Ardea ibis*),
- White-bellied Sea-eagle (*Haliaeetus leucogaster*),
- Latham's Snipe (*Gallinago hardwickii*),
- Eastern Curlew (*Numenius madagascariensis*) (also listed as Rare under the NC Act),
- Sharp-tailed Sandpiper (*Calidris acuminata*),
- Pacific Golden Plover (*Pluvialis fulva*),
- White-throated Needletail (*Hirundapus caudacutus*), and
- Rainbow Bee-eater (*Merops ornatus*)

With the exception of the Eastern Curlew, all these species are relatively common within the local area. The Eastern Curlew is a coastal species whose preferred habitat comprises estuaries and mudflats. The species can be occasionally recorded from artificial habitats including grassy drains. There are few records of this species within the airport area.

A Latham's Snipe (*Gallinago har dwickii*), was observed on the Airservices land during preliminary fieldwork. Of the remaining species, only the White-throated Needletail (*Hirundapus c audacutus*) and Fork-tailed Swift (*Apus pac ificus*), which are listed as migratory under the EPBC Act, have the potential to occur. These species are aerial foragers that can be observed over any terrestrial habitats, including dense urbanisation. All other migratory species known or potentially occurring within the region occur in habitats not present within the study area (e.g. estuaries, mudflats, mangroves, rainforest etc).

State-Listed Fauna Species

The fauna species listed under State legislation (the Queensland *Nature Conservation Act 1992*) and their likelihood of occurrence on the airport site are provided in **Table 5** below.

Table 5 State Listed Fauna Species and Likelihood of Occurrence on the Airport Site

Scientific Name	*Common Name*	*NCA Status*	*Record date/proximity*	*Likelihood assessment*
Adelotus brevis	Tusked Frog	Vulnerable (V)	Recorded in 2000 approximately 3.8 km to the south within Maroochy Wetland Reserve	Likely - suitable habitat occurs within the study footprint, particularly in wetland areas including the artificial drains. Further survey work is required during summer months to confirm presence/absence.
Crinia tinnula	Wallum Froglet	V	Several recent (e.g. 1995, 2005) records occur within close proximity (<2 km), including within the National Park to the immediate south	Known - several individuals identified during field investigations. Likely to be widespread both within remnant and non remnant habitats. Likely to inhabit wherever surface water collects, including artificial habitats.
Litoria freycineti	Wallum Rocket Frog	V	Recorded in 1995 less than 1 km west of the airport within National Park	Known – identified during recent fieldwork. Likely to be widespread both within remnant and non remnant habitats. Likely to be most common in wetland areas, including artificial drains. However the species is capable of moving through other habitats on a regular basis.
Eroticoscincus graciloides	Elf Skink	Rare (R)	Recorded in 2005 approximately 6 km south of the airport	Possible - the species is known to occur within heath habitats, but its occurrence is difficult to estimate without further survey
Ophioscincus truncatus		R	At least five recent (> 2003) records within 4-6 km of the airport. Records scattered to the north and south of the airport	Possible - the species is known to occur within heath habitats, but its occurrence is difficult to estimate without further survey
Numenius madagascariensis	Eastern Curlew	R	Numerous records associated with the Maroochy River. Also recorded during regular bird monitoring surveys within the airport grounds (Avisure 2009).	Presence Known - recorded from the airport grounds during regular bird monitoring surveys (1996-2009) (Avisure 2009). Species may occur within artificial drainage lines around and within the airport grounds. These habitats appear marginal and are probably visited infrequently

Scientific Name	***Common Name***	***NCA Status***	***Record date/proximity***	***Likelihood assessment***
Ephippiorhynchus asiaticus	Black-necked Stork	R	Recorded in 2009 within less than 1 km to the north-west of the Airport. The record appears to be associated with the artificial drain in National Park.	Possible - this species may sporadically occur within the artificial drain bordering the existing airport. Habitat values suggest it is unlikely to frequently occur within or around the airport.
Accipiter novaehollandiae	Grey Goshawk	R	Scatter records around the airport. The most relevant record occurred in 1993 approximately 2 km to the south.	Possible/Unlikely - while this species may possibly occur over the life of the project, habitat values are not optimal. Historic and any future records will most likely reflect transient individuals. No records during regular bird surveys (Avisure 2009)
Lophoictinia isura	Square-tailed Kite	R	Four relatively old records (most recent in 1994) within 5 km	Possible/Unlikely - while this species may occur over the life of the project, habitat values are marginal. Historic records are likely to reflect transient individuals. No records during regular bird surveys (Avisure 2009)
Pezoporus wallicus	Ground Parrot	V	Known to occur within airport grounds (Avisure 2009)	Presence Known - excellent heath habitat for this species occurs within and surrounding the airport. The species has been recorded within airport grounds during bird monitoring surveys (Avisure 2009; Hammermeister *et. al.* no date).
Phascolarctos cinereus	Koala (SE QLD)	V	Recorded in 1995, 1 km west of the airport within the National Park.	Possible - habitat value for this species is considered to be of moderate value; however the close proximity of records suggests that the species could occur. Further survey work required to determine its likely occurrence.
Pteropus poliocephalus	Grey-headed Flying Fox	Least Concern	Recorded in 2000 and 2002 from within the Maroochy Wetland Reserve approximately 4 km south	Possible - Grey-headed Flying Foxes are highly mobile and individuals may take advantage of locally flowering events for foraging, particularly within stands of *Eucalyptus robusta*.

State-listed fauna of particular significance, known to occur on the airport site are the Ground Parrot (*Pezoporus wallicus),* and Wallum Frogs - Wallum Froglet *(Crinia tinnula)* and Wallum Rocketfrog *(Litoria freycineti).* Further information on these species and their presence on the site are provided below:

Ground Parrot

Ground Parrots occur in a number of disjunct locations scattered between the Cooloola/Fraser Island region and Tasmania. There is also an isolated population in Western Australia. Within Queensland there are two main populations, those within the Cooloola Coast and those within the Sunshine Coast. Ground Parrots occur in a variety of low-closed heathlands, but particularly favour graminoid heaths. Several studies throughout Australia have found that habitat suitability is significantly influenced by fire.

Current information suggests that Ground Parrot numbers within and around the SCA fluctuate from year to year, with an estimated 100 individuals in the Sunshine Coast region. The population of the airport site is estimated to be approximately 12-15 individuals although further detailed survey work would be required to confirm this.

Observations by Queensland Parks and Wildlife Service (QPWS), preliminary field investigations for this Project and results of previous bird monitoring on the airport site indicate that birds predominantly inhabit the wallum heath areas within the fenced airport precinct.

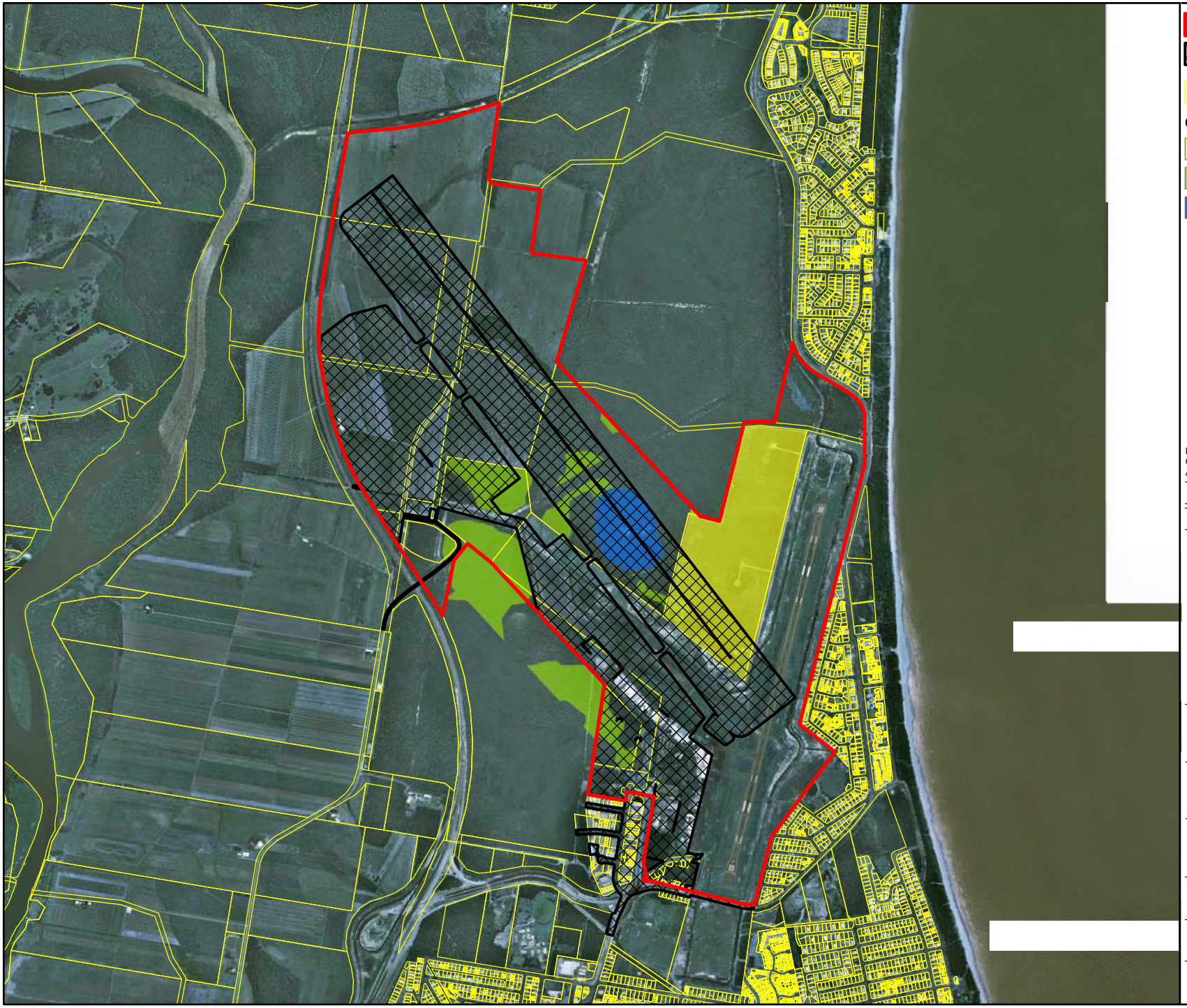
Habitats within and around the airport have been categorised during preliminary fieldwork (Ecosmart 2010) as the following:

- **Category 1 Habitats**: are currently inhabited by large numbers of Ground Parrots and are likely to be important for foraging and breeding
- **Category 2 Habitats**: are those areas that may be inhabited infrequently or by a low number of individuals. These areas may:
    1. Act as a refugia, ensuring the survival of local populations following ephemeralimpacts on wallum habitats within Category 1 Habitats, and
    2. Be future Category 1 habitats (i.e. recovery following fire).
- **Category 3 Habitats:** Those areas unlikely to be frequented by the species.

The distribution of these habitats within the study area is depicted in **Figure 3.1f**.

The population predominantly inhabits wallum heath within the northern airport precinct on Airservices Australia land. This land is approximately 42ha of the airport site and is identified as core habitat for the Ground Parrot, of which approximately 8ha would be required for the runway footprint. Subsequent fieldwork (October 2010) indicates the species occupies the central portion of the Airservices land, with the southern portion being weed infested and not suitable habitat for the species.

Areas of low wallum heath within adjacent habitats (see Category 2 habitats on **Figure 3.1f**) may act as refugia and provide future habitat following fire.



Airport masterplan boundary

Preliminary design outline

Cadastral boundaries (August 2010)

Ground parrot habitat:

Category 1 Habitat

Category 2 Habitat

Category 3 Habitat

Data Source:
Ground Parrot Habitat: Ecosmart Ecology, 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

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Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Ground Parrot Distribution and Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1f**

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Wallum Frogs

Wallum Frogs occur south from Bundaberg and Fraser Island into New South Wales. Their distribution is closely linked to coastal sandy lowland areas and offshore islands supporting wallum habitat. They therefore have a patchy distribution along the east coast. They inhabit acidic freshwater wetlands, swamps and lakes occurring on low nutrient sandy soils (wallum habitats).

Potential breeding habitat for these species within the airport site is widespread (**Figure 3.1g**). They are expected to occur within all areas of remnant vegetation, which shows evidence of seasonal inundation. Both the Wallum Froglet and Wallum Rocketfrog have been identified during fieldwork within the managed wallum heath area of the airport and have potential to occur along drainage lines in the nearby Finland Road cane field.

Areas of essential habitat for both these species are extensively mapped around the airport.

Koala Habitat

The current legislation applicable to koalas is the South East Queensland Koala Conservation State Planning Regulatory Provision (SPRP) and State Planning Policy 2/10: Koala Conservation in South East Queensland (SPP) made under the *Sustainable Planning Act 2009* (SPA). The airport has not been indicated as a Priority Koala Assessable Development Area or Koala Assessable Development Area (PKADA or KADA) under these pieces of legislation. Similarly, within the koala habitat values mapping associated with the Koala SPP 2/10 the airport is indicated as 'unsuitable habitat' and the National Parks to the north and south are indicated as 'low value bush land'. Connectivity between the areas of 'low value bush land' is currently very weak.

Preliminary fieldwork did not identify evidence of koala on the airport site.

Airport masterplan boundary

Preliminary design outline

Cadastral boundaries (August 2010)

Wallum Froglet and Wallum Rocketfrog habitat

Potential Habitat

Core Habitat

Data Source:
Wallum Froglet and Wallum Rocketfrog Habitat: Ecosmart Ecology, 2010
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

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Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
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Client

Sunshine Coast Regional Council

Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement
Wallum Froglet and Wallum Rocketfrog Habitat

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1g**

J:\220000\220372 - SCA New Runway\GIS\Workspaces\REF_and_IAS\IAS\IAS_Figure3.1g_Wallum_Froglet_and_Wallum_Rocketfrog_Habitat.mxd

3.1.6 Aquatic Fauna

3.1.6.1 On-Airport

As shown in **Table 6** below, two nationally threatened fish species are considered to possibly occur within the study footprint or immediate surrounds: Oxleyan pygmy perch *Nannoperca oxleyana* (Endangered EPBC Act, Vulnerable NC Act) and Honey blue-eye *Pseudomugil m ellis* (Vulnerable under EPBC Act and NC Act). These species are largely restricted to coastal heath systems with dystrophic, acidic tannin-stained waters, and both species are endemic to the bioregion. Based on Wildlife Online records, the closest confirmed populations occur at Coolum Wetland area, located immediately west of Mount Coolum and approximately 2 km to the north of the northern airport boundary. Aquatic fieldwork undertaken at the site did not record any threatened fish species.

While optimal structural habitat conditions are not known to exist on the airport site, water quality conditions appear to be near the maximum tolerance limits of the two target species. There are no known permanent freshwater refugia in the airport site. Where present, freshwater habitats appear to be represented by shallow semi-permanent water bodies that appear to be subject to seasonal drying and/or periodically influenced by saline waters. There have been no records of either species in any waterways of the SCA sub-catchment, though there are several known populations within close proximity to the airport. However, these populations are separated from the airport by the estuarine waters of the Maroochy River. Consequently, for freshwater fish with a low tolerance to saline waters, the site may be effectively isolated from adjacent areas, except perhaps during major flood events.

No other threatened aquatic fauna species are known or likely to occur in the airport or surrounds.

Table 6 Fish Species of Conservation Significance Recorded in the Wider Area (Source: DERM Wildlife Online data)

Scientific Name	Common Name	EPBC Status	NCA Status	Record date/ proximity	Likelihood assessment
Macculloch ella peelii mariensis	Mary River cod	E	-	Obi Obi Ck (1995), Lake MacDonald (1995)	Unlikely - preferred habitat not supported in study area (large deep streams)
Nannoperca oxleyana	Oxleyan pygmy perch	E	V	Coolum wetland (2006), Maroochy River (2003), Marcus Beach (1978, 1982, 1993), Noosa (2003)	Possible - while optimal structural habitat conditions are not known to exist on the airport site, water quality conditions appear to be near the maximum tolerance limits of the species
Pseudomugi l mellis	Honey blue-eye	V	V	Coolum wetland (2006), Lily Lagoon - Peregian (1981), Peregian (2003, 2006), Marcus Beach (1978, 1993), Noosa (2003)	Possible - while optimal structural habitat conditions are not known to exist on the airport site, water quality conditions appear to be near the maximum tolerance limits of the species

3.1.6.2 Off-Airport

A protected matters search for Moreton Bay identifies a range of matters protected under the *Environment Protection and Biodiversity Conservation Act 1999.* This includes 56 threatened species.

Reference has been made to the EIS for the BAC New Parallel Runway (BAC 2006), to identify the species likely to occur in the Middle Banks area. The EIS/MDP included a detailed assessment of the ecology of Moreton Bay, specifically the Middle Banks area. The following summarises the key findings in relation to protected species.

Three species of dolphins and four species of whales are known to visit or inhabit Moreton Bay Marine Park. There have been few sightings of either dolphin species in the vicinity of Middle Banks and surrounds. Whilst humpback whales generally occur east of Moreton Bay, a small number of humpback whales enter the bay each year during their northward migrations.

Moreton Bay contains one of the largest populations of dugongs on the Queensland coast. Middle Banks is located in the zone of lowest dugong density within Moreton Bay, with highest numbers found at Moreton Banks, approximately 10 - 12 km to the south (at its closest point).

Six species of marine turtle are known to inhabit (although some intermittently) Moreton Bay. The green turtle (*Chelonia mydas*) and loggerhead (*Carretta carretta*) are considered the most abundant or common species in the region and have resident populations in Moreton Bay. Two seagrass species that are known forage for the green turtle were reported for Middle Banks, however, it is unlikely that the patchy assemblages formed by these species within this area represent a regionally important (i.e. regular) feeding ground for these marine reptiles.

Similarly, for the area of Spitfire Channel, the referral prepared by PoB for the proposed dredging identified a total of 15 Threatened and 21 Migratory species (which included some cross listings) in the Protected Matters search for the site. None of these species were considered likely to inhabit or significantly rely on the Project site area.

Fish and nektobenthic invertebrate assemblages in both depth strata surveyed in the Middle Banks Study area for the BAC EIS/MDP were found to be diverse and abundant. Species richness did not differ considerably with depth. No rare or threatened species were encountered and the majority of fish species caught at Middle Banks are classified as either “common” or “abundant” in Moreton Bay.

3.1.7 Hydrology and Water Quality

3.1.7.1 On-Airport

The airport site is low-lying and forms part of the Maroochy River Catchment. The Maroochy River occurs approximately 300 m from the western boundary of the SCAMaster Plan boundary, to the west of the Sunshine Motorway. The existing flood behaviour in the study area is largely as a flood storage area, with overflow from the Maroochy River flowing into the floodplain via the Sunshine Motorway drainage culverts. The existing flood levels over the site range from 0.5-2.2 m above the existing ground level in a Q100 flood event.

The main waterway on the airport is a manmade storm water channel which runs parallel to the runway on the eastern side. The eastern storm water channel enters from the north where runoff from David Low Way and residential development at Marcoola contribute to the watershed. Storm water from commercial and residential areas enters the channel from piped storm water systems. The southern section of this waterway on the airport is concreted (Ecosure, 2010).

The eastern storm water channel enters the Twin Waters canal system after leaving the airport, discharging into Maroochy River and from there into the Coral Sea. On the western side of the runway there are a number of waterways which enter the airport from remnant bush land.

The secondary manmade storm water drain runs the western perimeter of the airport and is mostly open and unlined. This also starts from David Low Way before joining an agricultural drain, which ultimately discharges to the Maroochy River to the west of the airport. A section of the drain from the airport's main entrance road at David Low Way has been piped, and covered to allow for the development of the new main entrance to the airport. The drain flows to David Low Way in low flow rates, during lesser rain events, and flows towards the Maroochy River in high flow events following high rainfall events.

Preliminary testing of surface water indicates that the water is slightly acidic and predominately brackish.

Drainage lines on the airport site are shown in **Figure 3.1h.**

A limited geotechnical investigation has been undertaken for the site, focusing on the proposed new runway location. Borehole testing undertaken as part of this investigation identified that groundwater at the site occurs between 0.2 and 3.4 m below ground level. The pH of groundwater is between 4.9 and 5.3 in the southern/central areas of the site to pH 6.4 in northern areas. This indicates that the groundwater is moderately acidic in the southern/central areas and slightly acidic in the northern areas of the site. The pH values are within the typical range for a low-lying coastal environment. The electrical conductivity of groundwater indicates that groundwater is ‘fresh’ to ‘brackish’. Dissolved metals are present in the groundwater at all testing locations.

Airport masterplan boundary

Preliminary design outline

Drainage network

Cadastral boundaries (August 2010)

Waterbodies

Data Source:
All data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

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Job Title

SCA Masterplan Implementation Project

Map Title

Initial Advice Statement Hydrology of the Airport Site

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System

GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.1h**

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3.1.7.2 Off-Airport

Moreton Bay where sand is proposed to be dredged for the Project is a semi-enclosed basin of 113,314 ha in area bounded on its eastern side by Moreton Island and Stradbroke Island. Reference has been made to the EIS/MDP for the BAC New Parallel Runway, which included a detailed assessment of coastal processes in Moreton Bay.

Moreton Bay is largely sheltered from the southern ocean 'swell' waves by North Stradbroke and Moreton Islands. The northern entrance to the bay contains sand shoals that have a substantial influence on the tidal flow of waters to and from Moreton Bay. The processes and stability of the western shoreline of Moreton Island in the Middle Banks region are determined by sand supply and transport that are controlled by tidal currents and predominantly locally generated sea waves impinging on that area.

The ecosystem health monitoring program (Healthy Waterways 2010) identifies the eastern part of Moreton Bay (within which Spitfire Channel and Middle Banks are located) as being in good condition, with conditions meeting most set ecosystem health values for most of the reporting region.

3.2 Socio-Economic Considerations

This section outlines the existing socio-economic environment relevant to the Project. The focus in this section is the conditions at the airport site.

3.2.1 Land Tenure and Ownership

Land tenure of the study area includes crown land, council owned land, state land with Council as trustee, and land owned by Airservices Australia, as shown in **Figure 3.2a and Figure 3.2b.**

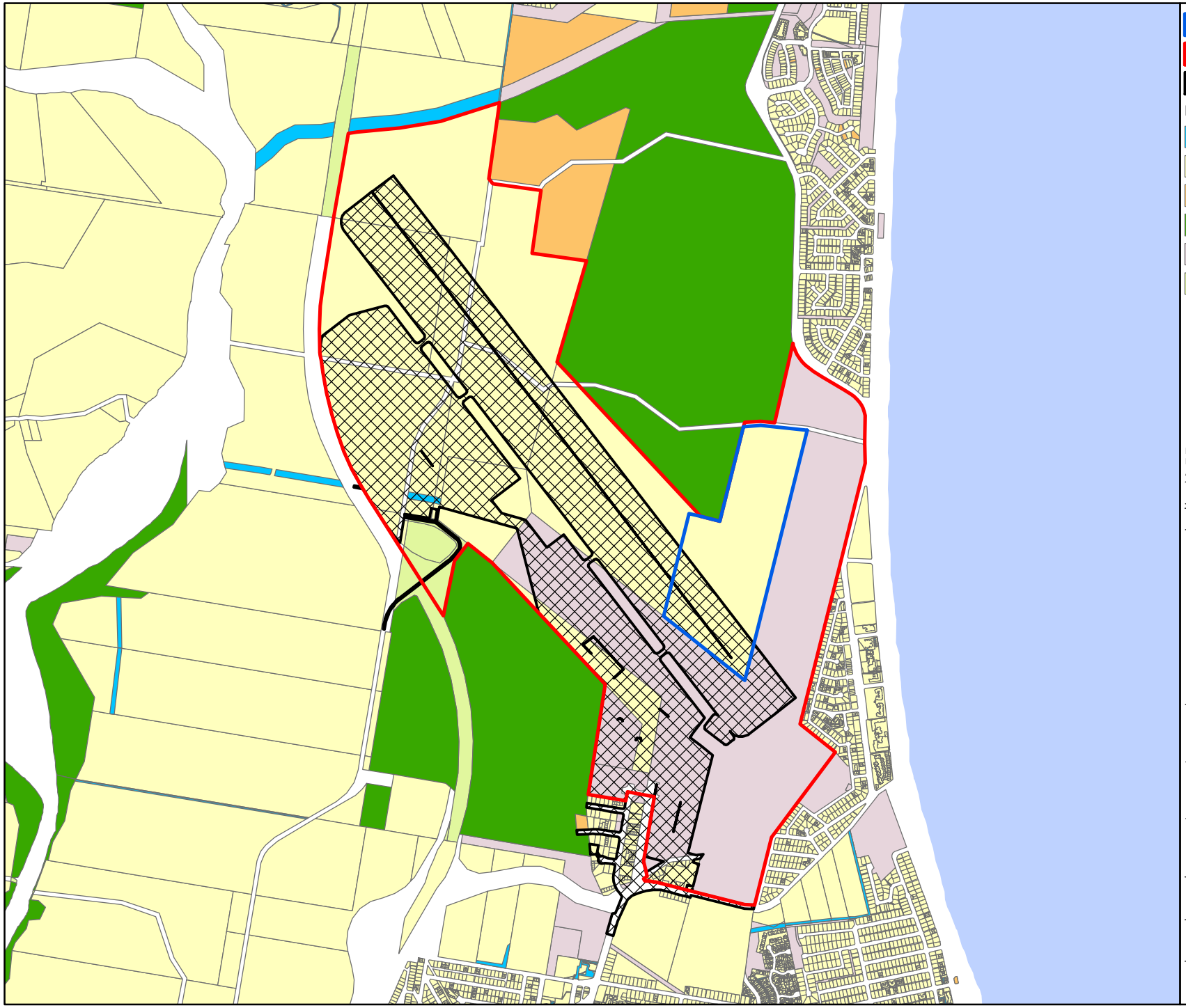
At the time of writing, Lot 898CG4782 on the airport site is owned by Airservices Australia (Commonwealth). Lot 898CG4782 is partially within the footprint of the proposed new runway. The site is currently characterised by wallum heath that is regularly slashed as part of airport maintenance. SCC plans to purchase this land from Airservices Australia. A Referral was submitted to SEWPaC by Airservices Australia in 2009 for the sale of this land to SCC. Approval was granted to Airservices Australia to sell the land to SCC for airport purposes subject to conditions.

The airport itself is classified as a "certified aerodrome" under the *Civil Aviation Safety Regulations 2003* Part 139 and is owned, operated and managed by SCC.

3.2.2 Planning Schemes and Government Policies

3.2.2.1 State

The SCA is classified under the "State Planning Policy 1/02 – Development in the Vicinity of Certain Airports and Aviation Facilities", as "being of state significance" on the basis that it meets the following criteria:



Airservices Land
Airport masterplan boundary
Preliminary design outline

Land Tenure:

Easement
Freehold
Lands Lease
National Park
Reserve
State Land

Data Source:
DCDB, QDERM, August 2010.
All other data supplied by SCRC

Issue	Date	By	Chkd	Appd
1	09-02-11	MJD	SW	CC

Metres
0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client
Sunshine Coast Regional Council

Job Title
SCA Masterplan Implementation Project

Map Title
Initial Advice Statement Tenure

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System
GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.2a**

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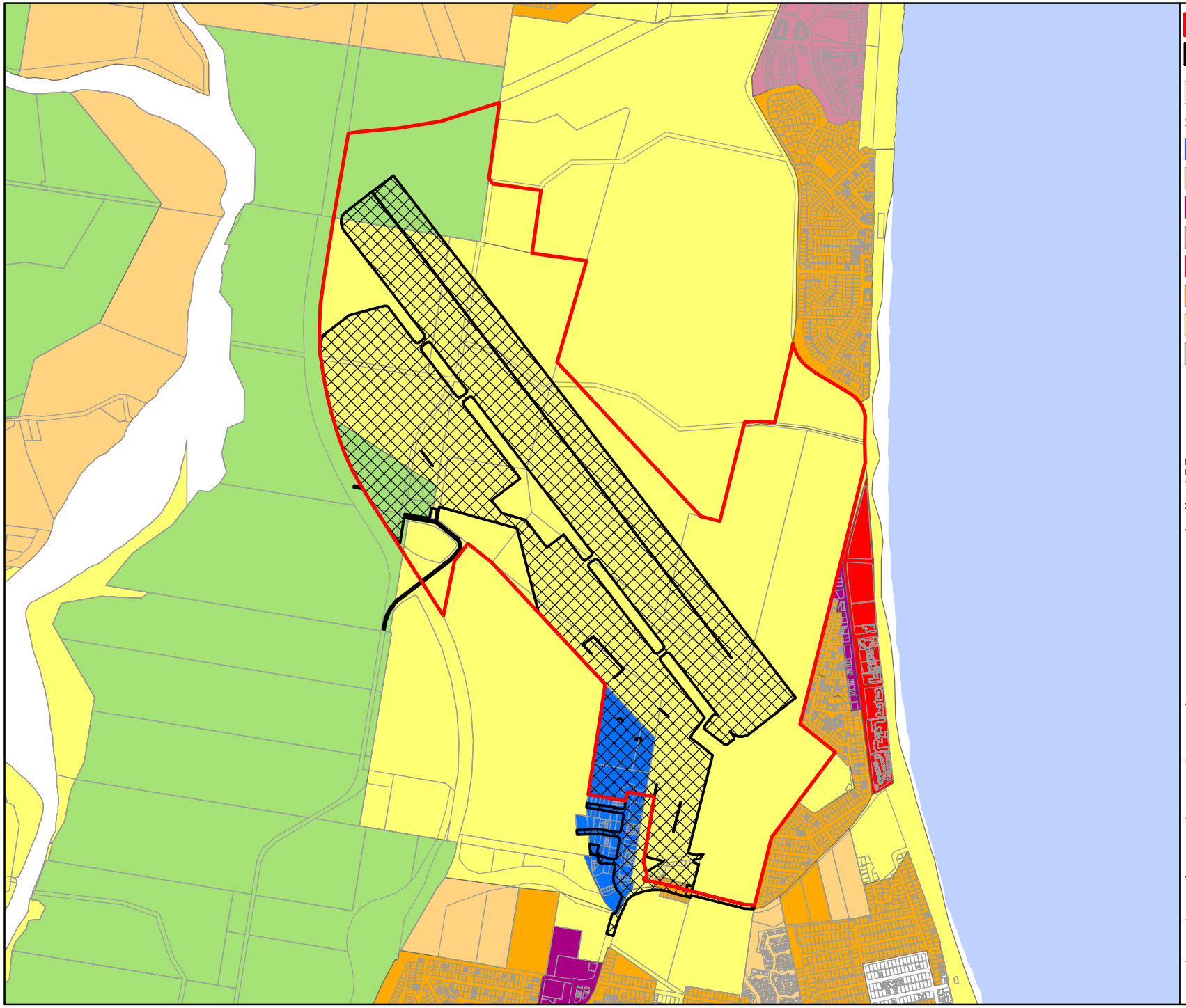

Airport masterplan boundary

Preliminary Design Outline

Cadastral boundaries (August 2010)

SCRC Plan - Precincts

- Business and Industry
- General Rural Lands
- Local Centre
- Master Planned Community
- Multi-storey Residential
- Neighbourhood Residential
- Special Purpose
- Sustainable Cane Lands

Data Source:
Landuse: SCRC 2010

Issue	Date	By	Chkd	Appd
1	26-08-10	MJD	KC	CC

Metres

0 250 500 750 1,000

ARUP

Level 4, 108 Wickham Street
Fortitude Valley, QLD 4006
Tel +61 (7)3023 6000 Fax +61 (7)3023 6023
www.arup.com

Client
Sunshine Coast Regional Council

Job Title
SCA Masterplan Implementation Project

Map Title
Initial Advice Statement Land Use

Scale at A4	Map Status
1:25,000	**Final**

Coordinate System
GDA94, MGA94 - Zone 56

Job No	Map No
220372	**Figure 3.2b**

J:\220000\220372 - SCA New Runway\GIS\Workspaces\REF_and_IAS\IAS\IAS_Figure3.2b_Landuse.mxd

- Is a key regional hub;
- Is an economic, industry, mining, or tourism centre;
- Is likely to influence major growth, environmental or land use decisions;
- Plays a key emergency service role; and
- Has a significant number of aircraft movements.

Furthermore, the *South East Queensland Regional Plan (2009-2031)* (SEQRP) is the key document for managing the growth and development of SEQ. In terms of guiding development, the SEQ Regional Plan (SEQRP) identifies areas as Regional Landscape and Rural Production Areas, Rural Living or Urban Footprint (with urban areas being recognised as suitable for development). The Project area is part of the urban footprint in the SEQRP.

The SEQRP notes the significance of the SCA to the future economic prosperity of the Sunshine Coast. The plan makes specific reference to the airport at section 9.3 – Enterprise Opportunities Areas, and notes in the sub-regional narrative for the Sunshine Coast that:

"the Sunshine Airport and associated aviation enterprises contribute to the economic diversity and employment in the sub-region";

and

"the Sunshine Coast Airport is a specialist aviation and aerospace opportunity area and one of South-East Queensland's major existing and expanding specialist locations."

The need to diversify as well as to expand the employment base of the region is a theme repeated in the Regional Plan vision statement and throughout Desired Regional Outcomes 9 – Employment Location. Under Desired Regional Outcome 10 – Infrastructure, the need to support technology incubators is identified.

The *South East Queensland Infrastructure Plan and Program 2010–2031* (SEQIPP) outlines estimated infrastructure investment across SEQ to 2031 and is closely linked to the SEQRP.

3.2.2.2 Local

The existing SCA and surrounding lands are located within the Sunshine Coast Regional Council Area and that part of the area for which the Maroochy Plan 2000 is the relevant local planning scheme document for the regulation of development.

Under the *Maroochy Plan 2000*, the SCA site is located within Planning Area No. 9 – North Shore and is zoned Special Purpose. Some of the land within the planned expansion boundaries for the airport are located within Planning Area No. 23 – Maroochy River Plains and are zoned Sustainable Cane Lands.

Interpretation of Table 4.7 of the *Maroochy Plan 2000* identifies that the proposed new runway will be an assessable material change of use (MCU) requiring code assessment against applicable planning scheme codes. Relevant planning scheme codes include:

- Nature Conservation and Biodiversity – areas directly to the north and south of the SCA are identified as Nature Conservation Management Areas;
- Waterways and Wetlands – the drainage line along the existing runway is classified as a waterway in the waterways mapping of the Maroochy Plan, and wetlands occur within 100m of the airport boundary;
- Assessment and Management of ASS – the airport site is at or below 5 m AHD and therefore a high risk area for ASS; and
- Development in the vicinity of the SCA – this code identifies, amongst other things, the obstacle limitation surface for the airport, existing noise affected areas, possible future noise affected areas and safety areas.

The plan also identifies the airport as flood prone land.

3.2.3 Airspace

The operation of the proposed new runway requires the design of new flight tracks and associated changes to airspace surrounding the airport. Preliminary design of instrument approach and departure procedures has already occurred (MJG Aviation 2009).

It is anticipated the development of a parallel runway at Brisbane Airport and the SCA new runway will alter the dynamics of the "Brisbane Basin" airspace to the extent that redesign will be necessary.

A referral has been made to SEWPaC for the change to airspace under Section 160 of the EPBC Act.

3.2.4 Noise

Noise, or unwanted sound, is a by-product of all forms of transportation, including air transport.

The most effective means of reducing the impact of aircraft noise is through appropriate planning of land use in areas surrounding an airport. Aircraft noise scenarios, based on the development of the new runway (13/31) were conducted and an Australian Noise Exposure Forecast (ANEF)[1] was prepared (for the existing and new runways) as part of the 2007 Master Planning process. In addition, an Obstacle Limitation Surface (OLS) drawing was prepared based on the existing and future runways to protect airspace associated with the airport in the long-term.

Existing noise data indicates that there are currently over 2,000 households within ANEF 20 noise parameters, and some within the public safety area (PSA). Noise complaints received by the airport relate predominantly to general aviation operations from the existing runway.

The alignment of the proposed new runway will mean that fewer households are within ANEF20 contour and no houses will fall within the PSA. These have been key factors in the design of the new runway. The 2007 master planning process

[1] An ANEF is a plot of estimated noise exposure based on a forecast of aircraft movements and a fleet mix for a defined future horizon. The ANEF is assessed and endorsed by Airservices Australia for adoption as the likely noise exposure at a designated time in the future

identified that of all options considered for airport expansion, the new runway option had the strongest community support.

Furthermore, the increased length of the new runway will mean that a newer generation of quieter aircraft will be able to operate out of the SCA.

The proposed new runway will however, include new flight paths over areas that are not currently affected by aircraft noise, particularly to the north west of the airport.

Preliminary spot noise monitoring was undertaken for the purpose of this IAS. Attended ambient noise measurements were taken at select locations to provide indicators of what the existing ambient noise levels are and what is influencing the existing noise environment.

Seven monitoring locations, in Alexandra Headlands, Mudjimba, Maroochy River and Yandina Creek, were selected on the basis that they represent localities either currently affected by airport operations or localities predicted to be affected by the proposed new flight paths arising from the development.

Preliminary noise monitoring indicates that:

- In rural areas, the ambient noise environment is low, with LA90, 15 minute levels typically 30 to 35 dB(A). The ambient noise environment in these areas is dominated by local bird and wildlife noise, and noise from intermittent road traffic. No existing aircraft noise was audible at these locations;
- In areas closer to main roads, road traffic noise is the dominant noise source; and
- Audible existing aircraft noise at the measurement locations is typically caused by light aircraft, rather than larger passenger-freight aircraft.

More detailed noise monitoring and modelling would be conducted as part of the EIS phase of the Project.

3.2.5 Visual and Landscape

The airport site is flat and low lying, with development including the terminal access roads and existing runways. The air traffic control tower is a visible feature of the site. There are vegetated areas and cane lands in the northern and western parts of the site.

Surrounding landscape elements include Mt Coolum and Mt Ninderry to the north and northwest, the coastline to the east, high rise developments at Marcoola and light industrial land uses to the south west.

3.2.6 Cultural Heritage

3.2.6.1 On-Airport

There are no items of heritage significance listed on the State or Commonwealth registers within the airport site.

The airport site and surrounds is the traditional country of the Gubbi Gubbi people, who registered a Native Title Claim, which has since been discontinued.

There are no known Indigenous heritage values on the airport site, however this would be further assessed if/when the CHMP is prepared for the project in consultation with the traditional owner representatives.

3.2.6.2 Off-Airport

The areas of northern Moreton Bay are important to a number of Indigenous family groups and are the subject of several native title claims (both registered and unregistered).

Previous cultural heritage work in Moreton Bay has highlighted that the entire landscape and seascape are part of the Indigenous cultural heritage of the region.

3.2.7 Regional Economy

SCA is the 15th busiest airport in Australia by passenger volume. Of the non-capital city airports, SCA is the 6th busiest regional airport in Australia in relation to Regular Public Transport passengers.

An economic impact study, carried out in 2008 by EC3 Global Consultants, indicated that the airport contributed $469.3 million in direct expenditure to the regional economy in 2007/08 including $166.6 million in wages and salaries. The study found that indirect and flow-on impacts of the airport are also significant, accounting for 72% of total airport-related expenditure and 66% of total airport-related value added benefits to the regional economy. The study went on to conclude that the Sunshine Coast, as a region, supports a total workforce of approximately 100,000 full-time employees with the airport directly or indirectly generating approximately 4400 jobs or 4.4% of the region's total employment.

According to SCA's 2009 Business Case conducted by PricewaterhouseCoopers (http://www.infrastructureaustralia.gov.au/2011_coag/submissions.aspx), it is estimated that 9% of all visitors to the Sunshine Coast access the region through the SCA. Latest forecasts reveal a demand of between 2.1 million and 2.8 million passengers by 2030.

Of all industries, tourism contributes the most to the economy of the Sunshine Coast being approximately 17% of the Gross Regional Product. This is followed by retail, construction and community services at approximately 8% each.

SCA is a major commercial aviation hub in South-East Queensland, and as a regional airport, is likely to service not only the immediate Sunshine Coast but also populations further afield.

The airport is appropriately recognised in Council's Economic Development Strategy as a key contributor to the future diversification of the Coast's economy. The airport is already home to a diverse range of aviation related businesses. The concept design provides for an additional approximately 25ha of land for aviation related business. At an estimated average employment density of 1 employee per 100m^2, this equate to a potential workforce of 2800.

The new terminal when constructed would be expected to provide a further 5000m^2 of commercial floor space with an average employment density of 1 employee per 30m^2 or approximately 150 jobs in addition to those engaged in airline, security and airport operations and management functions.

There would also be flow on effects throughout the regional economy arising from the additional employment opportunities at SCA.

4 Potential Impacts and Mitigation

The Project will result in direct and indirect impacts, both adverse and beneficial in nature. The approach to impacts has been to avoid in the first instance, reduce in the second, mitigate as a third level of priority and offset as a last resort. This approach complements current offset policy at both a State and Commonwealth level.

The section below outlines key impacts associated with the Project and treatment of these as well as 'other' impacts likely to result with general mitigation measures. Both the construction and operational phases have been considered.

Impacts and associated mitigation measures will be dealt with in more detail at the EIS stage of the Project. A detailed Construction Environmental Management Plan (CEMP) will be prepared to manage the identified construction impacts. Species Specific Management Plans will also be developed as part of the CEMP, to detail the mitigation measures specific to the key threatened species on the site. These would be developed in line with Commonwealth Recovery Plans for relevant species, including the Wallum Sedgefrog and other wallum-dependent frog species, Grey-headed Flying Fox and Oxleyan pygmy perch.

Furthermore, a Dredge Management Plan will be prepared to manage the dredging process in Moreton Bay.

4.1 Environmental Considerations

4.1.1 Terrain

The airport site is relatively flat and low-lying, and surcharging of the site will be required to prepare the ground surface for the construction of the new runway and associated infrastructure. Fill heights in the order of 1.5 m to 3 m are expected. There are likely to be bunds required for construction, which will be removed following the construction period. Excavations are expected to be limited to underground service trenches and shallow surface drains up to about 1m deep.

The impacts to terrain as a result of construction or operation are expected to be minimal and no specific mitigation measures are proposed at this stage.

4.1.2 Soils and Geology

Impacts to soil during the construction phase would result from the removal of topsoil and the compaction of soil on access routes and work areas. Soil profiles would also be disrupted in this process. There is the potential for erosion and sedimentation once vegetation has been cleared and soil is exposed to the effects of wind or rain.

The full extent of earthworks is not known are this stage. However, as previously described, the site will be filled with marine and terrestrial fill sources. Some excavations for drains are also expected.

Preliminary geotechnical investigations have identified that the majority of the airport site has high potential for the presence of ASS, which could result in acidification of soil or water resources if not managed during the construction

phase. Preliminary geotechnical investigations identified that the underlying alluvium should be capable of withstanding the planned fill-loads without being subject to significant lateral displacement. Therefore the disturbance to ASS/PASS as a result of the fill works is considered to be low, however further investigation is required.

There is also the potential for contaminated land to occur within the Project boundary and this will be identified where possible during the EIS phase of the project.

Typical management measures to reduce the impacts to soils during construction include the following:

- Investigations to identify and remediate areas of potentially contaminated land;
- Detailed investigations to identify areas of ASS and the implementation of ASS management measures during construction in accordance with QASSIT Guidelines to prevent acidification of soil and water and impacts to flora or fauna;
- Minimising the time that soil is exposed by rapid work methods and rehabilitation of the site;
- Soil may be stockpiled on site for reinstatement following construction. Timing of construction activities to take account of weather conditions and reduce the likelihood of erosion; and
- Implementation of erosion and sediment controls which will be specified in the EMP that will accompany an EIS for the Project.

During the operation phase of the Project there is not expected to be ongoing impacts to soils at the airport site, as disturbed surfaces will be rehabilitated or sealed.

4.1.3 Flora and Fauna

4.1.3.1 On-Airport

The preparation of the site for construction will involve the clearing of vegetation within the Project footprint, and other areas that are required for temporary access or storage. Vegetation clearing is likely to have the following direct impacts:

- Reduction in the amount of remnant vegetation within the airport site. As identified in Section 3.1.3, there are four REs within the airport site which will be impacted to different extents. Three are classified as ‘Least concern’ and one is ‘Of concern’ under the VM Act;
- Removal of threatened flora species such as *Allocasuarina emuina.* Based on preliminary ecological fieldwork it is expected that 5.3 ha of core habitat and some marginal habitat for this species would be removed as a result of the Project;
- As identified in Section 3.1.4, State and Commonwealth-listed threatened fauna species are known to occur on the site, include Wallum Frog species, Ground Parrot and the Grey-headed Flying Fox. The removal of vegetation for

the construction of the runway and associated infrastructure would directly impact the availability of habitat or food source for these fauna species;

- The removal of vegetation could also potentially result in the loss of a fauna movement corridor between habitat areas to the north and south of the airport site. The functionality of this corridor and movement by particular species will be further investigated during the EIS phase of the project to determine the nature and significance of the impact.

As well as the above direct impacts from clearing, there also is also potential for the following indirect impacts:

- There is the potential for the spread of weeds, feral animals and pathogens both within and adjacent to the study area;
- Earthworks may result in the disturbance of soils and sediment mobilisation, potentially affecting habitat for aquatic species in drainages on the airport site;
- Any disturbance of ASS could affect aquatic ecosystems and any threatened fish and amphibian species within receiving waters; and
- Any construction of water bodies could provide habitat for water birds, and pose a threat to aircraft safety.

During the operation of the Project there are not expected to be ongoing impacts to flora species, as clearing and any rehabilitation measures will be completed during the construction phase.

The proposed new runway at the site has the potential to disrupt movement corridors for fauna species during operation, or result in fragmentation of populations on the airport site. There is also the potential that the changed flight path resulting from the new runway would have an impact to movement paths of birds and potentially the Grey-headed Flying Fox, creating a safety hazard to aircraft operations. The nature of these impacts and measures to reduce the impact will be further investigated at EIS stage.

Typical management measures, in line with Commonwealth Recovery Plan objectives, to be implemented to mitigate the identified impacts include:

- The impact to threatened flora species (*Allocasuarina emuina*) has been minimised through modification of the design. This means that the larger southern core habitat area for the species would not be impacted as a result of the Project.
- Translocation of individual *Allocasuarina emuina* plants to the adjacent Mt Coolum National Park is being investigated and would be proposed prior to clearing to minimise the loss of this species as a result of the Project. Seed collection would also occur to enable further plantings of the species in the event that translocation is unsuccessful.
- The amount of vegetation to be removed as a result of the Project would be minimised where possible through adherence to clearing limits and the trimming of trees where possible to avoid total removal.
- Areas of the site that are cleared for temporary construction uses would be re-vegetated following construction and in some cases this would be managed to enhance habitat availability for threatened species. For example the Ground Parrot inhabits low wallum heath on the airport site that is managed by

slashing and mowing. Recreation of this type of habitat following construction would potentially minimise the total habitat loss for this species.

- A detailed site survey would be undertaken prior to clearing to locate threatened flora or fauna species and enable their removal prior to clearing. A fauna spotter catcher will be in attendance at the site during the vegetation clearing.
- The implementation of work practices which prevent the establishment (or further promotion) of introduced weed species and weed removal.
- A CEMP would be implemented prior to construction, to detail the management measures to be implemented and the responsibility for their implementation. This would include the measures identified above.
- Species Specific Management Plans would also be developed as part of the CEMP, to detail the mitigation measures specific to the key threatened species on the site. These would be developed in line with Commonwealth Recovery Plan objectives for relevant species, including Wallum Sedgefrog and other wallum-dependent frog species, Grey-headed Flying Fox and Oxleyan pygmy perch.
- Significant vegetation communities at the site would be monitored in the long term to check their ongoing viability.

While the mitigation measures outlined will help to minimise impacts to threatened flora and fauna species, offsets will be required under Commonwealth and State policies. The offsets proposed for the Project are further described below.

4.1.3.2 Offsets Strategy

The direct impacts to vegetation communities and fauna habitat as a result of the Project will be avoided and minimised as much as possible during the design and construction of the Project.

Preliminary investigations into the potential offset requirements for the Project have commenced. However, the offsets strategy for the Project will continue to be developed during the EIS phase and through further discussion with local, State and Commonwealth regulators.

Commonwealth Offsets

Offsets for impacts to species listed under the EPBC Act, is guided by the Draft Policy Statement: *Use of Environmental Offsets under the EPBC Act 1999* from SEWPaC. This policy states clearly that offsets are the last resort and proponents need to show that they have made an effort to 'avoid', 'minimise' and 'mitigate' first. The offsets can be direct (on-ground) or indirect (actions that improve knowledge, understanding and management) and there are eight guiding principles for Commonwealth offsets:

1. Targeted to the matter under EPBC Act being impacted;
2. Flexible approach to achieve long-term and certain conservation outcomes and cost-effective;

3. Deliver real conservation outcomes, i.e. one that would not otherwise be achieved, on ground outcomes;
4. Developed as a package including direct and indirect actions;
5. Commensurate with the impacts of the development – ecological equivalence, satisfying state and local requirements too;
6. Within the same general area;
7. Delivered in a timely manner and long lasting; and
8. Enforceable, monitored and audited.

Initial investigations have determined that the project will result in clearing of habitat for three Threatened Species under the EPBC Act. Translocation of *A. emuina* population to an area adjacent to the site in the National Park may negate the need for an offset of habitat for this species (subject to further discussions with SEWPaC). Habitat offsets will need to be located for the Wallum Sedgefrog (approximately 10 ha of wallum heath is affected) and Grey-headed Flying Fox foraging habitat (approximately 34 ha of *M. q uinquenervia* and *E. r obusta* / wetland vegetation is affected).

Areas potentially suitable to provide the required offsets have been identified in conjunction with SCC and are subject to further investigation to determine their suitability.

State Offsets

Clearing of mapped remnant and re-growth vegetation is assessable under the *Vegetation M anagement A ct* 1999 unless the activity is listed as an exemption under *Schedule 24, Sus tainable P lanning R egulation 2000*. There are different exemptions for various types of tenure. Some exemptions apply to the proposed development of the SCA:

- On freehold land - the expansion of the airport within the 'Special Purposes' zone is considered to be an urban purpose within an urban area, which qualifies for the 'urban exemption' under *Schedule 24, Sus tainable P lanning Regulation 2000*. However, development or clearing within areas on the site that have been zoned as 'sustainable cane land' will require assessment under the VM Act (which may lead to the requirement for offsets). This has been confirmed through consultation with Vegetation Management Officers at DERM;

- On Good Quality Agricultural Land (GQAL) - those parts of the former Maroochy Shire area that are considered as "good quality agricultural land" are identified on the Strategic Plan Map 2-1 of the Maroochy Plan 2000 as "Agricultural Protection". It is understood that the principal intention of this identification is to retain the land for agricultural purposes and consequently protect the future viability of agriculture in the area. To this end, intensive agricultural activities are generally allowed within these designated areas, while uses which contradict this intention or threaten the agricultural capability are usually not be supported, except where in accordance with State Planning Policy 1/92 (SPP1/92).

Under SPP1/92, the Queensland Government is aware that *the alienation of some productive agricultural land will inevitably occur as a consequence of development, but the Government will not support such alienation when equally viable alternatives exist, particularly where developments that do not have very specific locational requirements are involved* (Policy Principle 2). Within this context, the future expansion of the Sunshine Coast Airport in accordance with the Master Plan does have specific locational requirements in order for the new runway and associated aircraft movement areas (taxiways, aprons, etc) to satisfy specific airport planning and aviation operation standards.

Therefore, despite some of the area of the proposed expansion of the Airport being designated "Agricultural Protection" on the *Maroochy Plan 2000* Strategic Plan Map, it is appropriate that the alienation of this land be considered given the benefits to the local and regional communities and economies and the need for the Airport to expand in accordance with its adopted Master Plan to ensure that it continues to function as a key State, regional and local aviation facility.

- Lot 348 M93335, Lot 844 SP214352, Lot 699 SP214349, Lot 59 CP855985 and Lot 58 CP855985 (reserve or unallocated state land) – the only exemptions in these areas relates to management / maintenance of existing airport infrastructure.

The requirement for vegetation offsets under the VM Act is legislated through the Policy for Vegetation Management Offsets by the Department of Environment and Water Resources.

Taking into consideration the exemptions applicable, the project will be required to offset the clearing of approximately 0.1ha of remnant RE12.2.7, 2.16 ha of remnant RE12.2.12 and approximately 2.9 ha of re-growth least concern RE. Offsets for re-growth vegetation are required to be at a rate of 2:1 (or minimum 1 ha). Offsets for remnant vegetation will not be at a rate of 1:1, but will depend on ecological equivalence for remnant vegetation under the Vegetation Management Offsets Policy.

To provide a satisfactory offset under the VM Act, the offset must satisfy criteria 1-6 and 10 of the offsets policy. Criteria 1-4 are the most important at this stage of the Project and include:

1. Offset limitations – an offset cannot be protected already (as part of the national estate), it cannot be remnant vegetation (unless clearing has been approved over it), it must be land based (rather than financial or in-kind) and it cannot be re-growth that is in a restricted area (i.e. essential habitat, stream protection, wetland protection, slopes >12%).
2. Values and regional ecosystems – an offset must aim to replace like for like, i.e. be same broad vegetation type of same or higher conservation value (in this case, it doesn't have to be exact same RE, but will have to be wet heath).

If it is essential habitat it must include at least three habitat factors (including mandatory ones) recognised for that species.

3. Ecological Equivalence – this will determine the size of the offset and relates to strategic position (e.g. corridor, add to a protected area or buffer an area), species diversity, condition of vegetation, landscape context (e.g. corridor). Refer to offsets policy for detailed description.
4. Legally secured – within 4 months of approval or consistent with a legally binding agreement.

Initial investigations have identified sites in proximity to the airport site that are potentially suitable for offsets under the VM Act. Further investigation will be undertaken as the Project progresses to confirm their suitability and acceptability to DERM.

4.1.3.3 Off-Airport

Approved dredging works in Middle Banks and Spitfire Channel have been previously assessed and found to not have a significant impact to flora and fauna in Moreton Bay.

The MBSES identified that there would be localised removal of benthic fauna in the dredge footprint; however rates of recolonisation by organisms from larval dispersal and active colonisation from adjacent areas are very high.

While there is some potential for direct impacts to marine megafauna as a result of dredging, measures can be implemented to prevent this impact. Potential impacts will be further considered in the EIS and associated mitigation measures (such as deflectors to minimise impacts to marine megafauna) would be included in the Dredge Management Plan.

4.1.4 Hydrology and Water Quality

4.1.4.1 On-Airport

While there are no named watercourses on the airport site, it is traversed by a number of artificial drainage lines. The filling and surcharging of the site would result in modifications to drainage lines and overland flow paths on the site.

Vegetation clearing and earthworks would expose soil surfaces increasing the potential for erosion and sedimentation of drainage lines.

The use of marine fill on the site would mean that saline water would also be brought to the site, creating the potential for saline intrusion into surface and groundwater.

The presence of construction machinery on the site introduces the risk of oil or fuel spills into drainage lines or surface flow paths, with resulting downstream impacts.

During operation of the new runway, the impermeable surface area at the airport site would be increased, with likely increases in surface runoff. Due to surcharging of the site and the required flood immunity of the runway, the runway is likely to alter drainage and flood pathways on the airport site.

Preliminary flood modelling, which takes into account the proposed new runway, shows that there are likely to be adverse impacts to both Q10 and Q100 flood levels in the study area as a result of the runway. Further and more detailed flood modelling will need to be undertaken as part of the EIS.

Typical management measures to minimise the impact to hydrology and watercourses would include:

- Reinstatement or creation of new drainage lines on the site following construction;
- Minimising the time that soil is exposed by rapid work methods and rehabilitation of the site;
- Consideration would be given to minimising the amount of saline water that is brought to the site, by potentially pumping the fill material with a lower percentage of water. Alternatively the dredge material could be placed on the site over a longer period so that the saline drainage water can be captured in retention ponds prior to discharge;
- Further investigation would be undertaken at the EIS phase of the Project into the potential impacts from the dredge material and mitigation measures required to minimise impacts to surface and groundwater;
- Fuels and hazardous substances would be stored away from watercourses or drainage lines;
- Erosion and sediment control measures would be in place during construction;
- The CEMP for the Project would detail the site-specific measures required for managing impacts to hydrology and water quality; and
- The preliminary design for the Project proposes mitigation of flood impacts through the drainage of floodwaters from the site to the west and south of the airport site; and
- The operational impacts to hydrology and water quality would be mitigated through the consideration of water sensitive urban design in the design of drainage for the site. This would need to be balanced with the need to reduce bird hazards at the airport, so standing water and other suitable bird habitat will be minimised.

4.1.4.2 Off-Airport

The MBSES identified that sand extraction in Moreton Bay results in localised and short term increases in turbidity as a result of sediment disturbance but is unlikely to affect nutrient cycles in the long term.

The MBSES also identified that the extraction of sand from the identified areas in Moreton Bay presents no potential for change to overall hydraulics, with only localised effects on prevailing tidal flows in adjacent areas.

Potential water quality impacts associated with sand extraction from Morteon Bay will be further considered in the EIS. Measures to mitigate turbidity impacts will be included in the Dredge Management Plan.

4.1.5 Air Quality

4.1.5.1 On-Airport

Construction activities may impact local air quality through the emissions from:

- Machinery and construction vehicles present on site during construction;
- The generation of dust as a result of disturbance to soils during excavation;
- It is also possible that increased traffic on unsealed roads may cause localised dust impacts to airport users and directly adjacent areas; and
- The transport of fill from terrestrial quarry sources by truck may result in localised increases in emissions along transport routes.

Further air quality assessment will be conducted in the EIS phase however it is expected that air quality impacts will be minor and localised and will be mitigated through the following measures:

- Maintenance of construction machinery to reduce emissions;
- The use of designated and well maintained access routes where practicable; and
- The use of water trucks as necessary for dust suppression although this should be minimised to reduce water use.

During operation, the increase in flights may result in an increase in air emissions. The Project is also likely to increase the operational road traffic on the airport site as a result of increased passenger numbers.

4.1.5.2 Off-Airport

Negligible air quality impacts are anticipated from the dredging process in Moreton Bay, assuming the dredger's engines are maintained in good working order in accordance with best practice.

The transport of fill from terrestrial quarry sources by truck may result in localised increases in emissions along transport routes. This will be further considered as part of the EIS.

4.2 Socio-Economic Considerations

Implementation of SCA's Master Plan is expected to have a mostly positive socio-economic impact.

SCA is recognised in the South East Queensland Regional Plan and Council's Economic Development Strategy as a key element in the strategy to diversify the economy of the Region by building upon the existing cluster of aviation related businesses and providing continuing support to the Coast's tourism industry.

The dimensions of the existing runway and surrounding development areas mean that operations are restricted. The principal driver for the Project is to enable unrestricted Code C aircraft operations. This in turn will support the growing regional economy of the Sunshine Coast.

The majority of households currently within the Public Safety Area (PSA) or affected by the existing north/south (18/36) runway alignment would benefit from the new runway (13/31) configuration.

The Project will support the region's growing population and economy, as well as meet the projected increased demands on passenger growth. SCA will however require funding assistance from the Australian Government to realise its full potential.

4.2.1 Land Use and Access

4.2.1.1 On-Airport

The construction phase is expected to have minimal impact on land use as the majority of land within the study area is either owned by SCA or leased by SCA from the Queensland Government. Any impact to surrounding land uses as a result of access to the site or amenity impacts will be largely temporary and restricted to the construction phase.

The operation of the Project is not expected to have a significant impact on land use and access, as provision will be made through the layout of the Project access roads to ensure sufficient capacity for the forecast number of airport users.

Land use and access impacts during construction will typically be mitigated through the following measures:

- Consultation with landowners to discuss the best possible location of access tracks and other provisions during construction;
- Consultation with the Queensland Department of Transport and Main Roads regarding proposed future rail and road projects in the area; and
- Traffic management in and nearby the airport site during construction to reduce the impact of construction vehicles on local roads and land uses.

4.2.1.2 Off-Airport

Dredging would occur in areas of Moreton Bay that are within the General Use Zone of the Moreton Bay Marine Park, which allows for activities such as shipping, maintenance of shipping channels and sand extraction under the State approvals process. The dredging process is not expected to have a significant impact to existing uses.

The transport of terrestrial fill from quarry sites to the airport by truck is likely to have some temporary traffic and local land use impacts. These impacts will be further considered as part of the EIS for the Project.

The impact of the Project on local utilities and services, including water supply, electricity, sewer, traffic, public transport, emergency services and telecommunications will be further considered as part of the EIS process.

Consideration will be given to on-airport and off-airport impacts during the construction and operational phases of the Project. Minor impacts on local utilities

and services are anticipated once the new runway is operational, some beneficial in nature.

4.2.2 Noise

4.2.2.1 On-Airport

There is likely to be noise generated from construction machinery and activities which may cause temporary disturbance to adjacent residences. Additional noise and vibration would also be generated on local access roads due to the increase in traffic associated with construction vehicles.

Typical noise mitigation measures will include the following:

- Consultation with landowners prior to noise generating activities; and
- Restricted work hours in noise sensitive areas.

As described in Section 3.2.1 increased aircraft noise levels will be experienced by the pockets of rural residencies and/or communities located to the west of the proposed new runway once it is operational. However, there is expected to be a net decrease in the number of noise-affected residences as a result of the Project. This will be investigated in detail in the EIS stage of the Project.

4.2.2.2 Off-Airport

The BAC EIS/MDP identifies that noise from dredging operations at Middle Banks has been predicted to comply with all established criteria at all residential receivers including Tangalooma Resort on Moreton Island.

The pump out of dredge material to the airport site may result in noise impacts to adjacent land use, however this would need to be further assessed at the EIS stage of the Project.

The transport of terrestrial fill from quarry sites to the airport is likely to have some temporary noise impacts. This is a result of the anticipated increased truck movement along haulage routes for the construction phase of the Project. These impacts will be further considered as part of the EIS for the Project.

4.2.3 Visual and Landscape

4.2.3.1 On-Airport

The removal of vegetation, alteration of the landscape and presence of construction machinery during construction are likely to impact the visual and landscape qualities of the area. There may also be bunds during construction that could have a visual impact. Visual and landscape impacts will typically be mitigated following construction via revegetation and rehabilitation of disturbed areas (using airport friendly species).

4.2.3.2 Off-Airport

The dredging within Moreton Bay is not expected to have a significant visual impact given the existing commercial and recreational uses of Moreton Bay. The mooring of the dredge and the pipeline to transport fill to the site may have a visual impact from the foreshore, however this will be temporary during the construction period with no remaining visual impact during the operational phase.

4.2.4 Cultural heritage

4.2.4.1 On-Airport

Known or unknown cultural heritage artefacts may be impacted during construction works.

Detailed cultural heritage investigations and consultation with indigenous and local/historical groups will be necessary as part of the EIS process, to minimise the potential for these impacts. Cultural heritage issues will be further assessed if/when the CHMP is prepared for the project in consultation with the traditional owner representatives.

Ongoing impacts to cultural heritage are not expected to result during the operational phase of the Project.

4.2.4.2 Off-Airport

Work undertaken for the MBSES did not identify any specific places of Indigenous cultural significance however it was determined that there is potential for finding Indigenous cultural sites and/or materials in the area. A CHMP would be in place during construction to manage potential impacts to cultural heritage.

4.2.5 Economic Benefit

The total cost of implementing SCA's Master Plan is estimated to be $419 million.

As mentioned in Section 2.5, a benefit cost analysis of the Master Plan, conducted by Pricewaterhouse Coopers in 2010 concluded that, with all runway and RPT projects included as well as all new commercial precincts, the project offers a BCR (National) of 2.21, with NPV benefits of $247.4 million and an internal rate of return of 13.49 per cent.

The analysis found, following examination of a range of scenarios, the BCR is greater than one at all times, indicating there is value in the project which is not reflected purely in a financial sense. In other words, the analysis indicated that implementation of SCA's Master Plan would return substantial social and economic benefits for the local, regional and national economy.

The analysis however showed that the financial returns were insufficient to attract purely solely private investment as the returns were dispersed across the broader economy and were not limited to the airport's operator.

SCC has already committed over $50 million to the Project, and is not in a position to fully fund all the elements of the Master Plan to realise the airport's full social and economic potential. Hence, SCC has requested that the Australian Government invest $201 million to allow the construction of the new runway, thereby providing the necessary catalyst to realise the region's potential to drive long-term economic prosperity which would benefit all. A submission has been made to Infrastructure Australia to secure this funding.

5 References and Data Sources

Aecom (2010) *Airport Planning and Design Report.* A report provided to Sunshine Coast Airport.

Avisure (2009) Sunshine Coast Airport Wildlife Hazard Management Data.

BMT WBM (2010) *Sunshine Coast Airport Preliminary Ecological Advice.* A report provided to Arup.

BMT WBM (2010) *Freshwater Fish Assemblages of the Sunshine Coast Airport*

Brisbane Airport Corporation (2006) *New Parallel Runway Project, Draft Environmental Impact Statement* and *Major Development Plan for Public Comment*

Department of Environment and Resource Management (DERM) (2010) *Copy of the certified Regional Ecosystem and Remnant Map—version 6 for the purpose of the Vegetation Management Act 1999* . Online RE Maps, The Department of Environment and Resource Management, Brisbane. [URL: http://www.derm.qld.gov.au/REMAP] Accessed 30 March 2010.

Department of Environment and Resource Management (DERM) (2010) *Copy of the certified Regrowth Vegetation Map—version 2 for the purpose of the Vegetation Management Act 1999* . Online RE Maps, The Department of Environment and Resource Management, Brisbane. [URL: http://www.derm.qld.gov.au/REMAP] Accessed on 12 April 2010.

Department of Environment and Resource Management (DERM) (2010) *Copy of the certified Essential Habitat Map–version 3 for the purpose of the Vegetation Management Act 1999.* Online RE Maps, The Department of Environment and Resource Management, Brisbane. [URL: http://www.derm.qld.gov.au/REMAP] Accessed on 30 March 2010.

Department of Environment and Resource Management (2007). *Biodiversity Planning Assessment*: Biodiversity Assessment and Mapping Methodology. Version 3.5: South-east Queensland.

Queensland Department of Environment and Resource Management (DERM) *(2010) Wildlife Online database*. http://www.derm.qld.gov.au/wildlife-ecosystems/wildlife/wildlife_online.

Department of Environment, Water, Heritage and the Arts (DEWHA) (2010) *EPBC Act protected matters search tool*. The Department of Environment, Water, Heritage and the Arts, Canberra. [URL. http://www.environment.gov.au/erin/ert/epbc/index.html] Accessed on 30 March 2010.

Earthcheck (2008) *Sunshine Coast Airport Economic Impact Assessment*

Ecosmart Ecology (2010) *Sunshine Coast Airport Preliminary Review of Significant Environmental Factors*

Ecosure (2010) *Sunshine Coast Airport Environmental Management Plan*

Golder Associates (2010) *Sunshine Coast Airport Preliminary Geotechnical Investigation*

Healthy Waterways (2010) *Ecosystem H ealth Monitoring P rogram – Moreton Bay Report Card*

Meyer, E., Hero, J-M., Shoo, L. And Lewis, B. (2006). *National recovery plan for the w allum s edgefrog and ot her w allum-dependant f rog species.* Report to Department of Environment and Water Resources, Canberra. Queensland Parks and Wildlife Service, Brisbane.

Queensland Environmental Protection Agency (EPA) (2007) *National r ecovery plan f or t he M t E mu s he-oak A llocasuarina e muina.* Report to Australian Government Department of the Environment and Water Resources. Queensland Parks and Wildlife Service, Brisbane.

Queensland Department of Environment (1998) *Mt C oolum N ational P ark Management Plan.*

Queensland Herbarium (2009) *Regional E cosystem D escription Database (REDD).* Version 6.0b Updated November 2009. Department of Environment and Resource Management: Brisbane. Accessed on 12 April 2010.

PricewaterhouseCoopers (2009) *Business C ase for t he Suns hine C oast A irport Master Plan*

PricewaterhouseCoopers (2010) *Sunshine C oast Airport, A irport M aster Plan – Cost Benefit Analysis*

PricewaterhouseCoopers (2010) *Sunshine C oast Airport, A irport M aster P lan – Updated Cost Benefit Analysis Final Report*

Sunshine Coast Council (2010) *Sunshine C oast C ouncil B iodiversity S trategy 2010-2020*

WBM (2002) Moreton Bay Sand Extraction Study

Appendix A

Supporting Documentation

- Aecom (2010) *Airport Planning and Design Report.* A report provided to Sunshine Coast Airport.
- BMT WBM (2010) *Sunshine Coast Airport Preliminary Ecological Advice.* A report provided to Arup.
- BMT WBM (2010) *Freshwater Fish Assemblages of the Sunshine Coast Airport*
- Ecosmart Ecology (2010) *Sunshine Coast Airport Preliminary Review of Significant Environmental Factors*
- PricewaterhouseCoopers (2009) *Airport Master Plan – Cost Benefit Analysis*
- PricewaterhouseCoopers (2010) *Sunshine Coast Airport, Airport Master Plan – Updated Cost Benefit Analysis Final Report*