AQUIS RESORT AT THE GREAT BARRIER REEF PTY LTD ENVIRONMENTAL IMPACT STATEMENT

VOLUME 12

APPENDIX W AIRPORT AND AIRCRAFT ISSUES





AQUIS RESORT AT THE GREAT BARRIER REEF: ENVIRONMENTAL ISSUES RELATING TO CAIRNS AIRPORT

ENVIRONMENT NORTH

PROJECT NUMBER 490

MAY 2014



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DOCUMENT CONTROL CERTIFICATE

PROJECT AND CLIENT DETAILS

Project name:	Aquis Resort at The Great Barrier Reef	Job Number:	490
Title:	Environmental Issues Relating To Cairns Airport		
Client:	Flanagan Consulting Group		
Contact:	Pat Flanagan		
Description of report:	This report has been prepared to inform the Environmental Impact Statement (EIS) being prepared under the <i>State Development and Public Works Organisation Act 1971</i> (Qld) for the proposed Aquis Resort at the Great Barrier Reef (Aquis Resort).		
	Referring to the requirements of CairnsPlan regarding airport operations and consultation with Cairns Airport Pty Ltd, Airservices Australia, and the Civil Aviation Safety Authority, it documents environmental aspects relevant to the project due to its proximity to Cairns Airport, namely:		
	• light,		
	• wildlife strike,		
	• noise,		
	• air, and		
	 navigational issues (height restrictions and interference with land based navigational aids). 		
	It also investigates helicopter use from the site and provides recommended actions for future stages of the project (i.e. construction, design and operation) from the perspective of airport issues.		

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Acronyms and abbreviations

TERM	MEANING	
AADS	Aviation & Airspace Design Solutions	
AHD	Australian Height Datum	
ANEF	Australian Noise Exposure Forecast	
ASA	Airservices Australia	
CAPL	Cairns Airport Pty Ltd	
CASA	Civil Aviation Safety Authority	
CRC	Cairns Regional Council	
EIS	Environmental Impact Statement	
EMP(C)	Environmental Management Plan (Construction)	
ILS	Instrument Landing System (a form of 'Smart Tracking')	
OLS	Obstacle Limitation Surface	
PANS-OPS	Procedures for Air Navigation Services – Aircraft Operations Surfaces Overlay	
RNP	Required Navigational Performance (a form of 'Smart Tracking')	





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1 INTRODUCTION

1.1 PURPOSE

This report has been prepared to inform the Environmental Impact Statement (EIS) being prepared under the *State Development and Public Works Organisation Act 1971* (Qld) for the proposed Aquis Resort at The Great Barrier Reef (Aquis Resort). The report documents environmental aspects that affect the project due to its proximity to Cairns Airport, namely:

- light,
- wildlife strike,
- noise,
- air, and
- navigational issues (height restrictions and interference with land based navigational aids).

It also investigates helicopter use from the site and provides recommended actions for future stages of the project (i.e. construction, design and operation) from the perspective of airport issues.

1.2 STUDY AREA AND PROJECT AREA

For the purposes of this report:

- the **Project Area** is the parcel of lots upon which the project is to be constructed (i.e. currently under contract by the proponent), and
- the **Study Area** is that part of the Barron Delta that surrounds the Project Area and could be influenced by it nominally from the Barron River in the south to Trinity beach in the north. For the purposes of considering airport issues the study area is the area between the project area and the Cairns International Airport.

See Figure 1-1.







Figure 1-1 Locality showing Project Site and Study Area relevant to airport issues.

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1.3 CONSULTATION

As part of the preparation of this report consultation has been undertaken with the following agencies. A record of meetings and relevant correspondence is included as **Appendix A**.

COMPANY / AGENCY	REPRESENTATIVES	ISSUES	
Cairns Airport Pty Ltd	Kate McCreery Carr, General Manager Operations Paul Lamont, Manager Operations Colin Evans, Airside Operations Manager Jeff McEachern, General Manager Assets Matthew Williams, Environment David Voss, Manager Compliance	 Wildlife strike Fuel dumping Lighting constraints Height restrictions Noise issues Helicopter operations Interference with land-based navigational aids Safety and emergency management Capacity issues 	
Civil Aviation Safety Authority	Greg Parnell, Aerodromes Inspector	Height restrictionsLightingWildlife strike	
Airservices Australia	Steve Tattam, Aviation Relations Manager, Corporate and Industry Affairs John Freeland, Manager Technology and Asset Program	 Project information as available in November 2013 was provided for assessment. Response received 18 December 2013 – see Section 2.6.4b). Meeting to discuss radar issues 13 February 2014. 	

Source: Study team compilation. See also Appendix A.

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2 DESCRIPTION OF CAIRNS AIRPORT ISSUES

2.1 BACKGROUND

The Cairns Airport is located approximately 5 km to the south-east of the project site (see **Figure 2-1**). Whilst the location of the site in close proximity to the Cairns Airport was a major consideration in the proponent's selection of the site for the project, it also means particular attention must be paid to factors that can influence the safe operation of the airport. The majority of these factors are considered in the 2009 CairnsPlan which gives effect to State Planning Policy 1/02: Development In The Vicinity Of Certain Airports and Aviation Facilities and has overlay codes for the following:

- Primary Light Control / Bird and Bat Strike Hazard,
- Australian Noise Exposure Forecasts (ANEF) 2005,
- Airport Public Safety Zone,
- Obstacle Limitation Surfaces (OLS),
- Aviation facilities, and
- Procedures for Air Navigation Services Aircraft Operations Surfaces Overlay (PANS-OPS).

SPP 1/02 has now been incorporated into the SPP 2013 – Planning for infrastructure (Strategic airports and aviation facilities).

Section 4.6.7 of CairnsPlan documents Operational Aspects of the Cairns International Airport Code including both performance criteria and acceptable measures to minimise the effect a development will have on airport operation and the effect activities associated with the airport will have on a development.

Of particular importance is the existence of two flight paths which pass over the Project Site. These are the standard night/bad weather/jumbo jet approach (ILS¹) which is directly over the project and the other over Richters Creek (RNP²).

Finally, the issue of possible helicopter operations between the airport and the resort and between the resort and other destinations was explored. This is not covered in CairnsPlan but is nonetheless relevant to the design and operation of the resort.

2.2 LIGHT

Part of the project site lies within Zone D of the CRC CairnsPlan Barron – Smithfield District Plan Primary Light Control Plans/Bird & Bat Strike Hazards Overlay. The overlay is shown in the map below with the project area highlighted in green.

¹ ILS (Instrument Landing System) is a form of 'Smart Tracking' described as a 'course-forming radio navigation aid that supports the safe and efficient movement of air traffic into and out of the airport, particularly during low visibility and bad weather conditions'. The ILS route is directly over the resort site.

² RNP (Required Navigational Performance) is a form of 'Smart Tracking' that allows more aircraft arriving from the north to track along Richters Creek close to the eastern part of the Aquis site and avoiding residential areas. This will result in noise improvements for some suburbs to the north including Yorkeys Knob and is they basis of the draft ANEF (see Section 2.4.2). The Smart Tracking proposals do not include a departure track over the city.







The map above shows that the southern part of the project area is within Zone D. Performance Criteria and Acceptable Measures for light under the CairnsPlan are as follows.

Table 2-1 Performance criteria and acceptable measures – ligh

PER	RFORMANCE CRITERIA	ACCEPTABLE MEASURES		
Lighting				
P2: Development does not impact on the operational aspects of the Cairns Airport with regard to light emissions.		A2.1:	Lighting does not exceed the maximum intensity of illumination, within the respective zone, as identified on the Overlay Maps.	
		For Zone D (see above), maximum Intensity of Lig Sources is 450 Candela measured at 3 degrees at the horizontal.		
Prin	nary Light Control			
P6:	Development does not impact on the operational aspects of the Cairns Airport with regard to light emissions.	A6.1	Development does not involve external lighting or road layout that creates straight parallel lines of lighting that is 500 m to 1000 m long.	
		A6.2	Buildings and structures do not contain reflective cladding, upwards shining lights or flashing or sodium lights.	

Source: CairnsPlan.

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During consultation CAPL (see **Appendix A**) advised that specifically upward facing lights are considered to be the greatest hazard. Street light style lighting which includes a shield on the top to point light to the ground is acceptable. However, upward facing lights light search lights, laser lights, or volcanos are unacceptable.

2.3 WILDLIFE STRIKE

2.3.1 Department of Infrastructure and Transport Guidelines

The Commonwealth Department of Infrastructure and Transport has published guidelines for state, territory and local government decisions makers (Department of Infrastructure and Transport 2012) to manage the risk of collisions between wildlife and aircraft in accordance with known wildlife-attracting land uses. The vast majority of wildlife strikes involve birds or flying mammals (such as bats and flying foxes).

According to the National Airports Safeguarding Framework Guideline C land uses with the potential to become high risk wildlife attractants include artificial and natural lakes (presumably for birds) and outdoor theatres (presumably for birds during the day and flying mammals at night). The table below presents actions recommended for proposed land uses relevant to this project at varying distances from an airport and is aligned with international benchmarks set by the International Civil Aviation Organisation. The project is located between 3 km and 8 km from the airport (i.e. Area 2 on **Figure 2-2** below) and the 8 km radius column is shaded for ease of reference.

LAND USE	WILDLIFE ATTRACTION RISK	3 km RADIUS FROM AIRPORT (AREA 1)	8 km RADIUS FROM AIRPORT (AREA 2)	13 km RADIUS FROM AIRPORT (AREA 3)
Wildlife sanctuary/conservation area - wetland	High	Incompatible	Mitigate	Monitor
Showground	High	Incompatible	Mitigate	Monitor
Golf course	Moderate	Mitigate	Mitigate	Monitor
Sports facility	Moderate	Mitigate	Mitigate	Monitor
Park/Playground	Moderate	Mitigate	Mitigate	Monitor
Shopping centre	Low	Monitor	Monitor	No action
Hotel/motel	Very Low	Monitor	No action	No action

Table 2-2 Actions for proposed land uses near an airport

Source: Australian Aviation Wildlife Hazard Group (2012) (The Australian Aviation Wildlife Hazard Group is a combined industry and government discussion panel for aviation wildlife hazard management.)

The distances and areas are marked on Figure 2.3.2 below with the project location shaded in green.





2.3.2 CairnsPlan

The Primary Light Control Plans/Bird and Bat Strike Hazards Overlay and the Overlay Code 4.6.7 in CairnsPlan document the requirements for development. Performance Criteria and Acceptable Measures for bird and bat hazard under the CairnsPlan and the relevant map are as follows.

Table 2-3: Performance criteria and acceptable measuresbird and bat hazard

PEF	FORMANCE CRITERIA	ACCEPTABLE MEASURES			
Managing Bird and Bat Hazard to Aircraft					
P3:	Development and the design of facilities and landscaping in the immediate environs of the	ACCEPTABLE MEASURES as and of the lly serious A3.1: N/A (Public Utility (refuse collection and disposal)). A3.2: N/A (Aquaculture (major), Industry Class uses involving food handling or process Primary industries involving fruit or turf production, and Intensive animal husband including the keeping or protection of wild outside enclosures). A3.3: For a Restaurant or Outdoor Sport and Recreation: a) There (sic) the use is located within th radius shown on the overlay map potenti	N/A (Public Utility (refuse collection and disposal)).		
	airport does not compound the potentially serious hazard from wildlife (bird or bat) strike.		N/A (Aquaculture (major), Industry Class B uses involving food handling or processing, Primary industries involving fruit or turf production, and Intensive animal husbandry including the keeping or protection of wildlife outside enclosures).		
	A	A3.3:	For a Restaurant or Outdoor Sport and Recreation:		
			a) There (sic) the use is located within the 3km radius shown on the overlay map potential food and waste sources are covered and collected so that they are not accessible to wildlife; or		
			b) The use is located outside the 3km radius.		

Source: CairnsPlan.



Source: CairnsPlan. The Aquis project site (marked in green) is within Area 2 (3 km to 8 km radius).

* See end of text of a larger version of this figure (combined with Figure 2-1).

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The Overlay Code specifies that land uses listed above (A3.1 and A3.2) are not permitted within specified distances of the airport and documents acceptable measures to manage the potential to encourage wildlife that pose a risk to aircraft. Of relevance to Aquis is the fact that restaurant or outdoor sport and recreation uses are permitted without restriction, as the site is located more than 3 km from the airport.

2.3.3 CAPL Advice

Advice from Cairns Airport Pty Ltd (CAPL) (Lamont pers. comm. 2 August 2013) is that wildlife that pose the highest risk are large birds that are known to fly at heights concurrent with approaching aircraft (i.e. pelicans, birds of prey, larger waders). Birds that are too small or do not soar pose less of a risk to approaching planes. CAPL's Bird and Wildlife Management Strategy (Ecosure 2008) analysis bird strike data and notes that strikes peak in March to May with a slow drop to July. At this time, the airport is used as a refuge as it retains fresh water for several months into the dry season. The presence of water attracts ducks, waders and birds of prey. A risk analysis was undertaken by CAPL and indicated that highest level of risk was associated with pacific black duck, black kite, flying fox, bush stone-curlew, magpie goose and pied imperial pigeon. CAPL observations documented in the strategy also note that nocturnal species constitute the highest percentage of strikes (22%) and represents peaks in strikes at dawn and dusk. Specifically, strikes with flying-foxes are more common than with any other single species.

CAPL commissioned research into spectacled flying foxes to better manage the potential wildlife strike hazard in Cairns. This research found that the mammals would feed on flowering paperbark trees, especially *Melaleuca leucadendron* from March to June. The greatest risk to strike was found to be the large Central Swamp camp because the (bat) flight path to the *Melaleuca sp.* stands in the northern beaches took them directly over the airport. The findings of the research were used to develop a Cairns Airport Bird and Wildlife Management Strategy (Ecosure 2008).

To further manage the risk of wildlife strike, CAPL also contracts an ornithologist to undertake fortnightly wildlife monitoring of the lower Barron River and Cairns foreshore. The results of the monitoring trigger 'specific management actions' under the Strategy, including:

- dispersing birds through a number of methods,
- trapping,
- removal of eggs and nests, and
- issuing notices to pilots advising that the risk of bird strike is high.

The Strategy lists the following addition measures to minimise the attractiveness to birds:

- removing dead animals that potentially attract scavenger species (particularly soaring birds),
- ensure that structures are not attractive roosting sites for birds,
- limiting perching opportunities, and
- ensuring grass is kept low to prevent attracting seed eating species.

2.3.4 CASA Advice

The Civil Aviation Safety Authority (CASA) Advisory Circular on Wildlife Hazard Management at Aerodromes (2011) states that wildlife monitoring in the vicinity of the aerodrome should include wetlands, areas of water discharge, and open waterways. Treatments to mitigate risk include:

- covering of open water sources, drains etc.,
- selection of plant species with reduced attraction qualities,
- maintenance of grasses at set lengths above the ground, and
- the use of appropriate landscaping techniques.





The potential to use these treatments and others to minimise the risk of wildlife strike should be considered during detailed design. Further advice has been sought from ASA / CASA but is currently outstanding (see **Appendix A**).

2.4 NOISE

2.4.1 CairnsPlan

Unlike the previous matters that involve resort land uses that could affect aircraft or airport operations, noise is a matter whereby these operations could adversely impact on future land uses. The concern here is both for the amenity of future users and the legal aspect of 'adverse amenity' (i.e. that that future users will complain and activate to limit airport operations).

To minimise the potential adverse effect the airport may have on the surrounding community CairnsPlan includes an Australian Noise Exposure Forecast (ANEF) 2005 Overlay (shown in figures below). This reflects anticipated levels of noise impact an area would experience. A subsequent draft map has also been produced by CAPL which reflects predicted ANEF contours when the Cairns Airport is at peak capacity. See **Section 2.4.2**. Both maps show that the 20, 25 and 30 ANEF contours cover the project site.



The compatible and incompatible lands uses based on ANEF contours are listed below. Applicable ranges to the Aquis site are shown shaded.

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Table 2-4 CairnsPlan criteria (Table 1 - Compatible and Incompatible Land Uses within ANEF Contours)

USES	COMPATIBILITY	OF USE WITHIN ANEF CONTOUR OF SITE ^(1, 2)			
	Compatible	Compatible subject to conditions	Incompatible		
Residential (all forms including caravan parks)	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF		
Hotel, motel, hostels (short-stay)	Less than 25 ANEF	25 to 30 ANEF	Greater than 30 ANEF		
School, university	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF		
Hospital, nursing home	Less than 20 ANEF	20 to 25 ANEF	Greater than 25 ANEF		
Pubic building	Less than 20 ANEF	20 to 30 ANEF	Greater than 30 ANEF		
Commercial	Less than 25 ANEF	25 to 35 ANEF	Greater than 35 ANEF		
Light industrial	Less than 30 ANEF	30 to 40 ANEF	Greater than 40 ANEF		
Other industrial		Acceptable in all ANEF zones			

Source: CairnsPlan.

Notes: 1. Table 1 excludes consideration of aircraft noise impacts on outdoor spaces specifically. However, the table does reflect the extent/frequency of outdoor space use associated with particular uses.

2. AS 2021 should be referred to by those seeking information / background on the basis for Table 1.

This table shows that between the 25 and 30 ANEF contour, hotels and motels are considered compatible subject to conditions. According to CairnsPlan residential premises are incompatible within the 25 ANEF contour.

Performance Criteria and Acceptable Measures for acoustic treatment for noise exposure in areas within the ANEF contours under the CairnsPlan are as follows.





Table 2-5 Performance criteria and acceptable measures acoustic treatment for noise exposure

PEF	PERFORMANCE CRITERIA		ACCEPTABLE MEASURES		
Aco	ustic Treatment For Noise Exposure				
P4:	Land uses not directly associated with the Airport are protected from aircraft noise levels that may cause harm or undue interference.	A4.1: A4.2:	 Residential, tourist or short term accommodation uses: (a) are located outside the 20 ANEF; or (b) where located within the 20 - 25 ANEF contour the development is acoustically insulated to at least the minimum standards as required by AS2021 – Acoustics – Aircraft Noise Intrusion – Building Siting and Construction for the relevant ANEF. Non-residential uses – no acceptable measures are specified. 		

Source: CairnsPlan.

It is assumed that the Australian Standard also deals with buildings that are in the 25-30 ANEF (as is some of the project area).

2.4.2 CAPL Advice

In consultation with CAPL (see **Appendix A**), it was stressed that that the resort must mitigate the noise created by airport operations. It is critical that future development on the site does not lead to pressure to modify airport operations (reduced noise levels, curfews etc.).

Follow up consultation with CAPL (P Lamont pers. comm. 30 August 2013) is as follows:

- The ANEF in the current CairnsPlan is based on CAPL's current 2005 ANEF.
- CAPL has developed a new Ultimate Capacity ANEF which has received Airservices Australia's Technical Assessment approval. This is referred to as the 'draft ANEF'. This document is to be submitted to the Queensland Government and Cairns Regional Council for comment. Their comments will then be considered and a report forwarded back to Airservices Australia. If accepted, Airservices Australia will endorse the draft ANEF and it will be adopted as the new ANEF for Cairns Airport and will be incorporated interest the new CairnsPlan.
- It would be prudent for the Aquis development to be assessed for aircraft noise impacts using the new draft ANEF (this will be relevant to post-EIS detailed design). The draft ANEF is not available for use in this report. However, it has been sighted and shows that the project lies between the 25 and 30 ANEF at maximum capacity. Compared with the 2005 ANEF, the draft plan results in the current contours widening to the east to reflect the increased use of the Richters Creek corridor (see below).
- It is of relevance that the draft ANEF is based on the new 'Smart Tracking' flight paths on both the Runway 15 arrivals (i.e. Runway 15 ILS approach and the Runway 15 Richters Ck Approach) and on the Runway 33 departure which uses Richters Ck for all RPT aircraft departures. Referring to these flightpaths:
 - the Runway 15 ILS approach passes over Aquis development, and
 - the Richters Creek flight path skirts the south-eastern site boundary.

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2.5 AIR

2.5.1 CairnsPlan

Performance Criteria and Acceptable Measures for protection of operational airspace (air emissions) under the CairnsPlan are as follows.

Table 2-6 Performance criteria and acceptable measures protection of operational airspace (air emissions)

PERFORMANCE CRITERIA		ACCEPTABLE MEASURES		
Protection of Operational Airspace				
P5:	Emissions do not affect air turbulence, visibility or engine operation in operational airspace.	A5.1:	 None of the following is emitted: a) a gaseous plume at a velocity exceeding 4.3m/s; or b) smoke, dust, ash or steam. 	

Source: CairnsPlan.

2.5.2 Fuel Dumping

It is understood that fuel dumping occasionally occurs in the vicinity of Cairns Airport. The most common reason for this is that most planes cannot land when they are as heavy as they can be on take-off. Accordingly, if for some reason a plane needs to return to the airport and is too heavy to land (or in an emergency to reduce fire risk), it must dump fuel. This issue was raised during initial consultation with CAPL (see **Appendix A**) and in subsequent consultation via the Aquis Community Reference Group which includes a senior CAPL officer. The combined advice given was that

- dumping is a rare event and is certainly not a common practice,
- if aircraft do need to dump fuel, they do so over water (in most cases the fuel evaporates before it reaches the ocean),
- many aircraft cannot even dump fuel and instead burn it in the exhaust, and
- the Commonwealth Government (CASA) has undertaken monitoring that demonstrates that dumping is not a common practice.

In its preliminary report on air quality issues for the Aquis project, ASK Consulting Engineers (2013) reference the Civil Aviation Safety Regulations (1998), Part 172 Manual of Standards: Air Traffic Services Section 13.2.2 Fuel Dumping which states that the limitations of this activity are specified by Civil Aviation Safety Regulations (1998) are:

- The minimum release height to be 6000 ft agl³ (~2000 m).
- The vapour zone extends a half nautical mile on each side, 2000 ft below, and is to be kept clear of other aircraft until 5 minutes after dumping completed.'

ASK conclude that the release of fuel 2000 m above ground and dispersed over considerable distance is only likely to reach the ground level in trace amounts below odour detection thresholds and health criteria. Based on this advice it appears that fuel dumping is not a risk to air quality for the resort.

³ above ground level.





2.6 NAVIGATIONAL ISSUES

2.6.1 Introduction

This section discusses two types of issues that impact on aircraft navigation at the Cairns Airport, namely:

- protection of operational air space (height restrictions), and
- interference with land based navigational aids caused by project buildings.

2.6.2 Protection of Operational Air Space (Height Restrictions)

For safety reasons there are limits to how high structures can be in defined areas round the Cairns Airport. These height restrictions are set by CAPL, CASA and Airservices Australia and are reflected in two maps:

- The Obstacle Limitation Surface (OLS) as identified on the Overlay Map in CairnsPlan, and
- The PANS-OPS for the Cairns International Airport Map contained in Chapter 3 of CairnsPlan.

Performance Criteria and Acceptable Measures for protection of operational air space (height restrictions) under the CairnsPlan are as follows.

Table 2-7 Performance Criteria and Acceptable Measures protection of operational air space

PERFORMANCE CRITERIA		ACCEPTABLE MEASURES		
Protection of Operational Air Space				
P1	The construction of buildings or other structures does not interfere with the movement of aircraft or the safe operations of the Airport.	A1.1:	Build into a) b)	dings or other structures do not protrude the: Obstacle Limitation Surface as identified on the Overlay Map; or PANS-OPS for the Cairns International Airport Map (contained in Chapter 3).

Source: CairnsPlan.

The height restrictions have the potential to affect the design of the permanent structures as well as potential construction methodology as they may impinge on operational crane heights.

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Based on the proximity of the project site to the airport the following acceptable measures apply:

- the OLS restriction limits building height to about 50 m AHD at the south of the site sloping to 120 m AHD at the north, and
- assistance has been offered by CAPL on securing access to new ASA PANS-OPS maps (in preparation). It is understood that these require slightly lower building heights than the OLS requirements.

2.6.3 Interference with Aviation Facilities

There are a number of aviation facilities (navigational aids) located in and around Cairns Airport to assist with aircraft management and safety at the airport. CairnsPlan contains a number of specifications relating to each type of facility and generally relates to the type and size of buildings within given proximities. Whilst the majority of the aviation facilities are located in and around Machans and Holloways beach and do not affect the project, the radar located at Cairns Airport has associated requirements that may impact on the design and location of some buildings.

Performance Criteria and Acceptable Measures for function of aviation facilities under the CairnsPlan are as follows. It should be noted that the only relevant aviation facility (based on site proximity – see **Figure 2-7**) is radar.

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Table 2-8 Performance criteria and acceptable measures function of aviation facilities

PERFORMANCE CRITERIA ACCEPTABLE MEASURES			BLE MEASURES
Function of Aviation Facilities			
P8: Development does not impair the function of th aviation facilities at Cairns Airport, Saddle Mountain, Mt Bellenden Ker and the northern beaches (Airservices Aust. Ref Nos 452, 453, 462A, 463, 464, 467A, 557, 566 & 1180) by creating physical obstructions, electrical or electro-magnetic interference and deflection of signals.	e A8.1 A8.2 A8.3 A8.3 A8.4 A8.4 A8.5 A8.6 A8.7 A8.8	N/A N/A (Ra the site tha wor a) a) b) c) d) N/A N/A N/A N/A	A (NDB). A (DME). adar). Works or uses are not located within sensitive area of the Redden Creek radar e as depicted on the Aviation Facilities Map t involve any buildings, structures or other rks: within 1000 metres of the site which exceed 4 metres in height; or between 1000 and 1500 metres of the site which exceed 8.7 metres in height; or between 1500 and 2500 metres of the site which exceed 13 metres in height; or between 2500 and 4000 metres of the site which exceed 21 metres in height. A (VOR). A (Glidepath). A (Localizer). A (VHF Communication).
	A8.9 A8.1	N/A) N/A	A (VHF Communication. A (Markers).

Source: CairnsPlan. It should be noted that CairnsPlan does not include ASA's radar 'area of interest' which extends to 15 km from the radar facility and hence includes most of the Resort Complex Precinct. See **Section 2.6.4**.

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Based on the proximity of the project site to the airport the following acceptable measures apply:

- within the 4 km 'Radar' radius (southern part of site only see **Figure 2-7** and **Figure 2-8**) above buildings within this area will need to be less than 21 m in height above (assumed from natural ground level), and
- the applicability of the 'Markers' criterion has been tested and is not a constraint to Aquis.

The project implication is that buildings on the airport side of the 4000 m radius line passing through the site cannot be more than 21 m in height (AHD not specified). As shown above, development on the Resort Complex Precinct is clear of this restriction.





2.6.4 Radar

a) Assessment Material November 2013

As part of consultation regarding Cairns International Airport issues, Airservices Australia (ASA) was supplied with details of the project on 12 November 2013, as it was then conceived. This included a copy of the then-current version of **Figure 3-1** (see **Figure 2-9**) showing combined constraints on the site, the concept land use plan, and available details of the height and bulk of buildings proposed for the site at the time, for which architectural details were not available. As such, the visual assessment was based on models made up of the known building footprint and its associated height (described as Built Form Envelopes or BFEs). Within these BFEs, a number of separate buildings with height limits as stated were being designed, with the design itself and exact location still to be determined. While it was known that the BFE approach overstates bulk, this was all that was available at the time to show ASA what was proposed. See **Figure 2-10**.







Referring to Figure 2-10:

- BFE 1 is on the site of the northern part of the current Resort Hotel Complex Precinct and was then modelled with a top height of 65.5 m AHD.
- BFE 2 is on the site of the southern part of the current Resort Hotel Complex (and an southern extension that is now not proposed) and was then modelled with a top height of 45.4 m AHD.
- BFE 3 is what was then the Water Park (now removed from the project) with a top height of 40.5 m AHD.
- BFE 4 is what was then the Stadium (now removed from the project) with a top height of 50.5 m AHD.

This material was the basis of the ASA assessment.

b) Assessment December 2013

Airservices Australia responded in December 2013 as follows (this is verbatim):

Services Impacted

- Airservices conducted analysis into the impact that this proposed development would have on the performance and coverage of the REK (Redden Creek) Terminal Area Radar.
- BFE 1 would not be acceptable as it significantly penetrates the area of interest and would cause an unacceptable loss of coverage, especially at lower flight levels where REK is the only radar with PSR (Primary Surveillance Radar) coverage and reliable SSR (Secondary Surveillance Radar) coverage.
- The impact identified from analysis of BFE 1 is based on a greater circle block with a maximum height of 65.5m AHD (as represented in the drawing below [not attached]).

Services Not Impacted:

- The effects of BFEs 2, 3 and 4 on radar surveillance would be acceptable. This proposal in its current form will not impact on any other Communication, Navigation or Surveillance (CNS) facilities operated by Airservices in the vicinity of the proposed location.
- With respect to procedures promulgated by Airservices in accordance with ICAO PANS-OPS and Document 9905, at a maximum height of:
 - 65.5 m AHD for BFE 1
 - 45.4 m AHD for BFE 2
 - 40.5 m AHD for BFE 3 and
 - 50.5 m AHD for BFE 4
- There will be no affect [sic] on any sector or circling altitude, nor any instrument approach or departure procedure at Cairns aerodrome.





New Assessment Requirement:

- Airservices requires that the developer of the proposed Aquis Great Barrier Reef Resort provide detailed plans for <u>all proposed structures</u> to be contained within BFE 1 in accordance with the plan criteria set out below:
 - Essential: Plans with co-ordinates in WGS 84 for each corner of each structure (to 0.1 second of arc or better) and elevations in AHD in dwg file format.
 - Essential: Maximum elevation for each structure to include any rooftop infrastructure.
 - Desired: Any additional plans, such as 3D models in dwg file format with datum.
 - Desired: Any accurate drawings, vertical and oblique in pdf.
 - Desired: Any advice on any cladding materials expected to be used on any structures proposed within BFE 1.
- These plans will enable Airservices to conduct detailed analysis of the proposed structures contained within BFE 1 (as to be constructed) for any level of impact on the REK (Redden Creek) Terminal Area Radar.

c) Subsequent Action

This issue was discussed in detail with ASA and CAPL on 13 February 2014 and it was confirmed that the problem with BFE1 appeared to be bulk, not height. BFE1 has a diameter of 500 m and a height of 61.5 m above the ground levels as it was then proposed. It was not contemplated that such a volume would be filled with buildings, only that any buildings would be contained within this volume.

Specialist radar consultant Aviation & Airspace Design Solutions (AADS) was appointed in April 2014 to help resolve this issue.

April 2014 Assessment

Discussion

AADS reviewed the available ASA information and found that the Aquis Resort site lies within the *Area of interest* defined by a circle with a radius of 15 000 m centred on the radar antenna and inclined upward at 0.25° above the horizon. AADS note that any sharp discontinuity protruding into the area of interest will impact on the performance. For example, single metal light towers, power pylons and city buildings all will cause horizontal beam bending, resulting in loss of accuracy for aircraft along the line of obstruction. These errors can be up to +/-0.5° or ten times the normal sensor error.







The desktop review found that the Aquis Resort as proposed would penetrate the "area of interest" relative to the Airservices sighting criteria for surveillance systems.

Further analysis of the surrounding obstacle environment indicated that a large radar shadow area is likely to already exist to the west of Cairns Airport due to extensive terrain intrusions. The magnitude of the Aquis Resort radar shadow is most likely to be experienced at low level. The level that radar performance would be degraded is also most likely to be below normal aircraft approach and departure profiles. Assessment of the nominal approach path to Runway 15 indicated that an aircraft would be approximately 1000 ft. (300m) above mean sea level (AMSL) over the Aquis Resort. This would equate to the approaching aircraft having approximately 230 m clearance over the highest building within the proposed development and potentially clear of any radar shadow likely to present at that point.

Discussions with Cairns ATC staff indicated that while low level shadow areas were already present as a result of the terrain associated with Earl Hill located 8.9 km from the radar head, based on normal approach profiles this did not present an operational issue.

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Conclusions

The desktop review found that the proposed development would penetrate the 'area of interest' relative to the Airservices sighting criteria for surveillance systems. It was noted that a number of existing penetrations, of a greater magnitude than that of the proposed development already exist. These include;

- substantial areas of terrain immediately to the west of the airport and within the Sensitive Zone
- buildings and terrain within the area of interest and associated with the Cairns populous area
- potential shipping associated with that of the Port of Cairns and operations at HMAS Cairns may be of a similar magnitude as the proposed development and to a large extent 'uncontrolled'.

The radar shadow produced as a result of the Aquis Resort would be experienced at low level and below normal aircraft approach and departure profiles. It is therefore assumed that although the shadow may exist it will have limited impact on normal operations at the airport.

The final assessment into any operational impacts as a result of the Aquis development will be subject to Airservices internal assessment. In the meantime, AADS suggest that a number of potential mitigation actions may be available to relieve the impacts identified. These are summarised in **Table 2-9** below.

AADS RECOMMENDATION	ASSESSMENT
Reduction in the building height to a level below the sensitive area criteria	This is not considered feasible given the desired yield requirements
Relocation and or reorientation of the higher elevation buildings to a point at least 6.1 km from the radar site	This is not feasible as this lies outside the Aquis Resort site
Relocation of the existing Redden Creek radar site	Relocation could be seriously considered if absolutely necessary
A reduction in the frontal area of buildings exposed to the radar beam	This is most likely to not be feasible given design constraints

TABLE 2-9 AVAILABLE OPTIONS AND ASSESSMENT

Source: AADS (2104) – column 1 and study team – column 2.

Recommendations

Noting that there are already penetrations greater than that potentially involved with Aquis, AADS recommend that further discussion be held with ASA to determine the best course of action.

Consultation with the service provider be undertaken to clarify the issues

- further design development be done in consultation with both the airport and the service provider so as to achieve the desired outcomes
- orientation and positional data be calculated so as to assess true impact
- develop an accurate assessment of the likely impacts on radar efficiency incorporating stakeholder consultation and technical specifications.





2.7 HELICOPTER USE

Advice from CAPL (see **Appendix A**) is that Cairns International Airport is 'Helicopter Mecca' and in general the proposed use is supported. Three companies already operate from the airport and The Pier in the Cairns CBD. Some land at Green Island, pontoons, and on remote islands. Whilst CAPL is supportive of this use, there are certain requirements. For example:

- CASA and Airservices Australia will have to approve any proposed helipad (CAPL recommends that if a helipad is being considered, it should be included in the original proposal rather than adding it later).
- Ensure that helicopter flight path does not pass over residential areas and remains under 500 feet in proximity of airport.
- Operation will need to be coordinated with the tower because the project is under the two flight paths.

The former Cairns Port Authority (no date) has produced a guidelines for 'neighbour friendly' helicopter use. A copy is included as **Appendix B**.

2.8 AIRPORT CAPACITY ISSUES

Advice from CAPL is that the airport has adequate capacity to handle all Aquis Resort-generated air traffic.

2.9 EMERGENCY MANAGEMENT PLANNING AND POLICIES

Advice received from CAPL (P Lamont pers. comm. 1 October 2013) is that the extra flights required by Aquis Resort are insignificant in terms of emergency management planning and policies. In summary, the advice was that any passengers or aircraft using Cairns Airport will be adequately covered under the current Airport Emergency Plan. Specific comments are as follows:

- New aircraft type are expected to be the same or similar to existing aircraft types operating at Cairns. The size of the aircraft capable of operating to Cairns is determined by the design standard of the runway and taxiway infrastructure. Cairns Airport is currently designed for Code E aircraft i.e. B747 400 size aircraft.
- New airline operators possibly several of the existing airline operators may also operate on new China routes. However new airlines are regularly welcomed to Cairns Airport. All airlines are members of the Cairns Airport Emergency Committee. Each is provided a copy of Cairns Airports Airport Emergency Plan (AEP). Each airline operating into Cairns is required to provide a copy of their Airline Emergency Plan to CAPL.
- Airport rescue and fire-fighting (ARFF) coverage ARFF currently operates to a level capable of covering Code E aircraft.
- Increased passenger numbers an overall increase in passenger numbers is not critical to Cairns Airports AEP response. It is the size of the aircraft and maximum number of passengers in it that determines the level of response to any aircraft emergency. It is not expected the Aquis Resort will vary what is already provided for in the Cairns Airport AEP.
- Foreign nationals CAPL already has a large number of foreign nationals operating through Cairns Airport which is recognised as an international gateway. CAPL recognises the importance of responding appropriately when any foreign nationals are involved in an airport emergency. Cairns Airport's AEP already addresses this issue.
- Natural disasters the airport's response to natural disasters under the AEP will not be impacted by Aquis Resort.





3 IMPLICATIONS FOR THE PROJECT

The following table provides a summary of the requirements imposed on the project due to its proximity to the airport and the actions proposed to address these requirements through the design, construction and operational phases of the project. Figures produced above have been used to compile a composite constraints map (**Figure 3-1**) for the site.







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Table 3-1 Summary of requirements and management measures

ISSUE	SPECIFICS	DESIGN PHASE ACTION (Relevant acceptable measures from CairnsPlan are in bold)	CONSTRUCTION PHASE ACTION	OPERATION PHASE ACTION	
Light management	Light emissions can potentially interfere with a pilot's navigational ability.	Ensure that the design complies with the requirements of the SPP (documented above).	Implement the EMP(C) and ensure that contractors are complying with contract requirements.	Ensure the operation continues to comply with light requirements particularly in relation to special	
	CAPL and CASA requirements are in the SPP 01/02 which is incorporated into CairnsPlan.	Ire Develop contract conditions and an Environmental Management Plan (Construction) (EMP(C)) that specifies lighting requirements that comply with SPP requirements.		events (e.g. fireworks).	
		No upward facing lights, search lights, laser lights, volcanos or flashing lights.			
		No light sources stronger than 450 Candela.			
		No external lighting in parallel lines of between 500 m and 1000 m long.			
		No reflective cladding.			
Wildlife management	There is the potential for the water body to attract large birds	Ensure the water bodies have steep sides to discourage use by waders.	Implement the EMP(C) and ensure that contractors are complying with	Refine and implement the wildlife management strategy.	
	(particularly pelicans) and waders.	Develop a concept level wildlife management strategy to implement during operation to minimise the potential to attract high risk birds.	nt		
		Develop an EMP(C) that addresses and minimises the attraction of birds to temporary water bodies that may develop during the construction process.			

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ISSUE	SPECIFICS	DESIGN PHASE ACTION (Relevant acceptable measures from CairnsPlan are in bold)	CONSTRUCTION PHASE ACTION	OPERATION PHASE ACTION
Wildlife management (cont.)	The flying fox camp at Yorkeys Knob does not currently pose a risk to aircraft. However, the project could potentially result in a change to the feeding and flight patterns.	Use existing information to determine factors most likely to cause alteration to behaviour of flying foxes and ensure that design elements minimise the risk of altering current behaviour.	Implement the EMP(C) and ensure that contractors are complying with contract requirements.	Refine and implement the wildlife management strategy.
		Develop a concept level wildlife management strategy to implement during operation to minimise the potential to attract high risk birds.		
		Develop an EMP(C) that minimises risk of construction activities impacting on flying fox behaviour in such a way that causes impacts on the operation of the airport.		
	Potential for land uses associated with the project to attract wildlife that pose a strike risk to aircraft. Potential for aquaculture ponds (if retained) to contribute to birdstrike risk.	Use design elements that reduce the risk of attracting wildlife. Develop a concept level wildlife management strategy to implement during operation to minimise the potential to attract high risk birds. Consider the acceptability of retaining the aquaculture ponds that are currently used as bird habitat.	Implement the EMP(C) and ensure that contractors are complying with contract requirements.	Refine and implement the wildlife management strategy
		Develop an EMP(C) that reduces the risk of attracting wildlife during construction activities.		
		Cover potential food and waste sources to prevent wildlife foraging.		

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ISSUE	SPECIFICS	DESIGN PHASE ACTION (Relevant acceptable measures from CairnsPlan are in bold)	CONSTRUCTION PHASE ACTION	OPERATION PHASE ACTION
Noise management	It is possible that noise associated with aircraft flying overhead will cause nuisance to visitors.	Incorporate noise mitigation measures into the design of accommodation buildings. Ensure that aspects of the design do not amplify the volume of noise generated by aircraft (through resonance). Acoustically insulate to minimum standards AS2021.		Airport noise must be accepted as a condition of approval of the development and that the development does not lead to pressure to modify airport operations (reduced noise levels, curfews etc.)
Air management	It is possible that air emissions from the project may affect operations at the airport.	Ensure the design does not include structures that emit gaseous plumes at high velocities or excessive smoke or steam. Develop an EMP(C) that includes a detailed dust management strategy to minimise dust emissions from the site during construction. No gaseous plume at a velocity exceeding 4.3 m/s. No smoke, dust, ash or steam.	Implement the EMP(C) and ensure that contractors are complying with contract requirements.	

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ISSUE	SPECIFICS	DESIGN PHASE ACTION (Relevant acceptable measures from CairnsPlan are in bold)	CONSTRUCTION PHASE ACTION	OPERATION PHASE ACTION
Navigational issues	Height restrictions are imposed to ensure that both temporary and permanent structures do not pose a safety risk to aircraft approaching the airport. CairnsPlan documents CAPL and CASA requirements. PANS-OPS maps are also produced by Airservices Australia and included in the CairnsPlan overlays.	Ensure the design does not incorporate permanent structures that contravene the requirements of CairnsPlan. Liaise with CAPL, CASA and Airservices Australia to ensure that temporary breaches of height restrictions are complied with. Develop contract conditions and an EMP(C) that ensures that construction activities comply with SPP requirements. Building heights to be below OLS and PANS-OPS (varies across site from 50 m to 120 m). At the southern extent of the site (within 4 km of the airport) buildings not to exceed 21 m. Max height of buildings on southern part of Resort Complex Precinct not to exceed 62 m (see also radar below). Max height of buildings on southern part of Resort Complex Precinct not to exceed 70 m (see also radar below). Allow for construction – i.e. cranes will most likely not be permitted to compromise the OLS.	Implement the EMP(C) and ensure that contractors are complying with contract requirements.	Ensure that the operation of the resort does not result in breaching of height restrictions.

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ISSUE	SPECIFICS	DESIGN PHASE ACTION (Relevant acceptable measures from CairnsPlan are in bold)	CONSTRUCTION PHASE ACTION	OPERATION PHASE ACTION
Interference with land based navigational aids.	Navigational aids (markers, transmitters, beacons and radar) are located at Redden Creek, Machans Beach and Yorkeys Knob. It is a Performance Criteria under CairnsPlan that the project does not create physical obstruction, electrical or electro-magnetic interference and deflection of signals. CairnsPlan (A8.1 – 8.10), documents acceptable measures for ensuring structures do not impair the operation of the aids.	Ensure that the design of the project complies with CairnsPlan requirements. Ensure that methods and equipment required to construct the project do not interfere with land based navigational aids. If necessary liaise with CAPL to ensure that the Performance Criteria are complied with. Ensure that buildings on Resort Complex Precinct do not interfere with radar (refer Section 2.6.4).	Ensure that contractors are aware of any potential for interference with navigational aids.	
Use of helicopters to/from the project	The option of including a helipad in the project scope has been considered and will result in particular requirements being placed on the project.	Locate the helipad in an area that ensures anticipated flight paths do not pass over residential/public areas. Ensure that the helipad complies with the requirements of CASA and Airservices Australia.	If helicopters are required for the construction of the project ensure they comply with CASA and Airservices Australia requirements.	Ensure helicopters remain within flight paths identified during the design phase to minimise impacts on the surrounding community (see 'neighbour-friendly' guidelines (Appendix B).

Source: Study team compilation based on material discussed in previous sections.

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4 CONCLUSIONS AND RECOMMENDATIONS

Whilst the proximity of the Aquis at The Great Barrier Reef Resort to the Cairns International Airport provides an opportunity to minimise transfer/travelling distances for visitors, it also presents constraints to the design, construction and operation of the project. Constraints to development have been identified and these are principally:

- height limitations to buildings (including during construction),
- restrictions on lighting,
- management needs associated with minimising risk of wildlife strike, and
- the need to mitigate impacts of aircraft noise on resort users.

It is recommended that further consultation with CAPL, Airservices Australia and CASA is undertaken throughout the detailed design stage in relation to the following:

- the OLS and potential temporary intrusions during the construction stage,
- potential impacts on navigational aids (especially Redden Creek radar),
- minimising birdstrike risk by attention to design of all waterbodies and construction management, and
- proposed location of a helipad and proposed helicopter operation.





5 REFERENCES AND DATA SOURCES

- ASK Consulting Engineers. 2013. Aquis Resort Yorkeys Knob Interim Draft Air Quality and Greenhouse Assessment Report. Prepared for Flanagan Consulting Group, 3 September 2013.
- Aviation & Airspace Design Solutions. 2014. Aquis Great Barrier Reef Redden Creek Radar Shadow Assessment. Prepared for Flanagan Consulting Group, 25 April 2014.
- Cairns Port Authority. No date. Helicopter 'Fly-Neighbourly' Procedures. Accessed at <u>http://www.cairnsairport.com.au/Corporate/Procedures-Guidelines.aspx</u> on 28 August 2013.
- Civil Aviation Safety Authority. 2011. Wildlife Hazard Management at Aerodromes. Advisory Circular. July 2011.
- Department of Infrastructure and Transport. 2012. *National Airports Safeguarding Framework Guideline C*. Prepared by the Australian Aviation Wildlife Hazard Group.
- Ecosure. 2008. Cairns International Airport Bird and Wildlife Management Strategy. Consultant's report prepared for Cairns Airport Pty Ltd. July 2008.



Maps extracted from CairnsPlan with site marked up plus composite map













APPENDIX A

MINUTES OF CONSULTATION ON AIRPORT ISSUES

8 Raintree Place, Edge Hill P O Box 616N NORTH CAIRNS QLD 4870

 Tel:
 (07) 4032 3180

 Fax:
 (07) 4032 4278

 Mobile
 0459 077 750

 Email:
 Alison.Burgoyne@EnvironmentNorth.com.au

Organisation: Cairns Airport, Environment North

File No: EN490/ 3528-02 EIS

Meeting Date: 2/8/2013

Meeting Time: 8:30-10 am

Attendees

CAPL: Kate McCreery Carr (General Manager Operations), Paul Lamont (Manager Operations), Colin Evans (Airside Operations Manager), Jeff McEachern (General Manager Assets), Matthew Williams (Environment), David Voss (Manager Compliance). Jane Piva (PA)

Environment North: David Rivett (Principal), Alison Burgoyne (Consultant).

Agenda item	Key points	Action
1. Introduction	 Background to client, project and EIS team provided. Discussion regarding anticipated timeframes and general EIS approach. 	IAS is available at http://www.dsdip.qld.gov.au/aquis-resort-at- the-great-barrier-reef-project/coordinator- general-projects/assessments-and- approvals/aquis-resort-at-the-great-barrier- reef-project.html
2. Measures to reduce wildlife strike risk	 CAPL made a submission in response to Rainbow Harbour that documented key wildlife management issues. The project crosses two approach paths including the standard night/bad weather/jumbo jet approach (ILS) which is directly over the project. The other is over Richters Creek (RNP). The large lake is a concern for attracting large birds (particularly pelicans) and waders. Steep sides on, & depth of, the lagoon will help prevent use by waders. Flying fox colony at Yorkeys Knob could become an issue if the project results in an alteration to their feeding and flight patterns. This colony is currently not a concern but could be if disturbed. Would be of use to find out what birds occur in the broader area that could colonise the site. CRC might have info on birds at Cattana wetlands. CAPL commissioned Avisure to do the original bird surveys and management plan. Ian Northcott currently has commission to undertake wildlife surveys on fortnightly basis but will only cover areas to the south of the project. 	 Jeff to provide copy of Rainbow Harbour submission. Paul to provide copy of CAPL Wildlife Management Strategy. Matt to provide guideline docs for contractor environmental management documents. Paul to provide contact details for Ian Northcott (CAPL's ornithologist). Matt to provide list of plant species to avoid in landscaping to minimise potential wildlife attraction. Environment North to provide fauna (bird particularly) list to CAPL for reference. Environment North to recommend best- practice approach suggested i.e., try to not attract birds of concern.

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Agenda item	Key points	Action
3. Fuel dumping	 "A myth" - is not regular practice, only occurs during emergencies. 	No action required.
	 If aircraft do need to dump fuel, they do so over water. Many aircraft cannot even dump fuel and instead burn it in the exhaust. 	
	 Commonwealth government has undertaken studies that demonstrate it is not common practice. They also undertake monitoring. 	
4. Lighting requirements	 CAPL and CASA requirements are in the SPP 01/02 which is incorporated into the CairnsPlan. All lights should be downward facing (like street lights). 	 Comply with CairnsPlan requirements. Jeff to provide Lighting zone plan specific to Cairns Airport.
	 It was noted that in many respects the pattern of lights from the resort are similar to what would occur with residential growth. 	 For detailed design refer to Manual of Standards MOS Part 139– Aerodromes.
	 No fireworks, upward facing lights (e.g. search lights, laser lights, volcanoes). 	
5. Current noise monitoring	 The Airservices Australia Website has actual real time noise monitoring documented in Yorkeys Knob. It also has interpretive reading that will give anticipated noise levels at given addresses. 	 Environment North to advise subbies (ASK) to research this. Contact Paul for any further advice.
6 – 8. Noise Issues	• A draft ANEF map has been produced for consultation. This shows that the project lies between the 25-30 ANEF at maximum capacity. This plan is not available but Environment North may note that a draft exists and that it reveals that the current contours will widen to the east to reflect the increased use of the Richters Creek corridor.	• Environment North to note a very important point: that the resort must mitigate the noise created by airport operations. It is critical that future development on the site does not lead to pressure to modify airport operations (reduced noise levels, curfews etc.).
	 Normally residential development would not be encouraged and would be heavily conditioned. 	
	• Noise mitigation measures to protect visitors from noise generated by aircraft will be required (will be a statutory condition) to ensure flight paths will not be an issue in the future.	
	• Quarterly reports are produced by Airservices Australia that document all flight arrivals (type of plane, arrival time etc.). ASK to contact Airservices Australia to get data (although it is sometimes up to 3 months late).	
	• Airport Environment Consultative Committee (AECC) exists (Paul is Chair) and includes representatives from the Yorkeys Knob, Holloways Beach ratepayers' Assn. as well as residents from the Esplanade.	

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Agenda item	Key points	Action
9. Intrusion into height restrictions	 CairnsPlan overlay is the appropriate source of height restrictions. 	 Paul to provide contact name at Airservices Australia to obtain PANOPS maps/discuss requirements
	 It is possible for temporary structures to intrude into this space – subject to assessment. 	 Jeff to provide copy of height overlay in GIS format (or AutoCAD).
	 CAPL, Airservices Australia and CASA assess applications. 	Environment North to provide plan and elevation of development superimposed and the superimposed
	• Cairns Hospital currently has a crane that exceeds the height restrictions (69 m in 46 me area, subject to approvals. 10 m extra incursion for an hour or so has been approved. Message is that approvals can be sought.	by CAPL.
	 The ability to approve will depend on exact location in relation to the PANOPS maps of the ILS approach. Airservices Australia have the PANOPS maps. This approach must be preserved. 	
10. Helicopter use and requirements	• Cairns Airport is "Helicopter Mecca" and in general the proposed use is supported. Three companies already operate from airport and The Pier. Some land at Green Island, pontoons, and on remote islands.	
	• There are requirements. CASA and Airservices Australia will have to approve a helipad. If a helipad is being considered, include it in the original proposal rather than adding it later.	
	 Ensure helicopter flight path does not pass over residential areas and remains under 500 feet in proximity of airport. 	
	• Operation will need to be coordinated with the tower because the project is under 2 flight paths.	
11. Issues that we should contact CASA	 CASA should be contacted and consulted particularly in relation to lighting. 	Paul to provide contact for CASA.
about	helicopter, height restrictions, and radar interference (i.e. reflection from tall buildings).	 Environment North to contact CASA and discuss proposal.
12. Other issues.	 No other issues that have not already been identified. 	• At the detailed design phase, the project team will need to secure specific technical expertise on airport operations.
13. Appropriate CAPL rep for CRG	 Paul is chair for the Airport Environment Consultative Committee. Recommends we contact Wendy Dowsett of Yorkeys Knob Ratepayers Association. 	 Paul to provide contact details for Wendy Dowsett and Margaret Dendle. EIS team to consider best way to engage with AFCC
	 Holloways Beach Ratepayers Association should also be contacted. Margaret Dendle. 	with AECC.
	 AECC to meet in the next couple of weeks (28th August @1230). May be opportunity to consult then. 	
14. Confirmation of Discussions	 Airservices Australia should be contacted regarding impacts on land based navigational aids at various locations (requirements are included in CairnsPlan). 	Environment North to contact Airservices Australia

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Regards

a.B.g. ~

Alison Burgoyne Consultant

Alison Burgoyne

From:	Tattam, Steve <steve.tattam@airservicesaustralia.com></steve.tattam@airservicesaustralia.com>
Sent:	Wednesday, 28 August 2013 9:08 AM
To:	Alison Burgovne
Cc:	'PARNELL, GREG'
Subject:	RE: Airport requirements in relation to AQUIS at Great Barrier Reef

Hi Alison,

Thank you for the additional reference information.

I will need some time at this end to discuss the best plan moving forward for any type of impact study that will be required. Initial thoughts are that the proponent may need to engage an aviation consultant to conduct a full aviation impact study who will be better positioned to keep pace with planning variations.

However, I am looking at some preliminary considerations before I provide you with some more formal advice on the best approach to an assessment.

Regards,

Steve Tattam Aviation Relations Manager Corporate and Industry Affairs Airservices Australia

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From: Alison Burgoyne [mailto:Alison.Burgoyne@environmentnorth.com.au]
Sent: Tuesday, 27 August 2013 2:33 PM
To: Tattam, Steve
Cc: 'PARNELL, GREG'
Subject: RE: Airport requirements in relation to AQUIS at Great Barrier Reef

Hi Steve, further to my email last week, we have developed some maps showing our project location in relation to the airport and various constraints. I have attached these for your reference. We are unsure about the implications of the PAN-OPS maps and are keen to discuss this with you even if it must be by teleconference.

Regards,

Alison Burgoyne (O'Brien) Consultant



Environment North Pty Ltd 8 Raintree Place Edge Hill PO Box 616N North Cairns QLD 4870 From: Tattam, Steve [mailto:steve.tattam@AirservicesAustralia.com]
Sent: Thursday, 22 August 2013 5:31 PM
To: Paul Lamont
Cc: Alison Burgoyne; 'PARNELL, GREG'
Subject: RE: Airport requirements in relation to AQUIS at Great Barrier Reef

Thanks Paul,

Alison, I will contact you soon once I've reviewed your email below and the attached minutes.

I've copied in Greg Parnell, who is the CASA inspector that manages this region.

Regards,

Steve Tattam Aviation Relations Manager Corporate and Industry Affairs Airservices Australia

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From: Paul Lamont [mailto:Paul.Lamont@cairnsairport.com.au]
Sent: Thursday, 22 August 2013 1:10 PM
To: Tattam, Steve
Cc: 'Alison Burgoyne'
Subject: Airport requirements in relation to AQUIS at Great Barrier Reef

Steve,

I had given Alison an incorrect email address for you. Copy of Alison's email fyi. Regards

Paul Lamont MANAGER OPERATIONS





From: Alison Burgoyne [mailto:Alison.Burgoyne@environmentnorth.com.au]
Sent: Wednesday, 21 August 2013 4:54 PM
To: steve.tatum@airservicesaustralia.com
Cc: David Rivett; Paul Lamont
Subject: Airport requirements in relation to AQUIS at Great Barrier Reef

Good Afternoon Steve,

As discussed a moment ago, below is a list of topics we were hoping to discuss with you and (ideally simultanteously) CASA in relation to potential restrictions and requriements that may apply to the proposed AQUIS at Great Barrier Reef. As I mentioned we have already undertaken initial consultation with CAPL (mintues are attached) and have a fairly good idea of the general requirements although our understanding is largely limited to the CairnsPlan supplemented by invaluable information that Paul Lamont has provided.

As general background, we are taking a staged approach to the project. The first stage is to undertake an assessment of opportunities and constraints that the environment poses on the project (currently underway). We will then be undertaking a detailed design and definition of the project to observe the constraints and make best use of the opportunities. Following detailed design, the actual EIS will be completed on a final project that will hopefully have the statutory and other requirements already accomodated. The idea is to make the project as "approaveable" as possible and remove the need for iterations of design and conditioning. Hence, we consider your advice regarding potential constraints to be critical to the design and definition of the project and we would welcome the opportunity to discuss these in detail.

Specifically we have identified the following issues:

- Advice on the possibility of obtaining authority for short term, temporary, programmed and intensively managed transgressions of the airport obstacle limitation surfaces. Ultimately we are trying to determine if cranes, for example, could transgress this space for short periods during construction.
- Potential for helipad and requirements to be included in design/planning.
- Interference with navigational aids.

We believe we have a good understanding of the potential wildlife strike, noise, air and lighting issues. However, if you have advice regarding any of these topics we welcome your input.

The project is on a very tight timeframe with the draft EIS programmed to be completed by end of September. So, any assitance you can render would be greatly appreciated.

Thanks very much for your time this afternoon and we look forward to hearing from you.

Regards,

Alison Burgoyne Consultant



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David Rivett

From: Sent:	Tattam, Steve <steve.tattam@airservicesaustralia.com> Tuesday, 17 December 2013 2:55 PM</steve.tattam@airservicesaustralia.com>
То:	David Rivett
Cc:	Paul Lamont; Lee, Clive; Bowthorpe, Kevin; 3528-02EIS@flanaganconsulting.com.au; pat@flanaganconsulting.com.au; 'PARNELL, GREG'; Sparrow, Andrew
Subject:	Airservcies Australia - CS-MA-005 - AQUIS Great Barrier Reef Resort Cairns
Importance:	High

Hi David,

Airservices Australia has finalised its preliminary assessment of the proposed Aquis Great Barrier Reef Resort to ascertain if any level of impact would exist on the services we provide to aviation at that location. This assessment was based on the BFE layout indicative of the diagram included below.

Services Impacted:

Airservices conducted analysis into the impact that this proposed development would have on the performance and coverage of the REK (Redden Creek) Terminal Area Radar.

BFE 1 would not be acceptable as it significantly penetrates the area of interest and would cause an unacceptable loss of coverage, especially at lower flight levels where REK is the only radar with PSR (Primary Surveillance Radar) coverage and reliable SSR (Secondary Surveillance Radar) coverage.

The impact identified from analysis of BFE 1 is based on a greater circle block with a maximum height of 65.5m AHD (as represented in the drawing below).

Services Not Impacted:

The effects of BFEs 2, 3 and 4 on radar surveillance would be acceptable. This proposal in its current form will not impact on any other Communication, Navigation or Surveillance (CNS) facilities operated by Airservices in the vicinity of the proposed location.

With respect to procedures promulgated by Airservices in accordance with ICAO PANS-OPS and Document 9905, at a maximum height of:

- 65.5m AHD for BFE 1,
- 45.4m AHD for BFE 2,
- 40.5m AHD for BFE 3 and
- 50.5m AHD for BFE 4

there will be no affect on any sector or circling altitude, nor any instrument approach or departure procedure at Cairns aerodrome.

New Assessment Requirement:

Airservices requires that the developer of the proposed Aquis Great Barrier Reef Resort provide detailed plans for <u>all proposed structures</u> to be contained within BFE 1 in accordance with the plan criteria set out below.

These plans will enable Airservices to conduct detailed analysis of the proposed structures contained within BFE 1 (as to be constructed) for any level of impact on the REK (Redden Creek) Terminal Area Radar.

Plan Criteria:

- Essential: Plans with co-ordinates in WGS 84 for each corner of each structure (to 0.1 second of arc or better) and elevations in AHD in dwg file format.
- Essential: Maximum elevation for each structure to include any rooftop infrastructure.
- Desired: Any additional plans, such as 3D models in dwg file format with datum.

- Desired: Any accurate drawings, vertical and oblique in pdf.
- Desired: Any advice on any cladding materials expected to be used on any structures proposed within BFE 1.



Inset: BFEs assessed by Airservices for proposed Aquis Great Barrier Reef Resort - Cairns

Kind Regards,

Steve Tattam

Aviation Relations Manager Corporate and Industry Affairs Airservices Australia

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APPENDIX B

HELICOPTER 'FLY-NEIGHBOURLY' PROCEDURES



CAIRNS INTERNATIONAL AIRPORT HELICOPTER "FLY NEIGHBOURLY" PROCEDURES

After consultation between helicopter operators, Airservices Australia and Cairns Port Authority the following "Fly Neighbourly" procedures were established with helicopter operators are to operate under.

Compliance with these procedures are monitored by both Airservices Australia and Cairns Port Authority. The procedures can amended, by agreement, as required.

- 1. Arrivals Flights from Pier/City
 - Request direct route Pier to the Tower east of Runway 15/33 and await clearance for runway crossing before commencing left turn on approach to designated landing area.
- 2. Arrivals Flights from South West of Airport
 - Request western VFR corridor route west and north of Mt Lumley, if available, remaining clear of residential areas enroute to airport, or
 - Maintain 1000 feet east of highway / west of Runway 15/33. Remaining clear of residential areas, turn right onto approach to designated landing area.
- 3. Departures Flights to North East/West
 - Maintain upwind east of highway / west of Runway 15/33 until 1000 feet before commencing turn. Request left turn if traffic permits to the north east, or commence right turn, avoiding residential areas wherever possible.
- 4. Circuit Training
 - Avoid use of Bell 47's in the western training areas.
 - Use eastern training areas during quieter traffic periods.
 - For western circuits parallel Runway 15, maintain upwind east of highway / west of Runway 15/33 until 1000 feet before commencing right turn. Preferred downwind leg east of highway / west of runway.
 - Avoid residential areas wherever possible.