Archerfield

Brisbane's Metropolitan Airport

Master Plan 2011-2031

PART 2: Environment Strategy 2011-2016

Archerfield Airport Master Plan 2011-2031

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May 2012

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Foreword

Archerfield Airport Corporation (AAC) is pleased to present the Archerfield Airport Environment Strategy (AES) for 2011-2016. This version includes updates to synchronise the AES with the Master Plan that we have just prepared.

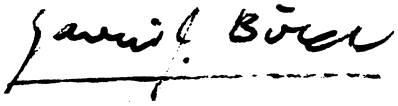
Archerfield Airport is Brisbane's metropolitan airport. It plays a vital role in meeting the needs of general aviation in south east Queensland and has an emerging role as a focus for a range of land based aeronautical, transport, industrial, commercial and recreation enterprises.

The airport is well located in the midst of the Archerfield and Rocklea industrial area and is served by a range of land based transport including heavy rail, road and motorway access to the centre of Brisbane and to the rest of Australia.

This strategy has been prepared in accordance with the *Airports Act 1996*. It reflects on the achievements of the past twelve years and defines a framework for the ongoing mangement of the airport environment.

It continues to focus on the main issues for the airport which relate to surface water management, groundwater protection, noise control, management of hazardous goods, and conservation of heritage and natural environmental values. It also responds to the new and emerging challenges of efficient water and energy use.

Over the coming years, evolving technology and methods will provide further opportunities for improvement to the environmental performance of the airport. With this in mind, AAC will seek ongoing improvement and will periodically review its environmental policies to ensure that best practice is applied.



Gavin J. Bird AM
Managing Director
Archerfield Airport Corporation
May 2012

Summary

INTRODUCTION

The Archerfield Airport Environment Strategy 2011-2016 (AES) is a five year plan for managing the environment at Archerfield Airport, Queensland. The location of Archerfield Airport is shown in Figure 1.

The AES addresses the ongoing environmental management of the airport site. It also provides the framework for responsible environmental management by airport tenants.

This strategy comprises:

- a statement of environmental responsibilities that apply to Archerfield Airport;
- a description of the airport environmental management system, including the process by which AAC implements the AES and related environmental management procedures;
- the AAC corporate environment policy;
- a summary of existing environmental issues, management responses to those issues and an action plan to address them;
- details of the ongoing consultative processes AAC uses to implement and review the AES.

This strategy should be read in conjunction with the Archerfield Airport Master Plan that sets out AAC's 20-year vision for the development of the airport.

ACHIEVEMENTS 1998-2011

AAC has over the period 1998-2011 achieved a number of milestones which have contributed to the improvement of the airport environment.

Studies have been completed, Environmental Management Procedures (EMPs) prepared, major drainage works have been implemented, water and energy use has been audited, water conservation measures implemented, the airport environment has been monitored and analysed, and relationships with key stakeholders strengthened.

A summary of these achievements is provided in Chapter 1.

AAC ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)

Environmental responsibilities

AAC maintains the runways, taxiways, grassed areas, and infrastructure; develops new airport facilities; leases sites; and oversees environmental compliance by tenants.

AAC prepares the AES; develops and maintains the airport's environmental management system; undertakes environmental reviews of relevant aspects of the airport; works with the Airport Environment Officer (AEO) and tenants to protect the environment of the airport and assist with the investigation of incidents on the site; liaises with environmental authorities; and provides annual reports to Department of Infrastructure and Transport (DIT) on progress on implementing the AES.

These responsibilities are established through legislation and are set out in Chapter 3 of this strategy and in the airport Environmental Management Procedures (EMPs).

AAC tenants are responsible for environmental management of their leased site in accordance with the AES, lease conditions and relevant legislation, standards and guidelines; providing practical assistance to AAC in developing, reviewing and revising the AES; adhering to requirements of the AES; devising environmental management procedures and implementing improvements specific to the lease site; and adhering to appropriate dangerous goods handling and storage standards, and to occupational health and safety standards.

Scope

The Archerfield Airport EMS addresses AAC operations, existing tenants, new facilities, non-aviation tenants and activities, and emergency events occurring on the site.

It comprises this Strategy, the EMPs, and the management processes that are in place.

AAC works with tenants to ensure that all responsible parties are aware of their environmental obligations.

Environmental Management Procedures

In February 2003, AAC completed a fundamental review of its EMPs. The EMPs include procedures for assessing prospective tenants, communication and consultation, emergency preparedness and response, minor and major spill response, environmental awareness and training, tenant environmental reviews, environmental reviews at the end of a tenancy, and assessment of new development works.

Action plan

The actions identified in the AES are summarised in the *Archerfield Airport Environment Action Plan*, which is included in Appendix B.

Communication

AAC communicates with a variety of parties both on the site (tenants and operators) and external to the site.

Key aspects relevant to environmental management include:

- facilitation by AAC of monthly management meetings involving the AEO, Airport Building Controller (ABC) and AAC personnel;
- a rolling program of reviews of tenant operations;
- provision of information on the AAC web site;
- targeted consultation with stakeholders on specific issues;
- community consultation on major projects;
- regular 12 monthly reporting of environmental matters to DIT;
- environmental training and education.

Environmental training

The majority of current AAC staff have undertaken environmental awareness training in recent years. Training is ongoing, responsive to needs. AAC personnel and tenants will be briefed on the new AES.

AIRPORT ENVIRONMENT POLICY

AAC recognises the importance of maintaining and where practical, enhancing the quality of the environment on Archerfield Airport and neighbouring areas.

Its commitment and actions to realise this are described in the AAC Corporate Environment Policy in Chapter 3.

CURRENT ENVIRONMENTAL STATUS, ISSUES, AND ACTIONS

The AES includes for each aspect of the environment, management objectives, a statement of existing conditions, potential impacts, management measures, and targets for the planning period.

The information is based on a review of past studies and more recent investigations of groundwater, surface water, potable water consumption, asbestos and heritage.

More detail is provided in Chapters 4 to 13.

Archaeology

In 2001 AAC completed a *Cultural Heritage Assessment and Management Plan: Archerfield Airport, Brisbane*. The findings have informed subsequent development decisions, including new tenancies in the Beaufighter Avenue/Mortimer Road and Central Aviation precincts.

There is no evidence of archaeological sites or features that require specific management at this time.

European heritage

God's Acre Cemetery and the Airport Terminal and Administration building are significant historic features. In addition, there are some hangars and other buildings that mark important phases in the development of the airport.

AAC has invested more than $1M in heritage projects. In 2007 AAC restored the Shell building. In 2009 AAC completed the refurbishment of the Terminal building which

has once again become the airport administration offices.

The Friends of God's Acre Inc has also undertaken conservation works at the cemetery, with the support of AAC.

Consideration will be given to conserving or relocating other identified features in future development projects.

Flora and fauna

The airport environment has been heavily modified since prior to the establishment of the airport, when the site was farmed.

The main operational areas have been subject to a continuous maintenance program that has included mowing and removal of large trees where these infringe on obstacle clearance standards.

The area fringing Oxley Creek has some remnant values, and this land has been incorporated into a green buffer.

A flora and fauna assessment of the buffer area (shown in Figure 5 *Development precincts*) will be undertaken prior to any future development in this area.

Air emissions

There are negligible emissions to air. Establishments such as paint shops that emit to air have appropriate filters installed and these are maintained in accordance with Brisbane City Council requirements and are inspected by the AEO.

Ozone depleting substances

A detailed audit of the airport in 1993/94 identified all equipment containing ozone depleting gasses. All BFC fire extinguishers were removed in 1997, and there are no remaining air conditioners filled with Freon/CFC's.

Ongoing environmental reviews by AAC seek to identify any ozone depleting gasses on site. If any are identified their removal will be negotiated.

Surface water

The airport surface water falls into six sub catchments (Figure 7), and is conveyed ultimately to Oxley Creek by a network of open and piped drains. Two detention basins have been constructed to help manage the peak flows, and improve water quality. Rainwater tanks have been installed in a number of tenancies, and in new developments undertaken by AAC.

Groundwater quality

Groundwater quality is monitored annually, and since this practice commenced in 1993, water quality has generally conformed to or exceeded relevant environmental criteria. Localised elevations are being addressed progressively with the AEO.

The bore locations and the direction of groundwater flow are shown in Figure 8 *Groundwater*.

Soil

With the exception of BP Truckstop (which was subject to soil contamination from a leaking storage tank, discovered in 2006), there are no known areas of soil contamination that pose a threat to the environment of the airport.

Assessments show that localised contamination levels are within accepted criteria. Any soil contamination at the Truckstop is being managed by BP in accordance with a remediation and monitoring program.

Hazardous materials and waste

Existing asbestos is recorded in the airport asbestos register, which is kept up to date as works are completed.

The storage and handling of hazardous materials is required to comply with relevant State legislation, and this is assessed during tenant environmental reviews.

Waste is managed and disposed of in accordance with Trade Waste requirements.

Natural resources and energy

Potable water use has been reviewed and in 2008 a management plan formulated to minimise consumption and improve efficiency.

Energy usage is considered as part of the periodic environmental reviews of tenant and AAC operations. Opportunities for energy efficiency are also considered in the design,

siting and specification of new works by AAC and the assessment of new works by tenants.

Noise

Potential noise sources from on ground activities at Archerfield Airport are limited to maintenance and general commercial activities conducted on site, and ground running of aircraft.

Noise emissions are considered as part of the assessment of new tenancies and ongoing tenant environmental reviews.

To address noise from ground running of aircraft, dedicated engine run-up areas have been established away from the main centres of development.

NEW FACILITIES

AAC is committed to sustainable development.

The environmental performance of the recently refurbished offices in the historic Terminal building is a prime example of this.

Improvements in energy efficiency, water use and indoor environment quality, whilst maintaining the heritage aspects of the building, were paramount to this project.

Since completion, AAC energy consumption has been reduced by almost half, saving around 5000 kg of greenhouse gas emissions per annum.

Water tanks have been incorporated into new developments such as the Corporate Hangars and the Lot 15 warehouse.

Additional water storage facilities have been created to collect rain water for use in new developments and for watering the grass runway complex for dust mitigation.

AAC requires new tenants to identify all potential environmental issues or impacts, and assists them to clarify applicable legislative requirements and best practice management guidelines that will be applied.

AAC's EMPs include procedures to manage this process.

The AEO and Airport Building Controller (ABC) (if required) are involved in this process.

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Archerfield Airport Environment Strategy 2011-2016

Figure 1 **Airport location**

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1 Introduction

1.1 ARCHERFIELD AIRPORT LOCATION, ROLE AND CONTEXT

1.1.1 Airport location and role

The airport is located 12 kilometres by car south-west of the Brisbane Central Business District (CBD). It is shown in Figure 1 *Airport location.*

Archerfield served as Queensland's main airport between 1931 and 1949 and played a strategic role during World War II. It was also an important facility for the development of airmail services for Australia. Archerfield now operates as a general aviation and secondary airport for greater Brisbane. It is also the headquarters for Emergency Management Queensland helicopter rescue.

The airport has a multi-runway configuration comprising two parallel runways in two directions. Aircraft parking is currently available for 200 fixed wing aircraft. Helicopter operations are facilitated with two approved helicopter landing sites (plus the EMQ helipad), and separate parking areas.

1.1.2 Airport context

The site covers approximately 257.7 hectares. It is an important part of the Archerfield/Rocklea/Acacia Ridge area, in an industrial and transport services corridor of regional significance. The airport is surrounded to the north, north-west, east, and south by mostly industrial and related uses. Some residential areas are located at Acacia Ridge south of Mortimer Road (and east of Beatty Road) and to the east of the site, near Beaudesert Road.

To the west and south-west is Oxley Creek. This, in conjunction with the nearby Blunder Creek forms part of a regional habitat link and open space corridor running through the southern urban area of Brisbane. This corridor joins to the Brisbane River (to the north of Archerfield).

The area between the Oxley and Blunder Creeks is an important sand resource, and there is active sand extraction underway on the south side of Oxley Creek, approximately 800 metres from Mortimer Road (to the south of the airport).

The airport and surrounding district is shown in Figure 2 *Airport context*. Existing conditions on the airport are shown in Figure 3 *Aerial view*, and Figure 4 *Existing conditions*.

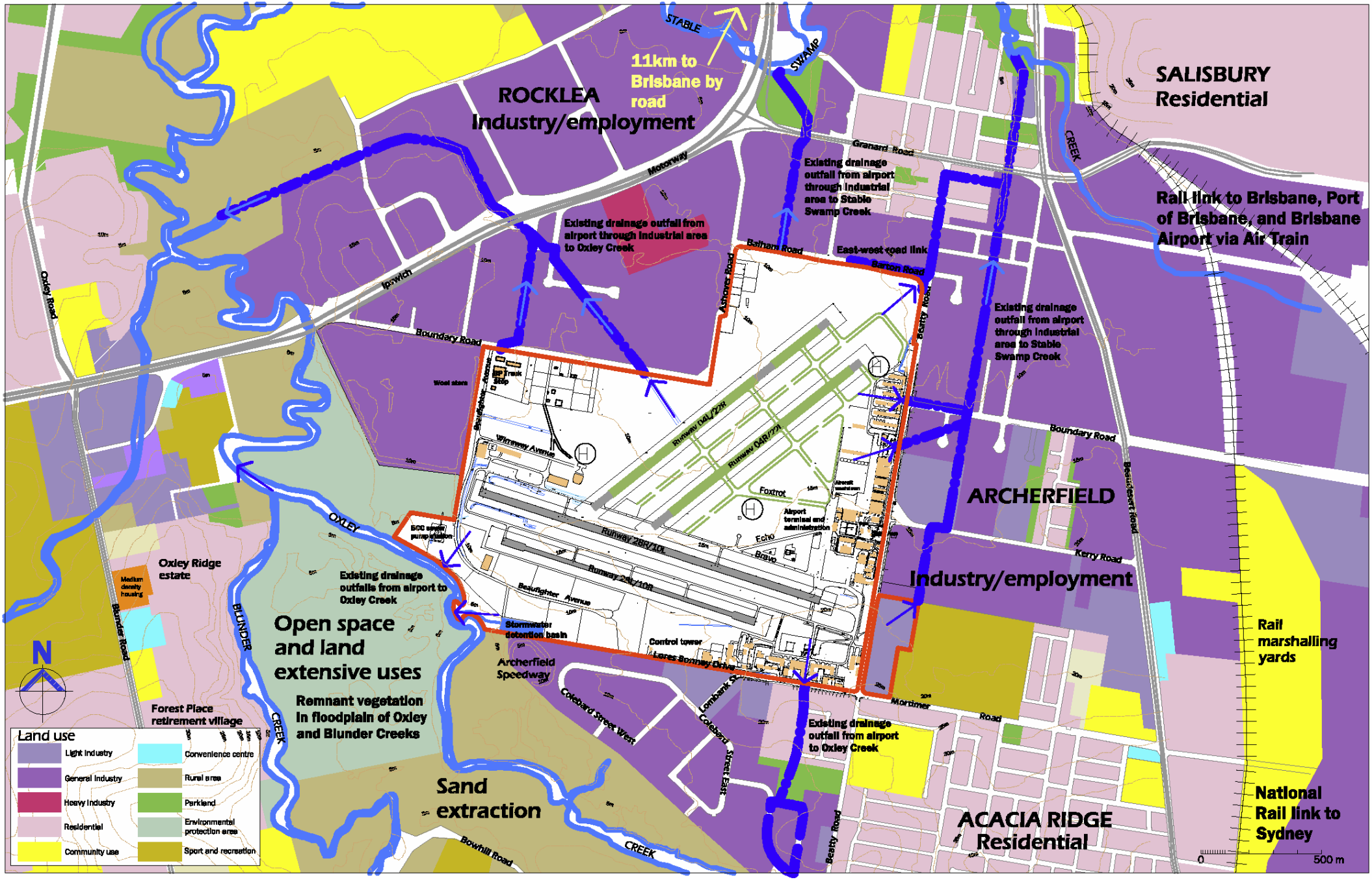

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Figure 2 **Airport context**

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Figure 3 **Aerial view**

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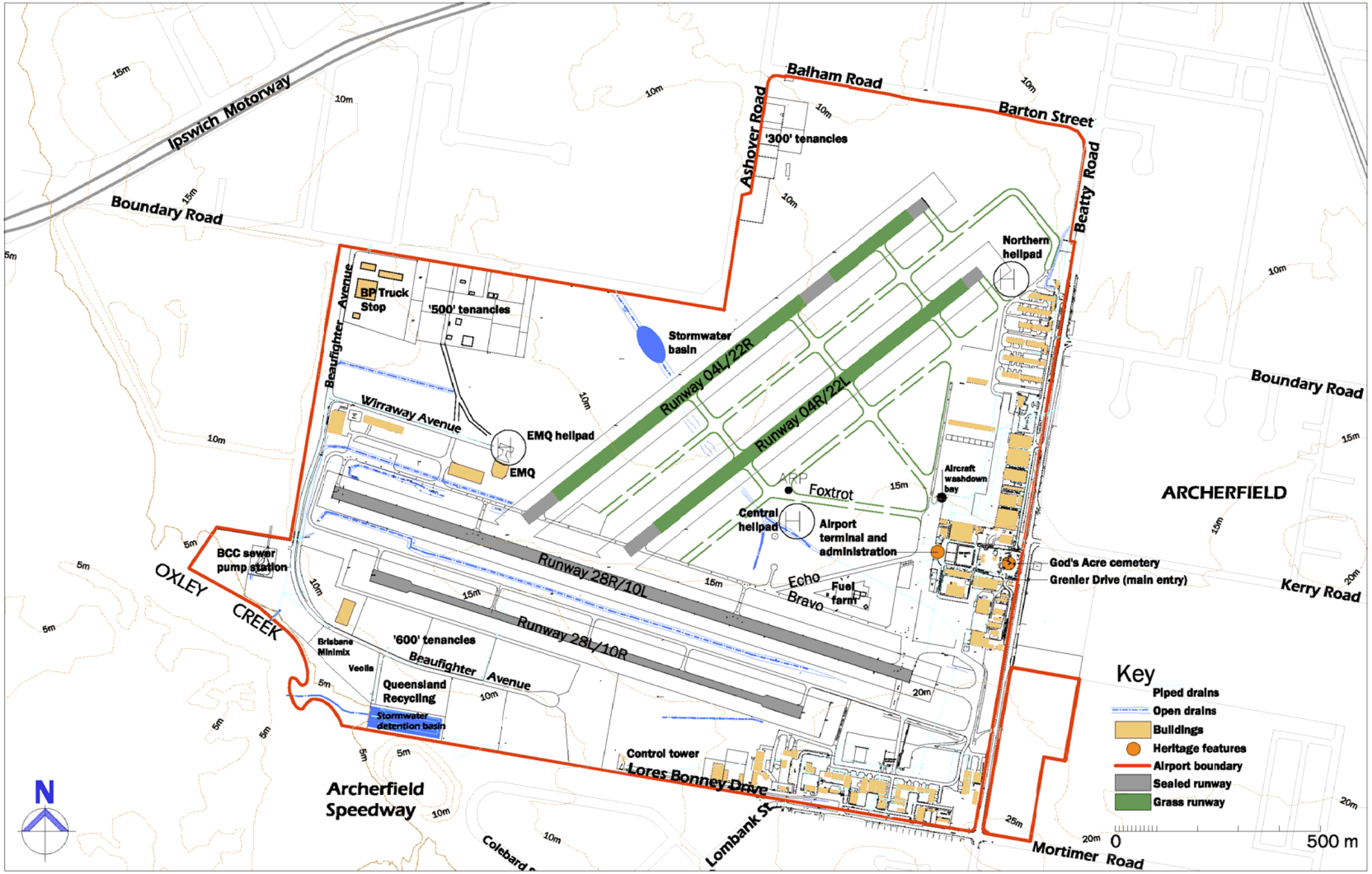

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Figure 4 **Existing conditions**

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The site slopes gently north-west from a high point on the corner of Beatty Road and Mortimer Road (elevation about 25 metres) to a low point of about 8 metres at Boundary Road (near the intersection with Ashover Road). The south west corner falls to Oxley Creek.

1.1.3 Ground transport access

The airport is highly accessible to ground transport, being close to the Ipswich Motorway (to the west) and the main National Rail freight terminus on the Brisbane to Sydney line (approximately 1.5km to the east).

The regional road system provides arterial linkages north to Brisbane and the Sunshine Coast via Ipswich Motorway, South East Freeway or Gateway Motorway; south east to the Gold Coast via the Pacific Highway or inland to Sydney via Ipswich. These links are shown in Figure 1.

1.2 ARCHERFIELD AIRPORT CORPORATION

Archerfield Airport Corporation (AAC) has operated and managed Archerfield Airport, Brisbane since June 1998.

AAC, as Airport Leasing Company (ALC), is a locally owned business committed to the long-term success of the airport as a significant general aviation facility serving south-east Queensland.

AAC is committed to:

- nurture and maintain the aviation activities of the airport;
- attract quality commercial developments to land that is not required for aviation purposes in the long term;
- encourage and work with the aviation community to ensure that healthy growth and quality services are achieved so that Archerfield Airport is recognised as an aviation centre of quality;
- apply appropriate pricing policies for recovery of aviation related costs;
- protect and where possible enhance the airport environment; and
- build partnerships with government, industry and the local community to facilitate the realisation of this vision.

1.3 SCOPE OF THE ENVIRONMENT STRATEGY

Under the *Airports Act 1996* and regulations, AAC is required to develop and implement an AES that:

- sets out AAC's objectives for the environmental management of the airport;
- identifies environmentally significant areas within the airport;

- identifies sources of environmental impact associated with airport operations;
- defines studies, reviews and monitoring to be carried out in relation to the environmental impact of the airport;
- sets timeframes for completion of audits and reviews;
- sets out specific measures to be implemented by AAC to address existing or potential impacts, and timeframes for completion of these; and
- provides details of consultation undertaken in preparing the AES.

1.4 OVERVIEW OF AES 2011-2016

Under the *Airports Act 1996*, the AES applies to a five year period, and is then reviewed,

On 26 March 2010, the current AES for the period 2010-2015 was approved by the Minister.

Recent changes to the *Airports Act* require that this AES be reviewed so that it applies to the initial five years covered by the Master Plan (2011-2016).

The AES has been revised to synchronise the AES with this five year planning period.

The AES addresses the management of environmental issues arising from airport activities and operations.

It covers the ongoing environmental management at the airport arising from the use of the airport site.

The relationship between the various elements of the AAC environmental management system are illustrated in Figure 6, in section 3.

This strategy comprises:

- a statement of environmental responsibilities that apply to Archerfield Airport;
- a description of the Airport Environmental Management System, including the process by which AAC will implement the AES and related environmental management procedures;
- the AAC corporate environment policy;
- a summary of existing environmental issues, management responses to those issues and an action plan to address them;
- details of the ongoing consultative processes AAC will adopt in implementing and reviewing the AES.

This strategy should be read in conjunction with the *Archerfield Airport Master Plan* that sets out AAC's 20-year vision for the development of the airport. The current Master Plan (2005-2025) is under review as part of the 5 yearly

planning process for the airport. Following consultation on the preliminary draft Master Plan, AAC anticipates that the replacement plan will be introduced in 2012.

This AES builds on the previous strategies (1999, 2000, 2005 and 2010) and the current approved Master Plan.

1.5 ENVIRONMENTAL MANAGEMENT ISSUES

The principal environmental management issues at Archerfield Airport are:

- management of new development works to minimise and ameliorate impacts on the environment;
- conservation of any significant flora and habitat values along Oxley Creek;
- protection of storm water and ground water quality from contamination by pollutants from the airport;
- encouraging the efficient use of water and energy;
- ensuring that all chemicals on airport are appropriately handled, used, stored and disposed of;
- containment and management of spills;
- appropriate containment and handling of all asbestos in buildings and plant on airport (as identified in the asbestos audit and register);
- protection of any cultural and heritage values (pre and post contact); and
- ensuring that airport tenants are aware of their environmental obligations and comply with all relevant requirements.

1.6 OVERVIEW OF ACHIEVEMENTS 1998-2011

Over the period 1998-2011, AAC has achieved the following milestones. These have all contributed to improvements to the management of the airport environment.

Table 1 Summary of achievements 1998-2011

Activity	Date
Environmental management system	
AAC adopted new airport *Environmental Management Procedures* (EMPs).	2003
AAC reviewed EMPs, and identified minor revisions	2010
Heritage	
AAC has supported the restoration works by Friends of God's Acre Inc, including with donation of funds and provision of maintenance services over the past 11 years.	1998 onwards
AAC restored the Shell building	2001
The *Cultural heritage assessment and management plan* for the airport was completed.	2003

Activity	Date
AAC refurbished the Airport Terminal building and relocated its administration offices to the upper floors of the building	2009
Flora and fauna	
Fire Ant control has been undertaken by helicopter and motorcycle broadcasting.	2001 onwards
Creation of a conservation zone in the south-west part of the airport, adjacent to Oxley Creek, to provide a permanent buffer	2009
Air quality	
Existing data on airshed quality obtained from the DERM (formerly EPA) monitoring station at Rocklea	2004
Inventory of existing airport tenants and users was compiled as a baseline for possible future air quality assessments	2004
Dust	
Wirraway Avenue was reconstructed and resurfaced.	2000
Beaufighter Avenue was sealed and extended into the Beaufighter Precinct.	2000
Surface water management	
The former open drainage line through the Beaufighter Boundary Road, Runway and Beatty precincts (which was subject to significant scouring) was piped, and silt traps and dissipation structures installed to moderate peak flows and manage water quality prior to discharge to Oxley Creek.	2001
A significant new stormwater detention basin was constructed in the Beaufighter precinct, treating stormwater prior to its discharge to the Oxley Creek.	2001
The stockpile areas for the Queensland Recycling facility on Beaufighter Avenue drain to a sedimentation basin for treatment prior to discharge to the main drainage system on airport. Water is recycled for dust suppression and irrigation purposes.	2001
A triple interceptor was installed to treat water from the aircraft washdown bay. The washdown bay was signed to encourage its use.	2002
The second wash down bay (at the eastern end of Taxiway Bravo) is no longer in use. Signage has been removed and pilots are advised to use the alternative, central facility.	2002
Swale drains have been constructed along the southern boundary of the Beaufighter Precinct.	2003
The open drain running north-west from the Runway precinct, under the 04/22 runways to Boundary Road has been upgraded with the piping of the section near the runways, and the creation of a detention basin in the Boundary precinct. This will modulate peak flows entering the drainage system through Rocklea, which ultimately discharges to Oxley Creek approximately 2 km downstream of the airport.	2008
Stormwater tanks have been provided for the new corporate hangars on Wirraway Avenue, and the new warehouse constructed by AAC on Beaufighter Avenue to retain stormwater for use on site, and assist with reducing peak discharge volumes to Oxley Creek.	2007-8
Small rock landscaping has been introduced to localised sections of open drains showing evidence of minor soil erosion.	1998 to present
Open earth drains have been periodically slashed and weeds removed.	Ongoing
Surface water quality monitoring in open drains and at drain outlets has been undertaken on an annual basis.	Ongoing
Ground water	
The network of groundwater quality monitoring wells across the airport was	2004

Activity	Date
serviced and upgraded.	
Well No. 9 was relocated, to fit with redevelopment in the Beaufighter precinct.	2004
A new sampling and analysis program was implemented.	2004
The annual groundwater monitoring program by AAC has continued throughout the planning period.	Ongoing
Issues identified from analysis have been assessed in consultation with the AEO and will continue to be addressed over the planning period.	Ongoing
Soil contamination	
The former Airport Rescue and Fire Training Area was closed and remediated.	1994
The former battery recycling site has been remediated by removal of the contaminated soil and reclamation with clean fill.	1997
The underground storage tanks at the Shell Building were decommissioned and the site remediated.	1998
Hazardous materials and waste management	
Asbestos Audits Queensland Pty Ltd prepared an *Asbestos Materials Report and Register for Archerfield Airport.* The report identified asbestos in AAC owned buildings, and has been updated since then as buildings come into AAC ownership.	2003 to present
A Management Plan and risk assessment was added to the asbestos register.	2006
AAC created a *Chemical and Hazardous Materials Register* for its grounds maintenance and works operations	2009
AAC has included in its tenant inspections consideration of materials storage, handling, waste management, and disposal.	Ongoing
Brisbane City Council regularly tests sewage entering its treatment system from the airport. Any non conformances are reported to AAC and the tenant (if applicable) for action.	Ongoing
Natural resources and energy	
Rainwater tanks have been installed by AAC for the new corporate hangar development on Wirraway Avenue, and the warehouse and office on Beaufighter Avenue.	2007-8
Runways have been irrigated from stormwater detained on site, rather than potable water from the metropolitan water supply.	2007
Water meters have been upgraded to improve monitoring of consumption.	2008
Efficient water fittings have been installed in AAC buildings.	2007
AAC developed a *Water Efficiency Management Plan* (WEMP) in accordance with Queensland Water Commission requirements, in consultation with tenants and Brisbane Water. Efficiency measures will be implemented progressively.	2008
The airport has secured a number of businesses that recycle materials and equipment for reuse in construction and manufacturing. These include Veolia Environmental Services, and Queensland Recycling, which has operated successfully a major concrete recycling operation in the Beaufighter Precinct. These operations promote the reuse of resources, and reduce the energy required to produce these raw materials.	1998-present
Use of natural resources and energy is considered in tenant assessments.	1998-present

Activity	Date
Noise	
Noise emissions from tenancies on airport are managed in accordance with the EMPs and any site environmental management plan in place for their operation.	Ongoing
New facilities	
EMPs have been developed for new tenancies, renewal of existing tenancies, and for assessment of major works.	2003
New corporate hangars have been developed, incorporating rainwater harvesting.	2006
A new warehouse and office development incorporating energy efficiency measures and rainwater harvesting has been undertaken by AAC.	2008

2 Plans for the future

2.1 VISION

Archerfield plays a significant role in Queensland. It is Queensland's primary general aviation airport, a major airport in south—east Queensland, and is Brisbane's metropolitan airport.

AAC's corporate mission is to strive to nurture the dynamic potential of Archerfield Airport as a superior aviation destination. The airport will become a sustainable aviation and enterprise hub, integrated with and serving the growing needs of Brisbane. The vision for Archerfield Airport is set out in Chapter 2 of Part 1 of the draft Airport Master Plan.

2.2 AVIATION, LAND USE AND DEVELOPMENT PRECINCTS

The Master Plan divides the airport into eight precincts as shown in Figure 5.

These precincts are:

- **Runway**—which is all of the land used (or proposed) for runway and primary taxiway purposes.
- **Beatty**—the land generally fronting Beatty Road, between Boundary Road and the main 28/10 runways.
- **Mortimer**-land in the south-east corner of the airport, including the section on the east side of Beatty Road.
- **Beaufighter**- including land along Lores Bonney Drive west to Oxley Creek, and north to the main runway complex.
- **Wirraway**-comprising the aviation land between Wirraway Avenue and the main and secondary runways.
- **Boundary**—the area along Boundary Road and bordered to the west by Beaufighter Avenue, to the south by Wirraway Avenue, and to the east by the secondary runway complex.
- **Ashover**-all of the land between Ashover Road and the realigned secondary runways, and north of the Wirraway Precinct.
- **Barton**-the land on the corner of Barton Street and Beatty Road.

The primary functions and future plans for each of these precincts are discussed in Part 1 of the Master Plan.

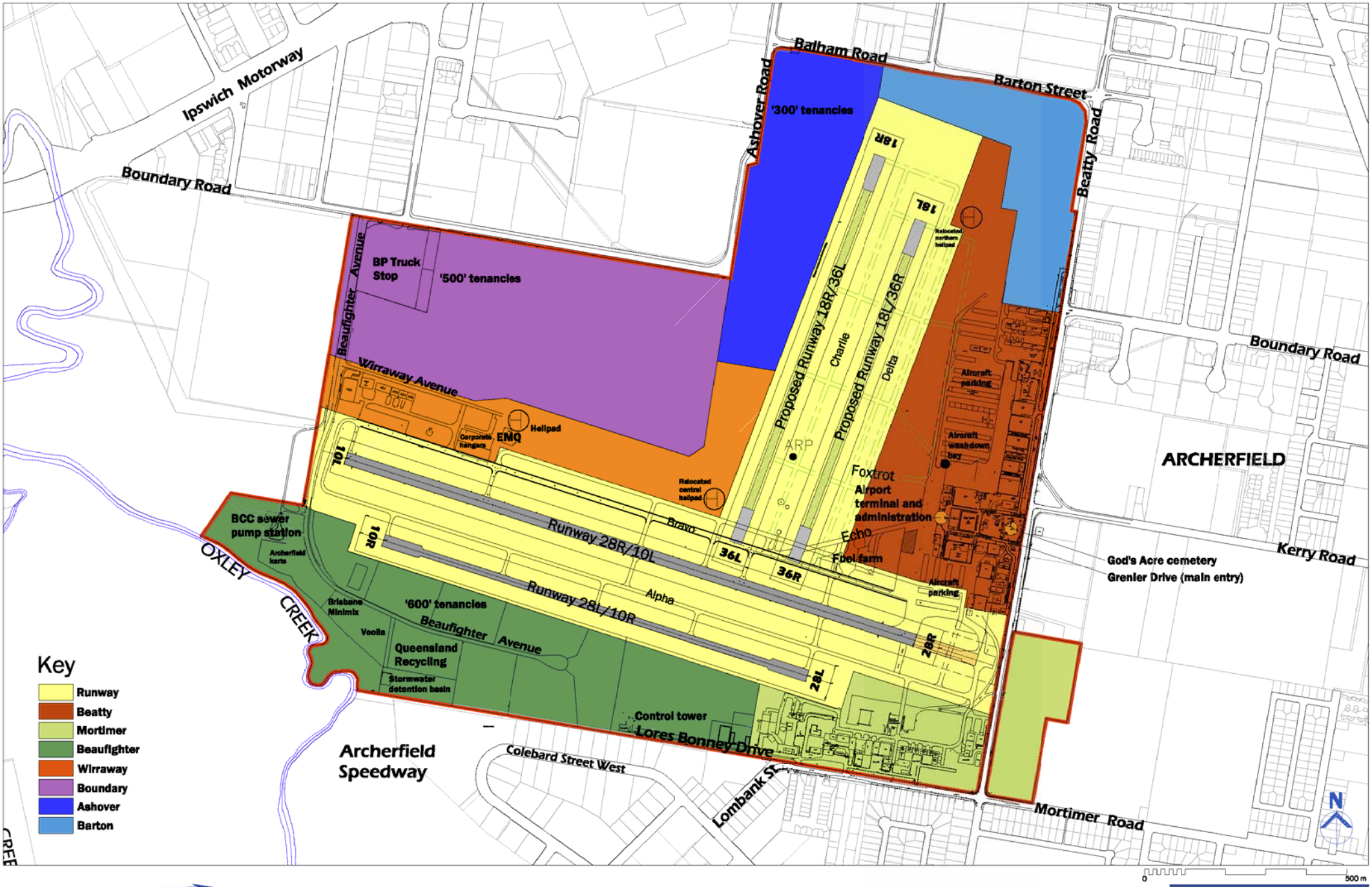

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Figure 5 **Development precincts**

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3 Environmental management framework

3.1 REGULATORY FRAMEWORK

3.1.1 Airports Act 1996

The *Airports Act, 1996* and the associated *Airports (Environment Protection) Regulations, 1997* provide the primary mechanism for Government to ensure the ongoing responsible environment management of Archerfield Airport.

This legislation requires AAC to produce and implement an Airport Environment Strategy (AES).

All operators of undertakings on the airport, including AAC, have an obligation to comply with the AES, the *Airports Act 1996* and Regulations.

AAC has the additional obligation to prepare the AES, monitor pollution levels at the airport in accordance with its AES and report the results of this monitoring on an annual basis.

The first AES for Archerfield was approved on 15 November 1999. In December 2000, an amended version was published, including the approved 2019 ANEF for Archerfield Airport. The AES for 2004-2009 was approved on 18 January 2005. The replacement AES for the period 2010-2015 was approved on 26 March 2010. This version covers the period 2011-2016.

Airport operators and airport regulators

The Act provides a system for separating the roles of the airport operator and airport regulator.

In the case of Archerfield Airport, the Commonwealth Department of Infrastructure and Transport (DIT) and the Civil Aviation Safety Authority (CASA) provide the regulator role. Archerfield Airport Corporation being the Airport Leasing Company (ALC) undertakes the airport operator role.

AAC as airport operator is responsible primarily for activities that take place on the ground and within airport confines. Airservices Australia (AsA) has the principal responsibility for aircraft operations.

AAC recognises that operational issues at times need to be addressed jointly by AAC and Airservices Australia, and AAC is proactive in identifying relevant aspects and potential solutions as appropriate.

3.1.2 Airports (Environment Protection) Regulations 1997

The regulations:

- set limits for environmental pollution of air, water and soil, and for noise emissions;
- set out the duties everybody operating at the airport must comply with; and
- authorise the monitoring and remediation of breaches of environmental standards.

The Regulations do not apply to pollution generated by aircraft, or to noise generated by an aircraft in flight or when landing, taking off or taxiing at the airport.

All users of Archerfield Airport are required under the Airports (Environment Protection) Regulations 1997 to:

- avoid polluting the environment
- preserve local biota and the ecosystems and habitats of native species
- preserve existing aesthetic, cultural, historical, social and scientific (including archaeological and anthropological) values of the local area;
- ensure there are no adverse consequences for endangered or vulnerable flora or fauna species or endangered ecological communities;
- ensure there are no adverse consequences for sites of indigenous significance on the airport site; and
- Prevent the generation of offensive noise.

3.1.3 Environment Protection and Biodiversity Conservation (EPBC) Act 1999

The Commonwealth EPBC Act provides a legal framework to protect and manage nationally and internationally important flora, fauna, ecological communities and heritage places.

The Act applies to the following areas or matters of national environmental significance:

- world heritage sites
- national heritage places
- wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- nationally threatened species and ecological communities
- migratory species
- Commonwealth marine areas

- the Great Barrier Reef Marine Park
- nuclear actions.

The Act aims to:

- provide for the protection of the environment, especially matters of national environmental significance
- conserve Australia's biodiversity
- protect biodiversity internationally by controlling the international movement of wildlife
- provide a streamlined environmental assessment and approvals process where matters of national environmental significance are involved
- protect Australia's world and national heritage
- promote ecologically sustainable development.

The Act is triggered when a proposal has the potential to have a significant impact on a matter of national environmental significance.

The Commonwealth Department of Sustainability, Environment, Water, Population and Communities, coordinates the assessment of potential impacts. After consultation and assessment, the environment Minister (or delegate) is responsible for deciding whether a project needs approval under the Act, and if it does, whether it is allowed and under what conditions.

The Minister will not intervene in a proposal that has no significant impact on one of the eight matters of national environmental significance, even though there may be other undesirable environmental impacts, for example on air quality, noise, odour, general amenity or on animals that are not listed as threatened or endangered under the EPBC Act.

The regulation of these matters is the responsibility of the Queensland State government, and the environment protection requirements are administered by various agencies, including Brisbane City Council.

3.1.4 Airport Environment Strategy

Under the *Airports Act 1996* AAC is required to produce and implement an Airport Environment Strategy. The Strategy must:

- set out AAC's objectives for the environmental management of the airport;
- identify environmentally significant areas within the airport;
- identify sources of environmental impact associated with airport operations;
- define studies, reviews and monitoring to be carried out in relation to the environmental impact of the airport;
- set timeframes for completion of audits and reviews;
- set out specific measures to be implemented by AAC to address existing or potential impacts, and timeframes for completion of these; and

- provide details of consultation undertaken in preparing the AES.

The current AES was approved on 26 March 2010, after completion of the consultative processes set out in the *Airports Act*. This version of the AES has been prepared to update the AES to synchronise it with the first five year period of the new Airport Master Plan (2011-2031), in accordance with recent changes to the *Airports Act*.

3.1.5 State law

AAC is required to comply with relevant State legislation and regulations, to the extent that these do not conflict with the Airports Act or Regulations.

State laws concerning occupational health and safety, waste management (including trade waste), motor vehicle pollution, emissions of substances that deplete stratospheric ozone, or the use of a pesticide are examples that are relevant to activities at Archerfield.

3.1.6 Compliance requirements

All operators of undertakings on the airport, (AAC and tenants), have an obligation to comply with the Airport Environment Strategy, the Airports Act and Regulations. It is an offence to cause deliberate damage to the environment.

3.1.7 Legal register

AAC has identified in Appendix A legislation and regulations relevant to its operations.

The register of legal requirements will be kept up-to-date through liaison with the Airport Environment Officer (AEO) at least monthly during the regular Airport Environmental Management Forum.

3.2 ARCHERFIELD AIRPORT CORPORATION ENVIRONMENT POLICY

Environmental management at Archerfield is guided by the AAC environment policy.

3.2.1 Policy scope and principles

In developing and managing Archerfield Airport, AAC will:

- identify and manage the environmental issues that are within AAC's responsibility;
- comply with relevant environmental legislation and regulations;
- establish environmental objectives and targets to minimise the environmental impact of the airport;

- measure, monitor and improve upon the environmental performance of the airport;
- promote to AAC's employees, tenants, customers and neighbours its commitment to sound environmental management.

These principles have been taken into account when preparing this AES.

3.2.2 AAC environment policy

Archerfield Airport Corporation Environment Policy

Archerfield Airport is operated and developed by Archerfield Airport Corporation (AAC). AAC is a private company which in 1998 acquired the long term lease to the airport.

AAC has overall responsibility for environmental management on the airport. Airport users, including tenants have responsibility for appropriate environmental management of their activities.

AAC recognises the importance of maintaining and where practical, enhancing the quality of the environment of Archerfield Airport and neighbouring areas.

AAC will:

- *operate the airport in an environmentally responsible manner*
- *minimise any adverse environmental impacts of its operations*
- *comply with all legally binding environmental management requirements*
- *encourage environmental responsibility amongst its employees and contractors*
- *encourage environmental responsibility amongst airport tenants and users*
- *strive to continually improve environmental performance of all aviation and non-aviation operations on the site.*

To achieve this AAC will:

- *establish and maintain procedures and practices to comply with all applicable environment laws and regulations*
- *ensure that this policy, management procedures and environment protection actions are communicated to all relevant personnel, including AAC staff, airport tenants, airport users and contractors*
- *conduct regular reviews of all site operations to identify areas which are or may have the potential to breach a regulatory requirement or which require improvement*
- *conduct regular monitoring and analysis of the airport environment to identify potential issues and ensure compliance with relevant regulations*
- *implement environmental management and operating procedures to ensure that the development of Archerfield Airport is carried out in an environmentally sound manner*
- *consult as appropriate with authorities and the community to ensure that the views of external parties regarding environmental issues are considered when making decisions*
- *ensure that AAC staff are appropriately trained and briefed on compliance and regulations*
- *ensure that tenants and users of the airport are adequately informed of their obligations, compliance and regulatory requirements.*

AAC managers are accountable to the Managing Director to ensure that this policy is implemented.

3.3 ENVIRONMENTAL MANAGEMENT SYSTEM

AAC's system for management of environmental issues on Archerfield Airport follows the principles and format of *ISO 14001:2004 Environmental Management Systems-Requirements with guidelines for use.*

The management system provides a structure for identifying environmental issues, developing environmental management plans to manage these issues, and a method to review and measure environmental performance.

It applies to all operations carried out at Archerfield Airport, encompassing both aviation and non-aviation related activities. As a minimum, it provides a system to ensure that operations for which the AAC is responsible will comply with all applicable legal requirements, and where deemed necessary, exceed these requirements.

3.4 ENVIRONMENTAL ROLES AND RESPONSIBILITIES

The roles and responsibilities of AAC, tenants, the Airport Environment Officer, and the Airport Building Controller are set out below. The relationships between the various stakeholders are illustrated in Figure 6.

3.4.1 AACs responsibility

AAC is responsible for:

- overall environmental management on the airport;
- preparation of the AES (reviewed on a five year cycle);
- overseeing implementation of the AES, including informing tenants of their obligations under the Strategy;
- conducting reviews of AAC's own operations, such as maintenance of runways, taxiways, aprons and grassed areas;
- development and management of new facilities, such as runways and airport infrastructure;
- preparing Environmental Management Procedures (EMPs) for AAC activities and developments;
- leasing sites to tenants (and setting environmental management requirements via lease conditions, where appropriate);
- adhering to appropriate dangerous goods handling and storage standards, and to occupational health and safety standards; and
- monitoring pollution levels (for aspects defined in the AES) and report the results of this monitoring on an annual basis.

Under common law as a landlord AAC may also conduct pollution and contamination tests, order remedial works, or stop activities in the event of

environmental harm. Under the *Airports (Environment Protection) Regulations*, the Commonwealth can also assist AAC in having tenants comply with tests, implement remedial works, or stop harmful activities.

3.4.2 Responsibilities of tenants of AAC

Tenants on the site can be broadly divided into four categories:

1. aircraft maintenance and service facilities;
2. aircraft charter operations;
3. airport passenger facilities and flight schools; and
4. sites carrying out non-aviation related activities, such as industry, warehousing, service stations and shops.

Tenants are responsible for:

- environmental management of their leased site in accordance with the AES, lease conditions and relevant legislation, standards and guidelines;
- providing practical assistance to AAC in developing, reviewing and revising the AES;
- adhering to requirements of the AES;
- implementing improvements relevant to the leasehold;
- devising environmental management procedures specific to the lease site;
- implementing guidelines set by the AAC;
- meeting the requirements of their lease agreements; and
- adhering to appropriate dangerous goods handling and storage standards, and to occupational health and safety standards.

Most leases entered into, or renewed since 1999 stipulate the tenants' environmental responsibility and the requirement to conform to the AAC Environment Policy and AES.

3.4.3 Airport Environment Officer (AEO)

The AEO is part of the Commonwealth Department of Infrastructure and Transport (DIT) and fulfils the role of environmental regulator on the airport.

The AEO monitors operations on airport sites and where necessary, enforces the requirements of the Act and its subordinate legislation.

The AEO works cooperatively with AAC and tenants, supporting and ensuring compliance with environmental standards. The AEO can apply financial penalties to environmental offenders.

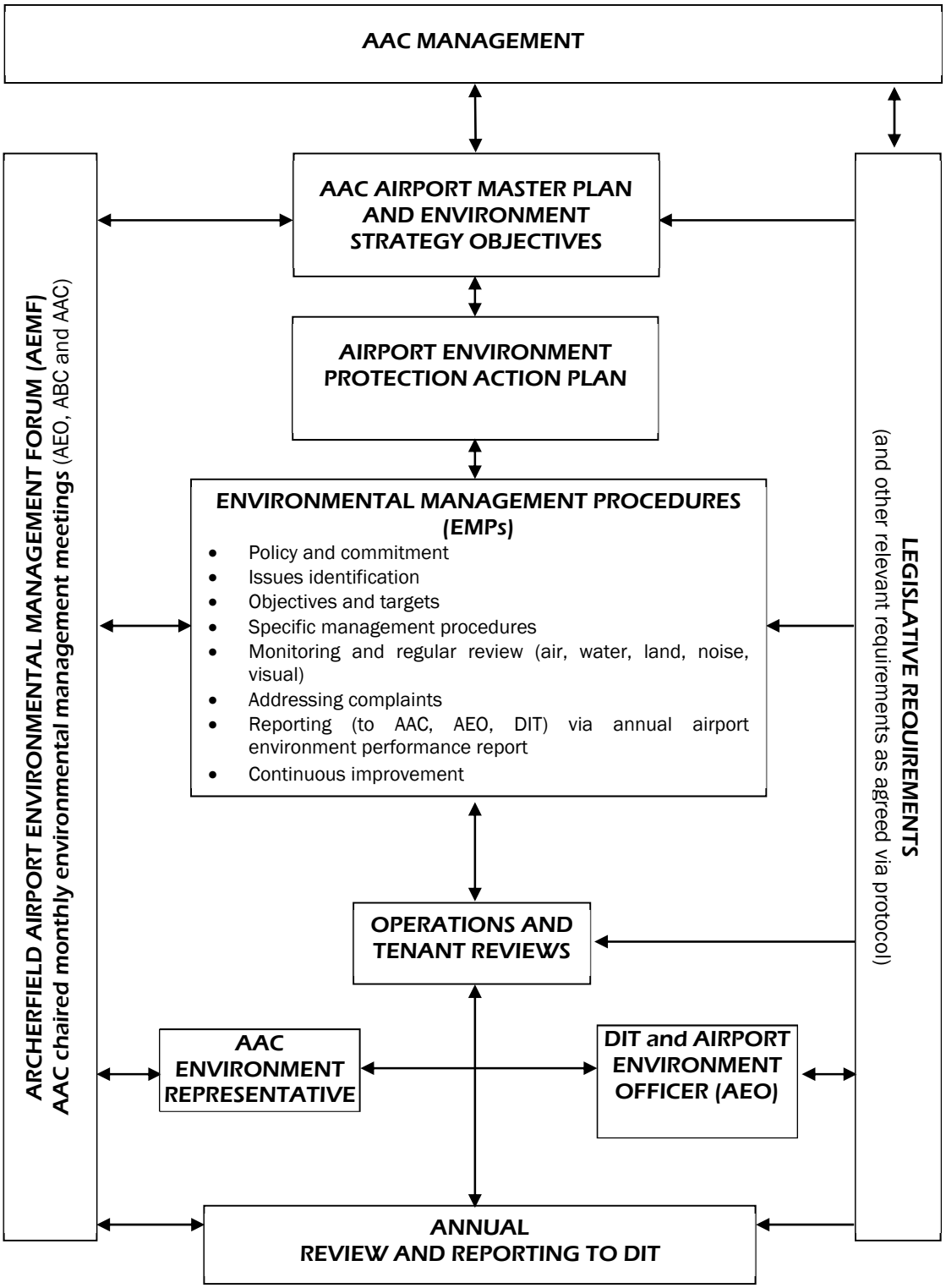


Figure 6. **Overview of environmental management at Archerfield Airport**

AAC may also conduct pollution and contamination tests, order remedial works or stop activities in the event of environmental harm.

The AEO investigates incidents relating to pollution. The AEO can require any operator on the airport to carry out works; reduce or cease generation of pollution.

If an operator cannot meet the standards detailed in the Regulations due to local conditions, but the operator believes the operations will still comply with the general objectives of the Regulations, the operator can apply to the AEO for an authorisation, allowing the non-compliance to continue for a specified period. If the AEO is satisfied that the authorisation is warranted and the objectives of the Regulations can be achieved, then the authorisation may be granted.

If necessary, the AEO can issue an environmental protection order or infringement notice to any operator on Archerfield Airport who has committed an offence. If the offence is considered serious, the operator and individuals involved can be prosecuted.

3.4.4 Building approval requirements

DIT has appointed an Airport Building Controller (ABC) who is responsible for ensuring that all activities at Archerfield Airport meet the appropriate building and engineering standards.

The ABC must be notified in writing of all proposed construction and building activities; including minor repairs, alterations, and signs. Some minor works are exempt from formal approval.

Building and construction must comply with the Building Code of Australia (BCA) as operational in Queensland. Where the BCA does not apply (for example in relation to civil engineering works) the relevant Australian Standard or international standard will apply. The ABC identifies the appropriate standards.

A Certificate of Compliance for Occupancy is required for all building or construction work that requires formal approval by the ABC. A Certificate of Compliance for Occupancy is issued before a building can be occupied, and a Certificate of Compliance for Use is required before engineering works, electrical works, or other utility services can be used.

The consent of AAC is required before the ABC can approve a development application. The AAC is responsible for ensuring that all development proposals are consistent with the Archerfield Airport Master Plan and AAC's planning objectives. AAC will in each case assess the impact of the proposal on infrastructure and the operations of the airport, and may impose conditions on building activities.

3.4.5 AAC environment representative

In addition to facilitating the Airport Environmental Management Forum (AEMF), the appointed AAC environmental representative also has the following responsibilities:

- work with the Airport Environment Officer on issues associated with Archerfield Airport;
- prepare associated documentation;
- make recommendations to the Managing Director, AAC;
- ensure that AAC is compliant with relevant legislation and laws;
- work with the airport community to ensure that compliance is being achieved;
- conduct or coordinate environmental reviews in accordance with policy;
- apply policy initiatives and identified strategies.

The following table sets out who at Archerfield is responsible for ensuring that the environment protection obligations are fulfilled and environmental management procedures are followed.

Items marked with an asterisk need to be addressed by each tenant in their environmental management plans and other initiatives. Their compliance will be assessed during the cyclical tenant reviews.

Table 2. Environmental responsibilities

Function	Responsibility
Policy and strategy-direction	
Defining environmental policies, and modifying existing policies	AAC Board
Determining objectives, priorities and targets in accordance with policy	AAC Board
Determining environmental management procedures in accordance with the policy direction, objectives, priorities and targets	AAC management
Construction and maintenance activities	
Securing building and environmental approvals	Proponent (typically AAC or tenant)
Assessing contractor's abilities to meet AAC's environmental requirements	For AAC works-Airport Operations and Technical Officer. * For works by tenants-each tenant, ABC, AEO and AAC
Ensuring compliance with environmentally sound work practices	For AAC works-Airport Operations and Technical Officer. * For works by tenants-each tenant, ABC, AEO and AAC
Operation phase	
Compliance with State regulated waste, hazardous good and other requirements	AAC for AAC operations. * Tenants and contractors are responsible for their own activities.
Containment of chemicals, fuel and oils	AAC for AAC operations (staff and

Function	Responsibility
	contractors). * Tenants and their contractors are responsible for their own activities.
Awareness and training	
Promoting awareness of environment protection and management requirements amongst AAC personnel and tenant representatives.	AAC management
Promoting environmental awareness and compliance within each tenant's operation	* Each tenant, with assistance from AAC and AEO
Induction of AAC personnel	AAC management
Training of AAC personnel	AAC management
Induction of tenant personnel	* Each tenant
Training of tenant personnel	* Each tenant
Ensuring that AAC is conversant and compliant with relevant legislation, including changes	Airport Operations and Technical Officer
Ensuring that tenants are aware of changes in environmental management requirements	AAC and AEO
Ensuring compliance with legislation	AAC for AAC activities and works * AEO for tenants
Monitoring and review	
12 monthly reviews of AAC operations, surface water and groundwater	AAC
Cyclical tenant reviews, with the review schedule determined according to an assessment of risk to the environment (12 monthly for tenants with hazardous materials on site)	AAC and AEO
Annual Airport Environment Performance report to DIT.	AAC
Revision of EMP documentation to reflect findings of reviews of AAC operations and tenancies	AAC management
Maintenance of records of overall condition of airport environment	AAC
Monitoring and reporting of emissions from tenancies	* Each tenant is responsible for monitoring and reporting on their emissions. Such reports to be made available to AEO/AAC on request.
Monthly AEMF meetings between the AAC, AEO and ABC.	Minutes of meeting maintained by AAC
Emergency response	
Spill containment airside, and from AAC operations	AAC
Spill containment within tenancies	* Each tenant
Spill containment on common airport land (where caused by a person other than a representative of the AAC).	The person causing the spill (enforced by AAC and the AEO)
Document control	
Ensuring that the key users of the EMPs have up to date copies of the EMPs	Airport Operations and Technical Officer.
Acquiring and disseminating environmental management information	Airport Operations and Technical Officer with assistance from AEO.
Maintaining EMPs up to date (from replacement pages provided by AAC)	Each person on the Document Distribution Register.

3.5 ENVIRONMENTAL ASPECTS AND POTENTIAL IMPACTS

The potential impacts of airport activities (to the extent these are required to be addressed by this strategy) on aspects of the environment is summarised in the table below.

The activities have been grouped into three phases:

- construction;
- operation (AAC and tenants); and
- emergency action.

Table 3 Summary of environmental aspects and potential impacts

Activity	Aspect	Impact or potential impact
Construction activity		
Transportation of machinery and materials	Increased traffic on nearby roads	Nuisance noise
		Nuisance dust
	Dirt on roads	Disruption to local traffic
		Possible importation of weeds and plant pathogens
		Possible importation of Fire Ants
		Contamination of stormwater
		Pollution of surface water
Operation of machinery/equipment on site	Increased noise levels	Nuisance noise
	Production of dust	Air pollution
		Nuisance dust (possible impacts on aviation and ground based activities, on and off airport)
Plant and vehicle wash down	Discharge of wash down water contaminated with oils, fuels etc	Contamination of soil, surface water and/or groundwater
		Possible spread of weeds and plant pathogens
		Possible importation of Fire Ants via contaminated plant or vehicles
Site clearance	Vegetation removal	(Low) potential loss of habitat and/or significant plant species along Oxley Creek
	Heritage values	Potential disturbance of heritage or archaeological sites
	Surface destabilisation	Sediment pollution of receiving waters (Oxley Creek)
		Nuisance dust (possible impacts on aviation and ground based activities, on or off airport)
Demolition of buildings, structures or plant containing asbestos	Human health	Potential for impacts on health if asbestos material is not appropriately contained and/or disposed of.
Excavation/levelling and construction of stormwater drains	Increased sediment discharge in runoff from surface disturbance	Sediment pollution of receiving waters
On site storage of fuel and oil	Major spillage or leakage of fuel	Soil, surface water and/or groundwater contamination
Refuelling plant and vehicles	Minor spillage or leakage of fuel	Soil, surface water and/or groundwater contamination
Concrete work on site	Increased suspended matter in stormwater runoff	Sediment pollution of receiving waters
Landscaping works	Flora and fauna	Importation or spreading of soil or plants contaminated by Fire Ants

Activity	Aspect	Impact or potential impact
Earthworks	Increased suspended matter in stormwater runoff	Sediment pollution of receiving waters
	Release of acid sulphate soils-potentially found at or below the 5m (AHD) contour	Degradation of Oxley Creek environment
Airport operation (AAC and tenants)		
Storage and use of chemicals, fuel, oils (including hazardous and dangerous chemicals)	Escape of chemicals to the environment from spillage or leakage	Health impact on site personnel and neighbours Potential pollution of soil, air, surface, and/or ground waters.
Aircraft wash down	Discharge of wash down water contaminated with oils, fuels etc	Contamination of soil, surface water and/or groundwater
General rubbish from airport activities	Production of general waste and litter	Potential stormwater contamination Potential visual pollution
	Tracking of waste from generation to disposal	Potential nuisance or hazard to aviation activities
Hard rubbish generated by airport activities	Disposal of waste off site	Use of landfill space
Generation and handling of regulated waste	Containment of waste Tracking of waste from generation to disposal	Potential occupational health and safety issue
Ground running of aircraft	Aircraft noise	Nuisance noise in nearby areas
Industrial plant and equipment used on site.	Machinery noise	Health risk to site workers Nuisance noise in surrounding areas
Maintenance work, office operations and staff facilities	Production of general waste and litter	Use of landfill space
Activities with emissions to air.	Discharge of pollution to the atmosphere	Potential effects on air quality
Handling of dangerous goods	Accidental discharge via spill	Pollution of soil, air, surface water and/or ground water
Handling of hazardous goods	Accidental discharge via spill	Pollution of soil, air, surface water and/or ground water
Emergency actions		
Incidents or accidents causing material spills	Escape of materials to the environment from spillage or leakage	Pollution of soil, air, surface water or ground water
Identification of Fire Ant in plants or soil on airport	Introduction of Fire Ant via imported plants or soil	Containment and destruction in accordance with government requirements

As part of the ongoing management of the airport environment, site and activity specific assessments are required. The methodology for doing this is provided in the EMPs.

3.6 ENVIRONMENTAL OBJECTIVES AND TARGETS

Objectives and targets for each aspect of the airport environment are set out in the chapters that follow.

Actions and the timing of their implementation are summarised in the Airport Environment Protection Action Plan in Appendix B.

3.7 TENANT REVIEWS

AAC will identify environmental issues on the airport by conducting regular reviews of its own operations and works and those of its tenants on a cyclical basis.

In the case of tenants with hazardous goods, the reviews will be undertaken on an annual basis. The timing of reviews for other tenancies will be determined from an assessment by AAC of the likely risk to the environment of the tenant activities.

The reviews will identify:

- level of compliance with environmental regulations, guidelines or standards;
- any unacceptable work practices;
- any opportunities for minimising the use of natural resources or generation of waste;
- any general environmental training that may be required by the organisation being reviewed.

Each environmental review will identify any operations or works that are, or could cause a breach of the regulations and also identify possible environmental improvements.

Issues identified by previous environmental reviews will also be checked to ensure that they have been appropriately addressed.

Environmental review results will be compiled into a summary report and where required, management plans will be devised. For each case where an environmental issue is identified, the following key steps will be taken:

- following clear definition of the issue(s), a priority will be assigned, based on AAC's assessment of the environmental risk posed by the aspect;
- an objective and target will be developed detailing what needs to be achieved;
- a management plan will be developed showing how objectives and targets will be achieved, who is responsible for ensuring the necessary actions are taken, and the timing of that action;
- the achievement of the management plan actions will be monitored, and the AAC personnel advised of this.

Where the issues relate to tenant activities, AAC (with the AEO as appropriate) will liaise with the tenant to ensure that they take all necessary action to bring their operations and/or works into conformity with legislation, standards, and guidelines.

3.8 ENVIRONMENTAL MANAGEMENT PROCEDURES

Environmental Management Procedures (EMPs) have been prepared by AAC to manage the environmental effects of operations and works on the airport.

The EMPs identify a range of activities likely to take place at Archerfield Airport, the aspects of the environment that might be affected by these activities, and the potential impacts of these activities. Objectives and targets are also described.

3.8.1 Procedures

The EMPs include the following procedures:

- Procedure AA1-*Environmental assessment of new tenancy or lease renewal*
- Procedure AA2-*Communication and consultation*
- Procedure AA3-*Emergency preparedness and response*
- Procedure AA4-*Minor spill response*
- Procedure AA5-*Environmental awareness and training*
- Procedure AA6-*Tenant environmental reviews*
- Procedure AA7-*End of lease tenant environmental review*
- Procedure AA8-*Assessment of environmental effects of new works*.

3.8.2 Forms

The EMPs include the following standard forms:

- EMP 1-*Lease proposal/tenant questionnaire*
- EMP 2-*Environmental awareness and training record*
- EMP 3-*Environmental complaint*
- EMP 4-*Environmental accident/incident report*
- EMP 5-*Review of environmental non conformance*
- EMP 6-*Environmental management checklist for new works*.

3.8.3 Review

The procedures and forms in the EMPs are subject to ongoing review (with a general review by AAC every 2 years) and may change over the life of this Strategy.

3.8.4 Information for tenants

On request, relevant parts of these operating procedures will be provided to airport tenants carrying out similar activities to assist them with environmental compliance.

The AAC EMPs provide a starting point for specific EMPs to be developed by tenants for their construction or operational activities. AAC will encourage tenants to work with AAC and the AEO to formulate EMPs to meet their environmental management obligations.

3.9 ENVIRONMENTAL TRAINING

3.9.1 AAC

Existing AAC personnel

AAC has in place an internal communication system that provides frequent forums for disseminating relevant information about environmental management issues and responsibilities. This comprises:

- weekly management meetings attended by the Airport General Manager, Airport Operations and Technical Officer and Airport Foreman; and
- quarterly staff meetings (involving all AAC operations and management personnel).

The training of AAC personnel focuses on improving awareness of responsibilities and liabilities under the AES; relevant State, and Federal environmental legislation; regulations and guidelines.

Training also assists personnel to familiarise themselves with the company policy, the management system and the environmental risks on the site.

New AAC personnel

All new AAC personnel are provided with an overview of the environmental issues relating to the airport; AAC's environmental policy, strategies, and procedures; and their role and responsibility in addressing those issues as part of their induction. This occurs within one month of appointment.

Contractors

The Airport EMPs set out procedures for ensuring that all potential effects of new operations or works are considered by AAC prior to commencement. Where required, Environmental Management Plans will be prepared and form part of the specification for the works (or management of the operation).

Any contractors carrying out environmentally sensitive activities on behalf of AAC will be required to demonstrate that they have completed appropriate skills, experience and management systems to successfully address relevant environment protection requirements.

Contractors will need to have in place appropriate environmental management procedures and personnel will be required to undergo relevant training.

The specific requirements will be highlighted in the project specification. AAC will provide inductions on environmental management requirements, as required.

3.9.2 Tenants

Tenants and their employees also need to have an understanding of the 2011-2016 AES.

AAC will provide all tenants with access to the AES and will require that all tenants:

- provide their staff and contractors with awareness training of the AES by the end of 2012, and
- provide further training on specific aspects, these being principally determined through the environmental reviews AAC undertakes at each tenancy.

3.10 EMERGENCY PREPAREDNESS

Archerfield Airport has developed *Airport Emergency Procedures* through a committee that includes the Police, Fire Brigade and Ambulance Services.

Emergency procedures are currently in place to deal with incidents which could impact on the environment, such as spills. AAC ensures that its personnel are familiar with these procedures and the location of emergency equipment.

Procedure AA3-*Emergency preparedness and response* in the EMPs details the methodology to be followed.

The need for tenants to maintain emergency equipment on their sites, develop emergency procedures, and ensure that staff are aware of the proper procedures will be identified during site environmental reviews.

3.11 INCIDENTS

Any incident on the airport that is within the responsibility of AAC will be managed in accordance with Procedure AA3-*Emergency preparedness and response*.

If an environmental incident occurs the details will be recorded on Form EMP 4 *Environmental accident/incident report* in the Airport Environmental Management Procedures.

The AEO will be contacted immediately. The incident will be investigated by AAC and a formal internal reporting, investigating and corrective action procedure initiated in accordance with the EMPs.

The AEO will be kept informed of all findings. If the incident has the potential to cause off site effects, the State Department of Environment and Resource Management (DERM, formerly EPA) and Brisbane City Council will also be advised.

The AEO will also be advised if routine monitoring indicates that an excessive discharge or level of pollutant is present.

3.11.1 Incident reporting

Any major environmental incidents which occur on the site, such as chemical spills, will be investigated by AAC and reported to the AEO.

Depending on the nature of the incident, the State Department of Environment and Resource Management may be informed of the incident, and may also be involved in consequential management measures.

This information will also be reported to DIT in the annual report.

3.12 NEW OPERATIONS AND WORKS

New operations will also be reviewed prior to and following their establishment, to ensure operations are conducted in a proper fashion and do not result in a breach of any legal requirements and comply with the requirements of this Strategy.

The EMPs include:

- Procedure AA8-*Assessment of environmental effects of new works*, and
- Form EMP6 *Environmental management checklist for new works.*

These set out AAC's requirements for management of new operations or works by AAC.

3.13 NON-CONFORMANCES

3.13.1 AAC's role

In administering the Archerfield Airport environmental management system for AAC operations or works, AAC is responsible for detecting non conformances, developing appropriate corrective and preventative actions, and ensuring that such incidents do not recur.

The following types of non-conformances can occur on the site:

- breach of an applicable Act or Regulation;
- failure to follow a formal procedure;

- non-achievement of a formal target; or
- an environmental incident.

3.13.2 Actions by AAC

In the instance of a non-conformance relating to AAC operations or works, the AAC is responsible for carrying out the following actions:

- recording details of the non-conformance (the form EMP 5 *Review of environmental non conformance* is included in the EMPs);
- investigating and identifying the reason for the non-conformance;
- developing an appropriate corrective and preventative action to avoid future non-conformance;
- ensuring the corrective and preventative actions are implemented in accordance with agreed EMPs or other relevant guidelines; and
- initiating incident reporting procedures.

Following an incident, the findings of the investigation and development of the corrective and preventative actions will be provided to the person/s involved in the non-conformance and the person/s carrying out the necessary preventative and corrective actions.

Typically, the results of a non-conformance investigation may result in one or more of the following actions:

- amendment of the Airport Environment Protection Action Plan;
- amendment of the relevant Environmental Management Plan;
- amendment of an existing environmental management procedure;
- development of a new procedure;
- additional training and instruction;
- new capital works; and/or
- involvement of the AEO or other relevant government authorities.

3.14 COMMUNICATION

Successful management of the airport environment requires appropriate and workable communication on environmental issues, management measures, and achievement of environmental objectives and commitments.

This communication includes:

- communication within the AAC organisation;
- communication with airport tenants;

- communication with interested parties external to the airport, such as the community and regulators;
- ongoing liaison with other airports.

Communication procedures are set out in Procedure AA2-*Communication and consultation* in the airport EMPs.

3.14.1 Information and training for AAC personnel

AAC will ensure that its personnel are informed about existing and emerging environmental issues by:

- conducting environmental awareness training in accordance with its Environmental Management Procedures;
- making available to AAC operational personnel the results of annual environment reports, relevant environmental reviews and any management plans; and
- involving relevant personnel in the review of existing environmental management plans and procedures, and the formulation of new procedures.

3.14.2 Communication with tenants

Airport tenants will be kept informed about new and emerging environmental issues and requirements via a variety of methods, including:

- newsletters;
- discussions during the cyclical tenancy reviews;
- discussions at the time of applications being made for new works, or lease renewal;
- information provided on the Airport web site.

3.14.3 Airport Environment Management Forum

The AAC will continue the monthly management meetings attended by the AEO, ABC and the AAC delegate responsible for environmental management aspects.

Where required, the core management representatives will consult with other appropriate stakeholders such as Airservices Australia, tenants, Brisbane City Council, or Queensland State Government.

The management forum will:

- disseminate information to relevant stakeholders concerning environmental aspects of new proposals, proposed environment management plans, etc;

- discuss current environmental issues and management practices, and their application to Archerfield Airport;
- consider and make recommendations to AAC on future amendments to the Airport Environment Strategy and Airport Master Plan;
- assess and make recommendations on the EMPs;
- recommend training and awareness programs;
- make recommendations to the AAC on preventative initiatives that could be implemented.

The forum will continue to meet monthly.

3.14.4 Communication with regulatory agencies

AAC communicates regularly with DIT, the AEO and Brisbane City Council. This includes liaison with stakeholders on issues arising from, or potentially impacting on the operations at the airport.

Procedures for this communication and consultation are set out in Procedure AA2-*Communication and consultation* in the airport EMPs.

3.15 COMPLAINTS

Complaints from the community or other parties (except the regulatory bodies) are recorded in the AAC Environmental and Complaints Register.

Any environmental complaints received concerning an operation on the site will be recorded on Form EMP 3 *Environmental complaint* in the EMPs and dealt with promptly. The complaint will be investigated and appropriate action taken to resolve any issues identified.

The AEO will be advised of complaints as appropriate.

A summary of environmental complaints received and actions taken will be reported to DIT on an annual basis.

4 Environmental conditions and actions

4.1 OVERVIEW

The following chapters provide, for each aspect of the airport environment:

- objective(s) for environmental management;
- an overview of existing conditions;
- identification of potential impacts of on-airport activities or developments;
- proposed measures to manage those impacts;
- a summary of achievements for the term 1998-2010;
- a summary of targets for actions for the period 2011-2016.

4.1.1 Environmental aspects

Consistent with the *Airports Act* and AAC's Environmental Management Procedures, the airport environment is described in the following categories:

- heritage;
- flora and fauna;
- noise;
- emissions to air and ozone depleting substances;
- surface water;
- ground water;
- soil contamination;
- hazardous materials and waste management;
- use of natural resources and energy.

Actions for the planning period (2011-2016) are summarised in the Airport Environment Protection Action Plan, in Appendix B.

5 Heritage

5.1 OBJECTIVES

To identify and appropriately manage cultural heritage values on the airport

5.2 EXISTING CONDITIONS

In 2001 AAC completed the *Cultural Heritage Assessment and Management Plan: Archerfield Airport, Brisbane* (Bonhomme Craib and Associates). The brief was prepared in consultation with the Queensland Department of Environment and Resource Management (DERM, formerly EPA).

The assessment and management plan address both Aboriginal heritage and European settlement.

5.2.1 Archaeology

Archerfield's original inhabitants were the Yerongpan clan who spoke a dialect of the Turrbal language. The first Europeans arrived in the Acacia Ridge area in the 1820s but the area remained mostly rural well into the 20th Century.

The airport site has been highly disturbed since European occupation of the area as a result of land clearance, stock grazing, and establishment of the airport in the 1930s.

The 2001 heritage assessment included a search of relevant literature, registers, and other data; identification and consultation with Aboriginal traditional owners, Native Title claimants and other indigenous interest groups; archaeological field surveys and preparation of recommendations and a Cultural Heritage Management Plan for the airport.

The study did not locate any sites or features of cultural heritage significance. It noted however that retention of the Oxley Creek margins as a buffer area (as shown in the Airport Master Plan) will protect any features that may exist in this part of the site.

5.2.2 European heritage

The airport developed in four historical phases, being *Pastoral* (pre 1927); *Development of air transport* (1927 to 1939); *World War II* (1940 to 1945); and *Post war*.

The airport site was originally purchased in 1855 by Thomas Grenier, publican of the Brisbane Hotel in Russell Street, South Brisbane. The land was lightly timbered alluvial soil, and some of the best grazing land in the district. The land was subdivided into three family farms in 1862. Grenier died in 1877 and was buried in God's Acre cemetery. The farms were sold to the Beatty family in the late 1890s and early 1900s.

In 1927 Qantas Airways test landed a DH-61 on Franklin's Farm which was located at the western side of the airport. Brisbane City Council decided that the site was suitable to be an airfield, and the Government initially acquired about 121 hectares (300 acres) of land in 1929. Two gravel air strips 1500 metres long were built and the airfield started operations. More land was purchased in 1930, 1936, 1942 and finally the cemetery (God's Acre) in 1946.

In the 1930s Qantas moved their operations from Eagle Farm to Archerfield after the first hangars were erected at Archerfield. Australian National Airways (ANA) and Trans Australia Airlines (TAA) both used Archerfield during the 1930s. The Queensland Aero Club, established in 1919, moved from Eagle Farm to Archerfield in 1931.

The Airport Terminal and Administration building was built in 1941 when Archerfield was the main airport in Brisbane. In the Second World War Archerfield became a base for the RAAF, and the United States Fifth Air Force and the Royal Dutch Air Force.

American B-17 Flying Fortresses, Kittyhawks, Dakotas and Dutch Mitchell bombers were at Archerfield. Large hangars were built on both sides of Beatty Road. There are examples of those remaining today along Kerry Road (on the eastern side of Beatty Road, off airport).

The Mustang and Vampire aircraft of the RAAF 23 Squadron were based at Archerfield until September 1955.

Once Eagle Farm became established as the main civilian passenger centre and the RAAF moved to Amberley, Archerfield became a thriving light aircraft centre.

The Bonhomme Craib report identifies a number of buildings and items on airport that are of historical interest and assist with interpretation of the past use and development of Archerfield.

Archerfield Airport was Brisbane's major airport from 1930 to 1947, and has been Brisbane's main general aviation airport since 1947. It played a significant role in the development of Australia's fledgling domestic and international airmail networks, and in controlling air traffic and operations during World War Two.

Items of interest are:

- Hangars 1-7;
- Fire Station (building 13);

- Shell kiosk (building 16);
- Toilets (buildings 17, 18 and 19);
- Dope building (building 21);
- Flight Training Australia (building 25);
- the Powerhouse (building 26);
- Canteen (building 27);
- Airport Administration Building/Terminal (building 28);
- Bellman hangars (buildings 105 and 110);
- G&R Ditchmen (building 107);
- Hempels Aviation (building 111);
- God's Acre cemetery;
- remnants of wooden rail and chain mesh fencing installed in the 1930s to segregate spectators from aircraft.

Of these features, God's Acre Cemetery and the Airport Administration/Terminal building have been assessed as having sufficient value to be included in a heritage register.

God's Acre Cemetery

God's Acre Cemetery is located on the corner of Beatty Road and Grenier Drive, at the main entry to the airport. This historic site is one of Queensland's oldest cemeteries. It is shown in Figure 4 *Existing conditions*.

The site was established by the early settler and South Brisbane Publican, Thomas Grenier on the family property after the death of their 16 year-old son. It was dedicated as a cemetery in 1859, just before Queensland became a separate state. 2009 marks 150 years since the cemetery was established.

About 200 people including descendants of the Grenier family and other members of the local community are buried in the cemetery, with the last funeral held there in 1980.

The land was acquired by the Government in 1946. It represents an historic link to the pioneers of the district, and a valuable resource for interpreting the evolving history of the local community.

The cemetery was previously on the Queensland Heritage Register but was removed in 2004 as the Queensland legislation is not applicable to Commonwealth sites.

The cemetery was assessed by the Australian Heritage Council for inclusion in the Commonwealth Heritage List.

The assessment found that the site satisfied two criterion for listing. The following is an extract from the assessment, as published on the Australian Heritage Database (www.environment.gov.au).

> ***Criterion: A Processes***
>
> *God's Acre Historic Cemetery was among the earliest cemeteries established in Brisbane, and is now one of the oldest surviving. Of nearly 400 cemeteries in Queensland, most are in rural areas, and God's Acre Historic Cemetery is unusual as a former rural cemetery in metropolitan Brisbane.*
>
> *The place is uncommon in that it was a privately-established burial ground in the Brisbane area. It illustrates some of the principal characteristics of a small burial ground, including a lack of denominational divisions.*
>
> *It is associated with many of the earliest pioneering families in the Cooper's Plains /Oxley district and their descendants, and provides important evidence of an early Queensland farming community.*
>
> ***Criterion: G Social value***
>
> *There is broad community support for the God's Acre Historic Cemetery, both from descendants of those interred in the cemetery, and from people with no direct ancestral link to it. An annual 'Day of Remembrance' draws significant numbers to the cemetery.*
>
> *The place has broad community support, as is evidenced by the involvement of the Archerfield Airport Corporation, the Brisbane City Council and the Commonwealth, and is a valuable resource for interpreting the evolving history of the local community. A historical education pack about the cemetery is used in local schools.*

The Minister responsible for the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) decided that the cemetery has Commonwealth heritage values with respect to Criterion A and G, above. The Minister decided not to include the cemetery on the Commonwealth Heritage List as the heritage management regime implemented by the *Airports Act* and regulations, and under the EPBC Act provided the appropriate mechanism for conservation of the cemetery.

Airport Administration Building/Terminal

This building dates back to the 1940s and is still used today as the airport terminal. AAC owns the building.

Plans for the building were first drawn up in 1936, but construction did not commence until 1941. The terminal housed the airline companies, the Civil Aviation Department, the Flight Checking Department, the weather bureau and Airport control officials.

Facilities included a restaurant, restrooms, lounges, and a roof garden and reception hall. A control tower originally constructed on top of the building has since been dismantled.

The building is included in the Commonwealth Register of the National Estate. The Register was closed in 2007 as part of the rationalisation of heritage lists as agreed between the States, Territories and Commonwealth in 1997.

The Register is an archive of information about more than 13,000 places throughout Australia. It has no statutory effect, but provides useful information which can be taken into account in any future decisions about the conservation of the heritage values of the Airport Administration Building.

The building was also previously on the Queensland Heritage Register, but was removed from this in 2004 as Queensland heritage legislation is not applicable to Commonwealth land.

The building was assessed by the Australian Heritage Council for inclusion in the Commonwealth Heritage List.

Consistent with the decision on God's Acre, the Minister responsible for the EPBC Act decided that the building has Commonwealth heritage values and that the heritage management regime implemented by the *Airports Act* and regulations, and under the EPBC Act provided the appropriate mechanism for conservation of the building.

5.3 POTENTIAL IMPACTS

The potential impacts on heritage values would stem from:

- demolition or inappropriate alterations to buildings or structures;
- lack of maintenance.

5.4 MANAGEMENT

AAC will continue to support the work of The Friends of God's Acre Inc. which is engaged in conservation of the cemetery.

It will consider the findings and recommendations of the *Cultural Heritage Assessment and Management Plan: Archerfield Airport, Brisbane* in any decisions relating to development of sites or features of heritage value.

AAC is sensitive to the need to retain historically significant landmarks where adaptive uses can be found or their removal would otherwise contribute to the significant loss of past history.

AAC also recognises that a number of older buildings on the airport are no longer suited to modern aircraft and are inefficient in terms of their layouts for modern aviation related purposes.

In order to ensure Archerfield continues to attract aviation tenants of a high calibre and the airfield continues to regenerate, development options will be canvassed when approached by prospective aviation tenants.

Each development will be assessed on an individual basis, taking into account the tenant's requirements, the historic significance of the building, its potential for adaptive reuse, refurbishment, removal or relocation. Buildings containing asbestos will be handled in accordance with the AES.

The appropriate agencies will be consulted with prior to either approving works by tenants of buildings of recognised historic significance, or undertaking works that may impact on these sites or features.

AAC will use the *Cultural Heritage Management Plan* as a framework to guide such decisions.

5.5 ACHIEVEMENTS 1998-2011

Completion of the *Cultural Heritage Assessment and Management Plan: Archerfield Airport, Brisbane* by Bonhomme Craib and Associates for AAC in 2001. The brief was prepared in consultation with the Queensland Department of Environment and Resource Management (formerly EPA).

AAC has over the past 11 years spent more than $1M on heritage conservation initiatives at Archerfield.

It has restored the former Shell building.

AAC has purchased the historic Terminal building and in 2009 it completed a major refurbishment. The upper floors are now used for the airport administration offices.

AAC has supported the conservation work being undertaken by the Friends of God's Acre Inc., through donations and contribution of labour and provision of specialised equipment for maintenance works.

5.6 TARGETS 2011-2016

Continue to support the conservation work by the Friends of God's Acre Inc. and seek the cooperation of all levels of government and the broader community in improving the site and promoting it to the local community and visitors.

Consult with the relevant agencies prior to either approving works by tenants of buildings of recognised historic significance, or undertaking works that may impact on these sites or features.

Review and update the Cultural Heritage Management Plan to reflect legislative changes and provide to the Commonwealth Department of Infrastructure for its information.

6 Flora and fauna

6.1 OBJECTIVES

To identify and conserve significant indigenous flora and fauna.

6.2 EXISTING CONDITIONS

6.2.1 History

The land that the airport occupies was cleared by early settlers and used for farming.

In 1931, with the exception of the Oxley Creek environs the area was an open grassed paddock and since then, the airport has been managed mainly as a grassed area, with extensive mowing and removal of large trees where these infringe on obstacle clearance standards.

Trees and shrubs grow along the banks and flood area of Oxley Creek, and there is planted vegetation around the built up areas of the airport.

6.2.2 Oxley Creek context

Oxley Creek Catchment has an area of approximately 260 square kilometres. The creek is about 50 kilometres long and flows from the Flinders Peak Region to the Brisbane River.

The airport is in the lower to middle reaches of the creek catchment, approximately 500m upstream of the confluence of the Oxley and Blunder Creeks. This part of the Oxley Creek catchment is urbanised, and the land along the creek is used for housing, industry, open space, and sand extraction.

The Creek is part of a regional open space and habitat corridor that runs through the southern part of Brisbane to the Brisbane River.

In the general locality (and upstream of) the airport there are some remnant paperbark (*Melaleuca nodosa*) wetlands which before European settlement would have covered most low-lying areas of the catchment and provided habitat for waterbirds, frogs, and fish.

Riverine or vine forest was the dominant vegetation on creek banks, and 'dry' rainforest grew on the well-drained floodplains. In poorer soil, a mixture of Eucalypt and wetland species grew.

In recent years Brisbane City Council has secured the land on the south side of Oxley Creek immediately to the south of the airport (extending upstream of the confluence of Oxley and Blunder Creeks) and has designated this as an 'environmental protection area' in the Brisbane City Plan. This action was taken following an unsuccessful proposal to undertake sand extraction in that area.

The south western corner of the airport has a frontage of approximately 550 metres to Oxley Creek. This area contains some riparian vegetation on the creek banks. The airport land further away from the creek is cleared, and grazed.

6.2.3 Flora and fauna significance

In May 1997 the (then) Queensland Environmental Protection Agency (Stewart 1997) was commissioned by the Airport to advise on flora and fauna values. The study included site surveys and literature reviews. It concentrated on the Oxley Creek as, due to past and current use, and the relationship of the creek to the broader regional environment, this area was assessed to have the highest probability of containing flora and/or fauna of regional or higher significance.

The study found that:

- the vegetation of the Creek and surrounding area is considerably disturbed with numerous plant and weed species and substantial clearing of native vegetation;
- a total of 45 vertebrate species are known to occur along Oxley Creek. None are vulnerable (Schedule 3) or rare (Schedule 4) species under the Queensland Nature Conservation (Wildlife) Regulations 1994;
- two species of migratory birds or birds in danger of extinction, Little Curlew *(Numenius minutus)* and Sharp-tailed Sandpiper *(Calidris acuminata)* are species closely related to the short grass and wetlands of the airfield;
- a further species of international significance, the Rainbow Bee-eater (*Merops ornatus*) may breed in the sandy banks of the Creek;
- no mammals, frogs or reptiles were recorded along Oxley Creek during the survey;
- no threatened or endangered species of fauna were identified.

It concluded that the creek provides essential habitat for some native fauna, but is unlikely to support populations of regional significance. Three species of local significance and three of international significance are recorded along or in close proximity to the creek.

The (then) Queensland Department of Natural Resources and Water advised in June 1999 that:

- a more comprehensive survey would probably identify frogs, reptiles or mammals in Oxley Creek
- migratory waders *Numenius minutus* and *Calidris acuminata* are listed by DNR as being in danger of extinction. This occurrence is very transient as waders prefer coastal habitat. Waders are most likely to visit the creek during times of drought. This requires further investigation
- historically there is a high possibility of the rare frog species *Litoria brevipalmata* occurring within the Oxley Creek catchment. If it occurs within the area its presence would be significant
- the vegetation description suggests that the existing habitat is unsuitable for any scheduled species other than *Litoria brevipalmata*
- conservation of remnant fauna should be concentrated along Oxley Creek.

From this advice it is concluded that it is very unlikely that there are any species of flora significance on the airport site.

The Creek environment in particular is likely to provide habitat for some native fauna.

6.2.4 Pest animals

The airport has not been subject to excessive pest animal populations, with the exception of Fire Ants which were confirmed in 2001 and have been subject to a rigorous ongoing control program since then.

6.3 POTENTIAL IMPACTS

The main potential impacts of airport activities on flora and fauna values in Oxley Creek are:

- altered surface water flow patterns (including peak flows) entering the Creek;
- water quality decline, in particular through sedimentation; lowering of pH; changes in temperature; excess nutrient loads; and pollution by hydrocarbons or metals;
- pollution from heavy industry and waste processing;
- weed and pest animal invasion;
- vegetation removal for new development.

6.4 MANAGEMENT OF IMPACTS

The riparian zone of Oxley Creek is likely to provide habitat for frogs, reptiles and mammals, and these values have the potential to improve over time, particularly if Brisbane City Council implements habitat restoration works on the land on the south side of Oxley Creek.

Identification of appropriate management measures for the creek frontage will be addressed prior to any new development of land next to Oxley Creek (as shown hatched in Figure 5).

AAC will continue to facilitate the Fire Ant control measures being implemented by the Primary Industries section of the State Department of Employment, Economic Development and Innovation.

The use of mainly indigenous plants in landscaping works will provide some additional habitat opportunities, and reduced reliance on watering when compared with exotic species.

Bird and bat strike is a significant issue for airport management, so measures need to be implemented to manage bird and bat habitat to minimise the risk of this occurring.

6.5 ACHIEVEMENTS 1998-2010

AAC has maintained the airport grounds through regular mowing, control of weeds and maintenance of landscaped features on the site.

AAC has also worked with tenants to ensure that facilities on airport are established and maintained in a tidy manner.

Fire Ant control by helicopter and motorcycle broadcasting has since 2001 been undertaken by the Primary Industries section of the State Department of Employment, Economic Development and Innovation. The Department is proactive and conducts regular inspections of the airport grounds, and carries out spraying as required.

Extensive stormwater management works were implemented in 2003-2004 in association with new developments in the Beaufighter Avenue/Mortimer Road, and Central precincts. These works have replaced eroding open drains with a system of pipes, grassed swales and detention facilities. The new drainage system protects water quality and manages the peak quantity of water discharged to Oxley Creek. It has the potential to improve the habitat values of the creek over time.

Additional stormwater drainage works have been implemented with the construction of piped drainage under Runway 04L/22R and a new detention basin to the north-west of this.

6.6 TARGETS 2011-2016

AAC has designated the area next to Oxley Creek as 'greenspace' in recognition that it serves as a buffer between the aviation activities on the airport, and the Oxley Creek. Along the creek banks there is riparian vegetation that makes a contribution to the landscape and ecological values of the creek. The area also accommodates important stormwater management works, including a major stormwater detention basin, and drainage outfalls, and the cleared areas are managed by grazing.

With this in mind, the land has been designated as an 'open space buffer' in Figure 2 *Master Plan vision*, and zoned *Greenspace-Environmental Protection* in Figure 17 *Airport land use zoning* in Part 1 of the Master Plan.

The management regime of mowing and grazing will continue in those parts of the area that are currently managed in this way.

Prior to any major development of land in the area that is not currently intensively managed through mowing or grazing, appropriate flora and fauna investigations will be undertaken to confirm the existence of any significant species. If these are identified, appropriate nature conservation measures will be implemented.

AAC will obtain from Brisbane City Council and from the Oxley Creek Catchment Association Inc any existing reports on flora and fauna values in the Oxley Creek adjacent to and downstream of the airport, as background information for any ecological assessment of development proposed in proximity to the creek.

Landscaping will be provided in new developments to improve the presentation of the site. AAC will encourage the planting of mainly indigenous species on airport property.

A list of suitable plants for landscaping on AAC property will be prepared and made available to tenants.

All developments on the airport, including flood mitigation works and site landscaping, will be carefully planned to ensure that they do not increase bird or bat populations at the airport, due to the hazard to aircraft of bird or bat strike.

7 Air quality and ozone depleting substances

7.1 OBJECTIVES

To minimise where practicable emissions to air from AAC and tenant related activities (except emissions from aircraft)

7.2 EXISTING CONDITIONS

The airport is located in the industrial area of Archerfield/Rocklea, which is home to general manufacturing, and service industries; transport and related activities. The area is bisected by a network of arterial and main roads including Ipswich Motorway, Granard Road, Beaudesert Road, Boundary Road, Ashover Road, Kerry Road, Mortimer Road and King Avenue/Learoyd Road.

There are no significant sources of greenhouse gas emissions on the airport. No tenants or AAC operations produce significant discharges to the atmosphere.

A detailed audit of the airport in 1993/94 identified all equipment containing ozone depleting gasses. Since then, all BFC fire extinguishers have been removed (in December 1997), and there are no remaining air conditioners filled with Freon.

Archerfield Airport has one dedicated spray painting operation. Some tenants also undertake painting, but as an ancillary activity.

7.3 POTENTIAL IMPACTS

Experience at similar general aviation airports in Australia shows that a relatively small quantity of pollutants are released during the running of aircraft engines while on the ground for testing and maintenance procedures.

The majority of emissions are solvent vapours released either during the spray painting of aircraft bodies and components, or through cleaning of equipment.

Emissions would be similar to other spray painting and mechanical repairs establishments in the surrounding industrial areas. Due to the mix of uses and the extensive open space on airport the density of these uses is significantly lower than nearby industrial areas.

7.4 MANAGEMENT OF IMPACTS

7.4.1 Painting and cleaning

The main potential impact on the air environment from painting or cleaning operations is odour from solvents.

The dedicated painting operation has extractor ventilation systems coupled with filters to trap any material that would otherwise be discharged into the atmosphere. Odour is not an observed problem on the site.

AAC has replaced its solvent based line marking paints with water based alternatives to reduce the emission of solvent vapour from this source.

For new tenancies, any potentially odorous activities will be identified and managed so that there is no unacceptable impact on neighbouring areas. If painting is proposed, consideration will be given to the acceptable scale of the activity, and any mitigation measures that will be required.

Measures for achieving appropriate odour control will be determined prior to the establishment of the tenancy, in accordance with the EMPs.

In the case of existing tenancies, if any odour emission issues arise, these will be addressed through direct negotiation (if a complaint is received) or via the periodic environmental review process.

AAC requires all tenants with trade waste discharges to obtain from BCC appropriate trade waste disposal approvals, and maintain their operations in accordance with these requirements.

7.4.2 Ozone depleting substances (ODS)

AAC facilities

AAC operations will be managed to ensure that all discharges meet the requirements of relevant legislation being the *Airport (Environment Protection) Regulations 1997*, the *Ozone Protection Act 1989* and the *National Environmental Protection Measure (NEPM) for Ambient Air Quality*.

Regular environmental reviews will identify any ozone depleting substances on site, and their phase out will be arranged.

The progressive phase out and replacement of any remaining AAC equipment containing ozone depleting gasses will also occur as replacement equipment becomes commercially available and older equipment is replaced.

Tenants

The regular environmental reviews of tenant facilities will identify any halon fire extinguishers (sometimes used in aircraft), and if any are found in service for non-essential use, the tenant will be advised to remove the equipment from service as required by State and Federal legislation.

As the presence of halon extinguishers will be readily identifiable during the regular environmental reviews, additional monitoring is not considered necessary.

7.5 ACHIEVEMENTS 1998-2010

AAC has collated existing data on airshed quality from the EPA Rocklea monitoring site.

AAC has produced an inventory of existing airport tenants and users, as an indicative baseline for possible future air quality assessments.

Water based line marking paints are now used by AAC to reduce the emission of solvent vapour from this source.

7.6 TARGETS 2011-2016

Continue to identify the presence of ODSs in AAC and tenant reviews, and negotiate appropriate management (including decommissioning and removal wherever feasible).

Continue to advise tenants of their responsibility to obtain relevant environmental approvals in accordance with the Airports Act and Regulations.

8 Surface water

8.1 OBJECTIVES

To minimise the impact of airport operations on surface water quality

8.2 EXISTING CONDITIONS

8.2.1 Catchment context

The airport is located in the middle to lower reaches of the Oxley Creek catchment, just upstream of the confluence of Oxley Creek and Blunder Creek. Oxley Creek discharges ultimately to Brisbane River.

The airport location relative to the Brisbane River is shown diagrammatically in Figure 1. The location of Oxley and Blunder Creeks, and the alignments of the main drainage outfalls from the airport to these waterways is shown in Figure 2 *Airport context*.

The middle and lower reaches of the Oxley Creek catchment are highly urbanised.

The *1999 Oxley Creek Catchment Management Plan* identified the following issues for the catchment overall:

- Water quality within the creek system exceeds standards across all water quality parameters (suspended solids, total nitrogen, total phosphorus, faecal coliforms) in the lower urbanised part of the catchment. There is however some evidence of improvements since 1988.
- The primary causes of the existing degradation are point sources such as the Inala Sewage Treatment Plant, minor point sources (sewer overflows) and the non-point sources of sand extraction, stormwater run-off and land development, including areas using septic treatment systems.
- Brisbane River and Moreton Bay, the receiving waters of Oxley Creek, are experiencing excess sediments, nutrients and faecal coliforms, giving rise to problems of sea grass loss and algal blooms.
- Further development in the upper reaches of the catchment could exacerbate flooding.
- Riparian vegetation including wetlands has some critical areas requiring management and buffering.

- Soil erosion is an issue along the watercourses.

Stormwater management on the airport site needs to have regard to these broader contextual issues, and in particular to avoid causing detriment to water quality or flood conditions in Oxley Creek.

8.2.2 Site sub catchments

Surface water runoff from the airport falls generally into one of six main sub catchments and these are shown diagrammatically in Figure 7.

The boundaries of the sub catchments are diagrammatic, as there are few clearly defined watersheds across the site. In some cases, drainage infrastructure has been constructed such that stormwater flows will cross between the sub catchments as currently shown.

All surface water from the airport is discharged ultimately to Oxley Creek, and from there flows to Brisbane River and Moreton Bay. The northern and eastern part of the airport drains to Stable Swamp Creek (to the north) which enters Oxley Creek on the north side of the Rocklea industrial area.

1: Southern sub catchment

This sub catchment includes:

- grassed areas;
- sealed Runway 28L/10R and taxiways;
- hangars and businesses;
- open storage;
- the control tower.

This stormwater drains to the main detention basin that is located between the Queensland Recycling facility and the neighbouring Archerfield Speedway. The detention basin then discharges to Oxley Creek.

A small part of this sub catchment drains south under Mortimer Road, and through the neighbouring industrial area to Oxley Creek. This drain collects water from the eastern end of Lores Bonney Drive, and from the adjacent tenancies.

2: Beaufighter Avenue and Wirraway Avenue sub catchment

This sub catchment includes:

- the western end of the 28R/10L runway and associated taxiways;
- the majority of the '500' tenancies on Boundary Road;
- development along Wirraway Avenue; and

- development along Beaufighter Avenue, generally west and north of Queensland Recycling.

Stormwater in this sub catchment is conveyed via a new piped drainage system along Beaufighter Avenue to a concrete end wall and dissipation structure prior to entering Oxley Creek.

3: BP Truckstop

Stormwater from the BP Truck Stop site on the corner of Beaufighter Avenue and Boundary Road discharges to a drain at Boundary Road that runs north through the Rocklea industrial area before joining to the main drain to Oxley Creek.

4: Central sub catchment

This sub catchment comprises the grassed areas associated with the 04/22 runway complex, most of the northern half of the 28R/10L runway, the fuel farms, and aircraft parking positions.

The majority of storm water in this sub catchment is collected by an on airport drainage system that falls north-west under the 04/22 runways to a detention basin, and then passes under Boundary Road. From there the drainage runs through the neighbouring industrial area, under the Ipswich Motorway to Oxley Creek. Water in the Oxley Creek then enters the Brisbane River.

5: Eastern sub catchment

The fifth catchment on airport is the eastern and north eastern area fronting Beatty Road and Barton Street.

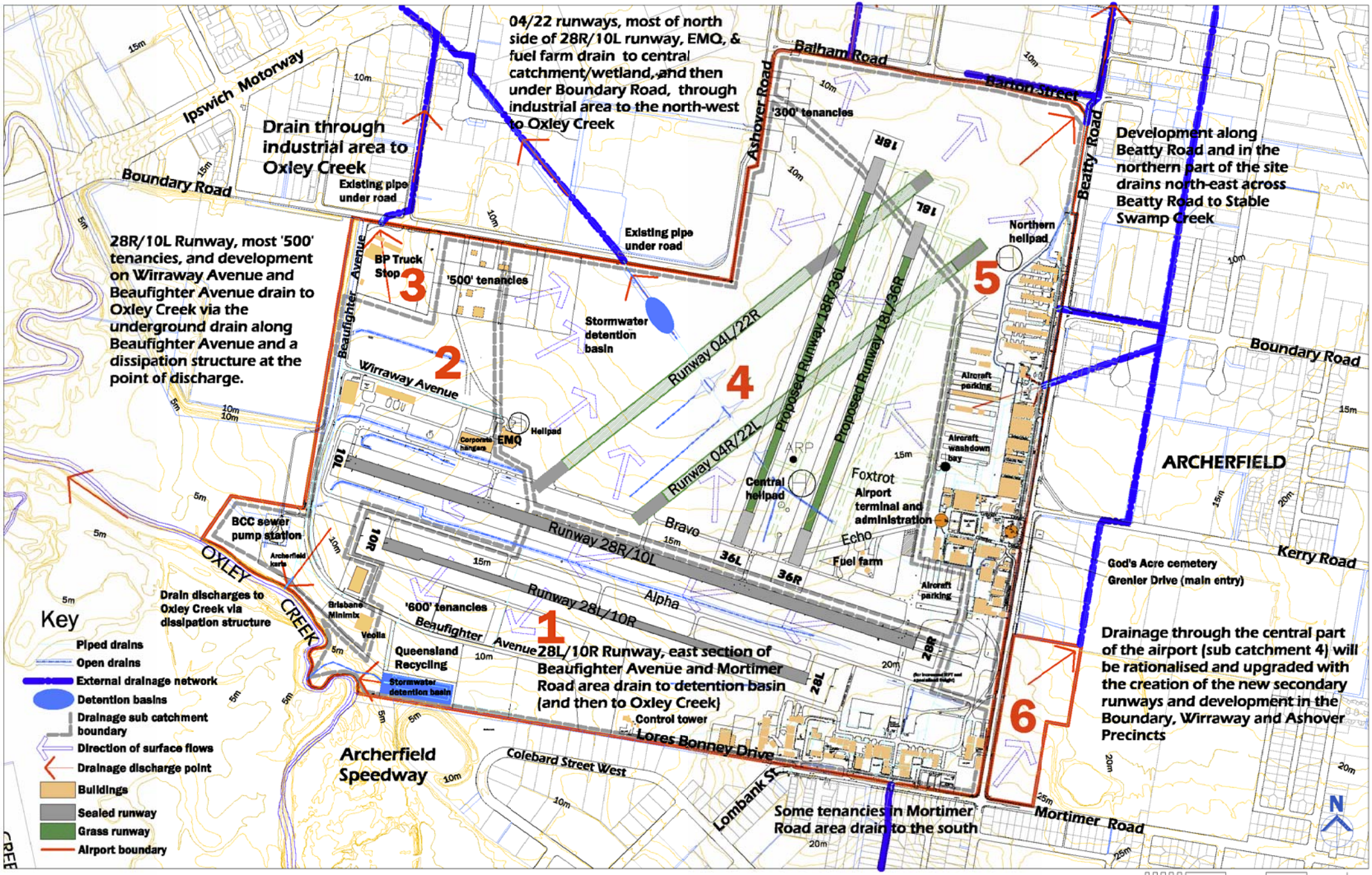
The stormwater run-off from this area enters the Brisbane City Council drains that run parallel with Beatty Road. At three locations along Beatty Road there are drains under the road that take stormwater to the east and then north to Stable Swamp Creek.

This part of the sub catchment is reasonably intensively developed, with extensive impervious areas (building roofs, roads, sealed aircraft parking, and manoeuvring areas).

The balance of the sub catchment has at present less impervious surfaces. Stormwater from development planned for this area could potentially discharge to points on Barton Street and Balham Road (subject to design investigation, and approval by BCC).

6: Beatty Road South

The vacant airport land on the north-east corner of Beatty Road and Mortimer Road drains to the north-east. It discharges to the main drainage line that runs parallel to Beatty Road, to Stable Swamp Creek, and then to Oxley Creek.



Archerfield
Brisbane's Metropolitan Airport

Archerfield Airport Environment Strategy 2011-2016

Figure 7 **Stormwater drainage**

PlannedFX
Planning Environment Strategy Design

8.2.3 Stormwater quality

AAC undertakes stormwater quality analysis on an annual basis. The sampling is undertaken at the main drainage discharge points, and at locations within the airport drainage network. Due to drought conditions in recent years there has not been sufficient water at some of the sampling locations.

Notwithstanding this, the program has provided useful information about site conditions.

The most recent assessment was completed by Simmonds & Bristow Pty Ltd in March 2009.

It found:

- pH levels were within the Commonwealth freshwater limits;
- electrical conductivity at all sample sites indicated low concentration of dissolved salts similar to freshwater;
- suspended solids were low when compared to BCC water quality objectives for a wet event;
- Total Petroleum Hydrocarbons (TPH) was only detected above the guideline at one site;
- Benzene, toluene, ethylbenzene and xylenes (BTEX) were below reporting levels;
- trace elements (aluminium, cadmium, lead and zinc) were above the guideline limits in some locations;
- nutrient concentrations were above BCC stormwater guidelines in some locations.

8.3 POTENTIAL IMPACTS

The potential impacts of stormwater drainage are:

- export of suspended solids off site leading to increased sedimentation of Stable Swamp Creek or Oxley Creek;
- transport of chemical pollutants, trace elements, or nutrients into these creeks and ultimately into Brisbane River;
- increased peak flood flows discharged to Oxley Creek, with the potential for exacerbating flooding in the creek;
- increased peak flows into the existing main drainage system through the Rocklea industrial area, and through Archerfield, north to Stable Swamp Creek.

8.4 MANAGEMENT OF IMPACTS

AAC is vigilant regarding stormwater management on the airport.

The following EMPs have specific relevance to managing the water aspects of the airport environment:

- Procedure AA1-*Environmental assessment of new tenancy or lease renewal*
- Procedure AA4-*Minor spill response*
- Procedure AA6-*Tenant environmental reviews*
- Procedure AA7-*End of lease tenant environmental review*
- Procedure AA8-*Assessment of environmental effects of new works*.

For example, the procedure for new construction requires an assessment of the potential impacts of construction on all aspects of the airport environment (including stormwater drainage), and where impacts are possible, the preparation of a construction phase Site Environmental Management Plan (CEMP).

Washing of aircraft in the wash-down bay (with triple interceptor) is strongly encouraged. However, if aircraft owners wish to wash their aircraft in its parking position to remove general dirt and insects this is allowed provided biodegradable detergents are used.

If there is a risk that oil or grease will be discharged onto the ground then the wash-down bay must be used. If there is regular washing of aircraft in parking positions then the AAC reserves the right to request soil testing to monitor for any contamination. This monitoring would be at the aircraft owners' expense.

Annual sampling by independent consultants in 2003 indicated at two locations elevated concentrations of nutrients and metals. Samples from one location (in the Beatty Road precinct) contained detectable concentrations of TPH. This was confirmed in the most recent sampling in 2009.

These findings appear to be consistent with the washdown of buildings or mechanical equipment.

AAC is now undertaking further investigations within the relevant sub catchment areas to identify any activities, machinery, or infrastructure that may be affecting water quality conditions. It will work with the AEO to identify the source and improve water quality wherever feasible. If required, the monitoring program will be reviewed to facilitate this.

AAC maintains a spill containment trailer that can be mobilised at short notice to deal with fuel and chemical spills from its own operations and for incidents involving aircraft.

Where appropriate, tenants are also required to have spill procedures for their operations. In addition to providing appropriately bunded storage facilities, tenants are also required to maintain stocks of spill control equipment where

their operations have the potential to release environmentally hazardous materials to the environment.

8.5 ACHIEVEMENTS 1998-2010

Stormwater management measures (addressing water quality and peak discharge volumes) have been incorporated where appropriate into new tenancies and into the airport development precincts.

The former open drainage line through the western part of the Boundary precinct and the west of the Beaufighter precinct (which was subject to significant scouring) has been piped, and silt traps and dissipation structures installed to moderate peak flows and manage water quality prior to discharge to the Oxley Creek.

A significant new stormwater detention basin has been constructed in the Beaufighter precinct, treating stormwater prior to its discharge to the Oxley Creek.

The stockpile areas in the Queensland Recycling facility drain to a sedimentation basin prior to discharge to the on-airport stormwater system.

Swale drains have been constructed along the southern boundary of the Beaufighter precinct, to direct flows from Runway 28L/10R and development in the Beaufighter precinct to the new basin.

Small rock landscaping has been introduced to localised sections of open drains showing evidence of minor soil erosion.

The drainage line under the 04/22 runways has been piped, and a new stormwater detention basin created at the north-western end, to moderate peak flows prior to discharge to the district drainage network, and provide water for irrigation of the runways.

Rainwater tanks have been included in new developments, including the corporate hangars on Wirraway Avenue, the Emergency Management Queensland facility, and the new office and warehouse development on Beaufighter Avenue.

Open earth drains have been periodically slashed and weeds removed.

The aircraft wash down bay is identified with signage. Washdown water passes through a triple interceptor prior to discharge from the site.

The second wash down bay (at the eastern end of Taxiway Bravo) is no longer in use as there is only the need for one bay for the airport.

Surface water quality monitoring has been undertaken at various locations in the drainage network on an annual basis.

8.6 TARGETS 2011-2016

The annual surface water quality assessments will continue at spot locations, on a sub catchment basis and will be analysed for contaminants.

Where elevated concentrations are found, AAC will undertake further investigations within the relevant sub catchment area(s) to identify the likely cause of reduced water quality. It will work with the AEO to identify the source and improve water quality wherever feasible.

If necessary, the surface water monitoring program will be revised to assist with identifying the distribution or source of pollutants.

Water sensitive design measures, including the use of rainwater tanks for capture and reuse of stormwater flows will be incorporated into new developments wherever feasible.

9 Ground water

9.1 OBJECTIVES

To minimise the impact of airport operations on ground water quality

9.2 EXISTING CONDITIONS

Groundwater at the airport has been assessed on an annual basis since 1993.

A network of groundwater monitoring wells has been developed, and the location of these is shown in Figure 8.

The most recent assessment *Annual Groundwater Monitoring Report Archerfield Airport Archerfield* was completed by Simmonds and Bristow Pty Ltd in September 2008. The report includes information about existing site conditions and the relevant information is presented below.

9.2.1 Regional hydrogeology

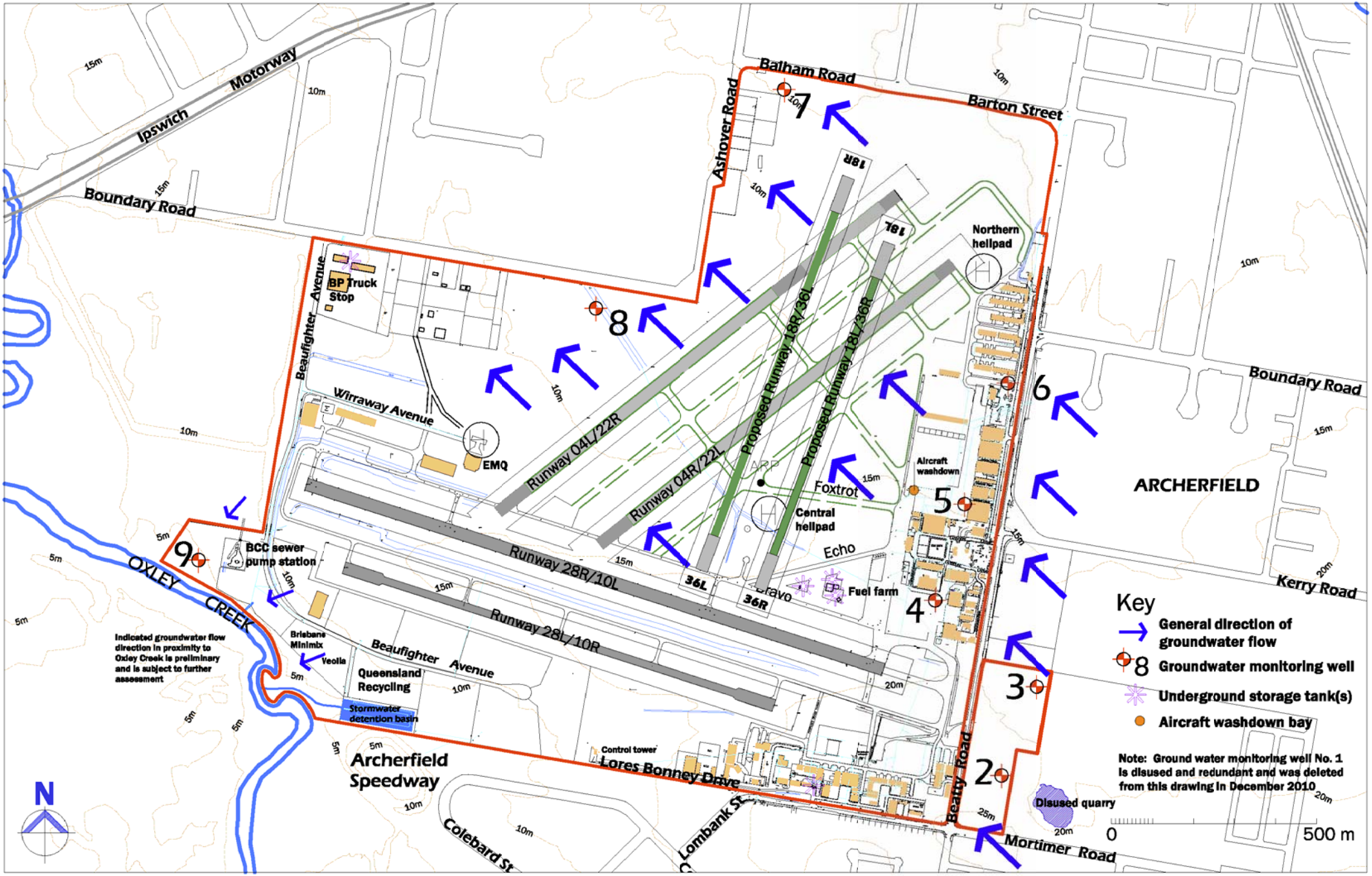
The site geology consists of Tertiary semi consolidated sediments and basalt (Sunnybank Formation).

It is likely that the basalt dips to the west. Underlying this is the Triassic-Jurassic Woogaroo sub-group, comprised of sandstone, siltstone, shale and conglomerate. These rocks are less permeable to groundwater flows than the basalt. Alluvial deposits occur along Oxley Creek (at the southwest boundary) and Stable Swamp Creek (which is approximately 1.2km further north, and 750m at the closest point).

Potentiometric contours have indicated that the groundwater flow across the site is in a northwest direction.

Therefore the section of Oxley Creek along the airport's south-west boundary would be the receiving environment for groundwater in areas immediately adjacent to the creek.

Otherwise groundwaters from the site would flow northwest toward the junction of Oxley Creek and Stable Swamp Creek. Indicative flow direction is shown in Figure 8.



Archerfield
Brisbane's Metropolitan Airport

Archerfield Airport Environment Strategy 2011-2016

Figure 8 **Groundwater**

PlannedFX
Planning Environment Strategy Design

9.2.2 Beneficial uses of groundwater

Groundwater resources in the area are not used for potable supply. There are no known major groundwater users from this tertiary aquifer.

9.2.3 Underground Storage Tanks

Known Underground Storage Tanks (UST's) have been located and most have been removed.

Those remaining on site are required for current uses. They are summarised below.

Table 4 Underground Storage Tanks

Site	Tank reference	Fuel type	Capacity (litres)
AAC Compound (Site 652)	AAC1	Diesel	5300
AirBP (Site 121)	AirBP 1	Avgas	55 000
	AirBP 2	Jet A1	55 000
BP Truckstop (Site 450)	BP 1	Diesel	110 000
	BP 2	Diesel	110 000
	BP 3	ULP	50 000
	BP 4	ULP	30 000
	BP 5	PULP	30 000
Mobil (Site 123)	Mobil 1	Avgas	55 000
	Mobil 2	Jet A1	55 000
Shell (Site 120)	Shell 1	Avgas	86 000

In 2006 one of the diesel tanks at the BP Truckstop on the corner of Boundary Road and Beaufighter Avenue was found to be leaking. The tank was removed and a soil and groundwater remediation and monitoring program was implemented by BP, under the supervision of an independent environmental assessor.

The tanks and related infrastructure have been replaced with double walled tanks and pipes.

The groundwater and soil remediation works were undertaken in accordance with an Environmental Management Plan.

The remediation and monitoring program is subject to ongoing assessment and reporting.

9.2.4 Groundwater quality

In 1993 Otek studied the potential migration off site of various compounds in the groundwater. The study found that BTEX, TPH and metal concentrations were below method detection limits in all monitoring wells.

The assessment undertaken in 1993 has been followed up with annual groundwater sampling and analysis to monitor for any changes in these conditions.

Annual reviews have confirmed that the quality of groundwater entering the site generally from the south east and discharging to the north-west meets regulated standards.

In 2003-4, AAC reviewed its water quality monitoring program. As part of this, sampling bores were serviced and upgraded.

The analysis of the annual groundwater monitoring data in 2003 indicated concentrations of chromium, lead and zinc above accepted limits in four monitoring wells. Field measurements at two of these four wells showed dissolved oxygen and conductivity levels that did not meet accepted limits. The AEO and AAC reviewed historical groundwater data but were unable to determine any possible causes for elevated chromium in groundwater.

The most recent groundwater assessment (Simmonds & Bristow 2008) found that:

- pH, electrical conductivity, temperature and dissolved oxygen were similar to previous years;
- no Total Petroleum Hydrocarbons (TPH) were detected in any of the wells;
- no BTEX were detected;
- the concentration of dissolved elements and metals were below the limits for marine water;
- copper concentrations exceeded guidelines at MW3 (in the vacant land on the east side of Beatty Road) and MW4 (next to the aircraft parking area north of the eastern end of the 28R/10L runway);
- zinc concentrations exceeded limits at MW2 (in the vacant land on the east side of Beatty Road);
- traces of endrin aldehyde that were detected in 2006 have not been subsequently detected in 2007 or 2008.

The north-westerly direction of the groundwater flow across the site suggests that contamination could be entering groundwater from off site. Low dissolved oxygen and high conductivity levels could be attributable to the drought conditions that have slowed groundwater recharge. In addition, the site is underlain by weathered basalt, which can result in higher concentrations of metals in the local groundwater.

9.3 POTENTIAL IMPACTS

Impacts in groundwater from activities on airport could arise from:

- leaking USTs and related infrastructure (pumps, pipes etc);
- inappropriate storage, handling or disposal of hazardous materials;

- buried waste (including from past occupiers);
- spills from the BCC sewer pump station off Beaufighter Avenue (and near Oxley Creek);
- material spills.

Similarly, there is the potential for areas surrounding the airport to impact on the groundwater conditions on airport. The past and present industrial uses, wartime developments, and the former quarry on the north side of Mortimer Road (next to the south-east corner of the airport) are all potential sources. These need to be considered in any groundwater monitoring program.

9.4 MANAGEMENT OF IMPACTS

AAC has in place a number of measures to protect groundwater from contamination by airport activities.

These include:

- annual monitoring of groundwater via the network of bores on site;
- provision of spill containment equipment for deployment by AAC in areas under its direct management;
- decommissioning of old and redundant USTs;
- discouraging tenants from installing new USTs if bunded above ground storage is feasible;
- requirements in the EMPs for new tenants to address hazardous materials storage and containment in their plans;
- consideration of spill containment during tenant reviews.

Any new UST and related infrastructure needs to be installed and operated in accordance with industry standards.

Existing tanks and related pipe and pumping infrastructure require ongoing monitoring to confirm the integrity of the fuel storage system. Any losses from the system need to be identified early so that remedial action can be taken.

This needs to be addressed by each tenant, and AAC needs to confirm during the environmental reviews of each tenancy with USTs that monitoring is being undertaken.

9.5 ACHIEVEMENTS 1998-2010

The network of groundwater sampling bores has been periodically serviced and was upgraded in 2003.

The annual groundwater monitoring program by AAC has continued throughout the planning period and now provides data for the past 15 years.

All tenants with USTs have in place gain/loss monitoring systems.

9.6 TARGETS 2011-2016

The annual groundwater monitoring and analysis program will continue. Attention will be given to determine the likely reasons for any elevated levels. The monitoring program will be updated if required.

A new groundwater monitoring well was established in the area between Beaufighter Avenue and Oxley Creek for the 2010 monitoring cycle. This will provide baseline data about groundwater conditions and movement in the south-western part of the airport.

AAC will during the cyclical environmental reviews follow up tenants with USTs to ensure that monitoring for losses is being undertaken.

AAC will undertake annual integrity testing of the diesel UST in the AAC grounds maintenance compound. If any discrepancy is identified immediate remedial action will be taken. These actions will be in accordance with the Australian Institute of Petroleum's Code of Practice, *'CP4 1998, Design, Installation and Operation of Underground Petroleum Storage Systems'*.

Any new USTs will be subject to either an integrity testing plan or an appropriate gain/loss monitoring system. The testing, monitoring, and reporting regime will be in accordance with the relevant industry standards.

10 Soil

10.1 OBJECTIVES

To minimise the potential for soil contamination to occur

To continue to manage contaminated sites in accordance with relevant legislation

10.2 EXISTING CONDITIONS

Soil conditions at the airport consist of silty and sandy clays that overlay weathered basalt. The basalt becomes less weathered as depth increases.

10.2.1 Soil contamination

In July 1993, a *Background Investigation Report* (Otek 1993) identified several potential areas of subsurface contamination associated with the airport. These included a number of USTs, scrap yards, a battery recycling operation, maintenance shops, painting facilities, and drum storage areas.

A subsequent more detailed environmental investigation (Otek September 1993) found that Benzene, Toluene, Ethylbenzene and total Xylenes (BTEX) and Total Petroleum Hydrocarbon (TPH) levels were below method detection limits in all borings tested. Metal analyses indicated elevated levels of lead in proximity to the former battery recycling facility. The study concluded that detectable concentrations of nickel, copper, cadmium, and chromium were consistent with background concentrations and were within applicable criteria. Analyses for volatiles, pesticides, and PCBs showed no concentrations above the method detection limits.

The study found no adverse impact on the environment from the USTs.

The minimal localised soil contamination detected in the Otek environmental reviews is well within the current acceptable environmental standards.

Otek, in 1993 also undertook soil sampling in the open unlined drains along the northern and western perimeters of the site. The analysis of the samples concluded that there was no detectable soil contamination.

In 2006 a UST used for diesel at the BP Truckstop on the corner of Boundary Road and Beaufighter Avenue was found to be leaking. The tank and related infrastructure was removed and a remediation plan developed and implemented.

An independent environmental assessor has overseen the containment of pollution and the implementation of the remediation and monitoring program. Contaminated soil was excavated to the maximum feasible extent (some allowance had to be made for protection of canopy foundations and other structural elements). The soil was farmed on adjacent land on the airport for approximately six months, before being disposed of off site.

The USTs on the site have been replaced with double walled tanks and related infrastructure.

10.2.2 Acid sulphate soils

As part of the Brisbane City Plan, Brisbane City Council has collated information about acid sulphate soils in the Council area, and prepared a Planning Scheme policy on management of this issue (Appendix 2, Brisbane City Plan).

The City Plan describes acid sulphate soils as follows:

> *'Acid sulfate soils' is the common name given to soils containing iron sulfides (usually Pyrite, FeS_2) that, if oxidised, produce sulfuric acid. When exposed to air, either naturally (e.g. during a drought), through soil disturbance (e.g. dredging or excavation) or through a lowered watertable (e.g. drain construction), the sulfides oxidise to produce sulphuric acid. The disturbance of acid sulfate soils can therefore result in soil and groundwater becoming acidic.*

In Brisbane, acid sulphate soils are generally found below 5m Australian Height Datum (AHD) and in Holocene sediments (organic-rich sediments and silts). They are usually associated with coastal lowlands and estuarine flood plains. Under natural conditions the soils are usually located below the watertable.

The only parts of the airport at or below the 5 metre contour are found in the south-west corner of the site, next to Oxley Creek. The 5 metre contour is shown in the *Existing conditions* drawing.

10.3 POTENTIAL IMPACTS

The main potential impacts of airport activities are:

- soil contamination from USTs;
- soil contamination from chemical spills;
- soil contamination from oil leaks from aircraft and motor vehicles.

The potential impacts of acid sulphate soils have been identified in subdivision and development guidelines prepared by Brisbane City Council as:

- elevated levels of sulphuric acid, iron, aluminium and heavy metals being leached from the soil and discharged to receiving waters, often in a concentrated 'slug' after a dry period (such discharges can be acutely toxic to aquatic species such as fin fish and shellfish);

- significant degradation of aquatic habitats, including habitat for commercial and recreational fisheries;
- increased levels of fish mortality, disease (eg red spot disease) and potentially some types of algal blooms;
- reduction in biodiversity in waterways and wetlands;
- decreased health of waterways and wetlands; and/or
- corrosion of infrastructure containing concrete and metal (eg culverts, bridges and stormwater drains).

10.4 MANAGEMENT OF POTENTIAL IMPACTS

AAC will continue to review activities on airport to identify any potential sources of soil contamination. For AAC operations and areas under AAC management, this will occur on an ongoing basis. Individual tenancies will be assessed during the tenant reviews, and at the end of lease assessment.

Underground storage tanks and businesses associated with the storage and use of potential contaminants (including waste materials) will attract specific surveillance.

All new AAC leases have the requirement for tenants to monitor for contamination, and where issues arise, to remediate. These activities will in each case be addressed through a tenant Site Environmental Management Plan for construction and/or operation phases (as applicable).

Tenants will be required to provide AAC with independent validation of site clean up works.

The AAC will encourage tenants to decommission underground tanks, regardless of condition, due to the significant potential liability associated with the ageing underground tanks. In the future, all storage tanks installed on the site (apart from fuel services) will wherever possible be above ground with appropriate containment, including bunding.

Bunding of hazardous materials storage equipment (containers and conveying infrastructure) will be required where there is the potential for spills.

Any future development in the lower lying land in the south-west corner of the airport, immediately adjacent to Oxley Creek, needs to take into account the possibility of acid sulphate soils. This should be addressed in an assessment to be undertaken as part of the formulation of any development proposals for the land at or below the 5 metre (AHD) contour.

If substantial excavation or filling is proposed for land below 20 m AHD (for example in conjunction with the realignment of the secondary runways, or the development in the lower lying central part of the airport), appropriate consideration will be given to acid sulphate soils in the design and construction of the works.

10.5 ACHIEVEMENTS 1998-2010

The former battery recycling site has been remediated by removal of the contaminated soil and reclamation with clean fill in 1994. The remediation is described in report reference B94C094/C1 prepared by OTEK Australia Pty Ltd dated 14 December 1994.

The former Airport Rescue and Fire Training Area was closed and remediated in 1994. The site remediation is also described in the 14 December 1994 report by OTEK Australia Pty Ltd.

The former underground storage tanks used by Mobil, Air BP and Shell were decommissioned and the sites remediated over the period 1997 to 2000.

With the exception of the BP Truckstop site, there are no known contaminated sites on the airport. The assessments indicate that only small contamination issues such as oil leaks from aircraft and motor vehicles exist on the airport.

10.6 TARGETS 2011-2016

All tenants operating or proposing to install underground storage tanks will be required to institute programs to ensure tanks do not leak. Tenants will be required to carry out annual testing of tanks, or alternatively implement a continual monitoring program as detailed in the Australian Institute of Petroleum's Code of Practice, *'CP4 1998, Design, Installation and Operation of Underground Petroleum Storage Systems'*.

Bunding will be required for all new storage facilities for hazardous materials.

AAC will continue to apply EMPs (and in particular the *End of lease tenant environmental review*) to ensure that leaseholds are appropriately managed and any contamination is identified and rectified.

An assessment for acid sulphate soils will be undertaken before any development requiring ground excavation in the south-west corner of the airport, at or below the 5 metre contour.

11 Hazardous materials and waste management

11.1 OBJECTIVES

To minimise the use of hazardous materials, where practicable

To minimise the quantities of waste produced where practicable

To maintain current information on hazardous materials on the airport

To ensure that wastes are properly handled, stored, transported, and disposed of

To encourage recycling of materials

11.2 EXISTING CONDITIONS

11.2.1 Effluent

The airport is serviced with reticulated sewer and is connected to the metropolitan network (including for trade waste). BCC has a sewer pump station in the south-west corner of the airport, adjacent to Oxley Creek.

11.2.2 Hazardous materials

AACs objective is to minimise where practicable the use of hazardous materials and to ensure that where hazardous materials are used, their impact on the surrounding environment is kept to a minimum.

Hazardous materials are stored in a variety of locations at the airport, and while some storage locations are fairly well designed, others require some improvement. There is also a need for constant vigilance to ensure that the storage methods and signage are appropriate to the types of product storage currently in use. Australian Standards will apply.

11.2.3 Potentially contaminated building materials

A comprehensive survey of buildings conducted in 1994/1995 and reviewed regularly since then has found evidence of some insitu building materials likely to contain asbestos. These materials are mostly in sheet 'fibro cement' form and have been used most commonly for cladding some buildings, and

roofing in particular. There are also incidences of asbestos in other building materials including flooring.

The survey found that this is confined to older existing structures, and, provided it is not disturbed from its current state, is regarded as not presenting any hazard.

The survey also identified a limited amount of asbestos fibre used in pipe lagging.

In 2003 Asbestos Audits Queensland Pty Ltd completed its *Asbestos Materials Report and Register for Archerfield Airport*. The report addressed all AAC buildings on the airport and included an inventory of asbestos, and recommendations for its management.

In 2006 the asbestos register was upgraded to include a risk assessment and Management Plan, and has been updated since then as developments occur, buildings are demolished, and buildings come into the ownership of AAC.

11.2.4 Recycling

AAC's objective is to comply with current waste management standards and to minimise waste. It will ensure that it adopts the most recent recycling practices.

Where possible during tenant reviews opportunities to minimise waste or utilise waste from other activities on site will be identified.

Queensland waste management policies and regulations, including *Environmental Protection (Waste Management) Policy 2000*, and *Environmental Protection (Waste Management) Regulation 2000* will be applied.

11.3 POTENTIAL IMPACTS

The potential impacts of ground based airport activities include discharge of hazardous materials or waste to soil, surface or groundwater; and litter pollution of the site or neighbouring land.

11.4 MANAGEMENT OF IMPACTS

AAC maintains a current register of asbestos in its buildings. Asbestos is marked with hazard stickers, and the asbestos register is made available to tenants and contractors undertaking work on the airport.

The asbestos register is updated as works are undertaken, and any changes are included in the annual environment report to the Commonwealth.

If buildings containing asbestos are to be demolished or modified, this work will be undertaken in accordance with an Environmental Management Procedure applying precautions stipulated under the *National Health and*

Medical Research Council Code of Practice and relevant government guidelines.

Monitoring of the quality and quantity of waste materials on site, and the actions taken to recycle this material will continue as part of environmental reviews of tenant operations.

Ongoing reviews will ensure environmental issues previously identified are addressed appropriately, as well as identifying any new issues related to the management and disposal of hazardous materials and wastes.

Environmental reviews will include an inspection of storage facilities and work practices, identification of unacceptably large waste stockpiles and a review of tenant records concerning the proper disposal of industrial wastes.

The regular environmental reviews will be supplemented by the on-going vigilance of all AAC staff. AAC personnel noticing unacceptable work practices, such as improper storage or leaking wastes will report their findings to AAC management for action.

The Archerfield EMPs require prospective new tenants (tenants or renewing their lease) to provide details of the materials they propose to store and use on site, and how these will be managed.

11.5 ACHIEVEMENTS 1998-2010

AAC has conducted regular inspections of tenancies to identify all materials storage and handling, waste management and disposal and other aspects of the activities conducted in the tenancy that could potentially impact on the safety of the airport, or on the environment.

Brisbane City Council regularly tests sewage entering its treatment system from the airport. Any non conformances are reported to AAC and the tenant (if applicable) for action.

In May 2003 Asbestos Audits Queensland Pty Ltd completed its *Asbestos Materials Report and Register for Archerfield Airport.*

AAC has maintained since 2003 an up to date register of asbestos in AAC buildings on the airport. In 2006 a risk assessment and management plan was formulated, and this has guided decisions on the ongoing management of asbestos.

AAC has compiled a register of chemical and hazardous materials for its grounds maintenance and works activities (2009).

11.6 TARGETS 2011-2016

Maintain the AAC asbestos register, management plan and risk assessments.

Review AAC operations and expand the Hazardous Materials Register as required.

Develop Hazardous Materials Register for relevant tenancies and prepare baseline snapshot.

Monitor hazardous materials on airport through tenant reviews and record quantities of hazardous materials in Hazardous Materials Register.

Ensure that tenants have hazardous materials licences where applicable and have a HAZMAP located at the site entrance.

Monitor the quality and quantity of waste materials on the airport.

12 Use of natural resources and energy

12.1 OBJECTIVES

To identify opportunities for cost effective reductions in consumption of natural resources and energy

To encourage efficient use of water and energy

To encourage the use of alternative sources of energy and water

To reduce airport use of non-renewable resources

12.2 EXISTING CONDITIONS

Archerfield Airport is supplied with reticulated water, mains power and other utility services from the Brisbane urban infrastructure networks.

12.2.1 Water

Sustainable Solutions International Pty Ltd prepared a *Water Efficiency Management Plan* (WEMP) for Archerfield Airport in April 2008.

The WEMP included a detailed assessment of past and existing water usage, and identified opportunities for more efficient use of water.

For the financial year 2005/06, Archerfield Airport used a total of 18.6ML of potable water from the Brisbane metropolitan water supply.

According to AAC records for 2007/2008, Brisbane Minimix/Qcrete concrete production accounted for 45% of total airport potable water consumption. The next highest usage was for toilets and urinals (22%), and taps (11%).

The current water use breakdown at Archerfield Airport is shown in Table 5. It is derived from AAC water metering data for the period from September 2007 to January 2008 and from information obtained from tenant surveys.

Table 5 Water use summary

End use	L/day	% total
Brisbane Minimix/Qcrete		
Concrete batching	10,941	30%
Slump correction	1,140	3%
Tank top-up	912	2%
Unaccounted	3,636	10%
Sub total	**16,629**	**45%**
Amenities		
Showers	141	0.4%
Taps	3,943	10.6%
Toilets	5,064	13.6%
Urinals	3,012	8.1%
Other staff usage		
Kitchenette	641	1.7%
Drinking water	470	1.2%
Food preparation includes the café and coffee shop	289	0.8%
Vehicle wash includes aircraft, truck, machinery, bus and other vehicle wash	1,426	3.9%
Hangarage	353	0.9%
Process engine washout, water used in blowers, and dust suppression	2,376	6.4%
Minor water uses including hand watering, outdoor activities	241	0.6%
Known leakages identified through the audit process and overnight meter readings	2,132	5.8%
Unaccounted other leakages, cleaning, and other unquantifiable uses	364	1.0%
Total	**37,081**	**100%**

12.2.2 Electricity

The airport is connected to the Brisbane grid. Electricity is supplied directly to the airport substations, and the airport distributes the electricity to tenants on serviced sites.

Infrastructure includes:

- a 500 kVA transformer substation at the BP Truckstop;
- a 300 kVA transformer serving developments in Wirraway Avenue;
- a 500 kVA transformer substation at the Veolia Environmental Services site, serving developments in Beaufighter Avenue;
- a 300 kVA supply to the BCC sewage pump station near the Oxley Creek;

- a 200 kVA and a 300 kVA transformer in the south east of the site, near Mortimer Road;
- a 300 kVA transformer at the fuel farm;
- a 750 kVA substation and a 75 kVA diesel powered standby generator (for essential power only) to the east of the Airport Terminal building;
- a 200 kVA substation serving the tenants on Beatty Road, opposite Boundary Road (on the east side of the airport).

12.3 POTENTIAL IMPACTS

Efficient use of energy and water at Archerfield will become increasingly important in coming years.

Water scarcity is expected to be more prevalent due to climate change and increasing demand for water to serve population and economic growth in South East Queensland.

Energy usage will also become a significant issue, from the perspectives of cost, and carbon emissions in particular.

AAC is committed to securing the economic sustainability of the airport, and is working hard to attract additional enterprises and people to the site.

It recognises that water and energy consumption overall could increase due to:

- occupation of vacant leasehold premises, or connection of existing sites to the reticulated network;
- increased staff and visitor numbers on airport;
- construction activity;
- increased production by tenants (particularly those with higher water usage requirements).

With growth in airport activity, the focus will be on achieving best practice efficiencies in water and energy use in new enterprises; use of renewable energy (including on site generation where feasible); and encouraging progressive improvements in existing AAC operations and tenancies.

12.3.1 Management of impacts

The management of water use will include:

- ongoing monitoring of consumption by AAC and tenants using the AAC metered supply, to identify opportunities for reductions;
- harvesting and reuse of water on site as a replacement (or supplement) for potable water (for suitable aviation and non aviation purposes);

- use of water efficient fittings and appliances in AAC facilities and new developments;
- incorporating grey water reuse in new developments, where feasible.

In terms of infrastructure, the WEMP action plan identified the following opportunities for recurrent savings totalling 1899kL/annum:

- replacement of taps with water efficient fittings-402 kL/annum;
- replacement of showers with water efficient fittings-9 kL/annum;
- water efficient upgrade for urinals-654 kL/annum;
- installation of a rainwater tank to the Emergency Management Queensland building-56 kL/annum;
- repair of known leakages-778 kL/annum.

As part of on-going improvements the following water reduction initiatives have been identified:

- sub metering of tenancies with high water usage, to identify unaccounted for uses and possible leakages;
- use of water efficient fixtures with a minimum of 3 WELS stars at the airport; and
- a leak identification and monitoring program including repair of known leakages.

In addition, drought tolerant indigenous vegetation will be used where possible in new landscaping, to minimise the need for irrigation.

Based on these initiatives a 38% reduction in the potable water usage at Archerfield Airport from the baseline year of 2005/2006 is possible. This would translate to an estimated airport water consumption of 31.9kL/day, equivalent to approximately 11.6 ML/year.

A staged reduction in energy usage will be pursued, through initiatives such as:

- specification of energy efficient appliances and fittings (including lighting) in refurbishments and new developments;
- achievement of energy efficiency in the siting, design, building fabric and specification of services for new development by AAC and tenants;
- encouraging tenants during environmental reviews to implement reduction strategies.

Improved efficiency in water and energy use will be pursued in new airport and commercial development. AAC has implemented such measures in the refurbishment of the Airport Terminal and administration building, the new corporate hangars, and the new warehouse development on Beaufighter Avenue.

12.4 ACHIEVEMENTS 1998-2010

Use of natural resources and energy has been considered in tenant assessments.

The airport has secured Queensland Recycling as a tenant. Their operation produces recycled materials that are used in construction and other sectors, promoting the reuse of resources and reducing the energy used in producing these raw materials.

AAC developed a *Water Efficiency Management Plan* (WEMP) in consultation with tenants and Brisbane Water in 2008. This builds on water efficiency initiatives introduced in recent years.

Water efficiency initiatives by AAC since the 2005/06 baseline year include:

- upgrade of all taps, showers, toilets and urinals at AAC owned buildings to more efficient fittings;
- irrigation of runways from stormwater, rather than potable water from the metropolitan water supply;
- installation of rainwater tanks;
- upgrading of water meters.

Rainwater tanks have been installed for the Emergency Management Queensland complex (for washdown for operational purposes), the new corporate hangar development on Wirraway Avenue, and the warehouse and office on Beaufighter Avenue.

AAC has provided quarterly reports on water usage to the Queensland Water Commission.

Energy and water efficiency have been key considerations in the recent refurbishment of the administrative offices in the historic Terminal building. Since completion, AAC energy consumption has been reduced by almost half saving around 5000 kg of greenhouse gas emissions per annum.

12.5 TARGETS 2011-2016

Use of natural resources and energy in AAC operations, and by tenants will continue to be monitored through the cyclical environmental review process.

Tenants will be encouraged to reduce natural resource and energy use, and initiatives will be recorded and reflected in management plans (as appropriate).

AAC will consider energy efficiency, water efficiency, and sustainable design when designing and specifying future projects or reviewing proposals by new or existing tenants.

The water saving initiatives identified in the WEMP Action Plan will be progressively implemented, in consultation with Brisbane Water.

13 Noise

13.1 OBJECTIVES

To minimise within the scope of AAC's responsibility ground based noise disturbance associated with airport operations.

13.2 EXISTING CONDITIONS

13.2.1 Aircraft noise

The major contributor of noise and vibration associated with airport operations is aircraft in flight.

The Archerfield Airport ANEF (presented in Part 1 of the Master Plan) identifies forecasted noise impacts. It takes into account current standards, the projected aircraft movement patterns, likely aircraft mix, and maximum aircraft volumes forecast for the Airport Master Plan.

Noise due to aircraft in flight, landing, taking off or taxiing is specifically exempted under the *Airports (Environment Protection) Regulations 1997*. Under the *Civil Aviation Act 1988* this activity is under the direct control of Airservices Australia (AsA).

Any complaints received concerning aircraft movements are immediately directed to the responsible officer at Airservices Australia. AAC works with AsA and aircraft operators on any aspects that involve AAC's areas of responsibility or interest.

13.2.2 Other noise sources

Noise emitted from an airport (other than discussed above) may be caused by activities including:

- ground running of aircraft;
- noise from aircraft parked near buildings;
- operation of engine test cells;
- construction operations;
- noise from non-aviation activities;
- road traffic movements.

These sound sources may affect the area immediately surrounding the airport.

13.3 MANAGEMENT OF IMPACTS

Noise levels due to ground based aircraft engine activities are minimised by restricting ground running and testing procedures to certain locations on the airport.

Helicopters are directed to pod Tango for run up, jet engine testing is only allowed at the run up bay to Runway 10L, and truck based dynamic engine test beds are directed to pod Tango.

Evening or night time activities of this nature rarely occur.

AAC investigates any complaint due to the ground running of aircraft.

AAC considers that its noise control strategy described above is suitable, and that noise monitoring or changes in noise management practices does not appear to be warranted.

If current circumstances change significantly then the need for monitoring and further controls will be reassessed and actions taken. Changes that would trigger further assessment could include proposals to commence a new 'noisy' process, or a significant increase in the frequency of ground based engine operation.

With respect to other potential noise sources, there has not been a significant history of complaints. Since 1999, all new leases have included clauses relating to the environmental management obligations on tenants.

Under the current environmental management regime, tenants assessed as having the potential to generate nuisance noise are required to develop and implement a Site Environmental Management Plan (operations) to address potential off site impacts. Implementation of these management plans will be subject to ongoing monitoring and periodic review by the AEO.

13.4 ACHIEVEMENTS 1998-2010

There have been no complaints relating to ground running of aircraft.

Noise emissions from tenancies on airport are managed in accordance with the EMPs and any environmental management plan in place for their operation.

13.5 TARGETS 2011-2016

Continue with noise management initiatives adopted by AAC which include:

- working with AsA to identify and implement solutions to any noise complaints, where these relate to AAC's areas of direct responsibility as airport operator;

- monitoring and reviewing the use of airport facilities (including ground running and testing procedures) with the view to minimising the noise impact on the community;
- ensuring if a significant issue arises that appropriate consultation processes are put in place to resolve the issue;
- working with Brisbane City Council and other relevant government agencies to ensure that structures built near the airport have taken noise into consideration and that off airport land is appropriately zoned;
- assisting neighbouring landholders with advice on airport operations, and in particular, options for minimising potential noise impacts on the use or development of their land.

Ensure that all AAC personnel know of the noise complaints process (as set out in the EMPs). Advise new employees during initial induction and refresh all personnel annually.

Develop guidelines for when tenants are able to produce noise and the noise limitations that apply.

14 Management of new facilities

14.1 APPLICATION REQUIREMENTS

AAC will require new tenants or proponents of new aviation or non-aviation facilities or activities to apply for approvals as provided for in the *Airports Act, 1996*.

In addition to the requirements of the Airport Building Controller, the application for approval will need to detail:

- the activities and operations proposed, in accordance with the Archerfield Airport EMPs;
- any chemicals to be used or stored on the site including type and maximum quantities;
- evidence that the proposal meets any applicable legislative requirements and guidelines for the construction and operation of the activity or site;
- evidence that the proposal will meet any applicable occupational health and safety, storage and placarding requirements.

Procedures for this and relevant forms are set out in the Airport EMPs.

These include:

- Procedure AA1-*Environmental assessment of new tenancy or lease renewal*;
- Procedure AA8-*Assessment of environmental effects of new works*;
- EMP1 *Lease proposal/tenant questionnaire*; and
- EMP6 *Environmental management checklist for new works*.

The information provided with applications will assist AAC and the tenant/proponent to identify all potential environmental issues or impacts, and to also clarify applicable legislative requirements and best practice management guidelines that will be applied. If required, the AEO will be provided with this information.

14.2 ASSESSMENT

From an environmental perspective the assessment of new works will consider the implications of the proposal for:

- airside operations;
- existing land uses on and adjacent to the airport, including through the emission of noise, dust or odour;
- existing utility services, and any connections proposed during and following construction;
- efficient use of water;
- access to and within the airport;
- significant native flora;
- heritage values (pre and post contact);
- potential risk of soil or air pollution;
- noise impacts;
- groundwater, including potential changes to groundwater levels on or off airport, and/or water quality;
- surface water, including potential changes to peak volumes entering existing drainage lines, diversion of existing stormwater flows and/or impacts on water quality;
- containment of asbestos, where works relate to buildings or plant listed in the airport asbestos register;
- the potential for the works to result in the introduction or spreading of Fire Ants; and
- the appearance of the site and the airport.

If on reviewing the proposal potential environmental impacts are identified, AAC will work with the proponent to identify how impacts can be mitigated. The preparation of a Site Environmental Management Plan for the construction and/or operational phases may also be required.

14.3 CONSULTATION

All new proposals for the site will be reviewed by AAC against the AES, the Airport Master Plan, and other relevant policies, guidelines or standards. Where the *Airports Act 1996* requires consultation with the wider community, AAC will facilitate this.

The AEO will be involved in assessing and advising on the environmental aspects of any major new developments on the airport site, including any Environmental Management Plan for the construction or operational phases.

If in the opinion of the AAC, the development could result in a significant off-site impact, AAC will identify and consult with relevant stakeholders including Brisbane City Council, and possibly State agencies and/or the community and their comments taken into consideration.

Information concerning new proposals will be provided to the AEO, in accordance with the Airport EMPs.

All comments received will be reviewed and considered by AAC before deciding on whether the proposal should proceed, and if relevant, under what conditions.

Any significant changes to airport operations will be reviewed in accordance with prevailing DIT environmental requirements for new airport development.

Where the *Airports Act 1996* requires consultation with the community (such as in the case of a Major Development Plan), AAC will initiate an appropriate consultative process. Comments received by external parties will be taken into account by AAC when deciding whether the proposal should proceed.

14.4 LEASING CONDITIONS

For all new leases, conditions will be included that ensure that facilities are constructed and operated in accordance with the AES and relevant environmental requirements.

Following construction of the facility, AAC will inspect the premises and verify compliance with any environmental requirements stipulated in the development approval.

15 Implementation

15.1 AAC'S ROLE IN IMPLEMENTING THE AES

AAC recognises that the successful implementation of the Environment Strategy requires the constructive involvement and commitment of a number of parties both on and off airport. AAC will facilitate this by:

- providing information about the AAC environment protection policy; its objectives, environmental issues, management and mitigating measures, actions to be taken, and outcomes of ongoing monitoring and review, to interested parties;
- working with key stakeholders with a common interest or responsibilities to address environmental issues;
- disseminating information about environmental issues and initiatives being undertaken;
- training AAC personnel on the environmental management needs of the airport, according to their obligations under the Airports Act and Regulations, and requiring airport tenants to also undertake environmental training;
- encouraging others operating from, or using the airport to develop and apply environmental awareness, consistent with the Airport Environment Strategy;
- continuing to include environmental management requirements in airport leases and development approvals;
- reporting on achievements and outstanding matters to assist all stakeholders to monitor the implementation of the Strategy.

AAC is committed to ensuring that the Environment Strategy and Master Plan remain focused on the relevant current and future planning and environmental requirements of the airport.

To this end, it will consider and address all future proposals for improvement to, or refinement of the Environment Strategy and the Master Plan. These improvements will be formally consolidated in revised documentation arising from a 5 yearly review.

15.2 ANNUAL ENVIRONMENTAL PERFORMANCE REPORT

An environmental performance report is supplied to DIT—Airports Division every 12 months, and copied to the AEO. The performance report details:

- the results of any site environmental reviews which have been conducted over the previous 12 months;
- achievement of AAC's environmental protection and management objectives and targets;
- progress in implementing the strategy;
- the results of the groundwater and surface water quality monitoring program;
- a summary of any environmental incidents that occurred over the previous 12 months and the findings of any incident investigations;
- a summary of complaints received and actions taken.

AAC will also advise the AEO if monitoring indicates that discharges from the site were excessive.

Contact will also occur following any spill of material that may adversely affect either the on-site or off-site environment.

Brisbane City Council and the Queensland Department of Environment and Resource Management will also be advised if environmental impacts have occurred external to the site.

15.3 CONTINUOUS IMPROVEMENT

AAC will advise relevant tenants of the findings of its environmental reviews.

AAC will also communicate with tenants on related environmental issues on an as needed basis, for example when tenants first arrive, or following an environmental incident.

In exceptional circumstances, the AEO will also be involved to ensure the implementation of the AES is achieved.

15.3.1 Airport Environmental Management Procedures

The EMPs are dynamic and subject to regular review and refinement.

The main opportunities for improvement are anticipated to arise from:

- monthly AEMF meetings involving the AAC, AEO and the ABC;
- monthly management reviews by AAC of key issue areas;
- Cyclical tenant reviews; and
- revisions and recommendations arising from the annual environmental management report to DIT.

AAC will undertake a general review of the EMPs every two years.

Authority for revision of the procedures in the EMPs rests with the Airport General Manager. Policy and strategies can only be revised with the approval of the AAC Board.

15.4 MONITORING AND REVIEW

As a part of maintaining the ongoing responsibilities identified in this AES it is important that there are mechanisms in place to monitor and identify any potential or emerging issues.

Key environmental aspects will be monitored through the following actions:

- an ongoing, annual assessment of groundwater quality on the airport;
- annual reviews of airport tenants that have hazardous chemicals on site, to monitor compliance with chemical handling and storage requirements;
- cyclical environmental reviews of each airport tenant to determine the environmental performance of the activities carried out and achievement of environmental management objectives against their Site Environmental Management Plan (where applicable);
- maintaining a register of known hazardous materials (including wastes) that are on the airport site;
- ensuring that with each new building application the appropriate environmental systems and considerations are put in place. This will involve working closely with the AEO;
- annual assessment of the quality of the airport stormwater run-off. AAC will continue the past practice of conducting assessments each year with sampling taken in each sub catchment on airport, and will maintain these data on a data base;
- ensuring that tenants secure any Trade Waste Agreement required prior to commencing activities on the airport;
- monitoring and reviewing products and chemicals used by AAC to ensure that environmental issues are considered and best practice is applied;
- investigating any complaints about nuisance noise relating to ground based activities, including those by tenants.

The AEO will be advised if monitoring indicates that any discharges are excessive.

There are currently no other known emissions to the environment that warrant monitoring. If an issue arises, or is identified during environmental reviews of activities or works by AAC or tenants, a monitoring program will be implemented as required.

The achievement of the AES objectives and action plan targets will be monitored by AAC and the AEO on a quarterly basis.

AAC will review the Airport Environment Protection Action Plan on a 12 monthly basis. It will check on the risk rating given to each action, progress on individual actions, and whether the Plan needs to be modified. It will provide the results of this review to DIT and to the AEO.

Appendix A

Legal register

The following is a list of Commonwealth and State environment protection, health and safety or dangerous goods management Acts and Regulations that may apply to Archerfield Airport and the operations conducted by its various tenants.

COMMONWEALTH LEGISLATION

Aboriginal and Torres Strait Islander Heritage Protection Act 1984

Air Navigation Act 1920

Airports Act 1996

Airports (Environment Protection) Regulations 1997

Airports (Building Control) Regulations 1997

Environment Protection & Biodiversity Conservation Act 1999 and Regulations

Hazardous Waste (Regulation of Exports and Imports) Act 1989

Industrial Chemicals (Notification and Assessment) Act 1989

National Environment Protection Measures (Implementation) Act 1998

Natural Resource Management (Financial Assistance) Act 1992

Ozone Protection and Synthetic Greenhouse Gas Management Act 1989

Ozone Protection Act 1989

Protection of Movable Cultural Heritage Act 1986

STATE LEGISLATION

Aboriginal Land Act 1991

Aboriginal Cultural Heritage Act 2003

Coastal Protection and Management Act 1995

Dangerous Goods Safety Management Act 2001

Environmental Protection Act 1994

Environmental Protection (Air) Policy 1997

Environmental Protection (Noise) Policy 1997

Environmental Protection (Water) Policy 1997

Environmental Protection Regulation 1998

Environmental Protection (Interim Waste) Regulation 1996

Environmental Protection (Waste Management) Policy 2000

Environmental Protection (Waste Management) Regulation 2000

Health Act 1937

National Environment Protection Council (Queensland) Act 1994)

National Trust of Queensland Act 1963

Native Title (Queensland) Act 1993

Nature Conservation Act 1992

Queensland Heritage Act 1992

Torres Strait Islander Cultural Heritage Act 2003

Transport Infrastructure Act 1994

Radiation Safety Act 1999

Soil Conservation Act 1986

Water Act 2000

Water Supply (Safety and Reliability) Act 2008

Workplace Health and Safety Act 1995

Wet Tropics World Heritage Protection and Management Act 1993.

OTHER PROVISIONS

Additional acts, regulations, procedures, and guidelines may apply.

Anyone undertaking works or activities at Archerfield must prior to commencement make their own enquiries to determine all relevant requirements and ensure that these are complied with.

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Appendix B

Environment Protection Action Plan

Action	Risk rating	Action by:	Cycle	Start date	Finish date
ENVIRONMENTAL MANAGEMENT SYSTEM					
Review core Environmental Management Procedures (EMPs).	Minor	AAC and AEMF.	2 yearly	March 2010	2 yearly
Prepare updated tenant questionnaire	Minor	AAC	N/A	February 2011	June 2011
Prepare additional EMPs as required.	Minor	AAC, Tenants	As required	As required	N/A
Provide framework for preparation of EMPs to those tenants undertaking activities that could cause environmental harm.	Minor	AAC, AEO	As required	As required	N/A
Administer Complaints Register.	Moderate	AAC	N/A	Ongoing	Ongoing
Ensure all new lease agreements for Airport tenants include the requirement that tenants address relevant environmental issues.	Moderate	AAC	Prior to grant/renewal of lease	Prior to grant/renewal of lease	On signing of lease
Identify new legislative requirements, relevant standards and guidelines for AAC activities.	Moderate	AEMF	Monthly	Ongoing	Ongoing
INFORMATION, EDUCATION AND TRAINING					
Provide AAC staff with copies of quarterly newsletter and alert them to any new or emerging environmental issues or requirements that might impact on their work.	Moderate	AAC	Quarterly	Ongoing	Ongoing
Train AAC staff in environmental responsibilities, key environmental issues for the airport, and actions.	Major	AAC	Annual	March 2010	Ongoing
Educate staff on new legislation requirements.	Moderate	AAC	As required	As required	Ongoing
Inform tenants of their obligations under the AES and provide copies of relevant AAC EMPs if requested.	Moderate	AAC and AEO	N/A	As required	N/A
Encourage tenants to work with AAC and the AEO in formulating appropriate and workable EMPs to meet their environmental management obligations.	Moderate	AAC and AEO	N/A	As required	As required

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Include on AAC web site this AES, relevant Environment Management Procedures (EMPs) and EMP forms; standard environmental requirements for leases; summary information about regulatory requirements under the Airports Act 1996 and its regulations; fact sheets; and updates on any current environmental issues.	Moderate	AAC	As required	June 2010	Ongoing
Develop fact sheets for common issues such as the need and required components for a Building Approval (BA) application; Construction Site Environmental Management Plan (CEMP); Operations Site Environmental Management Plan (OEMP); plant species for landscaping; noise limits and hours for tenants; AAC operation hours; etc.	Minor	AAC, AEO, ABC	As required	May 2010	Ongoing
Provide current airport-related environmental information to tenants via quarterly newsletter/email, AAC website environment section or summary with tenant invoices.	Major	AAC	Quarterly	Ongoing	Ongoing
HERITAGE					
Facilitate the conservation works at God's Acre cemetery by Friends of God's Acre Inc.	Minor	AAC	N/A	Ongoing	Ongoing
Consider findings and recommendations of the *Cultural Heritage Management Plan* in formulation or assessment of development of sites.	Major	AAC, AEO, ABC	N/A	Ongoing	Ongoing
Review and update the *Cultural Heritage Management Plan* to reflect legislative changes and provide to the Department of Infrastructure for its information.	Moderate	AAC	N/A	June 2012	June 2015
FLORA AND FAUNA					
Ensure new development does not cause an increase in bat or bird populations (due to drainage works, settlement ponds, storage of materials, or bird attracting landscaping).	Catastrophic	AAC, ABC and AEO	N/A	On assessment of each proposal	Ongoing

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Encourage use of mainly indigenous plants in landscaping works.	Minor	AAC	N/A	Ongoing	Ongoing
Prepare recommended plant list for landscaping works.	Minor	AAC	N/A	February 2012	August 2012
Prior to any major development in areas along Oxley Creek not already intensively managed, investigate fauna and flora values.	Moderate	AAC	As required	As required	N/A
EMISSIONS TO AIR AND OZONE DEPLETING SUBSTANCES (ODS)					
Continue to identify the presence of ODSs in AAC and tenant reviews.	Moderate	AAC and AEO	At tenant reviews	Ongoing	Ongoing
Advise tenants of their responsibility to obtain relevant environmental approvals for use of ODSs.	Major	AAC and AEO	At tenant reviews	Ongoing	Ongoing
In new tenancies request tenants to supply estimate of production in tonnes/yr of pollutant emissions to air.	Minor	AAC	N/A	June 2010	Ongoing
SURFACE WATER					
Continue surface water monitoring for each sub catchment.	Moderate	AAC	Annual	Ongoing	Ongoing
Carry out further investigations to identify pollution source(s) if results exceed acceptable limits in a catchment.	Major	AAC and AEO	Annual	As required	As required
Prepare management plan if pollution is attributed to AAC or tenant(s).	Moderate	AAC and AEO	As required	As required	As required
GROUND WATER					
Conduct annual assessment of groundwater quality.	Moderate	AAC	Annual	Ongoing	Ongoing
Install new groundwater monitoring well in the south west of the Mortimer Road/Beaufighter Ave precinct adjacent to the existing stormwater detention basin to provide data on groundwater in proximity to Oxley Creek.	Moderate	AAC	N/A	March 2012	June 2012

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Review with AEO findings of annual groundwater monitoring reports and determine likely reasons for any elevated levels. Update monitoring program if required.	Moderate	AAC and AEO	Annual	March 2010	Ongoing
AAC and tenants with USTs to monitor net quantities to identify any losses. Immediate integrity testing required if losses are identified.	Major	AAC and tenants	Annual	Ongoing	Ongoing
SOIL AND GROUNDWATER CONTAMINATION					
Assess storage of potential contaminants, work methods, and equipment during tenant reviews to identify potential for contamination.	Major	AAC	At tenant reviews	Ongoing	Ongoing
Encourage tenants to install bunded above ground tanks, rather than USTs where feasible.	Major	AAC, tenants	Ongoing	Ongoing	Ongoing
Ensure all new tenant lease agreements cover contamination monitoring and remediation requirements.	Moderate	AAC	As tenancies are let or renewed	Ongoing	Ongoing
Require tenants to remediate any contamination.	Major	AAC	As required	As required	As required
HAZARDOUS MATERIALS AND WASTE MANAGEMENT					
Implement recommendations *of Asbestos Materials Report and Register for Archerfield Airport* and keep asbestos register current.	Moderate	AAC, tenants modifying existing structures and services	As building demolition, works or modifications are undertaken, AAC acquires buildings	2003	Ongoing
Maintain Hazardous Materials Register for AAC operations.	Major	AAC	Ongoing	Ongoing	Ongoing
Develop Hazardous Materials Register for tenancies and prepare baseline snapshot for major tenants.	Major	AAC and tenants	At tenant reviews	August 2012	February 2013

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Record hazardous materials at minor tenancies during environmental reviews	Moderate	AAC and tenants	At tenant reviews	June 2010	Ongoing
Monitor hazardous materials on airport through tenant reviews and record quantities of hazardous materials in Hazardous Materials Register.	Major	AAC, tenants	12 monthly	January 2011	Ongoing
Ensure that tenants have hazardous materials licences where applicable and have a HAZMAP located at the site entrance.	Major	Tenants	12 monthly (with reviews)	July 2010	Ongoing
Monitor the quality and quantity of waste materials on airport.	Moderate	AAC and AEO	Ongoing	Ongoing	Ongoing
USE OF NATURAL RESOURCES AND ENERGY					
Encourage tenants to reduce energy and water use and make greater use of recycling by highlighting opportunities for resource recovery and reuse during environmental reviews of tenancies.	Minor	AAC, AEO and tenants	At tenant reviews	Ongoing	Ongoing
Include in new AAC developments rainwater harvesting where feasible.	Minor	AAC	Ongoing	2006	Ongoing
Identify opportunities in new developments for water conservation and reuse, efficient use of energy, natural light, and ventilation.	Minor	AAC	Ongoing	Ongoing	Ongoing
NOISE					
Investigate any noise complaints related to on airport activities (except aviation activity that is the responsibility of Airservices Australia). If necessary, conduct noise monitoring.	Moderate	AAC, AEO and tenants	Regular follow up if issue identified	As required	Ongoing

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Ensure that tenants have hazardous materials licences where applicable and have a HAZMAP located at the site entrance.	Major	Tenants	12 monthly (with reviews)	July 2010	Ongoing
Monitor the quality and quantity of waste materials on airport.	Moderate	AAC and AEO	Ongoing	Ongoing	Ongoing
Ensure that all AAC personnel are familiar with the noise complaints process, and the different responsibilities of AAC and AsA. Advise new employees during initial induction.	Minor	AAC	Annual	1998	Ongoing
ENVIRONMENTAL MONITORING AND REVIEWS					
Prepare risk matrix to set priorities for, and frequency of tenant reviews.	Moderate	AAC	N/A	June 2011	Ongoing
Maintain updated tenant review schedule, in accordance with tenant risk classification.	Moderate	AAC and AEO	N/A	Ongoing	Ongoing
Conduct tenant environmental reviews	Major	AAC, AEO	At tenant reviews (12 monthly for tenants with hazardous materials), others as scheduled	Ongoing	Ongoing
Identify opportunities during tenant reviews for improved waste management by AAC and tenants through cleaner production and potential synergies between activities on the airport.	Minor	AAC and tenants	At tenant reviews	Ongoing	Ongoing

Action	Risk rating	Action by:	Cycle	Start date	Finish date
Audit sites prior to tenant departure to confirm environmental condition, removal of plant and equipment, condition of utility services, and to identify any remediation or reinstatement required by tenant.	Major	AAC and AEO	Lease end	3 months before tenant is leaving.	2 months before tenant leaving
Ensure compliance of tenant with any actions arising from audit	Moderate	AAC and AEO	N/A	1 month prior to tenant vacating	Prior to release of tenant from lease
Investigate and report on received complaints	Minor	AAC	N/A	1998	Ongoing
COMMUNICATION AND CONSULTATION					
Facilitate the Archerfield Airport Environmental Management Forum (AEMF).		AAC	Monthly	2000	Ongoing
Undertake consultation with relevant stakeholders on major projects	Minor	AAC	As required	As required	As required
CONTINUOUS IMPROVEMENT					
Review progress of implementation of the Environment Protection Action Plan.	Moderate	AAC and AEO	Quarterly	July 2010	Ongoing
Review contents of Environment Protection Action Plan and revise as required, consistent with the AES.	Moderate	AAC	Annually	June 2011	Ongoing

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Appendix C

Glossary of terms

ABBREVIATIONS

AAC	Archerfield Airport Corporation
AEMF	Archerfield Airport Environment Management Forum
AEPAP	Airport Environment Protection Action Plan
ABC	Airport Building Control Officer
AEO	Airport Environment Officer
ALC	Airport Leasing Company (AAC)
ANEF	Australian Noise Exposure Forecast
AsA	Airservices Australia
ATC	Air Traffic Control
BCC	Brisbane City Council
CASA	Civil Aviation Safety Authority
DERM	Queensland Department of Environment and Resource Management
DSEWPC	Commonwealth Department of Sustainability, Environment, Water, Population and Communities
DIT	Commonwealth Department of Infrastructure and Transport
EMPs	Airport Environmental Management Procedures
EMS	Airport environmental management system
UST	Underground storage tank

OTHER TERMS

Airport Management Archerfield Airport Corporation

Environmental accident An unintentional event causing significant adverse environmental impact.

Environmental incident An unintentional event causing no, or minor adverse environmental impact.

Tenant All occupiers of AAC land or facilities at Archerfield Airport (other than AAC), including lessees and sub lessees.

Site Environmental Management Plan (Construction) Management plan for construction and related works.

Site Environmental Management Plan (Operations) Management plan for an operation or activity on the airport

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Appendix D

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