

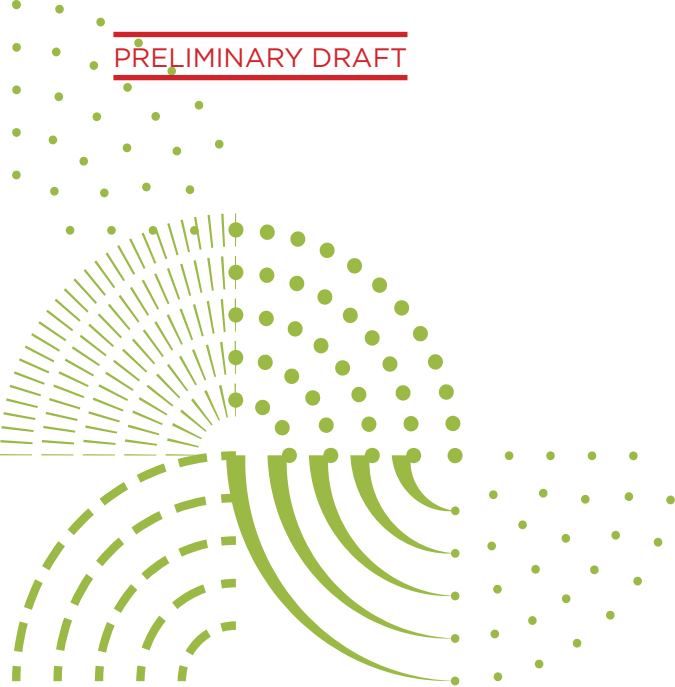
SYDNEY AIRPORT Environment Strategy 2019-2024

Preliminary Draft

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Executive Summary



At Sydney Airport our ambition is to be an industry leader in sustainability, driving responsible growth that balances social and environmental needs with corporate objectives.

This Environment Strategy provides strategic direction for environmental performance and management of the airport for the five year period between 2019 and 2024. This is the fifth Environment Strategy prepared by Sydney Airport.

This **Environment Strategy 2019-2024** (the strategy) has been prepared in accordance with the environmental principles outlined in the Sydney Airport Environment Policy and the requirements of the *Airports Act 1996* and *Airport Regulations 1997*. It is also consistent with the Commonwealth Government's Guidance Material for the Preparation of Environment Strategies by Airport Lessee Companies (2009). The purpose of the strategy is to:

- Establish a framework for assessing compliance and ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards
- Promote the continual improvement of environmental management and performance at the airport and build on the achievements and goals of previous strategies
- To realise improvements in environmental sustainability, by minimising our environmental footprint and working towards a more efficient and resilient airport

The strategy supports Sydney Airport's commitment to continual improvement of environmental performance at the airport, through the implementation of a range of environmental and sustainability initiatives. Sydney Airport has committed to over 100 new initiatives in this Strategy, building on previous strategies.

To date, Sydney Airport has achieved the following:

- International recognition of Sydney Airport's carbon program through Airport Carbon Accreditation, an independently assessed global program run by the Airports Council International
- Setting and achieving our first carbon reduction target and subsequently setting a new target to reduce carbon emissions by 50 percent per passenger by 2025
- Implementing the wetlands enhancement program at the nationally significant Sydney Airport Wetlands, to increase the numbers of native fish species and to improve the quality and ecological function of the wetlands themselves



Image 1-1: The solar panel installation at Sydney Airport's T1 International car park

- Developing and implementing an Energy Savings and Carbon Reduction Plan, driving improved performance and reducing our carbon intensity by over 27 percent between 2010 and 2017
- Significant investment in airfield and terminal infrastructure upgrades to facilitate the introduction of next generation aircraft, considered quieter, cleaner and more fuel efficient
- Installation of a solar array in the T1 precinct, generating over half a Megawatt of renewable energy
- Developing and implementing a Heritage Interpretation Strategy, including an online experience centre
- Commencing electrification of our ground transport fleet, being the first Australian airport to invest in electric buses which are better for local air quality and carbon emissions
- Developing and implementing a Climate Risk Assessment and Adaptation Plan to better prepare for a climate resilient future
- Installation of a new air quality monitoring station on the airport site to better understand local air quality and to inform future planning and strategies
- Expansion of our recycled water treatment plant, increasing our capacity to replace drinking water with an alternative, more sustainable recycled water source for toilet flushing and cooling towers
- Committing to target a Green Star Communities 4-Star Rating for the Master Plan 2039
- Preparing our first Sustainability Policy and Strategy
- Installing fixed electrical ground power units (FEGPU) at all T1 and T2 contact positions and preconditioned air (PCA) at all T1 gates, reducing ground based noise and emissions to air
- Developing community partnerships that deliver improvements to our local environment, including with Conservation Volunteers Australia

Once approved by the Minister for Infrastructure and Transport, the strategy is a legally binding document for the environmental management of operations at Sydney Airport. Sydney Airport and all persons who carry out activities at the airport are obliged to take all reasonable steps to ensure compliance with the Environment Strategy.



Image 1-2: The Electric Blu bus, Australia's first electric airport bus service



1.0 Introduction



1.1 Purpose of this strategy

This **Airport Environment Strategy 2019-2024** underpins Sydney Airport's commitment to continual improvement of environmental performance at the airport, and to become a more sustainable business through the implementation of environmental initiatives. It sets the strategic direction for environmental management at the airport over a five year period and replaces the Environment Strategy 2013-2018.

The purpose of this strategy is to:

- Establish a framework to ensure that all operations at the airport are undertaken in accordance with relevant environmental legislation and standards
- Promote the continual improvement of environmental management and performance at the airport and build on the achievements and goals of previous strategies
- To realise improvements in environmental sustainability, by minimising our environmental footprint and working towards a more efficient and resilient airport

The strategy covers all ground-based environmental aspects associated with the operation of the airport including:

- Sustainability and environmental management
- Climate change mitigation and adaptation
- Air quality
- Ground-based noise
- Ground transport
- Water quality and water use
- Biodiversity
- Heritage
- Waste and resource recovery
- Soil and land management
- Spill response and hazardous materials

The management of these specific environmental aspects is outlined in separate environmental action plans (EAP) as detailed in **Chapter 3.0** of this strategy.

1.2 Strategy requirements

This strategy has been prepared to meet the requirements of the *Airports Act 1996* (Airports Act). In accordance with section 71(2)(h) of the Airports Act this strategy:

- Outlines the existing environment and nature of operations at the airport
- Identifies the environmental aspects and potential environmental impacts associated with ground-based airport activities
- Identifies those areas considered to be environmentally significant
- Lists the key environmental achievements during the previous strategy periods to demonstrate both continual environmental improvement and continuity between the various strategies
- Details an overall framework for effective environmental management at the airport
- Establishes five year environmental action plans covering the period 2019 to 2024

Further detail of the regulatory framework for the development of the strategy is provided in **Chapter 2.0**.

1.3 Strategic location of Sydney Airport

Sydney Airport is located on the northern side of Botany Bay in the suburb of Mascot and about eight kilometres south of Sydney's central business district (CBD). The airport is located on a 907 hectare site, of which seven hectares is owned by Sydney Airport and the remaining 900 hectares is leased from the Commonwealth Government to Sydney Airport Corporation Limited (Sydney Airport), known as the airport lessee company (ALC) under the Airports Act.

The airport is strategically located on the northern shores of Botany Bay adjacent to Sydney's main shipping container port – Port Botany. Port Botany, NSW's primary bulk container, bulk liquids and gas port, is located south east of the airport site. The airport is also bordered in part by major roads including General Holmes Drive, the M5 East Motorway and Southern Cross Drive as well as Airport Drive and Qantas Drive.

A number of ground transport improvements have been undertaken by Sydney Airport to facilitate improved access to the terminal precincts. In addition, a number of roads in the vicinity of the airport site are being upgraded or planned to be upgraded by the NSW Government, including:

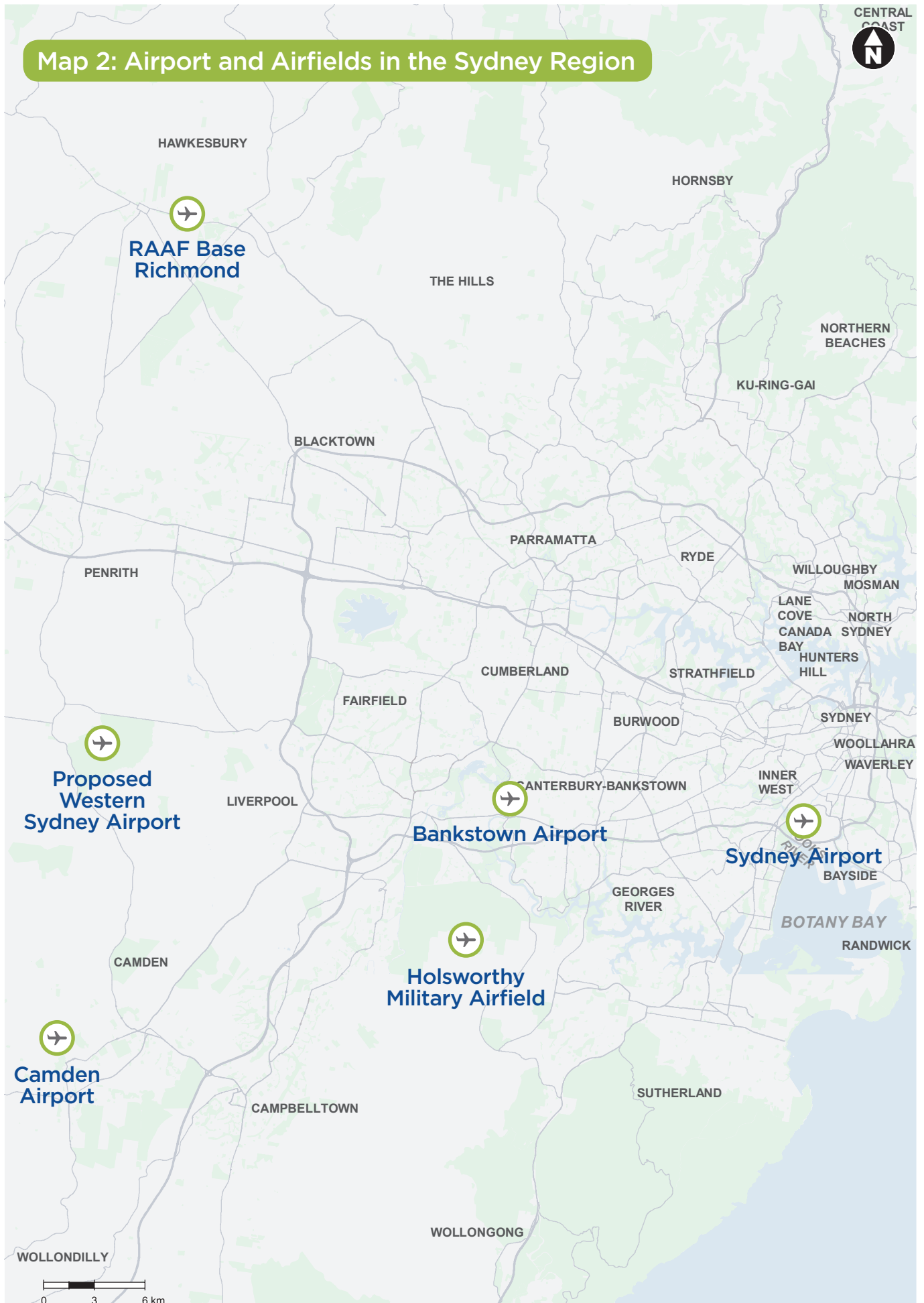
- WestConnex will link the M4 and M5 motorways, and develop a new surface interchange at St Peters, around 2km to the north of the airport site. From St Peters the proposed Sydney Gateway project will provide a connection to Sydney Airport and Port Botany
- Western Harbour Tunnel and F6 extension will further extend the motorway network and provide improved connectivity to the airport from the wider Sydney metropolitan area

The airport is also served by two on-airport railway stations which link into the Sydney Trains passenger network.

An aerial photograph of the airport is shown in [Map 1](#). The location of Sydney Airport in relation to other airports and airfields in the Sydney region is shown in [Map 2](#).



Map 2: Airport and Airfields in the Sydney Region



1.4 Environmental context

Sydney Airport is located on the northern side of Botany Bay. Part of the two north-south parallel runways at the airport extend into Botany Bay and were built on reclaimed land.

The airport site is generally flat, with the underlying geology comprising unconsolidated sediments (sand and silt) above sandstone and shale bedrock. The water table typically lies approximately 1.5 to three metres below the ground surface, although shallower in some areas. The site terrain has been extensively modified through historic development activities, including the redirection of the Cooks River which originally flowed through the centre of the airport site.

The airport site is surrounded by a number of waterways with Botany Bay to the south, Cooks River to the west, Alexandra Canal to the north, Engine Ponds and Mill Stream to the east. These are predominantly tidal waterways which drain to Botany Bay in the south and service large upstream urban catchments. While the natural environment at the airport has been significantly altered since 1920 when the site was first declared as an aerodrome, there still remain important areas of biodiversity, primarily the Sydney Airport Wetlands which comprises Engine Pond East, Engine Pond West, Mill Pond and Mill Stream.



Image 1-3: Sunset at Sydney Airport

Nearby residential areas include Kyeemagh to the south west, Tempe to the north west, Mascot to the north east and Botany to the south east. There has been significant mixed use development north of the airport site in recent years, particularly in the area of the Mascot town centre. Proposed medium density residential and mixed use development is also planned in the Cooks Cove, Arncliffe and Banksia precincts to the west and south west of the airport site. Industrial development precincts are located to the north of the airport within Mascot and to the east in Botany.

Sydney Airport acknowledges that there is heritage value associated with the airport and its site; however, there are currently no identified sites of indigenous significance within the airport. Archaeological studies indicate that the potential for sites of indigenous significance is low due to the highly disturbed nature of the airport site (refer to [section 3.9](#) for further detail).

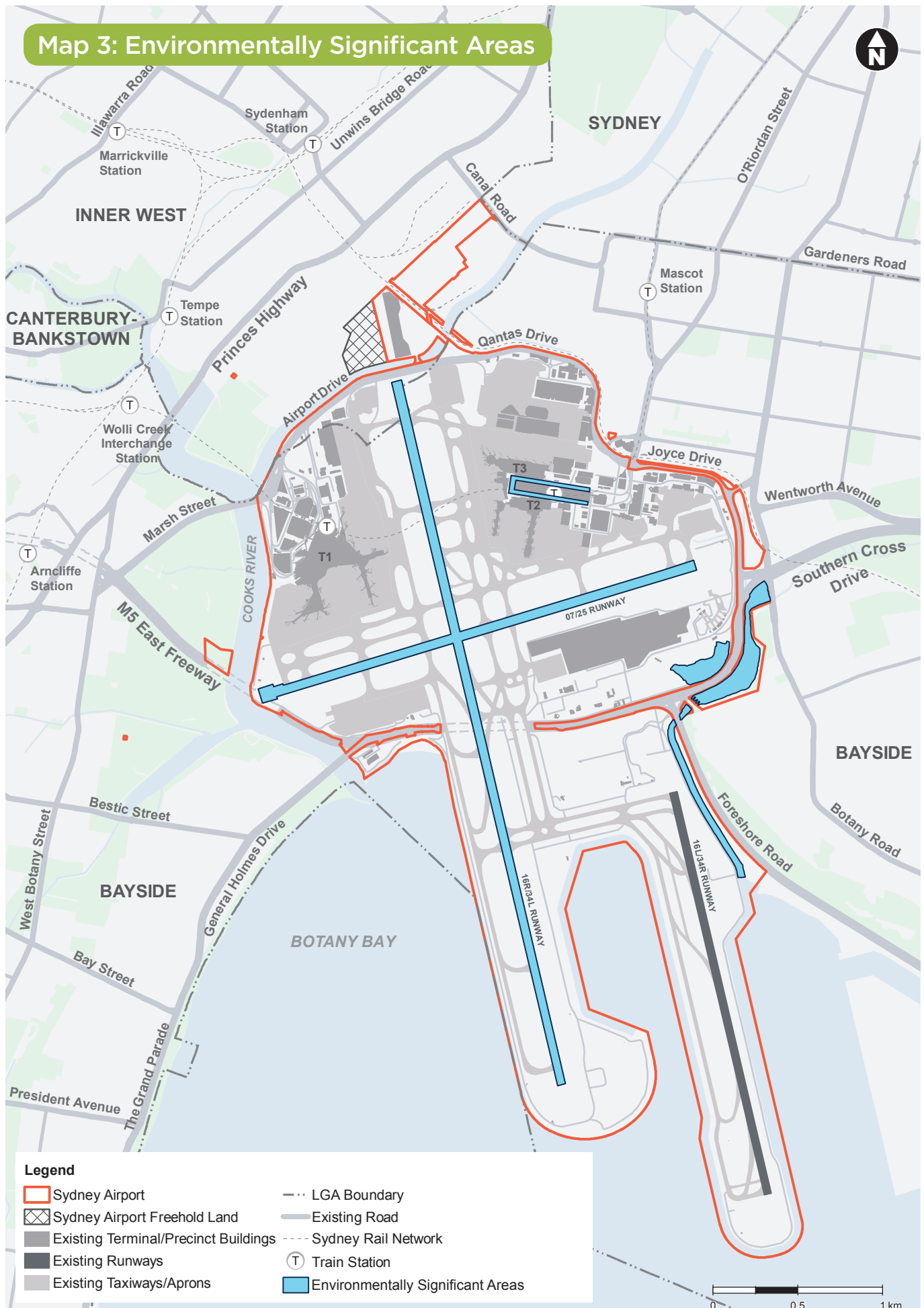
Section 71(2)(h) of the Airports Act requires that the strategy must identify any environmentally significant areas on the airport site, in consultation with state and federal conservation bodies.

The environmentally significant areas identified in this strategy are listed in [Table 1-1](#) and shown in [Map 3](#). There have been no changes to environmentally significant areas identified in the previous Environment Strategy 2013-2018.

Table 1-1: Environmentally significant areas

Site	Significance	Applicable Registers
Sydney Airport Wetlands (incorporating Engine Ponds East and West, Mill Pond and Mill Stream)	Heritage / biodiversity	Heritage management plan for Sydney Airport Directory of important wetlands in Australia
Main north-south and east-west runways (location and function)	Heritage	Heritage management plan for Sydney Airport
Keith Smith Avenue (location and form)	Heritage	Heritage management plan for Sydney Airport

Map 3: Environmentally Significant Areas



1.5 Site background and history

Sydney Airport is one of the world's oldest continually operating airports. However, for at least sixty millennia before the airport came into being, thousands of generations of Aboriginal people lived on our ancient continent and across today's coastal area of Sydney, including on and around Sydney Airport¹.

The coastal area of Sydney we know today was very different 20,000 years ago. At that time, during the last Ice Age, Botany Bay itself did not exist and the coastline was situated up to 20 kilometres to the east of where it lies today. The area in and around the bay, including today's airport site, was a vast wetland, fed by waters flowing down the Cooks and Georges Rivers. Aboriginal people lived during and successfully adapted to a period of rapid change to the environment and landscape.

Nearby water sources such as the Cooks River and Botany Wetlands, and a diverse range of habitats for food on the coast and adjacent hinterland would have made the area an ideal location for Aboriginal habitation.

European settlement and colonisation changed everything for the Aboriginal people of coastal Sydney. Aboriginal people continued to live across the coastal area well into the 19th century, including family groups living at Elizabeth Bay, Rose Bay, Camp Cove, Botany, La Perouse and Kurnell, as well as along the Georges and Cooks Rivers.

During this time, Aboriginal people encountered and engaged daily with the settlers. Fishing was an integral part of Aboriginal life and they fished not only for their families, but to trade with Europeans.

Local Aboriginal men and women also worked as guides in the area around Botany Bay and the Cooks and Georges Rivers, showing Europeans from other parts of the Sydney region these still largely undeveloped parts of coastal Sydney.

The ancestors of many of these families live in these areas to this day and the airport site is close to Indigenous communities in La Perouse and Redfern.

The airport lies on the area around Botany Bay explored by Captain James Cook and botanist Sir Joseph Banks in 1770. At this time the airport site was marshland traversed by the Cooks River.

The Mascot area around the Cooks River has been a site of industry from early colonial times – before it was an airport, the land played host to a number of other significant pieces of industrial and water supply infrastructure, the ruins of which are located on the airport site today.



Image 1-4: Botany Water Pumping Station ruins that supplied water to Sydney from 1859 to 1885

¹ Paul Irish, *Hidden In Plain View - The Aboriginal People of Coastal Sydney*, 2017.

Former convict, Simeon Lord acquired land in the Mascot area in 1812 and set up a woollen mill and later a flour mill on a stream at the original mouth of the Cooks River. In 1855, the City of Sydney acquired Lord's land, including the dams and mills, to establish Sydney's third water supply system, after the Tank Stream and The Tunnel (Busby's Bore). The original mills were demolished around 1862.

A steam pumping station, known as the Botany Water Works, was installed near the site of the former flour mill and operated from 1859 supplying water to Sydney. The pumping station supplied Sydney's drinking water for around 30 years until the late 1880s, when Botany was replaced by the Upper Nepean Scheme, which is still substantially in use today. Remains of the pumping station, including ruins of the engine house and boiler house and the lower part of the chimney are still present in the South East Sector of the airport site today (refer to [Image 1-4](#)).

The Sydney Airport Wetlands, including Engine Pond East and West, the Mill Stream and the Mill Pond, forming part of the greater Botany Wetlands system, are an important historical and environmental resource and the system is an important part of the cultural heritage of Sydney, and evidence of the growth of municipal services in Sydney during the 19th century.

The electric-powered sewage pumping station No.38 and associated inspection hall and sub-station were constructed at the airport site in 1916 (Sydney Water, 2018). The sewage pumping station is part of the southern and western suburbs ocean outfall sewer system (SWSOOS) and is still in use today.

In 1911, New Zealand aviator Captain Joseph Joel Hammond was the first pilot to fly at the airport, starting the site's aviation history. In 1919, flying enthusiast, Nigel Love was looking into the possibilities for aviation in Australia and chose the cow pastures at Mascot as the site to establish an aircraft manufacturing facility. In January 1920, the first official flight took place at the airport and the site was officially declared an aerodrome. Sydney Airport is today one of the oldest continuously operating airports in the world.

Mascot Aerodrome, also known as Sydney Airport at the time, was officially opened in January 1920. Soon after in 1921, the Commonwealth Government acquired the aerodrome as part of a program to develop a nationwide airport network. Additional land was acquired during the 1930s and a new passenger terminal was opened in 1940. In August 1936 the airport was renamed Sydney (Kingsford Smith) Airport in honour of pioneering Australian aviator Sir Charles Kingsford Smith.

The airport continued to be developed during World War II to enhance its civilian and military facilities. After the war, further land was acquired and the Cooks River was diverted to its present location to enable the construction of new runways. By 1949 the airport had three runways. The first paved runway was 07/25 and the next one constructed was 16/34 (now 16R/34L).

In 1968, the main north-south runway (16R/34L) was extended into Botany Bay to cater for the new long-haul international jets. The runway was extended again in 1972 to its present length of 3,962 metres. Runway 16R is presently the longest operational runway in Australia.

In 1989, the Commonwealth commenced development of the third (parallel north-south) runway (16L/34R), which was opened in 1994. In 1995, the *Sydney Airport Curfew Act 1995* (Commonwealth) was passed, limiting the operating hours of the airport in an effort to address aircraft noise complaints. Aircraft are generally prevented from taking off or landing between 11 pm and 6 am.

The airport was privatised in July 2002 and since then Sydney Airport has invested over \$4.3 billion in capital projects and other initiatives, with significant further investment to come. Key projects have included terminal upgrades, ground access improvements, new ground transport facilities, new checked baggage screening facilities, new runway lighting, new aircraft parking areas, runway end safety areas and other enhancements to cater to the new generation of larger, quieter, cleaner and more fuel efficient aircraft utilising the airport.

1.6 Airport components

Key components of Sydney Airport are described below. This includes major infrastructure elements required to operate a modern and efficient international airport.

1.6.1 Airfield system

The key feature of the airfield system comprises the three runways, which include:

- The main north-south runway (Runway 16R/34L)
- The parallel north-south runway (Runway 16L/34R)
- The east-west runway (Runway 07/25)

Additional features include taxiways, aprons and surrounding areas which together form the aircraft movement area of the airport. Other features include a dedicated helicopter precinct and support elements including the air traffic control tower, non-visual navigation aids, radar surveillance systems, and the aviation rescue and firefighting service (ARFF).

1.6.2 Terminal and passenger systems

Sydney Airport has two main terminal precincts:

- T1 International Operations Precinct – located in the north western part of the airport and is used for international aircraft operations
- T2/T3 Integrated Operations Precinct – located in the north eastern part of the airport serving domestic and regional operations, planned to expand to cater for international operations over the Master Plan 2039 planning period

1.6.3 Freight system

Sydney Airport facilitates air freight activities, handling about half of Australia's international air freight. Freight is transported in the cargo hold of passenger aircraft and in dedicated freight aircraft. Currently the airport has a number of freight facilities, mainly in the North West and North East Sectors.

1.6.4 Aviation support facilities

Aviation support facilities include fuelling facilities, aircraft maintenance facilities, ground support equipment, and flight catering facilities.

1.6.5 Landside access facilities

Access to the airport is provided by both the Sydney road and rail network.

Major roads surrounding the airport include Southern Cross Drive (M1), providing direct access to the Sydney central business district (CBD) and M5 South Western Motorway, which connects the airport with the south west of Sydney. Other surrounding roads include Airport Drive, Qantas Drive, General Holmes Drive, M5 East Freeway and Marsh Street. Ross Smith Avenue provides internal connections within the airport.

The airport is also serviced by two on-airport railway stations which link into Sydney's CityRail passenger network.

Landside access facilities include internal public roadways, kerbside transfer, car parking, public transport (bus and rail), cycling and pedestrian facilities. A number of ground transport improvements have been undertaken by Sydney Airport to facilitate improved access to the airport precinct.

1.7 Legislative context

The Commonwealth legislative framework controlling environmental management of the airport comprises the following Australian laws:

- *Airports Act 1996* Part 5 and Part 6
- *Airports Regulations 1997*
- *Airports (Environment Protection) Regulations 1997*
- *Environment Protection and Biodiversity Conservation Act 1999*

The regulatory authority administering the legislation for leased Australian airports is the Commonwealth Government's Department of Infrastructure, Regional Development and Cities (DIRDC). An airport environment officer (AEO) has been appointed by DIRDC to oversee the implementation of this legislation at the airport.

1.7.1 Airports Act 1996

The airport is operated in accordance with the Airports Act. The Act and associated regulations establish a system for the regulation of airports that has due regard to the interests of airport users and the general community.

Part 6 of the Act, Environmental Management, describes the requirements for the effective environmental management of the airport site. Sections 131B, 131C and 131D of the Act make it an offence to cause serious or material environmental harm, or to cause an environmental nuisance affecting an airport site.

Part 5 of the Act, Land Use, Planning and Building Controls, describes the mechanisms for planning, building and development assessment and approval at the airport. The provisions require each airport to have a master plan. The purpose of the master plan is, among other things, to promote the continual improvement of environmental management at the airport.

Sydney Airport's Master Plan 2039 can be downloaded from www.sydneyairport.com.au. The potential environmental issues associated with implementing the plan over the full 20 year planning period of Master Plan 2039 are identified in **Chapter 14.0**, along with a summary of Sydney Airport's plans for dealing with the environmental issues.

Part 5 of the Act also requires that, for each airport, there is to be an Environment Strategy included in its master plan. Under the Act, the Environment Strategy is required to include:

- The airport lessee company's objectives for the environmental management of the airport
- The areas (if any) within the airport site which the airport lessee company, in consultation with State and Federal conservation bodies, identifies as environmentally significant
- The sources of environmental impact associated with civil aviation operations at the airport
- The studies, reviews and monitoring to be carried out by the airport lessee company in connection with the environmental impact associated with civil aviation operations at the airport
- The timeframes for completion of those studies and reviews and for reporting on that monitoring
- The specific measures to be carried out by the airport lessee company for the purposes of preventing, controlling or reducing the environmental impact associated with civil aviation operations at the airport
- The timeframes for completion of those specific measures
- Details of the consultations undertaken in preparing the strategy (including the outcome of the consultations)
- Any other matters that are prescribed in the regulations

Once approved by the DIRDC, Sydney Airport and all persons who carry out activities at the airport are then obliged to take all reasonable steps to ensure compliance with the Environment Strategy.

In addition, the provisions of Part 5 of the Act require major development plans (MDPs) to be prepared and exhibited for public comment for certain types of development at the airport. The provisions detail the approval requirements for all building activities, including requirements for environmental assessment. This is detailed further in **Section 2.3** of this strategy.

1.7.2 Airports Regulations 1997

The *Airports Regulations 1997* specify detailed requirements for Environment Strategies, including:

- Demonstration of continuous improvement in the environmental consequences of activities at the airport and the progressive reduction in extant pollution at the airport
- Development and adoption of a comprehensive environmental management system for the airport
- Identification and conservation of objects and matters at the airport that have natural, indigenous or heritage value
- Involvement of the local community and airport users in development of any future strategy and dissemination of the strategy to sub-lessees, licensees, other airport users and the local community

1.7.3 Airports (Environment Protection) Regulations 1997

The *Airports (Environment Protection) Regulations 1997* (the regulations) impose a general duty to prevent or minimise environmental pollution and have as one of their objects the promotion of improved environmental management practices at Commonwealth-leased airports.

The regulations contain detailed provisions setting out:

- Definitions, acceptable limits and objectives for air, water and soil pollution, and offensive noise
- General duties to prevent or minimise pollution, preserve significant habitat and cultural areas, and to prevent offensive noise
- Monitoring and reporting requirements for existing pollution

The *Airports (Environment Protection) Regulations 1997* do not apply to noise or other pollution generated by an aircraft in flight or when landing, taking off or taxiing at an airport. These important issues are addressed elsewhere in the Sydney Airport Master Plan 2039 (see [Chapter 15.0](#)) and by laws such as the *Air Services Act 1995*, *Air Navigation Act 1920*, *Air Navigation (Aircraft Engine Emissions) Regulations* or *Air Navigation (Aircraft Noise) Regulations 1984*.

These laws are administered by the Australian Government through DIRDC or Airservices Australia.

1.7.4 Environment Protection and Biodiversity Conservation Act 1999

The *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) is the predominant Commonwealth statute for protection of the environment and biodiversity, and for the promotion of ecologically sustainable development.

Relevantly, under the provisions of the EPBC Act, actions may require assessment and approval by the Minister for the Environment if the action will have, or is likely to have, a significant impact on the environment of Commonwealth land (such as Sydney Airport).

An action includes a project, development, undertaking, activity or series of activities. Before adopting or implementing an MDP on Sydney Airport, Section 160 of the EPBC Act requires the Minister for Infrastructure and Transport to obtain and consider advice from the Minister for the Environment and Energy.

1.7.5 Application of state laws

The interaction between Commonwealth and state legislation in relation to major airports is complex and depends on the particular facts and circumstances surrounding each issue. Commonwealth laws generally take priority over state laws. However, State legislation does apply:

- Where no Commonwealth law exists
- Where Commonwealth law exists but operates concurrently with state legislation

In relation to other land owned either by Sydney Airport or the Commonwealth, which is not part of the Commonwealth airport site, additional state legislation will apply. That land is beyond the scope of the Environment Strategy.



2.0 Environmental management at Sydney Airport



2.1 Environmental management framework

Sydney Airport adopts a risk-based approach to environmental management, incorporating the Environment Strategy and Sydney Airport's environmental management system (EMS) to control identified environmental risks and to achieve a high standard of environmental management. The environmental management framework is illustrated in **Figure 2-1**.



Figure 2-1: Sydney Airport environmental management framework

2.2 Environmental management systems

Sydney Airport has developed and maintains an EMS which, as required by Clause 5.02B of the *Airports Regulations 1997*, is intended to maintain consistency with relevant Australian and international standards. In this case, the relevant standard is *AS/NZS ISO14001 Environmental Management Systems – Requirements with guidance for use*.

The EMS provides the system by which daily environmental management can be planned, implemented and reviewed, thus ensuring a cycle of continuous environmental improvement.

Sydney Airport's EMS comprises the following main components:

- Environment Policy
- Planning – including environmental aspect and risk identification and assessment, objectives, targets and action plans
- Implementation and operation – including environmental responsibilities, training and awareness, communication, document and operational control, and emergency preparedness and response
- Checking – including monitoring, assessment and auditing
- Management review

The strategy provides the strategic level policies, objectives, proposed actions and targets for the environmental management of the airport within which Sydney Airport's EMS will operate. The EMS is fully integrated with Sydney Airport's business and organisational structure and establishes the detailed day-to-day mechanisms by which the goals outlined in the strategy are to be achieved. The EMS also provides the tools to establish the operational framework, monitor progress, review performance and implement corrective actions for the strategic actions outlined in the strategy.

Sydney Airport regularly reviews and updates this environmental management framework to ensure that it provides appropriate guidance to the implementation of actions outlined in the Environment Strategy and to the various airport developments envisaged in the Master Plan.

2.2.1 Environment Policy and associated strategies

The Sydney Airport Environment Policy forms the basis for environmental management and performance of the airport. The policy establishes the principles for environmentally sustainable use of the airport, from which objectives, key performance indicators, and action plans and programs are developed. The Environment Policy is attached in [Appendix B](#).

The policy has been endorsed by Sydney Airport's Chief Executive Officer in 2018 and is presented in [Appendix B](#). In accordance with the EMS, the policy will be reviewed and updated periodically. Please refer to the Sydney Airport website for the most up-to-date version.

The Sydney Airport Environment Policy and key Environment Strategies and management plans which are used to provide strategic management of environmental matters across the airport site are listed below:

- Environment Policy
- Environment Strategy
- Sustainability Policy
- Sustainability Strategy
- Energy Savings and Carbon Reduction Plan
- Climate Risk Assessment and Adaptation Plan
- Heritage Management Plan
- Heritage Interpretation Strategy
- Stormwater Quality Management Plan
- Wetlands Management Plan
- Contaminated Sites Strategy
- Waste Management Plan
- Emergency Management Plan
- Wildlife Management Plan

These plans are updated from time to time and additional plans may be developed as appropriate.

2.2.2 Environmental risk management

Sydney Airport implements an integrated risk management framework which identifies and evaluates the key environmental risks associated with airport operations.

To inform the assessment of environmental risks, Sydney Airport undertook a review of environmental interactions (or environmental aspects) resulting from airport activities, products and services. These include:

- Sustainability and environmental management
- Climate change mitigation and adaptation
- Air quality
- Ground-based noise
- Ground transport
- Water quality and water use
- Biodiversity
- Heritage
- Waste and resource recovery
- Soil and land management
- Spill response and hazardous materials

Airport activities that act as sources of environmental impact are listed in **Table 2-1**

Table 2-1: Airport activities that act as sources of environmental impact

Area	Activities
Airport Management Activities	Passenger facilitation
	Terminal operation and maintenance
	Car park operation and maintenance
	Office operation and maintenance
	Road maintenance
	Runway, taxiway and apron maintenance
	Vehicle operation, maintenance and refuelling
	Vehicle washing
	Landscaping and grounds maintenance
	Utilities maintenance (sewer, electricity, water supply)
	Wildlife control
	Construction and fit out
Aviation Activities	Fuel storage and supply
	Aircraft operations
	Aircraft maintenance including painting and washing
	Ground handling
	Engine ground running
	Air traffic control services
	Customs and border control services
	Airline catering
	Construction and fit out
	Fire training and emergency exercises
Non-aviation commercial activities	Fuel storage and supply, including petrol stations
	Commercial retailing
	Hotels and offices
	Warehousing and logistics
	Waste and resource recovery operations
	Rental car facilities
	Vehicle washing facilities
	Recreational/community facilities
Historic activities	Construction and fit out
	Land-filling and terrain flattening
	Fuel storage and supply
	Aircraft maintenance
	Fill importation
	Fire training and emergency exercises

Environmental impacts associated with the sources listed in [Table 2-1](#) were determined and these impacts are outlined in the Environmental Action Plans (EAPs) in [Chapter 3.0](#).

Sydney Airport applies a risk management process to environmental aspects and impacts that:

- Identifies all risks
- Evaluates identified risks and assigns a risk rating by assessing the likelihood of occurrence and the resulting consequence
- Assesses risk mitigation strategies
- Allocates a risk owner to each risk

Role of the Environment Strategy in risk management

This strategy aims to provide a strategic direction for the environmental management of the airport. The strategy includes an Environmental Action Plan (EAP) for each environmental aspect (refer to [Chapter 3.0](#)) which outlines objectives, targets and strategic actions to address the environmental risks.

Sydney Airport adopts and implements EAPs that set clear responsibilities for the management of risk, allow for resources to be prioritised, and puts in place procedures and programs to ensure that such risks are eliminated or otherwise appropriately managed.

2.2.3 Responsibilities

Environmental performance and management is not exclusive to one section of the airport. Sydney Airport adopts an integrated approach to ensure that airport staff and operators (including tenants and contractors) have an appropriate level of environmental responsibility. The main environmental responsibilities at the airport are summarised in [Table 2-2](#).

Table 2-2: Sydney Airport Corporation Limited responsibilities

Sydney Airport Corporation Limited	Responsibilities
Sydney Airport Board – Safety, Security and Sustainability Committee	<ul style="list-style-type: none"> • Oversee the environmental management function of the business, including the effectiveness of strategies and initiatives that deliver environmentally sustainable outcomes • Assist the Board in its oversight of Sydney's Airport's compliance with applicable legal and regulatory requirements, alignment with industry best practice and relevant Sydney Airport and government policies • Oversee and monitor sustainability performance, and communication and reporting of activities to external stakeholders • Monitor that appropriate resources and expertise are devoted to the safety, security and environment functions • Recommend policies to the Board that ensure compliance with laws and regulations and allow for continuous improvement • Oversee and approve safety, security, environmental, work health, community and sustainability strategies, and monitoring the delivery of these strategies and their outcomes • Oversee reporting of significant incidents and accidents and the investigations into these
Chief Executive Officer	<ul style="list-style-type: none"> • Oversee the Sydney Airport Environment Policy • Ultimate responsibility for the implementation of the Environment Strategy • Allocating appropriate resources for the effective implementation of the EMS and other projects that improve environmental performance and ensure compliance with regulatory obligations • Reviewing Sydney Airport's environmental performance on a continual basis • Ensure Sydney Airport's general managers are informed and have systems in place to deal with environmental risks relating to their business unit's operations
All Sydney Airport Employees	<ul style="list-style-type: none"> • Demonstrate visible commitment to environmental protection • Ensuring his or her activities do not cause any harm to the environment • Follow the Sydney Airport Environment Policy and procedures • Report environmental incidents and emergency events • Minimise the usage of non-renewable resources • Minimise the generation of solid waste
Environment Department	<ul style="list-style-type: none"> • Guide and assist Sydney Airport to develop environmentally responsible and sustainable policies • Coordinate and manage environmental risks, issues and initiatives • Facilitate environmentally responsible and sustainable development and growth • Guide all airport operators in minimising pollution • Monitor pollution levels in air, water and soil/groundwater • Effective implementation of the actions contained within the Environment Strategy • Ensure EMS requirements are established, implemented and maintained • Report on the performance of the Environment Policy, Environment Strategy and EMS to the Chief Executive Officer and Sydney Airport Board

Tenant responsibilities for environmental management

Airport tenants and operators are responsible for conducting their activities in an environmentally responsible manner. Tenants and operators must comply with applicable environmental legislation (including the Act and regulations), the Environment Strategy and the objectives of the Sydney Airport Environment Policy. A tenant's lease or licence includes relevant statutory environmental requirements and, depending on the tenant's tier classification, may require the development of an operational Environment Management Plan (EMP).

Sydney Airport classifies airport tenants into three tiers based on the environmental risk posed by their activities, as described below:

- **Tier 1** tenants have the greatest potential for significant environmental risk. These include airlines that have substantial maintenance facilities at the airport, bulk fuel suppliers and aviation rescue and firefighting service providers
- **Tier 2** tenants have a medium potential for significant environmental risk. These include car rental companies, hotels and non-terminal fast-food outlets, freight companies, some international, domestic and regional airlines, general aviation (including corporate aviation and helicopters) tenants and refuelling companies
- **Tier 3** tenants pose the least potential for significant environmental risk. These consist of mainly terminal retail operators, including food and beverage outlets

Tier 1 tenants are required to develop and maintain an individual environmental management system. In addition, Sydney Airport requires tier 1 and 2 tenants, as part of their lease conditions, to develop and implement an EMP which ensures that:

- Their activities are in compliance with the Airports Act and the Environment Strategy
- They have identified all environmental risks associated with their operations and have appropriate controls and programs to eliminate or minimise these risks

EMPs should be consistent with ISO 14001 and should include:

- A description of the tenant's ground-based activities
- The identification of environmental risks, the level of risk and the impact associated with these activities
- Methods/procedures (including spill response and recognition of the Airport Emergency Plan where necessary) to be used to address identified risks and to ensure compliance with relevant legislation
- Targets for environmental performance
- Procedures to advise Sydney Airport of changes to activities and their associated environmental risks
- Management of environmental records and documents
- Staff training programs
- Contractor management
- Allocated responsibilities for the upkeep, review and auditing of the EMP
- Contact details of the person responsible for the EMP

Tenants should ensure that their EMP is kept current and that Sydney Airport has been provided with the most recent version of the EMP.

Tenant auditing and reporting requirements

Tier 1 and 2 tenants are required to have an environmental audit of their activities completed on an annual basis. This audit can be carried out by an internal staff member who is considered to be appropriately qualified for the audit. The results of the audit should be provided to Sydney Airport annually by no later than 31 July for the previous financial year. The audit should cover the following elements:

- Compliance with the EMP and relevant statutory requirements
- Compliance with requirements for EMPs listed in the Environment Strategy
- An assessment of the environmental impacts and of the methods/procedures/mitigation measures used to minimise these environmental impacts
- Any additional or new activities and the associated risk, impact and environmental procedures that have been established, or are required
- Assessment of progress in achieving environmental performance targets

Every second year, Tier 1 tenants must carry out an independent environmental audit of their activities. This audit should cover the elements listed previously and must be carried out by an independent, certified environmental auditor. The results of the independent audit should be provided to Sydney Airport by no later than 30 September for the previous financial year.

Tier 3 tenants are considered to have low environmental risk. Sydney Airport, through its general environmental awareness programs and lease agreements, will incorporate generic environmental requirements in the functional areas of waste management, energy and resource usage for these tenants.

Contractor responsibilities

Contractors engaged by Sydney Airport are expected to comply with this Environment Strategy, the Airports Act and regulations. Contracts are assessed on a case by case basis, with those identified as carrying high or significant environmental risk required to develop an EMP.

Department of Infrastructure, Regional Development and Cities (DIRDC) and the airport environment officer (AEO)

The AEO is appointed by the secretary of DIRDC and oversees the implementation of the Airports Act and the Regulations for the airport. Focusing on strategic environmental goals, the AEO liaises with Sydney Airport, airport tenants and operators to ensure management of the airport environment is within the intent of the Act and regulations. This occurs through regular meetings, site inspections, facility audits and reporting requirements conducted by the AEO. In addition, the AEO may be requested to consider, and place conditions on, applications submitted to the airport building controller (ABC) for activities on airport land (the development assessment and approval process is outlined in [Section 2.3.1](#)).

While the AEO is responsible for the day-to-day administration of the *Airports (Environment Protection) Regulations 1997*, DIRDC maintains overall responsibility for enforcement of the Act and regulations at Commonwealth-leased airports and oversees the AEO role. DIRDC monitors the environmental performance of Sydney Airport and airport tenants and operators through AEO's quarterly reports and liaison, annual environment reports produced by Sydney Airport as well as periodic inspections and communication.

2.2.4 Environmental awareness and training

Fostering knowledge and awareness is one of the principles of the Sydney Airport Environment Policy. This is to be achieved by developing and maintaining a broad-based understanding of the sources of environmental impact of Sydney Airport's operations, both on and off the airport, using, where necessary, research, education and awareness training.

Sydney Airport employs a number of measures and programs to implement this principle, including:

- Corporate induction program for employees
- Training for environment department staff to keep abreast of best management practices and emerging technologies

- Environmental information on Sydney Airport's internet and intranet websites for staff and airport users
- Ensuring appropriate environmental training is incorporated into tenant operations through EMP provisions.

2.2.5 Environmental audit program

Sydney Airport adopts a comprehensive review process to ensure the effectiveness of the Sydney Airport environmental management framework. The three key components of this process are:

- Tenant inspections and audits
- Airport operations and contractor audits
- EMS review

Tenant inspections and audits

Tenant inspections are conducted by Sydney Airport in consultation with the tenant, depending on the particular airport tenant's classification (refer to [Section 2.2.3](#)) as well as the tenant's annual audit results and EMP.

The main purpose of the inspection is to assist the tenant to comply with the requirements of the Strategy and the *Airports (Environment Protection) Regulations 1997*. The inspection will also allow a review of progress in implementing any recommendations outlined in previous audits. Tenant inspections undertaken by Sydney Airport are intended to complement the tenant's own auditing program.

Airport operations and contractors audits

It is equally important to review and audit Sydney Airport's own activities as it is to monitor the activities of airport tenants and operators. As a result, Sydney Airport's activities are under constant review and are audited by the Sydney Airport environment department. The range of activities and areas covered by Sydney Airport auditing includes:

- Airfield maintenance
- Airport operations
- Airport construction projects
- Airport property department
- Airport emergency procedures (where relevant to the environment)

EMS review

Sydney Airport's EMS is a dynamic system and accordingly requires constant review to ensure its validity. As part of this review process, monitoring of environmental performance and auditing are carried out. The main aspects addressed in this review are:

- Continuing appropriateness of the Environment Policy
- Application and compliance with environmental procedures
- Continuing relevance of objectives
- Legislative requirements review
- Achievement of targets

2.2.6 Annual environment reports

In accordance with clause 6.03 of the *Airports (Environment Protection) Regulations 1997*, Sydney Airport is required to prepare and submit an annual environment report (AER) to the secretary of DIRDC.

The AER is a comprehensive report that details the airport's environmental performance over the reporting period. The report contains information on, among other things:

- Key achievements over the reporting period
- Progress towards implementation of the Environment Strategy objectives and targets
- Progress towards implementation of the Environment Strategy's environmental action plans
- Compliance with relevant legislative requirements
- The results of any monitoring that was undertaken
- Information concerning any additional initiatives and actions that are proposed to ensure continual environmental improvement

2.3 Development approval process

A rigorous development assessment process has been established to enable Sydney Airport to address its obligations under the *Airports (Building Control) Regulations 1996*. If a proposed development has the potential to impact on the environment, an environmental assessment must be undertaken. Sydney Airport, the AEO, the ABC and, in some circumstances, the Minister for Infrastructure and Transport or Minister for the Environment and Energy can either refuse to permit a proposed development or impose conditions on a proposed development to ensure any environmental impacts are eliminated or minimised.

All development proposals at Sydney Airport are subject to a thorough planning and environmental impact assessment process undertaken by Sydney Airport's planning and environment departments. Sydney Airport must consider this strategy, Master Plan 2039, the Airports Act and the EPBC Act prior to granting any development approval. This ensures that developments are designed, constructed and managed in an environmentally responsible and appropriate manner.

2.3.1 Assessment process

The Sydney Airport assessment process is a hierarchal system consisting of three main components. The level of assessment of a proposal is dependent on the scale and nature of the development and may include:

1. Sydney Airport development application and/or
2. Sydney Airport consent or exemption and/or
3. Major development plan (MDP)

The assessment process for Sydney Airport consent or exemptions and MDPs is outlined in **Figure 2-3**. All assessment processes must comply with the requirements of the Airports Act and this strategy.

Development applications

Development applications assess proposed development to determine the potential impacts of a proposal and the most appropriate approval pathway. An initial review of environmental issues is conducted by the applicant, in consultation with Sydney Airport's environment department, to determine the potential for environmental impacts and therefore the degree of environmental assessment that will be required.

Where it is established by Sydney Airport that a project requires more detailed environmental consideration, a review of environmental factors (REF) must be completed, detailing all potential environmental impacts and proposed measures to eliminate or mitigate these impacts.

Sydney Airport consent or exemption

Following the development application process, a proponent is then required to lodge either an application for Sydney Airport consent or an application for exemption. Applications for exemption are made where a development is deemed to be minor. Sydney Airport consent applications and exemption applications are then assessed against the relevant regulatory requirements, including the *Airports (Building Control) Regulations 1996*. If approved, Sydney Airport will grant the consent or exemption with or without conditions. Proposals are then referred to the ABC for approval.

Major development plans

Under Section 89 of the Airports Act, certain developments are classified as being a "major airport development." Clause 89(1)(m) and (n) provide that major airport development includes development:

- That is of a kind that is likely to have significant environmental or ecological impacts
- Which affects an area identified as environmentally significant in the Environment Strategy

For each major airport development, a MDP must be prepared in consultation with the community and other stakeholders, and submitted to the Minister for Infrastructure and Transport for consideration and approval. The Minister may approve the MDP (subject to conditions) or refuse it.

Development that may affect an environmentally significant area

In dealing with specific internal and external applications for development, building or other works, which carry an environmental risk, Sydney Airport applies a number of environmental conditions of approval to ensure that they are designed, constructed and managed in an environmentally responsible manner, and in compliance with this strategy and relevant legislation.

To provide guidance and information concerning the environmental impact assessment process, including for a development that may affect an environmentally significant area, Sydney Airport provides applicants with a fact sheet for environmental impact assessment of development and other applications at Sydney Airport.

As part of this process, Sydney Airport ensures that any development, building or other work that may affect an environmentally significant area is thoroughly assessed in accordance with relevant legislation.

Under Master Plan 2039, land adjacent to the environmentally significant area known as the Sydney Airport Wetlands is zoned either BD2 (Enviro-Business Park) or EC1 (Environmental Conservation). The objectives of these zones specifically recognise the need to protect the wetlands and other heritage items.

Relevant objectives of the BD2 zone are to:

- Provide for a limited range of sustainable development, particularly for business purposes, that will not compromise the ecological, cultural or scientific value of this land or adjacent land including Mill and Engine Ponds and Mill Stream
- Ensure buildings achieve design excellence having particular regard to the surrounding natural and built environment and the associated sensitivities
- Incorporate appropriate environmental management principles and controls into development proposals
- Ensure heritage items are approximately considered and managed

Relevant objectives of the EC1 zone are to:

- Protect the ecological and scenic values of the waterways in this area
- Maintain the health and natural flows of the waterway
- Enable maintenance dredging of Mill Stream and related activities to maintain water depths and to ensure sedimentation accumulation is managed and controlled
- To ensure heritage items are appropriately considered and managed

Master Plan 2039 indicates that prior to granting consent for any permissible land use within these zones, Sydney Airport must have regard to the abovementioned objectives as well as comply with the development approval processes outlined elsewhere in this section.

2.3.2 Regulatory approval process

In accordance with the *Airports (Building Control) Regulations 1996*, a building or works permit must be obtained from the ABC prior to works commencing on the airport site. In considering permit applications, the ABC may obtain recommendations from the AEO and must ensure that:

- Sydney Airport consent has been granted for the proposal
- The proposal complies with the Airports Act and associated regulations
- The proposal complies with the Sydney Airport Master Plan 2039 and Environment Strategy 2019-2024, in accordance with clause 2.05 of the *Airports (Building Control) Regulations 1996*

The ABC may impose conditions on the approval to ensure applicable building codes and environmental impacts are properly addressed.

2.3.3 Baseline contractual obligations

As indicated in [Section 2.2.3](#), contractors engaged by Sydney Airport are expected to comply with this Environment Strategy, the Airports Act and Regulations. In the case of construction contractors, the airport tenant responsible for managing the contractor should ensure the preparation of an EMP covering the work to be performed by the contractor (although the contractor can themselves prepare the EMPs). These EMPs will generally require Sydney Airport approval before the works commence.

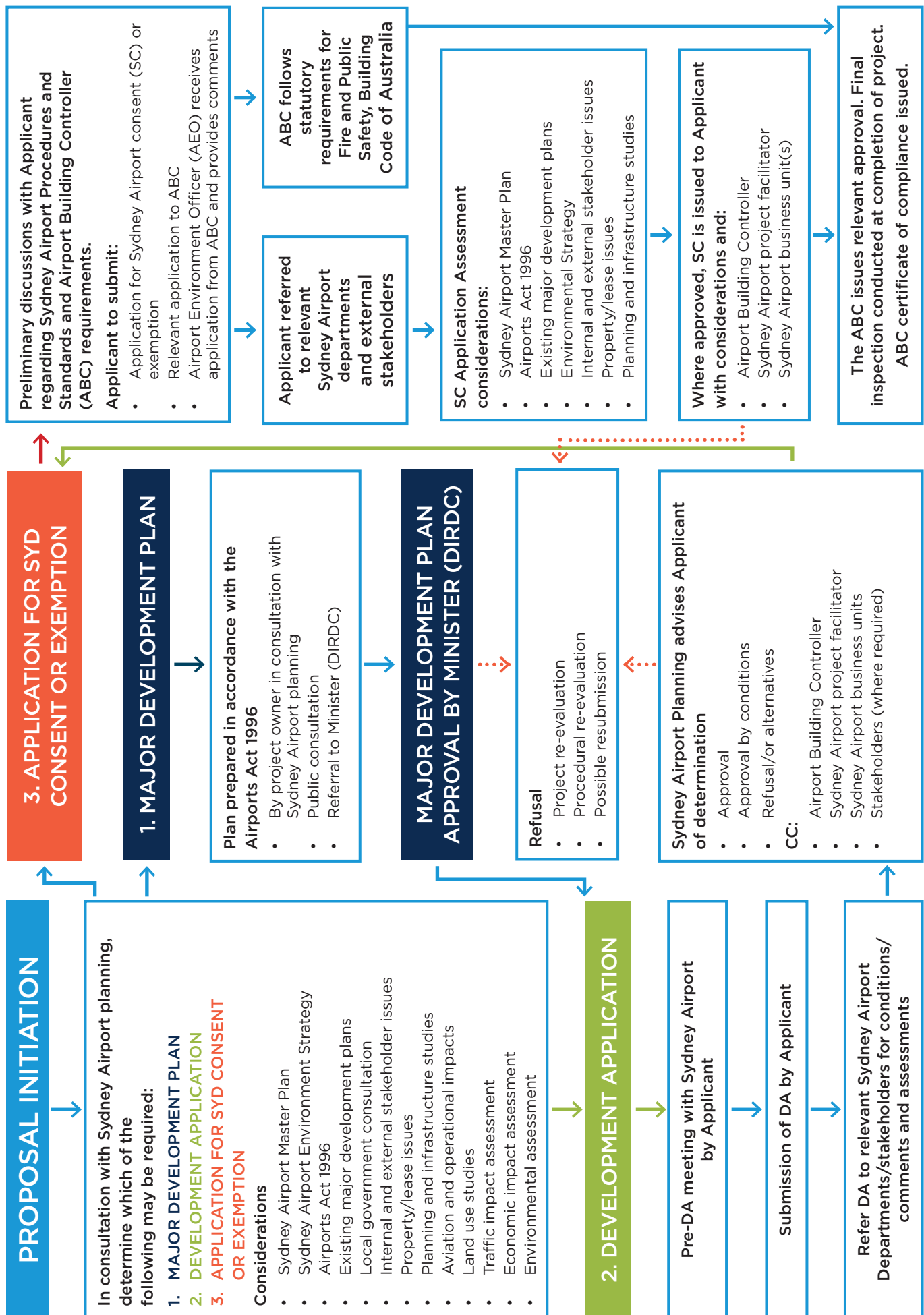


Figure 2-3: Sydney Airport Sydney Airport Development Assessment Process

3.0 Environmental Action Plans



3.1 Overview

This section details the strategic level Environmental Action Plans (EAPs) prepared to address the ground-based environmental aspects and impacts associated with the operation of the airport. The EAPs are the key reference tools for guiding environmental initiatives at the airport for the next five years.

Sydney Airport has developed the following EAPs:



Sustainability and
environmental
management



Climate change
mitigation
and adaptation



Air quality



Ground-based
noise



Ground transport



Water quality
and water use



Biodiversity



Heritage



Waste and
resource recovery



Soil and land
management



Spill response and
hazardous materials

For each EAP, the following response framework is utilised (see [Table 3-1](#)).

Table 3-1: EAP response framework

Key objective(s)	Key objectives for the operation and development of the airport - align with the principles of the Sydney Airport Environment Policy and Sydney Airport Sustainability Policy. The objectives set the strategic direction for the environmental management and performance of Sydney Airport for the period 2019-2024.
Background	Overview of the relevant aspect, how it applies to the airport, and a summary of general background information and existing sources of impact
Relevant legislation and standards	Applicable Commonwealth and NSW legislation and relevant standards (noting that these may be amended during the five year strategy implementation period).
Links to other EAPs	A number of environmental aspects overlap or address similar environmental issues. Linkages between relevant EAPs are identified where applicable.
Current management practices	This section describes the management practices currently implemented at the airport to address identified sources of environmental impact.
Achievements under previous Environment Strategies	This section summarises the major environmental outcomes and achievements associated with the implementation of Sydney Airport's previous strategies. These achievements demonstrate continual environmental improvement and continuity across the strategy periods. A summary of major environmental achievements under previous Environment Strategies can be found in Appendix A .
Five year action plan (2019-2024)	<p>This section describes the specific strategic level management actions that Sydney Airport intends to carry out in order to achieve the relevant key objectives during the five year period.</p> <p>These measures and actions aim to build on the achievements made under the previous Environment Strategies, thereby striving towards continual improvement of Sydney Airport's environmental performance. Actions proposed within this strategy include:</p> <ul style="list-style-type: none"> • New actions developed due to recent studies and plans • New actions required to address potential environmental issues associated with implementation of the master plan • Actions that remain relevant and carry over strategy periods <p>Each action has a defined priority and timeframe for implementation, established having regard to its risk, status of current management and the availability of resources.</p> <p>The categories of actions are:</p> <ul style="list-style-type: none"> • Short-term actions: These are actions to be completed within three years of approval of this Strategy • Long-term actions: These are actions to be completed within five years of approval of this Strategy • Ongoing actions: These are actions with rolling, regular timeframes or where action is dependent on external factors such as legislative requirements

3.2 Sustainability and environmental management

3.2.1 Objectives

- To ensure appropriate management systems and plans are in place to satisfactorily address all environmental risks affiliated with airport operations
- To establish and maintain appropriate mechanisms for effective internal and external communication of environmental matters
- To engage with and support our local community by contributing to the environment in which they live
- To develop and operate the airport in a sustainable manner

3.2.2 Background

Sydney Airport's Vision is to deliver a world class airport experience and foster the growth of aviation for the benefit of Sydney, NSW and Australia.

In delivering this Vision, Sydney Airport 'recognises its responsibility to manage the airport in an environmentally sustainable manner' and is committed to Sustainability: *"by adopting measures to use natural resources sustainably, including minimising our energy use and the generation of waste, doing our part to ensure the enduring wellbeing of the environment"*. (Sydney Airport Environment Policy)

We are committed to taking a sustainable approach to managing future growth at Sydney Airport. Our approach to sustainability is categorised into three broad themes:

- **Responsible business** – being ethical, responsible and transparent in how we do business
- **Planning for the future** – delivering operational excellence through innovative, technology based solutions and supporting our customer's needs now and into the future
- **Supporting our community** – working with our communities to protect the environment and create shared value



Image 3-1: Sydney Airport and community volunteers supporting Conservation Volunteers Australia

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports Regulations 1997*
- *Airports (Environment Protection) Regulations 1997*
- *Airport Development Consultation Guidelines (DIT, December 2007)*
- *Guidance Material for the Preparation of Airport Environment Strategies by Airport Lessee Companies (Department of Infrastructure, Transport, Regional Development and Local Government, March 2009)*
- *AS/NZS ISO 14001:2015 Environmental management systems – Requirements with guidance for use*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection and Biodiversity Conservation Regulations 2000*

Links to other EAPs

This EAP links to all of the EAPs in this Strategy.

3.2.3 Management

Sustainability Policy

Sydney Airport issued its first Sustainability Policy in 2016. The policy is updated periodically and can be found at <https://www.sydneyairport.com/corporate/about/corporate-governance>

Sustainability Strategy

Sydney Airport formulates sustainability strategies to underpin Sydney Airport's strategic vision and ensure a continued positive impact on people, customers and neighbours.

A set of sustainability principles were developed to address the issues that are most material to Sydney Airport and its stakeholders and to guide the management, operation and direction of sustainability. Consideration is also given to the United Nations Sustainable Development Goals (SDGs).



Image 3-2: The Sydney Airport community taking part in Clean Up Australia Day at Lady Robinson's Beach

Sustainability reporting

Sydney Airport produces annual sustainability reports to inform stakeholders and community members of the airport's progress towards sustainability targets. To ensure continued delivery of the sustainability strategy, forward commitments are made in reports and form an annual Sustainability Action Plan. The plan tracks the progress of commitments including responsibility for implementation and expected completion date. Sydney Airport's latest sustainability report can be viewed here: <https://www.sydneyairport.com/corporate/sustainability/investor-sustainability/reporting-and-performance>

Green Star Communities

Green Star Communities is a nationally recognised sustainability design framework and rating tool that assesses the planning, design and construction of large scale development projects at the precinct level (GBCA, 2016). The framework acts as a mechanism for driving sustainable development and behaviours which benefit both the direct asset and surrounding neighbourhoods through application and assessment against the five categories illustrated in **Figure 3-3**.

In line with Sydney Airport's ambition to become a recognised leader in sustainability, Sydney achieved a Green Star Communities Four Star rating for the Master Plan 2039. Achievement of the rating involved embedding each of the technical requirements in to the master plan and its implementation, and more broadly across all Sydney Airport operations and future development plans to provide social, environmental and economic benefit to airport users and community members.

The focus area for Green Star Communities are outlined in **Figure 3-1**.



Environment

Aims to reduce the impact of urban development on ecosystems. It encourages resource management and efficiency by promoting infrastructure, transport, and buildings, with reduced ecological footprints. The Environment category seeks to reduce the impacts of projects on land, water and atmosphere.



Innovation

Aims to recognise the implementation of innovative practices, processes and strategies that promote sustainability in the built environment



Governance

Aims to encourage and recognise developers and projects that demonstrate leadership within the sector, by establishing and maintaining strong governance practices. The category promotes engagement, transparency, as well as community and industry capacity building. It also seeks to ensure that community projects are resilient to a changing climate.



Livability

Aims to encourage and recognise developments that deliver, safe, accessible and culturally rich communities. The category encourages the development of healthy and active lifestyles, and rewards communities that have a high level of amenity, activity and inclusiveness.



Economic prosperity

Aims to encourage and recognise projects that promote prosperity and productivity. The category encourages affordable living and housing, investment in education and skills development, and community capacity building. This category also promotes greater productivity through emerging opportunities in the digital economy

Figure 3-1: Green Star Communities Categories (GBCA, 2016)

Community Engagement

Sydney Airport recognises the impact from aircraft operations on the local community and aims to demonstrate responsibility and leadership in corporate social responsibility. Sydney Airport's current Community Engagement Strategy focuses investment on the following pillars:

- Living Local - keeping local communities connected, healthy, vibrant and thriving
- Leading and Learning - be the best you can be in your field. Supporting the leaders of tomorrow
- Sydney's Airport - a great airport that embraces Sydney and of which Sydney can be proud

Sydney Airport's programs, initiatives and investments have been with local councils, sporting clubs, universities, community festivals and programs, charities, the arts and tourism organisations.

Stakeholder consultation

Sydney Airport is committed to effective and genuine consultation with all key stakeholders. Maintaining effective relationships with all key stakeholders is also essential to ensuring the effective environmental management of the airport. Sydney Airport liaises with a number of stakeholders, including:

- Commonwealth Government agencies
- NSW Government agencies
- Local government authorities
- Sydney Airport tenants and operators
- Sydney Airport Community Forum and other local community groups
- Other major Australian and New Zealand airports

Environmental management system

Effective environmental management is an essential function at the airport. Initiatives that have been developed to achieve this are:

- The **Sydney Airport Environment Strategy 2019-2024**
- The Sydney Airport environmental management framework (refer to **Section 2.1**)
- The environmental audit program (refer to **Section 2.2**)
- The development approval process (refer to **Section 2.3**)

Sydney Airport has developed and maintains an environmental management system (EMS) as required by clause 5.02B of the *Airports Regulations 1997*. The EMS is intended to maintain consistency with the relevant Australian and international standards; *AS/NZS ISO14001:2015 Environmental Management Systems - Requirements with guidance for use*.

The EMS provides the system for the management of environmental impacts at the airport. It includes requirements for implementation, monitoring and review, and ensuring a cycle of continuous environmental improvement.

Tenant management strategy

Sydney Airport recognises that, in addition to its own activities, there are a number of other businesses and organisations which carry out a diverse range of aviation and non-aviation related activities. Effective tenant management is therefore imperative in ensuring that any risks associated with a tenant's operations are managed appropriately to prevent environmental harm. Sydney Airport has also developed a tenant management strategy to ensure effective environmental management is achieved by tenants and operators. This strategy includes the following components:

- The environmental audit program (including Sydney Airport inspections)
- A requirement for tier 1 and 2 tenants to develop, provide to Sydney Airport and implement operational environmental management plans (EMPs)
- The development approval process
- Environmental fact sheets and guidance material
- EMS procedures to address new tenants, new processes and new activities
- Statutory requirements regarding environmental responsibilities included within tenant leases and licences

3.2.4 Achievements under previous Environment Strategies

The key sustainability and environmental management achievements under previous Environment Strategies include:

- Development of Sydney Airport's first Sustainability Policy
- Development of Sydney Airport's first Sustainability Strategy
- Development of a new Community Engagement and Investment Strategy
- Upgrade and alignment of the Environmental Management System to *AS/NZS ISO 14001:2015*
- Establishment of environment-based community partnerships including with Conservation Volunteers Australia and Kids teaching Kids
- Implementation of the Tenant Management Strategy
- Commencement of comprehensive, annual sustainability reporting

A summary of achievements under previous Environment Strategies is provided in [Appendix A](#).

3.2.5 Sustainability and environmental management five year action plan

The action plan is detailed in **Table 3-2**.

Table 3-2: Sustainability and environmental management action plan 2019-2024

Action/initiative	Status
Consider implementing a requirement that all contractors with a contract value of > \$5 million must have a valid ISO 14001 Environmental Management System accreditation	Short-term
Develop a 'dashboard' tool to track environmental performance, management and sustainability initiatives	Short-term
Review existing EMS and update to accommodate the Environment Strategy 2019-2024 commitments	Short-term
Develop an interactive environmental management database for historical and ongoing environmental monitoring data	Short-term
Pursue a minimum 4-Star Green Star Design and As-Built rating for new, large scale developments	Long-term
Pursue a minimum 4-Star Green Star Communities rating for Master Plan 2039	Long-term
Develop an environmental sustainability and management awareness program for Sydney Airport staff, to increase corporate sustainability competencies	Long-term
For construction works, a project-specific Environmental Management Plan will be developed in accordance with the 2014 Environmental Management Plan Guidelines (Australian Government Department of the Environment)	Ongoing
Continue the Sydney Airport Community Engagement and Investment Strategy, ensuring environment remains a focus area	Ongoing
Continue to explore partnership opportunities for environmental programs and education in the community	Ongoing
Ensure all developments, including those associated with the Master Plan 2039, are assessed against commitments in this strategy and applicable regulatory requirements	Ongoing
Conduct formal monthly meetings with the AEO to review environmental progress and implementation of the Environment Strategy 2019 – 2024	Ongoing
Submit Annual Environment Report to DIRDC, reporting on environmental performance, issues/incidents, regulatory compliance, monitoring and progress in implementing Environment Strategy commitments	Ongoing
Ensure effective communication and consultation with external stakeholders, including tenants, on environmental matters	Ongoing
Implement the environmental audit program in line with EMS and AES requirements	Ongoing

Key performance indicators

- Support and contribute to the wellbeing of the local community and the environment in which they live by developing partnerships, by providing grants, sponsorships and contributions
- Maintain open communications and effective relations with the local community
- Implementation of **Environment Strategy 2019–2024 Action Plan items**

3.3 Climate change mitigation and adaptation

3.3.1 Objectives

Reduce and manage the impacts of climate change on the airport by:

- Understanding and minimising direct and indirect impacts associated with climate change
- Cost effectively reducing energy and greenhouse gas emission intensities
- Meeting all relevant regulatory requirements

3.3.2 Background

It is widely recognised and accepted that continued emission of greenhouse gases will cause further warming of the earth and that warming above two degrees Celsius, relative to the pre-industrial period could lead to negative economic, environmental and social consequences.

In 2016, research undertaken by NASA scientists confirmed that average global temperatures have risen by one degree Celsius since pre-industrial levels, causing considerable changes in the earth's climate and weather systems. The Intergovernmental Panel on Climate Change (IPCC) Fifth Assessment Report (IPCC, 2013) states with high confidence that Australia is already experiencing impacts from recent climate change, including a greater frequency and severity of extreme weather events. Other observed trends include an increase in record hot days, a decrease in record cold days, ocean warming and sea-level rise. Due to the long lag times associated with climate processes, even if GHG emissions are mitigated and significantly reduced, the warming trend is expected to continue for centuries (IPCC, 2007).

In the future, Sydney is expected to experience an increase in frequency, intensity, and duration of extreme rain and flooding events and extreme heat events. Sea levels around Sydney are expected to rise and increase the impacts of coastal flooding events. Also, time spent in drought and severe bushfire weather is expected to increase (To70 Aviation, 2016).

The built environment, and the supporting infrastructure and services on which it depends, are vulnerable to the impacts of climate change. These impacts will also be influenced by the level of vulnerability and resilience of asset owners and managers, end users and the general community to respond or adapt.

Sydney Airport is a vital asset for Sydney, the state of New South Wales (NSW) and Australia as a whole. It delivers economic and social benefits to the Australian people as well as the global community. As aviation and weather are closely linked, airport operations and infrastructure development already take into account climatic conditions. Sydney Airport understands the need to ensure that its assets are designed and maintained to withstand future climatic conditions.

In responding to climate change, there are two broad response strategies. The first is proactive reduction of greenhouse gases emitted into the atmosphere to reduce the rate of climate change, also known as emission or carbon mitigation. The second is adaptation of infrastructure, systems, and organisations to reduce the impacts of climate change.

Global aviation industry commitment to action on climate change

Most carbon dioxide emissions associated with aviation are as a result of in-flight emissions from aircraft. In addition, aircraft contribute to climate change by the formation of condensation trails and emission of nitrogen oxides that form ozone, a greenhouse gas, when emitted at cruise altitudes. The best estimate of aviation's impact on climate change, given by the International Air Transport Association (IATA), is about three percent of the contribution by human activities. However, with airline travel becoming more popular in Australia and around the world, this contribution could possibly reach five percent by 2050 (International Air Transport Association and CORSIA, 2009). IATA recognises the need to address the global challenge of climate change and adopted a set of ambitious targets to mitigate CO₂ emissions from air transport:

- An average improvement in fuel efficiency of 1.5 percent per year from 2009 to 2020
- A cap on net aviation CO₂ emissions from 2020 (carbon-neutral growth)
- A reduction in net aviation CO₂ emissions of 50 percent by 2050, relative to 2005 levels

Aviation's challenge is to retain the many positive economic and social benefits that aviation provides while reducing its negative environmental impacts. Signing of the Global Aviation Industry Commitment to Action on Climate Change by aviation industry leaders – including Sydney Airport – was an important demonstration of aviation's worldwide commitment to introducing technological, operational and efficiency advances that will reduce aviation's contribution to climate change.

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports Regulation 1997*
- *Airports (Environment Protection) Regulations 1997*
- *National Greenhouse and Energy Reporting Act 2007*
- *National Greenhouse and Energy Reporting Regulations 2008*
- National Climate Resilience and Adaptation Strategy 2015
- Critical Infrastructure Resilience Strategy: Policy Statement and Plan 2015

NSW

- *Energy and Utilities Administration Act 1987* (Part 6A)
- NSW Climate Change Policy Framework 2016
- NSW Government Resource Efficiency Policy 2014

Links to other EAPs

- Air quality – [Section 3.4](#)
- Ground transport – [Section 3.6](#)
- Water quality and water use – [Section 3.7](#)
- Waste and resource recovery – [Section 3.10](#)

3.3.3 Management

Climate mitigation - energy and carbon strategy

As a signatory to the Global Aviation Commitment to Action on Climate Change, Sydney Airport is working towards an industry-wide target of carbon neutral growth from 2020 and to maintain its Level 3 Airport Carbon Accreditation (ACA). ACA is an internationally recognised certification system designed to assess and recognise participating airports' efforts to manage and reduce their carbon emissions.

The airport is a large consumer of energy resources. As shown in **Figure 3-2**, most of the energy consumed is electricity used in airport terminals predominantly for heating, cooling and lighting. Electricity and natural gas consumption make up over 97 percent of the greenhouse gases accounted for in Sydney Airport's carbon footprint. The Scope 1 and 2 carbon footprint was measured in FY2017 to be 87,888 tonnes, data which is reported annually to the Australian Government.

FY17 Scope 1 and 2 Emissions

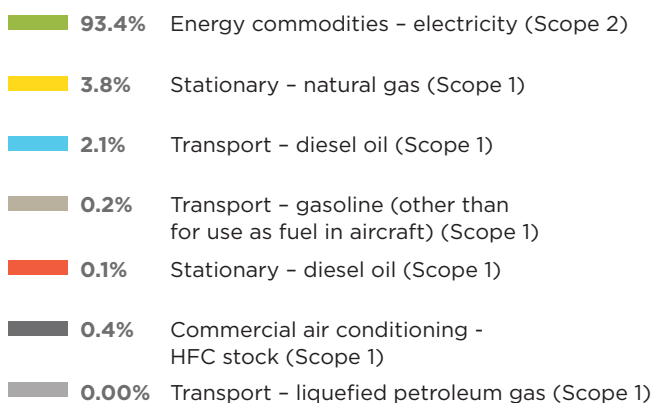
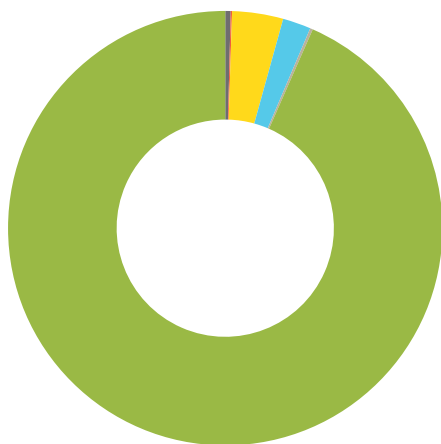


Figure 3-2: Sydney Airport Scope 1 and 2 emissions (FY2017)

As shown in **Table 3-3** below, the airport's Scope 3 emissions, such as those from aircraft landings and take-offs and surface access, were measured in FY2016 to be 952,749 tonnes. Scope 3 emissions are divided into categories depending on the ability of an airport to control, guide or influence emissions. The majority of the airport's Scope 3 emissions are able to be influenced with only a small proportion able to be controlled. This indicates it may be challenging to make significant Scope 3 reductions in the future as a large proportion of these emissions are outside of Sydney Airport's control. Surface access to the airport by staff and passengers is a major source of Scope 3 emissions and one that is targeted specifically by the ground transport actions in **Section 3.6**.

Table 3-3: Sydney Airport FY2016 Scope 3 emissions

Emission Source (Scope 3)	Emissions (tCO ₂ e)	Proportion
Surface access	387,806	41%
Landings and take offs (LTO)	434,694	46%
Ground Support Equipment (GSE)	15,442	2%
Auxiliary Power Unit (APU)	31,145	3%
T1 and T2 metered tenants	25,459	3%
T3 and Jet Base	47,453	5%
Waste	9,417	1%
Engine testing	1,023	0.1%
Corporate travel	159	0.0%
Aviation Rescue and Fire Fighting (ARFF)	149	0.0%
Total Scope 3	952,749	100.0%

By 2017 Sydney Airport exceeded its goal of reducing emissions per passenger by 25 percent by 2020, achieving a 27.2 percent reduction in emissions per passenger, measured from a 2010 baseline. A number of factors contributed to this achievement, including increased passenger numbers, stable energy consumption (as a result of the implementation of efficiency projects and improved energy management strategies), and a reduction in the grid electricity emissions factor.

In 2017, Sydney Airport updated the Energy Savings and Carbon Reduction Plan, which identified new energy saving, greenhouse gas emission reduction and energy efficiency opportunities. We have established a new target which is to achieve a 50 percent reduction in emissions per passenger by 2025. As electricity and natural gas consumption are the major sources of carbon emissions, they are a major focus in the Energy Savings and Carbon Reduction Plan. Sydney Airport will continue to develop and research further sustainable, cost effective energy initiatives, including the use of renewable energy such as solar.

Climate adaptation

Climate adaptation is defined by the Intergovernmental Panel on Climate Change as “adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities”. Sydney Airport currently has a range of policies and controls that reduce the impacts caused by climate and weather issues today. The Airport Emergency Plan is the principal tool used to manage business continuity. It provides Sydney Airport with a robust, risk based framework to manage incidents across the airport and minimise business and operational disruptions. This risk based management framework is the basis of new actions proposed to reduce climate risk.

The Sydney Airport Climate Risk Assessment and Adaptation Plan (Adaptation Plan) was completed in 2016. The assessment identified climate-based physical risks for potential future climate scenarios and identified actions required to fully prepare for a climate resilient future ranging from technical studies to stakeholder engagement. Key risks included:

- Pressure on external utilities (electric grid, water, and sewerage) leading to supply interruptions and/or increased costs
- Operational disruptions from airfield flooding, surface failures, subsidence, and drainage issues in extreme rainfall events
- Inundation of critical systems, building, and infrastructure leading to operational disruptions from either extreme rainfall events or coastal flooding from storm surge and/or sea level rise
- Inundation of access roads to the airport not controlled by the airport

Sydney Airport continually assesses climate adaptation resilience to better understand the specific risks. This includes examining inundation through the use of hydrologic modelling of future climate change scenarios to understand the potential impact that some of the major projects currently planned or under construction in the vicinity of the airport may have. This study will inform specific actions needed to minimise flood risk from extreme rainfall and coastal flooding.

Sydney Airport has committed to periodic reviews and updates of the Adaptation Plan to ensure it evolves in response to new science, new global, Australian or aviation policies and new information.

3.3.4 Achievements under previous Environment Strategies

Key climate change achievements under the previous Environment Strategies include:

- Commenced electrification of our bus fleet, being the first Australian airport to use six electric buses
- Installed a solar PV array, generating 0.5MW of renewable energy
- Setting and achieving our first carbon reduction target ahead of time and subsequently setting a new target to reduce carbon by 50 percent per passenger by 2025
- Developing and implementing an Energy Savings and Carbon Reduction Plan
- Joined ACI's Airport Carbon Accreditation program, achieving Level 3 Accreditation by the end of 2016
- Developing and implementing a Climate Risk Assessment and Adaptation Plan
- Offsetting carbon emissions associated with Sydney Airport's pool vehicle fleet
- Provided infrastructure to facilitate the introduction of electric GSE



Image 3-3: The airfield at Sydney Airport, looking back at the Sydney skyline

3.3.5 Climate change mitigation and adaptation five year action plan

The action plan is detailed in **Table 3-4**.

Table 3-4: Climate change mitigation and adaptation action plan 2019-2024

Action/initiative	Status
Implement feasible actions from the Climate Risk Assessment and Adaptation Plan and other associated studies	Short-term
Review and update the Climate Risk Assessment and Adaptation Plan	Short-term
Investigate the feasibility of offsetting Sydney Airport staff travel and events	Short-term
Target a 50 percent reduction in carbon emissions per passenger by 2025 (compared to 2010 baseline emission levels)	Long-term
Work with business partners to develop an airport-wide strategy for biofuels	Long-term
Maintain Level 3 Airport Carbon Accreditation	On-going
Continue to implement cost effective energy efficiency and saving opportunities in line with the Energy Saving and Carbon Reduction Plan	On-going
Investigate further opportunities for introduction of solar energy generation as part of proposed developments within the airport site	On-going
Continue to maintain compliance with existing energy and greenhouse gas reporting and assessment programs including NGER and NPI	On-going
Communicate with state and local government to understand Sydney Airport's role in overall city resilience	Ongoing
Continue to offset carbon emissions from Sydney Airport's pool vehicle fleet	Ongoing
Conduct workshops around climate risk and adaptation with key airport stakeholders and utility providers	Ongoing

Key performance indicators

Climate mitigation:

- Reduction in the total carbon emissions per passenger (MJ/PAX)

Climate adaptation:

- Implement actions in the Climate Risk Assessment and Adaptation Plan and work towards reducing risk ratings

3.4 Air quality

3.4.1 Objectives

The key objectives for air quality are to:

- Minimise air emissions from ground-based airport operations and activities
- Comply with State and Commonwealth legislation and relevant standards and guidelines
- Support and encourage the progressive introduction by airlines of cleaner and more fuel efficient next generation aircraft

3.4.2 Background

There are a number of emissions sources throughout the Sydney metropolitan region, with Sydney Airport one of the contributors to overall air emissions. Other contributors in close proximity to the airport include the Port Botany Container Terminal (which generates atmospheric emissions associated with container ship, rail and heavy truck movements) as well as petrochemical and other heavy industries located in the region. Major roads and motorways around the airport are also considered a major contributor to atmospheric emissions in the region.

The types of activity which result in air pollutant emissions at airports are identified in the *National Pollutant Inventory Emission Estimation Techniques for Airports* (Department of Environment, Water, Heritage and the Arts, July 2008). These activities generate emissions through either fuel combustion or evaporation and include:

- Aircraft main engines
- Aircraft auxiliary power units (APUs)
- Aircraft ground support equipment (GSEs) and other airside vehicles
- Tests on aircraft engines and APUs
- Landside road traffic, including parking facilities
- Heat-generating plant
- Emergency power generators
- Fuel storage and distribution
- Solvent use during aircraft maintenance
- Fire training

Legislation governing air pollutant emissions and ambient air quality at airports has been introduced at the Commonwealth and state levels. In NSW, air quality must be assessed in relation to criteria for specific pollutants that are contained in the *Approved Methods for the Modelling and Assessment of Air Pollutants in New South Wales* (NSW EPA, 2016).

The key air pollutants for airport operations include carbon monoxide (CO), oxides of nitrogen (NOx), particulate matter (PM), oxides of sulfur (SOx), and volatile organic compounds (VOCs). PM is categorised as particulate matter with an equivalent aerodynamic diameter of 10 micrometres (µm) or less (PM10) and particulate matter with an equivalent aerodynamic diameter of 2.5 micrometres (µm) or less (PM2.5).

In 2017, an air quality monitoring station was installed at Sydney Airport in the South East Sector which monitors CO, NOx, PM10 and PM2.5. Monitoring of VOCs is also conducted at appropriate receptor locations. The purpose of monitoring is to provide Sydney Airport and relevant stakeholders with an up-to-date picture of the local air quality, to assist in planning for airport growth and air quality management under the Master Plan 2039.

In order to understand the relative importance of operational air emissions, an emissions inventory has been prepared. An emission inventory was developed for the financial year of 2016-2017 (hereafter referred to as the 2016 base case year) and detailed dispersion modelling study has been undertaken.

In the modelling study, emissions and air pollution at the airport are calculated using the United States (US) Federal Aviation Administration's (FAA) Aviation Environmental Design Tool (AEDT) model. The FAA has mandated the use of AEDT for air quality modelling studies at airports in the US and the model has been widely used in other countries.

The AEDT model allows us to understand the contribution of our activities to local air quality. This analysis is used to inform key priorities for air quality management and to focus our air quality monitoring program to provide a targeted understating of our operations on ambient air quality.

The emissions inventory provides a summary of the predicted emissions to air from the different types of activity at the airport (for the 2016 base case year and future years 2024 and 2039) and are shown in **Figure 3-3**.

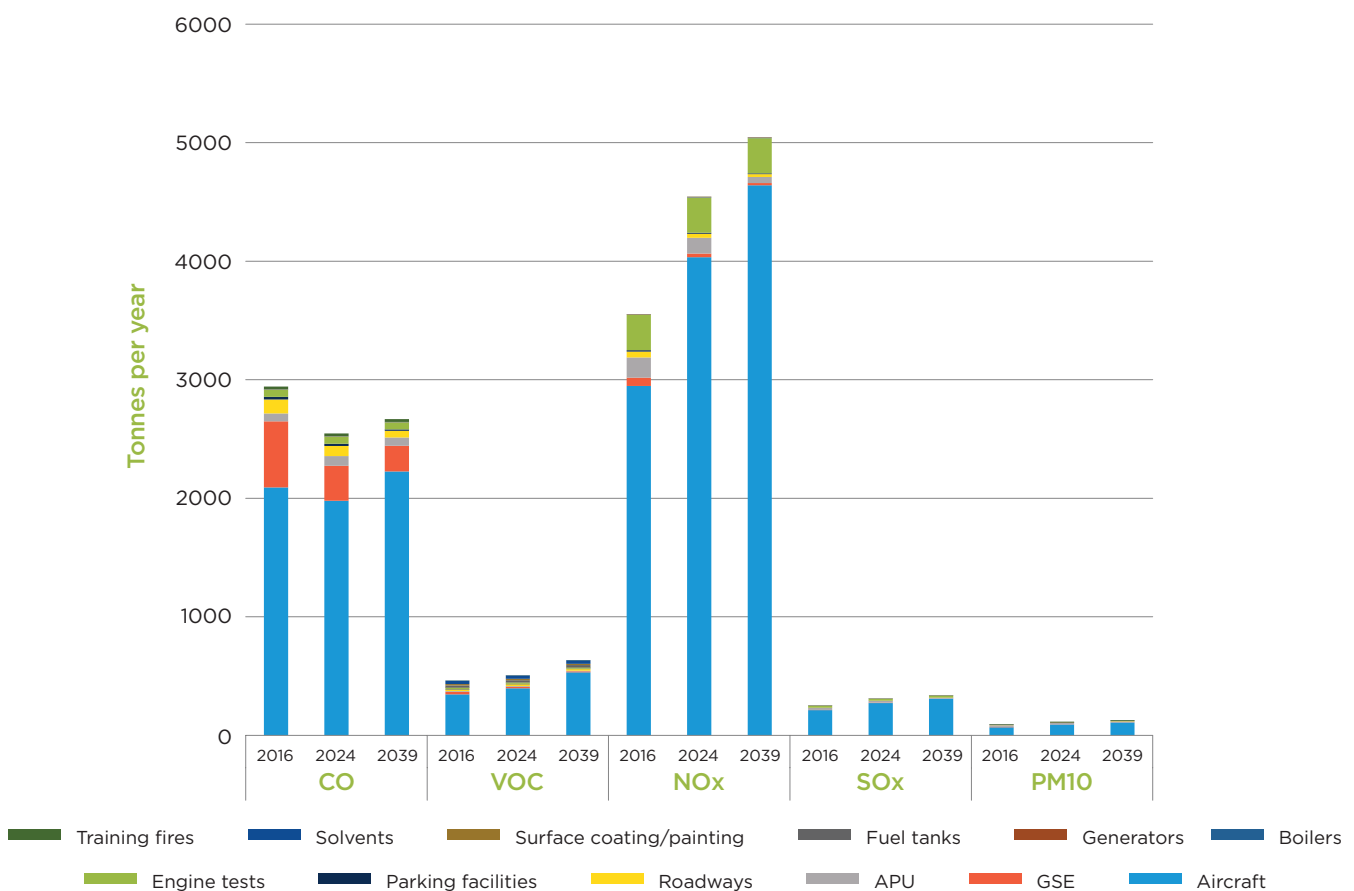


Figure 3-3: Predicted emissions to air from Sydney Airport's operations (2016, 2024 and 2039)

The Australian National Pollutant Inventory (NPI) provides information on air pollutant emissions within the Sydney-Wollongong-Newcastle airshed from industrial and mobile sources. **Table 3-5** presents the emissions from the airport in 2016 compared with the NPI data for the regional airshed in 2015/16. For all pollutants the emissions from the airport represent less than one percent of total emissions within the airshed.

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports Regulation 1997*
- *Airports (Environment Protection) Regulations 1997*
- National Environment Protection (Ambient Air Quality) Measure
- National Environment Protection (National Pollutant Inventory) Measure
- National Environment Protection (Diesel Vehicle Emissions) Measure
- *Ozone Protection and Synthetic Greenhouse Gas Management Act 1989*
- Air Navigation (Aircraft Engine Emissions) Regulations, Chicago Convention Annex 16

NSW

- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Clean Air) Regulation 2010*

Links to other EAPs

- Climate change mitigation and adaptation – **Section 3.3**
- Ground-based noise – **Section 3.5**
- Ground transport – **Section 3.6**
- Spill response and hazardous materials – **Section 3.12**

Table 3-5: Sydney Airport emissions compared with emissions in Greater Sydney, Newcastle and Wollongong airshed

Pollutant	Emissions in Sydney-Wollongong-Newcastle (NPI data for 2015/16) (tonnes per year)	Emissions from Sydney Airport in 2016 ^(a) (tonnes per year)	Emissions from Sydney Airport in 2016 (% of NPI for airshed)
CO	670,000	2,942	0.44
NO _x	710,000	3,553	0.50
PM ₁₀	960,000	251	0.03
SO ₂	970,000	94	0.01
VOC	99,000	463	0.47

Sources:

(a) NPI: www.npi.gov.au

3.4.3 Management

Airport infrastructure

Sydney Airport is actively supporting the introduction of the next generation of quieter, cleaner and more fuel efficient aircraft. To facilitate the introduction of these aircraft, Sydney Airport has invested significantly to upgrade airfield and terminal infrastructure. Sydney Airport has also installed Fixed electrical ground power units (FEGPU) at all T1 and T2 gates and Pre-conditioned air units (PCA) at all T1 gates. This enables airlines to minimise the use of APUs, which are powered by jet fuel, and as a result minimise impacts on local air quality.

Essential infrastructure upgrades to accommodate the progressive introduction of further next generation aircraft – such as the provision of additional stands at terminals and taxiways – are proposed to be undertaken as outlined in the master plan. These upgrades will keep Sydney Airport at the forefront of the introduction of the newer quieter and cleaner aircraft into the global airline fleet, making them increasingly common in the skies over Sydney.

Encouraging the use of sustainable transport modes

As outlined in [Section 3.6](#) (ground transport environmental action plan) Sydney Airport's objective is to encourage the increased use of sustainable transport modes (including public transport and cycling). Sydney Airport's Ground Transport Solutions Major Development Plan which is currently under construction includes measures to increase pedestrian, cycling and sustainable transport connections to and from the airport. This includes construction of a shared pedestrian and cyclist link from the T1 terminal to Cooks River Drive and beyond to the state active transport network.

In 2017, the NSW Government announced an increase in the frequency of trains on the T2 Airport line, reducing waiting times during off peak periods. Additional bus services to the airport are also planned and Sydney Airport is proposing to develop a ground transport interchange at the T2/T3 precinct to provide for public transport users.

Increased use of sustainable transport modes will help to minimise environmental impacts such as air and noise emissions associated with airport-related traffic.

Cleaner more efficient aircraft

The introduction of the Air Navigation (Aircraft Engine Emissions) Regulations ensures that aircraft within Australia comply with the emission standards contained within the Convention on International Civil Aviation (Volume II, Annex 16). The standards are aimed at reducing ground level emissions per aircraft movement and establish limits for relevant parameters including NO_x, CO, hydrocarbons and smoke. In March 1999, ICAO announced new limits for NO_x emissions which represent a reduction of about 16 percent applicable to new aircraft engine designs after 2003.

Despite the growth in aviation over recent decades, the fuel efficiency of today's modern jets is 70 percent better than it was with the early jets. Improved fuel efficiency means lower air emissions and a reduced contribution to climate change. It is expected that fuel efficiency will continue to improve, as demonstrated by the A380 and the new B787 and A350 XWB aircraft, where a further 20 percent efficiency improvement is expected.

3.4.4 Achievements under previous Environment Strategies

The air quality achievements under the previous Environment Strategies include:

- Installation of a new air quality monitoring station on the airport
- Commencement of air quality monitoring
- Introduction of electric buses, with zero tailpipe emissions
- Provision of infrastructure to facilitate the introduction of electric GSE
- Provision of infrastructure to enable aircraft to reduce fuel burn at the gate
- Development of a ground power improvement program, to encourage airlines to increase use of FEGPU and PCA



Image 3-4: Sydney Airport's air quality monitoring station

3.4.5 Air quality five year action plan

The action plan is detailed in **Table 3-6**.

Table 3-6: Air quality action plan 2019-2024

Action/initiative	Status
Develop and implement an air quality monitoring plan to examine trends in pollutant concentrations and identify any criterion exceedances	Short term
Facilitate discussions with Airservices Australia and other key stakeholders to ensure that aircraft taxiing times, idling times, and general aircraft usage is carried out as efficiently as possible and aircraft emissions are minimised to the extent practicable	Short term
Explore the potential for the introduction of alternative fuelled GSE and vehicle transport within the airport site	Short term
Develop and implement an air quality management strategy	Long-term
Actively engage with aircraft manufacturers and research bodies to gain an improved understanding of aircraft emissions and the options available to reduce emissions such as cleaner fuels and more efficient new generation aircraft	Long term
Continue to install FEGPU and PCA at all new terminal gates and at remote apron aircraft stands within the airport site	On-going
Develop a program to facilitate airlines' increased use of FEGPU and PCA and reduce the use of APUs	On-going
Ensure that potential air quality impacts are assessed and managed for the construction and operational phases of development proposals	On-going
Continue to implement the tenant management strategy and ensure tenants include air quality management in their EMPs	On-going
Carry out annual NPI reporting and submit to NSW EPA	On-going
Continue operation, maintenance and reporting for the air quality monitoring station, including off-site VOC sampling	Ongoing

Key performance indicators

- Increased use of clean energy sources including cleaner fuels for vehicles and equipment
- Increased percentage of aircraft gates and remote apron stands fitted with FEGPU and PCA
- Increased utilisation rate of FEGPU and PCA by airlines

3.5 Ground-based noise

3.5.1 Objectives

The key objectives for ground-based noise are to:

- Minimise and control noise associated with ground-based airport operations
- Comply with relevant Commonwealth and state noise standards

3.5.2 Background

Sydney Airport has a critical role to play in managing impacts from ground-based noise on the local community and on-airport users. The main contributors of ground-based noise include:

- Aircraft engines
- Aircraft auxiliary power units (APU)s
- Diesel and electric ground power and PCA mobile units
- Ground based transportation (tugs, baggage handling, buses etc.)
- Maintenance activities
- Mechanical plant and equipment
- Road traffic (on the airport)
- Construction and development activities

The *Airports (Environment Protection) Regulations 1997* provides guidelines for ground-based noise at Sydney Airport. Noise generated by an aircraft in flight or when landing, taking off or taxiing at an airport, except in the case of aircraft ground running, are addressed separately as aircraft noise (refer Chapter 15 of Master Plan 2039) and by other laws such as the *Air Services Act 1995*, *Air Navigation Act 1920*, *Air Navigation (Aircraft Engine Emissions) Regulations* or *Air Navigation (Aircraft Noise) Regulations*. These laws are administered by the Australian Government, through DIRDC or Airservices Australia.

On average, each year since 2013 there has been seven complaints from the community in relation to ground-based noise. Complaints are received either directly by Sydney Airport or through Airservices Australia, with most complaints related to aircraft engine running or APU usage. We recognise that this is an important issue for the local community and ensure that each complaint is investigated thoroughly.

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports Regulation 1997*
- *Airports (Environment Protection) Regulations 1997*

NSW

- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Noise Control) Regulation 2008*

Links to other EAPs

- Air quality – [Section 3.4](#)



Image 3-5: Completing ground-based noise monitoring at Sydney Airport

3.5.3 Management

Engine ground running

Engine ground running, which is essential for effective and safe aircraft operations and maintenance, is a major source of ground-based noise at Sydney Airport. Engine ground running is regulated by a policy that includes a comprehensive set of operational rules designed to maintain safety levels, comply with relevant standards and practices, and minimise noise impacts in areas outside the airport site boundary.

Engine ground running is currently carried out within the Jet Base precinct on the northern edge of the airport and, with permission from Sydney Airport, at other specific locations around the airport by Qantas and other carriers. Sydney Airport is committed to the ground running rules and to achieving minimal complaints regarding ground-based noise.

The increasing number of next generation quieter aircraft flying to Sydney in the future is expected to reduce the need for high power engine ground runs. It is considered that this will reduce ground-based noise impacts in areas around Sydney Airport.

Over the past five years, Sydney Airport has implemented a number of measures to reduce ground-based noise. All T1 and T2 contact positions with aerobridges are now fitted with FEGPU; gates at T1 are also fitted with PCA. The FEGPU are a quieter alternative to APUs which are a known source of ground-based aircraft noise.

Ground-based noise assessments and monitoring

Ground-based noise from new developments at the airport, such as new or expanded aircraft aprons or ground transport access improvements, are assessed for noise impacts on an individual basis at the planning stages of each development. Appropriate noise attenuation and mitigation measures are implemented where necessary to ensure relevant noise criteria are met. Noise monitoring and modelling for individual projects is undertaken where necessary.

Similarly, noise impacts associated with construction activities are assessed during the development approval process. Noise monitoring and modelling for individual projects is undertaken where necessary.

In recent years Sydney Airport has completed updated noise monitoring in residential areas surrounding the airport site which will be used to provide a baseline for future noise assessments.

Cumulative ground-based noise impacts

Sydney Airport intends to build on its existing management strategy by investigating the potential to include cumulative ground-based noise sources as part of future ground-based noise assessments. The prediction of the cumulative ground-based noise impacts provides a useful tool for Sydney Airport to evaluate operational changes and to report on its ground-based environmental noise performance over time.

Residential areas surrounding the airport

Areas of new residential and mixed-use development have occurred or are proposed in areas surrounding the airport site such as at Mascot, Arncliffe and Cooks Cove. The encroachment of residential development has the potential to reduce the criteria for ground-based noise at the airport, resulting in increased mitigation and/or a restriction on future allowable ground-based noise sources. Sydney Airport monitors residential development in areas surrounding the airport and will liaise with state and local governments to advocate for these developments to achieve nominated standards for noise insulation.

3.5.4 Achievements under previous Environment Strategies

The ground-based noise achievements under previous Environment Strategies include:

- A comprehensive review and update of the Engine Operating Procedures
- Carried out comprehensive program of baseline noise monitoring at 10 locations within the surrounding community
- Several noise impact assessments undertaken by independent noise specialists to inform infrastructure planning and development projects
- Provision of infrastructure to facilitate the introduction of electric GSE, quieter than traditional diesel GSE
- Provision of infrastructure to enable aircraft to switch off APUs, a significant source of ground-based noise at terminal gates and remote aprons
- Development of a ground power improvement program, to encourage airlines to increase use of fixed electrical ground power and preconditioned air



Image 3-6: Our airport community in action on an A380 engine

3.5.5 Ground based noise five year action plan

The action plan is detailed in **Table 3-7**.

Table 3-7: Ground-based noise action plan 2019-2024

Action/initiative	Status
Review aircraft engine operating procedures and ground running rules to: ensure that engine runs are carried out at acceptable times and in appropriate locations accommodate the proposed extension of terminals, aircraft bays, aprons and taxiways	Short term
Investigate the development of a cumulative ground-based noise model for the airport site to enable the overall noise footprint of the airport to be determined and to inform noise management strategies	Short term
Review the proposed hangar, terminal, aircraft bay and apron layouts (particularly in the North-East Sector of the airport) to ensure that noise reduction strategies are considered at the planning and design stage	Long term
Monitor residential developments proposed in the vicinity of the airport site to ensure that they will not unreasonably compromise the on-going operations of the airport	Long term
Continue to undertake regular monitoring of ground-based noise sources from the airport	Ongoing
Continue to install FEGPU and PCA at all new terminal gates and at remote apron aircraft bays within the airport site	Ongoing
Develop a program to facilitate airlines' increased use of FEGPU and PCA and reduce the use of APUs	Ongoing
Continue to ensure that ground-based noise is assessed and managed for the construction and operational phases of development proposals	Ongoing
Assess noise predictions against relevant criteria and develop appropriate noise management measures	Ongoing
Continue to monitor ground-based noise complaints at the airport. Any observed breaches in ground running rules are to be registered, investigated and referred to the AEO for further action if required	Ongoing

Key performance indicators

- No breach of the aircraft engine operating procedure, including the ground running rules
- Receive minimal complaints from the community regarding ground-based noise
- Increased percentage of aircraft gates and remote apron stands fitted with FEGPU and PCA
- Increased utilisation rate of FEGPU and PCA by airlines

3.6 Ground transport

3.6.1 Objectives

- Encourage the increased use of sustainable transport modes
- Minimise traffic-related environmental impacts (such as greenhouse gas, air and noise emissions)

3.6.2 Background

This ground transport action plan details Sydney Airport's commitment to sustainable transport options for airport users, with a focus on minimising traffic related environmental impacts.

Master Plan 2039 contains a ground transport strategy for the 20 year period and a specific ground transport plan for the five year period. The five year plan shows how Sydney Airport will maximise the efficient movement of people and freight to, from and within the airport precincts.

Transport and traffic at the airport is classified into airside and landside components. The following sections describe the landside access components

Road network

The M5 East Motorway, Eastern Distributor, Southern Cross Drive, General Holmes Drive, O'Riordan Street and Marsh Street are the main vehicular access routes to Sydney Airport. Arterial road access to the T1 precinct is provided by Airport Drive and Marsh Street and to the T2/T3 precinct by the Qantas Drive/Joyce Drive/O'Riordan Street intersection.

Airport Drive/Qantas Drive forms the northern boundary of the airport. These roads are located on airport land and maintained by Sydney Airport. They form an important element of the southern Sydney arterial road network. In addition, these roads provide important access and circulation for airport users.

There are three main sources of traffic on the road network in and around the airport. These are:

- Trucks travelling to or from the Port Botany Container Terminal (which carry freight)
- Trucks and cars that are directly associated with the day-to-day operation of the airport (which carry passengers, meeters/greeters, freight, and airport workers)
- Commuter and residential traffic that pass through the areas immediately adjacent to the airport

Forecast increased growth in air traffic and passenger numbers at Sydney Airport is likely to result in commensurate growth in ground transport demand.

The WestConnex motorway is currently under construction by the NSW Government and has the potential to significantly alter traffic patterns on the Sydney road network. In addition, any Sydney Gateway connection would provide a connection from WestConnex to both terminal precincts.

Public transport

Public transport services to Sydney Airport consist of both railway and bus services. Railway stations at both terminal precincts provide airport customers and employees access to the City Circle and other destinations along the T8 Airport and South Line, including Campbelltown and Macarthur. The T8 Airport and South Line also provides an inter-terminal transfer facility for passengers transferring between the terminal precincts. The T8 Airport and South Line currently operates up to 10 trains per hour through the Sydney Airport railway stations during peak hours.

Currently, public bus services are limited to the 400 service, a limited stops service operating from Burwood to Bondi Junction via Eastgardens. Two other bus services, the 410 Bondi Junction to Rockdale and 305 Stamford Hotel to Railway Square operate services on the edge of the Airport precinct on Roby Street and O'Riordan Street respectively.

Analysis of a recent airport passenger survey and public transport ticket data has also shown that since 2012, the mode share of people accessing the airport by rail has grown from 16 to 24 percent in 2017, resulting in a significant increase in the number of daily rail passengers. The current daily usage at both airport rail stations is over 33,000 trips on a busy day, which is an increase of 45 percent from 2012.

Taxis, ride share, coaches and mini-buses are an important transport mode for passengers accessing the airport. Mini buses link the airport to many hotels nearby and further afield. Sydney Airport has invested to provide parking, drop-off and pick-up facilities for this mode of transport. The growth of ride sharing has changed the mode share of travel to the airport, resulting in a reduction in the proportion of daily trips taken by taxi.

Active transport

Cycle routes are provided along the Cooks River and Alexandra Canal, on the north side of Airport Drive and via the Giovanni Brunetti Bridge. Cyclists have access to all terminals and cyclist facilities are provided at various locations.

Pedestrian access to T1 is via the Giovanni Brunetti Bridge and the Alexandra Canal footbridge and then on footpaths and covered walkways. Pedestrian access to T2/T3 is on footpaths along public roads and through the pedestrian facilities at the Qantas Drive/Sir Reginald Ansett Drive intersection. An elevated footbridge and cycleway connection linking the Alexandra Canal shared path and the P7 car park at T1 was opened in 2017 and additional bicycle facilities were provided as part of this project.

Relevant legislation and standards

Commonwealth

- *Airports (Environment Protection) Regulations 1997*
- *Airports Regulations 1997*
- *National Environment Protection (Ambient Air Quality) Measure*
- *National Environment Protection (National Pollutant Inventory) Measure*
- *National Environment Protection (Diesel Vehicle Emissions) Measure*

NSW

- *Protection of the Environment Operations Act 1997* - Part 5.8
- *Protection of the Environment Operations (Clean Air) Regulation 2002* - Part 3

Links to other EAPs

- Climate change adaptation and mitigation - [Section 3.3](#)
- Air quality - [Section 3.4](#)

3.6.3 Management

Roads

Sydney Airport has made significant investments in ground transport facilities to facilitate improved access to the T1 and T2/T3 precincts. In addition, a number of roads in the vicinity of the airport site are being upgraded, or planned to be upgraded, by the NSW Government, including:

- WestConnex will link the M4 and M5 motorways, and develop a new surface interchange at St Peters, around 2km to the north of the airport site. From St Peters the proposed Sydney Gateway project will provide a connection to Sydney Airport and Port Botany
- Western Harbour Tunnel and F6 extension will further extend the motorway network and provide improved connectivity to the airport from the wider Sydney metropolitan area

Sydney Airport continues to work closely with RMS and the Sydney Motorway Corporation to understand the impacts of WestConnex and the proposed Sydney Gateway connection on traffic volumes on roads surrounding the airport.

Public transport

As indicated in the Master Plan 2039, Sydney Airport is committed to working with the NSW Government and transport operators to develop sustainable transport options for airport users, which will assist to minimise traffic related environmental impacts. In its planning, Sydney Airport is committed to increasing the public transport mode share.

To do this, Sydney Airport aims to improve access to and enhance ground transport facilities at the airport, to improve the quality of experience for public transport users. Sydney Airport has approval to develop a ground transport interchange for the T2/T3 precinct between Ninth Street and the Seventh Street extension which will provide for improved access to the precinct by public buses.

Sydney Airport operates an airport transfer bus service between the T1 and T2/T3 precincts and also a bus transfer service between the Blue Emu Car Park in the South East Sector of the airport and the T2/T3 precinct. The introduction of a bus lane on Ross Smith Avenue has improved bus access to T2/T3, especially for the Blu Emu express bus transferring staff and long-stay passengers from the Blu Emu car park.

Sydney Airport continues to work with the NSW Government to achieve improved public transport services to the airport. Sydney Airport has welcomed the stated intention of the NSW Government to provide additional public bus services to the airport.

Achieving an increase public transport mode share for airport passengers and staff will assist in reducing congestion and improving environmental outcomes.

Active transport

Sydney Airport is committed to improving active transport infrastructure in the airport precinct. A number of initiatives to improve active transport access outlined in Master Plan 2033 have been implemented over the past five years including the T1 footbridge and cycleway connection linking the Alexandra Canal shared path and P7 providing direct access to the terminal.

The Five-Year Ground Transport Plan to 2024 includes additional measures to improve access to and connectivity of the active transport network. Sydney Airport is investigating potential inter-terminal and sub-regional links with Transport for NSW and local councils which will improve access to the airport precinct from surrounding transport nodes and major centres.

Airport ground transport plan

The focus of the Five-Year Ground Transport Plan is to accommodate projected growth in traffic movements. The emphasis at both precincts will be to reduce congestion, increase the efficiency of landside operations and travel to/from Sydney Airport, reduce traffic conflict points and mitigate congestion by improving end-to-end flow, rather than just moving the traffic bottleneck.

The emphasis to reduce traffic conflict points and mitigate congestion will be achieved by reducing the recirculation of traffic, demand management and improved signage, including the introduction of variable message signs to enable managed lane allocation.

Further detail of the Ground Transport Development Plan is provided in **Chapter 11.0** of the Master Plan 2039.



Image 3-7: Arriving via train to Sydney Airport's International terminal

3.6.4 Achievements under previous Environment Strategies

The ground transport achievements under the previous Environment Strategies include:

- Significant investment in major road and ground access improvements
- Provision of new infrastructure and facilities for active transport users including end of trip facilities, cyclist and pedestrian shared links
- Successful advocacy with the NSW Government to improve public transport services to the airport
- Sydney Airport staff initiatives including an awareness program developed and implemented with Bicycle Network

3.6.5 Ground transport five year action plan

The action plan is detailed in **Table 3-8**.

Table 3-8: Ground transport action plan 2019-2024

Action/initiative	Status
Review existing pedestrian and cycleway linkages and facilities within and between the T1 and T2/T3 precincts	Short-term
Investigate provision of an internal link between T1 and T2/T3, and South East Sector.	Long-term
Continue to explore measures to increase the number of airport staff and passengers who use public transport or other sustainable modes of transport	On-going
Continue to advocate for additional public transport services (including bus and rail) to and from the airport	On-going
On-going review and provision of bicycle storage, showers and changing facilities as well as lockers to support alternative sustainable transport modes in line with all applicable new development proposals	On-going

Key performance indicators

- Increased use of public transportation (train and bus) compared to the use of cars (including private cars, taxis and limousines)
- Improve efficiency of vehicle movements to/from and within the airport site

3.7 Water quality and water use

3.7.1 Objectives

Manage the water resources and impacts of the airport through:

- Minimising potable water use by using alternative and recycled water sources where appropriate
- Minimising the impact of airport operations and construction on water quality in water bodies on or adjacent to the airport
- Maintaining and improving the water quality and associated biodiversity values of the Sydney Airport Wetlands
- Preventing soil and groundwater contamination occurring from airport activities and managing known and suspected contaminated sites

3.7.2 Background

The water management environmental action plan reflects an integrated strategic approach to three water-related environmental aspects, being:

1. Water consumption
2. Groundwater protection
3. Treatment or disposal of wastewater/stormwater

Water consumption

Sydney Airport is a major water user for NSW. Major water uses at the airport include:

- Restroom and toilet facilities within the terminals
- Cooling towers (for air conditioning)
- Construction and maintenance activities
- Vehicle washing facilities

Other uses of potable water at the airport include cleaning, landscaping and fire training activities.

Sydney Airport is supplied with potable water from the external Sydney Water network at multiple locations at the perimeter of the site. Within the North West and

North East Sectors, this external supply is used to feed a Sydney Airport owned and operated potable water network comprising storage tanks, pump sets and a reticulation pipe network. Within the other parts of the airport, developments are typically supplied directly from the Sydney Water network.

In addition to the potable water network, since 2009 Sydney Airport has operated a recycled water treatment plant in the North West Sector which supplies non-potable water for toilet flushing and air conditioning cooling towers throughout the T1 precinct, reducing the reliance on the potable water network. This recycled water treatment plant has been upgraded and has a capacity of 960,000 litres a day.

Over the past decade, total consumption of potable water decreased from around 31 to 23 litres per passenger (refer to **Figure 3-4**).

This represents a significant decrease in potable water use of 25 percent per passenger in the period between 2008 and 2017. This decrease is primarily due to installation of the recycled water treatment plant which commenced operation in 2009. In 2016, the airport consumed approximately 600 kL/day of recycled water.

Total potable water use/passenger (L)

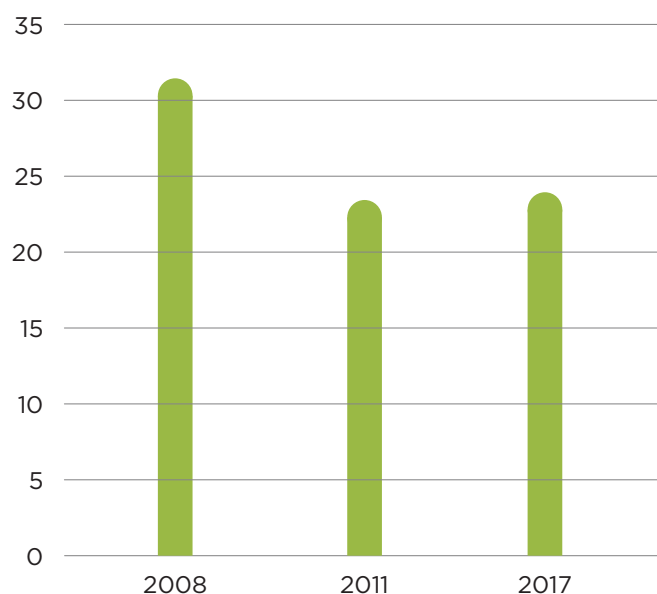


Figure 3-4: Sydney Airport total potable water use/passenger (2008, 2011 & 2017)

Surface water quality

Sydney Airport is almost entirely surrounded by waterways, with Botany Bay to the south, Sydney Airport Wetlands (incorporating Engine and Mill Ponds and Mill Stream) to the east, Alexandra Canal to the north and the Cooks River to the west.

Various activities at the airport have the potential to impact on the water quality of surrounding waterways, including:

- Spills from aircraft servicing and maintenance
- Refuelling and washing activities
- Stormwater run-off from areas of construction and/or maintenance activities
- Bulk liquids and hazardous materials storage
- Fire training exercises
- Runway de-rubberisation
- Vehicle traffic to and from the airport
- Litter disposal
- Sewerage systems and pumping stations

Additionally, urban stormwater run-off from upstream within the Botany Bay catchment area, containing sediment, litter, oil, nutrients and sewer overflows impacts on the waterbodies surrounding the airport and results in periodic deterioration of water quality, particularly following rainfall events.

Rainfall at the airport is collected through an extensive stormwater system and drainage run-off is eventually discharged into surrounding waterways, including Alexandra Canal, Engine Ponds, Cooks River, Mill Stream and Botany Bay. Detention basins, such as the Sydney Airport Wetlands and Northern Pond, are used to attenuate flooding and treat stormwater run-off.

Extensive stormwater drainage networks owned and maintained by Sydney Airport are located across the site, which incorporate a range of water quality controls including open swales, settling ponds, gross pollutant traps, flame traps on aprons and emergency shut-off valves for spill containment. Sydney Airport also employs appropriate spill management equipment and procedures to prevent any unplanned releases impacting the stormwater drainage system.

Groundwater

The area of the Botany Sands aquifer is estimated to be around 5,314 hectares stretching from Centennial Park to Botany Bay. Two units of the aquifer are present beneath Sydney Airport. These are:

1. A shallow unconsolidated, granular aquifer (which is formed by the Botany Sands and overlying fill material)
2. A deeper fractured sandstone aquifer system, which is present within the Hawkesbury Sandstone

The Botany Sands aquifer recharges from the following sources:

- Infiltration of rainfall into the unconsolidated sediments
- Open space areas including five local golf courses, Randwick Racecourse and Centennial Park
- Direct runoff from the Hawkesbury Sandstone rim
- Discharge of water from springs rising through cracks and bedding planes in the Hawkesbury Sandstone

The groundwater table at Sydney Airport typically occurs between 1.5 to 3 metres below the surface.

The NSW Government, which is responsible for regulating groundwater extraction, estimates that the sustainable yield of the aquifer is 39.2 ML/day. It has allocated licences to allow 11.5 ML/day to be extracted, though this excludes pre-1972 major industrial users and extractions associated with Orica's Botany groundwater clean-up project. Actual usage is thought to be of the order of 26.7 ML/day. Due to contamination within the aquifer the NSW Government has operated an embargo on the acceptance of new licence applications to extract groundwater since 2003.

Sydney Airport has been issued an access licence to extract 10 ML/year from the deeper sandstone aquifer. The extracted water is used for irrigation purposes.

Relevant legislation and standards

Commonwealth

- *Airports (Environment Protection) Regulations 1997*
- *Airports Regulation 1997*
- *National Water Quality Management Strategy*
- *Australian and New Zealand Guidelines for Fresh and Marine Water Quality 2000 (as amended in 2005)*
- *Wetlands Policy of the Commonwealth Government of Australia 1997*

NSW

- *Energy and Utilities Administration Act 1987 – Part 6A*
- *Water Management Act 2000*

Link to other EAPs

- Biodiversity – [Section 3.8](#)
- Soil and Land Management – [Section 3.11](#)
- Climate change mitigation and adaptation – [Section 3.3](#)

3.7.3 Management

Water consumption

Total water demand at the airport is forecast to rise. Increase in demand is being driven by the forecast increase in passenger numbers. Sydney Airport is committed to reducing total water consumption per passenger for the airport.

Construction of a water recycling plant and reticulation system for the T1 precinct was completed in 2009. The plant treats sewage effluent and uses the recycled water for toilet flushing and cooling towers. A recycled water pipeline system transports the recycled water throughout T1 and the surrounding precinct. The NSW Government supported this project and provided Sydney Airport with a \$3 million grant for the installation of the recycled water pipeline system.

The operation of the recycled water treatment plant has resulted in a significant reduction in potable water use per passenger during the past decade, and helped maintain total water use at stable levels, despite the significant growth in airport development and passenger numbers over this time.



Image 3-8: Wetlands at Sydney Airport

The capacity of the recycled water treatment plant was upgraded in 2017, with the capacity increased from 750,000 to 960,000 litres per day. This upgraded capacity is capable of meeting greater than 60 percent of the overall airport demand within the T1 precinct.

Sydney Airport has carried out a detailed holistic review of the potable and recycled water supply system to the T1 Terminal and Central Terrace Building. This review led to the implementation of a number of water saving measures, including installation of water saving fittings in the new terminal developments, replacement of a number of valves to stop water leaks and overflows and implementation of a new strategy for matching supply with peak demand periods, which will result in reduced energy and water consumption.

Sydney Airport consults regularly with Sydney Water to ensure that the projected growth in potable water demand can continue to be supported from the external network. While water savings initiatives and ongoing expansion of the recycled water production capacity will partially offset demand growth for potable water, it is anticipated that the internal potable water network will continue to require augmentation to ensure that growth can be supported while maintaining the required reliability and redundancy of the supply.

Surface water quality

Water quality at the airport is managed through a number of initiatives including:

- Passive filtration systems such as swales and vegetated garden beds to absorb pollutants and decrease runoff volumes
- Subsurface treatment devices such as gross pollutant traps and interceptor systems to remove stormwater pollutants passing through the system
- Detention basins to allow settlement of sediments and other pollutants before exiting the system to surrounding waterways
- Maintenance of stormwater infrastructure to ensure infrastructure remains in good-working order to convey and treat stormwater prior to discharge

- Appropriate spill management equipment and procedures to prevent any unplanned releases impacting the stormwater drainage system
- Regular water quality monitoring
- Assessment and management of water quality impacts as part of development applications
- Implementation of a Stormwater Quality Management Plan

Potential water quality impacts from construction and maintenance activities are managed via development and activity-specific EMPs. All bulk liquid and hazardous materials stores must be appropriately bunded to ensure that any spills or leaks can be contained on site.

Fire training exercises at Sydney Airport are conducted at a purpose-built facility in the Airport's South East Sector. The training area is contained with effluent draining to a separator system for treatment.

Water quality monitoring

Monitoring and reporting on water quality are also important components in managing the airport's water cycle, particularly with the introduction of recycled water and alternative water sources on the site. Water quality results are used to ensure that water sources are supplied at a quality that is fit for the intended use and is critical to managing the risks associated with water recycling processes.

The quality of water leaving the airport through stormwater channels and run-off is monitored to ensure stormwater management measures are treating stormwater as designed, and to monitor discharge to Cooks River, Alexandra Canal, Mill Stream and Botany Bay.

Sydney Airport has continued to implement its Water Quality Monitoring Plan, which guides biannual stormwater monitoring on the Airport. The monitoring continues to find that stormwater quality on the Airport is typical of the surrounding urban/industrial environment, with stormwater generally consistent with the quality of water in the Cooks River, the wetland systems and the local groundwater aquifer.

3.7.4 Achievements under previous Environment Strategies

The water quality and water use achievements under the previous Environment Strategies include:

- Significant investment in a recycled water treatment plant and reticulation network, and subsequent plant upgrade to increase capacity
- Development and implementation of the Stormwater Quality Management Plan
- Implementation of a stormwater monitoring program with biannual sampling carried out
- Use of bore water for irrigation, replacing potable water
- Implementation of water savings and efficiency projects resulting in a 25 percent decrease in potable water use per passenger over the last decade



Image 3-9: Our Environment team conducting water quality testing at Sydney Airport's wetlands.

3.7.5 Water quality and water use five year action plan

The action plan is detailed in **Table 3-9**.

Table 3-9: Water quality and water use action plan 2019-2024

Action/initiative	Ongoing
Identify water quality improvement projects for waterways surrounding Sydney Airport and proactively seek out partnership opportunities to implement feasible projects	Short term
Continue to implement cost effective water efficiency and saving opportunities	Short term
Investigate the feasibility of further expanding the capacity of the recycled water treatment plant in the North-West Sector of the airport site to address increased demand for non-potable water	Long term
Develop and implement a guideline for introducing water sensitive urban design and rainwater harvesting into new developments within the airport site as appropriate	Long term
Consider the impacts associated with climate change (increased rainfall intensities and elevated sea levels) on the performance of the stormwater drainage network and level of flood protection at the airport site and use this information to inform the design of proposed developments and associated stormwater infrastructure	Long term
Incorporate design features in new developments to reduce contaminant loads in stormwater and to align with catchment water quality objectives	Long term
Investigate feasibility of developing a new recycled water treatment plant to provide recycled water to the T2 and T3 precinct	Long term
Continue to ensure that stormwater quality is considered for the construction and operational phases of development proposals	Ongoing
Continue to implement the initiatives contained in the Sydney Airport Stormwater Quality Management Plan, including continuation of regular stormwater quality sampling	Ongoing
Continue to implement the Sydney Airport Wetlands Management Plan and Wetlands Enhancement Program	Ongoing
Continue to work with airport tenants and users to reduce the water quality impacts of airfield activities	Ongoing

Key performance indicators

- Reduction in total water consumed per passenger (kL/PAX)
- Water quality monitoring results show maintenance or an improvement in water quality of stormwater from the airport

3.8 Biodiversity

3.8.1 Objectives

- Identify, preserve and, where practicable, enhance significant native flora, fauna and biodiversity habitat on the airport
- Appropriately manage and control exotic species and species which present a risk to aircraft safety

3.8.2 Background

The wider area of Botany Bay and its catchment are rich in biodiversity, being home to many threatened and migratory species. Although highly disturbed, the airport retains areas of native biodiversity value and many of the species that visit the wider area of Botany Bay can be found at the airport at various times of the year.

Several studies have documented the biodiversity values of areas at the airport, including the Sydney Airport Wetlands (Biosis 2001, ERM 2001, Ecosure 2011b, Avisure 2012, AECOM 2012, MWH 2013 and écologique 2018) and these studies have informed this EAP.

The areas of native biodiversity value at the airport include the Sydney Airport Wetlands, Wattle scrub communities on the foredunes of Botany Bay, smaller pockets of native vegetation, estuarine and marine vegetation and habitat and both grassed verges and seawalls surrounding the runways which also provide habitat for wildlife.

Sydney Airport Wetlands

The Botany Wetlands are listed as significant on the Directory of Important Wetlands in Australia. They consist of 11 interconnected ponds spanning over 4km between Gardeners Road in Mascot and the northern shore of Botany Bay. Sydney Airport manages the downstream sections of the Botany Wetlands, known as the Sydney Airport Wetlands. The Sydney Airport Wetlands comprise Mill Pond, Engine Pond East, Engine Pond West and Mill Stream.

Mill Pond, Engine Pond East and Engine Pond West are freshwater ponds which were originally connected, forming part of a much larger pond system. The ponds are now divided by General Holmes Drive, with Engine Pond West effectively isolated from the direct flow line of Botany Wetlands (which flow through Mill Pond, Engine Pond East and Mill Stream to Botany Bay).

Mill Stream has been altered from its original form by development. It discharges to Botany Bay via a 40m wide lined channel between the parallel runway and Foreshore Road. A weir several hundred metres upstream of its mouth forms a barrier to tidal exchange, although fish passage to Engine Pond East has been facilitated through the construction of a vertical slot fish passage by Sydney Airport in 2006.

The Sydney Airport Wetlands are designated as an environmentally significant area (heritage and biodiversity) under the Airports Act. The wetlands have also been recognised on the following:

- Register of the National Estate (Indicative Place)
- NSW State Heritage Register
- Sydney Water Heritage Inventory
- Heritage Management Plan for Sydney Airport (2018)
- Directory of important wetlands in Australia (Botany Wetlands)

The Botany Wetlands including the Sydney Airport Wetlands are considered one of the last remaining green corridors in a highly disturbed area of Sydney.

Flora

Over 90 native flora species have been recorded at the airport, none of which are threatened, although field surveys in 2009 (Ecosure 2011) recorded *Hibiscus diversifolius* (swamp hibiscus) within the wetland margin to the north west of Mill Pond. The swamp hibiscus is considered regionally rare and since 2009 the species has spread extensively into the margins of both the Engine Ponds.

A number of planted fig trees located near Engine Pond West are identified in the Heritage Management Plan 2018 for Sydney Airport as having heritage value. These are further discussed in [Section 3.9](#).

Vegetation communities

Vegetation at the airport consists predominantly of mown grassed areas with occasional low to open shrubland and woodlands, man-made wetlands and planted native and exotic trees.

The most recent native vegetation mapping available (Native Vegetation of the Sydney Metropolitan Area VIS_ID 4489 OEH, 2016) indicates only two native plant community types (PCTs) occurring within the airport, as follows:

- Coast Banksia-Coast Wattle Dune Scrub, Sydney Basin and South East Corner (PCT 772)
- Coastal Freshwater Wetland (PCT 781)

PCT 772 occurs on airport land between Foreshore Drive and the Mill Stream with native vegetation comprising *Banksia integrifolia* (Coastal Banksia) and *Leptospermum laevigatum* (Coastal Tea Tree), *Acacia longifolia* (Golden Wattle) in the shrub layer and occasional *Hibbertia scandens* (Climbing Guinea Flower). The introduced shrubs *Chrysanthemoides monilifera* (Bitou Bush) and *Lantana camara* (Lantana), and introduced *Eragrostis curvula* (African Lovegrass) are widespread throughout this community. However the introduced shrub layer provides good habitat for smaller native bird species. This area is fenced to prevent public access and a weed control program is currently underway.

An additional area of PCT 772 occurs at the Old Control Tower site, which is located landside between the mouth of the Cooks River and the main runway. Vegetation is similar to that adjacent the Mill Stream but with *Casuarina glauca* (swamp oak) growing along the southern periphery of the site. This community is open to the public during the day and subject to ongoing disturbance as a result of recreational use (i.e. off leash dog exercise, walking tracks, plane watching).

PCT 781 is mapped within a small and isolated area located between Joyce Drive and Botany Road to the east of the airport. This community is under assessment to determine its origin as either a remnant of the pre-airport development estuarine extent or a later formed wet area as a result of rail and roadworks over time. It's very small extent and isolation within existing and future transport infrastructure adds further questionability to its viability over the longer term.

The remaining native vegetated areas at the airport are categorised as 'plantation (native & exotic)' and are largely contained within the Airport Wetlands.

Recent investigations conducted by *écologique* (2018) identified approximately 5,000m² of seagrass in over 69 separate locations between the parallel runways of the airport. The most dominant genus being *Zostera* with *Halophila* occurring in mixed stands with *Zostera* or as individual areas of very sparse growth (in the early stages of colonisation).

In addition to seagrass, macroalgae (predominantly from the genus *Ecklonia*) was found growing extensively along rock rubble at the base of the airport's runway seawalls.

Fauna

Significant fauna habitats are limited at Sydney Airport due to the highly modified environment. The Sydney Airport Wetlands, vegetated pockets and grassed areas provide an opportunity for a number of species to occur on the airport site, as discussed below.

Birds

There have been 96 bird species recorded on or within the vicinity of the airport site since 2009, which includes migratory and protected species.

The Sydney Airport Wetlands represent the most significant bird habitat at the airport, as reflected by the high diversity of bird species occurring in this area. Other areas of the airport also provide habitat for certain species. Various ducks and wading bird species have been recorded in the wetlands or on the edge of Botany Bay, along with other sedentary and migratory species such as the *Sterna albifrons* (little tern), *Gallinago hardwickii* (Latham's Snipe), *Calidris acuminata* (Sharp-tailed Sandpiper), *Haliaeetus leucogaster* (White-bellied Sea-eagle) and *Limosa lapponica* (Bar-tailed Godwit), *Charadrius bicinctus* (Double banded plover) and *Hydroprogne caspia* (Caspian Tern).

Open grasslands at the airport provide habitat for grassland birds such as *Ardea ibis* (Cattle Egret) and other migratory birds listed under the *Environment Protection and Biodiversity Conservation 1999* (EPBC Act). Areas of exposed sand at the end of Runway 34R provides potential nesting habitat for the little tern (endangered under the BC Act and migratory under the EPBC Act).

Herpetofauna

A total of 25 reptile and 12 amphibian species have been recorded on or in the vicinity of the airport in the past, however it is considered unlikely that this number currently exist on site (Biosis Research, 2001). Surveys completed in 2009 (Ecosure 2011b) identified four reptiles and one amphibian:

- *Ctenotus taeniolatus* (Copper-tailed Skink)
- *Tiliqua scincoides* (Eastern Blue-tongue Lizard)
- *Eulamprus quoyii* (Eastern Water Skink)
- *Lampropholis guichenoti* (Garden Skink)
- *Limnodynastes peronii* (Striped Marsh Frog)

Litoria aurea (Green and Golden Bell Frog), which is endangered under the BC Act and vulnerable under the EPBC Act, has historically been recorded on the airport and the surrounding region. However, they have not been recorded on airport grounds for a number of decades despite a targeted monitoring program commissioned by Sydney Airport (Biosphere 2010-2015). This could in part be due to the existence of *Gambusia holbrooki* (Mosquito Fish) in the wetlands.

Mammals

There are few records of native mammals on or in the vicinity of the airport, as a result of the urbanised environment. Species including *Hydromys chrysogaster* (Native Water Rats), *Perameles nasuta* (Long-nosed Bandicoots), *Trichosurus vulpecular* (Brushtail Possums) and *Pseudocheirus peregrinus* (Common Ringtail Possums) *Chalinolobus gouldii* (Gould's wattled bat) have been previously observed in the vicinity of the airport (Kinhill, 1990, ecologique 2018).

A number of mature planted fig trees located near Engine Pond West provide foraging habitat for *Pteropus poliocephalus* (Grey-headed Flying Fox) which are commonly observed at the airport and listed as vulnerable under both the BC Act and EPBC Act.

Fish

A range of fish species have been recorded in the freshwater and marine environments associated with the airport.

Aquatic surveys of Engine Pond West (Ecosure 2011b and AECOM 2012) recorded large numbers of *Gambusia holbrooki* (Mosquito Fish) in 2009 and *Anguilla australis* (Short-finned Eel) and one mature *Macquaria novemaculeata* (Australian Bass) in 2012.

Two mature specimens of Australian Bass were found in 2018 along with several *Gobiomorphus australis* (Striped Gudgeon) and eels (écologique 2018).

Aquatic surveys of Engine Pond East (Biosis 2001, Perrera 2009, Ecosure 2011b and écologique 2018) recorded 13 fin fish species. Of these 10 were native species and three were introduced species *Gambusia holbrooki* (Mosquito Fish); *Cyprinus carpio* (European Carp); and *Carassius auratus* (Goldfish). Native species included:

- Australian Bass
- *Tandanus tandanus* (Catfish)
- *Galaxias maculatus* (Common Jollytail)
- *Hypseleotris compressa* (Empire Gudgeon)
- *Hypseleotris galii* (Fire-tail Gudgeon)
- *Anguilla australis* (Long-finned Eel)
- *Mugil cephalus* (Sea Mullet)
- Short-finned Eel
- *Retropinna semoni* (Smelt)
- *Gobiomorphus australis* (Striped Gudgeon)
- *Centropogon australis* (Fortesque)



Image 3-10: Ecological assessment at Sydney Airport Wetlands

Adult *Anguilla* eels migrate to sea to spawn, while juveniles make their way back to estuaries and freshwaters until they are ready to reproduce. The presence of juvenile Anguillid eels and sea mullet indicates that the fish are using the fish ladder to move from the sea to the pond. Perrera (2009) found that sea mullet increased following commissioning of the fish ladder's operation in 2006, with sea mullet now the third most abundant fish in Engine Pond East.

Fish surveys in the Mill Stream (Ecosure 2011b and AECOM 2012) recorded juvenile *Platycephalus* sp. (flathead), *Tetractenos hamiltoni* (Toadfish), large numbers of *Ambassis jacksoniensis* (Glassfish), several juvenile *Sillago cilliata* (Sand Whiting) and adult specimens of toadfish and sea mullet. *Saccostrea commercialis* (Sydney Rock Oyster) were also found in abundance on hard structures. More recent surveys of the Mill Stream (AECOM 2012) found and sea mullet.

The larger *Crassostrea gigas* (Pacific Oyster) was also found sporadically along the outer sea wall of the parallel runway in more recent surveys (écologique 2018).

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports (Environment Protection) Regulations 1997*
- *Airports Regulations 1997*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Japan-Australia Migratory Bird Agreement (JAMBA)*.
- *China-Australia Migratory Bird Agreement (CAMBA)*
- *Republic of Korea Migratory Bird Agreement (ROKAMBA)*

NSW

- *Biodiversity Conservation Act 2016*
- *Fisheries Management Act 1994*
- *Biosecurity Act 2015*
- *National Parks and Wildlife Act 1974 (Parts 7 and 7A)*
- *Noxious Weeds Act 1993*

Links to other EAPs

- Water quality and water use – [Section 3.7](#)
- Heritage – [Section 3.9](#)

3.8.3 Management

Wetlands Management Plan

There are various pressures on the Sydney Airport Wetlands including pollution caused by stormwater run-off, sewage overflows and upstream catchment activities. These pressures inevitably present a range of ongoing management issues that must be balanced with the overriding need to protect aircraft from bird hazards.

As part of the development of this Environment Strategy an updated Wetlands Management Plan 2017 (WMP) has developed to guide ongoing management of the Sydney Airport Wetlands. The Plan provides the framework for management of the wetlands such that a range of often competing interests and functions are met, including biodiversity conservation, minimising risk to aircraft from bird strike, heritage values, visual amenity, education and research.

The WMP describes the current land use, hydrology, existing vegetation, and habitat value for the wetlands. It assesses the ecological significance of the wetlands including the presence of threatened or endangered species. The WMP provides recommended management actions and key performance indicators for the following key issues as they relate to management of the wetlands:

- Water quality
- Weed management
- Exotic fauna control
- Biodiversity conservation
- Heritage
- Contamination
- Bird hazard management
- Public access and amenity and
- Climate change considerations

Other management measures

Sydney Airport has implemented and is continuing to implement a number of other measures to manage biodiversity at the airport. These include:

- The on-going implementation of the Wetlands Enhancement Program for the Sydney Airport Wetlands which aims to increase the numbers of native fish species and to improve the quality and ecological function of the wetlands themselves. The program includes a weed eradication program for the wetlands and revegetation opportunities
- A Wildlife Management Plan provides guidance to minimise the hazard to aircraft operations created by the presence of wildlife on or in the vicinity of the airport. Fauna monitoring and population counts are conducted on a regular basis. Management actions include a number of passive to direct controls (i.e. culling) which is triggered by the hazard potential and conducted on an 'as required' basis. The plan also includes a landscaping policy to reduce vegetation which will attract birds that may increase the number of bird strikes
- The wildlife control working group which includes representatives from Sydney Airport, NSW Government agencies, local government authorities and other key stakeholders. The working group determines the most appropriate strategies to manage bird hazards for the airport
- Periodic feral animal control occurs on-site through a number of means to manage feral animal species such as foxes and rabbits
- Exotic fish (carp) are removed from the Sydney Airport Wetlands
- Management of vegetation is carried out in accordance with DIRDC's land clearing guidelines
- Replanting offset program - replacing vegetation lost through development

3.8.4 Achievements under previous Environment Strategies

The biodiversity achievements under the previous Environment Strategies include:

- Continued implementation of the Wetland Management Plan and Wetland Enhancement Program including installation of a fish ladder, revegetation projects, feral animal and exotic species management
- Water quality monitoring at the Sydney Airport Wetlands
- Green and Golden Bell Frog surveys
- Long-nosed Bandicoot surveys
- Offset planting to compensate for vegetation lost through development



Image 3-11: Regionally significant Swamp Hibiscus (*Hibiscus diversifolius*)

3.8.5 Biodiversity five year action plan

The action plan is detailed in **Table 3-10**.

Table 3-10: Biodiversity action plan 2019-2024

Action/initiative	Status
Complete the 2018 airport wide biodiversity assessment and implement all applicable recommendations	Short term
Implement the management plan for the fig trees located in the South East Sector.	Short term
Develop an airport wide vegetation strategy which incorporates biodiversity offsets	Long term
Undertake an updated airport wide ecological assessment	Long term
Develop a biodiversity management tool which provides seasonal and species-based mapping to better inform airport maintenance, operations and development activities	Long term
Undertake marine surveys (including Sea Grass) prior to proposed Taxiway extension	Long term
Ensure that, where appropriate, potential biodiversity impacts are assessed as part of the assessment of development proposals and, if necessary, managed	On-going
Monitor wildlife, particularly bird and bat numbers, through regular inspections	On-going
Continue to carry out feral animal control to ensure the safety of aircraft and reduce the impact of feral animals on native wildlife	On-going
Continue to implement the Sydney Airport Wetlands Management Plan and Wetland Enhancement Program	On-going

Key performance indicator

- Biological resources/values of wetlands at the airport are preserved or enhanced

3.9 Heritage

3.9.1 Objectives

- To recognise and celebrate Indigenous and Non-Indigenous cultural heritage
- Ensure that items listed in the Heritage Management Plan for the airport as having heritage value are managed appropriately and in accordance with applicable legislation

3.9.2 Background

Indigenous cultural heritage

For tens of thousands of years, Aboriginal people lived in and travelled throughout the coastal area of Sydney¹, including the site of today's Sydney Airport. The coastal area we know today was very different 20,000 years ago. At that time, during the last ice age, Botany Bay didn't exist, and the coastline was up to 20 kilometres east of today's coast. The area in and around the bay would have been a vast wetland, fed by waters flowing down the Cooks and Georges Rivers. But when the ice age ended, the shoreline moved westwards to its present location. Gradually, the familiar coastal landscape we see today formed. Aboriginal people successfully adapted to this period of rapid change to the environment and landscape.

Nearby water sources such as the Cooks River and Botany Wetlands, and a diverse range of habitats for food on the coast and adjacent hinterland would have made the area an ideal location for Aboriginal habitation.

European settlement and colonisation changed everything for the Aboriginal people of coastal Sydney. Aboriginal people continued to live across the coastal area well into the 19th century, including family groups living at Elizabeth Bay, Rose Bay, Camp Cove, Botany, La Perouse and Kurnell, as well as along the Georges and Cooks Rivers.

During this time, Aboriginal people encountered and engaged daily with the settlers. Fishing was an integral part of Aboriginal life and they fished not only for their families, but to trade with Europeans.

Local Aboriginal men and women also worked as guides in the area around Botany Bay and the Cooks and Georges Rivers, showing Europeans from other parts of the Sydney region these still largely undeveloped parts of coastal Sydney.

The ancestors of many of these families live in these areas to this day and the airport site is close to Indigenous communities in La Perouse and Redfern.

Sydney Airport acknowledges that there is heritage value associated with the airport and its site. The airport site has undergone significant alteration and development. Airport-wide heritage studies undertaken by archaeologists from Kinhill in 1991 and 1994 and Biosis Research in 2001 indicate that there are no Aboriginal archaeological sites or areas of potential archaeological sensitivity within the airport, due to the high disturbance by post-contact land use practices.

Notwithstanding this, Sydney Airport recognises the importance of the site to Aboriginal people.

¹ Paul Irish, Hidden In Plain View - The Aboriginal People of Coastal Sydney, 2017.

Non-Indigenous cultural heritage

Sydney Airport is one of the oldest, continually operating airports in the world, and as a whole has Commonwealth Heritage Values. The airport's layout, runways and other built, landscape and archaeological elements are the product of a century of development on the airport site, early colonial farming and industrial development of Sydney.

Prior to being developed as an airport, the land also played host to a number of other significant pieces of industrial and water supply infrastructure including the Southern and Western Suburbs Ocean Outfall Sewer (SWSOOS).

Sydney Airport acknowledges that there is heritage value associated with the airport and the airport site. The heritage values are associated with the airport as a whole and are embodied in the location, form and function of its individual elements, including the arrangement of streets, buildings, runways and the ways in which these attributes reflect its history of change and growth.

Heritage Management Plan

In accordance with its heritage obligations under the Airports Act, and the EPBC Act, Sydney Airport has previously commissioned the development of a Heritage Management Plan (HMP) for the airport site to provide guidance in managing, conserving and protecting the heritage values of Sydney Airport. The HMP was updated in 2018.

The HMP recognises the development pressures on existing heritage items associated with continued growth of the airport and in the context of a highly constrained site. The changes that have occurred in recent years, including removal or modification of elements of heritage significance, are primarily associated with development for essential aeronautical purposes.

In response to these changes and the need to conserve important heritage elements, the HMP has developed three key aims:

- Collect the stories of the airport
- Communicate with people about the airport
- Conserve the significant places of the airport

The HMP lists the built, landscape and archaeological elements at the airport that have been assessed as contributing to the overall heritage values of the airport site and classifies elements into four categories of either exceptional, high, moderate or little value. A total of 49 items are identified in the HMP as having exceptional (3), high (14), moderate (19) or little (13) heritage value. The HMP includes a detailed schedule on each of these items, including a brief description, assessment of heritage values and an indicative assessment of each element's tolerance for change.

The three items of exceptional heritage significance include:

- Keith Smith Avenue
- Main north-south and east-west runways
- Mill Pond and Mill Stream

Retention and protection of these items is important in ensuring that the heritage significance of the airport and the history of the airport site can be interpreted in a meaningful manner even while on-going development and growth of the airport is continuing to occur.

A number of other items of heritage significance are also identified including a small number of buildings in the Jet Base and T2/T3 precincts, the Lauriston Park Estate street layout, the fourth and fifth control towers, the Southern and Western Suburbs Ocean Outfall Sewer, sewage pumping station 38, Engine Ponds and the Botany Bay pumping station and chimney ruins.

The HMP notes that changes to the built form of the airport have occurred under the previous master plan including demolition and modification of a number of items of heritage significance. Sydney Airport completed detailed archival recordings of the affected heritage elements in accordance with applicable heritage guidelines.

The HMP also identifies key themes that can be used to guide future heritage management at the airport.

- **Theme One** is that each phase of redevelopment has been rooted in a fundamental framework established in the earliest days of the airport. That is, despite the nature of expansion typical of a major airport, the origins of the airport are, in places, still visible today
- **Theme Two** is one of continual renewal. The rapidity of development of air transport over the last century has meant that all major airports – including Sydney Airport – must change to meet the demands of a growing number of passengers as well as advances in aircraft and aviation technology

Heritage Interpretation Strategy

The HMP also identifies the need to implement a strategic and holistic interpretation of the airport's history and significance within the site. To meet these objectives Sydney Airport has developed a Heritage Interpretation Strategy. The strategy is an important mitigation measure to address the impacts to heritage elements occurring as a result of on-going development of the airport.

The strategy employs a range of interpretative devices such as artworks, installations, inlays, interior finishes, signage and place naming. A number of the interpretation recommendations of the strategy have been implemented (e.g. street naming and new signage at Shepps Mound) and Sydney Airport is committed to implementing further heritage interpretation.

Relevant legislation and standards

Commonwealth

- *Airports Act 1996*
- *Airports Regulation 1997*
- *Airports (Environment Protection) Regulations 1997*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Environment Protection and Biodiversity Conservation Regulation 2000 (Schedule 7B)*
- *Australian Heritage Council Act 2003*
- *Aboriginal and Torres Strait Islander Heritage Protection Act 1984*

NSW

- *Heritage Act 1977*
- *National Parks and Wildlife Act 1974*

Links to other EAPs

- Biodiversity – **Section 3.8**

3.9.3 Management

The Master Plan 2039 seeks to protect the future growth of the airport, within existing operational constraints, and in this context, heritage management going forward must be pragmatic. As such, whilst there are extensive impacts required to facilitate the necessary redevelopment, there are opportunities for heritage values to be retained and enhanced through the process. Elements of exceptional heritage value, which are considered environmentally significant areas, are retained under the Master Plan 2039.

The development of the airport is intended for aeronautical purposes, other aviation related uses and facilitating the introduction of quieter, cleaner aircraft.

A number of areas of heritage value may be directly or indirectly impacted by proposed development particularly in the North East and South East Sectors of the airport. The proposed changes would be in addition to previous additions/modifications to the airport, which may result in a cumulative loss of the heritage values inherent in the site.

A detailed heritage impact assessment has been prepared which concludes that implementation of the master plan, would result in a substantially adverse impact on the identified heritage values of the airport.

A number of mitigation measures will be implemented which significantly reduce the heritage impact of the proposed development. These mitigation measures are included as actions within this EAP.

3.9.4 Achievements under previous Environment Strategies

The heritage management achievements under the previous Environment Strategies include:

- Development of a comprehensive Heritage Management Plan and subsequent update
- Development and implementation of a Heritage Interpretation Strategy
- Development of management plans for the fig trees and Sydney Airport Wetlands
- Detailed archival recordings for elements of the airport with heritage value lost through development
- Construction of a community facility that includes heritage interpretation
- Development of a concept for an on-line experience centre, a place to tell the story of the site, the airport and aviation more generally
- Commissioning of a study to inform future management of the Botany Water Pumping Station Ruins and Spillway



Image 3-13: Botany Water Pumping Station at Sydney Airport

3.9.5 Heritage management five year action plan

The action plan is detailed in **Table 3-11**.

Table 3-11: Heritage management action plan 2019-2024

Action/initiative	Status
Finalise and launch the on-line experience centre	Short term
Implement the Heritage Interpretation Strategy for the airport. This should include preparation of an implementation plan which provides an overview of works completed to date and an implementation schedule for future works	Short term
Implement the management plan for the fig trees located in the South East Sector and the Sydney Airport Wetlands	Short term
Establish an archive of historical records, including oral histories and items relating to the history of Sydney Airport	Long term
Ensure that heritage items of recognised significance are recorded to an appropriate archival standard before any major works that would impact on the heritage item	Long term
Implement the recommendations of the Heritage Management Plan for the airport site	Long term
Implement all applicable recommendations from the Botany Water Pumping Station Ruins and Spillway Management Plan	Long term
Ensure that, where appropriate, potential heritage impacts are assessed as part of the assessment of development proposals and, if necessary, appropriately managed	Ongoing
Consult with relevant stakeholders to ensure heritage values are integrated within planning processes for the future development of the airport site	Ongoing
Actively conserve the values of those heritage elements assessed in the heritage management plan as being of exceptional significance including the Mill Pond and Mill Stream, the main north-south and east-west runways, and Keith Smith Avenue	Ongoing

Key performance indicators

- Increase in the number of heritage interpretive devices
- Implementation of the Heritage Management Plan 2018

3.10 Waste and resource recovery

3.10.1 Objectives

Minimise waste going to landfill by:

- Avoiding unnecessary resource consumption and waste generation
- Recovering material and energy from waste including waste reuse, reprocessing and recycling

3.10.2 Background

Sydney Airport manages much of the waste disposal for the airport with the exception of certain leased areas and waste off aircraft.

Waste generated at the airport includes solid and liquid waste streams. Solid wastes include food waste, office paper, packaging wastes, quarantine wastes, foreign object debris (FOD), scrap metals, timber, animal wastes and litter. Sources of solid waste include the terminal buildings, office and commercial buildings, airfield and maintenance areas, and landside access areas. Liquid wastes include sewage, waste oils and lubricants, trade wastes (containing various contaminants including solids, metals, hydrocarbons, paints, etc.) and cooking oils/ grease.

A large amount of waste generated at the Airport is currently not able to be recycled due to quarantine restrictions and requirements.

Recycling data continues to indicate that an increasing proportion of Sydney Airport's waste is being recycled rather than ending up in landfill. In 2017 approximately 42 percent of Sydney Airport's total non-quarantine waste volume was recycled, an increase on previous years (refer to [Figure 3-5](#)).

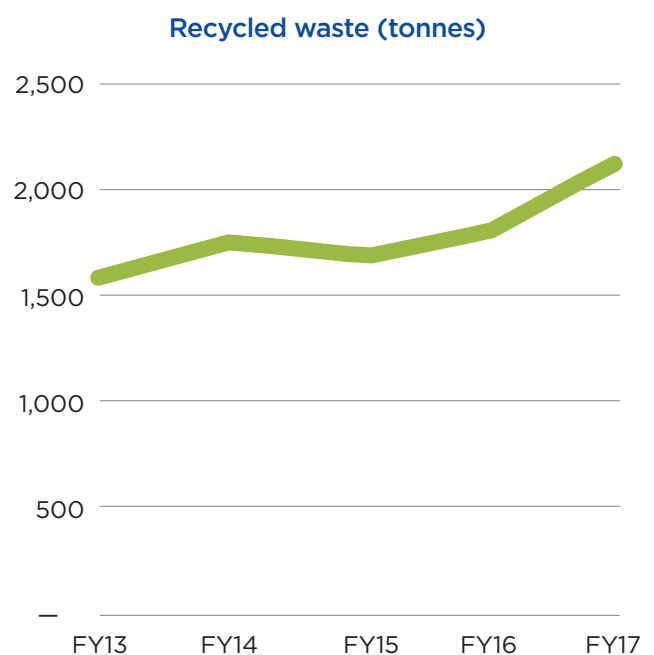


Figure 3-5: Sydney Airport total recycled waste in tonnes (FY2013 to FY2017)

Relevant legislation

Commonwealth

- *Airports (Environment Protection) Regulations 1997*
- *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure*
- *National Environment Protection (Used Packaging Materials) Measure*
- *National Waste Policy*
- *Product Stewardship Act 2011*
- *Clean Energy Legislation (Carbon Tax Repeal) Act 2014*

NSW

- *Waste Avoidance and Resource Recovery Act 2001*
- *Protection of the Environment Operations Act 1997*
- *Protection of the Environment Operations (Waste) Regulation 2014*
- *NSW Waste Avoidance and Resource Recovery Strategy*
- *Waste Classification Guidelines (issued by NSW EPA)*

Link to other EAPs

- Climate change adaptation and mitigation – [Section 3.3](#)
- Soil and land management – [Section 3.11](#)
- Spill response and hazardous materials – [Section 3.12](#)

3.10.3 Management

Sydney Airport source separates recyclables both within terminals and back of house. Public place recycling facilities are placed throughout the terminals including in food courts and gate lounges (excluding areas affected by quarantine requirements). Plastics and cardboard from retailers and office spaces are also segregated for recycling. In addition, Sydney Airport requires that its waste services contractor recovers an additional 30 percent of waste, post collection.

Recycling and recovery initiatives are implemented in Sydney Airport's offices to recycle a range of materials such as paper, cardboard, ink cartridges and batteries.

In 2017 Sydney Airport completed a detailed review of the airport's Waste and Resource Recovery Strategy, including a 24-hour waste audit. The review indicated that waste generation per passenger at Sydney Airport is at the lower end compared to international airports. In addition, the review identified and considered a number of opportunities for improvement in recycling and recovery resulting in greater diversion from landfill and disposal cost savings.

Sydney Airport is preparing a waste action plan to implement the findings of the review. Through the waste action plan, Sydney Airport will continue to pursue opportunities in the future to minimise waste and improve resource recovery initiatives.

3.10.4 Achievements under previous Environment Strategies

The waste and resource recovery achievements under the previous Environment Strategies include:

- Carried out a detailed review of the airport's Waste and Resource Recovery Strategy, followed by a comprehensive 24-hour waste audit
- Significant investment in a recycled water treatment plant and reticulation network, and subsequent plant upgrade to increase capacity
- As part of the NSW Government's work towards a sustainable circular economy, Sydney Airport partnered with other businesses in the local area to explore opportunities for holistic waste management and resource recovery
- Negotiated a new waste services contract with an increased percentage of waste to be recovered post collection
- Implemented a Supplier Code of Conduct for major supply contracts which includes consideration of sustainable procurement
- Commenced an investigation into the reclassification of T1 airside waste (departures) to non-quarantine waste, potentially increasing recycling by over 10 percent



Image 3-14: Waste and resource management at T2 Domestic terminal

3.10.5 Waste and resource recovery five year action plan

The action plan is detailed in **Table 3-12**.

Table 3-12: Waste and resource recovery action plan 2019-2024

Action/initiative	Status
Prepare and implement a waste action plan to improve recycling, resource recovery and waste minimisation	Short term
Develop a Waste Management Plan for construction and demolition waste with targets for recycled waste and reuse of waste	Short term
Work with tenants and retailers to create opportunities to reduce waste generation and increase resource recovery	Short term
Carry out an audit of Sydney Airport's waste streams to identify further opportunities for resource recovery	Long term
Ensure that appropriate consideration for waste management and resource recovery is included in the planning and design for all major proposed developments within the airport site	On-going
Ensure that waste management and resource recovery are considered for the construction and operational phases of development proposals	On-going
Ensure that sustainable procurement principles are considered and implemented where feasible in procuring goods and materials associated with proposed major developments within the airport site	On-going
Continue to implement the tenant management strategy and ensure that tenants include waste management and resource recovery in their EMPs	On-going

Key performance indicators

- Increase in the percentage of waste recycled, percentage of waste recovered, and percentage of waste diverted from landfill

3.11 Soil and land management

3.11.1 Objectives

- Prevent pollution from on airport activities
- Manage known and suspected contaminated sites in accordance with regulatory requirements

3.11.2 Background

Most of the land within the airport site has undergone extensive modification, including landfilling, terrain flattening and airport-related development. As a result of this and the location's long history of aviation and related activities (such as fuel storage, fuel distribution, land filling and use of firefighting equipment and foam), soil quality varies across the airport, with a number of locations considered to be poor quality.

Topography/soils

The airport is located within the Botany Basin which is characterised by a generally flat topography, rising only a few metres above sea level. The underlying geology of the airport comprises unconsolidated sediments overlying bedrock. The bedrock, which is located at depths of 50-100 metres below ground level, has relatively low permeability, acting as a barrier to vertical groundwater flow.

The Sydney 1:100,000 Geological Series Sheet 9130 (Edition 1, 1993) maps the site as man-made fill consisting of dredged estuarine sands, and possible demolition rubble, industrial and household waste. The Sydney 1:100,000 Soil Landscapes of Sydney (Chapman and Murphy, 1998) maps the site as disturbed terrain.

Acid sulfate soils (ASS)

The NSW Environment Protection Agency (EPA) acid sulfate soils risk maps show that areas of low to high acid sulfate soil risk are located adjacent to the airport and in some areas of the Botany Wetlands. As most of the airport's land has been extensively modified, it is generally classified as disturbed terrain and has not been further classified by the EPA.

The NSW ASS Risk Maps (ASSMAC, 1998), show the site as disturbed terrain below four metres AHD which requires investigation to assess potential for ASS.

Hydrogeology (Groundwater)

The site is located within the Botany Sands Aquifer which contains a system of unconfined and semi confined aquifers. The Botany Sand Beds Aquifer is a large volume of underground water present in the sandy ground surrounding Botany Bay. It is a coastal sand bed aquifer that is readily recharged by rainfall. It extends from Botany Bay northwards to Surry Hills and Centennial Park. Groundwater within the aquifer generally flows in a south to southwest direction, from areas around Centennial and Moore Parks into Botany Bay and the Botany Wetlands.

The Botany Sand Beds Aquifer has a relatively shallow water table, with the level under the airport being on average at three metre depth below ground level. The levels can often be less than one to two metres below the natural ground surface, with the level varying in relation to recharge from rainfall and evaporation. The Botany Sand Beds aquifer is highly vulnerable to contamination due to the permeability of the sands and shallow water table.

Given the presence of a significant shallow groundwater system, areas where soil quality is poor need to be managed to minimise the impact to this water resource.

Per- and poly-fluoroalkyl substances

The airport site is known to be impacted by per- and poly-fluoroalkyl substances (PFAS). The predominant known source of PFAS on the airport is historic use of certain firefighting foams used by firefighting service providers during fire training exercises.

Due to the widespread use of PFAS within a number of industrial applications, there is potential that PFAS found on the airport site are from other sources, including those originating from off-site.

While we consider those tenants who have used PFAS containing products responsible for ongoing monitoring and management of potential risks and issues, Sydney Airport recognises that we play a role in working with those tenants and the Commonwealth Government to seek a long term, effective management strategy for PFAS contamination.

In 2018, the Commonwealth, State and Territory environment ministers endorsed Australia's first PFAS National Environmental Management Plan (NEMP). We are working to align our PFAS strategy with the NEMP.

As PFAS is considered an emerging contaminant, Sydney Airport's strategy will continue to evolve. We have in place, and continue to develop, procedures and plans to implement relevant government guidelines.

Relevant legislation

Commonwealth

- *Airports Act 1996 Part 5 and Part 6*
- *Airports Regulations 1997*
- *Airports (Environment Protection) Regulations 1997 (AEPR 1997)*
- *Environment Protection and Biodiversity Conservation Act 1999*
- *Workplace Health and Safety Act and Regulations 2011 (Asbestos and Hazardous Chemicals)*
- *National Environment Protection (Assessment of Site Contamination) Measure 2013 (NEPM 2013)*

NSW

- *Contaminated Land Management Act 1997 (CLM Act 1997)*
- *Protection of the Environment Operations Act 1997 (POEO 1997)*
- *Protection of the Environment Operations (Underground Petroleum Storage Systems Regulation 2014*

Links to other EAPs

- Water quality and water use – [Section 3.7](#)
- Spill response and hazardous materials – [Section 3.12](#)

3.11.3 Management

Contaminated sites strategy

Sydney Airport has implemented a contaminated sites strategy. The strategy involves:

- A comprehensive risk classification and prioritisation system
- Contaminated sites register
- Groundwater monitoring program
- Identification of remediation opportunities
- Pollution prevention programs and measure

The risk classification and prioritisation system categorises contaminated sites as being either high, medium or low risk.

Under this classification system, identified high risk sites are regarded as Sydney Airport's priority sites for further investigation and/or management action.

Groundwater monitoring of known contaminated sites is carried out on a regular basis (usually yearly). Such monitoring results are provided to the AEO and DIRDC. Where required, certain contaminated sites are managed under a site-specific Environmental Management Plan (EMP) to ensure risks to human health and ecological values are minimised and managed appropriately.

Underground storage tank (UST) strategy

Sydney Airport has developed a bulk fuel management strategy, which incorporates the following principles:

- Where possible, new bulk fuel storage tanks and associated fuel lines are located aboveground and are double lined (vaulted)
- When safety, security and/or space considerations require new tanks and affiliated fuel lines to be placed underground, Sydney Airport requires that the tanks and affiliated fuel lines are double lined, corrosion resistant and include appropriate leak detection monitoring systems

For existing USTs, Sydney Airport ensures the following:

- An Environment Protection Plan is in place and implemented
- Integrity testing of tanks is carried out annually
- Groundwater monitoring around tanks is carried out regularly

Application of the above outlined strategy extends to both Sydney Airport operations and airport tenants.

Tenant management

Tenants with sites known to be contaminated are required to undertake monitoring of the contamination and provide appropriate documentation to Sydney Airport and the AEO, including remedial action plans, where required. Sydney Airport classifies tenants into three tiers based on the environmental risk posed by their activities. Tier 1 tenants have the highest potential for significant environmental risk, Tier 2 tenants have a medium potential, and Tier 3 tenants have the least potential.

Through Sydney Airport's tenant management strategy, Tier 1 and 2 tenants are required to develop and implement EMPs. The EMPs address pollution prevention measures such as procedures for hazardous materials storage, spill response and environmental training for staff. Auditing against the EMP is required on an annual basis.

Further information on the tenant management strategy can be found in [Section 2.2.3](#).

Sydney Airport leases require tenants, whose operations have the potential to cause contamination, to provide baseline audits/assessments (prior to lease commencement) and exit audits/assessments (prior to lease cessation). Tenants that have USTs are also required by Sydney Airport to provide results of integrity tests and/or routine groundwater monitoring events.

Contract and contractor management

The potential impacts of contaminated soil or acid sulfate soil disturbance are managed through the development approvals process. Where a development may impact these soils, environmental approval is required, potential impacts are assessed and conditions are imposed on development approvals to ensure that these impacts are minimised. This usually requires the proponent to conduct an environmental investigation of the development area to establish the contamination status of the land prior to submitting the development application and to recommend how any identified soil contamination issues will be managed during the construction works.

In addition to the measures outlined above, the following are implemented to prevent or minimise impacts to airport soil/land:

- Contractors are required to provide construction environmental management plans (CEMPs) for construction projects where there is a risk of contamination, spills or disturbing contaminated soils
- Sydney Airport has spill response capabilities that minimise the likelihood of contamination arising from airport operations (refer [Section 3.12](#) for more detail on spill response and hazardous materials management)

3.11.4 Achievements under previous Environment Strategies

The soil and land management achievements under the previous Environment Strategies include:

- Installation of a remediation system at the former fuel farm located in the T2 precinct, to manage a historical hydrocarbon plume
- Development of an Environment Protection Plan for Sydney Airport managed USTs including regular groundwater monitoring and tank integrity testing
- Implementation of the contaminated sites strategy to ensure the effective management of known contaminated sites managed by Sydney Airport
- Working with Airservices Australia to better understand and manage potential human health and ecological impacts associated with PFAS contamination arising from their operations, and advocating to DIRDC to provide clear guidance both to ALCs and polluters regarding PFAS standards and management



Image 3-15: Perimeter road works on the airfield at Sydney Airport

3.11.5 Soil and land management five year action plan

The action plan is detailed in **Table 3-13**.

Table 3-13: Soil and land management action plan 2019-2024

Action/initiative	Status
Work with airport tenants to align UST management with the intent of Underground Petroleum Storage Systems Regulations including EPP requirements	Short term
Develop a PFAS strategy aligned to the PFAS National Environmental Management Plan	Short term
Continue to advocate for airport regulators to address PFAS contamination with those responsible for the contaminating activities	Short term
Work proactively with airport tenants known to have historically used PFAS containing products to ensure any potential and/or known contamination is delineated, regularly monitored (minimum annually) and appropriately managed, with monitoring reports provided to Sydney Airport and DIRDC	Short term
Buildings and infrastructure will be planned and designed to minimise disturbance and potential impacts on soil and contaminated land where possible.	Long term
Implement the UST strategy including an Environmental Protection Plan (EPP) for all USTs operated by Sydney Airport	On-going
Continue to implement the Contaminated Sites Strategy ensuring each site has a comprehensive conceptual site model	On-going
Maintain the contaminated sites register including a detailed map illustrating areas of known contamination across the airport site	On-going
Continue to implement the tenant management strategy and ensure that tenants include hazardous materials storage, spill response and prevention pollution in their EMPs	On-going
Continue to monitor developing global, national and state information and guidance regarding emerging contaminants of concern including PFAS and implement management strategies as appropriate	On-going
Continue to ensure that fill material is reused and managed where appropriate in accordance with the PFAS NEMP and the <i>Airports (Environment Protection) Regulations 1997</i> or disposed of in line with applicable waste classification guidelines under the NSW Protection of the <i>Environment Operations Act 1997</i>	On-going
Where required, assess potential soil quality and contaminated land impacts and identify appropriate management measures for both the construction and operational phase of developments	On-going
Investigate opportunities to remediate known contaminated sites within the airport site to the extent practicable	On-going
Undertake training of tenants, contractors and project managers in relation to the identification and management of soil and land contamination	On-going

Key performance indicators

- Reduction (through management/remediation) of the number of contaminated sites

3.12 Spill response and hazardous materials

3.12.1 Objectives

- Implement best-practice environmental controls for the prevention and management of spills and release of hazardous materials
- Ensure that the storage and handling of hazardous materials and dangerous goods is managed in accordance with regulatory requirements
- Replace and/or reduce the use of hazardous materials where practicable

3.12.2 Background

The operation of the airport involves the storage and regular use of a range of hazardous materials and chemicals. Sydney Airport and its airport tenants and operators each use varying types and quantities of hazardous materials and chemicals.

The major hazardous material used at the airport is aviation fuel. Aviation fuel is supplied to the airport by two underground pipelines, the Viva pipeline from Clyde and the Caltex pipeline from Port Botany and Kurnell. BP and Exxon/Mobil supply fuel from their bulk storage terminal using the Caltex pipeline.

Aviation fuel is supplied to the various hydrant points within Sydney Airport from storage tanks located at the Joint User Hydrant Installation (JUHI) located at the northern end of the T1 precinct. In addition to the JUHI facility, Qantas has some on-site storage adjacent to its engineering facilities, and a number of the general aviation (GA) and helicopter operators have small refuelling storage facilities and equipment located in close proximity to their main facilities, either operated by the oil companies or by the operators themselves.

Aviation fuel is distributed across the airport from the JUHI storage facility via a number of underground pipelines to apron hydrant outlets located adjacent to aircraft gates. Into-plane dispensing is undertaken directly by the fuel companies or by other entities established by the oil companies. Specialist hydrant refuelling vehicles are used for this task and

their administrative and maintenance support is accommodated as part of the JUHI facility. Bulk tanker vehicles are used for the fuelling of regional and GA aircraft and helicopters where hydrant access is not available.

Other activities involving the use of hazardous materials include maintenance facilities operated by airport tenants, fire training (which requires the storage and use of fire-fighting foam), construction and related activities and the use of liquid hydrocarbons (other than aviation fuel), solvents, paints, pesticides and herbicides.

Each of these hazardous materials and chemicals can have an impact on the environment and, in some cases, their improper use could potentially cause significant harm to the environment.

Relevant legislation and standards

Commonwealth

- *Airports (Environment Protection) Regulations 1997*
- *National Environment Protection (Movement of Controlled Waste between States and Territories) Measure*
- *Hazardous Waste (Regulation of Exports and Imports) Act 1989*
- *Australian Dangerous Goods Code (7th Edition)*
- *Australian Code for the Transport of Explosives by Road and Rail (3rd Edition)*
- *AS 1940-2017: The Storage and Handling of Flammable and Combustible Liquids*

NSW

- *Work Health and Safety Act 2011*
- *Gas Supply Act 1996*
- *Environmentally Hazardous Chemicals Act 1985*

Links to other EAPs

- Air quality – [Section 3.4](#)
- Water quality and water use – [Section 3.7](#)
- Waste and resource recovery – [Section 3.10](#)
- Soil and land management – [Section 3.11](#)

3.12.3 Management

Effectively managing hazardous materials, and in particular ensuring an effective response to any spills of hazardous materials, is an important component of this strategy. It ensures pollution prevention and ensures that Sydney Airport's occupational health and safety obligations are met.

Sydney Airport maintains a hazardous materials storage database. This database includes a register of all known storage facilities, including above ground storage tanks (ASTs) and USTs for both Sydney Airport and tenants.

- USTs are considered to be the greatest risk to soil and groundwater at Sydney Airport. To manage the risk, Sydney Airport ensures regular integrity testing of its own tanks is carried out. Tenants are required to also include UST monitoring in their EMPs and report these results to Sydney Airport. Groundwater monitoring wells have been installed in the vicinity of all USTs, with ongoing groundwater monitoring to ensure the early detection of any leaks (refer to [Section 3.11](#)).

Records are kept of all spills and other environmental incidents reported on airport land.

The following measures are also employed by Sydney Airport to ensure minimal environmental impact should a spill or an incident occur:

- Spill response – Sydney Airport has two designated spill response trucks, which operate 24 hours a day to ensure all minor spills are addressed as soon as possible. Spill kits are also available at aircraft parking bays and other identified potential risk areas
- Sydney Airport has developed and implements spill response procedures and has also developed guidance material for tenants to ensure the correct handling and reporting of spills
- Emergency response – incidents involving hazardous materials are incorporated into the Airport Emergency Plan to ensure procedures are in place to deal with such incidents
- Infrastructure – pollution control gates, flame traps and other infrastructure are in place to control and contain any spills/losses, assisting with protecting the local environment

3.12.4 Achievements under previous Environment Strategies

The spill response and hazardous materials management key achievements under the previous Environment Strategies include:

- Development of a hazardous materials database and airport-wide map
- Developed an Environment Protection Plan for Sydney Airport managed USTs including regular groundwater monitoring and tank integrity testing
- Reviewed and updated Sydney Airport's Emergency Plan to ensure adequate provision for hazardous materials incidents and emergencies
- Received recognition for the Airport Emergency Plan and strategy by being awarded the Australian Airports Association Major Airport Award



Image 3-16: Spill response on the Sydney Airport airfield

3.12.5 Spill response and hazardous materials five year action plan

The action plan is detailed in [Table 3-14](#).

Table 3-14: Spill response and hazardous materials management action plan 2019-2024

Action/initiative	Status
Complete the development of a hazardous materials fact sheet for airport tenants	Short term
Investigate opportunities to replace hazardous materials and fuel with new technology, such as batteries for stand-by power	Short term
Continue to ensure all applicable airport staff (and tenants) are trained in environmental emergencies/spill response	On-going
Continue to assess high risk spill areas and ensure such areas have appropriate spill kits and response	On-going
Continue to participate in reviews of Sydney Airport's Airport Emergency Plan to ensure incorporation of appropriate environmental considerations	On-going
Continue to review contractor and tenant EMPs to ensure storage of hazardous materials and spill response are addressed adequately	On-going
Continue monitoring of Sydney Airport's bulk fuel storage through the Environment Protection Plan, including both tank integrity testing and groundwater monitoring	On-going
Liaise with fuel suppliers to ensure appropriate measures are in place to minimise environmental impacts of activities	On-going
Investigate the upgrade and/or replacement of USTs, including the utilisation of batteries for emergency power supply	On-going

Key performance indicators

- Reduction in hazardous materials use and hazardous waste generation
- Reduction in the number and volume of spills and leaks of hazardous materials



4.0 Public consultation and comment



4.1 Statutory requirements

As required by the Airports Act and Regulations, Sydney Airport undertook separate consultations while preparing the Environment Strategy section of the master plan.

Specifically:

- Following consultation with any relevant indigenous communities and organisations and any relevant Commonwealth or state body, Sydney Airport must specify within the strategy any areas within the airport site that are identified as being a site of indigenous significance
- Following consultation with state and federal conservation bodies, Sydney Airport must specify within the strategy any areas within the airport site that are environmentally significant
- The strategy must contain policies and targets for involvement of the local community and airport users in the development of any future strategy

4.2 Consultation

4.2.1 Sites of Indigenous significance

When preparing this Strategy, Sydney Airport consulted the La Perouse Local Aboriginal Land Council (La Perouse LALC) and Metropolitan Local Aboriginal Land Council (Metropolitan LALC).

For previous strategies, Sydney Airport relied on advice received from the Metropolitan LALC, which referred to an Aboriginal archaeological survey of Sydney Airport carried out in 1991 and a subsequent cultural and natural heritage assessment of the airport site carried out in 2001 as part of the original airport privatisation process.

This advice indicated that, based on these previous assessments, and as the airport boundary had not changed since this time, the Metropolitan LALC was of the opinion that the Sydney Airport study area does not have any potential for Aboriginal archaeological sites due to the high levels of disturbance by post contact land use practices.

Sydney Airport's focus for both the consultations and for this Strategy have been on how to appropriately recognise the value that the airport site has to Aboriginal people - for tens of thousands of years, the Aboriginal people of coastal Sydney lived in and travelled throughout the coastal area of Sydney, including on the northern shore of Botany Bay and in the lower reaches of the Cooks River catchment where the site of today's Sydney Airport sits.

Consultation and engagement with both the La Perouse and Metropolitan LALCs, and relevant agencies of the Australian and NSW Governments, will continue during the public exhibition period for this Strategy.

4.2.2 Environmentally significant areas

Before specifying the three environmentally significant areas (ESAs) shown in this Strategy, Sydney Airport undertook an airport wide ecological assessment and an updated heritage assessment.

As there has been no substantive change to Sydney Airport since the Airport Environment Strategy 2013 – 2018 was approved, and as the updated studies indicated no new significant sites, it is proposed that the existing ESAs be identified in the Airport Environment Strategy 2019 – 2024.

4.2.3 Key stakeholder workshops

A series of workshops were held in June 2018. All key stakeholders were invited to attend these workshops and contribute to the development of the Strategy, prior to its public exhibition as part of the preliminary draft master plan. The aims of the workshops were to:

- Provide an overview of the environmental legislation applicable to Sydney Airport and airport tenants
- Define the scope of the revised Strategy
- Highlight the identified environmental impacts associated with Sydney Airport's operations
- Present information concerning the proposed Environmental Action Plans (EAPs) that address each of the environmental aspects associated with the operation of Sydney Airport
- Seek feedback from stakeholders concerning the proposed EAPs and any issues they consider should be addressed in the five year environmental action plans

Workshops were held for the following stakeholders:

- Australian and NSW Government agencies and local government
- Sydney Airport tenants

Issues raised during the workshops were considered during the development of this Strategy and are summarised in the table below:

Summary of issues raised during initial consultation

Stakeholder	Summary of issues raised
Workshop 1	
Department of Infrastructure, Regional Development and Cities (Airport Environment Officer) NSW Office of Environment and Heritage NSW National Parks and Wildlife Service Department Planning and Environment Southern Sydney Regional Organisation of Councils Inner West Council Bayside Council Sutherland Shire Council Sydney Water Cooks River Alliance	<ul style="list-style-type: none"> • Climate change mitigation, adaptation and identifying and managing risks • Managing wildlife on and around the airport site to minimise wildlife strike • Management of the Sydney Airport Wetlands and involvement of off-airport stakeholders • Greater Sydney Commission's Green Grid proposal • Managing beach erosion at Lady Robinsons Beach • Environmental Action Plans and role of airport tenants • Energy conservation • Heritage significance of various areas on the airport site, including proposed environmentally significant areas • Managing "heat island" effects • Air quality monitoring and dispersion modelling • Green star rating system • Beach erosion attributable to the airport
Workshop 2	
Virgin Australia Qantas Airways Airservices Australia Execujet Aviation Group FEDEX NSW Air Ambulance BP Australia Heli experiences Pumperdump Avis – Budget Group	<ul style="list-style-type: none"> • Recognition that Sydney Airport is one of the most forward thinking Australian airports from an environmental perspective • Heritage significance of various areas on the airport site, including proposed environmentally significant areas • Continuous environmental improvement • Climate change mitigation, adaptation and identifying and managing risks • Airport tenants keen to work with the airport in the future on a collaborative basis to tackle environmental issues and challenges • Biofuels and the role airports can play in this area • Increased use of ground-based power to reduce reducing both air emissions and ground-based noise. • Need to increase landside access to the airport by public transport • Control of feral animals • Addressing PFAS

4.3 Public exhibition period

As the Environment Strategy forms part of the [Sydney Airport Preliminary Draft Master Plan 2039](#) (Master Plan 2039), it will be publicly exhibited for comment simultaneously with the Master Plan 2039.

Information concerning the community and stakeholder consultation and engagement process can be found in [Chapter 5.0](#) of the master plan.



5.0 Appendices





Appendix A

Summary of achievements under previous Environment Strategies



Summary of achievements under previous Environment Strategies

Environmental aspect	Initiative/achievement
 Sustainability and environment	<p>Sydney Airport has prepared the 2017 Sustainability Report which outlines our sustainability strategy that underpins the airport's strategic vision and establishes a number of targets and indicators for evaluating performance and driving continuous improvement.</p> <p>Sydney Airport has entered into partnerships with Conservation Volunteers Australia, Qantas and schools within Sydney and regional NSW to deliver sponsorships and innovative environmental education programs.</p>
 Climate change and energy use	<p>Sydney Airport has introduced six new electric buses to replace diesel buses. The new electric buses will deliver carbon emission reductions, improve local air quality, lower noise levels and reduce waste fluids.</p> <p>Sydney Airport has developed a new Energy Savings and Carbon Reduction Plan including a detailed review of airport operations to identify existing and potential carbon reduction opportunities. Sydney Airport has investigated and/or implemented a number of energy savings measures in accordance with this plan including introduction of electric buses and development of a solar energy project. Between 2010 and 2017 Sydney Airport has delivered a reduction in carbon emissions per passenger of 27.2 percent.</p> <p>Sydney Airport implemented a Climate Risk Assessment and Adaptation Plan, which aims to evaluate strategies to manage climate change and sea level rise, and to ensure that risks are being appropriately managed on an ongoing basis. A flood study and lightning protection study are currently being undertaken under the Adaptation Plan.</p> <p>In 2016 Sydney Airport achieved and has since maintained Level 3 Airport Carbon Accreditation and continues to work to reduce its carbon footprint. Airport Carbon Accreditation is an internationally recognised certification system designed to recognise participating airports' efforts to manage and reduce their carbon emissions.</p> <p>Sydney Airport achieved its original carbon reduction target of 25 percent, well ahead of the target date of 2020.</p>
 Air quality	<p>In 2018, Sydney Airport has installed and commissioned a new air quality monitoring station and has commenced air quality monitoring on the airport site.</p> <p>Sydney Airport continues to facilitate discussions with Airservices Australia and other key stakeholders on ways to minimise aircraft taxiing times, idling times and engine usage.</p> <p>Sydney Airport has installed a number of new facilities for the charging of electric. Working in partnership with airlines and ground handlers, a number of charging units have been installed to provide power for electric tugs and other GSE. Sydney Airport has also introduced six new electric buses to replace diesel buses.</p>

Environmental aspect

Initiative/achievement



Water quality and water use

Sydney Airport has prepared a (draft) Stormwater Quality Management Plan which aims to improve the quality of stormwater leaving the airport site. Sydney Airport completes biannual stormwater monitoring on the airport.

The operation of the T1 Recycled Water Treatment Plant and implementation of a number of water savings measures has helped to realise a significant reduction in potable water use per passenger during the past decade. Potable water use for Sydney Airport remains at historically low levels.



Ground-based noise

A number of noise impact assessments have been prepared for major development projects which include consideration of key noise sources from operations at the airport. Project specific noise management measures have been developed to mitigate noise impacts.

In 2016, Sydney Airport undertook baseline noise monitoring in residential areas surrounding the airport which will provide a baseline for future noise assessments.

All T1 and T2 contact positions with aerobridges are now fitted with FEGPU and all T1 contact positions are fitted with PCA. Sydney Airport is currently developing a program to increase airline usage of FEGPU and PCA.



Ground transport

Sydney Airport is currently implementing major road and ground access improvements to the T1 and T2/T3 precincts. The works include measures to increase pedestrian, cycling and public transport connections to and from the airport which will have flow-on environmental benefits.

Sydney Airport continues to advocate for improvements to public and sustainable transport modes. In 2017 Transport for NSW provided an additional 200 train services per week to the airport decreasing wait times and making it more convenient for staff and passengers to travel by train.



Biodiversity

Sydney Airport developed a Wetland Management Plan and continued implementation of the Wetlands Enhancement Program which aims to improve the quality and function of the Sydney Airport Wetlands, which are a valuable asset for the airport, the local community and the environment. This includes carp control, weed control, native fish restocking and maintenance of revegetation works.

Surveys were undertaken to determine the presence of Green and Golden Bell Frog and Long-Nosed Bandicoot within the airport site, but none were identified.

On-going monitoring of wildlife (birds and bats) and periodic feral animal control was carried out within the airport site.

Environmental aspect

Initiative/achievement



Heritage

Sydney Airport has developed a Heritage Interpretation Strategy to assist in mitigating the heritage impacts associated with on-going development within the airport site. Under the strategy Sydney Airport has constructed a community facility for plane spotting enthusiasts (Shepps Mound) and is developing an on-line experience centre to recognise and celebrate the airport's heritage.

Sydney Airport has completed detailed archival recordings of all identified heritage elements within the airport site that have been impacted by development. The recordings were undertaken in accordance with applicable heritage guidelines.

Sydney Airport has prepared a (draft) Plan of Management to guide the ongoing management of the figs trees located near the Engine Pond.



Waste and resource recovery

Sydney Airport engaged specialist waste consultants to undertake a detailed waste audit and assessment across the airport. The review identified a number of opportunities for improvement in recycling, recovery and waste minimisation. Sydney Airport is preparing an action plan to implement the findings of the review.

In 2015, Sydney Airport's waste contract was reviewed and the target for post collection recycling was increased from 25 percent to 30 percent. Sydney Airport recycling data continues to indicate that an increasing proportion of Sydney Airport's waste is being recycled rather than ending up as landfill.



Soil and contaminated land

Sydney Airport has developed an Environment Protection Plan and implemented a proactive integrity testing program of its USTs and ASTs on the airport to ensure the early identification of any leaks and prevent the potential for soil and/or ground water contamination.

Sydney Airport has implemented a proactive groundwater monitoring program. Groundwater monitoring wells have been installed in the vicinity of all USTs, with ongoing groundwater monitoring to ensure the early detection of any leaks.

Sydney Airport continues to manage known and suspected contaminated sites in accordance with regulatory requirements and the contaminated sites strategy.

Appendix B

Environment Policy



Environment Policy

Sydney Airport is Australia's major gateway, connecting to almost 100 destinations around the world. The airport is an essential part of our City's transport network and one of Australia's most important pieces of infrastructure.

Being only 8km from the Sydney CBD and located on the shores of one of our most significant waterways, Botany Bay, Sydney Airport (SYD) recognises its responsibility to manage the airport in an environmentally sustainable manner. This responsibility extends to all our staff, airport tenants, airlines and other stakeholders.

Our vision is to deliver a world-class airport experience and foster the growth of aviation for the benefit of Sydney, NSW and Australia. In recognition of our vision, SYD is committed to the following environmental principles:

- **Protecting the Environment:** by implementing proactive and effective measures to prevent pollution where possible, always considering the ecological implications of our actions.
- **Sustainability:** by adopting measures to use natural resources sustainably, including minimising our energy use and the generation of waste, doing our part to ensure the enduring wellbeing of the environment.
- **Addressing Climate Change:** by quantifying, managing and reducing our carbon emissions, together with planning ahead to adapt to the effects of climate change.
- **Systematic Management:** through the development and implementation of our comprehensive environmental strategies and systems, as well as the application of a risk based approach to reduce and manage environmental impacts resulting from our operations.
- **Integration:** By ensuring environmental considerations are incorporated into our planning, procurement and decision-making processes.
- **Continual Improvement:** by striving to constantly enhance our environmental performance through establishing, reviewing and reporting on our progress against objectives aligned with our environmental strategy.
- **Fostering Knowledge and Awareness:** by developing and maintaining a broad-based understanding of the sources of environmental impact of our operations, both on and off the airport, using research, education and awareness training.
- **Compliance:** by monitoring and complying with all applicable environmental laws, policies and standards and, where possible, exceeding the requirements imposed by them.
- **Stakeholder Involvement:** by developing and maintaining strong links with our local community and all key stakeholders involved with Sydney Airport.

All employees and stakeholders are encouraged to become actively involved in the environmental management of Sydney Airport.

A handwritten signature in black ink, appearing to read "Geoff Culbert".

Geoff Culbert
Chief Executive Officer

Dated: 19 March 2018

Appendix C

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