14.0 Environment Strategy

This section forms the Environment Strategy for Melbourne Airport. It highlights how the environmental and heritage values of the airport will be protected and enhanced; and how its operations will be managed to ensure continuous improvement, positive environmental and sustainability outcomes, and meet industry standards and community expectations.

CHAPTER C14 CONTENTS

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KEY FEATURES

PROACTIVE ENVIRONMENTAL MANAGEMENT

Melbourne Airport continues to actively respond to key environmental challenges including:

protecting biodiversity

managing contaminants

continuously improving our performance

14.1
OVERVIEW AND OBJECTIVES

The goal of the Melbourne Airport Environment and Sustainability Policy is for the airport 'to be an environmental leader for transport and logistics sites in Australia'. This strategy details how this goal will be achieved.

Given Melbourne Airport's complex heritage and environmental setting, achieving this goal will require continuous improvement of its environmental management practices and commitment to a clear strategy.

The Environment Strategy has been developed to give Melbourne Airport direction in achieving its environment and sustainability policy goal and, in doing so, satisfy the relevant requirements of the Airports Act 1996. Additionally, this strategy has been written as an integrated component of the Master Plan while also being able to be read as a standalone document.

14.1.1
Melbourne Airport's legislative obligations and environment and sustainability policy

The objectives of the Environment Strategy are to:

- continually improve environmental management practices
- maintain and appropriately manage Indigenous and non-Indigenous (historical) cultural heritage values
- ensure strong stewardship of the physical environment
- meet all compliance obligations and maintain the goodwill of regulators, passengers and the community
- assist in delivering the APAM Environment, Social and Governance (ESG) Strategy - People, Environment and Community - priorities and targets
- future-proof the environmental value of the airport site.

These objectives have been developed to provide overall direction to the strategy and include the multiple environmental aspects that the airport has an impact on. Each aspect represents a group of environmental management considerations with a common focus that is used to manage the airport's environmental impacts (Table 14-1). These aspect groups are useful for implementing the strategy through the airport's Environmental Management Framework.

14.2
ENVIRONMENT STRATEGY CONTEXT

This section provides an overview of Melbourne Airport's operating context, and how this could change into the future. A more detailed discussion of the current and future operating contexts is provided for each environmental aspect in the Action Plans section of this strategy.

Table 14-1
Relationship between overall strategy objectives and environmental aspects

Environmental Aspects	Overall objectives				
	Continually improve environmental management practices	Maintain and appropriately manage Indigenous and non-Indigenous (historical) cultural heritage values	Ensure strong stewardship of the physical environment	Meet all compliance obligations and maintain goodwill	Future-proof the environmental value of the airport site
Environmental management	✓	✓	✓	✓	✓
Sustainability management	✓	✓	✓		✓
Energy and carbon	✓			✓	✓
Hazardous materials	✓		✓	✓	✓
Cultural heritage	✓	✓	✓	✓	✓
Land and water management	✓	✓	✓	✓	✓
Biodiversity and conservation	✓	✓	✓	✓	✓
Air quality and ground-based noise[1]	✓		✓	✓	✓
Waste management	✓	✓	✓	✓	✓

Note 1: any air-quality impacts, noise impacts and greenhouse gas emissions directly attributable to aircraft are subject to different legislation and are outside the airport's direct operational control. These aspects are therefore outside the scope of the Environment Strategy. However, Melbourne Airport recognises the significance of these aspects and works continuously with airlines and stakeholders to pursue positive environmental outcomes in relation to these matters.

14.2.1
Meeting today's challenges while planning for the future

Melbourne Airport has a unique cultural heritage and environmental setting.

The airport is located on a broad plateau on the land of the Wurundjeri people, the traditional owners. The site includes several environmentally important areas and provides habitat for a variety of native fauna. There are several locations on or near the airport where artefacts of cultural significance have been found. The airport estate interacts with multiple natural surface waterways that support aquatic ecological communities and are used for irrigation and stock watering purposes. Figure 14-1 shows an overview of key environmental and heritage values at Melbourne Airport.

Operations at Melbourne Airport are expansive and characterised by many different organisations undertaking a variety of activities under differing degrees of airport control. There are a number of locations of known water and soil contamination, some caused by aviation operations (e.g. firefighting foams and fuel storage) and some likely due to historic or off-site activities (e.g. the use of pesticides and herbicides).

14.2.1.1
Environmentally significant areas

Melbourne Airport has completed further extensive biodiversity and heritage investigations since the last Master Plan in 2018. Based on these investigations and feedback from stakeholders, the following areas have been identified as being environmentally significant for the purposes of section 71(2)(h)(ii) of the Airports Act (Figure 14-2):

- cultural and some historical heritage sites
- grey box woodland, natural temperate grassland and seasonal herbaceous wetlands (matters of national environmental significance)
- growling grass frog and golden sun moth habitat (matters of national environmental significance).

14.2.1.2
Growth of operations and demand

The population of Melbourne, post COVID, will resume to a growth phase and with it a resumption of growing demand for air travel.

Significant growth is forecast for the airport. This growth is set to occur within a context of evolving environmental and carbon regulation, increasing energy prices and a changing climate. Although the COVID-19 pandemic resulted in record low air traffic volumes, a significant rebound is expected in future years and Melbourne Airport's growth trajectory is expected to continue in the long-term.

The 2027 airport development concept includes Melbourne Airport's Third Runway (M3R) which will involve construction of a new north-south runway. The 2042 concept includes expansion of the terminal buildings and new extended piers. These expansions are intended to meet a significant increase in demand for air travel over the long term. By 2042, Melbourne Airport is expected to cater for more than 76 million passengers per year (up from 37.4 million in the 2019 financial year). Over the same period, aircraft movements are expected to increase from 246,450 to more than 429,000 movements per year, and freight throughput is expected to almost double. Figure 14-3 shows the environment and heritage values with the 2042 development footprints.

Historically, organisational growth of this magnitude required an increased consumption of natural resources. This has both local and global risk implications for the airport's environment and heritage. Recognising these risks, Melbourne Airport is acting by investing in renewable energy, energy efficiency, water efficiency, improved waste management, and responsible procurement. By implementing these actions, Melbourne Airport will continually improve the resource efficiency of its operations and minimise its overall ecological footprint.

14.2.1.3
Expanded physical footprint

The potential impacts of future expansions will be assessed in advance. Risks will be mitigated through the implementation of pre-approved management and offset plans.

Figure 14-1 shows all areas of environmental and heritage values within the airport's boundaries.

As shown in Figure 14-3, the proposed Airport expansions will result in the disruption of known (or as yet undiscovered) areas of cultural and/or environmental value. Similarly, it is possible that works will intersect with areas of contamination; or result in emissions to air, land or water. Well-planned and proactive environmental management of expansion works will therefore be critical.

For major development projects such as M3R, thorough investigation and management programs for environmental and heritage impact are required prior to any approvals being granted by the Commonwealth government. For other development projects, Melbourne Airport requires higher risk proponents to prepare detailed Construction Environment Management Plans (CEMPs) which must be approved by the airport and the federal regulator prior to works commencing. Similarly, higher risk tenants require approved Operational Environmental Management Plans (OEMPs).

Through these investigation, assessment, approval and management mechanisms, Melbourne Airport will ensure that the environmental values and performance of the airport are safeguarded into the future.

14.2.1.4
Evolving regulation and expectations

The compliance environment within which Melbourne Airport operates will continue to evolve.

Melbourne Airport maintains as part of its Environmental Management System a register of state and Commonwealth environmental and heritage acts, regulations and policies with which it must comply (Appendix D). Each of these documents is subject to ongoing changes (e.g. the Airports Act has been updated 30 times since it was released in 1996).

Changes to the regulatory environment are an inevitable result of continuous improvement in regulation as new science is integrated and community expectations shift. For example, the body of knowledge around the health risks of diesel exhaust particulates and PFAS (per- and poly-fluoroalkyl substances found in firefighting foams) has improved in recent years and been reflected in regulatory changes.

Similarly, Melbourne Airport tracks the environmental management expectations of a broad range of stakeholders (including its customers, tenants, airlines, neighbours, community groups and shareholders).

These expectations have historically been focused on planning considerations, managing current risks, responding to incidents, maintaining compliance, providing guidance and reporting to regulators. These expectations will continue as stakeholders become increasingly interested in the broader, long-term risks that the airport manages and its environmental, social and governance frameworks. In particular, their interest relates to the airport's contribution to the sustainability of Melbourne (and Victoria) as a whole; and how the airport will manage risks and opportunities related to climate change.

Figure 14-1
Environment and Heritage Values

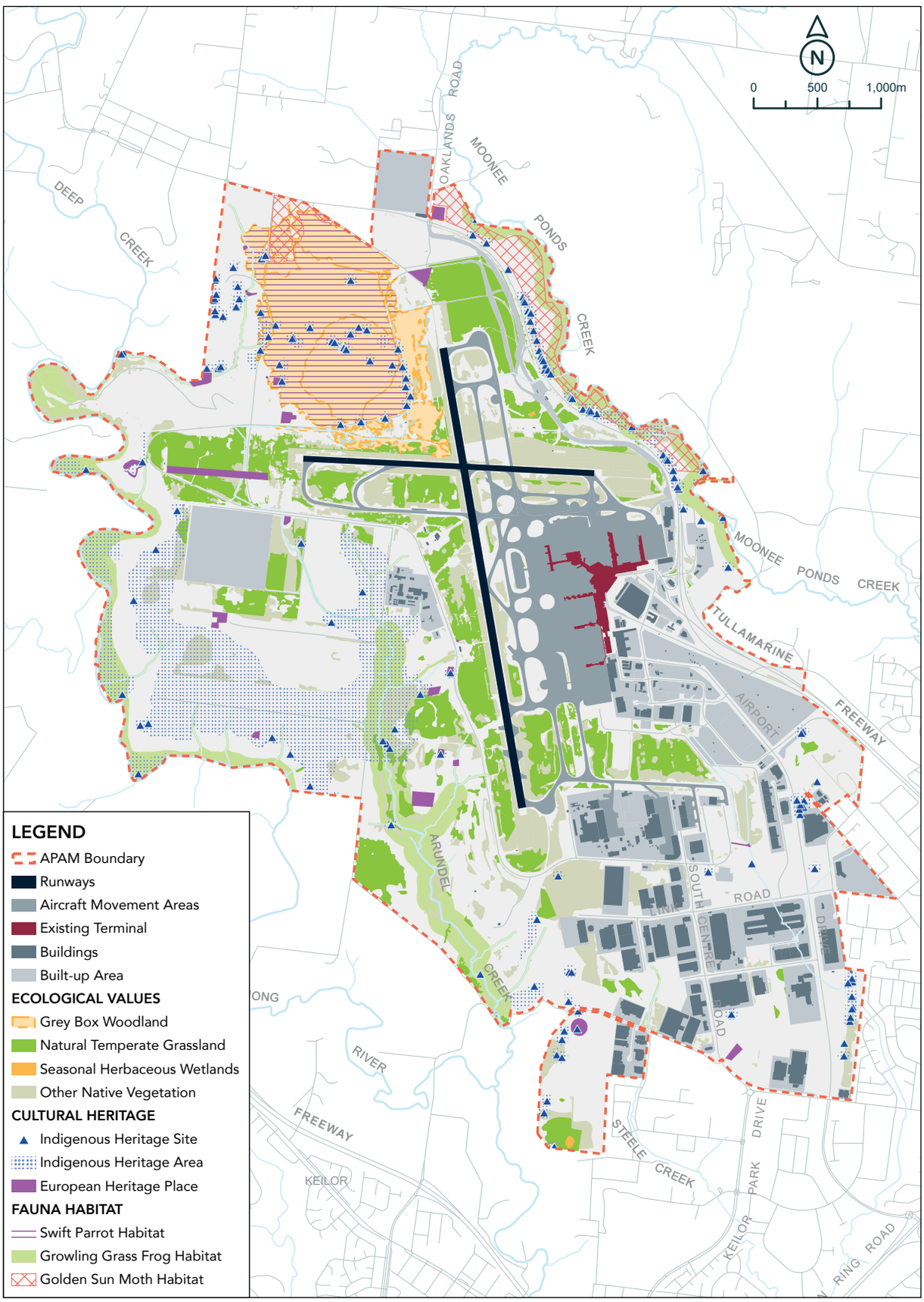


Figure 14-2
Environmentally Significant Areas

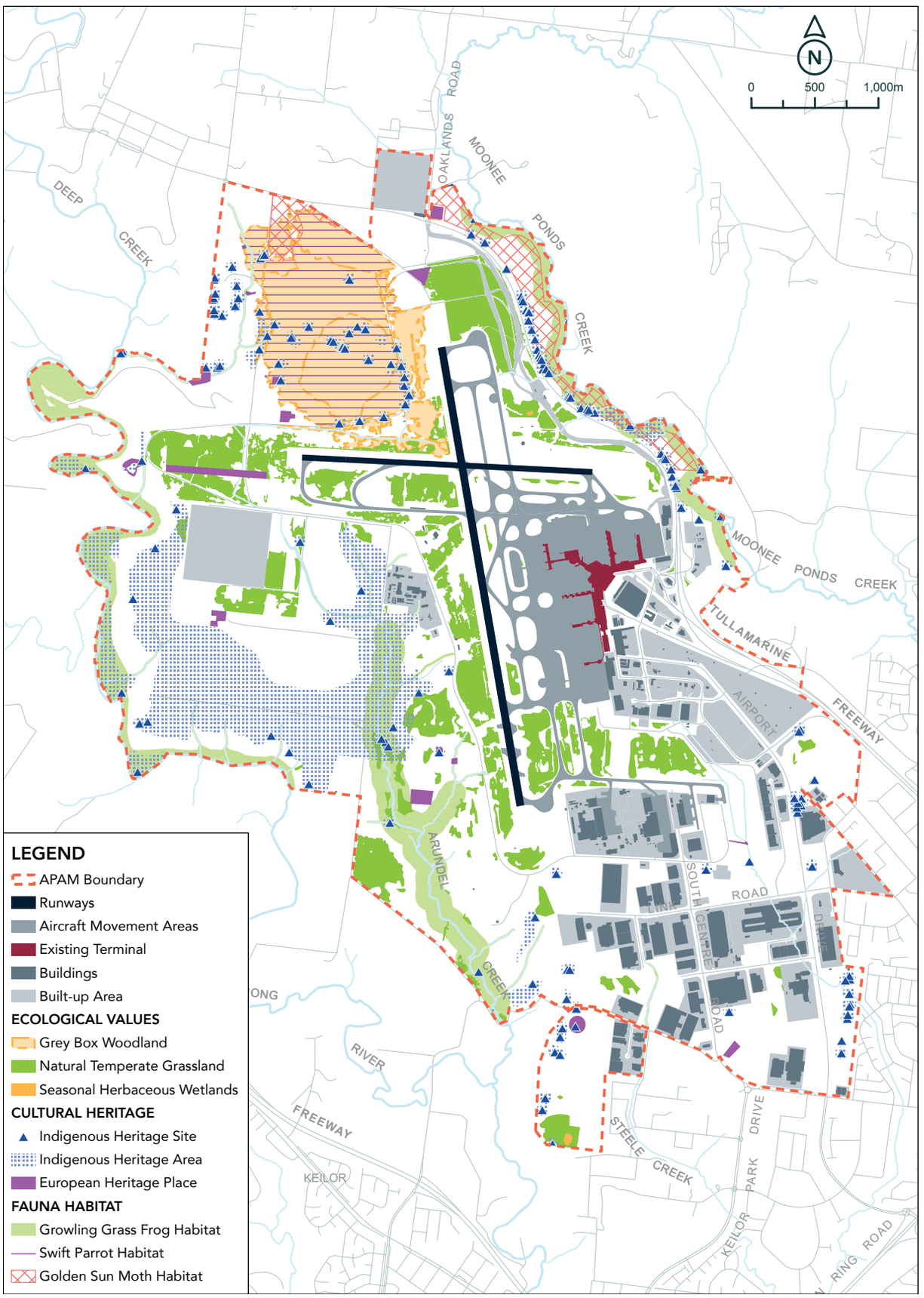
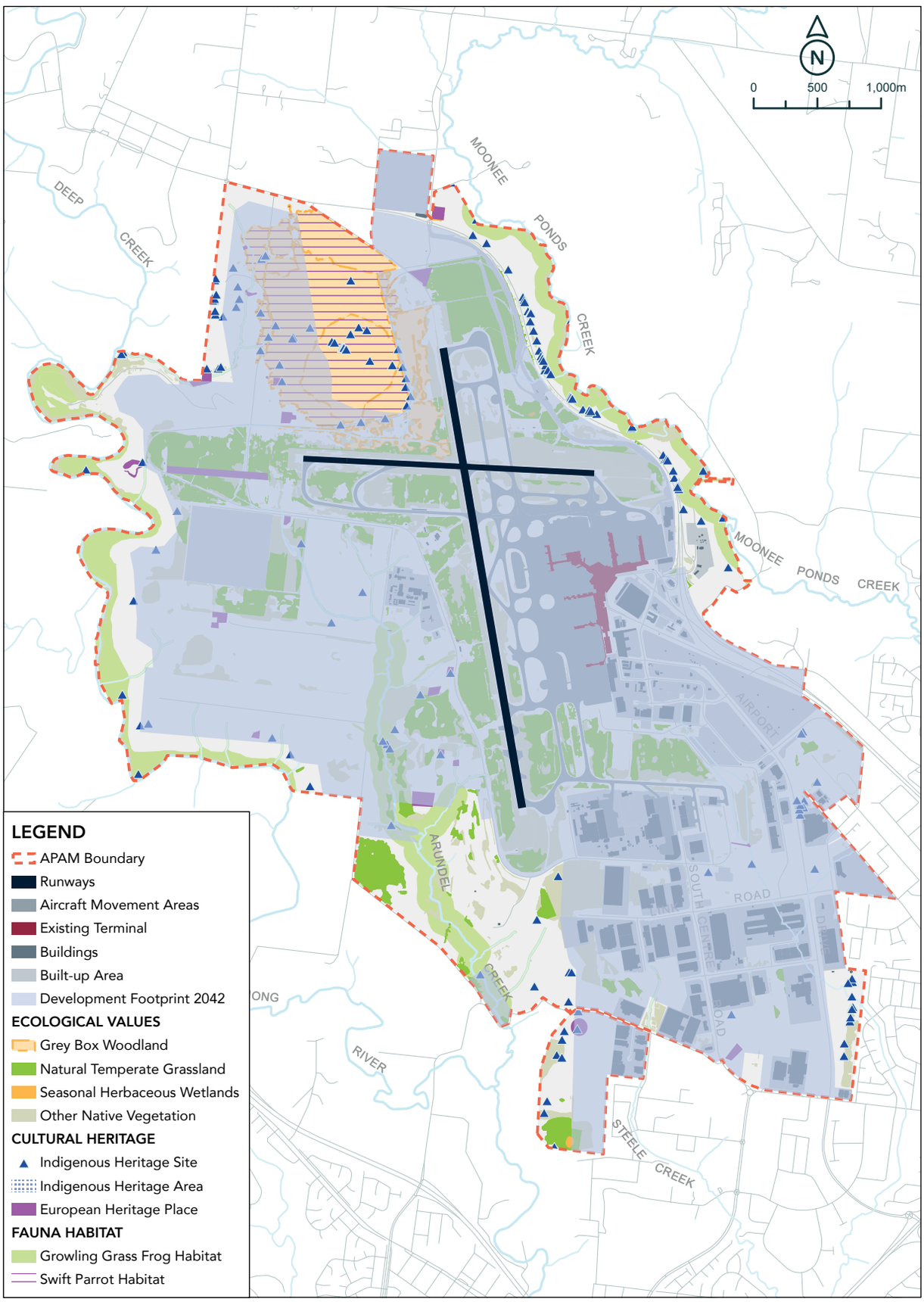


Figure 14-3
Environment and Heritage Values 2042 development footprint



14.2.1.5
Climate change

Climate change will amplify several risks and opportunities already faced by Melbourne Airport, and could introduce new ones. Melbourne Airport will therefore work to build its resilience to a range of possible future scenarios.

Melbourne Airport is located within a temperate climate with warm to hot summers, mild springs and autumns and cool winters. The region is showery with consistent rainfall throughout the year. The region is on the boundary of the hot inland areas and the cool Southern Ocean. This results in temperature differences that can cause strong cold fronts to form, which sometimes lead to severe weather conditions such as gales, thunderstorms and heavy rain. The region can also experience extreme heat in summer.

Historically, climatic events such as storms, high winds, fog, heatwaves and bushfires (smoke) have resulted in service disruptions, delays and temporary airport closures. Each of these has had financial implications and all except fog are expected to increase with climate change.

Melbourne Airport has undertaken a Climate Risk and Natural Hazard Assessment (in 2020). The identified climate-related risks and opportunities can be categorised as being physical or transitional in nature.

Physical risks and opportunities result directly from the physical effects of climate change. For Melbourne Airport, projected changes in climate will exacerbate many existing climate-related risks. In particular, those risks related to high temperatures, extreme rainfall, drought and fire weather are likely to increase in both likelihood and severity. The effect of climate change on other weather-driven risks (such as those related to wind and lightning) is less clear. These physical factors can impact airport operations as well as the health and resilience of the surrounding environment.

Transition risks and opportunities are not directly linked to climate-related events but relate to the regulatory and market transformation likely to result from governments and communities acting to curtail greenhouse gas emissions and/or adapt to climate change. These risks have been examined and have the potential to affect access to capital, reputation, investor concerns and regulatory pressure on the carbon-intensive aviation sector. The airport's current enterprise risk management system includes transition risks related to Victorian and Commonwealth carbon policies and energy market volatility. Conversely, some of these factors also represent opportunities to drive projects in renewable energy and resource efficiency.

The magnitude of climate-related risks and opportunities will depend on:

- whether the world is successful in actively moving towards the goals set in the Paris Agreement to keep 'global average temperature to well below 2°C above pre-industrial levels'
- the degree to which the Australian and Victorian regulatory environments align with these global aspirations.

Melbourne Airport recognises that the resilience of the airport contributes directly to the resilience of Melbourne and Victoria as a whole. In response, Melbourne Airport will work continuously to future-proof its operations and environmental performance in the face of this uncertainty. Recent examples of this commitment include the construction of a 12MW solar farm at Oaklands Junction, our continued involvement in the Airport Carbon Accreditation program and energy reduction programs across the terminals.

14.2.1.6
Global goals

Melbourne Airport helps to keep Australia connected with the global community. As such, global challenges factor into our environmental strategy.

The United Nations Sustainable Development Goals (SDGs) is the globally agreed upon strategy for sustainable development for the period 2015 to 2030. The SDGs provide a common framework to help address some of the world's most pressing environmental, social and economic challenges. They take the form of 17 goals and encompass a broad range of issues including climate change and water management.

We recognise the importance of the role of the private sector in achieving the SDGs and have mapped where our activities have a positive impact on relevant SDGs (Table 14-2). We acknowledge the interconnected nature of the SDGs and that our actions under the individual environmental aspects sometimes contribute to more than one goal.

14.2.1.7
Environment, Social and Governance Strategy

As responsible corporate citizen, APAM has an Environment, Social and Governance (ESG) Strategy - the People, Environment and Community Strategy. This Environment Strategy, which forms part of the Master Plan, incorporates a number of the same priorities and targets. The strategies are aligned and will complement each other in their delivery.

For APAM, being an ESG-aligned business means:

- Ensuring the conservation and stewardship of the natural and physical environment we operate in
- Having a positive impact on our community and stakeholders though engagement, support and advocacy on important local issues
- Ensuring that our people, as well as employees across the airport and precinct, work in a safe and inclusive environment
- Driving positive organizational and societal change through responsible governance and leadership.

The six priorities in our People, Environment and Community Strategy are:

- Carbon Emissions
- Water quality and PFAS
- Waste
- Diversity and inclusion
- First Nations
- Sustainable Procurement.

14.2.2 Building on past strategies and stakeholder consultation

This strategy builds on the successes of, and lessons learned from, the implementation of past strategies.

Melbourne Airport has had an Environment Strategy since the Airports Act first came into force in 1996. Since 2013, the Act has required that the Environment Strategy be prepared as an integral part of the five-yearly airport Master Plan. Over time, Melbourne Airport has established a culture of proactive environmental management and continuous improvement. This 2022 strategy represents the next iteration in this process. Key improvements in this strategy include:

- **Broadening sustainability within the coverage of the environmental aspects.** Sustainability management is expanded here to incorporate ground transport and contractor and tenant management, along with the existing planning and design and climate resilient components of sustainability.
- **Increased aspirations.** Except for four targets, Melbourne Airport has achieved, partially achieved or progressed towards all 39 targets in the 2018 Environment Strategy. Many of these targets represent the maintenance of a high standard of ongoing environmental management and are now considered to be ongoing functions of the Environment and Sustainability Team. The new targets described in this 2022 strategy represent the next steps in continuous improvement.
- **Responsiveness to an evolving risk profile.** The growth of the airport forecast in the 2022 Master Plan will bring with it changes to the risks that airport operations pose for the surrounding environment Similarly, the growth of the airport will also create opportunities for improved environmental management. The strategy has been developed to allow Melbourne Airport to mitigate these evolving risks and to realise new opportunities.

14.2.3 Stakeholder consultation

The development of this strategy has been guided by extensive engagement with our stakeholders.

As part of the formal 2022 Master Planning process, Melbourne Airport sought input directly from the following stakeholders in relation to the Airport Environment Strategy:

- the Department of Infrastructure, Transport, Regional Development, Communications and the Arts whose representative (the Airport Environment Officer) provided feedback on an early exposure draft of this document and meets regularly with Melbourne Airport's Environment and Sustainability Team
- the Victorian Department of Environment, Land, Water and Planning
- the Environment Protection Authority (Victoria)
- Melbourne Water
- the Community Aviation Consultation Group
- community, Victorian and Commonwealth agencies
- Essendon Airport Pty Ltd
- Victorian Planning Authority
- Local government authorities
- Airservices and CASA
- meetings with local environmental and community groups.

As part of this consultation process, stakeholders including regulators and the broader community have been provided a copy of the Environment Strategy and were invited to provide feedback online and through in-person engagement sessions. Feedback from the stakeholders has been reviewed and considered as part of development and finalisation of the Environment Strategy.

Further, this strategy has drawn extensively on the ongoing stakeholder engagement that forms a vital component of the operation of Melbourne Airport's Environmental Management System (EMS). Specifically, this has involved:

- consultation with internal and external teams responsible for the M3R Major Development Plan (MDP)
- consultation with the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, and the Department of Climate Change, Energy, the Environment and Water in relation to managing approvals and referral processes on Commonwealth land and the interaction of Commonwealth legislation
- regular discussions with EPA Victoria in relation to managing off-site environmental impacts of interest to the off-airport community
- regular discussions with the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation, the Registered Aboriginal Party that includes the land of the airport
- discussions with Heritage Victoria in relation to developing Heritage Management Plans and implementing recommendations
- consultation with contractors, tenants, monitoring professionals and technical advisers.

Table 14-2
UN SDGs matched to environmental aspects

Environmental management	
Sustainability management	
Energy and carbon	
Hazardous material	
Cultural heritage	
Land, surface water and groundwater management	
Biodiversity and conservation	
Air quality and ground-based noise	
Waste management	

Airport uses and the local community will continue to be involved in the development of future strategies, through the airport's existing stakeholder engagement forums, and other consultation portals as appropriate.

A copy of the final Environment Strategy will be available to tenants, contractors, airport users and the local community via the Melbourne Airport website. All groups will be notified of its finalisation via internal and external communications that will include relevant web links.

More information about the overall consultation in the development of the Airport Master Plan is provided in Section 3.3.

14.2.4 Risks and opportunities

Changes to Melbourne Airport's operating context and future uncertainties present a range of risks and opportunities for environmental management.

The international risk management standard (ISO 31000) definition of risk is the 'effect of uncertainty on objectives'. The Environment Strategy has been developed to safeguard the achievement of the airport's environmental objectives in the face of existing challenges and future uncertainty.

This Environment Strategy addresses the risks that the airport can pose to the environment in which it operates. It also addresses the risks that affect the effective operation and development of the airport.

Similarly, opportunities to improve the airport's environmental performance are identified. The key environmental risks and opportunities can be grouped into five broad categories for the purpose of this strategic-level summary:

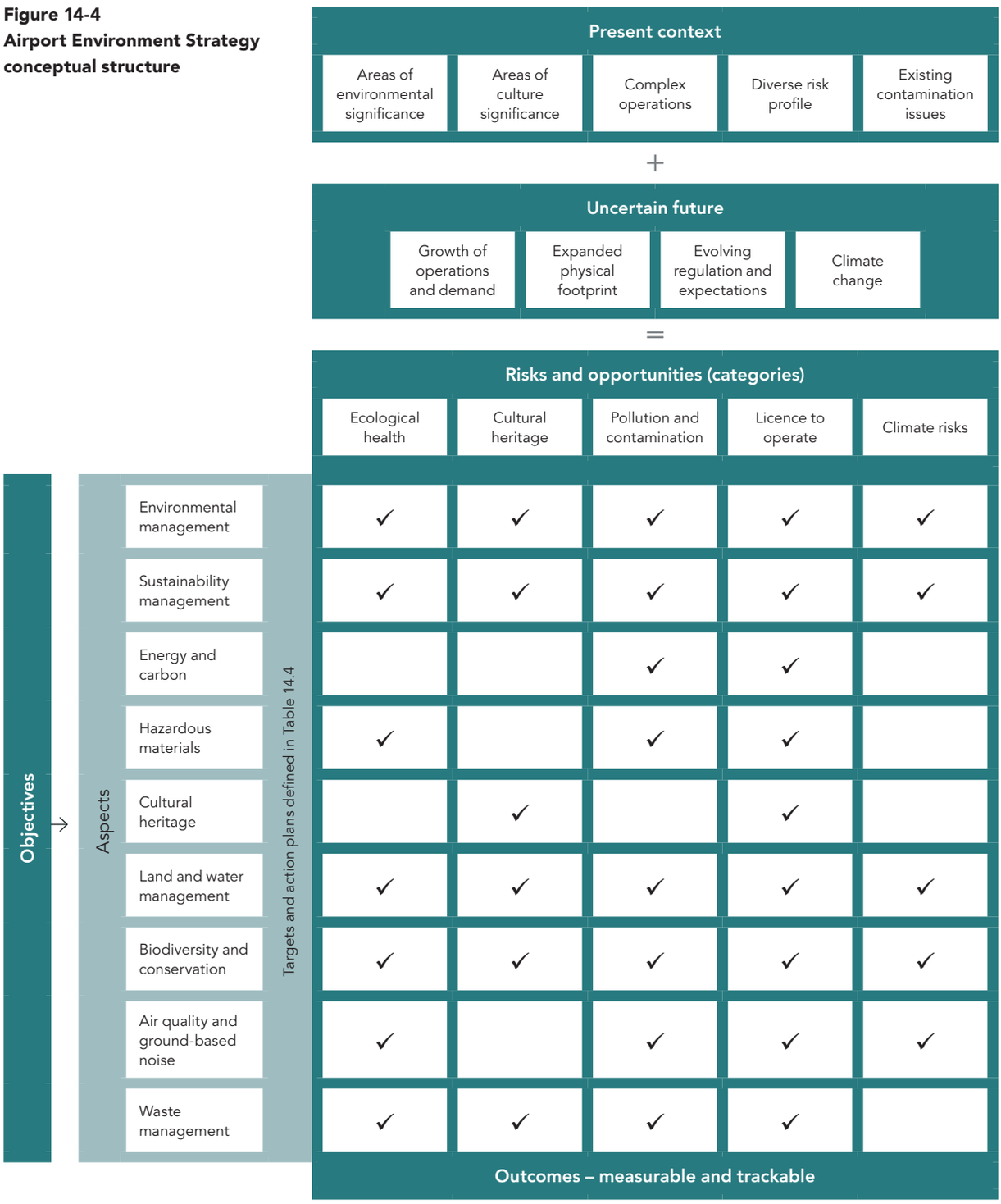
- ecological health
- cultural heritage
- pollution and contamination
- licence to operate
- climate risk.

Each category interacts with a number of environmental management aspects and will be managed through a combination of the action plans specified within this strategy (Table 14-3).

Table 14-3
Description of risk and opportunity categories

ECOLOGICAL HEALTH	Melbourne Airport supports a broad range of ecological communities, rare and threatened species and ecosystems. Threats to these significant assets include the continued growth of the airport, introduced plants and animals, contamination and climate change. Similarly, development works provide the opportunity to implement measures that further safeguard and improve ecological health.
CULTURAL HERITAGE	There are many locations on or near the airport where artefacts of cultural significance have been found. The unique cultural heritage assets of the airport are also subject to the impacts of growth, infrastructure development and erosion. Similarly, development works will afford the opportunity to better understand the significance of our cultural heritage sites and ensure their cultural recording, ongoing management and protection.
POLLUTION AND CONTAMINATION	Melbourne Airport has historical land and groundwater contamination that must be managed. Ongoing risks to the environment include surface and groundwater contamination, impacts on plants and animals and the cost of management and remediation. As the airport expands, works will interact with areas of contamination and the risk of new impacts will need to be minimised. This will also present opportunities for mitigating legacy contamination issues and improving ongoing management.
LICENCE TO OPERATE	The airport's social licence to operate relates not only to our regulatory compliance but to our reputation and the social responsibility we exercise in engaging with our stakeholders. These are all impacted by our environmental performance – a key part of our Environment, Social and Governance frameworks. Compliance with evolving regulation and community expectations is managed through our EMS, which includes a continuous improvement to ensure we retain control and oversight over dynamic day-to-day operations as the airport grows.
CLIMATE RISKS	Climate change will amplify several risks and opportunities already faced by Melbourne Airport and could introduce new ones. Physical risks can affect airport operations, staff health and safety and the surrounding environment. Such risks relate to high temperatures, extreme rainfall, drought and fire weather which are likely to increase in both likelihood and severity. Transition risks relate to the regulatory and market transformation likely to result from governments and communities acting to curtail greenhouse gas emissions and/or adapt to climate change. The magnitude of these risks will depend on the rate of global decarbonisation and the related regulatory and market changes. Melbourne Airport will work to build its resilience and capitalise on opportunities across a range of possible future scenarios.

Figure 14-4
Airport Environment Strategy conceptual structure



14.2.5
Strategy structure

The structure of this strategy reflects the inter-related nature of objectives, environmental aspects, targets and actions.

In summary, the structure of the Environment Strategy includes:

- overarching objectives that cover multiple environmental aspects
- targets defined against each environmental aspect
- highlighting the relevant SDGs
- action plans that support the achievement of targets and which, in application, represent a measurable set of performance indicators.

Note: action plans serve to mitigate one or more environmental risks, or to realise one or more opportunities. This structure is represented in Figure 14-4.

Table 14-4
Environmental targets for Melbourne Airport

Aspect	Targets
Environmental management	100% of scheduled inspections and audits completed
	100% of follow-up actions from inspections and audits closed out
	100% of Operational Environmental Management Plans received and reviewed
	100% of new staff and contractors undertake Environmental Induction Training
	Maintain certified EMS to ISO 14001:2015
Sustainability management	Integrate ESD principles in all new developments
	Implement appropriate actions that build climate resilience and reduce climate risks to the airport
	Continue to increase recycled water use across the airport estate
	Work proactively with airport operators (landside and airside) to increase the use of lower carbon transport options
	Embed sustainable procurement practices within APAM ensuring we contribute to positive employment outcomes and sustainable supply opportunities for our local community.
	Increase the use of suppliers who have an environmental management system and/or sustainable procurement strategies
Energy and carbon	Continue to transition from high to low carbon intensity electricity
	Target of net zero Scope 1 and 2 emissions by 2030 - with option of achieving net zero by 2025 held open.
	Continue to track APAM's emissions against science-based emissions reduction trajectory
	Maintain the Airports Council International Level 2 Airport Carbon Accreditation and progress towards Level 3 accreditation
Hazardous materials	No significant hazardous materials incidents per year
Cultural heritage	Continue to work with the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation to ensure 100% of Melbourne Airport assessed and / or has an approved Cultural Heritage Management Plan by end of 2025 (~450ha)
	No incidents of unauthorised damage to cultural heritage sites
	Acknowledgement and celebration of First Nations heritage in Melbourne terminals by end FY23
Land, surface water and groundwater management	No environmental incidents that lead to land, groundwater or surface water pollution
	Improve the ecological health of receiving waterways (as evidenced by environmental monitoring)
	Arundel Creek baseflow water treated 350 days / year.
	100% of PFAS impacted wastewater treated by Water Treatment Plant.
Biodiversity and conservation	No net increase in Melbourne Airport's annual 12-month average wildlife strike rate
	Reduce pest animal impacts on higher value ecological areas through the Implementation of a site-wide Integrated Pest Animal Management Plan
	Maintain and enhance the quality of high value ecological areas through the Implementation of the Ecological Community Management and Improvement Plan and adaptative management
Air quality and ground-based noise	No exceedances of relevant air quality criteria associated with airport activities
	No complaints from the community regarding ground-based airport noise
Waste management	Achieve 80% diversion of construction waste from landfill
	Reduce total volume of quarantine waste going landfill
	Identify and implement opportunities to develop circular economy projects across the airport estate
	60% terminal waste diversion rate from landfill by end of FY24.
	Zero terminal food waste to landfill by end of 2025.

14.2.6
Targets

Through the development of this Environment Strategy, Melbourne Airport has identified and committed to a number of targets within each environmental aspect. These targets serve two purposes:

- To provide specific direction for environmental management activities
- To allow for the tracking of environmental performance and the implementation of this strategy.

The targets are described in Table 14-4.

The achievement of each target is supported by defined action plans. The completion of the actions represents a measurable set of key performance indicators. Action plans for each environmental aspect are provided in Section 14.4.

14.3
IMPLEMENTING THE STRATEGY

This strategy will be implemented via Melbourne Airport's Environmental Management Framework.

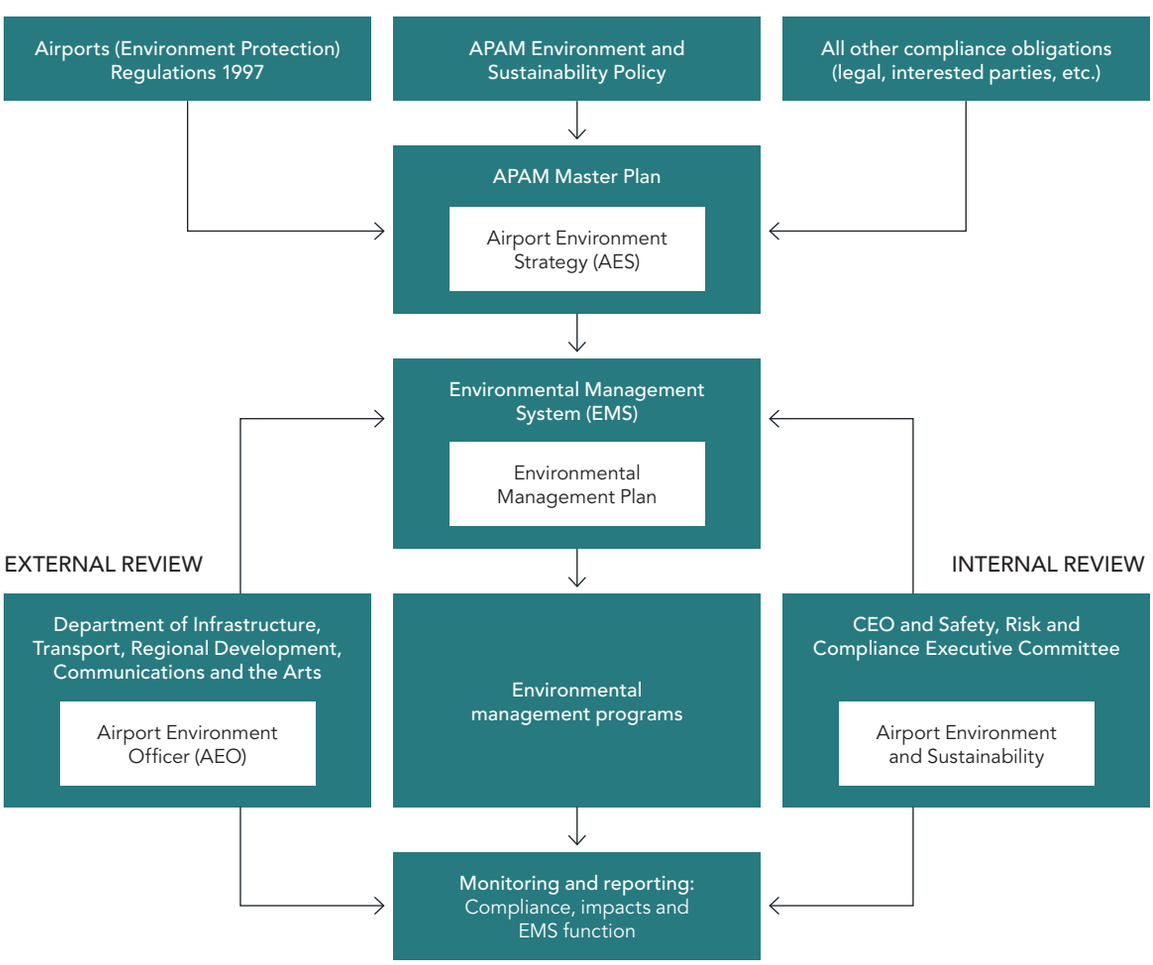
14.3.1
Environmental Management Framework

Melbourne Airport has an Environmental Management Framework designed to ensure that processes for continuous improvement and ongoing monitoring of compliance are embedded in the way it works.

The Environment Strategy is part of the Environmental Management Framework and one of the key mechanisms for ensuring commitments made in Melbourne Airport's Environment and Sustainability Policy are met.

More generally, Melbourne Airport operates within a framework of corporate governance, goals and values. These are reflected in the environmental management principles outlined in the Environment and Sustainability Policy. The Environmental Management Framework enables Melbourne Airport to effectively manage and adapt to environmental risks, and continually improve environmental management practices and performance.

Figure 14-5
APAM Enviornment Management Framework and continuous improvement review loop



Under the framework, environmental compliance is internally monitored and reviewed on an ongoing basis. Compliance is also externally (and annually) formally reviewed by the Airport Environment Officer (AEO), on behalf of the Department of Infrastructure, Transport, Regional Development, Communications and the Arts via the annual Airport Environment Report. In addition, the Melbourne Airport Environmental Management System (EMS) itself is externally audited periodically as part of maintaining ISO 14001 certification. These processes, and the overall framework are shown in Figure 14-5.

14.3.2 Environmental Management System

Central to the framework is Melbourne Airport's certified (EMS) which has been in operation since 2004 and is aligned with the current EMS standard (ISO14001:2015). The EMS consists of the policies, plans, procedures and activities that together form a system to manage the environmental aspects of the airport and enable compliance with environmental legislation. Internal and external audits of the EMS are undertaken regularly to assess the compliance of operational systems. The EMS is the primary mechanism for implementing this strategy.

The EMS applies to all Melbourne Airport staff, contractors and subcontractors. Key elements of the EMS relevant to the Environment Strategy are described below.

14.3.2.1 Environmental Site Register

A component of the EMS is the Environmental Site Register which records site-specific environmental and cultural heritage attributes and environmental assessment results. The register is used by Melbourne Airport to determine the environmental values, level of environmental risk and environmental mitigation measures that may be associated with proposed works. Melbourne Airport maintains the Environmental Site Register for:

- water quality, air and noise monitoring
- septic and fuel tank locations and inspections
- Aboriginal and European heritage site locations
- flora and fauna assessments
- groundwater monitoring
- contaminated land assessments.

14.3.2.2 Environmental responsibilities

The responsibility for environmental performance at Melbourne Airport lies with the board of directors and the CEO and Senior Leadership Team, supported by the rest of the business. This group is responsible for establishing, reviewing and implementing the EMS. The airport's Environment and Sustainability Team is responsible for identifying and delivering strategies to address environmental issues and for providing advice and support across the organisation. Responsible environmental management requires the collaboration and coordination of all airport staff, tenants, business operators and contractors.

Airport tenants, business operators and contractors are required to perform their activities in accordance with the EMS, the Environment and Sustainability Policy and the Environment Strategy; and must ensure their activities are compliant with applicable legislation and policy.

Figure 14-6 provides an overview of the corporate structure of the airport (left-hand side) and each team's responsibilities across the different environmental areas: Environmental Performance, Environmental Policy and Strategy, EMS documented information, and Operations and documented information. Under the area of 'Operations and documented information', the diagonal indicates that maintenance of this area is split on a sliding scale across the Senior Leadership Team and the Head of Environment and Sustainability.

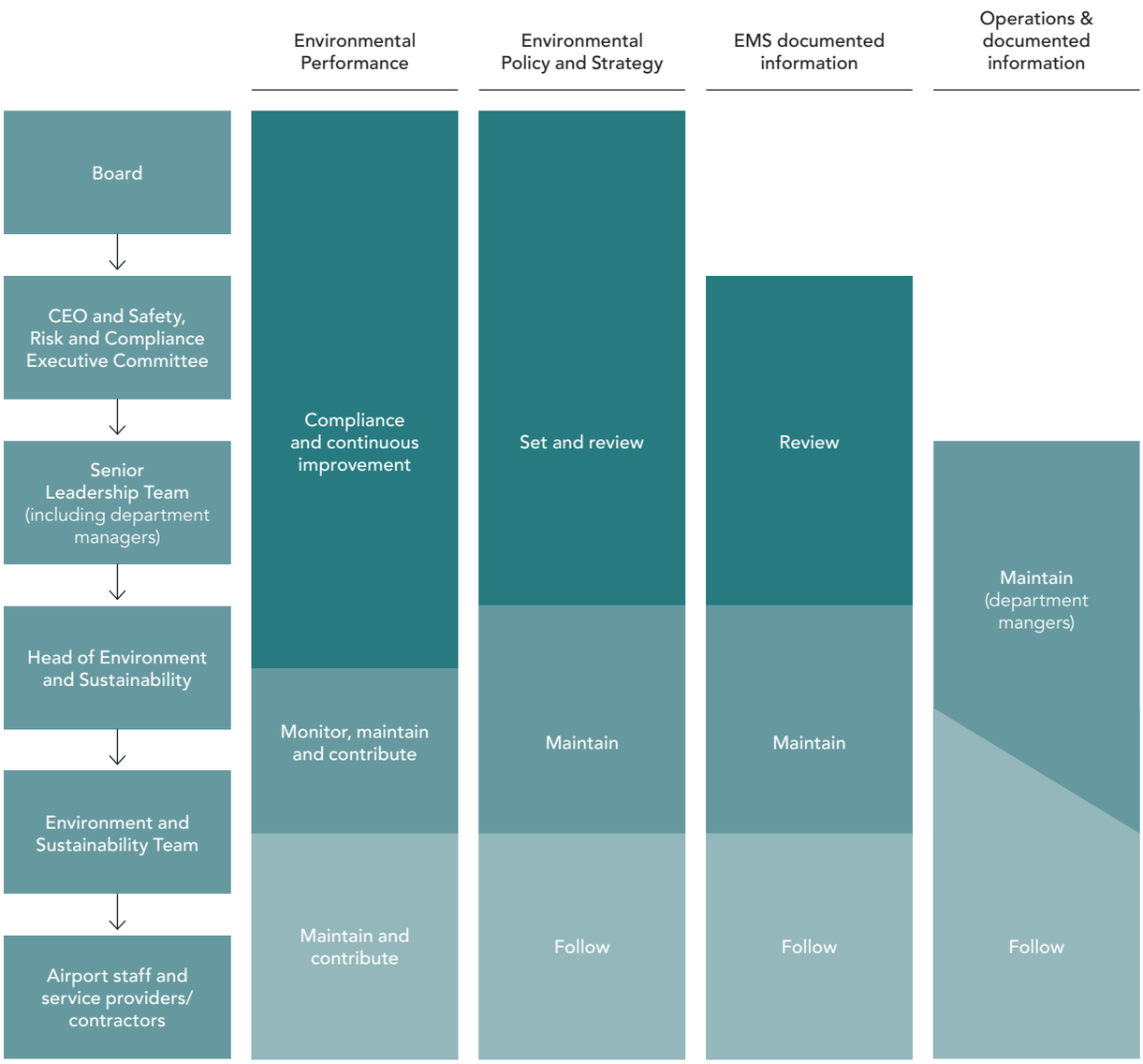
14.3.2.3 Environmental monitoring

Environmental monitoring is a critical component of Melbourne Airport's EMS to evaluate compliance, identify issues and opportunities; obtain information about environmental performance; and encourage continual improvement. Under the *Airports (Environment Protection) Regulations 1997*, the airport is required to monitor the levels of pollution (if any) present in air, water or soil at the airport; and the level of ground noise generated at the airport, in accordance with the Environment Strategy.

Environmental monitoring data is provided to the Commonwealth airport environmental regulator for review annually.

The Environment Strategy reflects the self-regulatory framework of the Airports (Environment Protection) Regulations. It includes real-time monitoring and targeted audits to manage risks and inform airport decision making. Should monitoring identify noncompliance, Melbourne Airport undertakes the necessary corrective actions. Where appropriate, public display of data will demonstrate the airport's efforts to mitigate environmental impacts.

Figure 14-6
APAM Environment Management responsibilities, relative to EMS documents



Melbourne Airport continues to refine and direct its environmental-monitoring program. All monitoring and monitoring advice is provided by a range of suitably qualified technical specialists using industry best practice testing, measuring and sampling techniques. In addition to monitoring environmental effects within the airport site, Melbourne Airport also monitors some aspects that can affect the surrounding environment.

Melbourne Airport provides the results of routine monitoring to the Secretary of the Department of Infrastructure, Transport, Regional Development, Communications and the Arts on an annual basis via the Annual Environment Report; and more regularly to the AEO in regular AEO / Airport progress meetings.

Monitoring programs undertaken in accordance with the Environment Strategy are listed in Table 14-5.

14.3.3 Environmental awareness and training

Ongoing environmental awareness and education within business units across Melbourne Airport is essential to identify and manage risks, and to achieve positive environmental and sustainability outcomes. As outlined in the EMS, Melbourne Airport administers an effective environmental training program through environmental induction training, environmental awareness training and job-specific environmental training. Topics include regulatory requirements, spill response, biodiversity and heritage awareness, and management of hazardous materials.

APAM employees whose work may result in a significant impact to the environment are expected to be competent in that work and to have received appropriate training. An effective environmental awareness and training program is essential for achieving good environmental performance.

Table 14-5
APAM's ongoing environmental monitoring program

Environmental aspect	Monitoring type	Specified frequency
Environmental management	Reporting to Safety, Risk and Compliance Executive Committee	2-monthly
	Internal EMS Conformance Audit	Twice yearly
	Environment Management System ISO14001 External Audit	Annual
	Environment Management System ISO14001 Recertification	3-yearly
Sustainability management	Qualitative review of the implementation of the ESD principles in new developments	Ongoing
	Water use	Monthly
Energy and carbon	Gas use	Monthly
	Fuel use	Monthly
	Electricity use (overall)	Monthly
	Electricity use (multiple submeters)	Ongoing
	Fuel usage (ground vehicles)	Weekly
Hazardous materials	Underground storage tank integrity testing	Annual
	Inspections of hazardous materials storage areas	Regular and ongoing
Cultural heritage	Archaeological site monitoring	As required by approved plans
Land, surface water and groundwater management	Soil contamination testing	Prior to all major construction activities
	Soil erosion	Monthly during CEMP inspections
	Stormwater quality	Annual
	Groundwater quality	Annual
	Visual inspections of stormwater outlets	Weekly and event based
	Stream health survey	Annual
Biodiversity and conservation	Airside wildlife monitoring	Daily
	Biodiversity monitoring	Prior to all major construction activities
Air quality and ground-based noise	Carbon monoxide, oxides of nitrogen, ozone, sulphur dioxide, particulate matter–onsite and offsite	Hourly with annual report
	Ground-based noise	As required
Waste management	Terminal and construction site tracking	Monthly or at end of project
	Triple interceptor traps	3 weeks to 12 months, depending on trap
	Trade/greasy waste discharge monitoring	3 weeks to 12 months, depending on trap

Table 14-6
Action plan for environmental management at Melbourne Airport

Action	Details	Timeframe
1	Review and implement a risk-based inspection and audit schedule (including OEMPs and CEMPS) for tenants, contractors and relevant APAM operations	Annual
2	Maintain a corrective actions register of follow-up actions from internal and external audits	Ongoing
3	Review and improve / update as required key environmental management documents (EMP; PFAS Framework)	Annual
4	Regularly report progress on targets to the APAM Board and Senior Leadership Team	2-monthly
5	Ensure the Melbourne Airport employee and contractor environmental induction is up to date and all staff and contractors complete the training	Ongoing
6	Undertake regular external audits of the EMS	9-monthly
7	Submit Annual Environmental Report to AEO including reporting on environmental issues/incidents	Annual
8	Where monitoring identifies pollution, Melbourne Airport will provide the AEO a report within 14 days addressing those matters outlined in Section 6.04 of the Airport (Environment Protection) Regulations.	14 days
9	Conduct formal monthly meetings with the AEO to review environmental progress and implementation of the Environment Strategy	Monthly
10	Prepare and make publicly available information on key environmental achievements	Ongoing

APAM delivers three levels of environmental training:

- Environmental Induction Training – to introduce new employees to the airport's Environment and Sustainability Policy the EMS and the Environment Strategy
- Environmental Awareness Training – to update employees with developments in the airport's Environment and Sustainability Policy, the EMS, the Environment Strategy and key environmental management initiatives
- Job-specific environmental training – to provide employees involved in activities with the potential for significant environmental impact with the skills needed to undertake these activities in a competent manner.

APAM's tenants and other operators are required to undertake relevant training related to the environmental risks associated with their operations. These requirements are documented within tenants'/operators' OEMPs and/or CEMPs. Compliance is verified via the airport's inspection and audit program.

Contractor managers (i.e. airport employees who oversee work undertaken by a contractor) are responsible for obtaining assurance that contractors carrying out activities at Melbourne Airport are appropriately trained and competent. Contractors working at the airport must undergo an induction, which includes a section that outlines their responsibilities under the airport's EMS.

14.4 ACTION PLANS

Achieving the objectives of this strategy and the targets for each environmental aspect requires:

- an understanding of the current situation and future trends
- a sequenced set of actions to be undertaken, with assigned responsibilities and timeframes for implementation.

The following sections provide an action plan for achieving the targets under each environmental aspect.

14.4.1
Environmental management

Proactive environmental management is critical to achieving the goals of this strategy. This action plan ensures that Melbourne Airport's EMS is fully functional and continues to be improved.

Aspect	Targets
Environmental management	100% of scheduled inspections and audits completed
	100% of follow-up actions from inspections and audits closed out
	100% of Operational Environmental Management Plans received and reviewed
	100% of new staff and contractors undertake Environmental Induction Training
	Maintain certified EMS to ISO 14001:2015

14.4.1.1
Background

Melbourne Airport's certified EMS has been in operation since 2004 and is aligned with the current EMS standard (ISO14001:2015). APAM is committed to maintaining this certification. The EMS is the primary mechanism for implementing the Environment Strategy. Please refer to **Section 14.3.2** for details on our EMS.

The EMS provides a framework for monitoring and addressing environmental impacts associated with APAM's operations. The EMS consists of the policies, plans, procedures and activities that together form a systematic approach to managing environmental aspects and meeting compliance obligations. Internal and external audits of the EMS are undertaken regularly to assess the compliance of operational systems.

The EMS applies to all Melbourne Airport staff, contractors and subcontractors. Environmental compliance is internally monitored and reviewed on an ongoing basis. Compliance is also externally (and annually) reviewed by the AEO, on behalf of the Department of Infrastructure, Transport, Regional Development, Communications and the Arts, via the annual Airport Environment Report. In addition, the EMS itself is externally audited periodically as part of maintaining ISO certification.

Airport tenants, business operators and contractors are required to perform their activities in accordance with the Airport Environment Strategy, Environment and Sustainability Policy and the EMS and must ensure their activities are compliant with applicable legislation and policy.

APAM monitors and measures the following EMS areas:

- environmental objectives
- operations and activities that can have a significant environmental impact
- compliance with applicable environmental legislation and other compliance obligations.

APAM tracks non-conformances and the corrective and preventive actions developed to address them.

An important aspect in an EMS is the identification and management of actual or potential contraventions of the Environment and Sustainability Policy or the EMS, and the incorporation of improvement suggestions to the system and procedures. The EMS requires a process be in place to en ure non-conformances are addressed through corrective and preventive action(s).

APAM uses the Safety (and environment) Incident Management System (SIMS) to document and track non-conformances. When SIMS is not available to the staff reporting the non-conformance, a templated Incident Report Form is used and provided to the Environment and Sustainability Team. In either case, non-conformances are registered, investigated, addressed and closed out.

Within the airport's complex operating environment, maintaining the day-to-day functionality of the EMS, while at the same time continually improving the efficiency and effectiveness of its processes, presents an ongoing challenge for the Environment and Sustainability Team. The action plan in **Table 14-6** summarises the activities in operating and maintaining the continuous improvement of the EMS and provides a clear pathway to ensure the Airport Environment and Sustainability Team effectively manages the EMS in meeting the targets outlined in **Section 14.2.6** and above.

14.4.2
Sustainability management

Melbourne Airport recognises its responsibility for contributing to the sustainability of Melbourne (and Victoria) as a whole. This action plan is targeted at ensuring that sustainability is integrated across Melbourne Airport's ongoing operations and new development projects.

Aspect	Targets
Sustainability management	Integrate ESD principles in all new developments
	Implement appropriate actions that build climate resilience and reduce climate risks to the airport
	Continue to increase recycled water use across the airport estate
	Work proactively with airport operators (landside and airside) to increase the use of lower carbon transport options
	Embed sustainable procurement practices within APAM ensuring we contribute to positive employment outcomes and sustainable supply opportunities for our local community.
	Increase the use of suppliers who have an environmental management system and/or sustainable procurement strategies

14.4.2.1 Background

This action plan focuses on issues that are significantly broader (in terms of space and time) than the airport's day-to-day operations. Specifically, this includes planning and design, climate resilience, ground transport, and tenant and contractor management considerations. Energy and carbon have similarly broad implications and are addressed in a separate action plan.

Environment, Social and Governance Strategy

The airport's first ESG Strategy was made publicly available in February 2022 and represents Melbourne Airport's commitment to making meaningful change in the ESG space. The strategy identifies six priority areas which address the issues of highest importance to our organisation, our stakeholders and our community. The strategy commits to the following key initiatives:

- Carbon emissions: Net-zero Scope 1 and 2 emissions by end of 2025 and focusing on onsite renewables
- Waste: 60% of terminal waste diverted from landfill by end of June 2024
- PFAS and Water Quality: Holding polluters to account to manage PFAS and other contaminants
- Diversity and Inclusion: Embedding diversity and inclusion principles across APAC's business policies and practices
- First Nations: Acknowledgement and celebration of First Nations heritage in terminals by the end of June 2023
- Sustainable procurement: Establishing local employment targets for all major capital projects by the end of 2022.

These targets have been incorporated into the action plan tables for each relevant environmental aspect, and progress against these targets are provided in the Annual Report.

Planning and design

As Melbourne Airport expands to meet future demand in terms of its physical footprint and operational activities, it wants to ensure that planning and design decisions are focused on building long-term sustainability and resilience. This encompasses Ecologically Sustainable Development (ESD) and water efficiency measures.

Ecologically Sustainable Development

Ecologically Sustainable Development (ESD) aims to meet the needs of people today while conserving our ecosystems for the benefit of future generations.

The Melbourne Airport Planning and Urban Design Strategy (2015) provides a framework to encourage the adoption of ESD principles and initiatives in Melbourne Airport projects. The incorporation of ESD principles into asset management and operational practices at the airport drives efficiencies in resource use, minimises environmental impacts, and maximises commercial returns.

The future development of plans for Melbourne Airport to accommodate predicted passenger growth will result in an increasing demand on natural resources and potentially increased impacts on the environment. Challenges associated with this growth and potential environmental impacts include:

- the rising cost of utilities
- increased water demand and potential scarcity exacerbated by climate change
- the depletion of non-renewable resources and materials
- increased carbon emissions
- climate change impacts
- other adverse environmental impacts including ecological harm, pollution and waste generation.

Melbourne Airport recognises the need to achieve a balance between future development and its environmental impacts. The mitigation of environmental impacts will be addressed by the integration of ESD principles into design guidelines, construction management, and the operation and maintenance of buildings and infrastructure.

Melbourne Airport has developed several initiatives and design principles aimed at mitigating environmental impacts and improving the efficiency of resources in development projects. Indeed, the Terminal 4 development was completed in line with the Leadership in Energy and Environmental Design (LEED) Guidelines.

The airport's *Contractor Guide to Working at Melbourne Airport*, and property and retail works fit-out guides, provide direction for incorporating ESD principles into the design and fit-out of Melbourne Airport developments. These guides recognise the importance of environmentally sensitive building design and construction practices to achieve high-performance building operations that are efficient and effective, and fit for purpose. This includes the use of environmentally sustainable materials, low-volatile organic compound finishes, and improved energy and water efficiency.

Water efficiency

Responsible water consumption and management is a key priority for Melbourne Airport due to the forecast demand from future airport growth and the potential impacts that climate change (and Melbourne's population growth) could have on water availability.

The main demand for water use in the airport comes from:

- terminal buildings, including bathroom facilities
- catering facilities
- airport and aircraft maintenance
- cooling towers.

Melbourne Airport's potable water network is undergoing a significant end-of-life replacement program to ensure it supports current and future demands.

Melbourne Airport is working through several initiatives that will promote water efficiency and water sensitive urban design, minimise potable water consumption and improve water quality. The intended benefits of the initiatives include:

- more accurate, efficient and cost-effective operation of water utilities
- water supply that is more reliable and of higher quality
- development of additional water re-use and treatment facilities
- securing sufficient water capacity for current operations and projected growth
- reduction in the total potable water consumption of the airport precinct through efficiencies, demand reduction, improved monitoring and water re-use
- feasibility analyses into further opportunities for water re-use and supply diversification
- support for local water utility recycled water schemes.

Further, Melbourne Airport has invested in significant rainwater and stormwater harvesting infrastructure and water treatment facilities. There are further opportunities to expand and complement this existing infrastructure. The incorporation of water-sensitive urban design initiatives within specific developments will result in a reduction in potable water demand and costs, improve water quality, and improve waterway resilience.

Climate resilience

In the interests of future-proofing its operations and environmental performance in the face of climate change, Melbourne Airport will work to build its resilience to a range of possible future scenarios. A key action to achieve this will be to integrate climate change and natural hazard considerations into the investment committee review process for all new projects.

Ground Transport

This section focuses on the landside components of ground transport and traffic access to Melbourne Airport. The Masterplan 2022 includes a Ground Transport Plan giving five-year and 20-year outlooks on how Melbourne Airport aims to extend and expand the internal road network, enhance the safety of the forecourt and parking areas, improve the external road network, and work with governments to plan for a future rail link to Melbourne Airport with potential connectivity to the planned Suburban Rail Loop (SRL).

Melbourne Airport will be making investments that encourage sustainable and active transport modes. These will focus on the new Ground Transport Hub, supporting the proposed Melbourne Airport Rail project, and upgrading service links to local and regional bus routes.

The Melbourne Airport Rail project in particular will provide a more sustainable option for passengers and workers alike travelling to Melbourne Airport and will play a large part in reducing the number of vehicles travelling to the airport in the future, and therefore reducing the airport's Scope 3 emissions.

In the longer term, as part of the airport rail link, Melbourne Airport will extend the off-road bicycle path network to provide better and safer connections to the cycle path network. Melbourne Airport will explore other sustainable ground transport initiatives such as:

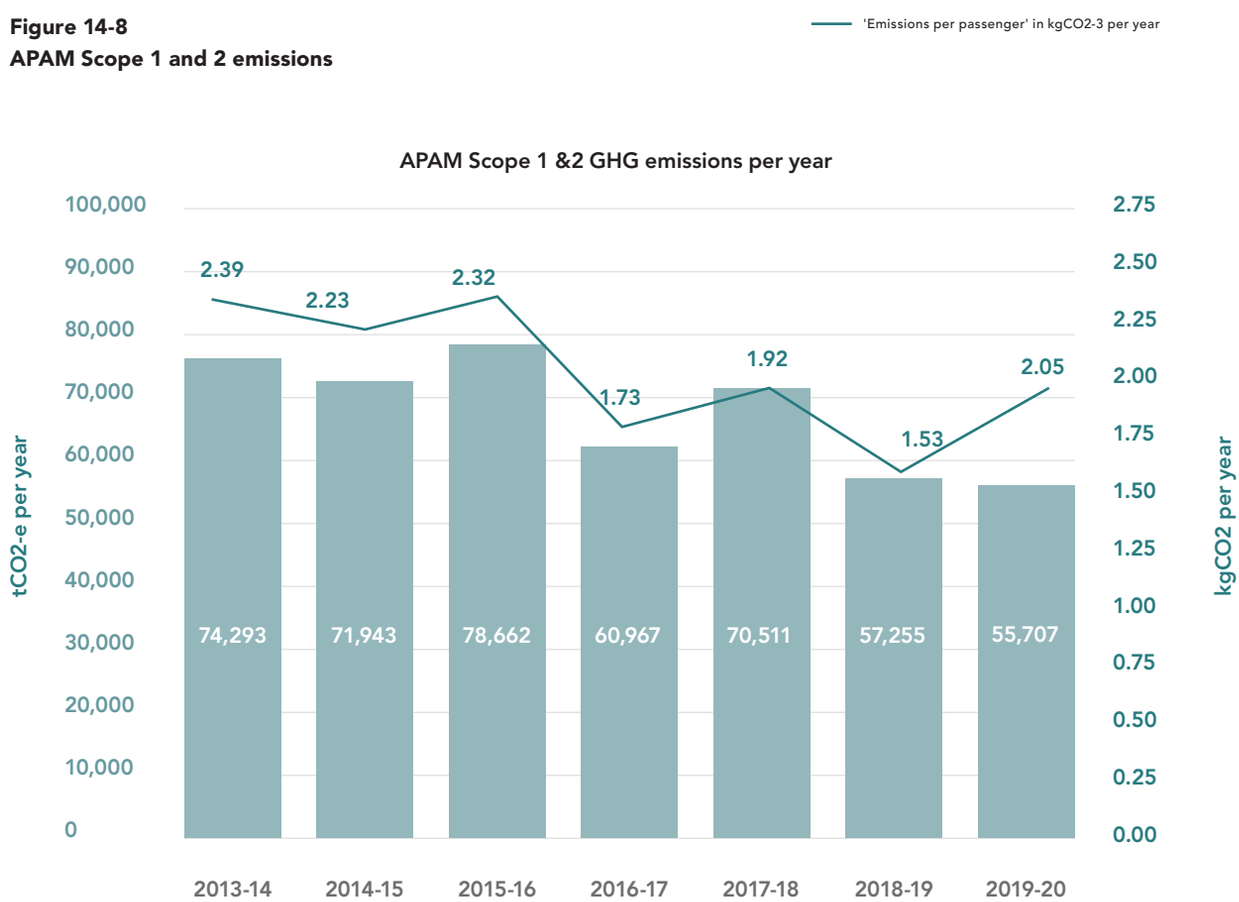
- optimising waiting zones
- installing electric vehicle charging stations
- expanding shuttle bus routes
- increasing use of electric buses and ground vehicles
- reducing congestion at intersections.

Table 14-7
Action plan for sustainability at Melbourne Airport

Action	Details	Timeframe
1	Ensure sustainability opportunities and initiatives are considered during the Investment Committee review stage of projects	Ongoing
2	Collaborate with Melbourne Airport business partners and tenants to identify opportunities for potable water, energy and carbon saving measures	Ongoing
3	Monitor potable water consumption and recycled water across Melbourne Airport and investigate/ implement improvements to the monitoring system	Annual
4	Integrate climate change and natural hazard considerations into Investment Committee (TCFD alignment) review stage of projects.	Ongoing
5	Engage with government and transport authorities to support and improve sustainable transport options to and from the airport	2022
6	Local employment targets established for all capital projects over $20M.	2022
7	Local employment targets for all service provider contracts with 20 or more employees	2022
8	A Sustainability in Design Checklist developed and implemented for all new capital projects.	2022

Figure 14-7
Melbourne Airport's 12MW Solar Farm at Oaklands Junction during construction

Figure 14-8
APAM Scope 1 and 2 emissions



Tenant and contractor management

Melbourne Airport's tenants and contractors are responsible for conducting their activities in an environmentally responsible manner and in accordance with the appropriate environmental legislation.

Tenants and contractors with significant environmental risk must develop and maintain Operational Environmental Management Plans (OEMPs) outlining how they will manage environmental issues or pollution, and ensure that they comply with the Airports Act and have evaluated the environmental risks and opportunities associated with their activities.

Responsible procurement

Sustainable procurement is a process that aims to reduce the triple bottom line (i.e. environmental, social and economic) impacts of purchased products and services. The process considers these impacts across the lifecycle of a product or service: from raw materials to operation and disposal/recycling. The scale of Melbourne Airport's operations means the upstream and downstream impacts of its procurement decisions can be far reaching and long-lasting.

In recognition of this, Melbourne Airport includes responsible procurement within its procurement policy to help it better manage the sustainability risks up and down its supply chain, including through tenants and contractors. It also seeks to achieve positive social impact delivered through local employment opportunities, particularly through generational capital projects such as M3R and Melbourne Airport Rail.

Its environmental action plan for tenant and contractor management focuses on responsible procurement and integration of this into tenant and sub-contractor contracts.

Table 14-7 presents the action plan to achieve the sustainability management targets outlined in Section 14.4.2.

14.4.3 Energy and carbon

The Australian energy market is in a state of change. Melbourne Airport will need to balance volatile energy prices, new technologies and decarbonisation. This action plan is aimed at ensuring Melbourne Airport strikes this balance while still ensuring reliability of services to customers and tenants.

Aspect	Targets
Energy and carbon	Continue to transition from high to low carbon intensity electricity
	Continue to track APAM's emissions against science-based emissions reduction trajectory
	Maintain the Airports Council International Level 2 Airport Carbon Accreditation and progress towards Level 3 accreditation
	Target of net-zero Scope 1 and 2 emissions by end of 2025 and engaging on Scope 3.

Substantial feedback was received during the M3R public exhibition regarding social and governance expectations related to the emissions implications of aviation growth. APAM has acknowledged the importance of this topic by including a reference to the APAC ESG Strategy that includes development of a Scope 3 carbon emissions strategy by the end of FY23.

The M3R submission will include:

- MDP: Additional and updated content in Part B: Airport (Chapters B11 Greenhouse gas emissions, and B13 Climate change and natural hazard risks).
- Supplementary Report: 'Issues' are dedicated to addressing emissions and Melbourne Airport's role in terms of Scope 1, 2 and 3 governance and influence:
- Issue A5 Australian Climate Change Policy
- Issue A6 Environmental Management Framework (inc. AES & Sustainability)
- Issue F7 Airport contribution to climate change (inc. greenhouse gas emissions)

14.4.3.1 Background

Melbourne Airport has long been committed to reducing its energy intensity and carbon footprint. Under its 2003 Environment Strategy, the airport developed and implemented an Energy Management Plan. Over subsequent years, the airport has, among other measures, rolled-out LED lighting in the terminals, carparks and airfield, and energy efficient appliances; continues to offset carbon emissions from APAM staff flights and vehicle emissions; and installed an 8-megawatt gas-fired trigeneration system. It has also recently commissioned a 12MW solar farm at Oaklands Junction (Figure 14-7), a solar powered water treatment plant, and a 1.8MW solar array on Business Park warehouse.

Primarily as a result of the tri-generation system, APAM's Scope 1 and 2 greenhouse gas emissions have continued to decrease since FY16 (Figure 14-8). In January 2019 the airport achieved Level 2 accreditation under the International Airport Carbon Accreditation scheme through our policy commitment to emissions[1] reduction and the development of a Scope 1 and 2 carbon footprint.

1 Scope 1 emissions are from sources that are directly controlled by APAM (e.g. gas boilers and on-site vehicles). Scope 2 emissions are from the generation of purchased electricity.

From an energy perspective, APAM's annual electricity consumption has varied slightly but not grown appreciably since the 2014 financial year. This demonstrates the effectiveness of the implemented energy efficiency measures given the growth of APAM's operations in recent years. However, electricity consumption across the airport (which includes non-APAM areas) has grown, as has energy from fossil fuels consumed on site.

Melbourne Airport is now facing significant challenges to its energy and carbon management position. These challenges are driven by:

- COVID-19 which led to a reduction in wholesale price for electricity and gas while business energy consumption decreased significantly. Lower gas prices make operation of the lower carbon tri-generation system economically more favourable.
- Property and Aviation business unit developments which place upward pressure on energy demand. Overall, this upward trend in consumption is forecast to continue post COVID-19.
- The need for APAM to play its part in reducing emissions in line with Victoria's target of net zero emissions by 2050.
- These challenges are expected to play out in an environment of rapidly evolving technology and economics. Renewable energy installations are becoming increasingly cost competitive and energy storage technologies are coming to scalable maturity. The software and contractual developments necessary to govern microgrids and peer-to-peer energy trading are rapidly emerging, and Power Purchase Agreements are becoming more established.

In addition, APAM continues to monitor the development of renewable hydrogen technology and its potential uptake by the aviation industry. As noted by CSIRO and Boeing in *Opportunities for hydrogen in commercial aviation* (2020), airports have the potential to become renewable hydrogen hubs acting as centralised locations for the generation, storage and distribution of renewable hydrogen. Initially hydrogen could be used to power ground service equipment and over the long-term steadily grow its footprint to power public transport services and/ or planes. In reference to the latter, Airbus announced in 2020 their own ambitions to develop a zero-emission commercial aircraft by 2035 by leveraging hydrogen propulsion.

Responding to these challenges and changes in context, Melbourne Airport has:

- rolled out its Energy Strategy, which has achieved the targeted reduction in energy intensity by 20 per cent by 2020. This strategy focused on APAM's 'Common Energy Use'. This is energy (electricity and natural gas) over which APAM has direct operational control to service the operation of the airport (aviation processing, lighting, thermal plant, etc) and supporting infrastructure (such as car parks, airfield lighting, data centres and roads). The strategy was achieved by:
  - optimising energy use through energy efficiency measures, and smart monitoring and control systems
  - transitioning to renewable energy
  - targeting smart procurement options.
- rolled out a Solar Adoption Program, which has confirmed 12 megawatts of solar photovoltaic generation installed. In addition, Melbourne Airport has developed a solar powered water treatment plant and installed a 1.8MW solar system on a new business park site
- prepared a Carbon Management Plan (2019).
- committed to net-zero Scope 1 and 2 emissions as confirmed in the APAC ESG Strategy. This will be achieved with a focus on onsite renewables and green energy sourcing.

Melbourne Airport was also able to achieve the 20 per cent reduction of annual grid electricity consumption by FY20 from a base year of FY17. This strategy included best practice targets for carbon emissions and continues to reduce our grid consumption of electricity.

Table 14-8 presents the action plan designed to meet energy and carbon targets outlined in Section 14.4.3.

14.4.4 Hazardous materials

Melbourne Airport will continue to work to reduce the risk associated with hazardous materials. Through our action plan, we will continuously examine options to replace hazardous materials with non-hazardous alternatives, reduce their use and manage the use and storage of those hazardous materials that cannot be avoided.

Aspect	Targets
Hazardous materials	No significant hazardous materials incidents per year

14.4.4.1 Background

Several hazardous materials are stored and used at Melbourne Airport. These include fuels, oils, herbicides, solvent-based chemicals and hazardous building materials. Without appropriate management and procedures, hazardous materials have the potential to affect the environment (including soil, groundwater, surface water, air quality, and human health and safety).

Sources and uses of hazardous materials at Melbourne Airport include:

- bulk aviation and automotive fuel storage and handling
- fire training and the storage and use of firefighting foam
- APAM and tenant-operated maintenance facilities for vehicles and aircraft
- general airport operation, construction, maintenance

Table 14-8
Action plan for energy and carbon at Melbourne Airport

Action	Details	Timeframe
1	Continue to roll out the APAM Energy Strategy which aims to reduce annual grid electricity consumption	Ongoing
2	Collaborate with Melbourne Airport business partners and tenants to identify opportunities for energy and carbon-saving measures	Ongoing
3	Explore the use of alternative fuel sources for airside equipment, including examination of electric vehicles, hybrid vehicles and alternative options for auxiliary power units	Ongoing
4	Maintain compliance with existing energy and greenhouse reporting and assessment programs including the National Greenhouse and Energy Reporting Scheme and the National Pollutant Inventory	Annual
5	Ensure future Master Plans include the opportunity to establish a hydrogen hub at the Melbourne Airport	Ongoing
6	Complete the Airport Carbon Accreditation program requirements	Annually
7	Scope 3 emission engagement strategy to be developed - focusing on opportunities to influence our commercial property tenants, airlines, travelers and contractors.	2022

Table 14-9
Action plan for hazardous materials at Melbourne Airport

Action	Details	Timeframe
1	Investigate and implement the replacement of hazardous materials with non-hazardous substances and/or identify options to reduce their use	Ongoing
2	Map location of hazardous materials used by APAM using the enterprise geographic information system (GIS)	Ongoing
3	Undertake regular inspections of hazardous materials storage areas via APAM's EMS audits, construction inspections and tenant inspections	Ongoing
4	Ensure all applicable airport staff (and tenants) are trained in environmental emergencies/spill responses	Ongoing
5	Maintain the Asbestos Register, inspect sites annually and map the location of sites using the enterprise geographic information system (GIS)	Ongoing

and landscaping. This includes the use and disposal of pesticides and herbicides, solvents and paints, batteries, and asbestos-containing materials within existing buildings, fuels and cleaning chemicals

- other hazardous materials present in buildings and structures.

Further, some operational and construction activities can affect soil quality.

Melbourne Airport has several control measures in place to ensure all activities involving hazardous materials are appropriately managed:

- The Melbourne Airport Emergency Plan details standard operating procedures to minimise volatile organic and odorous emissions in the event of chemical spills, and to reduce any potential environmental impacts.
- Business partners and tenants are required, as part of their OEMPs, to maintain registers detailing all hazardous materials (including asbestos) stored, handled or used as part of their operations. The individual OEMPs must include provisions for phasing out hazardous materials in favour of safer alternatives, and reviews are conducted annually.
- Similarly, OEMPs include procedures that allow for managing by-products. Business partners and tenants are responsible for ensuring that, for operations under their control, these procedures and control measures are adhered to and that appropriate records and registers maintained.
- Melbourne Airport's site-wide Environmental Management Plan and PFAS Management Framework also set out the minimum requirements for managing hazardous materials across the airport estate.

Melbourne Airport will continue to store, handle, use and dispose of hazardous materials appropriately; and will explore further options for sustainable environmental management principles. Table 14-9 outlines the action plan to meet our hazardous materials targets outlined in Section 14.4.4.

Table 14-10
Action plan for cultural heritage at Melbourne Airport

Action	Details	Timeframe
1	Train relevant employees in how to use CHMP and recognising cultural heritage values	Ongoing
2	Maintain and update heritage values on the airport's geographic information system	Ongoing
3	Consult with relevant stakeholders on proposals that have a potential impact on items of heritage value	Ongoing
4	Ensure all new developments have a Culture and Heritage plan where required	Ongoing
5	Identify opportunities to incorporate the airport's cultural heritage attributes and history into terminal precincts and design	2022

14.4.5
Cultural heritage

This action plan will ensure the management of risks that have the potential to have temporary or lasting impacts on cultural heritage values, and identify actions to improve significant areas.

Aspect	Targets
Cultural heritage	Continue to work with the Wurundjeri Woi Wurrung Cultural Heritage Aboriginal Corporation to ensure 100% of Melbourne Airport assessed and / or has an approved Cultural Heritage Management Plan by end of 2025 (~450ha).
	No incidents of unauthorised damage to cultural heritage sites
	Acknowledgement and celebration of First Nations heritage in Melbourne terminals by end FY23

14.4.5.1
Background

There are a significant number of known sites at which artefacts of cultural and historic heritage significance have been identified on or near the airport. Maintaining and recording cultural heritage values on site is a high priority, as is maintaining a good ongoing relationship with the Registered Aboriginal Party.

Indigenous silcrete stone artefact scatters are common on site, and there are cultural heritage sites including scarred trees within the Grey Box Woodland. There are also several historical heritage sites on airport land, primarily related to early Scottish agricultural settlement in the region. It is likely that there are further sites of cultural and historical significance not yet discovered on airport land.

There are a range of risks that have the potential to have temporary or lasting impacts on cultural heritage values. These risks are managed through approval processes for scheduled works and also through undertaking additional assessments for Management Plan updates to track the condition of cultural heritage values.

The most common cause of damage is inadequate identification and consideration of cultural heritage throughout the life of a project. To mitigate this risk, Melbourne Airport regularly undertakes assessments to actively manage Indigenous and non-Indigenous cultural heritage values. Prior to beginning works in the vicinity of a recorded site or in areas of cultural heritage sensitivity, Melbourne Airport liaises with specialists and stakeholders to manage any potential disturbance. In the first instance preference is to avoid any impact to recorded sites or areas of cultural heritage significance as a result of project works. If this is not possible, appropriate salvage operations are undertaken in accordance with best practice methodologies and in consultation with the Registered Aboriginal Party and/or Heritage Victoria. These assessments and liaison guide the approvals process.

Heritage values are documented on the airports enterprise GIS that also provides a range of management actions to prevent, control or reduce the major risks to culturally significant areas. This GIS also serves as the Cultural Heritage Environmental Site Register.

Where construction works are planned in areas of known or potential heritage values, Melbourne Airport requires the project contractor to prepare and implement a Construction Environmental Management Plan (CEMP) that outlines appropriate management measures and contingency plans. This includes cultural awareness training for all site personnel. In construction areas where a Cultural Heritage Management Plan (CHMP) or Heritage Management Plan (HMP) is required, the actions stipulated within the plan are also required to be addressed within the CEMP.

The continued management and conservation of cultural heritage is an important aspect of the airport's future planning. Melbourne Airport also recognises the value in promoting this information and connecting with the community and its passengers through enhanced experiences and the sharing of local knowledge. **Figure 14-1** shows all areas of cultural significance within the airport's boundaries.

The future management actions for cultural heritage are outlined in the action plan at **Table 14-10**.

14.4.6
Land, surface water and groundwater management

The management of land and water at Melbourne Airport involves mitigating risks that have a potential impact on both these environmental aspects. This action plan addresses land and water management as an integrated environmental issue.

Aspect	Targets
Land, surface water and groundwater management	No environmental incidents that lead to land, groundwater or surface water pollution
	Improve the ecological health of receiving waterways (as evidenced by environmental monitoring)
	Arundel Creek baseflow water treated 350 days / year.
	100% of PFAS impacted wastewater treated by Water Treatment Plant.

14.4.6.1
Background – land

The soil at Melbourne Airport overlies relatively shallow newer volcanic basalt, which is a hard and compact rock. Hazardous liquids (such as fuels, oils and solvent-based chemicals) used frequently at Melbourne Airport have a high potential to contaminate land. Activities with the potential to affect soil at the site include:

- chemical and waste storage, handling, use and disposal
- water run-off from vehicle-related activities (including aircraft maintenance and car park facilities)
- importation and storage of contaminated fill
- fuel storage tanks and associated infrastructure
- demolition and construction works.

Due to the broad range of activities that can cause soil contamination, Melbourne Airport has developed numerous control measures to minimise and manage this issue. Identified areas of soil contamination are added to the Environmental Site Register. This allows for easy identification of when further investigations are required for particular sites or projects.

Further project-based contaminated land investigations and a site-wide review were completed in 2020. The results will be used to better inform Melbourne Airport of the site's contamination status, as well as the construction activities that result in the excavation of soil and generation of spoil at the airport.

The ongoing growth of Melbourne Airport will result in significant expansion to the physical footprint of the Business Park, airfield and terminal precinct. With this expansion comes a risk that works will interact with areas of soil contamination or could result in new contamination events. Careful consideration and management will also be taken when transporting existing and imported fill material.

Melbourne Airport assesses all activities (including construction and demolition projects) for their potential impact on land, groundwater and surrounding waterways. Control measures are developed to minimise the impact of developments on these environmental aspects, with monitoring programs in place to evaluate their effectiveness.

Through its land and water action plan, Melbourne Airport will investigate opportunities to remediate and repurpose airport land that adds value for the airport, local communities and environment.

PFAS contamination

Per- and poly-fluorinated alkyl substances (PFAS) are manufactured chemicals used to make products resistant to heat, stains, grease and water. PFAS have been widely used for more than 50 years in many consumer and industrial products (including carpets, cookware, clothing, food packaging, pesticides, stain repellents, firefighting foams, mist suppressants and coatings). PFAS are stable chemicals that are resistant to physical, chemical and biological degradation. They therefore last for a long time and can be found in humans, animals and throughout the environment in Australia and other parts of the world.

At airports, aqueous film-forming foams (AFFF) containing per- and poly-fluoroalkyl substances (PFAS) were historically used because they are very effective at putting out liquid fuel fires. At Melbourne Airport, AFFF has been stored in aircraft hangers for deluge systems and used extensively in training (by far the greatest use of the product) and responding to firefighting emergencies involving liquid fuels. Source areas at the airport (**Figure 14-9**) include the following Airservices Australia (or their predecessors) facilities:

- Current and former fire training grounds (FTGs)
- The Melbourne Airport Fire Station
- The Smoke Hut.

Diffuse PFAS impacts are widespread across the project area and several secondary sources of PFAS contamination have also been identified, but these are predominantly associated with surface water drainage, groundwater contamination and water reuse impacts (e.g. Melbourne Airport Golf Club).

The PFAS National Environment Management Plan (NEMP) provides guidance on the assessment and management of sites contaminated by PFAS. The PFAS NEMP was first released in February 2018 (Version 2 was issued in January 2020) and developed by the heads of EPAs Australia and New Zealand (HEPA) and Commonwealth Department of Environment and Energy (now Department of Climate Change, Energy, the Environement and Water). The Commonweath, State and Territory environment ministers have all endorsed the PFAS NEMP.

Figure 14-9
PFAS concentration in soil

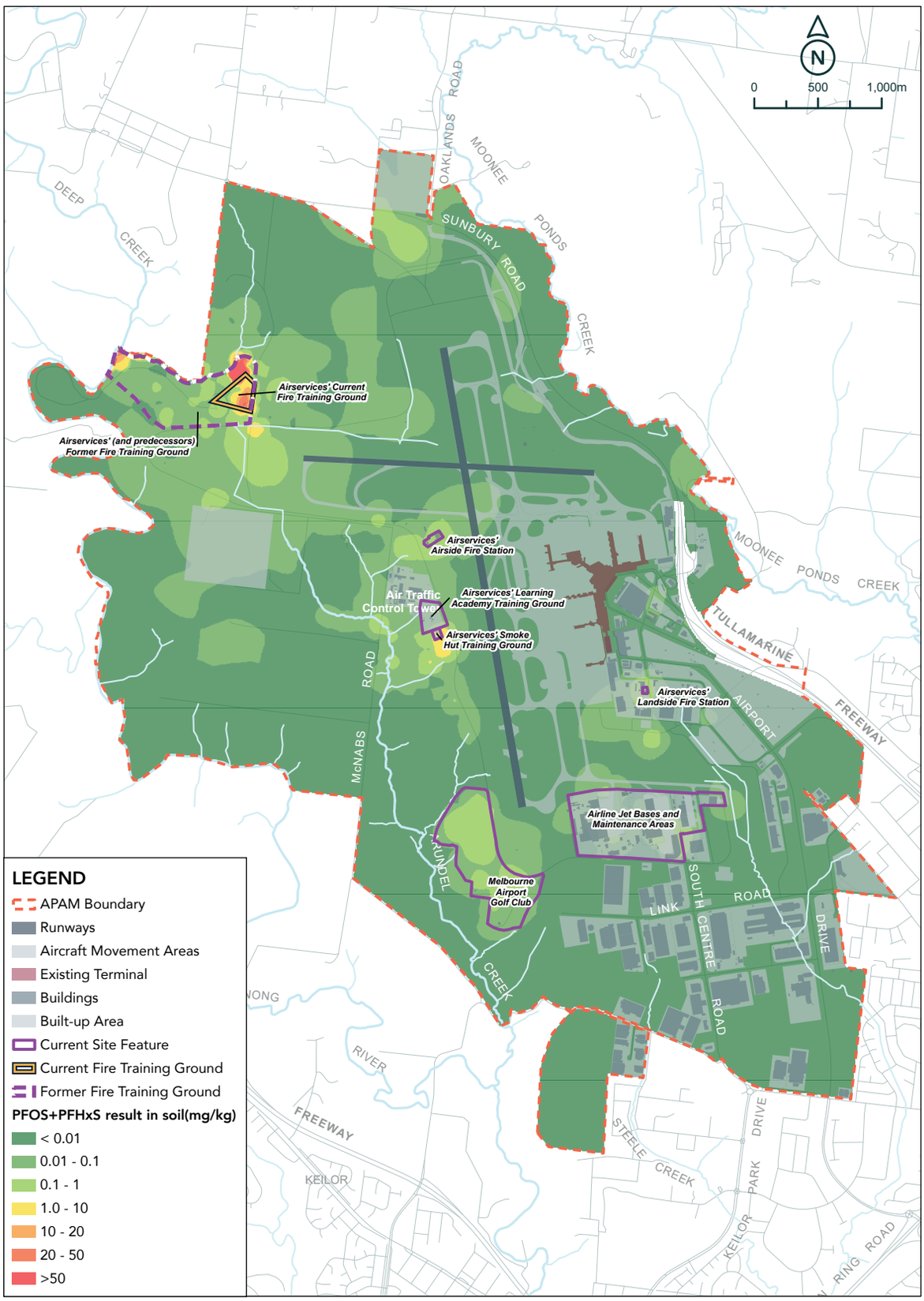
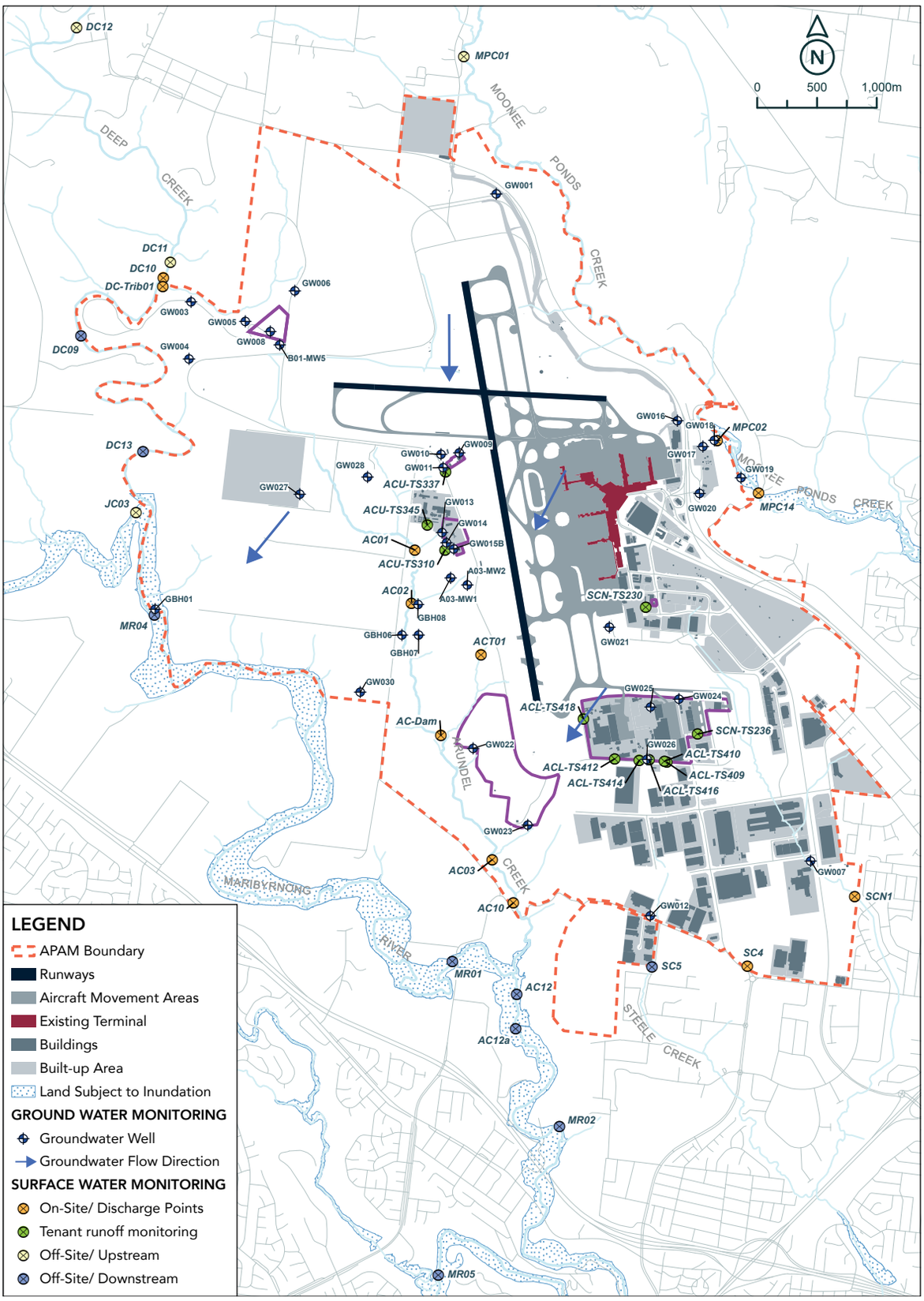


Figure 14-10
Location of waterways and water monitoring points at Melbourne Airport



APAM has developed a PFAS Management Framework consistent with the PFAS NEMP to address all aspects of PFAS management on site. The PFAS Management Framework applies to any maintenance or construction activities within the boundaries of Melbourne Airport-controlled land where PFAS impacted materials (including soil and construction and demolition waste) is to be disturbed or wastewater is to be generated/intersected. APAM's PFAS Management Framework will be updated to reflect any future changes in legislation/guidance.

PFAS impacted materials that are generated by on-airport maintenance or construction activities are taken to the onsite Temporary PFAS Storage Facility. This facility was commissioned in September 2019 and was purpose built to store up to 1,000,000m3 of material. All material stored at the facility is temporarily stored until an appropriate reuse opportunity is available within the airport estate. Any proposed reuse of PFAS impacted materials must be conducted in accordance with regulatory requirements and the APAM PFAS Management Framework.

Temporary PFAS Storage Facility

Airport estate-wide risk assessments commissioned by APAM identified that the on-site risks related to PFAS are considered low and acceptable. Further confirmation of off-site risks is ongoing and they are being addressed as part of broader estate management.

As part of its ongoing environmental management and monitoring of the airport in accordance with the Airports Act and regulations, Melbourne Airport is assessing and monitoring PFAS contamination on airport property. As part of this process, Melbourne Airport has established a Project Control Group (PCG) to review this issue in detail. The PCG comprises Melbourne Airport and:

- Commonwealth Department of Infrastructure, Transport, Regional Development, Communications and the Arts
- EPA Victoria
- Airservices Australia.

Melbourne Airport is also working closely with other relevant stakeholders including airport tenants, neighbouring local councils, community stakeholders and Melbourne Water. Melbourne Airport will continue to work with airport tenants to manage potential risks from PFAS contamination at the airport.

14.4.6.2
Background – surface water

Melbourne Airport is located on a broad plateau in the catchments of the Yarra and Maribyrnong rivers, with several local waterways located on or adjacent to the airport site (**Figure 14-10**). The headwaters of Arundel Creek, Steele Creek and Steele Creek North originate on the airport site itself. These waterways support aquatic ecological communities and are also used for irrigation and stock watering purposes. Some reaches of Arundel Creek, the Maribyrnong River, Moonee Ponds Creek and Deep Creek also provide habitat for threatened species including the growling grass frog, Litoria raniformis. These receiving waterways are an integral part of the local natural environment, and ongoing management for maintaining or improving their health is a key objective of the strategy.

Stormwater run-off at Melbourne Airport is managed through an extensive drainage network that includes vegetated swales, drainage pits, subsurface pipes, retention basins, bio-retention basins and gross pollutant traps. Site management practices are implemented to minimise potential contaminants leaving the airport site. These include construction environmental management plans, effective spill response, construction site audits, street sweeping, and regular stormwater pit and gross pollutant trap maintenance.

PFAS impacted wastewater and slurry that is generated by on-airport maintenance or construction activities is taken to the onsite solar powered water treatment plant (WTP) located at the Temporary PFAS Storage Facility. Here, wastewater and slurry is treated to reduce the levels of PFAS and other contaminants. The WTP also captures and treats all surface water runoff from the bunded Temporary PFAS Storage Facility. Since being commissioned in September 2020 the WTP has been successful at reducing PFAS levels in treated water to non-detect levels. This allows for treated water to be reused on the airport estate for activities such as dust suppression and irrigation.

Temporary PFAS Storage Facility
Water Treatment Plant

Water quality monitoring and stream health assessments have identified the need to increase the receiving waterways' resilience to airport stormwater flows. Some reaches of Moonee Ponds Creek and Arundel Creek have degraded habitats and are therefore more susceptible to impacts from stormwater flows. Revegetation and regeneration, weed and pest animal control, repairing bank erosion and stock management

Figure 14-11
Cross-section beneath Melbourne Airport showing aquifer and groundwater level

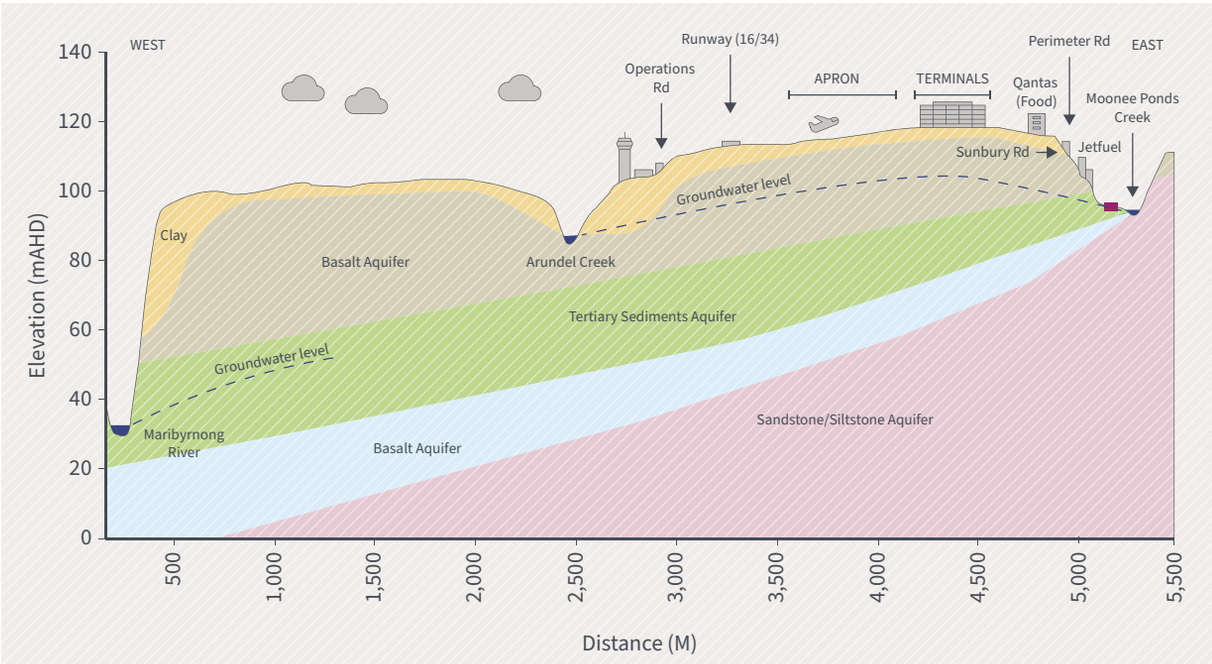


Table 14-11
Action plan for land and water management at Melbourne Airport

Action	Details	Timeframe
1	Implement the Melbourne Airport Environmental Management Plan and PFAS Management Framework that include measures to prevent contamination of land and water	Ongoing
2	Construct a water treatment plant to treat PFAS-contaminated water on Arundel Creek	2022
3	Identify opportunities across the airport to improve surface water quality incorporating water-sensitive urban design, with a focus on Arundel Creek	Ongoing
4	Improve the stability and ecological health of waterways by actively managing construction sites, feral animals, weeds, erosion and undertaking revegetation	Ongoing
5	Identify priority contaminated sites for management and/or remediation that follow a risk- based approach or can be addressed through project works	Ongoing
6	Undertake groundwater and surface water monitoring	Annual
7	Undertake stream health monitoring surveys	Annual
8	Implement the PFAS National Environmental Management Plan	Ongoing
9	Continue to ensure that tenants meet legislative and lease obligations relating to entry and exit site audits/assessments	Ongoing
10	Map the existing underground and above ground fuel tanks on the airport's enterprise GIS	2022
11	Polluters held accountable to manage PFAS and other contaminants. Timeframe	Ongoing

are all undertaken to continuously improve local waterway resilience.

Surface water pollutants have been primarily associated with certain PFAS, heavy metals from local geology, aircraft operations, the road network and fuel storage. APAM's surface water monitoring program found that levels of some contaminants were above adopted guidelines at several locations across the site. No unacceptable human health risks have been found and APAM continues to monitor water quality at and around the airport to inform future management actions. Melbourne Airport's growing footprint will result in more hard surfaces and stormwater run-off. This in turn is expected to increase pressure on stormwater infrastructure and the receiving waterways. Without effective management, adverse environmental impacts could occur (such as bank erosion, weed invasion and degradation of the aquatic and terrestrial habitat).

Climate change projections for the region indicate that surface water environments are likely to be affected by several climate variables including:

- altered rainfall patterns, with less rainfall in winter and spring affecting catchment rainfall and run-off regimes
- more frequent extreme rainfall events with increased potential for flooding
- increased ambient air temperatures and evaporation, with more hot days and fewer cold nights (potential impacts include increased surface water temperatures, drier catchment soils, and decreased run-off)
- higher incidence of severe fire weather conditions, with potential surface water impacts from a bushfire including high loads of ash and sediment run-off, and bank destabilisation.

In response to these challenges, through the development of several initiatives, Melbourne Airport has identified opportunities to improve water quality and increase the stability and resilience of receiving waterways to accommodate increased airport stormwater flows and minimise environmental impacts. These include better site management, new infrastructure, water re-use and habitat improvement. More specifically, key principles in managing stormwater discharge from the airport include:

- improving stormwater quality by upgrading water treatment measures such as filtration and retention
- reducing the potential for contaminants and litter in the stormwater catchments to enter the drainage network
- managing stormwater volumes so peak flows and flow velocities are reduced in order to mitigate downstream erosion impacts and improve surface water quality
- identifying stormwater reuse opportunities through treatment and harvesting.

Through its action plan for land and water, Melbourne Airport will prioritise improving the quality of stormwater run-off and receiving waters by managing contaminants and increasing the resilience of the system through improved processes and technologies, and on-ground rehabilitation.

One example of this technology is the Arundel Creek Water Treatment Plan which was commissioned in in January 2022. The WTP is located at the southern end of the airport estate and it treats baseflow volumes of water from Arundel Creek, before returning the treated water to the water body. The system has proved to be effective at removing PFAS and other contaminants to non-detect levels after treatment.

14.4.6.3 Background – groundwater

Melbourne Airport is located above a regional aquifer. In some areas, groundwater occurs at a shallower depth and interacts with surface and near-surface infrastructure. In these locations, groundwater is vulnerable to contamination from surface activities. Understanding groundwater flow patterns, interactions and potential sources of contamination is critical to identifying risks, management and remediation. A simplified cross-section through the site showing the aquifers and groundwater depth is shown in **Figure 14-11**.

Potential groundwater contamination sources include:

- aircraft and vehicle maintenance, fuel storage and fuelling activities (including those undertaken at hangars and ancillary workshops)
- fire control operations and firefighting training (including historical use of PFAS-containing foams and concentrates)
- petrol stations and other storage of petroleum hydrocarbons
- construction and refurbishment-related works
- existing solid waste disposal areas, and areas with interim containment of impacted soils
- surrounding land uses (e.g. former landfills, agricultural uses).

Monitoring and managing groundwater is a key focus of Melbourne Airport due to the long-term use of the site; and the historical use of PFAS-containing foams and concentrates, chemicals, oils and fuels. Several groundwater bores at the airport monitor groundwater quality.

Monitoring for a range of potential contaminants (including PFAS) is regularly conducted at high-risk sites where current or historical activities have led to groundwater contamination.

The effects of climate change have the potential to affect groundwater levels and quality through increased localised recharge of stormwater run-off and from surface water bodies to groundwater.

Figure 14-12
Deep Creek on the airport's eastern boundary

Figure 14-13
Revegetation planting at Moonee Ponds Creek – World Environment Day 2020

Table 14-12
Action plan for biodiversity and conservation management at Melbourne Airport

Action	Details	Timeframe
1	Investigate a whole of airport biodiversity offsets strategy	Ongoing
2	Implement the site-wide Integrated Pest Management Plan focused on reducing pest animals on the airfield and high value conservation areas	Ongoing
3	Map key weed and pest animal locations on the airport's enterprise GIS	Ongoing
4	Monitor and track Melbourne Airport's annual target 12-month average wildlife strike rate	Annual
5	Maintain and update biodiversity mapping on the enterprise GIS	Ongoing
6	Actively manage declared weeds in the Moonee Ponds Creek corridor to achieve ongoing reduction in density (primarily artichoke thistle and Patterson's curse)	Ongoing
7	Undertake ripping and other rabbit control in the in the Moonee Ponds Creek corridor to achieve ongoing reduction in rabbit density	Ongoing
8	Implement the Wildlife Hazard Management Plan	Ongoing
9	Maintain a committee to address wildlife management at the airport	2-monthly
10	Implement the Melbourne Airport Removal of Trees and Vegetation on Airport Property Procedure	Ongoing
11	Revegetate areas of land under our management to support biodiversity, stream health and cultural heritage in areas identified as 'Conservation, Recreation and Water Management' in Development Concept Plans	Ongoing

To mitigate potential impacts on groundwater, Melbourne Airport undertakes the following measures:

- review of tenants' operational environmental management plans to assess whether appropriate emergency response (including spill response) and management measures are in place
- regular inspections and operational audits of active areas to verify existing management measures in place to mitigate potential risks
- compulsory spill response training to relevant personnel
- maintenance of existing infrastructure to minimise spills and uncontrolled discharges that could reach groundwater
- ongoing monitoring of known areas with contaminated groundwater
- ongoing development and implementation of CEMPs that include measures to prevent groundwater contamination during construction projects
- communication of existing groundwater information and identified sources of contamination to business operators and future developers
- working with relevant government agencies and stakeholders to identify priorities and effective management solutions for all site contaminants.

The completion of large stormwater management projects such as the Steele Creek North harvesting project; installation of a sediment and hydrocarbon trap to protect Moonee Ponds Creek; operating an on-site water treatment plant; and ongoing ground and surface water quality monitoring are all part of this strategy. The airport is building on this information and experience to further improve land and water management over the next strategy.

The ongoing protection and maintenance of groundwater quality at Melbourne Airport is required to ensure compliance and to manage risks. Melbourne Airport undertakes annual groundwater monitoring to inform future management and investigation of groundwater contaminants. The future management actions for groundwater are outlined in the action plan at Table 14-11.

14.4.7 Biodiversity and conservation

We will continue to conserve and improve biodiversity during day-to-day operations and through the upcoming period of airport expansion.

Aspect	Targets
Biodiversity and conservation	No net increase in Melbourne Airport's annual 12-month average wildlife strike rate
	Reduce pest animal impacts on higher value ecological areas through the Implementation of a site-wide Integrated Pest Animal Management Plan
	Maintain and enhance the quality of high value ecological areas through the Implementation of the Ecological Community Management and Improvement Plan and adaptative management

14.4.7.1 Background

The Melbourne Airport site is home to, or is likely to support, threatened ecological communities, threatened species, and migratory species that are defined as Matters of National Environmental Significance (MNES). These MNES are inherently linked. The threatened ecological communities provide habitat for threatened or migratory species.

The site's Grey Box Woodland area is representative of a nationally threatened ecological community (**Figure 14-1**). The woodlands provide suitable foraging habitat for the swift parrot, listed as endangered under Commonwealth legislation.

Areas across the site meet the attributes of National Temperate Grasslands of the Victorian Volcanic Plains which is a nationally critically endangered ecological community. The golden sun moth has also been detected in limited locations east of Sunbury Road and north of the Grey Box Woodland. Targeted surveys for the striped legless lizard have not detected this species across the site for many years.

A range of endangered vegetation types have been mapped in waterways in and around the airport. The growling grass frog (a threatened species) is known to inhabit Moonee Ponds Creek, Deep Creek and Arundel Creek.

Within this sensitive environment, the species and habitat at the airport are subject to a range of existing and potential threats. These include:

- infrastructure development and changes to surrounding land use
- weeds, pest animal invasion and grazing (rabbits, kangaroos and cattle)
- wildlife strikes
- stormwater and drainage run-off and water-quality impacts
- lack of prescribed fire (to aid germination and biodiversity health)
- climate change
- bushfire and wildfire.

The interconnected nature of the ecological values at Melbourne Airport requires an integrated and adaptive management approach.

Melbourne Airport has undertaken numerous ecological studies and assessments since acquiring the lease in 1997. These studies form the basis for the airport's adaptive management approach to its biodiversity assets. This includes pest plant and animal control; fencing; improving water quality and stream health; timing of maintenance works; and regulatory reporting.

In addition, Melbourne Airport implements further measures to minimise impacts to fauna habitats and threatened species. Any proposed development at Melbourne Airport considers biodiversity values.

The Melbourne Airport Environmental Management Plan outlines flora and fauna protection measures to be implemented during routine maintenance, operational and construction activities on-airport.

Building on existing information, detailed assessments are undertaken prior to any development that has the potential to impact on these values. All proposed developments implement measures to minimise impacts to fauna habitats and threatened species or, where appropriate, offset those impacts at another location.

Table 14-13
Action plan for air quality and ground-based noise at Melbourne Airport

Action	Details	Timeframe
1	Explore the use of alternative fuel sources for airside equipment, including examination of electric vehicles, hybrid vehicles and hydrogen options for auxiliary power units	2023
2	Implement the Air Quality Monitoring Program including a review of existing modelling and recommendations for improvement. The plan includes both on and off-site monitoring	Ongoing
3	Continue to adopt fixed electrical ground power units to minimise use of diesel- fuelled auxiliary power units	Ongoing
4	Facilitate discussions with Airservices and other key stakeholders on ways to minimise aircraft taxiing times, idling times and unnecessary aircraft engine usage	Ongoing
5	Ensure CEMPs outline strategies to manage dust, and undertake regular site inspections to ensure dust is appropriately managed	Ongoing
6	Monitor all noise complaints to determine whether there are any particular emerging trends or issues	2-monthly

To date, Melbourne Airport has secured 95 hectares of offset sites managed in southwest Victoria. Moving forward, there is a preference for future projects to include offsets on the airport estate where possible, rather than offsite locations. All ecological offset strategies are created in accordance with relevant statutory requirements and policy.

The conservation and active management of environmentally important areas at the airport is a key priority. This is achieved through continued monitoring programs and assessments implementing offsets where avoiding the impact is unavoidable.

Melbourne Airport implements a tree and vegetation removal procedure on the airport estate whereby any tree or planted vegetation that is required to be removed as part of maintenance or construction works must be offset via a donation into the airport flora replacement fund. These offset payments directly fund a planting program implemented across the estate with a focus on regeneration of riparian areas along Moonee Ponds Creek and Deep Creek. In addition to regeneration planting, Melbourne Airport takes pride in managing the landscape areas surrounding the terminal, forecourt and business park. To ensure planting success landscape design at Melbourne Airport is moving towards a Modern Australian Native Landscape design that incorporates low maintenance and drought resistance plant species.

Melbourne Airport engages with the community to encourage the protection of biodiversity beyond the boundaries of the airport, liaising with neighbouring councils, the Victorian Department of Transport, Parks Victoria, Melbourne Water and community stakeholders. One example of this, is supporting the Conservation Volunteers Program which has been working adjacent to the airport to help preserve the endangered eastern barred bandicoot.

The airport has continued to build its knowledge of the site's biodiversity and conservation values over the period of the previous strategy, having achieved all – or continuing to undertake all – its identified targets. There are specific targets around reducing key threatening processes (pest plants and animals) and implementing a management plan for areas of high environmental value to ensure these areas are improved over the life of this strategy.

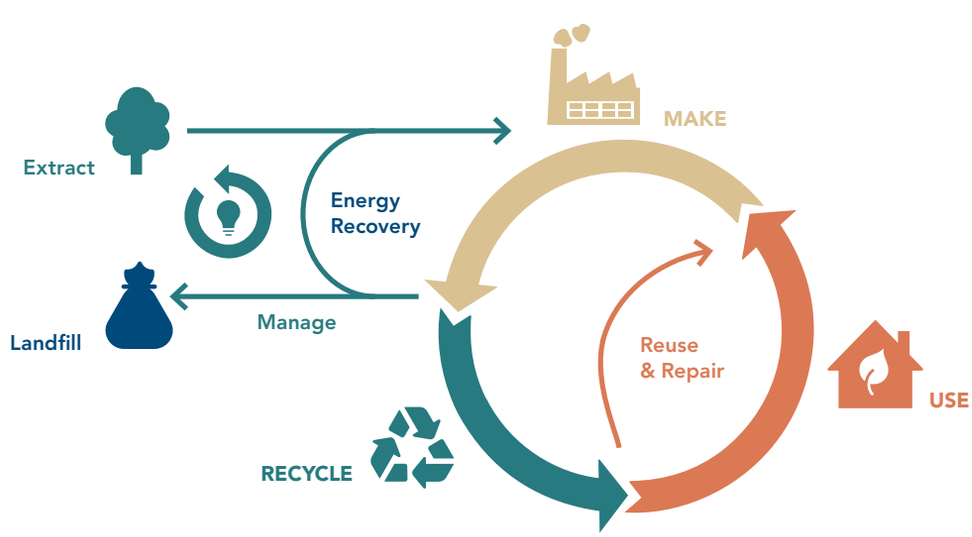
Table 14-12 presents the action plan for biodiversity and conservation at Melbourne Airport. Figure 14-1 shows the ecological values and fauna habitat at Melbourne Airport.

14.4.8
Air quality and ground-based noise

Several activities at the airport have the potential to affect both air quality and ground-based noise. As such, this action plan looks to manage these impacts in an integrated manner.

Aspect	Targets
Air quality and ground-based noise	No exceedances of relevant air quality criteria associated with airport activities
	No complaints from the community regarding ground-based airport noise

Figure 14-14
Alignment of Melbourne Airport's waste objectives to the circular economy principles



14.4.8.1
Background – air quality

Air quality around Melbourne Airport is typically affected by a range of sources and factors outside both the control and the boundary of the airport.

For example, management of bushfires, controlled burns, wind-blown dust and smog from city-wide motor vehicle emissions are beyond the airport's control. In addition, meteorological factors can worsen Melbourne's air quality e.g. recirculating light winds (the 'Melbourne eddy') or wind-blown dust from the Mallee or Wimmera.

Nevertheless, activities within the airport boundary do contribute to Melbourne's air quality; and Melbourne Airport reports annually to the National Pollutant Inventory via EPA Victoria.

Airport activities that can affect air quality include:

- aircraft operating on the ground and at low heights near ground level (less than approximately 900 metres above ground level)
- on-airport road vehicle traffic
- ground support equipment using diesel fuel on the apron
- ground power units and auxiliary (aircraft) power units
- power generation facility emissions related to Melbourne Airport operations and maintenance other than those specifically for flying aircraft (e.g. from boilers, emergency generators and air-conditioners)
- emissions related to fire training operations including dark smoke and the use of firefighting materials
- emissions of hydrocarbons and odours from aircraft and road vehicle refuelling/defuelling, and emissions from fuel storage tanks
- emissions of dust and odours produced during construction works
- ozone-depleting refrigerants used in chillers

Maintaining a sound scientific understanding of the airport's air emissions and air quality will enable adaptive management in the future. Since 2013, Melbourne Airport has been continuously monitoring air quality for pollutants including nitrogen dioxide (NO_2), sulphur dioxide (SO_2), ozone (O_3), carbon monoxide (CO), hydrocarbons, airborne fine particulate matter (PM10 and PM2.5); and for meteorological parameters such as wind speed and direction.

Monitoring is undertaken at two air quality monitoring stations. One station is located immediately south of the existing north-south runway (on-airport) and the second station is located offsite to the east of the airport (West Meadows).

In 2020-21, an air quality impact assessment was undertaken to investigate the effects of ground-based activities on the surrounding environment and compliance with relevant legislation. The assessment was undertaken through extensive modelling primarily to support M3R. When compared with national and Victorian air quality standards, the data shows that key air pollutants do not represent a significant air quality issue for Melbourne Airport.

The most effective mitigation measures for air emissions at Melbourne Airport will be achieved through minimising and improving the efficiency of movements by aircraft, road vehicles and ground support equipment; and advances in aircraft technology and emissions management. Efficiencies can be gained through switching to higher quality fossil fuels or replacing existing vehicles with electric or hybrid versions, resulting in lower emissions and better local air quality.

Table 14-14
Action plan for waste management at Melbourne Airport

Action	Details	Timeframe
1	Ensure any future APAM waste management procurement process includes strong consideration of on-site organics processing, compostable food court materials and elimination of single use plastics	2022
2	Collaborate with Melbourne Airport business partners and tenants to identify opportunities for engaging in circular economy activities (e.g. reuse of compostable waste, recycled water from the treatment plant)	Ongoing
3	Conduct regular tenant inspections to ensure appropriate waste management systems are in place.	Ongoing
4	Continue to ensure that waste management and resource recovery are considered through development proposals for both construction and operational phases	Ongoing
5	Ensure tenants include waste management and resource recovery in their OEMP	Ongoing
6	Finalise Biosecurity Risk Management Plan	2023
7	Mandate use of an organics waste stream in terminals.	2022

In line with the EMS, air quality management procedures are outlined in CEMPs, OEMPs and Permit to Commence Work conditions that minimise emissions of dust, odour and other air pollutants.

14.4.8.2 Background – ground-based noise

Airport noise is attributed to either air or ground-based noise sources. Air-based noise generated by aircraft during flight, taxiing, landing and take-off is regulated by Airservices. Although air-based noise tends to have a more significant impact on surrounding areas than ground-based noise, this action plan focuses on Melbourne Airport's ground-based noise sources with the potential to adversely affect the local community.

Ground-based noise sources at Melbourne Airport include:

- aircraft ground movements
- aircraft maintenance and testing including engine ground running
- fixed and mobile plant and equipment (e.g. power generation facilities and ground support equipment such as tow vehicles and fuel trucks)
- construction and demolition noise
- infrastructure maintenance
- road traffic noise from vehicles on the Melbourne Airport site (public and airport vehicles).

Melbourne Airport receives very few ground-based noise complaints and has never experienced a serious incident related to noise emissions generated by ground-based operations.

Further, Melbourne Airport has a specific policy in relation to ground running of aircraft (Melbourne Airport Operational Safety Policy: Ground Running of Aircraft, March 2015) that is used by airlines and maintenance staff. This policy specifies locations and procedures where aircraft ground running can be undertaken.

Melbourne Airport also conducts noise monitoring and manages the environmental impact in relation to ground-based noise sources by:

- monitoring all noise complaints monthly to identify any emerging trends or issues
- managing and responding to any noise complaints received by Airservices in accordance with the airport's EMS procedures.

Melbourne Airport will plan for the potential increase in ground-based noise sources as the airport continues to grow. Noise management measures will be integrated into airport operations and procedures when planning for new development.

Table 14-13 presents the action plan for air quality and ground-based noise at Melbourne Airport.

14.4.9 Waste management

Under this action plan, Melbourne Airport will take a leadership role in ensuring tenants and operators contribute to improvements in waste management and identify further opportunities to implement on-site circular economy activities.

Aspect	Targets
Waste management	Achieve 80% diversion of construction waste from landfill
	Increase total volume of quarantine waste being diverted from deep burial
	Identify and implement opportunities to develop circular economy projects across the airport estate
	60% terminal waste diversion rate from landfill by end of FY24.
	Zero terminal food waste to landfill by end of 2025.

14.4.9.1 Background

Melbourne Airport supports Victoria Government's 10-year circular economy policy and action plan, *Recycling Victoria: a new economy*, by exploring opportunities for holistic waste management and resource recovery among both its own waste generating activities and especially across those of airlines, tenants and on-site operators.

APAM, airlines and on-site operators generate at least 13,000 tonnes of solid waste every year. However, only about 20 per cent of the total waste stream is under APAM's direct control.

Waste is generated by Melbourne Airport and operators (including tenants, airlines, retailers, ground handlers, maintenance, engineering, catering companies, construction and development). Due to the variety of contributors, waste streams are wide ranging and include industrial wastes, priority wastes and reportable priority wastes both solid and liquid (as described by the Victorian *Environment Protection Act 2017*), quarantine waste, foreign object debris, organic waste (food and vegetation), paper, cardboard, and food and beverage containers. Ad-hoc waste types include scrap metal, construction and demolition waste, concrete and asphalt, electronics and computers, furniture, office fittings, and unclaimed baggage.

Due to the nature of airport operations there are a number of potential waste-related issues:

- inconsistent solid waste disposal by Melbourne Airport operators, contractors and tenants
- inappropriate storage of waste oils, chemicals and other hazardous waste materials

- limited options and regulatory restrictions for the recycling and re-use of certain waste streams
- wastewater run-off from airport operations such as aircraft and vehicle wash down
- generation of waste in an environment where many products must be used once and then disposed of due to biosecurity requirements
- illegal dumping of waste.

Waste management has transformed in the past decade as the cost of raw material and waste disposal has increased. There is now an increasing awareness of the embedded, life-cycle impacts of materials associated with their extraction, transport, use and ultimately disposal.

The airport recognises that waste processes need to be effectively managed to reduce negative impacts. In 2016, Melbourne Airport appointed a single operator to collect all waste streams across the site subject to APAM's operational control. This has resulted in improved waste management efficiencies and cost savings.

Melbourne Airport monitors contractor, operator and tenant performance as part of operational environmental management plan compliance, including review of waste tracking documentation where appropriate.

Melbourne Airport's Waste Minimisation and Environmental Policies document the airport's commitment to reducing the quantity of waste generated and the associated costs of managing that waste. The policy covers all airport operations and applies to all individuals, employees and contractors conducting business activities at the airport.

Under these policies, waste management is guided by circular economy principles that seek to maintain the value from resources used to create goods and services by good design and effective recovery of materials. This is a shift from a linear mindset to one of a circular flow of resources as shown in **Figure 14-14**.

There are limited on-site options for the management and treatment of most waste streams. However, a significant amount of construction waste (soil, concrete, asphalt) is recycled and re-used on site, as is waste vegetation as mulch. Quarantine waste (material from overseas posing a potential biohazard threat to Australia) must be securely contained not only on site at Melbourne Airport but also during transport to approved disposal facilities.

Melbourne Airport applies on-site waste minimisation and management practices across all airport-managed facilities by instigating new policies and procedures, and encouraging accountability and efficiency. The reduction in the amount of waste being disposed to landfill is a priority for the airport in order to minimise environmental impacts.

Over the next five years, construction and demolition waste will be generated including a range of waste from surplus or off-cut construction materials and clearing, and the demolition of existing infrastructure. This development and its associated waste generation presents an opportunity to explore alternative management practices for these waste streams.Its waste management action plan will help ensure that Melbourne Airport continues to improve waste management practices.

Table 14-14 presents the action plan for waste management at Melbourne Airport.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