# CANBERRA AIRPORT
# WATER MANAGEMENT PLAN

JUNE 2021

CANBERRA
AIRPORT

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# 1 Introduction

This revision of the Water Management Plan complies with the Canberra Airport 2020 Master Plan and Environment Strategy, approved by the Minister in February 2020.

Implementation of the Water Management Plan will be monitored and reported upon in Canberra Airport's Annual Environment Report which is submitted to the Department of Infrastructure, Transport, Regional Development and Communications. The Plan will be reviewed every eight (8) years in line with the regulatory requirement for Canberra Airport to submit a renewed Master Plan and Environment Strategy.

Canberra Airport is located in a catchment which has since the 1950s been highly disturbed over time with land clearing, cultivation and pasture improvements as well as through the installation of swales and contour banks, to divert water around the main Airport runway. The development of sediment control and stormwater detention structures to minimise sediment reaching Lake Burley Griffin and to mitigate inundation of the Airport's runway and taxiway system has also occurred over a significant period of time.

The majority of stormwater at Canberra Airport is collected in a network of open and closed drains before being discharged to Woolshed Creek, Pialligo Brook, and off-site via drains to the Molonglo River. Modifications in 2006 diverted stormwater flows more to the Molonglo River and to minimise stormwater entering Pialligo Village. All flows ultimately drain to Lake Burley Griffin.

Construction projects might reasonably be expected to have short term impacts on stormwater flows. Such impacts will be dealt with and managed through construction environmental management plans (CEMP's).

Stormwater flows may also change due to increased areas of impervious surfaces and due to the diversion of stormwater around and through developments. All developments, where such changes are regarded as likely, will be designed in accordance with the relevant Australian Standards.

Quality control measures for stormwater in place at Canberra Airport include designs to reduce the velocity of stormwater flow, allowing for the natural filtration of sediments, catchment released metals, and nutrients. Reducing the flow rate also controls erosion and promotes infiltration and groundwater recharge, which is beneficial for the overall catchment.

Furthermore, Standard Operating Procedures (SOPs) and comprehensive incident reporting procedures are also in place to mitigate any fuel or hazardous substances loss and outline subsequent clean-up procedures.

Canberra Airport will continue to work closely with the ACT Government and other neighbours to appropriately manage stormwater flows upstream and downstream of the Airport site.

# 2 Statutory Requirements

The key legislation controlling water management at Canberra Airport are the:

- *Airports Act 1996*
- *Airports (Environmental Protection) Regulations 1997*
- *PFAS NEMP 2.0 (2020) or as amended*

This legislation is supplemented by provisions in the *National Environment Protection Council Act 1994 (as amended)*.

## 2.1 Airports Act 1996 *(as amended)*

The *Airports Act 1996,* following amendment in 2018, requires the operator of Canberra Airport to now prepare an Airport Master Plan and Environment Strategy every eight (8) years following approval of the 2020 Master Plan in February 2020.

## 2.2 Airports (Environment Protection) Regulations 1997

The *Airports (Environment Protection) Regulations 1997* (the *Regulations*), in conjunction with National Environment Protection Measures, made under Section 14 of the *National Environment Protection Council Act 1994*, establish a Commonwealth system of regulation and accountability for activities at airports that generate or have the potential to generate pollution, including excessive noise. *The Regulations* also promote the improvement of environmental management practices for activities carried out at airport sites.

The *Regulations* set out provisions for potential major sources of environmental impact, including air, water and soil pollution and excessive noise. Specifically, *the Regulations* include detail on:

- Duties of "operators of undertakings" at airports
- Local standards and individual authorisations
- Monitoring, reporting and remedial action; and
- Enforcement.

Importantly, Part 4: Duties of operators of undertakings at airports states that**:**

> 4.01: General duty to avoid polluting
>
> *(1) The operator of an undertaking at an airport must take all reasonable and practicable measures:*
>
> *(a) to prevent the generation of pollution from the undertaking; or*
>
> *(b) if prevention is not reasonable or practicable – to minimise the generation of pollution from the undertaking.*

Noting Canberra Airport's natural exceedances of the standards in Schedule 2 of the *Regulations* from upstream in the catchment, it has been agreed that Canberra Airport's stormwater monitoring program and management will be based around compliance under *Regulation 4.01*.

## 2.3 Reasonable and Practicable Measures

The former Department of Infrastructure, Transport, Regional Development and Local Government, in consultation with Canberra Airport, identified Part 4 Section 4.01: General duty to avoid polluting as the most appropriate measure to demonstrate compliance under the *Regulations.*

Section 4.01 (2) states that:

*a) The considerations that determine whether a measure is reasonable and practicable include:*

*b) The sensitivity of the receiving environment to pollution that the undertaking is capable of generating; and*

*c) The nature of harm that pollution that the undertaking is capable of generating will cause, or has potential to cause; and*

*d) The current state of technical knowledge about preventing, or minimising, pollution being generated from an undertaking of the kind being operated; and*

*e) All measures that might practicable be used to prevent or minimise the pollution, and the probably benefits and detriment (if any) that should be expected from the implementation of each measure.*

Canberra Airport uses the following steps to demonstrate compliance with the *Regulations*:

- List of existing quality control measures;
- Identify analytes that are in exceedance of Schedule 2 of *the Regulations* and identifying what might cause these exceedances;
- Investigate if the current quality control measures are sufficient or reasonable and practicable to mitigate any negative effect on water quality;
- Install additional quality control measures, if required; and
- ongoing monitoring to demonstrate improvements in water quality due to modified and enhanced quality control measures.

## 2.4 Roles and Responsibilities

Pursuant to the Airports Act statutory regime and the Airport's Lease, the Airport Lessee Company (ALC) is responsible for the environmental performance of the Airport.

Since Canberra Airport became the ALC in May 1998 it has developed environment strategies, management plans and standard operation procedures to provide a framework within which to develop and operate the Airport's environment in compliance with all Commonwealth legislation including those set out above in this section.

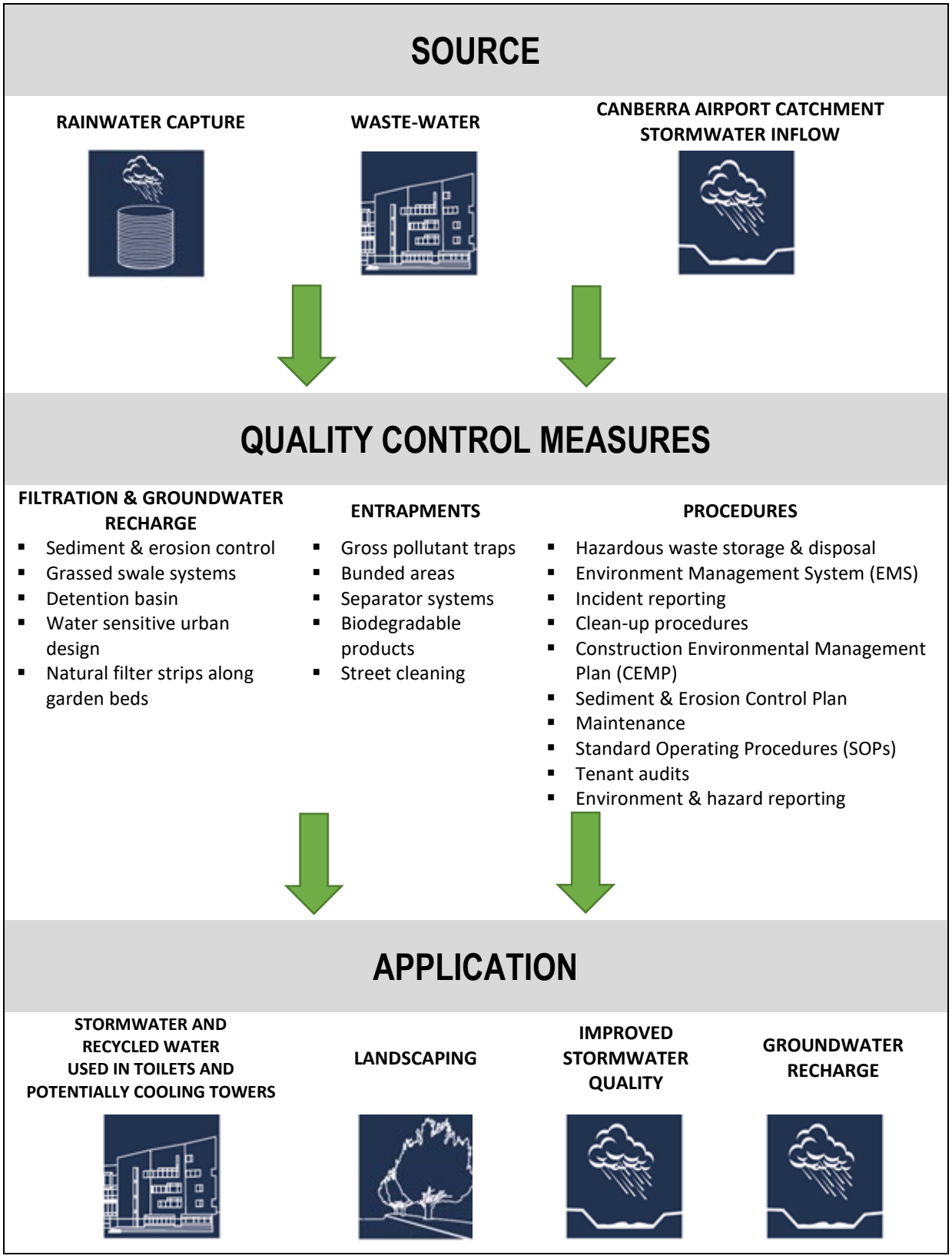
As set out in Section 1, this Water Management Plan complies with the Canberra Airport 2020 Master Plan and Environment Strategy, approved by the Minister in February 2020 and replaces the 2016 Water Management Plan based on increased knowledge and the Airport's objective of continuing improvement.

In its role as the ALC, Canberra Airport will continue to manage the Airport's water environment in consultation with the Airport Environment Officer. All major environmental pollution incidents will be managed after reaching agreement with the AEO and tenant on a reasonable and practical scope of works and timeframe to make good.

## 2.5 Summary of Canberra Airport's water-cycle objectives and initiatives

Figure 1 summarises the following sections of this Water Management Plan which outline Canberra Airport's water-cycle objectives and initiatives to mitigate water pollution and reduce demand per capita for potable supply. The continuous movement of water is harnessed from precipitation, groundwater and wastewater to provide recycled water supply for toilet flushing, while hardstand passive design facilitates runoff to landscape reducing demand for irrigation while activating social benefit outcomes of the landscape beauty providing coolness in the precinct and mitigating evapotranspiration. The passive design initiatives also deliver a replenishment cycle to groundwater by infiltration from the detention basin and open vegetated swale system.

**Figure 1: Canberra Airport Water Recycling and Reuse**



# 3 Objectives and Principles

The objectives of this Water Management Plan are to:

- Demonstrate that Canberra Airport undertakes all reasonable and practicable measures to manage the quality of stormwater, groundwater and recycled water on Canberra Airport;
- Outline ongoing and new actions by Canberra Airport to manage the quality of stormwater, groundwater and recycled water on Canberra Airport;
- Mitigate the use of potable water; and
- Comply with obligations prescribed under relevant legislation.

Our Water Management principles are to:

- Work in partnership with land managers of upstream inflows to maintain or improve the quality of stormwater flows into and from Canberra Airport;
- Provide upstream and onsite detention mechanisms to manage any increased rain event peak flows arising from new Airport development;
- Create the opportunity to irrigate landscape from rain events;
- Harness rain events wherever feasible to recharge groundwater aquifers;
- Undertake monitoring of surface water quality each season and, as required, groundwater quality to measure the effectiveness of management programs over time;
- Review management programs in response to monitoring outcomes and evolving best practice;
- Minimise potable water consumption per capita and comply with water restrictions;
- Investigate reuse opportunities of groundwater encountered in building basements;
- Use rainwater for re-use in buildings and for irrigation;
- Improve the management of waste-water, including the installation of waste-water recycling plants; and
- Expand initiatives relating to Water Sensitive Urban Design.

# 4 Catchments

Canberra Airport is situated in the Murrumbidgee catchment, within three sub-catchments, including two catchments with upstream inflows (refer Figure 2) with a total area of over 1,000 hectares.

Modification of the Airport catchments over the past 90 years has included the installation of contour banks to divert water around the main Airport runway in the 1930's, the development of sediment control structures since the 1950's to minimise sediment reaching Lake Burley Griffin and the protection of runway 17/35 system expansions in the 1940s, 1950s 1970s, 2006 and 2019/20. There are no permanent streams in the immediate upstream catchments that flow into and through the Airport. Water flows are induced by rain events that create catchment surface runoff.

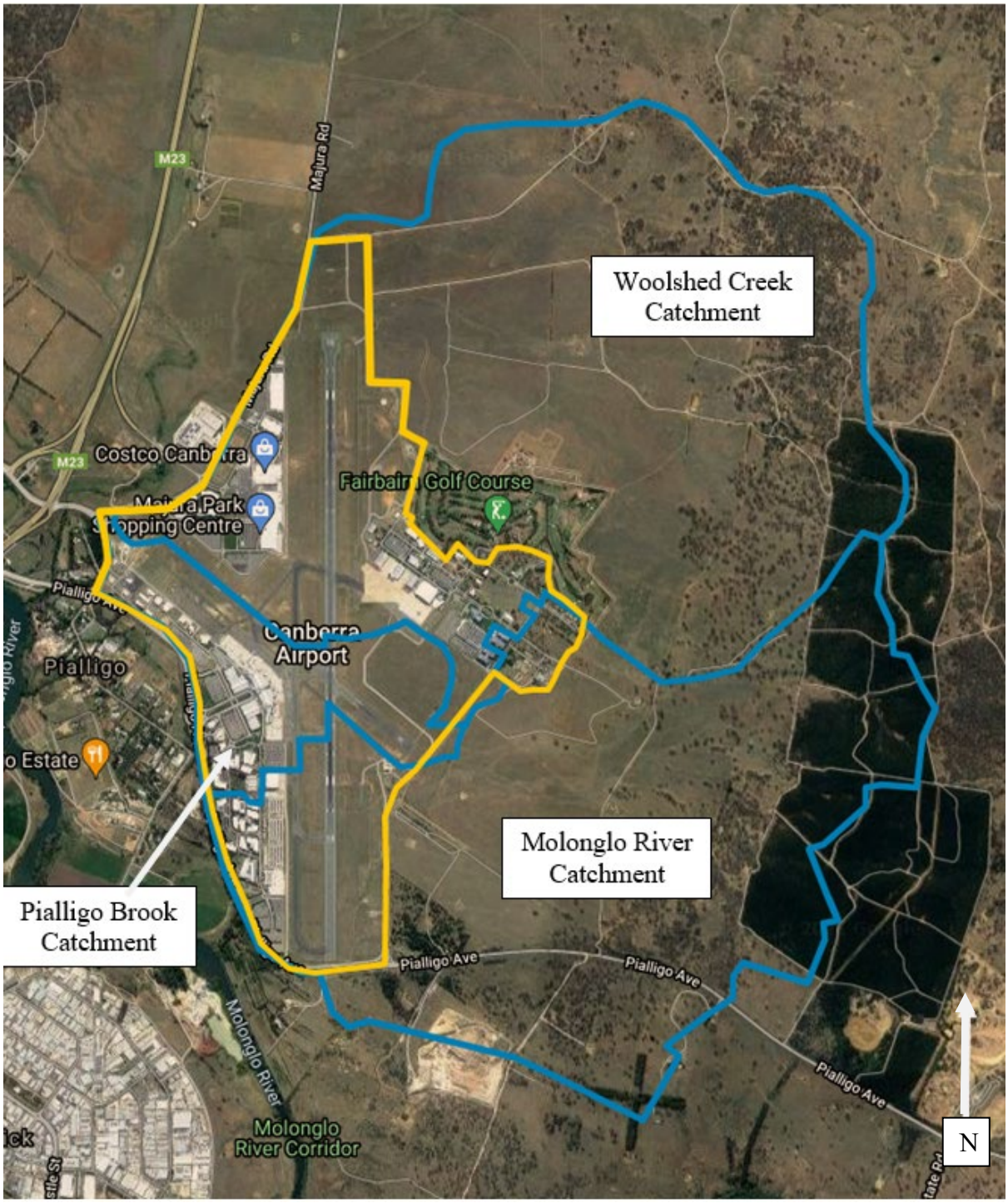
These changes have influenced the total flow and pattern of runoff in the Majura Valley adjoining and within the Airport boundary and have impacted flow rates in the major drainage lines to the Molonglo River and Woolshed Creek.

Historically, agricultural and horticultural land uses surrounded drainage lines upstream of the Airport boundary. Grazing of kangaroos, stock and horses in the upper catchment has at times resulted in sparse ground cover and droppings have been washed directly into the Airport's stormwater during storm events. Also, the addition of superphosphate, lime and nutrient application on upstream farms over the past 60 years has resulted in the release of metals from the soil and excess nutrients being washed down from the catchment.

In keeping with total catchment management principles, the Airport has worked in partnership with upstream users to provide detention mechanisms in order to minimise the impact of increased overland flows. This upper catchment flow management also acknowledges the need to control the water quality of inflows to the Airport.

The majority of stormwater at the Airport is collected in a network design of mainly open grass swales with some closed drains and detention basins, before being discharged to Woolshed Creek, Pialligo Brook or to the Molonglo River. All flows ultimately drain into Lake Burley Griffin.

**Figure 2: Canberra Airport Catchments in blue - Canberra Airport lease boundary in yellow**



## 4.1 Woolshed Creek Catchment

The Woolshed Creek Catchment is the largest catchment area and includes the northern part of the Airport as shown in Figure 2. Known upstream land uses include forestry, the Fairbairn Golf Course (irrigated and fertilised exotic grasses) and the Majura Military Training Area. The upper catchment was previously used for grazing and farming which included over 50 years of superphosphate application to exotic pastures. On-Airport activities to the east of Runway 17/35 and incorporated within this catchment include Fairbairn. Operations in Fairbairn include the former RAAF Service Station and Fuel Farm. Both of these facilities had been decommissioned by 2010. The Airservices Australia Aviation Rescue and Fire Fighting Service (ARFFS) Fire Station is located south of Fairbairn and the Fire Training Ground is located to the north. Works to reduce PFAS pollution on both these sites by Airservices Australia is yet to commence.

## 4.2 Molonglo River Catchment

The Molonglo River Catchment sees water flows entering the southern portion of the Airport from the east. The main upstream land uses include farming, grazing and forestry, the Pialligo concrete recycling and landfill site, as well as some elements of Fairbairn including as the Airservices Australia Aviation Rescue and Fire Fighting (ARFF) Fire Station.

## 4.3 Pialligo Brook Catchment

The Pialligo Brook Catchment is entirely contained within the Airport site and encompasses the passenger terminal facility, the General Aviation precinct, the former and new aviation fuel depot, a service station, part of the runway system, part of Fairbairn Eastern Grassland and the northern part of Brindabella Business Park. Much of the general operational activity of the Airport around the Terminal precinct, including all manner of aviation operations, maintenance and handling is incorporated within this catchment.

# 5 Water Quality Control Measures

The quality control measures at Canberra Airport are designed to reduce the velocity of stormwater flow allowing for the natural filtration of sediments, catchment metals and nutrients. In addition, measures to ensure the mitigation of any fuel or hazardous substances loss, comprehensive incident reporting and clean-up Standard Operating Procedures (SOPs) are in place to ensure stormwater quality.

Canberra Airport incorporates a number of water quality control measures in the design of new buildings and infrastructure. A number of structural and natural treatments have been applied to ensure there is no negative impact on stormwater quality exiting the Airport. The principles and practices used to manage stormwater quality exiting Canberra Airport are discussed in the following sections.

## 5.1 Grassed Swales and Detention Basins

Grassed swale systems and detention basins have been constructed upstream of and across the Airport to manage stormwater flow and quality. Grassed systems maintain the hydrological balance by using natural processes of storage, infiltration, evaporation and filtration of sediment.

Grassed swales are located in the vicinity of the runways and taxiways and between buildings and infrastructure. Reeds in open swales are also used throughout the Airport as a natural filtration device. The swales are designed to reduce the velocity of stormwater flow allowing for the natural filtration of sediments, catchment metals and nutrients. Reducing the flow rate also controls erosion and promotes infiltration and groundwater recharge, which is beneficial to the overall groundwater catchment.

Grassed detention basins have also been constructed to manage peak flows, filter sediment, metals and nutrients. Detention basins are located across and upstream of the Airport.

## 5.2 Stormwater Detention Basins

Innovative stormwater detention basins such as car parks, sporting fields, landscaped areas and ponds are incorporated at the design stage of new buildings and infrastructure. They allow for stormwater capture, thereby reducing peak stormwater outflow. By incorporating water sensitive urban design principles into the landscaping, the excess stormwater is redirected to garden beds and ovals to facilitate natural irrigation, groundwater recharge and to reduce stormwater outflow and flooding.

## 5.3 Water Sensitive Urban Design

Landscaping design includes the contouring of concrete paths and patios towards garden beds, which have a finished level below the footpath and stormwater inlets. This allows the concrete footpaths to be washed by the rain and the runoff to be directed towards the garden beds and away from stormwater drains. Gravel is also placed at the edge of paved paths to allow infiltration of excess runoff and large grassed areas are contoured for optimal stormwater infiltration.

**Grassed swales under Pialligo Avenue at the south of the Airport**

## 5.4 Construction

Prior to the commencement of any major construction works, a Site-Specific Construction and Environmental Management Plan (CEMP), including a Sediment and Erosion Control Plan, as agreed by the Airport Environment Officer, must be implemented. The Sediment and Erosion Control Plan details erosion control measures such as sediment fences, hay or straw bales, geotextile matting and sediment detention ponds as appropriate consistent with best practice guidelines. Where possible, any soil removed is relocated to a dedicated stockpile within the Airport boundary or used on-Airport for contour levelling as required or off-site as per the waste classification recommendations.

Contractors are also required to provide a vehicle shakedown area at the construction zone perimeter to minimise the accumulation of dirt and mud on roads. If deemed necessary by the Airport, the contractor will also regularly maintain the shakedown area to ensure that excessive build up of sediment does not impede the effectiveness of the area.

Stormwater sediment control devices and stormwater quality is inspected after adequate rainfall events by Airport staff. Additional sediment control devices are added when necessary. Contractors are also required to ensure sediment control devices are sufficient and to inspect stormwater after rainfall events that cause runoff.

If stormwater accumulates on a construction site, the Airport Environment Team is consulted prior to any water being pumped into the stormwater system. An Airport Environmental representative will then test the turbidity of the collected water before providing approval (or otherwise) to pump the accumulated water to stormwater or nearby grassed areas.

## 5.5 Gross Pollutant Traps

Gross pollutant traps are designed to trap coarse pollutants in stormwater and can be installed on drain entrances, outfalls, open channels or underground pipe systems. Gross pollutant traps are located each side of the Terminal building to prevent any debris from entering Pialligo Brook and the Molonglo River. Gross pollutant traps are cleaned and maintained on a regular basis.

## 5.6 Separator Systems

Separator systems are used to separate solids, oil and grease from water so that the water can be discharged to sewer or reused. Separator systems are used to collect any spillage from refuelling or servicing of vehicles or aircraft. Canberra Airport requires that tenants service their separator systems and grease traps on a regular basis and that they notify Airport staff of any incidents that arise. Service records will be reviewed to ensure maintenance agreements remain in place and services are performed in accordance with the manufacturer's recommendations.

## 5.7 Bunded Areas

All tenants on Canberra Airport are required to have appropriate bunded areas in accordance with the current relevant standard for the storage of fuel and chemicals and for vehicle and equipment maintenance. During construction works, fuel and chemicals are not to be stored on site unless in an approved bunded area. If a spillage does occur, cleanup methods appropriate for the specific incident are employed, as detailed in the Airport's Standard Operating Procedures, and the incident is reported to the Airport Environment Team.

## 5.8 Incident reporting and clean-up procedures

Canberra Airport encourages its staff and contractors to maintain ongoing vigilance of aircraft and Ground Service Equipment (GSE). Airport staff are required to report any environmental issues, including hazards and/or incidents, to the relevant Airport staff. Similar surveillance is encouraged of Airport operations staff and tenants to maintain equipment and to report potential environmental incidents.

All airside vehicles are required to provide proof of annual documented maintenance checks. This continues to have a positive impact on reducing oil, fuel and hydraulic fuel spills from GSE and vehicles.

An Environmental Incident Report form is to be completed in the event of an Environmental Incident on-Airport. These are received by Airport staff who manage the investigation and appropriate response, as well as being documented in the Airport's Incident Reporting Database (established as part of the Airport's Environment Management System).

## 5.9 Biodegradable Products

Canberra Airport and its tenants actively investigate non-hazardous product substitution and replace hazardous products where practicable. The majority of substitutions have been for products used for office and vehicle cleaning.

## 5.10 Hazardous Waste & Safety Data Sheets

Canberra Airport and its high-risk tenants maintain up-to-date Safety Data Sheet (SDS) Registers. Medium risk tenants who use a small amount of chemicals do not require a formal SDS Register, however, they are required to have Safety Data Sheets clearly labelled on storage containers.

Tenants and contractors are responsible for the disposal and storage of Hazardous Waste and having appropriate Hazardous Waste Storage and Disposal Procedures in place. Regular tenant environmental audits ensure that appropriate procedures are in place.

## 5.11 Landscaping

Landscape contractors and staff at Canberra Airport test soil nutrient concentrations to achieve optimum fertilisation levels. Chemical fertilisers have been replaced where possible with synthetic fertilisers, such as Deep Green (lawn fertilisers) and Nutrocote (garden fertiliser). Organic fertilisers, such as Seasol (tonic) and Power Feed (liquid fertiliser), are used when establishing newly planted trees and shrubs. Lawns are aerated regularly to improve water absorption and to minimise runoff.P

Garden beds are generally designed to capture nearby hard surface runoff and to be below the inverted level of stormwater ingress. This results in better irrigation of garden beds from rain events and detains stormwater flows.

## 5.12 Maintenance schedule

Stormwater systems need to be maintained to ensure excessive build-up of sediment and debris does not occur. Drainage maintenance at the Airport includes inspection, cleaning and repairing of open and piped drains, pits and gross pollutant traps. Tenants must also have signed maintenance agreements to service their separator systems as per the manufacturer's recommendations.

## 5.13 Street Cleaning

Roads, car parks and footpaths are major areas of pollutant accumulation, which may include street sediment, litter and vegetation. The primary purpose of street cleaning is to maintain attractive streetscapes; although there are also benefits for stormwater quality.

Canberra Airport owns and operates a waterless vacuum sweeper truck that reduces the accumulation of litter, dirt and vegetation from roads and footpaths. Maintenance at the Airport is ongoing and cleaning occurs on a daily basis.

## 5.14 Water Restrictions

Canberra Airport's Planning and Environment Team works together with landscapers, contractors, tenants and plumbers to ensure that the Airport remains compliant with any Water Restrictions when Water Restrictions are in force. Icon Water has permanent water conservation measures in place and Canberra Airport is compliant with these measures.

## 5.15 Water Conservation

Canberra Airport is a leader in water use and has led a dedicated campaign to reduce water use across the Airport and to educate other water users across the ACT to better use our precious water resources.

Our aim is to progressively reduce water use to an absolute minimum through a multi-targeted approach across the Airport. Canberra Airport already far exceeds any current water standards or requirements.

A number of water conservation measures have been implemented to decrease the use of water in the external environment. Canberra Airport's water conservation initiatives include:

- Garden beds are re-mulched on a regular basis;
- Wetting agents are used to aid with water penetration and to minimise water loss;
- Water storage crystals in garden beds are used to better utilise rainwater and runoff;
- Garden beds are weeded regularly to reduce competition with landscape plants for water;
- Lawns are regularly aerated to improve water absorption;
- Rubber stabilisers are used on high traffic lawns to reduce the need for lawn re-establishment;
- Drip watering systems are used in garden beds;
- Sub-surface irrigation in lawn areas is introduced outside of some newer buildings to eliminate evaporation in the watering process;
- Rainwater is harvested;
- Water efficient cooling towers;
- Reduced flow shower heads;
- Waterless urinals;
- Building management systems are designed to detect active water leaks; and
- Licensed plumbers are employed to attend to all water leaks.

## 5.16 Artificial Grass

In small areas artificial grass is used as it does not require watering, stays green all-year and does not require mowing, thereby saving on labour costs. Canberra Airport is testing small patches of artificial grass throughout the Airport.

## 5.17 Irrigation

At Canberra Airport, all external water is drawn from water recycling, rainwater tanks and groundwater. When recycled and rainwater resources are depleted or unavailable, Canberra Airport uses non-potable groundwater for uses which do not involve drinking or showering, further reducing our reliance on potable water supplies.

Drip systems are used in the garden beds and sub-surface irrigation in lawn areas has been introduced outside some of the newer buildings, eliminating evaporation in the watering process. Sub-surface irrigation is estimated to reduce water use in irrigation by approximately 30-40%.

## 5.18 Site Water Utilisation/Stormwater

Grassed stormwater swales and detention basins are used to reduce urban runoff and provide a natural filtration and groundwater recharge system. Innovative stormwater detention basins such as car parks, sporting fields and ponds are incorporated during the design stage of new buildings and infrastructure. Grassed swales and reeds are used to slow down stormwater flow that controls erosion and reduces sediments entering the natural waterways. Slowing down the stormwater flow also reduces flooding and increases moisture in the soil, which reduces the need for irrigation.


**Concrete to decrease turbidity and rocky landscape treatment to clean water from adjoining land uses**

## 5.19 Planting Design

Plantings have been designed to provide maximum amenity in the form of controlled sun and shade whilst also minimising water use. Plant species are selected for both appearance and drought resistance to reduce water requirements while mitigating bird and wildlife attraction.

# 6 Water Quality Control Measures

Stormwater control measures that have been implemented by Canberra Airport include:

- Detention basin and swale systems;
- Water sensitive urban design;
- Gross pollutant traps; and
- Water diversion banks

These innovative measures are described below.

## 6.1 Detention Basin and Swale Systems

Reduction of stormwater flow higher up in the catchment through the use of detention basins and grassed swale systems reduces the risk of overland flow across runways and provides water filtration and infiltration opportunities. Farming practices in the upper catchment has ceased; however residual superphosphate and other nutrients in the soil have impacted the stormwater quality entering the Airport.

The construction of detention basins south of the golf course and the modification of an existing farm dam to a detention basin north-east of the main runway will decrease flow rates and allow for enhanced filtration and infiltration of nutrients and sediment upper in the catchment.

Additional detention basins and grassed swale systems will be incorporated into Airport planning as and when required.

**Stormwater Detention Basin at 2 Brindabella Circuit to settle and clean water through natural aeration**

## 6.2 Water Sensitive Urban Design

Water sensitive urban design is integrated in the landscape design of new buildings around the Airport. Where practicable, overland stormwater flows are diverted to garden beds, detention basins and grassed swale systems to assist in groundwater recharge and to provide a natural filtration system for stormwater leaving the Airport.

## 6.3 Water Diversion Banks

The Airport has an agreement with the adjoining upstream Fairbairn Golf Course and the Department of Defence to clean and maintain the water diversion banks to the east of the Airport. These banks divert water from Fairbairn to the north of the main runway and into the grassed swale system to the west of Majura Park and/or south before leaving the Airport. A new detention basin and grassed swale system is planned for when the Northern Road is developed.

# 7 Soil / Water Quality and Monitoring

Airport operations may impact soil and water quality, especially at sensitive sites where substances are located.

## 7.1 Soil and Groundwater

Canberra Airport was privatised in 1998. Over the intervening years, a number of aviation-related and industrial activities undertaken at the Airport have been identified as potential or actual sources of soil contamination such as: fuel storage and transfer facilities; aircraft maintenance facilities; chemical and other hazmat storage; underground storage tanks; vehicle maintenance and washing; spills from aircraft and vehicles; and landscaping.

The potential for soil contamination is mitigated at Canberra Airport by applying appropriate management measures such as:

- Installing and maintaining separator systems and pollutant traps;
- Ensuring SDS Registers are up to date;
- Providing appropriate hazardous waste storage facilities;
- Implementing standard incident reporting and clean-up procedures;
- Providing staff and tenant education;
- Maintaining a stockpile register for all stockpile sites on Airport - Gate 8 and Gate 2A - including signage of where the soil came from, the date when it was moved and the $m^2$ quantity of soil;
- Documenting vehicle maintenance checks;
- Removing contamination sources and remediating sites; and
- Maintaining the Canberra Airport Contaminated Sites Register.

In addition to mechanical systems, sites that have the potential to become contaminated have groundwater monitoring wells installed as early detection mechanisms for groundwater contamination.

Management of contaminated sites at the Airport is based on the following principles:

- Preventing contamination of soil and groundwater;
- Identifying, recording and assessing potential of known contaminated sites; and
- Managing and where appropriate, remediating contaminated sites to a level unlikely to pose a risk to human health and the environment, in consultation with the Airport Environment Officer (AEO).

The prevention of contamination is achieved through a range of activities including:

- Lease clauses – all leases incorporate strict clauses concerning environmental performance. For example, all higher risk sites (such as service stations) are required to have groundwater monitoring bores from which baseline data is collected prior to the commencement of operation;
- Development control – all development on the Airport is subject to assessment and Development Approvals (including Major Development Plans - MDP). The Development Approvals include conditions that reduce the risk of potential contaminating activities associated with the construction and operation of the proposed development;
- Audits and inspections – Airport staff and the AEO inspect and assess all tenant sites upon the expiry of their lease or on a proposed change of land use. If there is any reason to suspect soil contamination may have occurred during a tenant's occupancy, a site assessment may be required; and
- Environmental audits and site inspections, which allow for regular inspection and assessment of all sites at the Airport.

A procedure has also been developed for investigating unoccupied sites that are being proposed for use. In this case Canberra Airport and the proponent agree on the scope of a pre-occupancy contamination investigation for the proposed site. The results of the pre-occupancy investigation can then be compared with the results of a post-occupancy contamination investigation (performed by the tenant if required) at the end of their lease period. By implementing this procedure, any contamination caused by the tenant during the lease period will be detected.

## 7.2 Per- and poly-fluoroalkyl substances, or "PFAS"

Current evidence available to Canberra Airport confirms that the Fire Station and Fire Training Ground sites leased by Airservices Australia (ASA) are the only two PFAS "hot spots" on the Airport.

ASA has informed Canberra Airport that Aqueous Film Forming Foam (AFFF) containing PFAS was used at their two facilities and generally in their aviation rescue and fire-fighting duties around the Airport between 1978 and 2010. Canberra Airport's research and site investigation reveals AFFF containing PFAS is the only significant use of PFAS on the Airport.

Canberra Airport has undertaken soil, stormwater and groundwater research and investigation for PFAS on sites across the Airport external to the ASA Fire Station and Fire Training Ground. The soil test sites include the former aviation fuel farm (now car park five), George Tyson Drive, the Qantas Hangar, Brindabella Circuit and generally in Fairbairn, the Terminal precinct, Brindabella and Majura Parks and north of Taxiway Delta, airside.

The widespread investigations by Canberra Airport have also identified other areas at the Airport where traces of PFAS have been detected at nominal levels in soil and with low levels in stormwater and groundwater. There is also evidence that the stormwater is PFAS impacted passing stormwater outlets and surface runoff from both the Fire Station and the Fire Training Ground. It appears reasonable and practical for groundwater down-gradient of the two ASA sites to also be PFAS impacted, albeit at significantly lower levels when compared to ASA's two sites.

These two sites continually leak PFAS from the surrounding soil into the Canberra Airport drainage system.

Whilst the risk of PFAS exposure to staff/contractors/tenants/the public is minimal, the Airport has adopted a precautionary approach by developing a Work Health and Safety Guideline for PFAS (current revision October 2020). This Guideline provides advice to staff and contractors to be cautious when:

- Nearby and on the ARFFS Fire Station and Fire Training Ground; and
- Working with stormwater and groundwater.

Canberra Airport will continue to manage trace level detections of PFAS on the Airport through monitoring and in compliance with relevant Commonwealth legislation, namely the PFAS National Environmental Management Plan 2.0 (NEMP 2.0) of 2020, including its guideline values, as amended from time-to-time.

# 8 Water Quality and Monitoring

Water quality has been monitored by Canberra Airport at a range of locations around the Airport since 1998. Ongoing monitoring of groundwater, stormwater and recycled water will continue in accordance with the commitments in the 2020 Environment Strategy and any significant variation to historical trends will be investigated. All reasonable and practicable measures will be employed to make-good and remediate the cause of the variation accordingly, in consultation with the AEO.

## 8.1 Stormwater

The quality of stormwater can vary significantly depending on the surrounding environment.

Stormwater monitoring is undertaken four times a year (once every season) when rainfall exceeds 13 millimetres over a 24-hour period (9am to 9am), subject to the trigger rainfall event occurring. The incoming and outgoing flow is measured against a number of parameters.

Some stormwater monitoring sites have been changed due to on and off-airport development to improve monitoring analysis. It is noted that further changes to testing sites are expected in the future to reflect ongoing development and when stormwater testing reveals irregularities.

During 2020, Canberra Airport decided to monitor the full suite of analytes once a year, while the other three seasons will only be monitored for PFAS.

Over the last twenty-three years of monitoring four times per year, the results of the full suite of analytes have been consistently stable and annual monitoring for these is reasonable and practical. This approach has been consulted with the AEO.

The results of stormwater monitoring are compared against threshold levels listed in Schedule 2 of the *Regulations* and are reported to the AEO and in the Airport's Annual Environment Report. Stormwater monitoring results are also provided to the ACT Environment Protection Authority from time-to-time.

## 8.2 Groundwater

Canberra Airport operations have the potential to impact soil and water quality, especially at sites where substances are located. All higher risk sites (such as at service stations) are required to have groundwater monitoring bores from which baseline data is initially collected prior to the commencement of operations. Core soil samples and water testing are required prior to the commencement of operations as baseline information that is later used to compare future monitoring results.

## 8.3 Groundwater Site Register

The Groundwater Site Register comprises a table of sites either suspected of, or confirmed as, having contaminants and for baseline monitoring in the vicinity of operations that may cause contamination.

Canberra Airport's policy is that all higher risk tenants such as service stations, maintenance hangars, car rental facilities and fuel depots are required to provide groundwater monitoring wells.

Where there is evidence of contamination, the contamination source is identified, and spoil may be removed if practical. The site is then placed on the Contaminated Site Register and subjected to annual review until the site has been made-good (remediated) by enacting a reasonable and practical scope of works in consultation with the AEO.

## 8.4 Water Recycling and Reuse

Water for reuse in urban areas can be sourced from rainwater, stormwater, greywater and effluent from sewage treatment plants. Canberra Airport reuses rainwater collection from the roofs of buildings at the Terminal, Majura Park and Brindabella Business Park. This water is reused as shown in Figure 1.

Water reuse projects achieve multiple benefits, including:

- Reduced demand for mains/potable drinking water;
- Reduced pollution loads to waterways;
- Reduced stormwater flows.

## 8.5 Trade Waste Agreement

In the absence of an Australian Government standard, Canberra Airport has adopted the ACT Government standard for trade waste. In the ACT, all non-domestic sewage (known as Trade Waste) must, by law, be approved by Icon before discharged to sewer. This also includes discharges from sewage recycling plants, cooling towers, rainwater filters, garbage bin enclosures, and pumped sewage.

Individual agreements are obtained for each tenant including details on the installation and maintenance of waste disposal systems.

Figure 1 on page 5 summarises Canberra Airport's water-cycle initiatives for reducing demand per capita for potable supply by the continuous movement of water harnessed from precipitation, groundwater and wastewater to provide recycling water for toilet flushing, hard stand runoff to landscape designed to both beautify and to cool the precinct while mitigating evapotranspiration. The initiatives also activate a replenishment cycle to groundwater by infiltration from the detention basin and open vegetated swale system and the hard stand runoff to landscape zones.