



Moreland City Council

Integrated Water Management Strategy 2040 – Towards a Water Sensitive City

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Acknowledgement of Country

Moreland City Council acknowledges local Aboriginal Australians, recognising the people of the Kulin Nation as the original custodians of the land now known as City of Moreland. On behalf of the municipality, Council pays respect to their Elders, past, present and future.

Moreland’s Integrated Water Management Strategy 2040 has been developed in partnership with E2Designlab

Relevant Documents

D20/289569, 2020 -2025 Five Year Action Plan for Integrated Water Management Strategy 2040

Integrated Water Management Strategy – Towards a Water Sensitive City

Integrated Water Management Strategy 2040 – Towards a Water Sensitive City is Moreland's plan for integrated water management for the next five years.

Moreland is committed to becoming a water sensitive city. We are a city defined by water; to the east the Merri Creek and to the west the Moonee Ponds Creek defines our natural boundaries. Edgars, Westbreen and Merlynston Creeks provide linking corridors of blue-green weaving through our suburbs.

Transitioning to a Water Sensitive City is a crucial part of becoming a resilient, climate adapted city that is able to respond to the Climate Emergency. The sustainable management of water resources remains crucial for resilience to climate change.

It is not only the waterways of our city that are important, the quality of our parks, open spaces and backyards also owe much to the life-giving qualities of water, whether it has been harvested locally or brought from far away catchments. Our aquatic centres, our streetscapes and urban forest are all dependant on water. Our stewardship of this precious resource and how we manage the interrelationship between water and the services we provide to the community, is important to the vitality of our City.

Council plays a key role in water management, as a service provider and a land manager and also, as a collaborator with community. Through effective water management we can unlock opportunities which will enhance the liveability of our city and protect the environment.

This Strategy provides the direction to continue support our transition to a 'Water Sensitive City'.

Vision

Moreland will be a Water Sensitive City;

a liveable city where we take good care of our waterways and make the most of our precious water resources. We keep our open spaces resilient to climate change impacts and, enhance urban and natural environments and support community health and wellbeing. Council leads by example and working together with our key partners, supports community actions to become a water sensitive city.

Aim

The aim of this Strategy is to guide the transition for Moreland to become a Water Sensitive City.

Table 1-. Overall IWM Strategy Framework 2040

Vision	Moreland will be A Water Sensitive City				
Principles					
Outcomes					
Indicators					
Key Action Items					
	<p>Outcome 1: Collaborating in a Water Sensitive City</p>	<p>Outcome 2: Resilient and Liveable Landscapes</p>	<p>Outcome 3: Wise Water Use</p>	<p>Outcome 4: Healthy waterways</p>	<p>Outcome 5: Community Embracing Water Sensitive Urban Design</p>
	<ul style="list-style-type: none"> Working with others improves IWM outcomes 	<ul style="list-style-type: none"> Increase urban tree resilience supported by water, increase permeability; Reduce flood extent, reduce urban heat island 	<ul style="list-style-type: none"> Reduce Council's mains water use; Increase Council alternative water use where there will be overall positive impact on the environment; Reduce community water use per capita 	<ul style="list-style-type: none"> Reduce stormwater pollutant loads and flow volumes discharged to receiving waters, Increase provision of water for biodiversity 	<ul style="list-style-type: none"> Increase uptake of water sensitive urban design in new development, Reduced flow volume conveyed from new development, Increased uptake of rainwater tanks in existing development Working together with community groups for a transition to water sensitive cities
	<p>2020-2025</p> <ul style="list-style-type: none"> Continue the IWM Steering Group supported by an IWM delivery Working Group - Develop an IWM project governance framework Actively seek alternative funding sources Undertake WSUD asset condition audit for small and large assets Develop a business case for dedicated WSUD maintenance/renewal funding tied to asset delivery and capitalisation of individual assets Develop rolling IWM implementation and delivery plan Develop internal IWM policy or Environmental Sustainable Infrastructure for all capital works All projects constructed by Council to investigate implementation of an integrated water management approach for managing stormwater Actively work with partners to achieve the IWM strategy Develop a system (or review process) to undertake quarterly review and reporting of water consumption using utility billing data.- Develop staff training program for all relevant aspects of IWM planning, design, operation and maintenance including site tours and other relevant knowledge sharing 	<p>2020-2025</p> <ul style="list-style-type: none"> Investigate the inclusion of passive irrigation systems for all newly planted council trees as part of capital works (e.g. tree planting program) to support tree health and canopy density to increase cooling. Develop standard detail design and technical notes for passive irrigation systems Consider flood management opportunities when planning WSUD and IWM (e.g. integrating stormwater harvesting with smart tank technology or water for biodiversity with flood mitigation) Develop a Green Streets Guideline to include WSUD, Passive irrigation, permeability and Urban heat considerations Piloting and trialling - Undertaking a pilot project on using pervious asphalt on one of the MCC carparks and implementing a small-scale green roof project Investigate the inclusion of WSUD/Passive irrigation in urban streets - particularly as part of road surface, drainage renewal and carpark renewal 	<p>2020-2025</p> <ul style="list-style-type: none"> Investigate sustainable water options for sportsfields (e.g. turf types and irrigation volume, turf and soil health and Soil Moisture Monitoring) Implement two new harvesting systems and upgrade two existing stormwater harvesting schemes that substitute potable mains water supply by an additional 18 million litres per year Advocating for using rainwater tanks in households and continue enforcing implementation of rainwater tanks through planning Undertake service review of irrigation operation and maintenance to identify needs, gaps and opportunities for service improvement 	<p>2020-2025</p> <ul style="list-style-type: none"> Deliver three large scale WSUD Projects to benefit water quality and biodiversity Undertake functional design and costing of identified large scale WSUD projects Plan and deliver street scale WSUD through all relevant capital projects Develop a framework guideline for WSUD treatment opportunities and integrate into technotes Implement the Litter and Gross Pollutant Action Plan 	<p>2020-2025</p> <ul style="list-style-type: none"> Review the approach to stormwater management in new private developments Investigate the potential to develop a stormwater offsets policy in line with current State Government policy directions Working strategically with friends' groups on planting floodplains Consider the implications of permeability in reviewing the ESO and preparation of an SBO surrounding Council drains Continue to support community engagement program for water (Support through MCMC Waterwatch) Support increased community and school involvement in water management and waterway health through expanded support for schools and early learning centres (i.e. ResourceSmart and MCM'C Waterwatch incursions/excursions etc), and community initiatives (e.g. facilitated by Merri Creek Management Committee) to reduce plastic pollution in the environment

¹ Merri Creek Management Committee (MCMC)

A Water Sensitive City

A water sensitive city is a city in which water cycle management is integrated into all aspects of the city. It is a city that is healthy, green, productive and resilient to climate change impacts; created through collaboration and which interacts with the urban water cycle in ways that:

- provides water security for economic prosperity through efficient use of diverse water resources available;
- enhances and protects the health of watercourses, wetlands and aquatic environments;
- mitigates flood risk and damage; and
- creates high quality, healthy, cool and connected public spaces and landscapes that harvest, clean and recycle water.

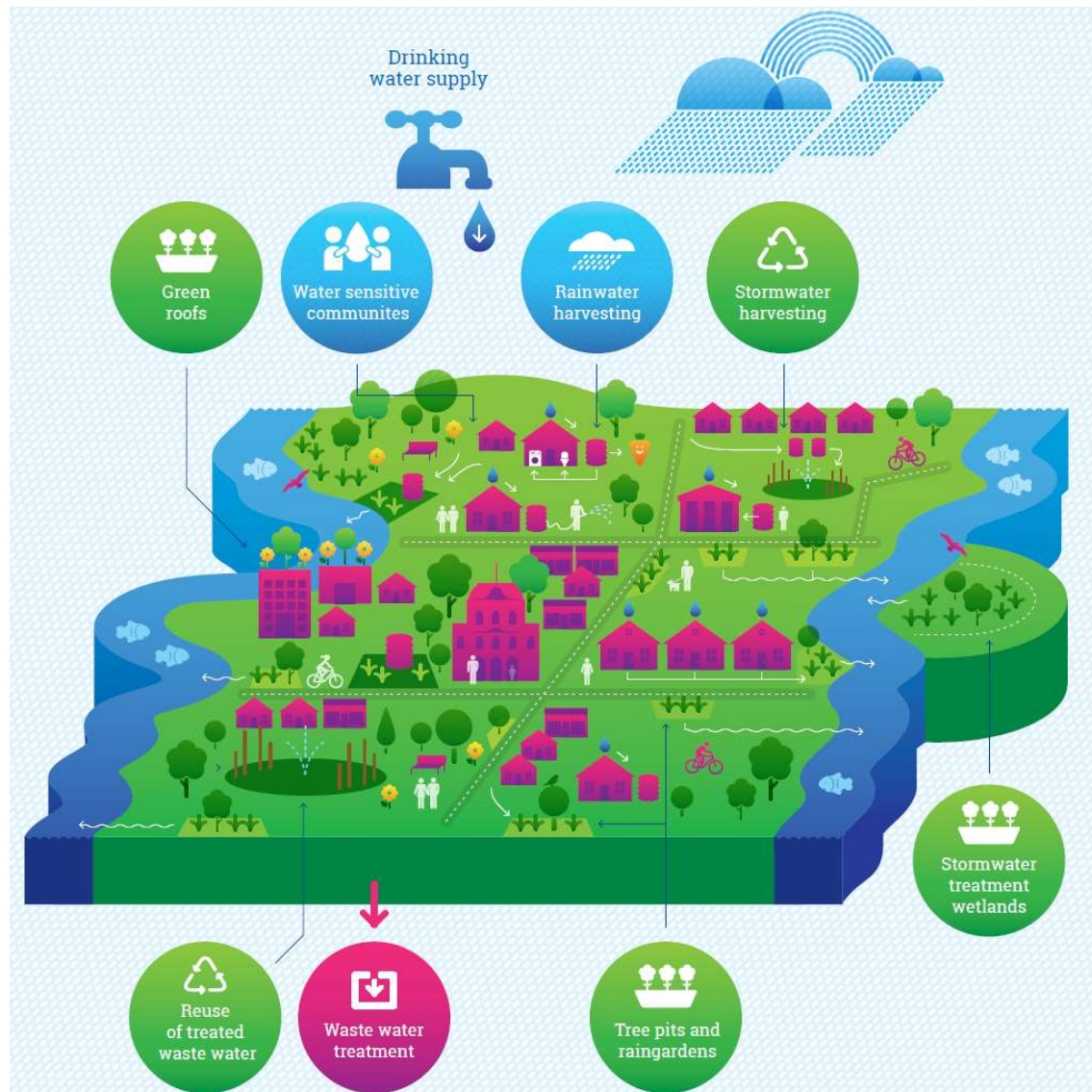
The three principles of a water sensitive city are:

- **Cities as water supply catchments:** Access to suitable water through a diversity of sources from a diverse range of supply scales – small local scale supply solutions through to mains water supplied to Moreland.
- **Cities providing ecosystem services:** The built environment supplements and supports the function of the natural environment including local biodiversity through to using or replicating natural water treatment systems.
- **Cities comprising water sensitive communities:** Communities are engaged with decision makers and enabled to participate in creating a water sensitive city through political support and their own local actions.

What would a Water Sensitive City look like?

A water sensitive Moreland is a city where this precious resource is highly valued, carefully managed to best practice standards and accessed equitably by all users to protect ongoing liveability and sustainability.

The elements of a water sensitive Moreland will be visible in our values and in our natural and built environments.



Moreland Context

Our Catchments

Moreland is located between the middle to lower reaches of the Moonee Ponds Creek and the Merri Creek catchments. Both are large and important tributaries to the Yarra River. These urban waterways are recreational and ecological treasures and are highly valued not only by the Moreland community but also by upstream and adjacent Council's including Darebin and Whittlesea Councils (Merri and Edgars Creeks), Hume Council (upper Merri and tributaries and Moonee Ponds Creek) and the Shire of Mitchell (upper Merri and tributaries). Downstream Council's include Yarra and the City of Melbourne. Urban and rural influences from the upper catchments have impacted significantly on waterway health and a range of community groups (such as Friends of Merri Creek, Friends of Edgars Creek, Friends of Moonee Ponds Creek and others) along with land and water managers such as Melbourne Water and the City of Moreland are working hard to protect and enhance the important values of these waterways. This is a combined effort and requires not only protecting the immediate reaches within Moreland's boundaries but also working with surrounding partners to reduce negative impacts on these precious waterways.

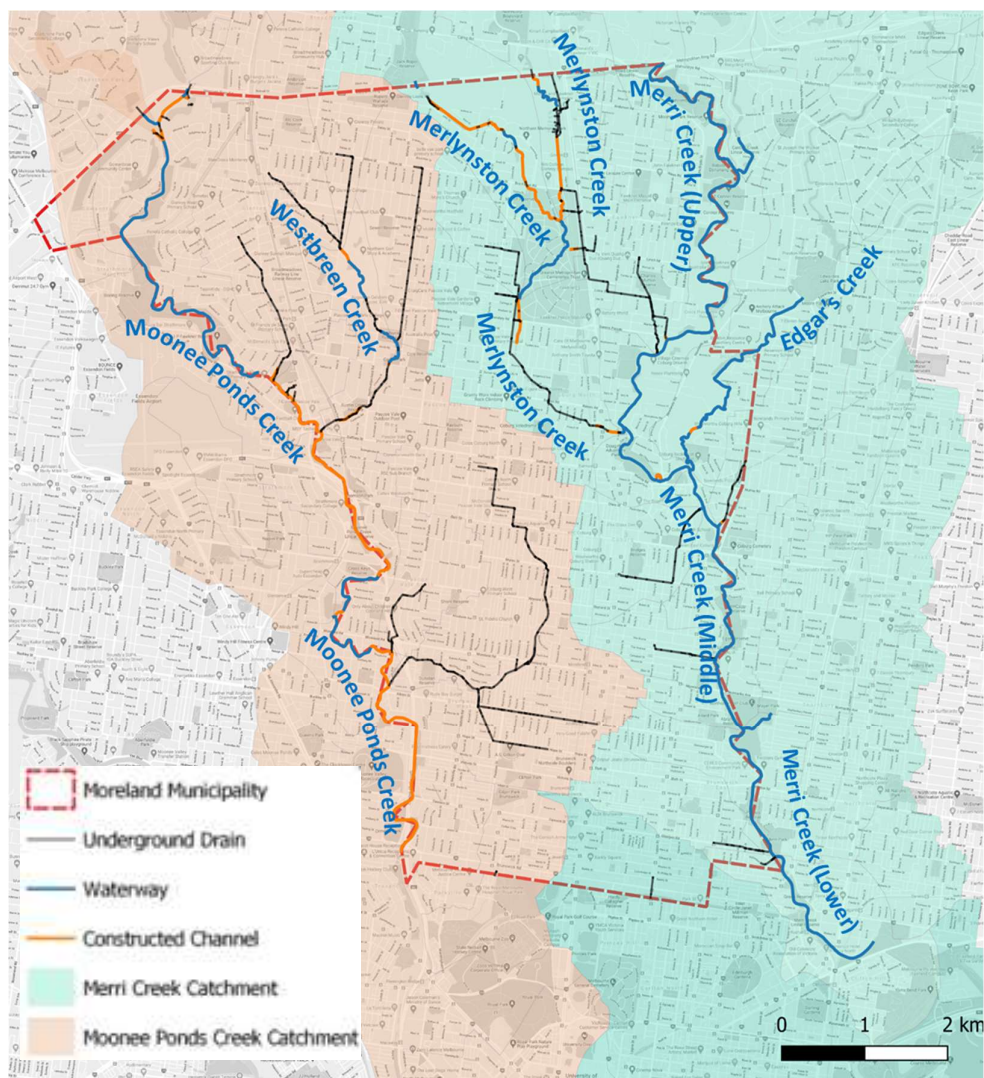


Figure 1. Moreland is a city with water at its heart

Moreland's Climate Emergency² is being felt in many ways with direct impacts related to water. Climate impacts have been growing in effect over the past twenty years. This trend was noticeably apparent during the onset of the Millennium Drought (1996-2010)³. What began with significant water shortages and concerns for Melbourne's metropolitan water supply has evolved to include a range of related issues. Water scarcity, urban heat, ecological health and the quality of green landscapes, our backyards and tree lined streets and parks, are highly vulnerable to a changing climate. These challenges must be addressed not only through global action but also locally, by applying the principles of integrated water management. In this way, council both utilises and protects water resources to the greatest extent possible.

Moreland's Role as a Water Manager

Moreland plays a key role as a water manager and undertakes a range of functions important to local waterways and Port Phillip Bay. Implementation of local and state planning policy for environmentally sustainable development and integrated water management is very important. It ensures that development across the city is undertaken in such a way that protects our waterways and also is building our city for the future. A city with improved water quality, reduced water demand and resilient landscapes that are better prepared for the ongoing effects of climate change.

Moreland has a range of responsibilities under various legislation and regulation, as identified in the Table 2.

Table 2. Guiding Policy for Water in Moreland

Policy	Purpose	Council's role
State Environmental Protection Policy (SEPP) - Waters	State-wide policy which requires that stormwater runoff must not negatively impact on beneficial uses of receiving waterways (environmental or human). The SEPP (waters) also calls up BPEM (discussed below)	Ensure municipal activities are in accordance with the SEPP (waters) and that BPEM is implemented including through private development
Water for Victoria (2016)	A new water plan which sets the strategic directions for all aspects of water management in Victoria. The Victorian Government has set a new long-term direction for managing Victoria's precious water resources.	It sets the framework for government agencies, businesses and the community to work together to protect and rehabilitate Victoria's surface water environments.
Victorian Planning Provisions VC154 - Integrated Water Management	To ensure Integrated Water Management and Water Sensitive Urban Design is incorporated into development	Ensure compliance with VC154 through statutory planning processes
City of Moreland Local Planning Policy C.22.08 Environmentally Sustainable Design (ESD)	To ensure Environmentally Sustainable Design (including Water Sensitive Urban Design) is incorporated into development	Ensure compliance with C.22.08 through statutory planning processes

² See Zero Carbon Moreland – Climate Emergency Action Plan 2020/21 – 2024/25

³ DELWP , Managing extreme water shortage in Victoria, Lessons from the Millennium Drought, 2016

Urban Stormwater Best Practice Environmental Management Guidelines (BPEM 1999 as amended)	Subordinate to the SEPP, BPEM sets standards for 'Best Practice' management of stormwater pollutants to be met through development. Currently under review and likely to be updated with new flow protection requirements.	Ensure BPEM performance standards are met in the statutory planning assessment process
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An Integrated Stakeholder and Partner Approach

Achieving Integrated Water Management (IWM) strategy implementation requires the engagement, cooperation and compliance with a broad range of key stakeholders and regulators. Table 2 as shown below summarises Council's primary stakeholders and their links to IWM. Council should ensure that our opportunities and obligations to work with these key stakeholders and regulators are always considered when delivering the objectives, strategies and actions outlined in this plan. Our collaboration with partners such as Department of Water, Environment Land and Planning (DEWLP), Melbourne Water, Yarra Valley Water and neighbouring councils is helping to improve our waterways. Projects such as the Moonee Ponds Creek 'Chain of Ponds' Catchment Collaboration provide a platform to achieve outcomes, at a scale Moreland cannot achieve alone. These activities acknowledge our place in the catchment and our commitment to collaboration and catchment action to improve waterway outcomes.

Table 2-Opportunities for advocacy and collaboration with key stakeholders to deliver IWM strategy outcomes

STAKEHOLDER	AREA OF RESPONSIBILITY	POTENTIAL AREA OF ADVOCACY AND COLLABORATION
DELWP	Sets the overarching strategic direction for water management activities across the state Facilitation of the IWM Forums and Working Group	<ul style="list-style-type: none"> ✓ Develops, implements and updates high-level government strategies and supporting policies and legislation ✓ Development of a Catchment Wide Integrated Water Management Plan for the Yarra and Maribyrnong Catchments ✓ Delivery of more coordinated and catchment focussed outcomes
Environmental Protection Authority (EPA), Victoria	Government environmental Regulator, EPA administers the Environment Protection Act 1970 and The Environment Protection Act 2018 (the Amendment Act) and issues work approval and licenses	<ul style="list-style-type: none"> ✓ Reduction of discharging waste to the environment. ✓ Sets and enforces environmental regulations ✓ Community Education
Melbourne Water	Flood management (including waterways and retarding basins) Waterway health Stormwater quality Drainage schemes and larger drainage infrastructure	<ul style="list-style-type: none"> ✓ Waterway health, restoration and rehabilitation ✓ Design and implementation of surface water management assets (including wetlands) ✓ Community education and engagement ✓ Offering councils funding to manage stormwater within an integrated water

STAKEHOLDER	AREA OF RESPONSIBILITY	POTENTIAL AREA OF ADVOCACY AND COLLABORATION
		management approach (e.g. Living Rivers fund)
Water corporations (Yarra Valley Water)	Potable water provision Sewage collection, conveyance and treatment Recycled water	<ul style="list-style-type: none"> ✓ Recycled water and other alternative water source provision ✓ Community education and engagement ✓ Innovation and R&D for reduction of potable water usage ✓ Sewage resource management and recovery
Traditional Owner groups	Communicating Traditional Owners water values Cultural and heritage approvals Interpreting landscapes for developers	<ul style="list-style-type: none"> ✓ Advice on water planning and management ✓ Communicating values of Traditional Owners ✓ Access to water for economic development and capacity
Neighbouring Councils	Stormwater quality entering the municipality Open space management Land use planning	<ul style="list-style-type: none"> ✓ Peer to peer learning (re: water sensitive assets and design) ✓ Implementing integrated water management approach through the catchments formulating a strategic plan called 'Greening the West'
Community, Creek committees and Friends groups	Revegetation and bushland management Waterway clean-up and litter control Campaigns on key issues, such as: native grasslands Water quality testing	<ul style="list-style-type: none"> ✓ Waterway health (through Citizen Science data on the ecological health and biodiversity of local waterways and catchments. Collecting, interpreting and reporting this data, which helps council achieve its monitoring and reporting aims) ✓ Community education ✓ Rehabilitation of flood plains by organising planting days
Developers	Designs and builds stormwater systems in accordance with regulations including Planning Scheme and ESD Policy	<ul style="list-style-type: none"> ✓ Implementation with stormwater treatment and retention through green infrastructures ✓ Support innovation
Land owners	Property owners are responsible for ensuring that rainfall is appropriated directed to an allocated point of discharge to the street, so that their stormwater runoff does not affect other properties	<ul style="list-style-type: none"> ✓ Implementing rainwater tank and reusing stormwater ✓ Reducing potable water consumption

The Challenges We Face Today

There are many pressures on Moreland's water cycle including population growth, drought, past and present development, pollution and climate change. How we manage these pressures is critical to our efforts to become a water sensitive city.

Climate Change, the Climate Emergency and Water Use

Our City has always had a climate susceptible to heat, drought and variable rainfall. However, temperature and rainfall patterns are changing in Melbourne and our climate variability has become more pronounced as a result. Droughts are becoming longer in duration and more extreme and temperatures have increased. Weather volatility means we are also experiencing more intense storm bursts and flash flooding. The resilience of our city is challenged by these changes and it is becoming increasingly difficult to keep our city cool, green and flood free. Our community, our plants, animals, and infrastructure must all adjust.

Water Scarcity

It is critical that Moreland's water use is as efficient and effective as possible. At a time when water is becoming scarcer, we must invest in new ways to diversify supply, reduce demand and consumption and build resilience.

The Victorian State Water Plan - Water for Victoria (October 2016) and Melbourne's Water Outlook 2020 models a range of scenarios in relation to changing climate, use and demand. As shown in Figure 2, under the high climate change impacts scenario, we may need to add to Melbourne's supplies by 2028. The future is uncertain so there is a need to act now to keep our water supply secure⁴.

Population growth combined with decreasing flows from our catchments, due to a changing climate, are the primary drivers affecting water security.

⁴ [Melbourne's Water Outlook 2020](#)

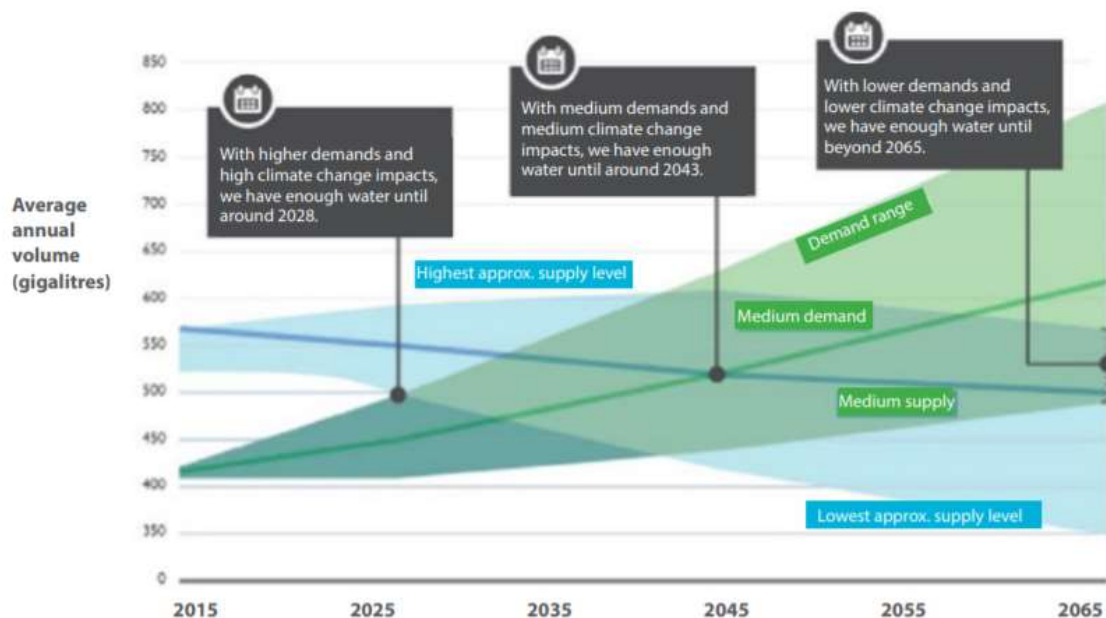


Figure 2. Long-term water supply and demand (Source: *Water for a Future-Thriving Melbourne*, 2017))

Our urban forest

Moreland's urban forest refers to all the trees and other vegetation in public and private spaces. It includes street and park trees, front and backyard vegetation, grasslands, shrubs, wetlands, nature strips, and green roofs and walls. Moreland has a relatively young urban forest providing 14% tree canopy cover comprised of 9% private trees and 5% public trees (Urban Forest Strategy 2017-2027).

Over the past two decades Moreland's urban forest has been under pressure from a growing population, urban densification and climate change. This has resulted in a significant decline in tree canopy cover on private land. At the same time, the community are increasingly calling for more action to improve the amenity of streetscapes, increase vegetation cover, and reduce the impact of the urban heat island effect. To deliver on these needs and offset the vegetation loss on private land, Moreland must look to develop optimal soil conditions (soil volume and moisture) in the public realm for new street tree plantings and healthy canopy development.

The Urban Heat Island

The urban heat island (UHI) effect describes higher air and surface temperatures that occur within urbanised environments when compared to the natural environment. The UHI is particularly important from a human health perspective as high urban temperatures place urban inhabitants under heat stress (especially in combination with heat waves) and the UHI restricts night time recovery from daily heat stress.⁵ Several studies in Melbourne demonstrate the occurrence of an UHI ranging from a mean of around 2 °C to 4 °C, with daily peaks as high as 7 °C, depending on location and time of day and year. There is growing evidence that the UHI can be mitigated through thoughtful design approaches that consider built infrastructure, tree canopy cover and water management (e.g. Coutts et al, 2012). These large scale WSUD assets, will help retain more water in the landscape and support more trees and vegetation and therefore cool the microclimate.

⁵ Coutts, A.M., Beringer, J., Jimi, S. and Tapper, N.J. (2009) The urban heat island in Melbourne: drivers, spatial and temporal variability, and the vital role of stormwater. Stormwater Conference 2009.

Making the Most of Our Open Space

Moreland has a rapidly growing population; this puts strain on existing infrastructure. We are now asking more of our existing parks, gardens and ovals than ever before. As houses give way to apartments and backyards become smaller, open space areas must now provide respite and recreation to a larger community. Our spaces for passive and active recreation require greater maintenance, with a need to irrigate more to support higher intensity use.

Irrigation in a Water Scarce Environment

During the millennium drought many public spaces were left unirrigated and dry, in order to save water. We now know that this had a huge impact, making many spaces unpleasant and unplayable. During this time the effects of not properly irrigating our open spaces also impacted on community health and wellbeing and did long term damage to our 'urban forest'. Rethinking how we ensure our open spaces remain resilient and healthy in times of water scarcity is important. As a result of the drought major upgrades were required at Wallace Reserve in Glenroy, Shore Reserve in Pascoe Vale South and Cole Reserve in Pascoe Vale. Alongside our sporting venues, how we irrigate parks and passive landscapes must be considered.

Waterway Health: Water quality and protecting our waterways

Moreland is blessed to be located along some of Melbourne's most important waterway corridors. Our city is split into two main catchments, one flowing to the Merri Creek in the East and other to Moonee Ponds Creek in the West. The Westbreen, Merlynston and Edgars Creeks are very important local waterways within our city. In the past we have turned our backs on these waterways and in some instances, they have been channelised or put into drains. In more recent times we have turned to embrace these important natural assets.

Improving biodiversity and the health of our waterway corridors requires careful consideration of how we manage stormwater. Urban stormwater, particularly from major land subdivision, building and construction, sewerage and major roads are the most common 'threats' to the quality of our water. They have an ongoing impact on our waterways, reducing water quality and biodiversity while also causing erosion and the spread of weeds.

Our stormwater network was designed at a time when these problems were not well understood, and we must now work to protect and enhance these waterways. This requires finding alternative ways to manage stormwater runoff from our public spaces such as roads and carparks and also making sure new development in the city integrates the principles of water sensitive urban design. It also requires considering how we utilise stormwater to recreate natural systems and processes that support biodiversity and the health of our waterway corridors. This may include the 'daylighting' of drains and creating wetlands and aquatic habitats.

Waterway Health: Flow and protecting waterways

Runoff from hard surfaces not only carries pollutants but creates stormwater flow problems. Stormwater is efficiently transferred via impermeable surfaces, such as rooftops and asphalt, through stormwater pipes to the natural creek system. This creates damaging flow velocities and when stormwater flows are not managed to slow their erosive forces, it results in 'flashy' creek flows characterised by regular pulses of stormwater which impact creek ecology and stability. In the past the response has been to 'armour' the creek to protect against excessive flows. The concreted channel on Edgars and Moonee Ponds Creeks, the bluestone base in Merlynston Creek and piped sections of Westbreen Creek are all examples of past attempts to manage excessive stormwater flows. We now know the damage this has caused to the ecology and health of these waterways and are working to undo past damage.

Current approaches to stormwater management recognise the importance of trying to capture and slow down stormwater in order to protect our downstream environments. This can be done in many different ways, methods such as protecting permeability, open space, vegetation cover, rainwater tanks, stormwater harvesting, wetlands and raingardens all make a difference.

Urban Habitat and Biodiversity

Moreland's population is growing significantly, with the population estimated to be 196,133 in 2020 and forecasted to grow to 228,425 by 2036⁶. Population growth will lead to more medium (and high) density housing. ⁷ Increased building coverage combined with an associated reduction in the size of private open space and less open space per capita will result, reducing habitats and biodiversity within our corridors if left unchecked.

Urban landscape planning, urban greenways and wildlife corridors are increasingly recommended to encourage animals and plants to move around urban areas and thus to preserve and/or enhance urban biodiversity. This can be achieved by increasing green infrastructure in the urban area. Green infrastructure like constructed wetlands, provide an opportunity to increase the diversity and availability of habitats for a variety of plants and animals that have become rare within Moreland due to urbanisation including birds, frogs, reptiles and insects as well as food sources critical to their wellbeing and ability to breed⁸.

Permeability

Moreland's landscape is often dominated by buildings and hard surfaces. This has many implications for our urban forest, urban heat island effect, water quality, amenity etc. Permeability is a measure of the extent to which natural surfaces have been switched for surfaces such as rooftops, driveways, roads and other hard surfaces. Population growth and the impact of infill development (such as the loss of backyards and front yards) has impacted current permeability levels; this has long term negative consequences. Permeable sites, reduce the volume of stormwater runoff which can cause localised flooding and can damage homes and property and greatly increase insurance premiums in certain areas. Permeable sites reduce pollution of waterways and habitats, reduce the need for expensive upgrades to local stormwater infrastructure, increase infiltration to sub-soil and allow groundwater recharge. This not only helps to maintain groundwater supplies, but also aids local site ecology by ensuring sufficient water reaches tree root zones and reduce downstream flooding and stream-bank erosion. It is important to ensure that both public and private realm permeability does not reduce beyond current levels and that future development and the management of the public realm focus on an increase in permeable surfaces.

Rising to the challenge

The great thing about the challenge of becoming a water sensitive city is that many of the challenges can be opportunities. For example, one of the best ways to protect our waterways from pollution is to harvest stormwater. While improving outcomes for the receiving waterway, once cleaned, this can also provide an excellent resource for irrigating our parks and open spaces instead of using scarce potable water.

In becoming a 21st century water sensitive city our challenge is to think of our city as a catchment and to not only protect our community from impacts such as flooding but to also harness a host of benefits from our local catchments including green infrastructure, new sources of water and a healthy downstream environment.

⁶ WWW.forecast.id.com.au/moreland

⁷ Medium Density Housing Review Moreland City Council Adopted by Council, October 2018.

⁸ Large scale WSUD opportunity and feasibility study across the Moreland municipality, Alluvium 2015

Moreland as a Water Sensitive City

As a water sensitive city Moreland will be able to demonstrate:

Water wise community; A shared community understanding of the need for careful use of high-quality drinking water, appreciation of our waterways, and embracing the use of “fit for purpose” water where-ever possible

Cities as water supply catchments; Local “fit for purpose” water systems supplying water across the municipality and passive irrigation for street scapes

A water sensitive built environment; Buildings that include: raingardens, green roofs, rainwater tanks, permeable surfaces and stormwater infiltration and water efficient fittings, fixtures and whitegoods as standard

Greener streets and high quality open spaces; Constructed wetlands and raingardens, passive irrigation systems, tree pits, increased tree canopy and urban biodiversity, efficient irrigation systems and increased permeability

Grassed sportsfields; Maintained to high standards even during periods of drought

Cleaner, less polluted waterways; Water Sensitive Urban design (WSUD) and other stormwater treatment measures to reduce stormwater pollution entering our waterways

Improved liveability and amenity; High-quality open space, waterways and natural areas providing attractive options for recreation, relaxation and connecting with nature

Community health and wellbeing; Cool, green streets and parks and high-quality open spaces encouraging community participation and interaction

A city more adapted to heatwaves and other weather extremes in a changing climate; Mitigation of urban heat island effects by increased tree canopy and urban greenery, reduced effects of flash flooding and access to alternate water supplies that reduce demand for drinking water in times of low rainfall

Ecological and biodiversity benefits; Increased habitat and biodiversity through healthy natural waterways and wetlands, increased streetscape vegetation and constructed stormwater treatment wetlands and biofiltration systems

Financial savings and avoided costs; Savings on water utility costs and drinking water infrastructure upgrades through reduced drinking water consumption and the use of “fit for purpose” water supplies

These elements will be used to inform the detailed Monitoring, Evaluation and Reporting Plan.

Outcomes, Indicators and measures

The transition to a water sensitive city is a long-term objective. Delivering the outcomes which together support this goal will take many years. As old infrastructure is renewed Council has the opportunity to replace it with infrastructure which delivers on the 2040 outcomes. Capital programs and infrastructure are not the only areas where action is necessary. Building skills and capacity across organisation to manage water in an integrated approach is also necessary.

Outcome 1 – Collaborating in a Water Sensitive City

As part of a larger catchment we share water management responsibilities with neighbour councils and other water managers such as Yarra Valley Water and Melbourne Water. It is important to consider our city within this catchment context and to work with partners to achieve outcomes collectively. Council will also collaborate with traditional owners to learn from and incorporate water values into the planning and management of water cycle at Moreland City Council.

Indicator 1: Working with others improves IWM outcomes

Measure: Number of opportunities and projects implemented with partners to achieve Moreland's Integrated Water Management Strategy 2040 outcomes including through participation in the Yarra and Maribyrnong Integrated Water Management Forums

Outcome 2 – Resilient and Liveable Landscapes

Our urban landscapes are vital to the liveability of our city and to the health and wellbeing of the people who live, work and recreate here. There are many important benefits that our open spaces provide including:

- They are spaces for outdoor recreation such as walking, cycling, play, organised sport and simply relaxing.
- They are also our streets, laneways and civic spaces where trees, shade and green spaces improve overall amenity, comfort and heat levels.
- The restorative qualities of these spaces improve our mental and physical health and wellbeing, and are spaces we are drawn to and want to be in.
- These places are also our transport corridors. Managing flooding and ensuring safety as we go about our lives is critical.
- These places provide habitat for a range of flora and fauna, some of which are highly threatened. This in turn provides us with natural pest control and pollination services.

Resilient and liveable landscapes are resistant to the impacts of drought and a changing climate. They provide services such as cooling and greening making the urban environment a more desirable place for our community to enjoy. Water is fundamental to delivering these outcomes. Irrigation, and rainfall sustain our urban environments whether it be the leafy trees lining our streets or the sports oval in a local park. How we design and manage these spaces is important not only to take advantage of the opportunities water sensitive urban design provides to resilient and liveable landscapes but also to minimise the water resources required to maintain their quality and function.

Our urban forest

Trees play a very important role in our urban landscapes. Through their shading, evapotranspiration and photosynthesis trees provide many services. Alongside making our spaces more beautiful, they make them cooler, reduce stormwater runoff, provide habitat for animals and improve air quality.

There is a strong link between the quality of the urban forest and water management. Water is important for strong and healthy growth of trees. Trees with good access to water will grow larger and will be more resilient to disease and heat stress. Through evaporative cooling, trees provide significant cooling to the surrounding environment.

Moreland's urban forest has come under increasing pressure from a growing population, urban densification and the effects of climate change. In order to counteract these pressures, Moreland aims to have 29% tree canopy coverage across the whole municipality by 2050 (Moreland Urban Forest Strategy). This will be done through a combination of protecting existing forest and enhancing tree canopy cover. A resilient urban forest will take advantage of 'fit for purpose' available alternative water sources and where possible active or passive irrigation will provide a water supply to maintain a healthy forest.

Indicator 2.1 Increase urban tree resilience supported by water

Measure: Percentage of urban forest or street trees with a non-potable source of water such as stormwater harvesting or passive irrigation.

Permeability

A resilient and liveable landscape will be highly permeable. Hard surfaces will be minimised giving way to natural surfaces capable of capturing and infiltrating runoff from surrounding surfaces. Permeability is an important measure which is closely connected to improving water quality and the ecological health of our waterways. It is also a key factor helping to decrease heat, reduce stormwater runoff volumes conveyed downstream and mitigate flooding. There are also biodiversity benefits associated with increasing permeability. As Moreland's population grows and backyards make way for development, permeability will be maintained by introducing green roofs, raingardens and pervious pavement.

Indicators 2.2 Increase permeability

Measure: Increased permeability by de-paving hard surfaces and introduce surfaces which allow water to recharge surrounding soils across public areas

Measure: Ensure more than 20% site permeability is adhered to in private development (as required under ResCode).

Flooding

Our City has unique drainage challenges because of our relatively flat landscape, our historic development and population density. Increased storm intensity due to a changing climate is further exacerbating flood risk in our city. A flood resilient landscape will utilise a range of techniques to manage flooding. Wherever possible this will include solutions which have added benefits such as multifunctional infrastructure and the retention of stormwater for later use on our parks and sportsfields.

Indicator 2.3 Reduce extent of flooding

Measure: Number of opportunities identified to reduce the impacts of flooding through the increase of effective flood storage volume created as part of multi-functional assets (e.g. green infrastructure, stormwater harvesting schemes, talking tanks⁹, leaky tanks¹⁰, combined retardation and treatment schemes).

⁹Talking Tanks are smart rainwater tank technology that monitors water levels in a rainwater tank and automatically releases water at a controlled rate if required

¹⁰ Leaky rainwater tanks are designed to slowly draw down to the garden

Urban heat

Moreland is subject to a disproportionately high Urban Heat Island Effect (UHIE) this is due to its densely urbanised environment. A multitude of hard surfaces dominate the landscape and tree canopy across the city is less dense than comparable municipalities. Surfaces are often dense and dark (such as roads, footpaths and driveways) and these surfaces readily absorb heat (Moreland Urban Heat Island Action Plan).

A heat resilient landscape will be supported by a range of water sources such as passive irrigation and stormwater harvesting which provide evaporative cooling and support the health of green infrastructure. When vegetation has access to water the effect of evapotranspiration combined with shade can provide significant cooling to the surrounding environment.

Indicator 2.4 Reduce urban heat load

Measure: Utilise stormwater harvesting and water sensitive urban design to support increased vegetation and cooling in areas of high heat vulnerability.

Outcome 3 – Wise Water Use

As our population grows and climate change reduces water availability it is important that we do everything we can to use water wisely. We must identify ways to reduce our consumption and improve water efficiency and we must find 'fit for purpose' alternatives to avoid unnecessary use of precious drinking water supplies. Our challenge is to use smart management and innovation to do more with less. Using water where it is needed, in efficient and effective ways that best respond to community needs and the services we provide is essential.

Council water use

Council uses around 465 million litres of drinking water per year. This supplies our aquatic centres, our buildings and the irrigation of our parks, gardens and sporting venues. These water demands are critical to the services we provide to our community. Wise water use will include continued rollout of water efficiency measures and rainwater tanks across council buildings, undertaking auditing and leak detection and implementing measures to optimise irrigation efficiency and effectiveness.

Indicator 3.1 Reduce Council's mains water use

Measure: Implement building retrofits and irrigation efficiency upgrades to achieve a 5% reduction in councils mains water use (from 2018/19 mains water consumption of 465ML).

Council alternative water use

Moreland has the capacity to harvest up to 39 million litres of stormwater per year. Increasing our rollout of stormwater harvesting schemes such as our Mutton Reserve and City Oval Stormwater Harvesting Schemes, will make Moreland more resilient to the effects of climate change and provide independent supply in times of water restrictions. We will utilise our stormwater harvesting schemes to achieve a reduction in our drinking water demand without compromising irrigation of our parks where there will be overall positive impact on the environment.

Indicator 3.2 Increase council alternative water use where there will be overall positive impact on the environment

Measure: By 2025 implement an additional two new stormwater harvesting schemes and upgrade two existing stormwater harvesting schemes that together substitute potable mains water supply by an additional 18 million litres per year

Community water use

Our community, our residents, businesses and organisations, consume most of the water used in our city (over 96%). There are many ways we can collectively reduce our consumption as a community and Council can assist the community to reduce potable water use by promoting the use of rainwater tanks and water smart gardening and continue to implement water sensitive urban design through the planning process.

Indicator 3.3 Reduce community water use (per capita)

Measure: Number of collaborative projects with partners, the community and businesses to increase the number of water tanks, water smart gardening and WSUD on private property and reduce per capita water use to 155 litres per person per day

Moreland City Council with Melbourne Water and Yarra Valley Water identify and implement opportunities for wastewater reuse and minimisation within the municipality and explore wastewater reuse as appropriate.

Outcome 4 – Healthy Waterways

Moreland's waterways receive high pollutant loads and damaging flows from stormwater runoff. As a mid-catchment municipality, we are also subject to impacts from upstream municipalities. Managing stormwater pollution and reducing flow volumes across our catchments will enhance amenity values and support improvement in waterway health.

This can be achieved through upgrading stormwater systems and progressively increasing the area of the city that is treated each year. Installing WSUD systems (e.g. wetlands, raingardens, and GPTS, harvesting systems) in our streets and parks and maintaining them can contribute to ensuring sustainable stormwater management. With careful design and planning stormwater can support ecosystems by providing a source of reliable water. This can support urban biodiversity and the quality of our urban environment. By adopting Integrated water management approach across the municipality our creeks and waterway corridors will be showing great improvements in ecology and waterway health the development of catchment wide integrated water management plans for the Yarra and Maribyrnong Catchments will include water and pollutant balance modelling which could be of use to future planning and management related to healthy waterways. Upstream councils also play important roles on impact of pollution in the receiving waterways. Collaborating with other councils to achieve this outcome plays a very important role.

This outcome is also aligned with the implementation of the draft Nature Plan Outcomes.

Indicator 4.1 Reduce stormwater pollutant loads and flow volumes discharged to receiving waters

Measure: Reduce our impact on downstream waterways by further reduction of 112 kg/year Total Nitrogen in five years from existing urban stormwater via implementation of water sensitive urban design (WSUD) tools.

Measure: Reduce amount of litter, rubbish and plastic entering our waterways

Indicator 4.2 Increase provision of water for biodiversity

Measure: Area of passive public open space supported by an alternative water source to capture and utilise stormwater to enhance biodiversity by retaining water in the landscape and mimicking natural flow regimes.

Measure: Area of revegetation and rehabilitation works on floodplain or improving the condition of degraded waterway

Outcome 5 – Community Embracing Water Sensitive Urban Design

Around 60% of our municipality is privately owned. Like other areas of the municipality our roofs, driveways and backyards also contribute to stormwater pollution and increased stormwater flows. Through the rollout of water sensitive urban design during redevelopment we can progressively reduce stormwater impacts. Rainwater tanks and other systems not only improve stormwater outcomes but can also provide us with a range of other benefits such as saving water.

Indicator 5.1 Continue uptake of water sensitive urban design in new development

Indicator 5.2 Reduced flow rate and volume of water from new developments, improving on pre-development conditions

Indicator 5.3 Working together with community groups for a transition to water sensitive cities

Measure: Percentage of planning approvals with inclusion of water and stormwater management meeting clause 22.08 of the Moreland Local Planning Scheme and VC154 of the Victorian Planning Provisions.

Measure: The volume of new detention systems and water tanks, the area of WSUD treatments

Measure: Number of projects and Council contribution on collaborative projects with community groups (e.g. planting, raingarden webinars, Waterwatch collaboration)

Monitoring, Reporting and Evaluation

Monitoring and reporting against the key indicators and measures outlined in this Strategy will be undertaken. This will support development of a shared understanding of progress and help identify opportunities to enhance delivery of the strategy. Each indicator has one or more measures which will be tracked over time.

Monitoring and reporting on the IWM plan will include:

1. Annual reporting on the actions and
2. Quarterly and annual reporting on the actions and outcome by an IWM Working Group to monitor progress towards the objectives.
3. Review of the action plan every year, with changes made as appropriate, to allow Council to revisit emerging trends and changing priorities, and to enable adaptation to new policy positions at the state or national level.
4. Action plan will be fully reviewed at 4 years. New action plan to be developed by five years (2025).

Further detail on monitoring, reporting and evaluation is included in Appendix 1.

Strategic Risks and Opportunities

There are a range of key variables which can impact on the success of Strategy delivery. Some of which can to be actively managed and some which can be monitored and may require adjustment throughout the life of the Strategy. These include:

- Recognition of the Climate Emergency and the impacts Council, the community and the environment

Response: this strategy takes an integrated approach to managing climate risk, in terms of creating high quality green public spaces and landscapes, provide water security, enhance and protecting the health of watercourses and wetlands and mitigated flood risk and damage, all essential elements of creating a resilient, climate adapted Moreland

- Recognition of the need for a comprehensive understanding and allowance for resourcing for ongoing maintenance of existing and new large WSUD assets.

Response: Ensure enough trained resources and funding has been allocated for maintenance of WSUD assets.

- Funding requirements to implement stormwater projects (including construction costs rising substantially due to Victorian and Federal Government infrastructure expenditure) Benefits are often a mix of financially measurable and harder to measure social and environmental benefits.

Response: Ensure projects are well planned in advance and that costs and benefits can be well communicated. Identification of the multiple benefits associated with IWM is critical to supporting budget processes

- Voluntary community activation remains difficult, especially when compared to other environmental issues such as energy efficiency or renewable energy

Response: This can be managed through partnership with community groups and other stakeholders (e.g. schools, Melbourne Water) to increase Community Knowledge about Water.

- Embedded governance structures – Taking an enterprise wide approach across council, ensuring a unified commitment and established processes for delivery of the Strategy is vital. Lack of coordination and or commitment to the strategy across the organisation can impact significantly on delivery of the strategy.

Response: Manage through formalised governance and reporting structures as described in the 5 year action plan.

- Integrated planning – IWM projects are often dependant on taking an integrated approach to other core assets and services. Civil infrastructure such as roads, drainage, parks and reserves all have important water related functions.

Response: Ensure capital planning incorporates IWM planning as BAU and look to future proof IWM opportunities as necessary. Developing an IWM policy or Environmental Sustainable Infrastructure for all the projects that happens in MCC including Council's capital works will ensure that IWM approach for managing stormwater will be considered.

- The IWM Strategy 2040 is aligned with Strategic Directions Statements for the Integrated Water Management (IWM) Forum for Yarra and Maribyrnong. The indicators and measures in the Catchment Scale IWM (CSIWM) plans are more comprehensive than the IWM Strategy 2040. However, specific targets for each measure will be determined by the forum in future through a co-design process with Forum stakeholders including Council representatives.

Response: Council will work closely with DELWP to incorporate the targets and measures set by IWM Forum if needed. Meanwhile, MCC will incorporate the measures for reporting and monitoring purposes, to create a baseline for information that will be required for the next IWM Strategy.

- Knowledge and skills – Integrated water management is multi-disciplinary and requires specialist expertise. Delivery occurs across multiple areas of council and therefore skill gaps can exist.

Response: Ensure in-house expertise is made available to support training, knowledge transfer and specialist technical advice. Outside expertise may be required where internal skill gaps are identified.

- Operations and maintenance – As with all assets, integrated water management assets require appropriate levels of maintenance. Understanding maintenance requirements, establishing protocols and resourcing appropriately is critical to successful asset management.

Response: Ensure resources are prioritised for operation and maintenance as described in the 5 year action plan

- Pace of development – Private development can have a significant impact on the built form and the impacts this can have on the water cycle such as reduced permeability, loss of private green space and urban heat.

Response: Ensure appropriate resourcing to achieve high levels of compliance with water sensitive urban design and permeability requirements in private development

Watching Brief

State policy is evolving over time – Key State policies under consideration or review include:

- Urban Stormwater – Best Practice Environmental Management (BEPM) Guidelines (1999)
- Development of Catchment Wide Integrated Water Management Plans (Yarra and Maribyrnong)
- Ongoing Victorian Government reform agenda as a result of the Stormwater Management Advisory Committee (2018)
- New environmental laws by Environment Protection Authority (EPA) Victoria come into effect from 1 July 2021.

Response: Maintain strong stakeholder relationships and adjust delivery of strategy as necessary to accommodate evolution in State policy.

Moreland's 5 Year Integrated Water Management Action Plan

The five-year action plan identifies the individual actions necessary to achieve the IWM outcomes, and tailored to address each outcome area and ensure that a balanced and comprehensive approach is taken. Some actions are ongoing, and some are one off activities. The combined efforts across many areas of Council is required.

The intent of the action plan is to ensure Moreland maintains a transition toward a Water Sensitive City. This is a journey that began with the inception of Watermap 2020 and is a journey that will continue to 2040 and beyond. The identified Outcomes are long term outcomes for 2040 and actions will need to be revised and prioritised in order to maintain their relevance to the Outcomes over time.

Projects and costs are defined including the action's contribution towards delivering the outcomes and vision for the IWMP 2040.

The implementation plan will be reviewed annually to ensure the actions remain relevant.

Action Plan Prioritisation

Actions have been designated as either High, Medium or Low. This assessment is based on the action's:

1. Contribution to the outcome
2. Benefit to the community
3. Capital outlay
4. Ability to attract external funding
5. Alignment with other council strategies and priorities
6. Co-benefits provided by the action (such as mitigation of the Urban Heat Island Effect, increased community amenity)

Several of our advocacy, partnership and delivery actions apply to the whole of the municipality and are listed in the Five Year Action Plan: 2020/21 – 2024/25 for the Integrated Water Management Strategy 2040.

Appendix 1. Monitoring, Reporting and Evaluation Framework

Table 3. Reporting and Evaluation Framework

Type of Reporting	Purpose	High level progress of 2040 Outcomes & deliverables	We will report on		
			2025 Quantitative Indicators	Quantitative Measures and Metrics	2025 Qualitative Indicators and Measures
Quarterly Reporting	<ul style="list-style-type: none">- To update the IWM Steering Committee Group on implementation of Plan including key measures of relevance to a quarterly reporting cycle- Monitoring and analysis to support efficiency and timely management of systems (e.g. identify excessive use and potential leaks)	<ul style="list-style-type: none">- Outcome 2 (Wise Water Use)- Project/Program progress reporting (relevant actions)	<ul style="list-style-type: none">- 3.1 Reduce Council's mains water use	<ul style="list-style-type: none">-3.1 benchmark against same quarters in previous years and historic water use for specific sites (reporting overall use, sector use and high use sites)- report on water utility costs benchmarked against same quarters in previous years	All relevant indicators including progress reporting on implementation of Action Plan in accordance with allocated annual capital and operational delivery plans
Annual Reporting	<ul style="list-style-type: none">- To update the Executive and Council on implementation of the Plan and progress toward measures- To assist with and prioritise planning and calibration of projects and programs identified in the Action Plan	All Outcomes	<ul style="list-style-type: none">- 3.1 Reduce Council's mains water use- 3.2 Increase council alternative water use- 3.3 Reduce community water use- 4.1 Reduce stormwater pollutant loads and flow volumes discharged to receiving waters-5.1 Increased uptake of water sensitive urban design in new development	<ul style="list-style-type: none">- 3.1 reduction over baseline of 465ML/yr and cumulative 1% reduction year on year- 3.2 volume of alternative water used- 3.3 benchmarked against previous years and per capita use of T155 l/p/d- 4.1 total area of new catchment treated (target 200 ha in five years) and total cumulative area treated over time-5.1 number of planning permits issued incorporating WSUD and area treated to BPEM Best Practice	All relevant qualitative measures reported with status update and progress against implementation of Action Plan
2025 Final Evaluation of Action Plan of Moreland IWMS	Evaluate the success of Moreland IWM Strategy Implementation, identify successes and gaps in delivery in preparation for Strategy renewal	All Outcomes	<ul style="list-style-type: none">- 2.1 Increase urban tree resilience supported by water-2.2 Increase permeability- 3.1 Reduce Council's mains water use- 3.2 Increase council alternative water use- 3.3 Reduce community water use- 4.1 Reduce stormwater pollutant loads and flow volumes discharged to receiving waters-5.1 Increased uptake of water sensitive urban design in new development	<ul style="list-style-type: none">- 2.1 percentage of urban forest supplied by non-potable source-2.2 total area of hard surfaces re-paved- 2.2 percentage of development retaining greater than 20% site perviousness- 3.1 Measure 420ML (5% reduction over baseline 465ML/yr plus further reduction of 18ML p/yr offset by stormwater harvesting- 3.2 Measure 57ML/yr (18ML/yr new supply 2020-25)- 3.3 benchmarked against previous years and per capita use of 155 l/p/d- 4.1 Measure the total area treated to BPEM Best Practice-5.1 number of planning permits issued incorporating WSUD and area treated to BPEM Best Practice	Qualitative reporting on all measures and overall delivery of Action Plan
Catchment Wide Integrated Water Management Plan CWIWMP Reporting	<ul style="list-style-type: none">- Reporting on Yarra and Maribyrnong Catchment Wide Integrated Water Management Plans once completed and agreed with regional partners	Still to be determined	TBC	TBC	TBC

Appendix 2. Links to other plans

Council’s provision of services is very broad and interacts with the water cycle in many ways. Integrated Water Management Strategy 2040 both supports and is reliant on how these services are delivered. Mutually reinforcing actions and goals across a range of Council plans will support delivery of Integrated Water Plan 2040. The Vision of our Council Plan 2017-21 states “*Moreland will be known for its proud diversity and for being a connected, progressive and sustainable city in which to work, live and play*”. With its focus on liveability and sustainability, the Integrated Water Management Strategy supports this vision in many ways with particularly strong linkages to the Progressive City theme. The relationship between the Integrated Water Management Strategy and Council’s relevant key plans and strategies is presented below.

Delivery of the Integrated Water Management Plan 2020/21 -2024/25 will be achieved not only through direct programs and projects, it will also be delivered through a range of other plans.

Table 4. Related policies, plans and strategies to the Integrated Water Management Strategy 2040

	Council Plan 2017-21	Urban Heat Island Effect Action Plan 2017-26	Zero Carbon Action Plan 2021-25	Waste and Litter Strategy 2018-2022	Municipal Public Health and Wellbeing 2017-21	Urban Forest Strategy 2017-27	Open Space Strategy 2012-22	Nature Plan (draft)	Food Systems Strategy 2017-20	Action on Climate change
Resilient and Liveable Landscapes	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Wise Water Use	✓						✓		✓	✓
A Healthy Environment	✓	✓		✓	✓	✓	✓	✓		✓
Community embracing WSUD	✓									
Collaborating in a Water Sensitive City	✓			✓				✓		✓