City of Kwinana

Water Plan 2024-2028

The City of Kwinana acknowledges the Traditional Custodians of the land in which we live, work and play, the Nyoongar people, and we pay our respect to Elders past and present.

Contents

Approved by the City of Kwinana Executive Leadership Team 26 March 24

Introduction

Background

Water is vital for sustaining human life, the well-being of our planet and its inhabitants. Being the world's driest inhabited continent, Australia faces significant challenges due to a long-term drying trend observed since the mid-1970s. As demonstrated in Figure A, this has particularly impacted southwest Western Australia, with a 26% reduction in rainfall by 2018 compared to the 1900-1969 historical average (CSIRO, 2023). Climate-driven challenges, including declining rainfall, rising temperatures, and their implications for water availability, security, and quality, affect all members of our community (UWA, 2014).

Many local governments are actively addressing these issues to mitigate their impacts, recognising far-reaching consequences for the community. They approach these challenges with a strong commitment to solutions that meet the needs of growing communities while minimising negative impacts and promoting long-term sustainable outcomes.

Purpose

The City of Kwinana acknowledges its responsibility to address local and regional water challenges. The City will continue to provide forward-thinking and future focused water management of its own operations and education to residents and businesses, with the aim to help build resilience, increase water literacy and overall water efficiency. This Water Plan replaces the Sustainable Water Management Plan (2018-2023) with a strong focus on the City's actions to increase water use efficiency, adapt to changing water availability and provide education opportunities to our community to do the same.

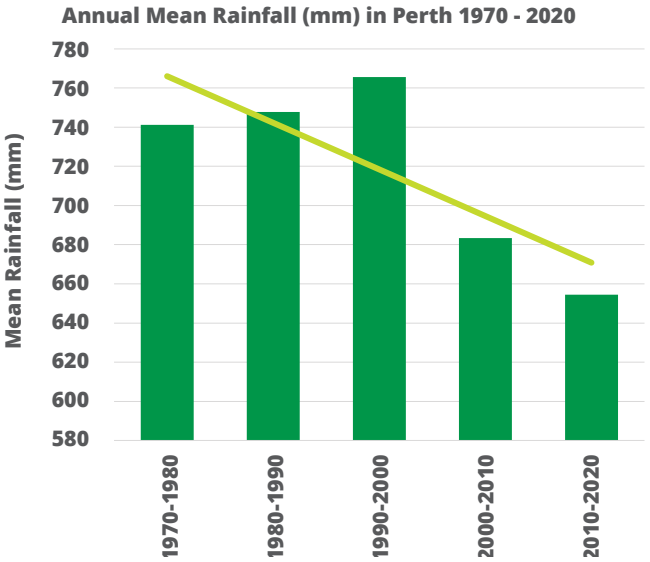
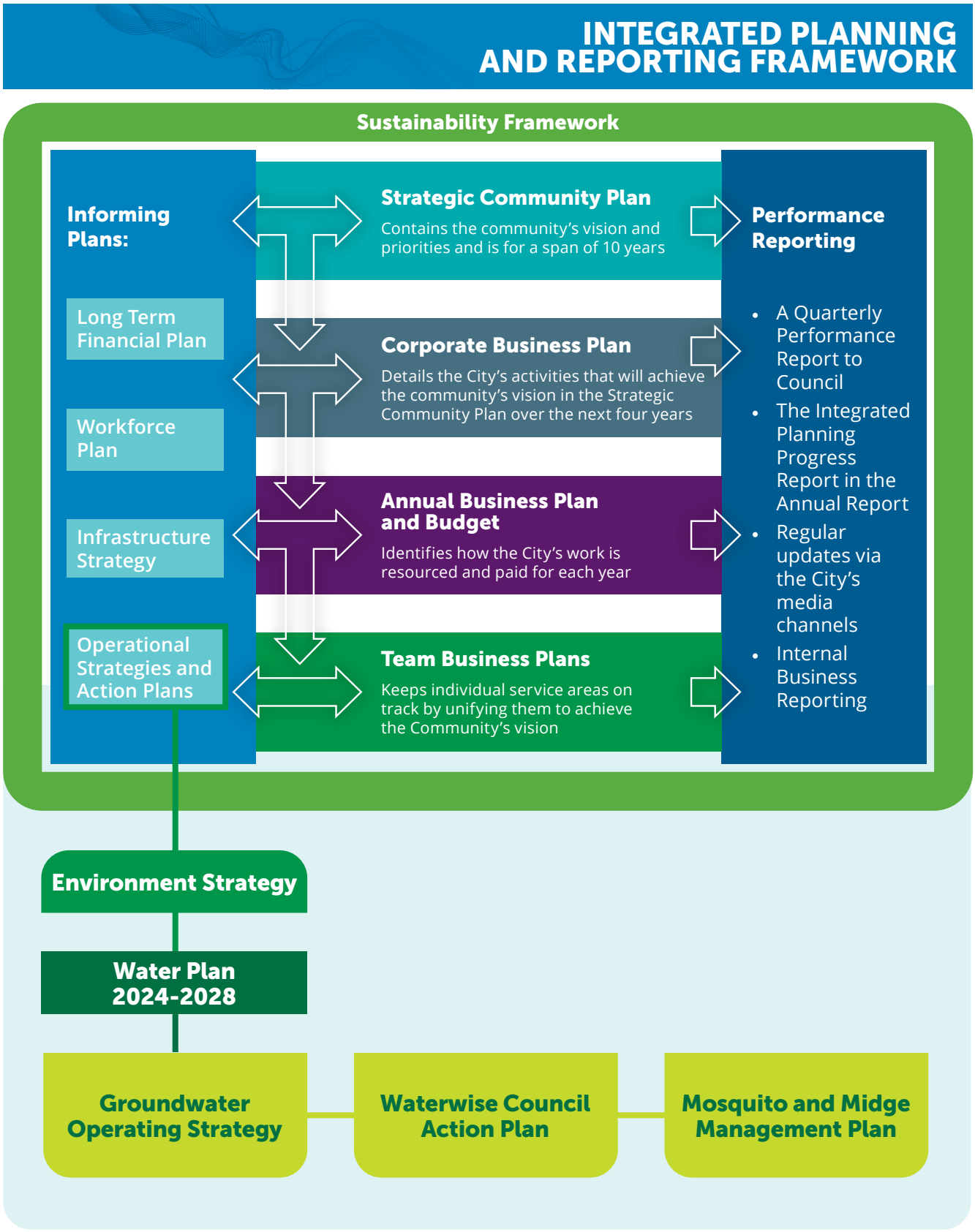


Figure A: Annual mean rainfall (mm) by decade 1970 - 2020 (Source; BOM 2023)

Strategic Context

The Water Plan will contribute towards the implementation of the City's Strategic Community Plan and the State Government *Kep Katitjin – Gabi Kaadadjan – Waterwise Perth Action Plan 2 (2022)*, while maintaining alignment with the Waterwise Councils program. Along with these programs, the City undertakes its operations so that groundwater usage remains within the City's allocated annual licenced amount set by the Department of Water and Environmental Regulation (DWER). The position of the Water Plan within the City's Integrated Planning Framework is outlined below, with its interdependency with key strategies and plans detailed thereafter.



City of Kwinana Sustainability Framework

The City's Sustainability Framework provides guiding principles and priority focus areas to aid the City's realisation of the United Nations Sustainability Development Goals outlined in the City's Strategic Community Plan. This Framework guides the City to make decisions that consider the well-being of future generations and achieve positive, sustainable outcomes. It aims to create a vibrant City that balances social, economic, and environmental values, through good governance. Several Principles and Priority Areas (Table 1) are applicable to the Water Plan.

Sustainability Guiding Principles

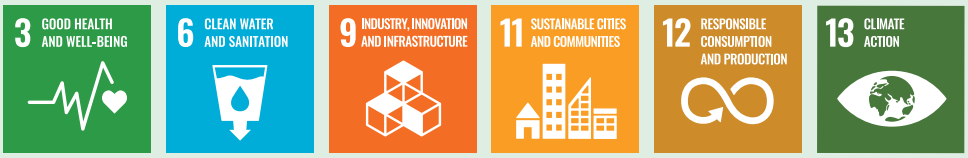
Community Wellbeing

Generational value creation

Environmental stewardship

Resilient and adaptable communities

United Nations Sustainability Development Goals



Priority Areas	
Priority Area 1: Climate Action	Climate change is increasingly affecting both our operations and our community. Climate action involves reducing greenhouse gas emissions and increasing our resilience and capacity to withstand the impacts of climate change
Priority Area 2: Environment and biodiversity	Environment is one of the pillars of sustainability: it provides ecosystem services and underpins all life. Biodiversity is a key feature of our local environment: its protection is an essential part of maintaining these ecological services and functions
Priority Area 3: Liveability	Liveability is a fundamental part of the City's role as a local government, to create and maintain a safe, connected, comfortable environment so that we have a thriving and happy community.
Priority Area 4: Engagement and Inclusion	Inclusion and engagement foster a community that feels it belongs and that can trust its decision-makers. Regularly hearing from a diverse range of voices ensures the needs of the community continue to be met
Priority Area 7: Innovation	Innovation is at the heart of employee involvement; it is a way to feel heard and be involved in decision-making processes that can have lasting and significant benefits to our organisation and community. Cultivating an environment of learning, stretching and continuous improvement, built on best practice can provide better outcomes.

City of Kwinana Strategic Community Plan

The City of Kwinana's Strategic Community Plan 2021-2031 (SCP) was developed in consultation with the community and is the overarching document that guides the City's priorities. The SCP prescribes a number of objectives aimed at achieving the City's vision of "*A unique and liveable City, celebrated for and connected by its diverse community, natural beauty and economic opportunities*".

There are several outcomes and objectives (Table 2) that are applicable to the Water Plan.

Table 2: SCP outcomes and objectives applicable to the Water Plan.

Outcome 1 **A naturally beautiful environment that is enhanced and protected**
1.1 Retain and improve our streetscapes and open spaces, preserving the trees and greenery that makes Kwinana unique
1.2 Maintain and enhance our beautiful, natural environment through sustainable protection and conservation
Outcome 3 **Infrastructure and services that are sustainable and contribute to health and wellbeing**
3.3 Maintain infrastructure, playgrounds, parks and reserves to a high standard through sustainable asset maintenance and renewal
Outcome 4 **A unique, vibrant and healthy City that is safe, connected and socially diverse**
4.3 Enhance opportunities for community to meet, socialise, recreate, and build local connections
Outcome 5 **Visionary leadership dedicated to acting for its community**
5.4 Establish a culture of continuous improvement, achieving high levels of business excellence

Waterwise Council and Waterwise Aquatic Centre Endorsement

The City participates in the state-wide Waterwise Councils program administered by Water Corporation and the Department of Water and Environmental Regulation. The program is aligned with the water sensitive cities approach. The City has participated in the program since 2010 and has been endorsed as a Gold Waterwise Council since 2017.

The City developed its current Waterwise Action Plan in 2021. Annual Waterwise Council re-endorsement involves reporting against the goals, targets and actions within the Waterwise Action Plan. These actions include the upgrade and maintenance of water-related infrastructure, other water efficiency initiatives and ensuring that water across the landscape is valued and considered holistically. The City will comprehensively review and update its current Waterwise Action Plan in 2026.

Local Factors

The water landscape within the City is changing rapidly, due to the impacts of climate change and population growth. This has been a fundamental consideration in the development of this Plan.

Population Growth

Population and economic growth within the City will continue to significantly impact water availability by increasing the demand for water. Existing water resources and infrastructure must accommodate this, to avoid potential to depletion and shortages. As the City's population is forecast to increase by 53,510 residents between 2011 and 2036, necessary design changes, education and increased water efficient technologies are required (RKCC, 2023).

Climate Change

Climate change is exerting significant impacts on the water landscape within the City. The region is experiencing decreased rainfall leading to heightened pressure on existing water resources. (DPIRD, 2023). As figure B illustrates, the average annual temperature is steadily increasing. As temperatures rise over time, so do evaporation rates, increasing the rate of loss of water from surface water bodies and vegetation. Rising sea levels associated with climate change could lead to saltwater intrusion into freshwater sources, rendering them unsuitable for use. An increased frequency of extreme weather events such as heavy rainfall and storms, have the potential to further disrupt the water landscape by causing infrastructure damage and water contamination. These impacts require the implementation of adaptive measures and actions to ensure a sustainable water future for Kwinana.

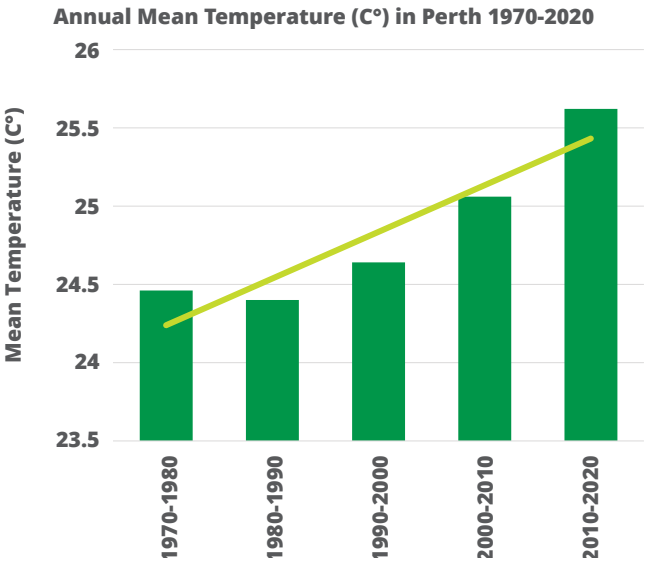


Figure B: Annual mean temperature (C°) in Perth 1970-2020 (Source; BOM 2023)

Natural Environment

Blue-green assets refer to environments where surface water occurs in the natural environment. Some local examples of these are wetlands, seasonal damp lands, sumplands and the Peel Main Drain system that traverses through Kwinana. The City is fortunate to have a variety of these types of ecosystems, including two Tumulus Mound Springs, a declared Threatened Ecological Community. Blue-green assets provide a range of benefits, including improved amenity, animal habitat, health and wellbeing arising from accessible green space, improved waterway health and urban cooling effects from water within the landscape (WSAA, 2023). Blue-green assets are an important component of the landscape within the City and the protection of these is integral to receiving these desired benefits.

Urban Stormwater Management and Water Sensitive Design

The City has been implementing water-sensitive urban design principles in its managed areas, and requiring developers to do the same across new developments, for many years. This includes sustainable water management practices, improved water use efficiency through public open space landscaping and irrigation upgrades, improved water quality through managing stormwater effectively, enhanced liveability by incorporating green infrastructure elements, and increased resilience to climate change (DWER, 2017). By incorporating these principles into urban planning as standard practice, the City becomes a more sustainable and environmentally conscious place that conserves water resources, protects ecosystems, and provides a better quality of life for its residents (Fogarty et al. 2021).

Litter and pollution

Litter and water pollution continue to affect local stormwater and waterways. These issues are persistent and are again addressed through this Plan. Plastics in the environment can take hundreds of years to break down, impacting wildlife and water quality for generations (Landcare, 2020). During implementation of the previous Sustainable Water Management Plan, the City took steps to reduce litter and illegal dumping across waterways and water bodies. The City's recently developed Litter and Illegal Dumping Plan 2023-2027 recognised that the implementation of drainage nets on five of the City's stormwater drainage outfalls, as an action of the City's previous Water Management Plan, had been successful in reducing the distribution of litter in these areas. Investigations will be undertaken to determine whether additional nets should be installed at other locations as an action in this Plan.

Corporate Water Use

The City's annual scheme-water consumption is presented in Figure C. The City monitors and utilises water data for performance analysis and to identify areas for improvement.

Scheme Water

The City's corporate water consumption over the past seven years has between between 33,000kL and 45,777kL per annum. This consumption figure varies from year to year due to factors such as staffing number variation and community facility usage and leaks.

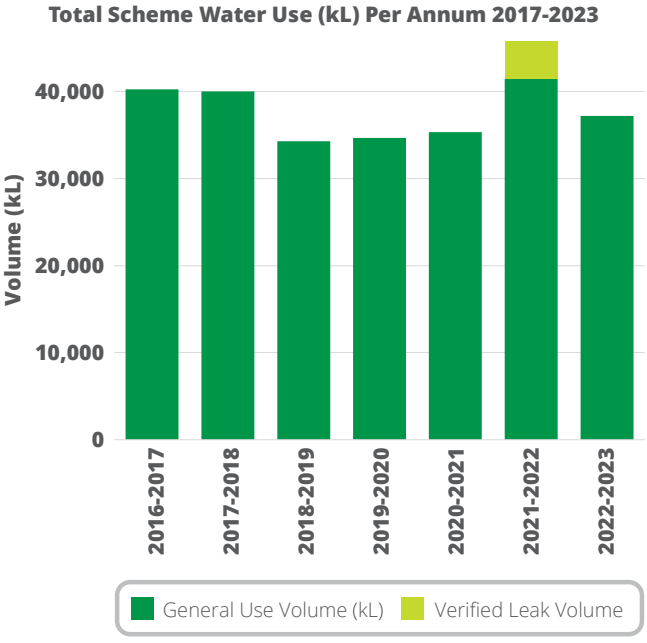


Figure C: Total scheme water use per annum 2016-17 until 2022-23

The City has experienced a reasonably consistent level of scheme water use since the baseline year of 2016-2017. Water consumption in 2021-2022 was noticably higher due to a significant and particularly difficult to locate underground leak outside The Zone youth space. The approximate volume of water lost by the leak was 4,300kL. This is indicated by the lighter coloured component of that year's annual use in Figure C. However, in terms of actual consumption, all years since the baseline year have been tracking within the corporate scheme water target of the preceding Sustainable Water Management Plan, to maintain usage within 5% of 2016-2017 levels.

There are some public facilities that are used more heavily during hot weather events and over the summer season, including the Recquatic and Kwinana Adventure Park splash pad. The scheme water efficiency measures implemented during the last seven years will allow the City to maintain consistent consumption, despite its growing population and other challenges.

The cost of water has doubled since 2016-17. The City is currently charged $2.78/kL for scheme water as it and the rest of WA face challenges associated with a warmer climate and drying landscape. As such, improved water-use efficiency by the City will not only better protect our diminishing water resources, but also help manage costs.

Figure D shows the top 10 scheme water consuming sites in the 2022-2023 financial year. These top sites represent 87% of all scheme water used by the City for this year. Due to the high proportion of consumption at these sites, efficiency and water saving upgrades are a priority, and consumption is monitored each billing period to help identify potential leaks or consumption anomalies. The increase in population and temperature will likely result in consumption increasing in some locations over time, as sites such as the Recquatic and splash pad at the Kwinana Adventure Park are likely to be used more often and by more people during periods of hotter weather.

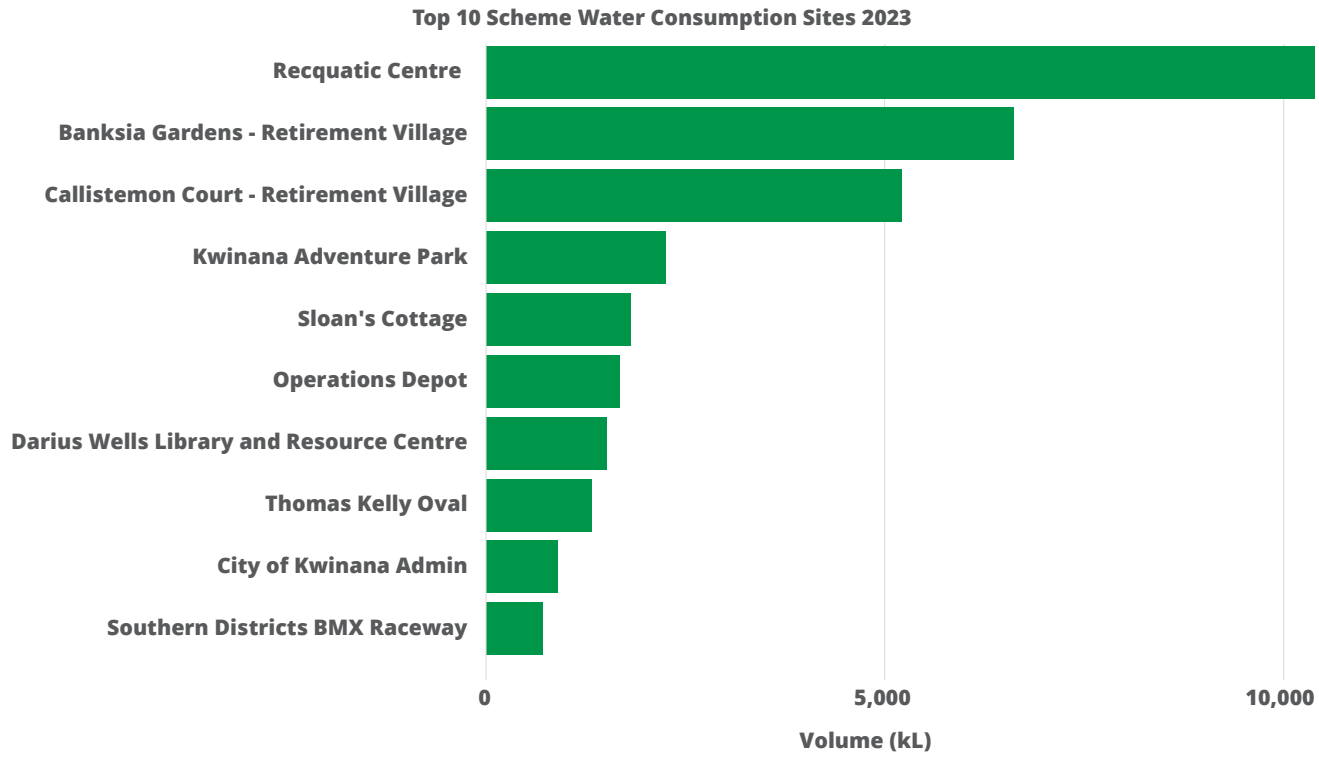


Figure D: City of Kwinana's top 10 scheme water consuming sites in 2023

Groundwater

Figure E shows the groundwater abstraction totals against the allocation for the City's groundwater licenses. The City has maintained its consumption under its annual allocation and has continued to implement the further techniques and technology-based solutions that will ensure the City's irrigation management remains effective and efficient. The City manages significant areas of sports and recreation turf that require higher levels of maintenance and water application to maintain the necessary service standards to support their heavy usage throughout the year.

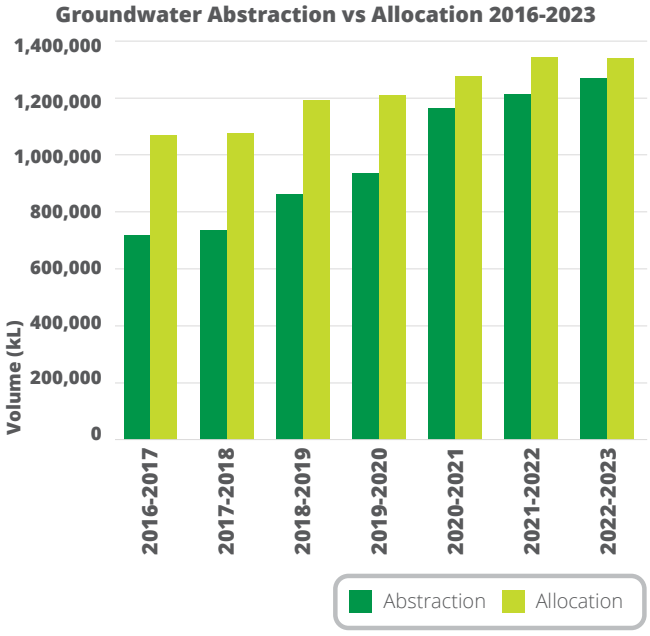
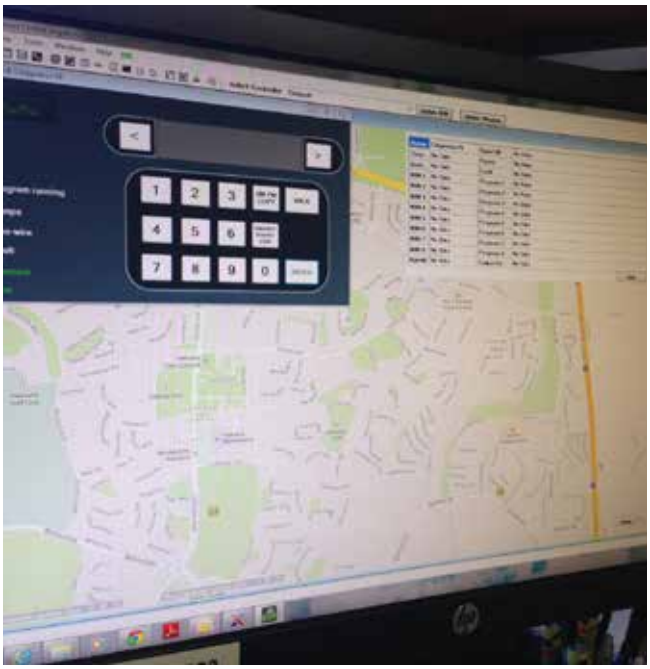


Figure E: City of Kwinana's Groundwater use vs allocation 2016-2023

The City's Groundwater Operating Strategy 2019, and its preceding versions, has helped the City maintain compliance with its groundwater licensing and implement various changes to how it manages its groundwater use through improved infrastructure, technology use and operational practices.

As at 2023, the City has converted 95% of its bores to a centralised control system, which helps the irrigation team manage its water application based on quality of turf and seasonal conditions. As the system includes mobile activation and control, this significantly reduces the amount of water used during system testing, maintenance and repair works.



Central Control Irrigation Software

Community Engagement

Each year, the City hosts sustainability and environmental workshops that engage and inform our community on locally relevant issues.

Living Green

The City's annual Living Green Program runs from April to June and includes various water-centric activities and education on environmental, sustainability, and waste issues. The program raises community awareness and action around water efficiency and management. In 2023, the City held native planting days, a native gardening workshop, household organic waste reuse workshops, a sustainable living course and its popular annual native seedling subsidy scheme. Through these initiatives, residents develop a better understanding of how their actions can positively impact their own household water efficiency and the value of waterwise landscaping and our local natural areas.

The City hosts an annual 7-week sustainable living course for residents, focusing on sustainable daily practices. Participants and apply practical ways to mitigate water-related climate challenges, how to effectively compost their household organic waste, integrate solar passive design to reduce water and energy usage in cooling, and other ways to enhance both energy and water efficiency at home. During the past seven years that the course has been run, participants have consistently rated it with high levels of satisfaction, demonstrating their heightened awareness and active participation in sustainable water practices.

Plastic Free July

Plastic Free July is an initiative aimed at reducing plastic usage, particularly focusing on addressing the issue of plastic waste in our natural waterbodies. During Plastic Free July, the City provides education and promotion around minimising the use of single-use plastic items, which often find their way into waterways, posing a significant threat to these ecosystems. The campaign is an opportunity to raise awareness about the detrimental effects of plastic litter, encouraging our community to actively participate in reducing their plastic footprint. Plastic Free July is now a widely recognised campaign that has effectively contributed to the reduction of approximately 2.1 billion tonnes of waste, including 300,000 tonnes of plastic consumption (PFJ, 2023), showcasing the impact of collective efforts in safeguarding the integrity of natural water systems worldwide.

The City will continue to deliver, review and update its Environment and Sustainability Education Plan to ensure that it remains relevant to the issues that affect Kwinana and its community.

Achievements to-date

This Water Plan replaces the Sustainable Water Management Plan 2018-2023 and builds further on actions that were undertaken previously while also planning new and innovative actions for the City's water future.

At the conclusion of the Sustainable Water Management Plan 2018-2023, the City had achieved the following outcomes:

- Gold Waterwise Council endorsement since 2017.
- Platinum Waterwise Aquatic Centre endorsement achieved in 2022.
- Conversion of 95% of the City's bore controller systems to a centralised irrigation control system.
- Development of the City's first Litter and Illegal Dumping Plan (2023-2027).
- Installation, upgrade, replacement and maintenance of water data loggers at high consumption sites, allowing quick and accurate flow readings to identify leaks and consumption variances. The City currently has five active water data loggers.
- Maintenance of drainage nets at five sites to intercept litter before it enters natural environments. These nets have collected 3.6 tonnes of debris since they were installed in 2018.
- Further hydrozone implementation and replacement of exotic or high water needs plants with waterwise/ endemic species in City managed landscapes.
- Annual participation in Clean Up Australia Day and other litter clean-up events.
- Annual revegetation programs including community and staff planting events.
- Hosted the Living Smart 7-week sustainable living course annually for City residents and various sustainable living workshops through the Switch Your Thinking sustainability program, providing workshops and events to promote sustainable living in our community.

Vision

"Water everywhere is appreciated as an essential and finite resource that brings value to us all and is utilised in ways that ensure its continued availability and quality into the future."

Goals

The City aspires to be a Water Sensitive City, as defined by the Cooperative Research Centre for Water Sensitive Cities. According to the Water Sensitive Cities Index, the journey towards becoming a Water Sensitive City involves making improvements within the following seven overarching goal areas:

1
Ensure good water sensitive governance

2
Increase community capital

3
Improve productivity and resource efficiency

4
Improve ecological health

5
Ensure quality urban space

6
Achieve equity of essential services

7
Promote adaptive infrastructure

(CRC for Water Sensitive Cities, 2018)

The City is already experiencing a range of benefits from working towards the Water Sensitive Cities Index for several years.

Targets

To continue to support our journey towards becoming a Water Sensitive City, the following targets and the implementation plan actions were developed collaboratively with relevant teams. Representatives from the City's cross-functional water management team will drive the actions that will contribute towards these targets.

Corporate Water Target

1. Achieve Platinum Waterwise endorsement by 2027.

The City will work to achieve Platinum endorsement for the Waterwise Councils program by 2027. The criterion for this endorsement is to achieve high water efficiency and deliver above standards for water management within the City. It also ensures that the City goes beyond business-as-usual and makes ambitious and innovative decisions regarding water management going forward.

Scheme Water Target

2. Maintain scheme water use within 5% of 2016-2017 levels until 2027.

In 2022-2023 the City used 7.52% less water than 2016-2017, indicating that this target has been consistently achieved to date. This target will become increasingly challenging due to population growth and the drying climate. If the above target is achieved, it would represent the City's consumption remaining within 5% of the baseline level for an entire decade, which would be a noteworthy milestone achievement.

Groundwater Target

3. Maintain Groundwater abstraction below 90% of allocation until 2027.

The City has a strong recent history of Groundwater efficiency. The above target is achievable but increasingly challenging due to continued climate change and will likely rely on further advances in technology and best practice. The current 5-year average allocation usage is 85.64%, sitting 4.36% under this target.

Community Water Target

4. Maintain residential water use below the Waterwise Perth Action Plan target of 110kL/Capita until 2026

To support this target, the City will:

- Provide community water literacy education, encouraging water efficiency at all levels.
- Continue to provide accessible online information and updates.

The City of Kwinana community annual water usage has consistently remained beneath the target of 110kL/capita, with usage being 75.83kL/capita in 2022-2023 with similar usage rates during preceding years. Along with this, the City has been running engaging community events and workshops that enable residents to be more water conscious.

Implementation Plan

Implementation Plan

The implementation of the actions set out by this Plan may vary if circumstances change. These actions follow on from the Sustainable Water Management Plan 2018-2023 actions and will be listed as new, ongoing, updated and existing.

Action Number	Water Sensitive City goal area	Action (Actions marked with an asterisk* are Waterwise Council Program mandatory actions)	Responsible
Community			
1	Improve productivity and resource efficiency, Increase community capital	Continue to support and run community waterwise verge initiatives and education, education on climate resilient, biodiverse native gardens. Education on fertilise-wise practices to prevent nitrogen from entering natural water systems. Deliver events and education practices outlined in the Environment and Sustainability Education Plan.	Sustainability Officer, Environment Officer
2	Increase community capital	Deliver annual native seedling subsidy scheme.	Environment Officer, Sustainability Officer
3	Increase community capital	Promote water initiatives such as National Water Week, the Waterwise Schools and Waterwise Business Programs	Sustainability Officer, Senior Marketing and Communications Officer
4	Increase community capital	Continue to engage with the Boola Maara Aboriginal Advisory Committee to identify opportunities for learning, local input and outcomes related to water and waterways	Boola Maara Aboriginal Advisory Committee, Sustainability Officer, Coordinator Parks and Natural Areas, Community Development Officer - Diversity
Strategy			
5	Good water sensitive governance	Ensure that developers are aligning to the City's adoption of DWER's decision making process for stormwater and Urban Water Management	Coordinator Engineering Development
6	Improve ecological health	Maintain surface water quality monitoring at aquatic sites at risk of vector-capable mosquitoes	Coordinator Environmental Health
7	Promote adaptive infrastructure	Promote the continued use of the City's online reporting tool to report leaks or damaged/ broken equipment identified by our community	Sustainability Officer, Senior Marketing and Communications Officer
8	Improve productivity and resource efficiency	Recquatic Centre to maintain Gold Waterwise Aquatic Centre endorsement.	Aquatic and Centre Operations Team Leader, Sustainability Officer
9	Good water sensitive governance, Improve productivity and resource efficiency.	City of Kwinana to maintain Gold Waterwise endorsement and be awarded Platinum endorsement by 2027.	Sustainability Officer, Coordinator Parks and Natural Areas, Supervisor Irrigation, Aquatic and Centre Operations Team Leader
10	Good water sensitive governance	Continue to use a cross-functional water management team to consider and implement council initiatives related to the progression toward a water sensitive city	Sustainability Officer, Cross – Functional Water Team (as listed in Waterwise Council Action Plan)
11	Improve ecological health	Monitor the effectiveness of drainage nets on stormwater outfall pipes and investigate other targeted approaches to litter in stormwater and waterways	Technical Officer – Infrastructure Operations, Sustainability Officer

New/ Existing/ Updated	Timeframe for completion	Budget	Measure of success
Updated	Ongoing	$6000/yr (existing sustainability workshops budget)	Number of residents registering and participating in water-related events run by the City
Existing	Ongoing - Annual	$8000/yr (existing seedling subsidy scheme budget)	Number of residents participating in the seedling subsidy scheme
New	Ongoing	Staff time	Local businesses and schools participating in Waterwise programs and working to improve their water management and efficiency. Increase in promotion within the Environment and Sustainability Education Plan.
New	Ongoing	Staff time, Boola Maara meeting time	Boola Maara are engaged with on water-related topics
New	Ongoing	Staff time	All new developments are waterwise and include water sensitive urban design
Updated	Annually	Operating budget	Water quality monitoring undertaken and reported annually
Updated	Ongoing	Staff time	Online report usage for reporting of leaks or damaged/broken water equipment
Updated	Annual	Staff time	Maintenance of Gold Aquatic Centre endorsement
Existing	Ongoing	Staff time	Maintenance of Gold Waterwise Council endorsement Achieve Platinum endorsement by 2027
Existing	Annually	Staff time	Water management team meeting with Sustainability Officer twice a year to discuss water initiatives
Updated	2024-2026	Staff time	Nets are deployed and maintained at chosen sites and are performing effectively

Implementation Plan *continued*

Action Number	Water Sensitive City goal area	Action (Actions marked with an asterisk* are Waterwise Council Program mandatory actions)	Responsible
12	Improve ecological health	Develop and adopt an Urban Forest Plan that will direct how the City will preserve, expand, and manage its urban forest. This will help to support ecological connectivity between the City's natural areas and blue-green assets and mitigate urban heat	Coordinator Environmental Planning, Sustainability Officer, Environment Officer
Groundwater and Scheme Water			
13	Improve productivity and resource efficiency	Trial new irrigation techniques and water saving initiatives in parks to further improve irrigation efficiency	Supervisor Irrigation, Coordinator Parks and Natural Areas, Sustainability Officer
14	Improve productivity and resource efficiency	Identify groundwater bores where irrigation is no longer required and investigate decommissioning where appropriate	Sustainability Officer, Coordinator Parks and Natural Areas, Supervisor Irrigation
15	Improve productivity and resource efficiency	Undertake a review of the current provision and positioning of existing water data loggers and the need for additional loggers to enhance monitoring of consumption and data capture	Sustainability Officer
16	Improve Productivity and resource efficiency	Maintain database of water consumption and billing, allowing for identification of anomalies and leaks	Sustainability Officer, Aquatics and Centre Operations Team Leader

New/ Existing/ Updated	Timeframe for completion	Budget	Measure of success
New	2024-2025	Staff time	Urban Forest Plan is finalised and implemented
Updated	Ongoing	Annual Parks Budget	Improved irrigation efficiency results from irrigation trials
New	2024-2025	Staff time	Completion of investigation into relevant bores. Bores identified as no longer required have been decommissioned
New	2024-2026	Staff time	Completion of data logger review. Data loggers are placed at high-risk and/or high-consumption sites. Data logger monitoring and alert system in place.
Updated	Quarterly ongoing	Staff time	Database updated every billing period and dataloggers included (if possible)

Monitoring and Review

The status of implementation plan actions will be reviewed annually to ensure that their progress is monitored and reported.

This Plan will undergo a mid-cycle review in 2026 to update actions and data to ensure the City remains up-to-date with technology and strategic changes. In 2023, the City introduced an Environmental Data Management System (EDMS), an online web-based data collection and validation resource. This will allow staff to view current and validated corporate billing data for utilities, including water, and thus enable significant improvement to monitoring capabilities.

The City will ensure that any changes that arise will be considered, and relevant adaptations made to the actions within this Plan, so they remain relevant to the City's progress toward being a water sensitive city.

Credit: Anthony Santaro

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