1. INTRODUCTION

Urban development within the City of Rockingham (the City) has traditionally taken advantage of elevated land with sandy soils, limited surface water drains or watercourses, as well as generous clearance to groundwater. As the more suitable land has now largely been urbanised the focus has moved to areas which are more difficult to develop due to the presence of seasonal surface water inundation and/or geological complexity.

In addition, the new focus on housing diversity typical throughout the Perth Metropolitan and regional growth areas has meant lot sizes have decreased in size; which in turn has increased the impervious area (house, driveway and pavement), as well as providing less garden area and turf suitable for infiltration purposes.

With a view to obtaining the best possible environmental and water management outcomes for the City, it is important to ensure that all development occurs with a focus on total water cycle management and not just traditional 'end of pipe' drainage solutions. The purpose of this Planning Policy is therefore to:

(a) Ensure the application of *Better Urban Water Management* (WAPC, 2008), and any future versions of BUWM, as part of the planning approvals process;

(b) Provide guidance on the City's urban water management requirements to ensure that planning and development proposals are dealt with in a consistent manner;

(c) Ensure that appropriate measures are taken to manage catchments in order to maintain or improve surface and groundwater resources;

(d) Promote alternative water conservation and sustainability practices that reduce reliance on traditional supplies.

2. POLICY APPLICATION

This Policy articulates the City's position on the planning, design and construction of Urban Water Management proposals and is to be considered by applicants, and City Officers in the design, assessment, and determination of:

- Structure Plans (District, Local and Activity Centre);
- Subdivision Applications;
- Development Applications;
- Detailed engineering/landscape drawings.

This Policy applies to proposals that facilitate residential (on both rural and urban land), commercial and industrial zoning, subdivision or development; and is also consistent with the responsibilities applied to the activities, works, services and programs conducted by the City.

3. POLICY OBJECTIVES

The objectives of the Policy seek to:

(a) Improve the achievement of total water cycle management outcomes via the structure plan, subdivision and development approvals processes, consistent with *State Planning Policy 2.9: Water Resources* (2006), *Better Urban Water Management* (WAPC, 2008), future versions of BUWM and *Decision Process for Stormwater Management in WA* (2017).

(b) Ensure that land use planning decisions integrate land and water planning, achieve catchment specific environmental criteria, and thereby deliver better-improved water management outcomes for the catchments within the City.

(c) Implement Water Sensitive Urban Design (WSUD) principles and best management practices for all development proposals and City Operations.

(d) Improve water quality within the City and ensure the protection and management of sensitive environments. Where possible, restore and enhance the environmental, economic and social values of the City's waterways and protected wetlands.

(e) Assess the practical and appropriate level of risk related to the proposal (guidance on level of risk is contained in Appendix 1*)*.

4. POLICY STATEMENT

4.1 General Requirements

Under the *Better Urban Water Management* (WAPC, 2008) framework, the following table articulates the integrated urban water planning with land planning process to ensure WSUD is achieved.

Planning Trigger	Document Required	Responsibility	Approving Authority
District Structure Plan	District Water Management Strategy (DWMS)	Local Authority or Landowner/ Developer	WAPC on advice of DWER
Local Structure Plan	Local Water Management Strategy (LWMS)	Local Authority or Landowner/ Developer	WAPC on advice of DWER and City of Rockingham
Subdivision Application	Urban Water Management Plan (UWMP)	Landowner/ Developer	City of Rockingham
Development Application (DA)	Engineering Design Landscape Design	Landowner/ Developer	City of Rockingham

4.1.1 District Water Management Strategy (DWMS)

A DWMS is to be prepared to support a District Structure Plan (DSP) and/or as a component of an amendment to the Metropolitan Region Scheme (MRS). A DWMS must demonstrate that the area is capable of supporting the change in land use to rural residential, urban residential, commercial or industrial by achieving appropriate urban water management outcomes.

A DWMS is to be prepared consistent with *Guidelines for District Water Management Strategies* (DoW, 2013).

4.1.2 Local Water Management Strategy (LWMS)

A LWMS is required to support rezoning at the Local Scheme Amendment stage, or where the provisions of the zone require a Local Structure Plan to be prepared. Any Structure Plan associated LWMS is to be consistent with the overarching DWMS, where applicable. In the absence of a DWMS, a combined District and Local Water Management Strategy (D&LMWS) must be prepared.

A LWMS must demonstrate how the proposed change in land use (rural residential, urban residential, commercial or industrial) will address water use, the protection of water dependent environments and management, and identify existing and required water management infrastructure, including detailed land requirements.

Any application to amend a Structure Plan is to include an assessment of the impact of the proposed amendments on the approved LWMS. The City will then determine whether the proposed Structure Plan amendment is required to be supported by a revised LWMS.

A LWMS is to be prepared consistent with *Interim: Developing a Local Water Management Strategy* (DoW, 2008).

4.1.3 Urban Water Management Plan (UWMP)

An UWMP is to be submitted to the City as a condition of Subdivision Application approval and must be approved by the City prior to the commencement of any subdivisional works and/or lodgement of associated subdivision clearance. An UWMP is not generally required for subdivision in infill/brownfield areas, unless the development is likely to impact on significant water resources.

The UWMP is an extension of the LWMS that articulates the critical parameters for infrastructure design at the subdivision stage. An UWMP must demonstrate how the final built form will use and manage water including specific infrastructure, land requirements and detailed designs for both stormwater and groundwater management. An UWMP applies to urban residential, rural residential, commercial and industrial land uses.

The UWMP must include detailed hydrologic and hydraulic investigation, modelling and design to resolve issues identified within both the DWMS and LWMS with the level of detail required for the UWMP to be determined by the City based on the complexity and risk associated with each development proposal.

An UWMP is to be prepared consistent with *Urban Water Management Plans: Guidelines for Preparing Plans and for Complying with Subdivision Conditions* (DoW, 2008).

4.1.4 Stormwater Management Plan

Where applicable, the City may impose conditions on Development Application (DA) approvals to ensure the implementation of strategies outlined in an approved UWMP. In the absence of an approved UWMP, a DA is still bound by the objectives and assessment criteria provided in this Policy. The applicant may be required to demonstrate the function and/or efficacy of their stormwater management methodology through the submission of a Stormwater Management Plan (Plan) which includes detailed Engineering and Landscape drawings. The Plan may be requested as a condition of a DA or in support of a DA, depending on the nature of the development proposed and the sensitivity of the area in which it is located.

4.2 Environmental Criteria Compliance

Development proposals and City projects must demonstrate compliance with catchment specific environmental criteria outlined in the following:

- *State Planning Policy 2.1 – Peel-Harvey Coastal Plain Catchment (WAPC, 2003)*
- *Water Quality Improvement Plan for the Rivers and Estuary of the Peel-Harvey System (EPA, 2008)*
- *Hydrological Nutrient Modelling of the Peel-Harvey Catchment – Water Science Technical Series Report No. WSPT 33 (DoW, 2011)*
- *Environmental Quality Criteria reference document for Cockburn Sound (EPA, 2015)*
- *State Environmental (Cockburn Sound) Policy 2015 (EPA, 2015)*

4.3 Urban Water Management Compliance

Development proposals and City project stormwater management systems must be designed using *Australian Rainfall & Runoff* (Geoscience Australia, 2016) in conjunction with the Bureau of Meteorology's 2016 Intensity-Frequency-Duration design rainfall estimates.

Stormwater and groundwater management systems must consider the principles, objectives and guidelines outlined in the following:

- *Stormwater Management Manual for Western Australia (DoW, 2004-2007)*
- *North East Baldivis Drainage and Water management Plan (in preparation by DWER)*
- *Decision Process for Stormwater Management in WA (DWER, 2017)*
- *Local Government Guidelines for Subdivisional Development (WAPC, 2017)*
- *Water Resource Considerations when Controlling Groundwater Levels in Urban Development (DoW, 2013)*
- *Specification Separation Distances for Groundwater Controlled Urban Development (IPWEA, 2016)*
- *Peel-Harvey Coastal Catchment WSUD Technical Guidelines (Peel Development Commission, 2006)*
- *Urban Development within a Rural Drainage District: Development Services Fact Sheet (Water Corporation)*

4.4 WSUD Principles

The following WSUD principles (in order of priority) adapted from *Stormwater Management Manual for Western Australia* (DoW, 2004 – 2007) must be applied for all new development proposals as well as City operational projects and activities:

(a) Provide protection to life and property from flooding that would occur in a 1% Annual Exceedance Probability (AEP) event.

(b) Manage runoff from small rainfall events on-site or as close to the source as possible.

(c) Retain and restore existing elements of the natural drainage system, including waterway, wetland and groundwater features, regimes and processes, and integrate these elements into the urban landscape.

(d) Protect and enhance sensitive receiving environments by managing the water cycle, water quality, habitat diversity and biodiversity.

(e) Minimise pollutant inputs through implementation of appropriate non-structural source controls and structural controls.

(f) Increase water use efficiency and reduce potable water demand by maximising use of harvested stormwater from impervious surfaces.

(g) Achieve good urban amenity by integrating stormwater management systems within the design of road reserves and public open space.

(h) Reduce urban temperatures, runoff volumes, and peak flow rates and improve water quality, biodiversity and aesthetics by managing stormwater through the retention and planting of vegetation.

4.5 Assessment Criteria

4.5.1 Stormwater Management

The assessment criteria for stormwater management must be cognisant of the existing hydrological regime and the level of detail to be presented in accordance with the general requirements as outlined in Section 4.1.

Stormwater Quantity

(a) For frequently occurring small rainfall events up to and including the first 15mm, lot runoff should be managed within lots and road runoff should be managed within road reserves. Where site conditions do not allow for the full runoff to be managed at source, manage as much as practical at-source. The remaining runoff should be conveyed from a lot or road reserve via piped drainage or overland flow wherever practical.

(b) For minor events up to and including 20% AEP (residential) and 10% AEP (high density residential, commercial and industrial), stormwater management systems must be designed to provide appropriate levels of serviceability, amenity and road safety.

(c) For major events, protect people and property from flooding by constructing residential, commercial and industrial building habitable floor levels at least 0.3 m above the 1% AEP flood level of the urban drainage system and at least 0.5 m above the 1% AEP flood level of waterways and major drainage systems, or otherwise based on advice from the Department of Water and Environmental Regulation (DWER). Overland flow paths utilising the road network must be provided whilst avoiding trapped low points.

(d) For land within the Peel-Harvey Estuary Catchment, stormwater management designs must be cognisant of the criteria specified by the DWER and Water Corporation in the following publications:

- *Urban Development within a Rural Drainage District: Development Services Fact sheet (Water Corporation);*
- *Drainage for Liveability Fact Sheet: Living Streams in Water Corporation Assets (Water Corporation), and;*
- *Drainage and Water Management Plan (DWMP)* (In prep.) (DWER).

Development proposals located with *the* Water Corporation's Mundijong Drainage District will need to seek advice from Water Corporation. Where there is no published criteria, adequate on-site detention and/or retention is required to maintain post development outflows relative to pre-development conditions, consistent with BUWM.

(e) Drainage infrastructure (including basins, swales, living streams and drainage channels) should be designed so that flood depths do not exceed 0.5m for a 1 Exceedances per Year (EY) event, 0.9m for 20% AEP event and 1.2m for a 1% AEP event.

(f) The City will not accept direct discharge of small rainfall event runoff into wetlands or the Cockburn Sound. Runoff from minor and major events is acceptable providing it has been demonstrated that there is appropriate onsite management and treatment of small rainfall events to improve water quality.

Stormwater Quality

(a) Stormwater retention, use and quality treatment for runoff generated by small frequent rainfall events, up to the first 15 mm, shall occur at source or as high as possible in the catchment. Minimise pollutant inputs through implementation of appropriate non-structural source controls and structural controls.

(b) A treatment train approach is to be applied to maximise water quality improvement and achieve objectives of water sensitive urban design at the appropriate scale of development.

(c) Biofiltration systems (incorporated into swales, rain gardens, tree pits and drainage basins) are required to remove nutrients, sediment, heavy metals and other pollutants from stormwater runoff. Biofiltration systems should be considered as part of an overall strategy for managing stormwater in a development where the depth to Maximum Groundwater Level (MGL) is less than 5m. The City requires biofiltration systems to be designed and constructed in accordance to the specifications outlined in *Adoption Guidelines for Stormwater Biofiltration Systems (Version 2)* (CRCWSC, 2015).

(d) To reduce health risks from mosquitoes, retention and detention treatments should be designed to ensure detained immobile stormwater is fully infiltrated in a time period not exceeding 96 hours. Where applicable, the City may require a Mosquito Management Plan to address how mosquitoes will be controlled.

(e) The City requires the development of Multiple Use Corridors (MUCs) to integrate water quantity and quality management within Public Open Space (POS) that preserve nature conservation and ecological function, and provide recreational and educational opportunities.

(f) Demonstration of compliance with the environmental criteria referred to in Section 4.2 must be achieved through appropriate computer models (e.g. UNDO), assessments and calculations appropriate to the stage of planning and scope of the proposal, as supported by the DWER.

4.5.2 Groundwater Management

The assessment criteria for groundwater management must consider the existing groundwater regime to determine whether specific measures are required. This includes pre-development monitoring consistent with DWER standard practice. The level of detail to be presented is to be in accordance with the general requirements as outlined in Section 4.1.

Groundwater Levels

(a) Where the Maximum Groundwater Level (MGL) is at or within 1.2m of the surface, the importation of fill will be required together with the provision of subsoil drainage. In areas where the MGL is more than 1.2m from the surface, subsoil drainage may still be required to restrict the rise in groundwater and ensure there is adequate separation to critical elements of the built form and infrastructure. Any sub-surface drainage will need to be placed at an approved controlled groundwater level consistent with *Water Resource Considerations when Controlling Groundwater Levels in Urban Development* (DoW, 2013).

(b) Groundwater management systems must be designed to provide sufficient separation distances appropriate to acceptable levels of risk and amenity for critical elements of built form and infrastructure. Modelling must be performed to predict the performance of groundwater management systems under future climate, site and land use conditions. Planning and development proposals must consider the design methodology and criteria outlined in the *Specification Separation Distances for Groundwater Controlled Urban Development (IPWEA, 2016)*.

Groundwater Quality

(a) Groundwater discharged by subsoil drainage should be treated to the appropriate level as determined based on the requirements of the receiving environment (outlined in Section 4.2).

(b) Treatment may be achieved using a suitably selected filter material to treat groundwater prior to entry into the subsoil pipe or by construction of a treatment system at the subsoil drainage system outlet (as described in Section 4.5.1).

4.5.3 Wastewater Management

A connection to reticulated sewerage is required as part of any proposal to develop land for residential, special residential, commercial or industrial uses. If exemptions apply, then:

(a) On-site sewerage disposal proposals are required to meet the minimum specifications outlined in the *Government Sewerage Policy* (as amended).

(b) The City may require additional setbacks for effluent disposal facilities and/or require the installation of specific types of facilities (including those involving the removal of nutrients) where it is considered such requirements appropriate or necessary for the protection of water resources or other environmental values.

4.5.4 Water Conservation and Sustainability

The City has been endorsed as a Waterwise Council under the Water Corporation and DWER's Waterwise Councils program. As such, the following water conservation and sustainability criteria must be considered.

(a) At the lot scale alternative sources of water and actions to minimise the use of potable water such as the reuse of rainwater and grey water in toilets, laundries and on gardens are encouraged and should be investigated as part of the planning and design process.

(b) At the development scale, where water resources are constrained, a water balance may be required to determine what impacts the development may have on the existing environment.

(c) The City requires the application of waterwise design and practices to minimise total water use. Land use planning should apply an average irrigation rate across a development of 7,500 kL/ha/yr from a suitable fit-for-purpose water source, unless directed otherwise by the DWER. A reduced rate of 6,750 kL/ha/yr may be acceptable providing sufficient information is provided to demonstrate suitability.

(d) Potential alternate water sources, which may otherwise be underutilised or wasted, (i.e. Groundwater replenishment, managed aquifer recharge schemes or wastewater recycling).

5. AUTHORITY

This Planning Policy has been adopted by the Council and applies to the entire Scheme area. Whilst it is not part of the Scheme, the Council is to have due regard to the provisions of this Policy and the objectives which the Policy is designed to achieve.

6. INTERPRETATIONS

6.1 Agency Acronyms

CRCWSC - Cooperative Research Centre for Water Sensitive Cities

DoH - Department of Housing

DoW - Department of Water (now referred to as DWER)

DWER - Department of Water and Environmental Regulation (formerly referred to as DoW)

IPWEA - Institute of Public Works Engineering Australasia

WAPC - West Australian Planning Commission

6.2 Interpretations

Annual Exceedance Probability (AEP) - the probability of an event occurring or being exceeded within a year expressed as a percentage.

Best Management Practice - devices, practices or methods for removing, reducing or preventing targeted pollutants from reaching receiving waters and for reducing runoff volumes and velocities. Includes structural and non-structural controls.

Biofilter - (also known as biofiltration basin and rain garden) are excavated basins or trenches filled with porous filter media and planted with vegetation to remove pollutants from stormwater runoff. They use natural and physical processes to treat stormwater.

Controlled Groundwater Level (CGL) - the controlled (ie modified) groundwater level (measured in metres Australian Height Datum) at which drainage inverts are set. This level must maintain the hydrologic regimes of groundwater dependent ecosystems, such as wetlands, that are to be protected.

Council - means the Council of the City of Rockingham.

Exceedances per Year (EY) - expresses the probability of how many times in any year that an event will occur.

Intensity Frequency Duration (IFD) - IFDs are Intensity-Frequency-Duration design rainfall intensities (mm/h) or design rainfall depths (mm) corresponding to selected standard probabilities, based on the statistical analysis of historical rainfall.

Maximum Groundwater Level (MGL) - to be determined through on-site measurement, monitoring and/or modelling and compared to the DWER's regional long-term monitoring records (if available).

Non-Structural Practices - institutional and pollution prevention practices that prevent or minimise pollutants from entering stormwater runoff and/or reduce the volume of stormwater requiring management. They do not involve fixed permanent facilities and they usually work by changing behaviour through government regulation, persuasion and/or economic instruments. Such practices use alternative maintenance procedures, regulatory measures, economic incentives, education of management and technical personnel, or planning and design of structures to reduce the amount of pollutants entering stormwater and accumulating on impervious areas.

Multiple Use Corridors (MUCs) - wide corridors of land that provide water quality treatment, flood conveyance and retention/detention, wildlife habitat, pedestrian and cycle paths and public open space.

Structural Practices - structural stormwater quality and quantity best management practices are permanent, engineered devices implemented to control and improve stormwater quality and restore natural hydrological flows and velocities. Structural controls should be installed at or near the source of run-off/pollutant inputs, to prevent or treat pollution and manage the quantity of stormwater as high in the catchment as possible.

Total Water Cycle - water supply, stormwater, groundwater and sewage services are interrelated components of catchment systems, and therefore must be dealt with using an holistic water management approach that reflects the principles of ecological sustainability. Water efficiency, re-use and recycling are integral components of total water cycle management.

Treatment train - application of several types of stormwater best management practices in series or designed to achieve improved stormwater management.

Water Sensitive Urban Design (WSUD) - the philosophy of achieving better water resource management outcomes in an urban context by using an integrated approach to planning and incorporating total water cycle management objectives into the planning process. The key elements of this design include protection from flooding; management of water quantity and quality to achieve ecological objectives; and water conservation, efficiency and re-use.

7. ADOPTION

This Planning Policy was adopted by the Council at its ordinary Meeting held on 17 December 2019.