INTEGRATED WATER MANAGEMENT USEFUL REFERENCES AND RESOURCES

REFERENCE/AGENCY	CONTACT DETAILS	DESCRIPTION
KEY STAKEHOLDERS		
Growth Areas Authority	www.gaa.vic.gov.au	Precinct Structure Planning Guidelines
Melbourne Water	melbournewater.com.au	Drainage and Waterways Authority
	wsud.melbournewater.com.au	WSUD Engineering Procedures: Stormwater (2004)
	ldm.melbournewater.com.au	Land Development Manual - Drainage
Department of Sustainability and Environment	www.dse.vic.gov.au	Water Conservation Government Programs and Action
City West Water	www.citywestwater.com.au	Water & Sewer Authority
Western Water	www.westernwater.vic.gov.au	Water & Sewer Authority
South East Water	www.southeastwater.com.au	Water & Sewer Authority
Yarra Valley Water	www.yvw.com.au	Water & Sewer Authority
Environment Protection Authority Victoria	www.epa.vic.gov.au/water	Protection and monitoring of water environments. Drainage, recycling, rivers, streams and creeks. Guidelines on water re-use and third pipe systems. Guidance on how to use alternative water sources safely. Code of Practice – Onsite Wastewater Management.
SPECIALIST INFORMATION		
CSIRO	www.publish.csiro.au (Books & CD's – engineering)	The Urban Stormwater Best Practice Environmental Management Guidelines (BPEMG).
Victorian Planning Provisions	www.dse.vic.gov.au/planning	Clause 56 – subdivision provisions
Department of Environment, Water, Heritage and the Arts	www.environment.vic.gov.au/water	Water Policy and Programs
Living Melbourne Living Victoria Roadmap	www.water.vic.gov.au	Living Melbourne Living Victoria Road Map
Clearwater	www.clearwater.asn.au	Information and training on Sustainable Urban Water Management
Water Sensitive Cities Study Tour 2009	www.watersensitivecities09.com	Report 1 - A Vision for a Water Sensitive City Report 2 - Ideas for a Water Sensitive City
Centre for Water Sensitive Cities	www.watersensitivecities.org.au	Sustainable Urban Water Research, Support & Engagement
Departmant of Health	www.health.vic.gov.au/environment/	Public Health Issues for Grey Water and Blackwater reuse, and Rainwater and drinking water.
Southern Rural Water	www.srw.com.au	Groundwater resource management

PSP NOTES
Integrated Water Management

This document provides guidance about the integration of water management into precinct structure plans for growth areas.

It should be read in conjunction with the PSP Guidelines, in particular Element 5 – Integrated Water Management. Other PSP Notes which should also be referred to include *Contents of Precinct Structure Plans* and *Engaging the Public and Private Sectors*.

This PSP Note may need to be revised to recognise any changes to integrated water management policy arising out of the *Living Melbourne Living Victoria Roadmap*.

OVERVIEW

Integration of water management in Precinct Structure Planning is a critical element to the creation of better suburbs.

Integrated Water Management seeks opportunities beyond 'business as usual' to foster innovation and to provide better environmental, health, economic and liveability outcomes in all aspects of water management, supply and disposal.

This approach is fundamental to creating livable, vibrant communities which meet social and financial needs while being in harmony with the local environment.

INTEGRATED WATER MANAGEMENT

Integrated water management (IWM) deals with all elements of water management, supply and disposal as a single system, recognising that new approaches are necessary in order to conserve our valuable water resources while improving and protecting our environment.

Development of an integrated water management solution requires co-ordination of multiple stakeholders across many disciplines, each with their own objectives and strategies.

At a precinct scale, integrated water management emphasises developing innovative solutions at a centralised as well as decentralised scale. A centralised approach can provide economic benefits through larger scale facilities.

IWM requires the adoption of a risk-based hierarchy approach, which promotes water conservation, followed by choosing the most appropriate alternative water supply for non-potable applications, with the lowest risk and lowest use of energy and resources.

Stakeholder planning for IWM will occur at various levels and scales from a broader strategic approach, through to a detailed localised scale.




CONTEXT

In recent years there has been a major shift in community expectations and in the way that our water resources are managed, largely in response to the effects of drought, potential for climate change, increased water demand as the result of rapid growth and the need to ensure the health of our environment.

The approach to water management in our newest suburbs is to ensure that water is used efficiently and effectively, being recycled and reused wherever safe and practicable, stormwater is managed and treated to minimise flood risks and improve quality, and waste water is treated and disposed of in a sustainable way.

Water networks should influence the precinct design in the same way transport networks, topography or retail provision might. Existing creeks and waterways should form a key structural element to the early precinct design.

Opportunities need to be considered for combining land uses such as drainage infrastructure, recreational facilities, open space and walking and cycling trails. This approach can lead to significant cost savings while promoting efficient use of land, which ultimately assists housing affordability.

This PSP Note focuses on the issues to be considered when preparing a precinct structure plan. It does not consider detailed design issues. It aims to ensure integrated planning will facilitate the implementation of innovative water management approaches.

The Note sets out:

- A process for delivering an integrated water management plan, including key agencies to involve in discussing particular water options; and
- "Water Toolkit" with options to be considered when designing an integrated water management plan.

IWM IN THE PRECINCT STRUCTURE PLANNING PROCESS

Each precinct structure plan should include an Integrated Water Management Plan (IWM).

The aim of the IWM plan is to identify and bring together relevant water strategies and plans to consider land use impacts and opportunities as part of the overall approach. The objective is to consider how to manage water as a strategic resource within a sustainable development framework.

In doing so, the IWM should show how water will be used through the precinct, and how multiple land uses and innovative design solutions are to be achieved, where appropriate and consistent with flood risk management standards and other matters such as ground water management.

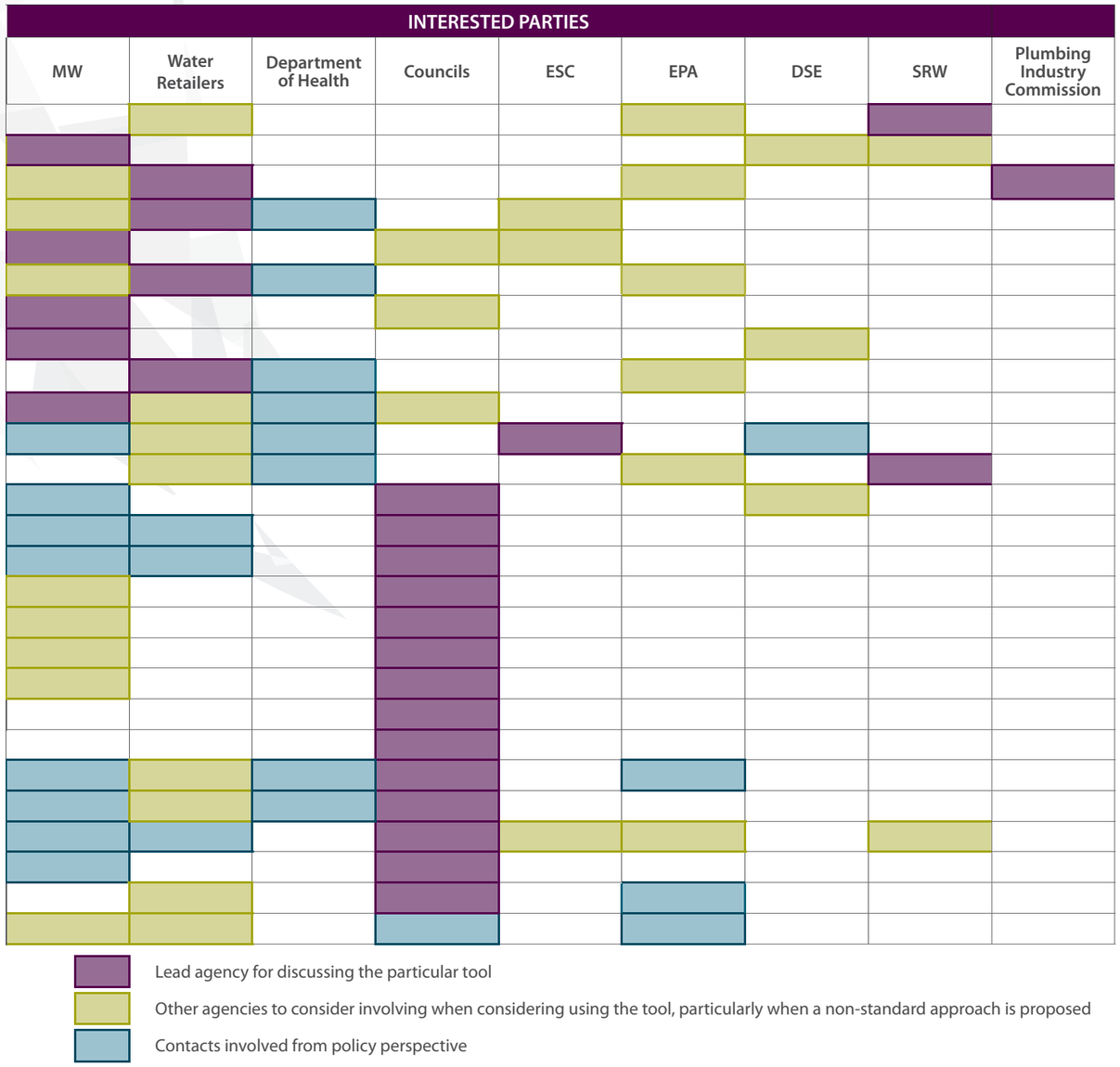
Innovative ideas need to be encouraged during the development of the Precinct Structure Plan, while building in sufficient flexibility to respond to changing circumstances and needs.

Integrated water planning is a part of the overall PSP process that considers functional and amenity needs while identifying opportunities for multiple land uses.

Overall, the approach should be to design for efficiency by minimising treatment (fit for purpose, while achieving appropriate environmental standards), incorporating gravity feed wherever possible, utilising existing infrastructure and features and allowing for multi use of facilities such as floodplains, where appropriate.

Options indicated in table 1 that relate to the PSP scale should be considered for inclusion in the precinct structure plan's integrated water management plan. The lead agency for the particular options should be involved in discussions, along with other relevant agencies, particularly if a non-standard approach is proposed.

In all circumstances, the solution must be efficient and effective. The aim should be to consider the water network as integrated to precinct design.






WATER TOOL KIT

Table 1 is provided for context and lists matters that should be considered at the regional, precinct structure plan level and domestic scales.

Regional and domestic level solutions, and strategies for their provision produced by the water retailers, Melbourne Water, and Councils, should be taken into account in the Set the Scene stage, to provide context for the precinct structure plan design.

Table 1: The Water Options

MANAGEMENT TECHNIQUE	SCALE			
	Regional	Precinct (PSP)	Development /Local	Domestic / Household
Aquifer Recharge and Rural Reuse				
Retarding Basins				
Purple pipe				
Potable Water				
Wetlands				
Sewerage Treatment & Recycled Water Plants				
Dams				
Rivers & Creeks				
Sewer Mining				
Stormwater capture and reuse				
Pricing				
Aquifer Recharge and Urban Reuse				
Land Use Layout & Green space				
Sediment traps				
Bio-retention systems				
Swales				
Local run off treatments				
Litter traps				
Infiltration trenches				
Porous Paving				
Rain Gardens				
Greywater Reuse				
Rainwater Capture (roofs) and re use				
Inspection and monitoring				
Rooftop greening				
Onsite domestic sewerage treatment and reuse				
Education				

PSP

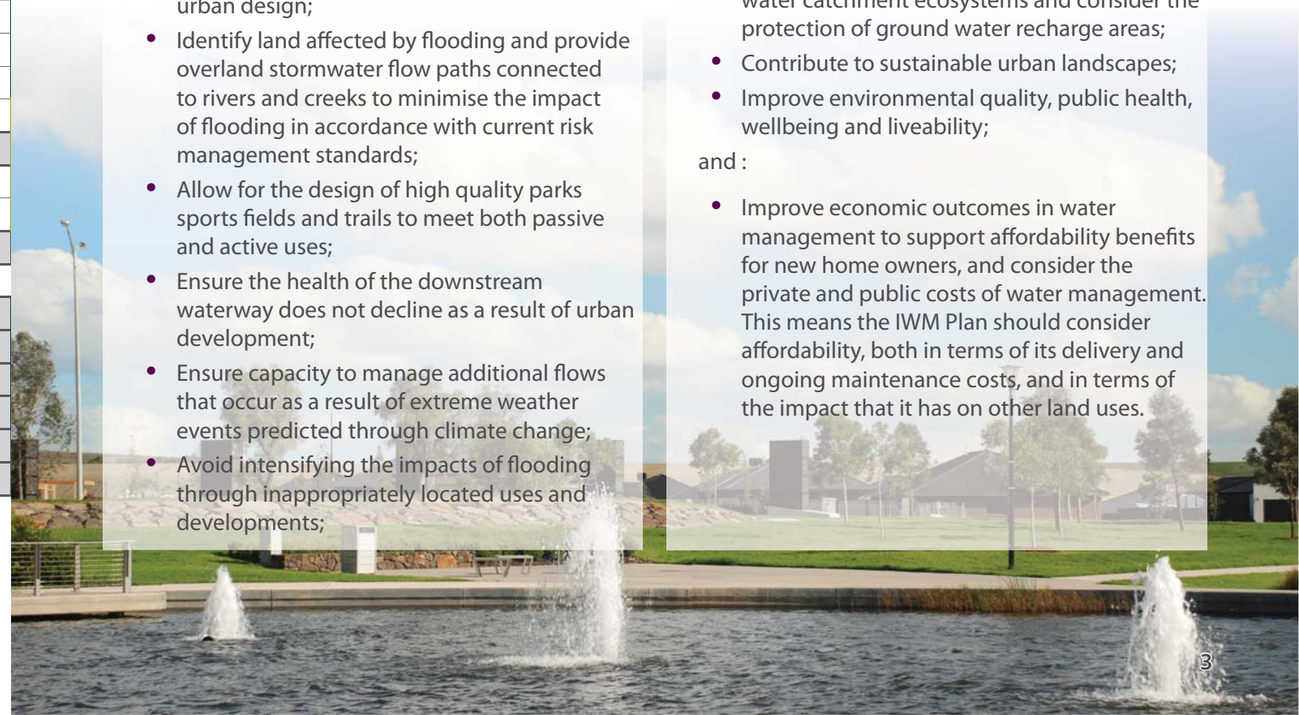
Non-PSP

An **Integrated Water Management Plan** will:

- Consider existing water management strategies;
- Focus on water management efficiency and effectiveness, land use efficiency, sustainability, housing affordability;
- Provide land at strategic locations for the supply of water (i.e. drinking quality water, recycled water), storage and treatment (i.e. holding ponds, retarding basins, sewage and water treatment plants), and discharge to downstream environments (i.e. wetlands);
- Use waterways, road reserves, easements, and linear or open space reserves to link water treatment and reuse systems and infrastructure and connect communities;
- Provide access to water and stormwater treatment systems and infrastructure for maintenance and operational purposes;
- Reduce potable water consumption, wastewater discharges and stormwater runoff through water conservation measures, safe and sustainable water recycling initiatives for non-potable applications, and water sensitive urban design;
- Identify land affected by flooding and provide overland stormwater flow paths connected to rivers and creeks to minimise the impact of flooding in accordance with current risk management standards;
- Allow for the design of high quality parks sports fields and trails to meet both passive and active uses;
- Ensure the health of the downstream waterway does not decline as a result of urban development;
- Ensure capacity to manage additional flows that occur as a result of extreme weather events predicted through climate change;
- Avoid intensifying the impacts of flooding through inappropriately located uses and developments;
- Be underpinned by preventive risk management principles and a Risk Management Plan to ensure the appropriate management of health risks;
- Ensure initiatives are consistent with best practices and comply with regulatory requirements;
- Take advantage of wetter lower lying land as well as opportunities for stored water resources for irrigation;
- Allow for high amenity recreation and biodiversity areas that can form a focus for new communities;
- Utilise creeks as recreation corridors with cycling and walking trails;
- Consider a range of design features such as swales, infiltration trenches and rainwater tanks, through to more significant engineering techniques such as sewer mining and aquifer recharge;
- Produce an integrated water solution that is area specific and tailored to the particular needs of the precinct;
- Promote the improvement of water quality in water catchment ecosystems and consider the protection of ground water recharge areas;
- Contribute to sustainable urban landscapes;
- Improve environmental quality, public health, wellbeing and liveability;

and :

- Improve economic outcomes in water management to support affordability benefits for new home owners, and consider the private and public costs of water management. This means the IWM Plan should consider affordability, both in terms of its delivery and ongoing maintenance costs, and in terms of the impact that it has on other land uses.






THE IWM PLANNING PROCESS

Integrated water management planning has the potential to improve co-ordination between water authorities and leading to broader consideration of opportunities and acceptance of innovative solutions.

The process should ensure the development of an innovative localised water solution, using appropriate and current science and technology, and partnerships to overcome constraints or gaps in knowledge.

The optimum outcome for each precinct should be sought, reflecting the needs of the community, local landscape and infrastructure, and balancing environmental, economic and social benefits.

THE IWM PLANNING PROCESS TABLE

	DEVELOPMENT OF THE INTEGRATED WATER MANAGEMENT PLAN	
SET THE SCENE	Stakeholders will determine principles and objectives for IWM at the outset. Establish the strategic agenda: • Growth Area Framework Plan considerations. • State and local council planning policies. • Catchment Management Authority plans and water allocation plans. • Capacities of existing and planned bulk services, including potable water supply and storage, and sewerage transfer and treatment facilities. • Melbourne Water existing development services schemes or proposals for new development services schemes. • Water Retailer strategic plans and if they have mandated recycled water third pipes, or plan to do so. • Catchment Management Authority requirements and objectives. • Municipal public and environmental health, strategic and corporate plans, municipal strategic stormwater plans. • Existing biodiversity values within waterways, and any strategies to protect or improve these values over time. • Locally specific targets best practice water management and conservation principles and supply strategies for the precinct. • Water sensitive urban design to support water conservation, high quality landscapes, waterway health and biodiversity.	Melbourne Water to: • Define catchments affected by the precinct structure plan, along with boundaries, existing waterways and flood extents. • Determine capacity of existing stormwater drainage systems and need for upgrade or expansion. • Define existing waterways and floodplains. • Determine appropriate risk between assets and land uses. Water Retailers to: • Determine capacity of existing water supply, sewerage and recycled water systems and need for upgrade or expansion. • Determine requirements and objectives of Water Supply & Sewerage Authority strategic plans. Local Council to: • Determine capacity of existing stormwater systems and need for upgrade or expansion.
CREATE THE STRUCTURE	Prepare an overall concept for water management including: • Identify stormwater flow patterns and peaks. • Consider how and where stormwater and wastewater will be stored and treated. • Determine layout and location of treatment facilities such as retarding basins, bio-retention systems wetlands and sewerage treatment plants. • Determine opportunities for stormwater and wastewater harvesting and re-use. • Make provisions for storage and conveyance of floodwaters and flood events through drainage reserves and water courses, including consideration of likely increases in extreme events due to predicted climate change. • Consider centralised and de-centralised systems or a combination of both for stormwater, water supply and waste water. • Environment Protection Authority and Department of Health requirements for managing the health and environmental risk associated with water recycling.	Melbourne Water and Local Council to: • Investigate opportunities for integration of the stormwater management system with the open space network, trails, biodiveristy protection, reserves and landscaping. • Integrate road reserve drainage and landscaping treatments. • Confirm their respective maintenance responsibilities based on the catchment size (i.e. below or above 60 hectares). Water Retailers to: • Integrate the stormwater systems with water supply, recycled water and wastewater systems. GAA to: • Consider opportunities for new habitats and discuss these with DSE and Melbourne Water. • Achieve an overall water management concept for the precinct. • Consult with Department of Health and EPA to ensure the concept is consistent with guidelines and that health and environmental risks can and will be appropriately managed. EPA and Department of Health to: • Advise health and risk management issues associated with recycled water for the precinct.
MAKE THE PLACE	Prepare the Integrated Water Management Plan for the precinct incorporating: • Functional drainage design set out in Melbourne Water development services scheme, including design and location of wetlands/retarding basins and design of flow channels. • Design of strategic water supply, recycled water third pipe system and sewerage system. • Local stormwater drainage network for major and minor flows including drainage reserve and drainage easement requirements. • Public open space and irrigation requirements.	GAA to: • Ensure land use development is consistent with IWM, including addressing amenity impacts. • Develop integrated water management and land use plans, including identification of joint uses with irrigation opportunities in consultation with relevant public authorities.
CHECK THE PLAN	• Confirm with Stakeholders that the Integrated Water Management plan meets relevant performance objectives, KPIs and standards.	GAA to: • Confirm with Melbourne Water approval of drainage services scheme. • Confirm with water retailers approval of sewerage/ water supply/ third pipe system or other water management innovations. • Confirm with DSE that new habitats meet biodiversity objectives.