



Integrated Water Management Plan

2009/10 – 2012/13



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1. Executive Summary

Moreland City Council has developed the Integrated Water Management Plan (IWMP) to set the direction for the sustainable management of water resources for Council operations and the Moreland community.

The development of the IWMP is in response to current and emerging issues that are impacting on the management of water resources, including:

- climate change – reduced availability of potable water supplies and added pressures on the stormwater system;
- population growth – higher demand for limited water supplies and pollution pressures caused by urban consolidation;
- regulatory and policy – water restrictions and regulated water management requirements;
- economic – increasing water and sewage charges;
- knowledge and technology – developments in water recycling, stormwater reuse and stormwater treatment.

Addressing these issues requires significant changes in the way our water resources are managed. Developing more integrated and decentralised responses to water supply and stormwater management is necessary to ensure long-term sustainability of water resources and the environment.

Building on a number of related strategies, including the Moreland *Watershed and Stormwater Management Plan*, the IWMP outlines a range of initiatives aimed at reducing potable water use, improving stormwater quality and increasing the use of alternative water supplies.

Water use within Moreland has reduced by 21 percent since 2001 and Council's own water use has reduced by approximately 50 percent in the same period. Much of this reduction can be attributed to the impact of water restrictions. In particular, Council's open space water use is now only a quarter of that in 2001.

Water quality within the Moonee Ponds Creek and Merri Creek and their tributaries is very poor. Diffuse stormwater pollution as well as illegal pollution spills, particularly from industrial areas, remains the main cause of poor waterway health.

Council's existing water use targets are:

- reduce Council water consumption 50 percent by 2021 from baseline consumption in 2001; and
- reduce community water consumption to 20 percent by 2011 and 25 percent by 2021 from baseline consumption in 2001.

Council and community water use has reduced to levels close to these targets, however these overarching targets will be retained as it is expected that water use will rise in the short to medium term with an easing of water restrictions expected to coincide with the State Government's water supply augmentation projects commencing (e.g. Wonthaggi desalination plant).

The IWMP outlines objectives, targets and actions for seven **priority areas**, which have been identified as central to Council efforts in sustainable water management. The priority areas address:

- the highest water consuming areas of Council's activities;

- Council activities with the greatest impact on water quality;
- community engagement and education;
- sustainable water management in private development;
- monitoring and reporting on progress;
- working with external organisations and capacity building.

Key Actions 2009-10 – 2012-13

Long-term success in effective integrated water management relies on a resilient and targeted program of integrating best practice water management into Council's practices and planning processes. The IWMP sets a clear program of how to achieve this integration while delivering on the benefits to Council and community of leading water management practice.

However, in order to drive the organisation towards best practice integrated water management, the following two key projects throughout 2009-10 – 2012-13 provide Council with the opportunity to make significant progress towards Council's consumption, efficiency and water quality targets and engage the Moreland community in the journey towards a water sensitive city.

The Coburg Initiative

The effective implementation of the Coburg Initiative requires the incorporation of best practice environmentally sustainable design principles and provides numerous opportunities for incorporating integrated water management practices and water sensitive urban design (WSUD) on a precinct scale urban renewal project not before seen in Australia.

Action: Embody the principles and targets of the IWMP to achieve world's best practice stormwater treatment and reuse, water recycling and water efficiency measures for the future development of central Coburg.

Brunswick Baths redevelopment

The redevelopment provides an opportunity to incorporate water efficiency, reuse and recycling components to significantly reduce potable water consumption.

The Brunswick Baths is a premier aquatic facility in the north of Melbourne and is traditionally the highest individual consuming site for Council. The redevelopment of this site provides an irresistible opportunity to reduce Council's overall water use and engage the surrounding community.

Action: To significantly reduce the use of potable water and increase water reuse and recycling to ensure the Brunswick Baths is a leading example of sustainable water management in an aquatics facility.

2. Introduction

Water is essential to all life on earth. All species require water for biological or ecological purposes. Our community uses water for a large range of purposes incorporating residential, commercial, community and industrial uses.

Within an urban environment such as Moreland our relationship to water is in the context of a highly modified environment in which engineered drainage, water supply and sewerage systems form the basis of how we use and manage water. As a result we are physically and culturally separated from the ecological and natural systems that supply our water; the same systems that are also dependent on our responsible management of water resources to ensure healthy waterways and ecosystems.

Despite this separation, changes to and deterioration of natural water systems directly impact on the urban environment and our lifestyles including in our homes, gardens, open spaces and businesses.

There are now two critical developments that are adversely impacting on water supplies and waterway health. These are climate change and population growth. Both are forcing a change in the management of water resources.

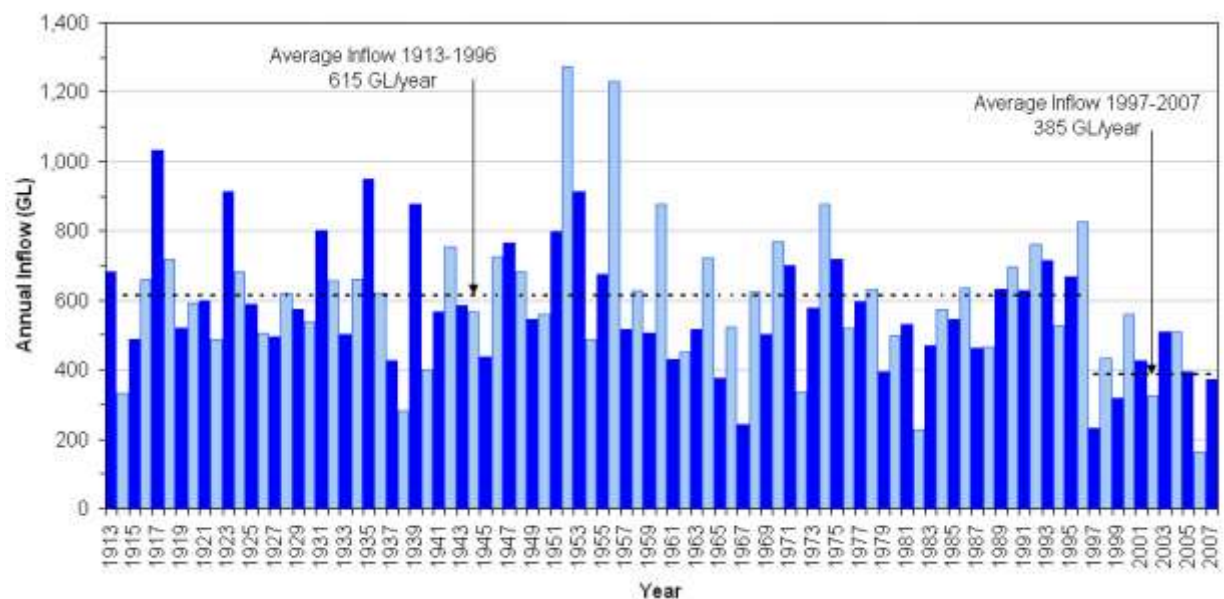
It is evident that the world's climate is changing as a result of increased levels of greenhouse gases in the atmosphere. The Intergovernmental Panel on Climate Change (IPCC) in its most recent report stated that, globally, temperatures have risen and the incidence of drought has increased (IPCC, 2007). While it is more difficult to link this growing body of evidence to local conditions it is increasingly likely that these same effects are being experienced in Victoria and Melbourne (Melbourne Water, 2006).

Lower average rainfall means reduced flows to Melbourne's water supply catchments and less water available for urban use (see *Figure 1*). The impact of climate change is also altering the patterns of rainfall, decreasing the overall amount of rainfall but creating more intense rainfall events. This increases the risk of flooding, placing greater pressure on our drainage systems and waterway health.

Population growth is increasing the pressure on Melbourne's water supplies. Additionally, as much of our population growth occurs in urban environments, there will be further pollution and flow pressures on our waterways, as a result of the increasing levels of development and urban density that coincides with this growth.

These pressures exacerbate problems that our community has faced in managing water in the past, whether it be drought or urban pollution.

Figure 1: Melbourne catchment storage inflows (Source: Melbourne Water, 2008)



2.1 Why develop an IWMP?

In addition to the challenges presented by both climate change and population growth there have been a number of related developments that have and will continue to result in changes to water management practices for Council and the community.

These changes include:

- regulatory and policy – water restrictions and other State Government water management requirements have forced both Council and the community to improve water management and significantly reduce water consumption;
- economic – rapidly increasing costs of water associated with reduced supply and State Government infrastructure projects;
- technological – changing technologies and approaches in the areas of water reuse and recycling and stormwater treatment;
- sectoral – greater expectation on local government to improve management of resources.

All of these issues require Council to continuously review the way it manages water resources both for its own needs and those of the community and the environment. Council must also ensure that the actions it takes are consistent with the requirements placed on the community (e.g. development controls and water restrictions) and the expectations of the community (e.g. responsible resource use). Through mechanisms such as the planning and building approvals process, standards and norms within the community are constantly changing and Councils actions must reflect these changed values.

Council's sphere of influence is significant in establishing and promoting sustainable water management practices and principles. There is now a widely recognised need for more integrated responses in water management to produce sustainable outcomes both in water consumption and water quality.

Water is also important to the delivery and maintenance of numerous Council services, for example sports fields and open space. Therefore ensuring sustainable water use is also critical to maintaining levels of services for the community in an environment where water resources are becoming increasingly scarce and access restricted.

2.2 Purpose

The purpose of the IWMP is to set the direction for the sustainable management of water resources in Moreland. Primarily the actions within the IWMP are focused on Council's own programs and activities – those over which Council has direct control. This includes planning and management of buildings, aquatic centres and open space as well as drainage and related infrastructure.

It is also recognised that Council has a role in influencing the behaviour and practices of the wider community through a variety of mechanisms including planning and building regulations, local laws and education initiatives. Accordingly, the action plan contains community-focused actions based on those mechanisms by which Council has the greatest ability to exert influence.

For both corporate (Council) and community actions the focus of the strategy is on the following areas:

- water conservation;
- stormwater reuse and water recycling;
- stormwater quality and waterway health improvement.

2.3 Principles of sustainable water management for Moreland

The key principle of the IWMP is that of Integrated Urban Water Management, which is an emerging approach to water management that takes “a comprehensive approach to urban water services, viewing water supply, stormwater and wastewater as components of an integrated physical system and recognises that the physical system sits within an organisational framework and a broader natural landscape” (Mitchell, 2004).

This differs from the historical water management approach in which the water supply, wastewater and stormwater components are planned and delivered as completely independent and separate entities.

Underlying the principle of Integrated Urban Water Management are a range of concepts and approaches to implementation that are detailed below. These form the basis for sustainable water management decision making by Council and are reflected in the actions and targets within the IWMP.

Whole of water cycle approach

Melbourne, like many other cities, has drawn its water supply requirements from dams outside the urban boundary and then transported the waste sewage for treatment and disposal to large treatment plants such as at Werribee in Melbourne's southwest. Likewise, stormwater has been captured underground in large stormwater

pipe networks and transported untreated to creeks and waterways. These approaches have provided benefits such as improvements to health and reduction of flooding risks. However, this has resulted in environmental degradation and continues to undervalue and disregard large quantities of locally available water in the form of stormwater and wastewater; water that is increasingly valuable as our traditional methods of supply decrease.

Incorporating a whole of water cycle approach to managing our water resources involves rethinking these traditional approaches to develop more localised responses capable of achieving multiple benefits including water conservation and reuse, improvements in water quality and localised landscape and ecological benefits.

Figure 2: Urban water management transitions framework (Source: Brown, Keath and Wong 2008)

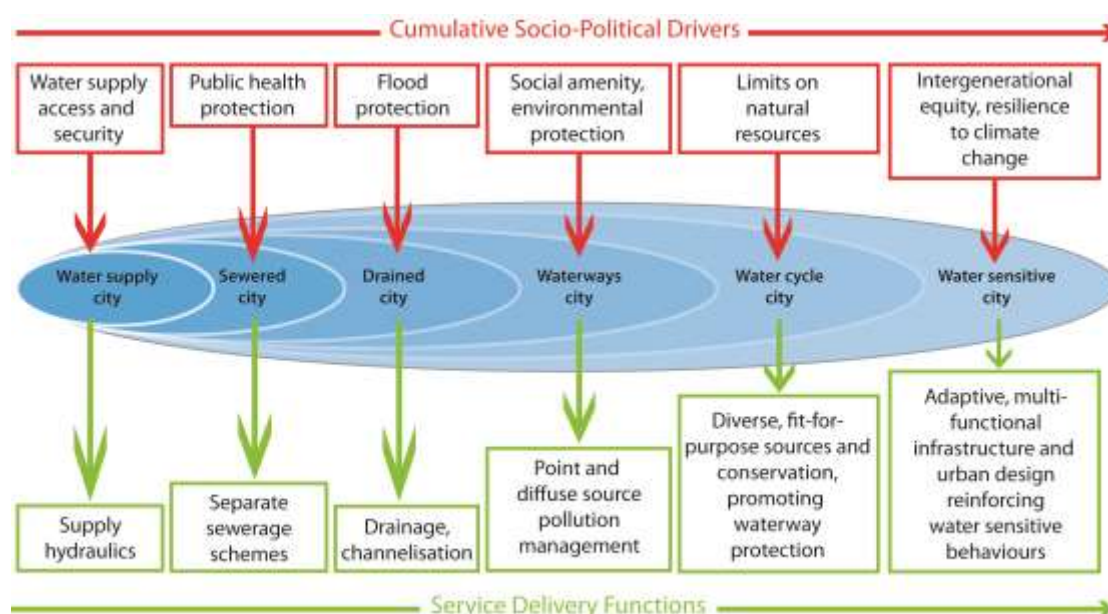


Figure 2 shows a progression of transitional stages in the development of urban water management in Australia (Brown, Keath and Wong 2008). Each transitional stage builds on the previous stage, responding to changing social, environmental and political drivers and incorporating greater levels of service provision.

Australian cities, including Melbourne, are largely within the *Waterways city* stage with the initial adoption of elements of the *Water cycle city*, incorporating greater social and environmental considerations into policy and implementation. Council's challenge is to adopt the necessary responses that will enable further incorporation of the social and environmental sustainability principles encompassed within the *Water cycle* and *Water sensitive cities*.

Water sensitive urban design (WSUD)

Water sensitive urban design (WSUD) refers to an approach to water management that aims to improve the links between urban built form and landscape and the urban water cycle to produce more sustainable water management outcomes. In practice this means including the following key components in the planning and design of our urban environments:

- water conservation;
- stormwater treatment and/or reuse;
- waste water recycling.

Broadly, WSUD includes two separate components, these being structural and non-structural. Structural components include all of the physical and technological responses that enable the aims of WSUD to be met. The non-structural components refer to the tools used to govern and direct behaviour to improve the way that Council and the community manages water resources, including guidelines, regulations, enforcement etc.

Structural

Structural responses include:

- water conservation measures (e.g. 3-star showerheads, high efficiency dual flush toilets, waterless urinals);
- rainwater and stormwater capture and reuse;
- blackwater and greywater recycling;
- stormwater treatment systems, including:
 - o Bioretention systems
 - o Porous and permeable pavements
 - o Wetlands
 - o Bio swales
 - o Gross pollutant traps (GPT's).

Non structural

Non-structural responses include:

- building and planning regulations;
- incentives;
- building and construction regulatory controls;
- education programs.

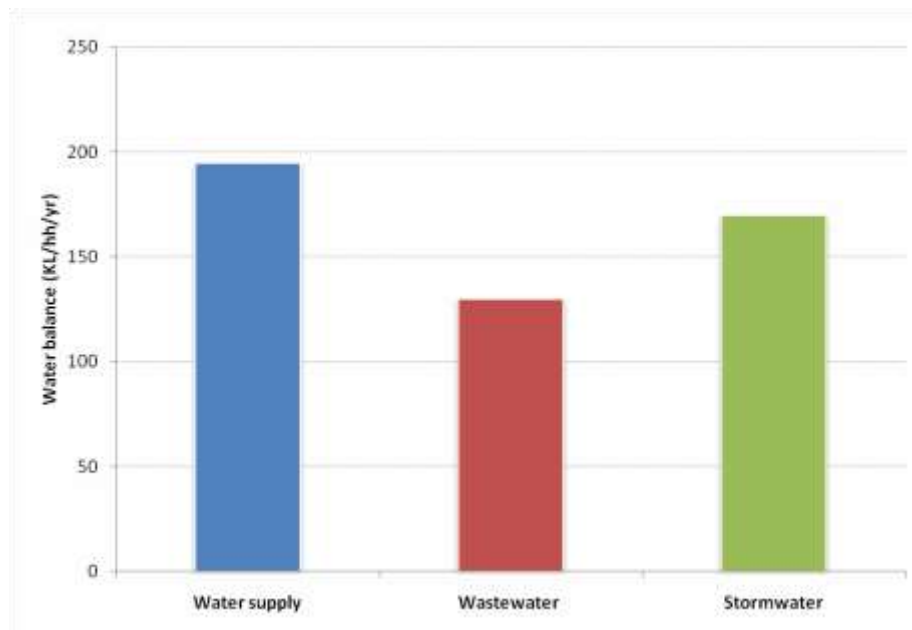
Both structural and non-structural measures are required to ensure the uptake of WSUD by Council and the community and progression to long-term sustainable water management.

Fit for use

A key consideration in developing sustainable water management practices is to match water supplies of different qualities with appropriate end uses. This is termed *fit for use* and recognises that not all of our water use requires water of the highest quality. Recycled water and stormwater may not be considered appropriate for drinking or direct human contact but are suitable for a whole range of uses including toilet flushing, open space irrigation, street sweeping and fire services.

The volumes of stormwater runoff available within Melbourne are between 400 and 550 gigalitres per year, which is similar or greater than Melbourne's total annual water demand (Environment and Natural resources Committee, 2009). This demonstrates that a significant proportion of our water needs can be met from locally available sources of water.

Figure 3: Average annual water balances from households in Melbourne (Adapted from: Coomes and Brown, 2007)



Water use hierarchy

Council's water use hierarchy provides a basis for assessing and planning the use of water and can be applied equally to community use.

- Avoid unnecessary water use.
- Reduce water consumption (use the most efficient means when water use is required).
- Reuse stormwater and rainwater.
- Recycle water (recycling of water refers to the use of greywater or blackwater) – generally, water recycling is a more difficult and costly process than using rainwater or stormwater.
- Disposal – treat water to ensure that receiving waters are not adversely affected.

Community benefit

Given the limited availability of water supplies, particularly potable water, Council must make decisions on the allocation of water resources between different uses. The allocation of water resources is initially governed by regulation (e.g. water restrictions) and market signals (prices). This then requires Council to determine the allocation of limited supplies on Council assets for public use. For example, Council is currently restricted to a relatively small volume of water for irrigating sports fields and therefore must determine the best and most equitable use of this supply.

Within the boundaries established by regulatory frameworks, Council is committed to ensuring water is allocated to uses that provide the greatest community benefit.

Climate change

As climate change is a key driver for changes to water management practices for Council, the planning and development of any projects must take into consideration the direct and indirect climate impacts. This involves considering the energy and greenhouse gas emissions implications of projects, for example energy use associated with pumping or water treatment.

Innovation

Council has an important role as a leader within the community, requiring Council to explore and demonstrate innovative solutions to water management issues and encourage innovation in water management in the community.

3. Background

The responsibility for sustainable water management, including water conservation and water quality improvement, is shared by a diverse range of federal, state, local and non-government bodies as well as businesses and individuals within the broader community. Often the responsibilities and jurisdiction between Council and other organisations overlap. Therefore, Council targets and actions must be developed to complement or reflect the numerous State and Federal policies, programs and regulations aimed at improving the management of water resources and ensuring water security.

Much of the Federal and State policy and regulation also places a direct responsibility on Council to implement actions relating to sustainable water management.

Additionally, Council has previously developed strategies focused on sustainable water management, which form the basis and provide the context for this plan.

3.1 Federal Government strategies and initiatives

The National Water Initiative (NWI) is the main national program addressing water management issues. Each State and Territory Government as well as the Federal Government is a signatory to the NWI. Under the NWI State Governments have agreed to a range of actions and commitments including meeting and managing urban water demands and incorporating the principles of integrated urban water management and WSUD (National Water Initiative, 2004).

A key document produced to date through the NWI is the *Australian Guidelines for Water Recycling*, which has established the current benchmark in relation to the treatment and use of recycled water.

3.2 State Government strategies and initiatives

The State Government has produced a number of strategies relating to managing the state's water resources. The most relevant are *Securing Our Water Future Together – Victorian Government White Paper (2004)* and *The Next Stage of the Government's Water Plan (2007)*.

These policies outline the State Government's plan for securing water supplies and protecting waterways, including strategies focused on education, planning and building regulations and incentive programs. Many of these programs have already been implemented.

The Next Stage of the Government's Water Plan (2007) established a number of major water supply augmentation projects. The two main projects being the Wonthaggi desalination plant and the Sugarloaf Pipeline project involving the construction of a pipeline from the Goulburn River to Melbourne's supply network. These projects are projected to increase supply to Melbourne's water system by approximately 225GL per year (150GL from desalination and 75GL from the Sugarloaf Pipeline).

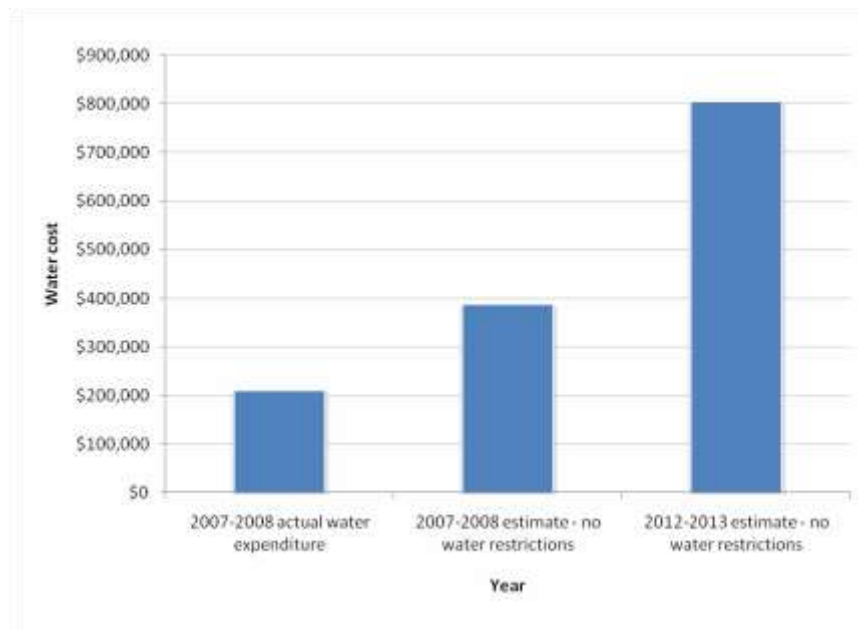
In an average year Melbourne's water use is approximately 500GL per annum (Melbourne Water, 2009), however water use between 2000-01 and 2006-07 averaged 449GL per annum (DSE, 2008). State Government modelling projects that Melbourne metropolitan water use will increase to around 550GL per annum in 30 years based on water consumption patterns equivalent to when Melbourne was under Permanent Water Saving Rules.

Based on these supply and demand forecasts it is estimated that the desalination plant will result in sufficient supply levels to lift Melbourne out of water restriction conditions between about 2013 and 2030 (DSE, 2008).

The construction and operation of the desalination plant and the Sugarloaf Pipeline are also contributing to significant price increases over the next 4-year period which will directly impact Council operations. *Figure 4* shows the potential increase in variable water costs for Council based on water price increases from the Essential Services Commission pricing decision in 2009 (figures utilise a return to Councils pre-water restrictions water consumption).

Based on Council's historical water use, water costs will be up to three times more than the 2007-08 expenditure and more than double the long-term average for Council.

Figure 4: Comparison of current and projected water costs for Council 2007-08 to 2012-13



3.3 State Government legislation

The State Environment Protection Policies (SEPPs) established under the *Environment Protection Act (1970)* set the statutory framework for protection of waterways throughout the Port Phillip Bay catchment. The SEPPs identify a range of responsibilities for local government in protecting water quality. The SEPPs also identify water quality guidelines for waterways throughout the metropolitan region.

The Planning and Environment Act (1987) is the policy and legislative instrument that provides Councils with the greatest ability to influence water management within the community. It allows Council to require developers to incorporate water conservation, water reuse and stormwater quality measures into developments.

Council has the power to develop local laws under the provisions of the *Local Government Act (1987)*. Council has a number of local laws that manage stormwater quality, including building site management, litter and waste management and responsible pet management (e.g. requirement for dog waste removal).

3.4 Council strategies

Council Plan 2009-13

The Council Plan 2009-13 contains the following water conservation targets:

- Reduce Council water consumption 25 percent by 2011 and reduce community water consumption 20 percent by 2011 from baseline consumption in 2001.

The relevant Key Strategic initiatives within the Council Plan 2009-13 are:

- develop the Integrated Water Management Plan;
- undertake a stormwater reuse and recycling feasibility assessment.

Water strategies

Council's *Stormwater Management Plan (2001)* and the *Watershed Plan (2005)* are the two strategies developed specifically for sustainable water management. They contain actions to improve water quality outcomes, reduce potable water consumption and increase water reuse.

The *Watershed Plan* contains the following water conservation and reuse targets:

- reduce corporate water consumption 25 percent by 2011 and 50 percent by 2021 from baseline consumption in 2001;
- reduce community water consumption 20 percent by 2011 and 25 percent by 2021 from baseline consumption in 2001;
- to increase corporate reuse to 20 percent by 2021.

The current strategy supersedes the *Stormwater Management Plan* and the *Watershed Plan*. However, these strategies remain important reference documents.

The following Council strategies are also relevant to sustainable water management:

- Moreland Drainage Asset Management Strategy (2006);
- Moreland Litter Trap Action Plan (1998);
- Moreland Open Space Strategy (1997);
- Moreland Waste and Litter Strategy (2007-12);
- Moreland Street Landscape Strategy (1997);
- Moreland Climate Action Plan.

3.5 ICLEI Oceania Water Campaign

Council was a member of the ICLEI Water Campaign until Yarra Valley Water and Federal Government funding of the program ceased in 2009. The program assists councils in setting targets and planning and implementing initiatives aimed at sustainable water management through a milestone based program.

The ICLEI milestones are:

M1	Undertake baseline assessment of corporate and community water consumption.	Complete	2003
M2	Develop corporate and community water use and water quality targets.	Complete	2005
M3	Develop and adopt an action plan.	Complete	2005
M4	Implement action plan (measured by achieving equivalent of 20 percent of targets).	Complete	2009
M5	Complete a re-inventory of water use and actions.	Reinventory completed – M5 not completed due to cessation of the Water Campaign program.	2009

3.6 Non government local strategies

There are two non-government bodies that coordinate strategic planning and works associated with the Merri and Moonee Ponds Creeks and their respective tributaries. These are the Merri Creek Management Committee (MCMC) and the Moonee Ponds Creek Coordinating Committee (MPCCC).

The MCMC *Merri Creek and Environs Strategy 2009-14* is a key strategic document in managing the Merri Creek corridor. The Strategy sets out objectives, targets and actions for addressing issues associated with the management of the Merri Creek and its tributaries. The Strategy contains a number of water quality specific targets and actions reflecting State Government and local government objectives around stormwater management and WSUD.

The MPCCC is currently reviewing both its governance arrangements and strategy, which should be complete by the end of 2009.

4. Council commitments and actions 2001 – 2008

A range of programs and actions have been undertaken, both by Council and within the community, aimed at sustainable water management since the baseline measurement year (2001). The following lists provide an overview of actions implemented:

Stormwater quality

- Installation of gross pollutant traps (Council currently maintains 15 GPT's throughout the municipality).
- Continued development of the STEPS and SDS sustainability planning assessment tools.
- Installation of bioretention treatment systems and gross pollutant traps as part of the subdivision and planning process.
- Community stormwater education undertaken by Council, Waterwatch, MCMC and MPCCC.
- Waterway rehabilitation work undertaken by community groups and the MCMC and MPCCC.
- Trial of bioretention treatment systems by Council.

Water conservation, stormwater reuse and water recycling

- Conducted water audits and installed flow restriction devices and low flow showerheads at Council facilities, including swimming pools and Council offices.
- Installation of waterless urinals at Coburg Civic Centre, Brunswick Library and Brunswick Town Hall.
- Commencement of a program of swimming pool shell repairs which to date has included works at Coburg Olympic Swimming Pool, Brunswick City Baths, Coburg Leisure Centre and Oak Park Aquatic Centre.
- Installation of new irrigation systems at eight sportsgrounds.
- Transition of 10 sports fields to warm season turf.
- Installation of 50KL sub-surface collection tank at ATC Cook reserve for recycling excess irrigation and stormwater runoff.

- Installation of three 150KL water tanks for storage of Class A recycled water to be used for sportsground, garden and street tree irrigation.
- Adding a weather station to the centralised irrigation control system to further automate and improve the application of irrigation.
- Completion of an irrigation audit of a further 15 irrigation systems.

4.1 Assessment of sustainable water management programs

The incorporation of sustainable water management initiatives has progressed moderately within Council over the past nine years (since the development of the *Storm Water Management Plan*). Water restrictions have resulted in increased levels of activity relating to sports field and open space management (e.g. transition to warm season turf and irrigation system improvements). Additionally, there has been major expenditure on pool shell repairs and gradual incorporation of water efficient fittings as part of maintenance and capital works processes for other Council facilities.

Stormwater management has largely focused on the installation of gross pollutant traps (litter traps) with some trial installations of other forms of stormwater treatment, including bioretention systems. A number of stormwater education programs have been conducted over this period, however there has been no consistency in the delivery of these programs.

A review of the implementation of previous water management plans has highlighted the need to improve the processes and systems in place to further the adoption of sustainable water management practices. This includes:

- developing more appropriate planning and assessment processes (both in stormwater management and water conservation) enabling better integration of sustainable water management principles into Council projects;
- better coordination and consultation between Council departments in planning and implementation of projects;
- greater integration of sustainability principles into the current roles and practices of Council departments;
- improved processes for measuring progress towards Councils goals, including benchmarking and target setting;
- developing a consistent approach to educating the community on sustainable water management.

5. Roles and responsibility for water management

Council's role in relation to water management is diverse due to the number of services delivered to the community and includes:

- managing water consumption – Council is a significant user of water and therefore has a responsibility to ensure appropriate management;
- drainage management – Council is responsible for managing the minor drainage network as well as minor roads and numerous car parks. The management of these assets has implications for stormwater quality management;
- sustainability education – Council has delivered a number of water conservation and stormwater management education programs;
- planning and building – Council is responsible for administering and enforcing planning and building policy and regulation and therefore has significant influence over private development within Moreland with implications for water consumption and stormwater management;
- local laws – several of Council's local laws cover environmental and asset protection measures to reduce stormwater pollution.

In the delivery of services to the community many departments within Council have either direct or indirect responsibility for water management issues.

Table 1 outlines the roles and responsibilities of departments within Council as they relate to water management. These have been aligned with current and potential initiatives reflecting integrated water management (IWM) principles to demonstrate the links between current roles and broader sustainable water management responsibilities and opportunities.

Table 1: Council departmental water management roles and responsibilities

Council department	Responsibilities for water management	Structural IWM	Non structural IWM
		Related to the installation and maintenance of assets	Related to guidelines, regulation, education etc.
Youth and Leisure	- Leisure Centre and Swimming pool management - Community facility leasing arrangements	- Water conservation – maintenance of plant and equipment - Water recycling – backwash and other recycling - Stormwater reuse	Education and information – water conservation
Open Space	- Sports ground management - Maintenance, planning and design of open space - Waterway revegetation - Maintenance of stormwater treatment devices (landscape) - Wetland development - Street level vegetation - Planning referrals – landscape assessments	- Water conservation – turf selection, irrigation systems and controls, landscape assessment and design - Water Recycling - Stormwater reuse - Stormwater quality – wetland development, maintenance of landscaped stormwater treatment measures	- Staff education and information – herbicide, pesticide and fertiliser use - Planning controls – landscape design referrals - Education and information – sustainable gardening, waterway health - Community groups – Working with MCMC, MPCCC and community environment groups
Asset Planning	- Design and construction of drainage works and road reconstruction - Management of Council capital works program - Administration of asset protection permits	Stormwater quality – design and construction of stormwater treatment measures	Construction and contractor management
Engineering Operations	- Maintenance of drains and stormwater treatment devices - Environmental education - Waste management - Enforcement of asset protection permits	- Stormwater quality – maintenance of stormwater treatment measures - Litter and waste management – waste collection, removal of dumped rubbish	- Education and information – community sustainability education programs - Enforcement – Asset Protection Local Law
Urban Planning and Building	Incorporating ESD requirements in development applications and inclusion of Clause 56.07 of the Planning Scheme	Inclusion of the following in developments (in conjunction with Asset Planning and ESD): - water conservation; - water recycling; - stormwater reuse; - stormwater quality improvement.	Planning controls – ESD planning requirements

The Coburg Initiative/Activity Centres	• Planning and development of Coburg, Brunswick and Glenroy activity centres	• Capital works planning – infrastructure provision associated with the development of activity centres	• Planning and development controls and amendments – ESD planning requirements
Property Services	• Building maintenance (including swimming pools) • New Council buildings and major renovations • Oversight of disused landfill sites • Property leasing arrangements	• Water Conservation – leak prevention and repairs, installation of water efficient fittings • Water Recycling – blackwater/greywater recycling at Council facilities • Stormwater reuse – installation of rainwater tanks at Council facilities • Stormwater quality – installation of stormwater treatment measures at Council facilities	• Pollution management – monitoring of disused landfill sites • Education and information – sustainable use of buildings
Urban Safety	• Enforcement of waste and litter provisions in Local Law • Septic tank approval process and administration of Nuisance provisions in Health Act 1958	• Water recycling – oversight of water recycling projects at Council facilities	• Litter and waste management – enforcement • Water recycling – advice and approval of water recycling initiatives in the community
Sustainable Development	• Strategic planning • Research • Promotion • Project coordination and implementation • Liaising with external organisations regarding sustainability initiatives and policy development • Development of guidelines and information • Planning referrals - ESD • Incorporating ESD principles into Council policies and projects • Data management	Ensure the inclusion of sustainable water management components in Council projects, including: • water conservation; • water recycling; • stormwater reuse; • stormwater quality.	• Education and information – promotion of sustainability initiatives and sustainable water management education • Policy development • Planning controls – ESD planning requirements • Liaison and coordination – coordinating sustainable water management activities within Council and with external organisations

External stakeholders

There are numerous State Government organisations and non-statutory bodies that are responsible for contributing to sustainable water management. These organisations provide opportunities for partnerships on sustainable water management initiatives or funding support.

Melbourne Water

Responsibilities include:

- managing the water supply network infrastructure in the Melbourne metropolitan region;
- bulk water suppliers to the water retailers;
- management of waterways and drainage infrastructure for catchments over approximately 60ha in size;
- significant role in managing water quality through the direct funding of water quality projects (e.g. regional scale wetlands) and through the provision of support to other sections of the community, particularly Councils, in capacity building and projects to improve water quality;
- undertaking and funding waterway revegetation and rehabilitation projects;
- drainage planning referral authority.

Yarra Valley Water (YVW)

Responsibilities include:

- water retailer in Moreland;
- providing water supply and sewage infrastructure;
- management of localised sewage treatment plants and provision of recycled water;
- delivering community water conservation education programs.

Environment Protection Authority (EPA)

- Responsibilities include:
- protection of Victoria's environment through the administration of The Environment Protection Act 1970;
- development of the SEPP (Waters of Victoria);
- regulation of treatment and use of recycled water (in conjunction with the Department of Human Services);
- provision of works approvals and licenses for scheduled premises;
- pollution monitoring, investigation and enforcement;
- education on environmental protection and sustainability.

Port Phillip and Westernport Catchment Management Authority

- Responsibilities include:
- preparation and implementation of a regional catchment strategy;
- monitor and report on condition of land and water resources;
- education and grant provision supporting sustainable land and water resource management.

Merri Creek Management Committee and Moonee Ponds Creek Coordination Committee

Responsibilities include:

- creek revegetation and rehabilitation works;
- water quality monitoring;
- community education;
- strategic planning and coordination.

Local environment groups

The following local environment groups are actively involved in the management and restoration of Moreland waterways:

- Friends of Merri Creek;
- Merri and Edgars Creek Confluence Area Restoration Group (MECCARG);
- Friends of Edgars Creek;
- Outlook Road Monitoring Group;
- Friends of Moonee Ponds Creek;
- Friend of Westbreen Creek.

6. Current water consumption and water quality

6.1 Community water consumption

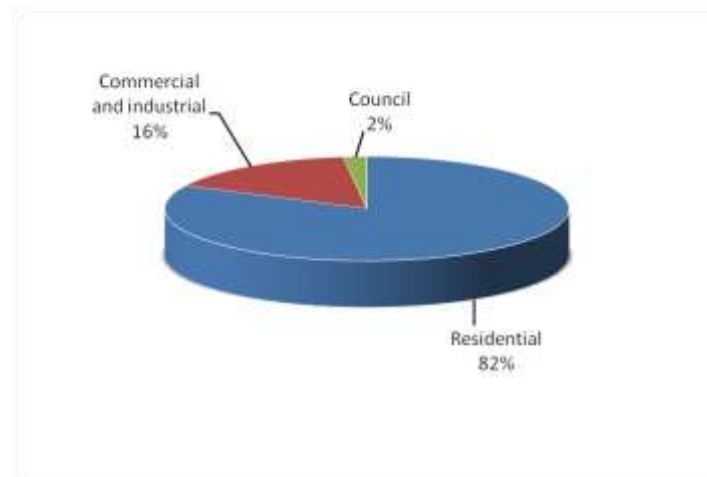
Community water consumption refers to all Moreland potable water consumption. Data is supplied by Yarra Valley Water who are the Moreland water retailers.

Water consumption in Moreland has reduced by 21 percent since the baseline year of 2001-02. It is reasonable to assume that this reduction is largely as a result of the impact of water restrictions on outdoor water use. However, some of this reduction will have occurred through households installing more efficient fixtures and appliances and a growth in rainwater reuse.

2001-02 total community water use was 13.5GL, with residential use constituting 78 percent or 10.5GL. Current total water use for the municipality is now only 10.6GL per year with the residential component dropping to 8.8GL per year. Industrial and commercial consumption has dropped from 2.6GL per year to 1.7GL per year.

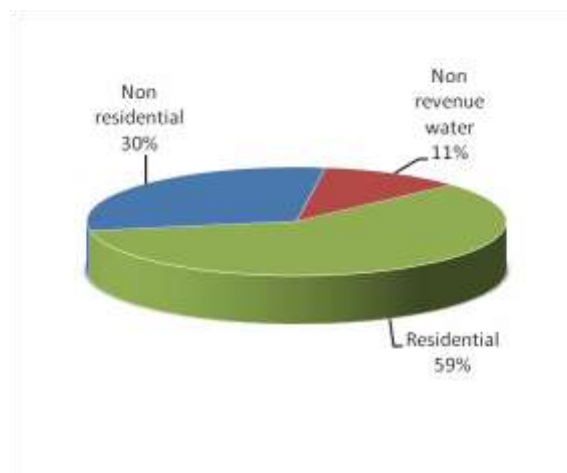
In the past three years the amount of water used per property has reduced from 196KL to 159KL per property per year.

Figure 5: Moreland water use 2007-08 by sector (Source: Yarra Valley Water)



The distribution of water use between residential and non-residential within Moreland shows a greater proportion of water use in the residential sector when compared with the whole of the metropolitan Melbourne region (see Figure 6).

Figure 6: Melbourne metropolitan water use by sector (Melbourne Water, 2006) – note: non-revenue water use is comprised of leakages and un-metered use



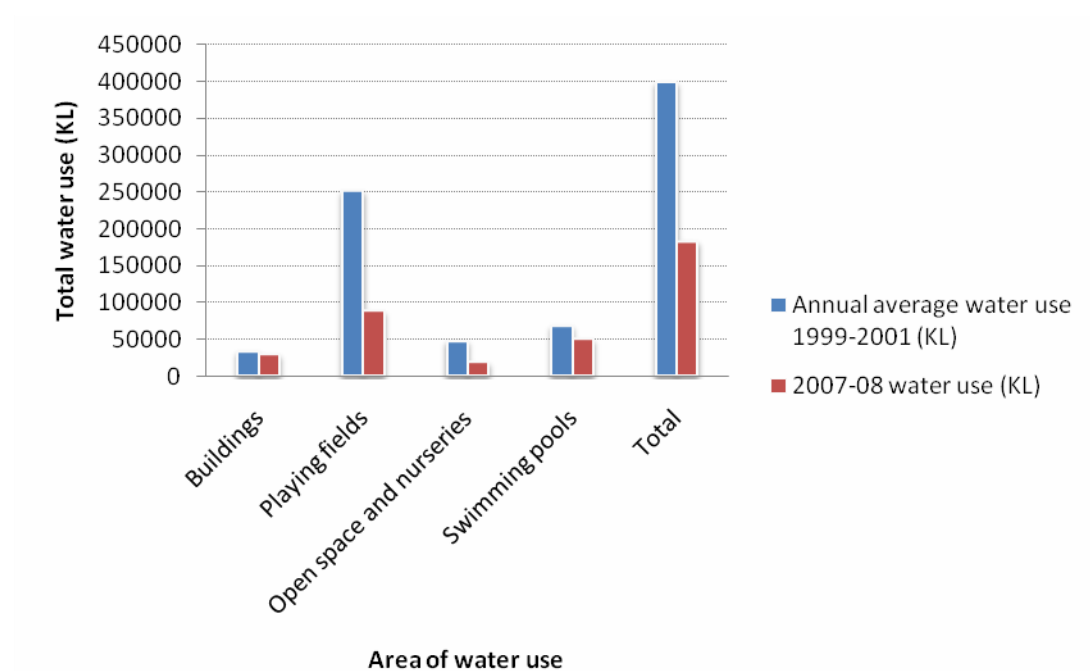
6.2 Corporate water use

Corporate water use refers to water consumption at Council owned and managed sites, including open space (sports fields, gardens and parks), aquatic and leisure facilities, community centres, civic centres, operation centre, public toilets etc.

Council's water consumption has reduced significantly since the baseline measurement years (1999-2001), largely due to water restrictions and the subsequent reduction in sports field irrigation. Water saving actions in other areas such as pool shell repairs have also resulted in sizeable reductions in Council water use.

Despite the large reduction in water use for sports field irrigation this area remains the highest water user for Council (47.9%). Swimming pools use the next largest volume of water (26.8%) followed by buildings (15.5%) and open space (9.7%).

Figure 7: Comparison of baseline (1999-2001) average annual water use with 2007-08 water use



Sports fields

The impact of water restrictions on sports field irrigation from 2006 is clearly recognisable in *Figure 8*.

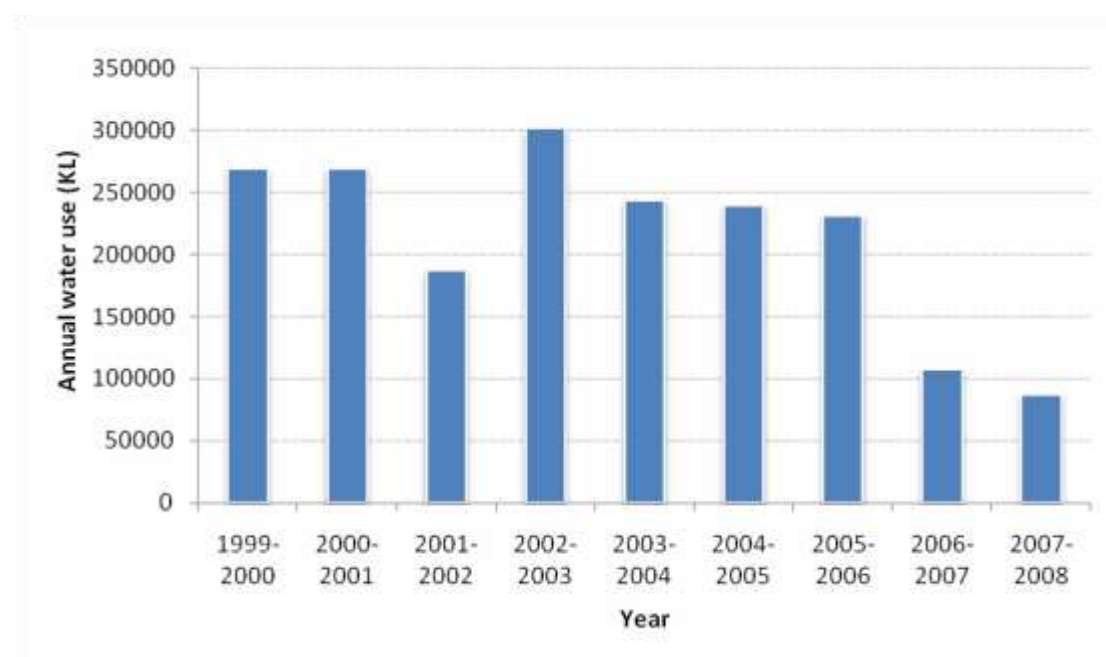
The most recent round of water restrictions have been in place since August 2006 and have progressed in the following manner:

- Stage 1 – 28 August 2006
- Stage 2 – 1 November 2006
- Stage 3 – 1 January 2007
- Stage 3a – 1 April 2007

Council was allocated an annual water use for sports field irrigation of 65ML for 2008-09.

It is not possible to determine the impact of efficiency measures that have been implemented, such as transitioning ovals to warm season turf, through the water use data due to the impact of water restrictions. However, long-term savings in the order of 30 to 50 percent can be expected with continued transition to warm season turf and upgrades and improvements to sports field irrigation systems.

Figure 8: Total water use for sports field irrigation (1999-2000 to 2007-08)



It is anticipated that water restrictions are to be gradually lifted as major water supply augmentation projects come online. This will mean that by approximately 2013 Melbourne will return to Permanent Water Saving Rules¹.

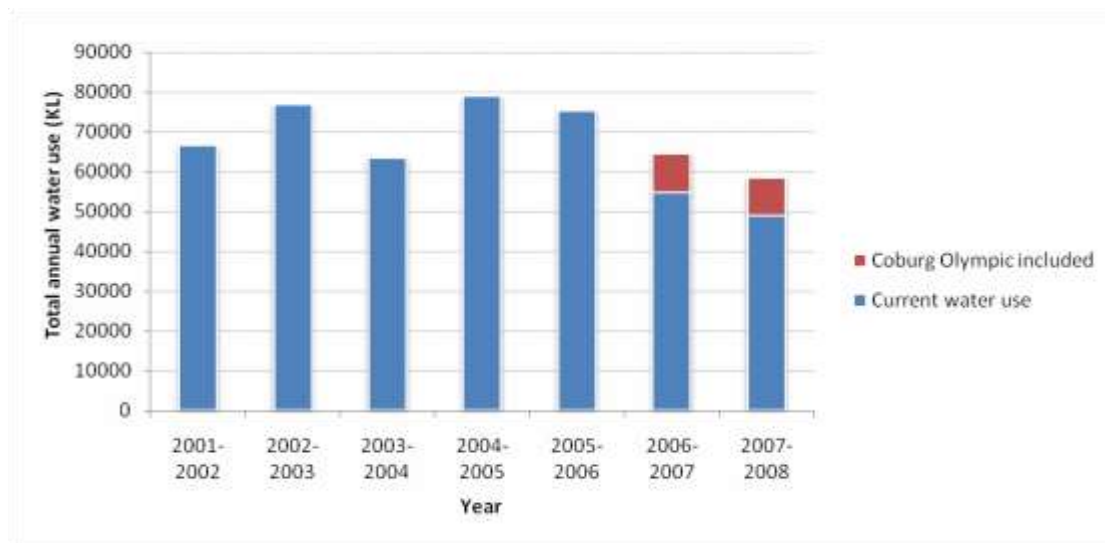
Aquatic centres

Aquatic centre water use has started to trend down following the commencement of the program of pool refurbishments. *Figure 9* shows the reduction in water use following 2005-06.

Coburg Olympic Pool was not open for the 2006-07 and 2007-08 financial years. An average from previous years for this facility has been included to give a more accurate indication of total water use across all aquatic facilities. However, water use is likely to be lower than the 2007-08 figure as pool shell repairs have now been undertaken at Coburg Olympic Pool. Additionally, refilling of pools after repairs at other aquatic facilities will have inflated water use figures from 2006 to 2008.

¹ Permanent Water Saving Rules are in place at all times, even when no water restrictions are in place. Further information can be found at <http://www.ourwater.vic.gov.au/saving/restrictions/rules>

Figure 9: Total water use for aquatic centres (2001-02 to 2007-08)



While every effort is made to provide the most accurate data possible, the large number of sites managed and/or owned by Council means that inaccuracies are contained within the data. Errors in the data are caused by:

- changes to metering (i.e. removal or addition of meters);
- errors in data provided by YVW or in the interpretation of data (i.e. uses attributed to sites or meters);
- changes of use of water at particular sites (and therefore incorrect attribution of use);
- missing data (often due to changes in operation and leasing arrangements).

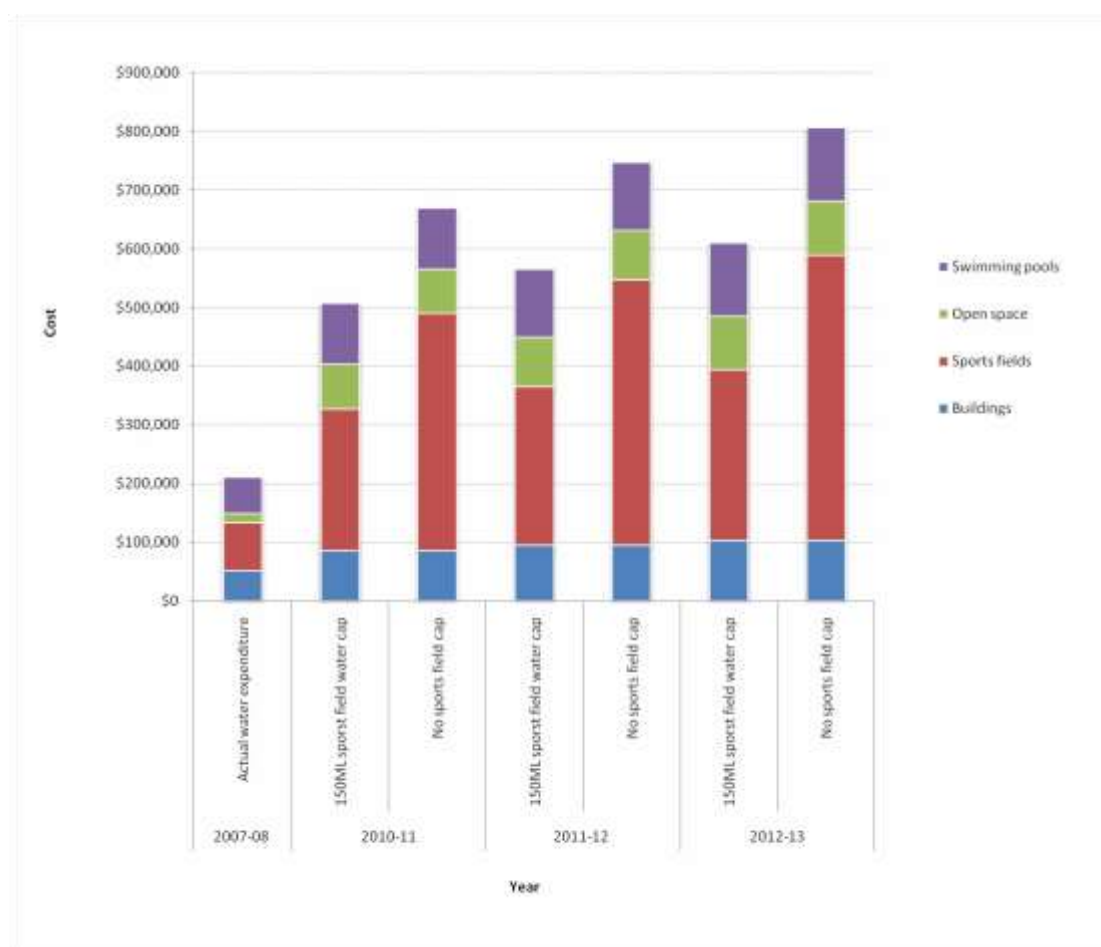
Water costs

Council's water costs have reduced significantly in line with water restrictions and the reduction in sports field and open space water use. Variable water and sewage costs have reduced from an average of approximately \$514,000 per year in the period 1999 to 2001 to the current level of approximately \$210,000. Some cost reductions have been attained through improved metering resulting in reduced sewage disposal charges.

Figure 10 provides a comparison of 2007-08 variable water and sewage costs with two future water use scenarios. One scenario provides an indication of projected water costs with a return to sports field water consumptions levels equivalent to those prior to the introduction of water restrictions. The second scenario models water and sewage costs assuming a 150ML cap on sports field irrigation (contained as a target within the IWMP). The cost increases are based on the Victorian Essential Services Commission water pricing decision handed down in July 2009.

Under the proposed 2012-13 water prices, a return to water use levels equivalent to those prior to the introduction of water restrictions would result in annual water and sewage charges of approximately \$800,000 per year compared with the 2007-08 water and sewage charges of approximately \$210,000.

Figure 10: Water and sewer cost scenarios (excluding fixed costs)



Recycled water consumption

In the 2008-09 period (to May 2009) Council purchased approximately 7ML of Class A recycled water to supplement water requirements for sports fields and other open space assets, due to the extremely low rainfall over summer and water restrictions. The cost of this water is approximately 15 times that of potable water due to the cartage costs. Total cost for the period was \$108,470.

The purchase of recycled water in this form is likely to continue in the short term to ensure that public open space assets can be maintained. In particular, this is to ensure continued availability of sports grounds and to maintain health of trees in Council parks.

6.3 Water quality

Waterwatch and several community environmental groups based in Moreland collect water quality data for waterways within Moreland. Melbourne Water also collects water quality data for urbanised stretches of the Merri and Moonee Ponds Creeks; the Melbourne Water data is not necessarily measured within the municipality but still provides an indication of waterway health for these waterways and their tributaries.

The testing undertaken by Waterwatch and Moreland environment groups in the 2007-08 period has shown a number of stream health indicators outside the SEPP

guidelines (Waterwatch, 2008). In the Merri Creek reactive phosphate, ammonium levels and conductivity (a measure of salinity) were above SEPP guidelines. These elevated levels can be attributed to various pollution sources such as sewage discharge, detergents, animal waste and industrial wastes discharged via the stormwater system. Aquatic macroinvertebrate measures were all well below the SEPP guidelines reflecting poor waterway health most probably caused by severe pollution events from the stormwater system (Waterwatch, 2008).

Within the Moonee Ponds Creek high PH levels outside the SEPP guidelines and high conductivity both reflect stormwater pollution. No macroinvertebrate data is available for Moonee Ponds Creek (Waterwatch, 2008).

Melbourne Water rates waterway health on a scale from very poor to excellent on water quality, aquatic life, habitat and stability, vegetation and flow. The most recent data relating to Merri and Moonee Ponds Creek shows the following conditions:

Merri Creek

	Water Quality	Aquatic Life	Habitat and Stability	Vegetation	Flow
Excellent					
Good					
Moderate					
Poor					
Very Poor					

Moonee Ponds Creek

	Water Quality	Aquatic Life	Habitat and Stability	Vegetation	Flow
Excellent					
Good					
Moderate					
Poor					
Very Poor					

7. Objectives, targets and actions

Council's *Watershed Plan (2005)* contained water reduction targets for corporate water use of 25 percent reduction by 2011 and 50 percent by 2021 from 2001 levels. Currently Council is using approximately 50 percent less than the baseline year. This reduction is predominantly due to the impact of stage 3a water restrictions on open space irrigation. While progress has been made in implementing actions to assist with permanent water savings, water consumption would return to a higher level with the easing of water restrictions.

Efficiency improvements and use of alternative supplies will continue to drive a reduction in Council water use. This needs to occur across all areas of Council operations to ensure a permanent reduction of 50 percent can be achieved.

Council will retain the long-term target of reducing potable water use 50 percent by 2021. No targets for stormwater pollution are contained within the SWMP and the targets for water quality in the Watershed Plan are based on an ICLEI points system attached to individual actions. Establishing quantifiable stormwater quality targets is an action contained within this Plan.

Priority areas

The objectives, targets and actions have been grouped according to seven **priority areas** identified as central to Council efforts in sustainable water management. The priority areas address:

- the highest water consuming areas of Council's activities;
- council activities with the greatest impact on water quality;
- community engagement and education;
- sustainable water management in private development;
- monitoring and reporting on progress;
- working with external organisations and capacity building.

Target and indicators

Indicators are measurable pieces of information that allow Council to determine how it is tracking towards its goals (for example total water use per hectare of open space). They can also allow Council to benchmark its performance against other organisations to gain a better understanding of how it is performing.

Each of the following priority areas include selected indicators to assist in measuring progress. It is possible that further indicators can be developed as benchmarking information becomes available.

Targets have been developed for a number of indicators based on information including industry best practice guidelines, Council data, resourcing and knowledge of previous Council practices.

8. Priority areas

8.1 Open space and water use

Open space water use includes irrigation of both sports fields and parks and gardens. Irrigation of sports fields utilises a much higher amount of water than other open space assets. Open space irrigation has reduced significantly with the introduction of staged water restrictions but still represents the highest consumption of water for Council, with a cap on irrigation of sports fields of 65ML for the 2008-09 period (excluding exempt surfaces such as turf wickets). Council has implemented a range of initiatives (detailed in *section 4*) that have contributed to further reductions in potable water use and increases in the use of alternative water sources.

Due to the uncertainty surrounding the future of potable water supplies in Melbourne including levels of water restrictions and water availability for open space consumption it is difficult to predict the amount of potable water that will be available for open space water use in the next few years.

Therefore to ensure that Council can effectively and sustainably manage its water resources, it is important to incorporate indicators and targets that allow for benchmarking of progress regardless of these external influences (e.g. water restrictions or additional supply) and the associated uncertainty surrounding the availability of potable water.

Objectives

- Reduce the total amount of potable water consumed and required for irrigation on open space.
- Increase the use of alternative sources of water for irrigation.
- Ensure that appropriate levels of water resources are used which balance community and environmental needs.

Responsible Council Departments

- Open Space
- ESD

Indicators	Targets	Comments
Total water use for irrigation	A cap of 150ML per year for sportsground irrigation from potable water.	This cap would be based on an average over a 5-year period to account for seasonal variation.
Total water use per hectare	Water use per hectare cap is 2.14ML per hectare per year based on the total water use cap target of 150ML.	Prior to water restrictions being introduced water use averaged between 3 and 4 ML per hectare per year.
Efficiency of irrigation systems	Distribution uniformity of a minimum of 75 percent for all systems by 2021.	Distribution uniformity is the industry standard benchmark for measuring the efficiency of an irrigation system. Between 75 percent and 85 percent is regarded as current best practice for sprinkler irrigation systems.

Total water recycled or reused	30ML per annum of locally available alternatives to potable water.	<i>The Watershed Plan (2005)</i> contained a target of increasing water reuse to 20 percent. However no baseline was provided. Based on the overall cap of 150ML for potable use, a 20 percent target would equate to 30ML per annum. Providing a potential maximum total supply of 180ML per annum for open space irrigation. This figure will be reviewed following completion of an investigation into reuse and recycling opportunities in Moreland.
Priority Actions		
1	Complete a review of passive and active open space water use to establish Council guidelines for the provision of future irrigation, including: • determining community needs – particularly demand for passive versus active open space use; • landscaping water requirements and landscape planning; • establishing an assessment framework for determining level of irrigation for active open space based factors including, but not limited to: ○ number of active users of a ground; ○ level of competition; ○ age/gender etc. balance; ○ existing condition of assets (efficiency of irrigation system, ground condition etc); ○ links to Activity Centres.	
2	Continue to improve efficiency of water use for irrigation by: • Irrigation efficiency – continue to upgrade irrigation systems, including management systems, and ensure adequate maintenance and monitoring (including irrigation audits). • Turf management – continue to install warm season grasses and improve associated management practices.	
3	Undertake a municipal wide study of potential stormwater and recycled water supply and demand locations to determine opportunities for water reuse and recycling projects, including partnership opportunities with external organisations/companies.	
4	Continue to investigate the use of alternative technologies and approaches to reducing Council's demand for water for irrigation (e.g. synthetic surfaces, water retention technologies).	

8.2 Council facilities and swimming pool water use

Swimming pools are the second highest consumers of potable water outside of open space irrigation. Since the introduction of water restrictions Council has been required to submit water conservation plans to YVW demonstrating strategies to reduce potable water consumption. Significant amounts of water are consumed in filter backwash processes as well as maintaining pool water levels, showers and toilets and cleaning. Other Council buildings with a high annual water use are the Coburg Civic Centre, Brunswick Library and Town Hall, The Bob Hawke Centre and the Walter Street Operations Centre.

Objectives

- Reduce total potable water use in Council facilities and swimming pools.
- Increase the use of alternative water sources and amount of water recycling.

Responsible Council Departments

- Property Services
- Youth and Leisure
- ESD

Indicators	Targets	Comments
Total potable water use	50 percent reduction by 2021.	Currently there is a water reduction target for all Council use of 50 percent by 2021.
ESD building rating tool	To be decided.	Targets developed from the overall building performance through the Building Operations Plan and Sustainable Buildings program.
Efficiency of water fittings, appliances and toilets	All Council facilities to have 2009 best practice fittings, appliances and toilets by 2021.	This target will ensure that outdated and inefficient fixtures, appliances and toilets are replaced by the target year.

Priority Actions

1	Integrate all Council facilities into the Sustainable Buildings Program, Sustainable Small Facilities Program and Building Operations Plan (e.g. audits, facility rating, implementation program).
2	Retrofit water efficient fixtures and toilets in all aquatic facilities and Council buildings with priority for facilities with high water use (>300KL per year) through inclusion in the Building Operations Plan (BOP) and associated maintenance and capital works program.
3	Determine feasibility of backwash recycling, greywater and blackwater recycling and stormwater reuse prior to aquatic facility and major facility refurbishments (>300KL per year).
4	Develop Technical Notes for water fittings, toilets and water using appliances.
5	Continue program of pool shell repairs.
6	Continue to review and improve pool maintenance and backwash procedures.
7	Continue to work in partnership with external organisations, such as YVW, to implement water saving actions.

8.3. Roads, drainage and carparks

Council is responsible for the management and maintenance of a large percentage of road and drainage infrastructure throughout the municipality. Council also manages a number of car parks. VicRoads and Melbourne Water are responsible for managing major arterial roads and larger drainage infrastructure within the municipality. In a highly developed area such as Moreland the stormwater runoff from roads, carparks and other impervious surfaces causes significant levels of pollution in Moreland's waterways. The continuous process of maintaining and replenishing road and drainage assets presents an opportunity to integrate WSUD and improve stormwater quality.

Objectives

- Reduce the pollutant loads entering the stormwater system and waterways in Moreland.
- Ensure adequate resourcing for the planning, implementation and maintenance of WSUD projects.
- Incorporate best practice stormwater management into Council capital works projects.

Responsible Council Departments

- Asset Planning
- Open Space
- Engineering Operations (maintenance)
- Property Services
- ESD

Indicators	Targets	Comments
Total reduction in key pollutants as established by CSIRO Best Practice Environmental guidelines (TN, TP, TSS and gross pollutants).	To be decided – based on municipal stormwater modelling.	Establish targets based on total Moreland pollutant loads and catchment pollutant loads developed by MUSIC model.
Long term improvements in water quality as measured by Melbourne Water and Waterwatch data.	Contribute to achieving Melbourne Water targets for water quality indicators at Merri and Moonee Ponds Creek.	Targets contained in Regional River Health Strategy. More variable indicator and also dependent on other Councils and organisations and therefore only useful for long-term trends.

Priority Actions

1	Establish a WSUD working group with staff responsible for the identification, development, implementation and maintenance of WSUD projects from Asset Planning, Open Space, ESD and Engineering Operations.
2	Undertake modelling of current stormwater pollution loads for Moreland and identify priority catchments and stormwater pollution reduction targets based on: • pollution loads/target pollutants; • capital works program.

3	Develop Council guidelines for the incorporation of WSUD treatment systems including project identification (including modelling and selection criteria), design, construction and maintenance.
4	Identify and implement projects through the capital works program to incorporate WSUD treatment systems that are based on best practice design and construction and prioritised based on Council WSUD guidelines and stormwater targets.
5	Identify and utilise partnership opportunities with external organisations to implement WSUD projects.
6	Require all contractors to submit environmental management plans prior to the commencement of works.
7	Include best practice WSUD stormwater treatment in all new facilities.

8.4. Development, urban planning and building construction

Council is able to influence the environmental impact of private developments through the planning process. Currently Council requires developers to implement sustainability initiatives based on assessments and management plans submitted through the planning process. Stormwater quality and water conservation are both included as requirements in this process. Additionally, Council is responsible for the inclusion of WSUD in subdivisions under the provisions of Clause 56.07 of the Moreland Planning Scheme.

The construction phase of developments also has a significant detrimental impact on stormwater quality and waterway health. Construction practices frequently result in high volumes of litter, sediment and other pollutants (such as paints, concrete etc.) entering the stormwater system.

Objectives

- Reduce the stormwater pollutant and flow impact of all development.
- Reduce the amount of potable water consumed in the operational stage of all developments.
- Increase water reuse and recycling in developments.
- Reduce the amount of stormwater pollution associated with the construction stage of developments.
- Educate the development community on the benefits of sustainable water management practices both in construction and post construction phases.
- Ensure effective enforcement of building site environmental management requirements.
- Ensure effective levels of Council resources (budget and staff) for the maintenance and monitoring of WSUD assets.

Responsible Council Departments

- Planning and Building
- Sustainable Development

Indicators	Targets	Comments
Total water reduction based on ESD assessments provided to Council.	All developments to incorporate best practice water efficient fittings, toilets and appliances.	Installation of 3 star showerheads, 4-5 star basins/sinks, 5 star toilets, waterless urinals and 4 star dishwashers and washing machines can achieve in the range of 30-40 percent savings

		compared to using minimum rated fittings in residential developments.
Total amount of water reused or recycled based on ESD assessments provided to Council.	All developments to incorporate best practice water reuse and/or recycling.	Connection of water tanks to toilets and washing machines and/or use of greywater for toilets and garden water use can achieve water savings greater than 30 percent in residential developments.
Total reduction in key pollutants (TN, TP, TSS and gross pollutants) based on ESD assessments provided to Council.	All developments to achieve best practice stormwater quality objectives (80 percent TSS, 45 percent N, 45 percent P and 70 percent litter).	Current requirements for best practice stormwater management are focused on subdivisions and larger scale developments.
Assessment of building site management practices through building site audit program.	To be decided – based on initial site audit outcomes.	Regular audits of development sites throughout the municipality will provide an indication of the effectiveness of education and enforcement programs.
Priority Actions		
1	Continue to expand and improve the Council planning assessment tools and requirements (e.g. STEPS and SDS).	
2	Strengthen Council ESD planning policy through the inclusion of a ESD Local Planning Policy into the Moreland Planning Scheme and identification of further opportunities to strengthen planning policies.	
3	Continue to advocate the State Government to expand the coverage and strengthen sustainable water management requirements within the planning and development system.	
4	Improve Council processes for the assessment and handover of WSUD assets through the development of Council WSUD planning guidelines.	
5	Undertake developer WSUD training sessions on design, installation and maintenance of WSUD assets.	
6	Incorporate the principles of the Industrial Stormwater Code of Practice into Council planning assessments and possibly through incorporation into the Moreland Planning Scheme.	
7	Commence annual auditing of building sites to determine changes in builder behaviour in building site environmental management.	
8	Develop a building site local law inspection and enforcement process to improve compliance with the Moreland City Council Environmental and Civic Assets Local Law 2006 and EPA regulations.	
9	Undertake a building site management education program for the construction industry to coincide with increased inspection and enforcement regime.	

8.5 Community engagement and education

Continued community engagement and education is critical to ensuring sustainable management of water resources. The aim of this section is to outline Council's commitment to educating the broader Moreland community (e.g. residents, traders, schools) in more sustainable water use and reducing pollution entering waterways. Some components of education are contained within other sections of the IWMP where they are specific to a particular action area, for example education of the building and construction industry on sustainable building site management practices.

Objectives

- Foster greater community understanding of the water cycle and our relationship with it.
- Educate the community in reducing water consumption through more efficient use.
- Educate the community on the impacts of stormwater pollution and means of reducing their impact.
- Encourage the use of alternative sources of water such as rainwater, stormwater and recycled water (greywater and blackwater) where appropriate.
- Engage the community on the concept of water sensitive urban design.

Responsible Council Departments

- Engineering Operations (Environmental Education)
- ESD

Indicators	Targets	Comments
Surveys of awareness of stormwater and water conservation issues and uptake of sustainable actions.	Increase in awareness of sustainable water management issues.	
Numbers of Moreland residents, community groups, schools etc. engaged in sustainable water management issues.	To be decided.	Baseline measure needs to be determined.

Priority Actions

1	Develop an ongoing community stormwater education program.
2	Continue to support the activities of external groups and organisations engaged in community environmental education (e.g. MCMC, Waterwatch, MPCCC, CERES, local schools, YVW, Melbourne Water and tertiary institutions).
3	Improve Councils links between Council education programs and external programs.
4	Continue to promote Council projects and inform the community about sustainable water management using Council website and other communication tools (e.g. media releases, workshops, newsletters, festivals, Council signage).
5	Develop Moreland specific education materials and resources focused on stormwater management (e.g. catchment stormwater information).

8.6. Waterway management

Council works in conjunction with Melbourne Water, MCMC, MPCCC, Port Phillip and Western Port Catchment Management Authority and local environmental groups to undertake a range of works to improve the health of waterways in Moreland including revegetation, erosion control works and weed and pest management. Melbourne Water is directly responsible for the management of the bed and banks of waterways. There is potential to improve water quality, habitat and biodiversity by incorporating larger scale wetlands adjacent to waterways.

Actions relating to waterway management are predominantly contained in the *Moreland Open Space Strategy* and also within Strategies such as the *Melbourne Water Regional River Health Strategy*.

Objectives

- Align water quality and ecological objectives in the management of waterways.
- Ensure that water quality objectives are incorporated into open space planning and project delivery.

Responsible Council Departments

- Open Space
- ESD

Indicators	Targets	Comments
Long term improvements in water quality as measured by Melbourne Water and Waterwatch data.	Contribute to achieving the Melbourne Water targets for water quality indicators at Merri and Moonee Ponds Creek.	

Priority Actions

1	Incorporate water quality targets into the review of the <i>Moreland Open Space Strategy</i> .
2	Identify wetland and other stormwater treatment development opportunities along Merri and Moonee Ponds Creeks and their tributaries for stormwater treatment and ecological purposes.
3	Implement the recommendations of the Merri Creek Constructed Urban Wetlands Feasibility Study.
4	Identify opportunities to link WSUD objectives with open space management objectives including: • stormwater reuse and stormwater treatment; • biodiversity and habitat enhancement.
5	Work with MCMC, MPCCC and Melbourne Water to identify project opportunities which will incorporate stormwater pollution reduction outcomes.

8.7 Monitoring, reporting and data management

Adequate and accurate management of data and information on water consumption, water reuse and recycling and water quality is central to measuring progression towards water sustainability targets.

Council is able to monitor water consumption and water quality through a variety of means and it is important that consistent methods are established so that accurate benchmarking and comparison can occur over the long term.

Objectives

- Ensure that quantitative and qualitative information and data is available to benchmark performance and provide accountability in Council decision making.
- Develop and maintain clear, consistent and relevant data.
- Ensure regular reporting on indicators.

Responsible Council Departments

- ESD

Indicators	Targets	Comments
Reporting on progress.	Annual progress report.	

Priority Actions

1	Establish a data management process for potable water use from YVW bills or database that incorporates targets and indicators (including additional indicators as benchmarking information becomes available).
2	Establish a monitoring database for water quality improvements based on modelling of Council projects and information submitted in planning applications.
3	Develop monitoring program for WSUD treatment systems to determine effectiveness relative to modelled treatment predictions.
4	Develop a monitoring database to quantify impacts of sustainability initiatives included in developments and measure relative to targets.
5	Install separate metering for large scale water reuse projects.
6	Investigate the installation of sub-metering at aquatic centres.
7	Conduct annual reporting of progress toward water conservation, reuse and water quality targets.

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10. Glossary

BOP	Building Operations Plan
CERES	The Centre for Education and Research in Environmental Strategies
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DSE	Department of Sustainability and Environment
ESD	Environmentally Sustainable Development
ICLEI	International Council for Local Environmental Initiatives
IPCC	The Intergovernmental Panel on Climate Change
IWM	Integrated Water Management
IWMP	Integrated Water Management Plan
MCMC	Merri Creek Management Committee
MPCCC	Moonee Ponds Creek Coordinating Committee
MUSIC	Model for Urban Stormwater Improvement Conceptualisation MUSIC is a software tool for modelling stormwater systems including treatment of pollutants
NWI	The National Water Initiative
SDS	Sustainable Design Scorecard
SEPPs	State Environment Protection Policies
STEPS	Sustainable Tools for Environmental Performance Strategy
SWMP	Storm Water Management Plan
TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
Waterwatch	A Council, State and Federal funded waterway education and water quality monitoring program
WSUD	Water Sensitive Urban Design
YVW	Yarra Valley Water