



# Environmental Sustainability Plan 3 2011-2013

# Signatories

(Statement of endorsement from the Board)

We acknowledge our local community, local councils, local environmental groups and our customers.

We pledge commitment to implementing this plan, including its ongoing review, in consultation with these groups.



Anne Barker  
Managing Director, City West Water

The following signatories acknowledge, endorse and support the City West Water Environmental Sustainability Plan.

## Community Liaison Committee



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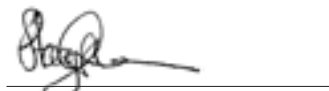
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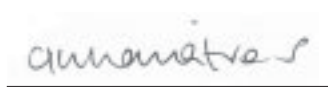
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# Definitions

## **Alternate water**

Water derived from a variety of sources including recycled water, stormwater, greywater, groundwater and industrial water that is treated to an appropriate standard for given uses. The standards and allowable uses are established in national and state guidelines.

## **Biogas**

Biogas typically refers to gas produced by the biological breakdown of organic matter in the absence of oxygen. It can provide a clean source of renewable energy from organic waste.

## **Bulk water**

Total water supplied by a water provider (Melbourne Water) to another water provider (City West Water).

## **Central Region Sustainable Water Strategy**

The Central Region Sustainable Water Strategy released in 2006 is the strategy developed under the previous State Government to secure water supplies for homes, business, industry, agriculture and the environment for the next 50 years. It considers all water sources including rivers, reservoirs, aquifers, as well as recycled water, stormwater and seawater. The region covers an arc around Melbourne, including Geelong, Ballarat, the Macedon district and West Gippsland. It includes the Barwon, Moorabool, Werribee, Maribyrnong, Yarra, Bunyip, Thomson and Latrobe river catchments.

## **Class A recycled water**

A health-based microbiological standard for recycled water quality that is defined in EPA Victoria guidelines.

## **Dual water supply scheme**

An urban water recycling scheme where recycled water is provided to households for uses approved in EPA Victoria guidelines, via a reticulation system that is separate from the drinking water supply.

## **EMS**

Environmental Management System

## **Environmental Assessment**

Environmental Assessment is an internal City West Water process to identify and manage environmental risks associated with City West Water managed capital projects.

## **Environmental Management Plan**

A plan or program that seeks to achieve a required end state and describes how activities that have, or could have, an adverse impact on the environment, will be mitigated, controlled, and monitored.

## **EPA**

Environment Protection Authority Victoria

## **ESP**

Environmental Sustainability Plan

## **Fit for purpose recycled water**

Water generated from sewage, greywater or stormwater systems and treated to a standard that is appropriate for its intended use.

## **Green Power**

Electricity sourced from renewable sources, typically wind, solar, biomass or hydro. City West Water purchased Green Power is sourced from nationally accredited renewable energy sources.

## **Greenhouse gas emissions**

Gaseous pollutants released into the atmosphere through human actions that amplify the greenhouse effect. The greenhouse effect is widely accepted as the cause of global climate change. Gases

include carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), chlorofluorocarbons (CFCs), hydro fluorocarbons (HFCs), per fluorocarbons (PFCs) and sulphur hexafluoride (SF<sub>6</sub>).

## **Greening the West**

A strategy to secure supply of fit for purpose water in City West Water's service area to enable the planting and maintenance of suitable trees and vegetation in areas that will deliver:

- an improvement in suburb microclimate by reducing the area of paved surfaces exposed to sunlight
- a reduction in airborne particulate matter and contaminants
- an increase in the number and size of passive recreation sites to enhance the health of residents
- increased habitat corridors in new and established areas to promote wildlife diversity
- an increase in the amenity value of new and established suburb streetscapes.

## **Integrated water management**

A philosophy of managing all facets of the water cycle including water supply, sewerage and drainage, in an integrated way.

## **ISO14001 Standard**

ISO14001 is a standard that provides a framework to assist organisations to develop an Environmental Management System (EMS). It requires an organisation to:

- determine the organisation's impact on the environment and relevant regulations to the operations of the business
- create a plan to control processes to minimise the environmental impact
- monitor the effectiveness of the system at meeting objectives as well as legal and other
- continually analyse the results and improve systems.

## **ISO22000 Standard**

ISO22000 is an international standard that specifies requirements for a food safety management system where an organisation in the food chain needs to demonstrate its ability to control food safety hazards in order to ensure that food is safe at the time of human consumption. City West Water applies this standard to sewage quality management.

## **Joint Water Efficiency Plan (JWEP)**

The Plan details the water efficiency actions to be implemented by Melbourne's water corporations for two years from 2011-12 until 2012-13. It takes into account targets established in the Central Region Sustainable Water Strategy, other Government policies and the Water Supply Demand Strategy.

## **Life cycle assessment**

An assessment process which determines the environmental impacts of products and services through all stages of production, usage and disposal.

## **NESC**

Non English Speaking Communities

## **Non residential water use**

Water use on industrial, commercial, institutional and council properties.

**Net zero greenhouse gas emissions**

A balance of a measured amount of greenhouse gas emissions released in a nominated scope of activities with an equivalent amount of sequestered or offset value of emissions to make up the difference.

**Priority pollutant**

A pollutant that has been identified (through a documented risk assessment) and agreed between the Melbourne metropolitan water utilities as posing a potential unacceptable risk to sewage quality and requires active management to reduce the risk to acceptable levels.

**Priority Pollutant Management Plan**

An agreed plan that includes actions, responsibilities, timelines and stakeholder consultation for reducing a priority pollutant to acceptable levels.

**Residential water use**

Water for household purposes, such as drinking, food preparation, bathing, washing clothes and dishes, flushing toilets, and watering lawns and gardens.

**Reverse osmosis**

A filtering process in which a contaminated liquid is purified by forcing it through a semi-permeable membrane.

**Scope 1 emissions**

Scope 1 emissions, also known as direct emissions, include any emissions that occur on-site or from company-owned assets. This includes the combustion of fuels, process emissions, and refrigerant leakage. These emissions are aggregated on a facility-level, with the company's vehicle fleet considered as one facility.

**Scope 2 emissions**

Scope 2 emissions, also known as indirect emissions, include any emissions created directly on behalf of the company in the generation of electricity or the delivery of energy via hot water or steam.

**Scope 3 emissions**

Scope 3 emissions, also known as other indirect emissions, such as the extraction and production of purchased materials and fuels, transport-related activities in vehicles not owned or controlled by the reporting entity, electricity-related activities (e.g. transmission losses) not covered in Scope 2, outsourced activities, waste disposal, etc.

**Sewage**

Wastewater conveyed by the sewerage system. It includes domestic wastewater, trade waste, commercial wastewater, inflow and infiltration.

**Sewer mining**

Diversion and treatment of sewage directly from the sewerage system to produce fit for purpose recycled water for a defined use.

**Sewerage**

System for the collection and transfer of sewage. It includes sewerage pipes and pumping stations.

**Sustainability Covenant**

A Sustainability Covenant is a public commitment by City West Water and EPA Victoria to work together to achieve resource use efficiencies and to reduce operational ecological impacts.

**Trade waste**

Liquid waste that is defined to be trade waste under the Water Industry Regulations 2006. It includes any matter discharged from premises as a result of trade, industrial, commercial, medical, dental, veterinary, agricultural, horticultural or scientific activities. It does not include wastewater that is discharged from a private residential premises.

**Unaccounted for water**

Unaccounted for water includes water that is lost through bursts and leaks, used for fire fighting, taken through illegal connections or used through inaccurate meters.

**Water sensitive urban design**

The integration of urban planning with the environmentally sensitive management of the water cycle.

**Water Supply Demand Strategy**

This strategy details how the Melbourne water utilities will implement the government's policy directions including the Central Region Sustainable Water Strategy.

# 1.0 Environmental Sustainability Plan

The Environmental Sustainability Plan (ESP) sets out City West Water's plan for environmental management and improvement. It details our targets and actions, aligned to our strategic objectives and plan, over two years from 1 July 2011 to 30 June 2013. It includes responsibilities for implementing actions and targets, reporting and review.

It is available to the public via our website at [citywestwater.com.au](http://citywestwater.com.au).

**It also applies to the life cycle impacts of our products and services including:**

- customer water use (residential and non residential)
- influencing the use of water sources to maximise the environmental value of our products and services
- sewage quality management including trade waste.

For the purposes of our ISO14001 certified Environment Management System (EMS) the ESP is designed to meet all of the requirements of clause 4.3.3 (Objectives, targets and programs) of the ISO14001 standard. It is consistent with the requirements of our Sustainability Policy and Environmental Policy.

**The purposes of the ESP are to:**

- maintain a comprehensive and integrated plan for the management of our environmental performance
- clearly identify actions and targets to achieve improved environmental management, linked to our strategic objectives and plan
- promote continual improvement in environmental performance.

**The ESP applies to all operations under our control including our:**

- water, sewerage and alternate water assets
- treatment plants
- head office building located in Sunshine
- field operations, including those of our maintenance contractor PFM.

1996	1997	1998	2000	2003	2005
Community Liaison Committee inception	ISO14001 Environmental Management System accreditation obtained	Environment Improvement Plan 1 developed	Environment Improvement Plan 2 developed	Environment Improvement Plan 3 developed  Enviro Partnerships developed  Sustainability Street and Green Street programs developed	Sustainability Covenant #1 (Resource Efficiency)  Environmental Management System upgrade to revised ISO14001 standard

## 1.1 A proud history

We believe setting actions and targets is only the starting point for good environmental performance. Through previous ESPs we made some major leaps forward on our sustainability journey, including:

- **Becoming the first water business in Australia to achieve net zero greenhouse gas emissions.**

By partnering with EPA, Victoria's independent environmental regulator, which supported our approach to achieving net zero greenhouse gas emissions through a Sustainability Covenant made under the *Environment Protection Act 1970*, we successfully achieved this goal on 30 June 2007 and maintained it thereafter.

- **Recording a 48.7% reduction in per person water use since the 1990s.**

When comparing 2009-10 water consumption to the 1990s average, water use across our customer base has dropped significantly. This has been achieved through water restrictions, partnering for sustainable outcomes with our business and residential customers and a proactive leak detection program.

- **Completing construction of the Altona Recycled Water Plant in 2010.**

The plant will deliver up to 9 million litres per day of high quality recycled water to industrial and commercial customers for manufacturing and irrigation uses in the Hobsons Bay area.

Since our inception in 1995, we have developed and implemented a range of plans and strategies to achieve our sustainability objectives which are depicted on the following timelines:

2006	2007	2008	2009	2010	2011
ESP 1 developed	ESP 1 Year 2	ESP 2 developed	ESP 2 Year 2	ESP 2: Year 3	ESP 3 developed
Sustainability Covenant #2 (Net Zero greenhouse gas)	Commissioning of upgraded Altona Treatment Plant	Sustainability Covenant #3 including life cycle analysis of clothes washing	Sustainable Water City Principles developed by Community Liaison Committee	Net zero gas emissions commitment continued	Commissioning of Altona Treatment Plant Ultra Filtration Reverse Osmosis Plant
Water Conservation Solutions Program for business customers implemented	Net zero gas emissions commitment continued	Net zero gas emissions	Net zero gas emissions commitment continued	Business Resource Efficiency program implemented	Net zero gas emissions commitment continued
		Water way studies commenced			
		Finalist – Business Sustainability Banksia Awards			

## 1.2 An exciting future

Our Strategic Plan 2011-2016 provides a framework for how we will continue to meet the sustainability challenge under the dual pressures of population growth and climate change.

This ESP outlines how City West Water will continue to reduce our environmental impact and drive sustainability in accordance with the Strategic Plan. It includes commitments to:

- continue to support residents and businesses to practice water efficiency
- reduce reliance on drinking water supplies and make supply available to enable environmental solutions in our community by maximising the use of sustainable alternate water supplies
- drive environmental improvement in our day to day operations
- minimise greenhouse gas emissions and maintain net zero greenhouse gas emissions
- drive resource efficiency
- facilitate a healthy urban habitat through Greening the West.

## 2.0 Background

### 2.1 What do we do?

City West Water is one of the three retail water companies servicing metropolitan Melbourne and is wholly owned by the Victorian Government. Our core business is the delivery of drinking water and alternate water and the collection of sewage and trade waste from our customers in Melbourne's central business district, inner and western suburbs.

Key facts about City West Water for 2009-10 are included in Table 1 (actual data for 2009-10).

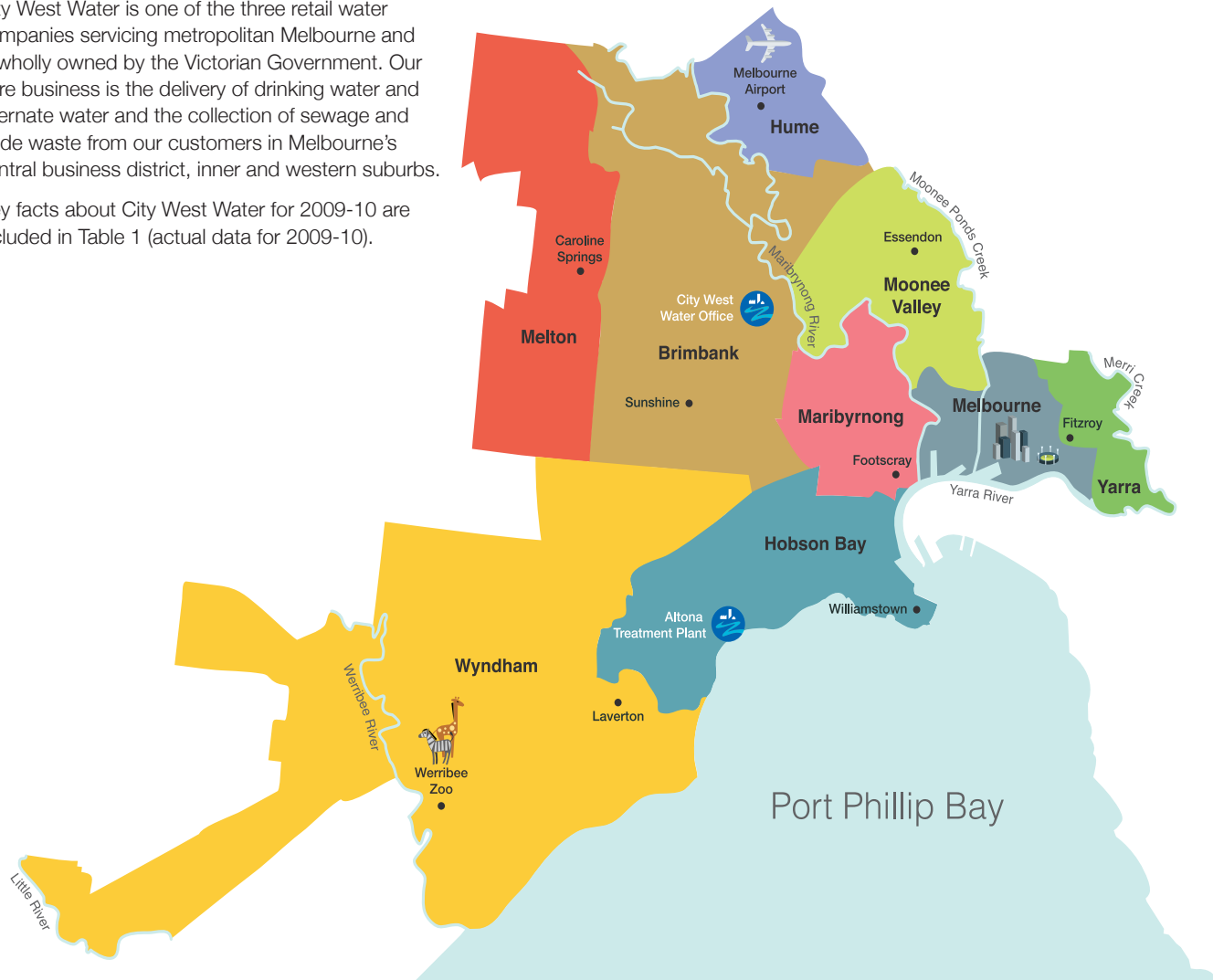


Figure 1: Our service area

Asset	Description
The volume of water purchased from Melbourne Water and supplied to residential and non residential customers	90.3 billion litres
Kilometres of water main (distribution and reticulation)	4431
Kilometres of sewer (main, branch and reticulation)	3909
No. of water pumping stations (including alternate water)	11
No. of sewerage pumping stations	71
No. of sewage treatment plants	1
No. of sewer mining plants	1
Volume of alternate water supplied to customers	380 million litres
Volume of trade waste collected from our customers	14 billion litres
Volume of sewage collected and transferred to Western Treatment Plant	70 billion litres

Table 1: City West Water Facts and Figures 2009-10

## 3.0 What makes us unique?

### 3.1 Our customers

City West Water has a smaller residential customer base and geographic area with a greater proportion of non residential customers than the other metropolitan water retailers.

Our non residential customers include large industrial operations in the food and beverage manufacturing, chemical manufacturing, oil refining, textile and automotive manufacturing industries. Our residential customers are equally diverse, with approximately 34% of people living in our service area speaking a language other than English at home.

With population projections showing that Melbourne's population growth will be greatest at its western edge, part of the resultant demand for resources will be met by City West Water.

### 3.2 Our service area

City West Water's service area spans the Werribee Plains district — an area that traditionally has lower rainfall than the eastern metropolitan area as a result of the 'rain shadow' created by mountain ranges north of Geelong. The Werribee Plains is home to native grasslands and Plains Grassy Woodlands which are significantly depleted on both the regional and state level. Average maximum temperatures in Melbourne are higher in the western suburbs than the eastern suburbs.

### 3.3 Our role in the water cycle

Our role in the water cycle includes the following:

- distribution — our assets deliver water to homes and businesses within our service area
- discharge — our assets transport sewage and trade waste from homes and businesses within our service area and discharge to Altona Treatment Plant (6%) and into Melbourne Water sewers connected to the Western Treatment Plant (94%)
- sewage treatment — we operate the Altona Treatment Plant which treats approximately 6% of the sewage discharged to our system. The plant produces high quality recycled water and discharges treated wastewater to Port Phillip Bay
- alternate water — we continue to identify and implement new opportunities to provide fit for purpose alternate water supply produced by treating sewage and blackwater, greywater, stormwater and rainwater, industrial refuse water and groundwater.

We work closely with Melbourne Water whose role in the water distribution cycle includes:

- collection and treatment of rainwater in protected catchments
- operation of the Western Treatment Plant which treats approximately 94% of the sewage discharged to our system
- production of biogas, which is produced from the anaerobic treatment processes at Western Treatment Plant, to generate renewable energy.

### 3.4 Towards a sustainable water city

City West Water recognises that through our role in the water cycle we can advocate for the adoption of sustainable practices across the industry and by our customers. Key opportunities to influence more sustainable outcomes include:

- the development of Water Supply Demand Strategies for metropolitan Melbourne once every five years in conjunction with the retail water businesses and Melbourne Water
- input into the development of the government water supply strategies
- collaboration with developers to create water sensitive designs for new urban developments
- working with local government to plan precincts in accordance with integrated water management guidelines
- providing sustainable alternate water supplies to supply water where it is needed most and reduce reliance on drinking water supplies
- working with residential and non residential customers to help them to value and practice water and energy efficiency
- positioning ourselves as a facilitator to connect, assist and coordinate stakeholders to contribute to a healthy urban habitat and provide suitable water supplies to enable this
- engagement with key government stakeholders on policies and programs
- participation in industry groups
- collaboration with other Victorian water businesses to align views on sustainability.



Figure 2: An artist's impression of a sustainable water city

#### 1. Solar hot water heating

In Victoria, water heating accounts for over 25% of total residential energy demand. Using the solar energy from the sun to provide this heat could save our customers money on energy bills. Scientific modelling shows that a wide uptake of solar hot water systems, (80% on new dwellings and 20% of existing dwellings) would also save around 30 petajoules(PJ)/year. That's around 10 desalination plants worth of energy and associated greenhouse

gas emissions. City West Water will continue to communicate the link between water and energy to both residential and non-residential customers through our targeted behavioural change programs and in future City West Water publications and bill inserts.

#### 2. Sewer mining

City West Water currently operates a sewer mining plant that treats water to Class C standard for irrigating the Sunshine Golf course. Sewer mining

is the process of tapping into a sewer and extracting sewage which is then treated and used as recycled water. City West Water is currently working with our customers on implementing their own sewer mining projects to reduce demand on drinking water supplies, including the iconic MCG.

### **3. Water and energy efficient equipment and appliances**

City West Water encourages the uptake of water saving appliances through free showerhead exchanges and other customer programs including a range of rebates for water efficient equipment. To ensure we use the resources we have as efficiently as possible, the government has introduced the WELS (Water Efficiency Labelling Scheme) and Energy ratings of products to provide guidance to consumers when purchasing. Water supply, sewerage, plumbing and drainage goods installed by licenced plumbers also need to adhere to the minimum quality standards (WaterMark). By choosing a quality assured and more water efficient appliance you will be saving money whilst contributing to reducing water usage and often associated energy use related to hot water reduction.

### **4. Resource Efficiency and Industrial ecology**

City West Water works with its industrial customers to reduce and recover resources that would otherwise be disposed of as waste. Heat and resources can be produced as by-products of industrial processes. Sharing heat across facilities is an efficient way to ensure it is not wasted. In this example, waste heat from an industrial facility is used to heat a nearby commercial office building. This idea is known as industrial ecology. As energy and resources become increasingly constrained more examples are occurring around Australia and the world. City West Water is part of an industrial ecology working group led by the Waste Management Association of Australia.

### **5. Nutrient Recovery**

Our sewage contains important nutrients for agriculture. Recovering nutrients essential for plant growth such as nitrogen and phosphorus is becoming increasingly feasible with the development of new technologies. Recovering these nutrients not only saves phosphorus but also minimises the impacts of sewage waste on the environment.

### **6. Waste to energy**

Technology now enables the extraction of resources from organic waste. City West Water, as part of their Research and Development program is continuing to work on improved ways to harness resources such as energy. The program includes emerging technologies to co-digest sewage sludge with other types of organic waste e.g. food manufacturing waste. This technique could improve the amount of gas generated and the potential reuse possibilities for organic sludge.

### **7. Water recycling**

There are a number of processes which can be used to clean wastewater so that it can be reused. This example shows the reverse osmosis treatment technique which is employed at City West Water's Altona Treatment Plant. Reverse Osmosis (RO) involves forcing wastewater through membranes under high pressure. The membranes remove impurities from the wastewater, allowing it to be reused in industrial processes and landscape irrigation.

### **8. Brine in wetlands**

As well as producing clean water for reuse, water recycling also produces a concentrated brine (high salt content) stream. Finding a beneficial reuse for these brine streams is an important challenge for the water industry. One example of how these brine streams might be used is to create salt marsh wetland habitats. Salt marsh wetlands are one of the vegetation classes at greatest threat from Climate Change. City West Water is investigating the potential for reusing the brine in artificial wetlands at our Altona Treatment Plant. This would provide a home for native wildlife whilst removing nutrients from the wastewater stream.

### **9. Integrated City Planning**

The Water Services Association of Australia has been working to develop a set of principles for how Australian Cities of the Future could integrate with other parts of the community. In this example workers take the opportunity to replant trees, while undertaking a sewer renewal. In the short to medium term, realising such goals will be explored through the Victorian Governments Water Supply and Demand Strategy and our Greening the West program.

### **10. Fit for purpose water usage**

Different end uses require different qualities of water. Matching water supplies to the end usage means all available water sources will be utilised as effectively as possible. For example treating stormwater in wetlands is becoming an increasingly popular way to remove contaminants, at the same time providing attractive natural habitats for birds, animals and people to enjoy. Treated stormwater can meet irrigation needs for trees and open spaces so we can enjoy the benefits of a healthy urban habitat without comprising our drinking water supplies. City West Water is trying to facilitate such usage of water through the Greening the West project and we are working with councils on storm water harvesting projects.

### **Environmentally Sustainable Design**

Urban buildings can significantly contribute to environmental impacts including water and energy use, air quality and waste production. By adopting the principles of Environmentally Sustainable Design (ESD) the impact of buildings can be significantly reduced. Illustrations 11-14 demonstrates examples of ESD in buildings.

### **11. Rooftop gardens**

Green roofs are constructed on roof tops to help insulate buildings, and make good use of inner city roof space. Creating green roofs on buildings increases building insulation, lowering temperatures within. Plants also provide shade, and release water through a process known as transpiration. If enough green roofs are constructed this could help to lower temperatures in the surrounding vicinity. This would help combat the "heat island effect" where temperatures in urban areas are warmer than surrounding natural landscapes. Rooftop gardens provide a haven for inner city residents to relax. Green roofs can be watered naturally by rainwater, or by storing it in tanks for later use.

### **12. Rainwater harvesting**

Rainwater harvesting refers to water that is captured off roof spaces in order to be stored for later use. Because roofs are relatively clean surfaces, rainwater requires the least treatment of all alternative water supplies. City West Water assists businesses to implement viable medium to large scale rainwater harvesting projects. Rebates are also available for residents and community groups to install rainwater tanks.

### **13. Geothermal Heating and Cooling**

Heating and cooling is provided by a geothermal heat pump, which pumps a liquid through the earth below the building in order to regulate the buildings internal temperature. This removes the need for traditional cooling towers which can contribute up to one third of a building's water usage. The website [mycoolingtower.com.au](http://mycoolingtower.com.au) has been set up by the Victorian Government to assist business customers improve their water and energy efficiency and save on chemical treatment costs.

### **14. Biogas Production**

Sewage produced in the building is fed into a digester which produces a biogas used to heat shower water.

# 4.0 Environmental management at City West Water

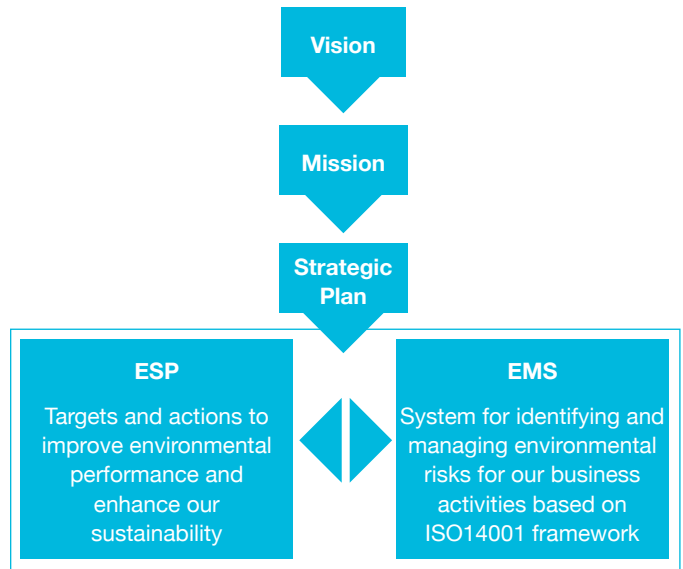
With our vision to be a truly sustainable water business, we understand the importance of integrating environmental sustainability across the business. In all our operations, we work to a 'triple bottom line' approach which balances the social, economic and environmental impacts of our business. We are a dynamic, proud and environmentally conscious company, driven and defined by our vision, mission and values. With a certified ISO14001 Environmental Management System we understand the environmental risks of operating our business. The environmental management framework is shown below.

Our Strategic Objectives (numbered) and Measures (sub points) in Table 2 define what it means to be a truly sustainable business.

## 4.1 What sustainability means to City West Water

For City West Water sustainability means:

- continually improving our business performance by balancing the social, environmental and economic impacts of our actions
- living and working in ways that do not jeopardise our current and future social, environmental and economic resources.



Environment	Social			Economic
	Customer	People	Community	
<i>Significantly more with significantly less</i>	<i>Right product, right price, right way</i>	<i>For today and tomorrow</i>	<i>Leading and including</i>	<i>Efficiency and growth</i>
<b>1. Balance the needs of our customers and the environment in managing the supply and demand for water</b> <ul style="list-style-type: none"> <li>• Melbourne will be green and no water will be wasted</li> </ul> <b>2. Maximise sustainable use of alternate water</b> <ul style="list-style-type: none"> <li>• Alternate water to reduce potable water usage</li> </ul> <b>3. Protect the environment and minimise the impact of our services on the environment</b> <ul style="list-style-type: none"> <li>• EPA discharge quality</li> <li>• CO<sub>2</sub> emissions tonnes</li> <li>• Minimise and offset greenhouse gas emissions</li> </ul> <b>4. Towards zero waste</b> <ul style="list-style-type: none"> <li>• Reuse biosolids</li> <li>• Recycle effluent</li> <li>• Reuse of maintenance and construction materials</li> <li>• Minimise energy use</li> <li>• Reduce our own waste</li> </ul>	<b>5. Services matched to customer needs. There are 45 standards measured for this key objective, covering:</b> <ul style="list-style-type: none"> <li>• Water supply</li> <li>• Sewerage management</li> <li>• Customer response and complaints</li> <li>• Drinking water quality</li> <li>• Alternate water quality</li> <li>• First contact resolution</li> <li>• Reduce avoidable contacts</li> </ul> <b>6. Efficient water users</b> <ul style="list-style-type: none"> <li>• Residential water usage</li> <li>• Residential resource efficiency programs</li> </ul> <b>7. Clean and efficient producers</b> <ul style="list-style-type: none"> <li>• Non residential water usage</li> <li>• Reduce critical contaminants</li> <li>• Energy efficiency</li> </ul>	<b>8. Right people, right jobs, right outcomes</b> <ul style="list-style-type: none"> <li>• No. people going through technical &amp; professional development programs</li> <li>• Technical Officer Development Program delivery</li> <li>• Staff turnover</li> <li>• Staff engagement survey</li> </ul> <b>9. Absolute safety</b> <ul style="list-style-type: none"> <li>• Zero lost time injuries</li> </ul>	<b>10. Community leader and advocate in water cycle management</b> <ul style="list-style-type: none"> <li>• Increased recognition of our participation in the community to support our business objectives</li> <li>• Increase water literacy esp. in NESCC</li> </ul> <b>11. Partnering for sustainable outcomes and a healthier urban habitat</b> <ul style="list-style-type: none"> <li>• Create alliances in every municipality for Greening the West</li> </ul>	<b>12. Financial strength to deliver sustainability</b> <ul style="list-style-type: none"> <li>• Revenue, Profit, ROE</li> <li>• Gearing, Interest, Debt</li> </ul> <b>13. Prudent and efficient</b> <ul style="list-style-type: none"> <li>• Delivery of Water Plan commitments</li> <li>• Efficient operating costs</li> <li>• Efficient use of capital</li> </ul> <b>14. Services enhance new business and growth in the community</b> <ul style="list-style-type: none"> <li>• Our services are available when our growing community needs them</li> </ul> <b>15. Demonstrate to our customers the value of the service we deliver</b> <ul style="list-style-type: none"> <li>• Market research feedback</li> <li>• Community feedback and recognition</li> </ul> <b>16. Maximise the triple bottom line return to shareholder</b>

Table 2: Our triple-bottom line Strategic Objectives and Measures

## 4.2 Policies

The ESP has been developed to balance our environmental programs with our social and economic objectives and contribute to our overall sustainability. It is consistent with our Strategic Objectives and Plan, Sustainability Policy and Environmental Policy.

## 4.3 Environmental Management System

Our Environmental Management System is ISO14001 certified and considers the risks associated with our operations. All of the activities associated with our business operations and their interactions with the environment are detailed in our environmental aspects and impacts register. These activities and impacts are risk ranked based on the likelihood and consequence of these events occurring. Impacts that are ranked high or significant are given priority for management through the development of actions and targets set out in this ESP. Our significant and high environmental risks are available on our website.

## 4.4 Our maintenance contractors

Our principal maintenance contractor, PFM, undertakes the maintenance of our water, alternate water and sewer networks. It has an ISO14001 accredited Environmental Management System which ensures that its operations are managed to minimise the impact of works on the environment.

## 4.5 Inputs into development of the ESP

Inputs into development of the ESP targets and actions are shown in Figure 3.



Figure 3: Development of ESP3 Targets and Actions

# 5.0 Consultation, implementation and reporting

We have built on a proud history of environmental advocacy which has seen various actions implemented across our operations since our inception. To ensure that the ESP continues to drive environmental improvement and is appropriate to the current operating environment, key stakeholders have been consulted in the development of this plan, including:

- our Community Liaison Committee
- the City West Water Board
- City West Water employees and management.

We will report progress of ESP implementation quarterly to the Community Liaison Committee and publish results annually in our Sustainability Report.

Further details of consultation and feedback on this ESP is included in Appendix A.

## 5.1 Community Liaison Committee

The Community Liaison Committee is made up of community members including residential and non residential customers and meets quarterly. The committee serves to help us understand community expectations, priorities and goals and facilitate greater public participation on issues that matter to the community. The committee contributes to the development of the ESP and monitors our performance against its targets and actions.

The Community Liaison Committee also believes that City West Water should seek to exercise influence through partnering with other organisations to contribute to the achievement of a Sustainable Water City. The committee has developed 10 principles that are designed to aid City West Water in its influencing role. The committee uses these principles as a basis for providing feedback to City West Water on future projects. These principles are published on City West Water’s website.

A subgroup of the Community Liaison Committee is the Altona Treatment Plant subcommittee, with members from City West Water, EPA Victoria, local government, business and community organisations within our licence area. This group considers issues relating to the operation of the treatment plant.

## 5.2 When will this plan be reviewed?

This ESP covers the period July 2011 to June 2013. In order to drive continual environmental improvement we must evaluate our performance and review targets and actions. This will be done in consultation with the Community Liaison Committee annually.

An outline of how we ensure our plans drive continual improvement is shown in Figure 4.

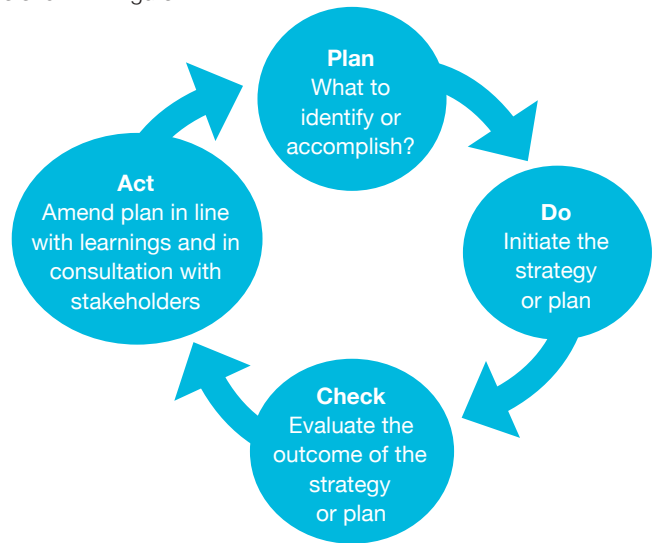


Figure 4: ESP3 Review Diagram

## 6.0 Objectives, targets and actions

The following sections outline City West Water's actions and targets aligned to strategic objectives, for the period July 2011 to June 2013:

- water efficiency
- driving resource efficiency
- alternate water supply
- driving environmental improvement in our existing operations
- climate change adaption and mitigation
- Greening the West.

Each section includes targets and actions aligned to City West Water's strategic objectives.

We will measure the outcomes and progress of the ESP annually and report on it within our annual Sustainability Report.

### 6.1 Water efficiency

Strategic Objective & Measures	Action	Target
<b>Efficient water users</b> <ul style="list-style-type: none"> <li>• Residential water usage</li> </ul>	<b>Residential water usage</b> Implement actions outlined in our Water Efficiency Plan which are based on the deliverables outlined in the Central Region Sustainable Water Strategy, Melbourne Water Supply Demand Strategy and Joint Water Efficiency Plan including: <ul style="list-style-type: none"> <li>• a sustainable garden program to educate customers on water efficient practices</li> <li>• an efficient washing machine exchange program to coincide with the state government rebate on front loading washing machines commencing 1 July 2011</li> <li>• continued delivery of the Toilet Replacement Program</li> <li>• continued delivery of the Showerhead Exchange program</li> </ul>	<b>Target 1</b> Bulk water use target: 296 litres/person/day
		<b>Target 2</b> Residential water use target: 174 litres/person/day
<b>Clean and efficient producers</b> <ul style="list-style-type: none"> <li>• Non residential water usage</li> </ul>	<b>Non residential water usage</b> Implement actions from the Business Resource Efficiency program based on the deliverables outlined in the Central Region Sustainable Water Strategy including: <ul style="list-style-type: none"> <li>• provision of resources to support customer water efficiency projects</li> <li>• continued work with customers to identify and implement cost effective water efficiency actions including specialised or innovative projects unique to customers' water use circumstances and support to broader scale water efficiency across business sectors which may include building amenity retrofits</li> <li>• continued partnerships to influence and lead business water efficiency</li> <li>• continued work with small and medium enterprises to coincide with State Government assistance and rebates commencing 1 July 2011</li> <li>• encouragement of customers to implement alternate water supply options where feasible</li> </ul>	<b>Target 3</b> 125 litres per capita per day non residential customers

Note to table: These targets reflect the JWEP commitments for 2011-12 to 2012-13

## Background

Water efficiency not only helps to maintain Melbourne's drinking water supply, it also contributes to significant environmental benefits including:

- saving energy and other resources such as treatment chemicals associated with the use and supply of drinking water
- contributing to sustainable environmental flows to enhance the health of waterways such as the Yarra and Thomson Rivers
- avoiding loss of biodiversity and other environmental degradation associated with the augmentation of water supplies including construction of new infrastructure and upgrade of desalination capacity.

Melbourne has been through a prolonged dry period which has dramatically reduced inflows into its water harvesting storages. Although increased rainfall has occurred in 2010 and 2011 it is predicted that there will be ongoing reductions in surface water supplies due to the effects of climate change.

We anticipate that in a sustainable Melbourne, water will be provided from a suite of sources to meet an 'efficient' demand requirement. It is in this context we are working to transition from a water conservation focus to customers valuing and practising sustained water efficiency. The transition means moving away from restrictions and compliance focused water conservation messages to programs and messages that focus on maintaining and improving household and business water efficiency for the long term.

## Achievements to date

City West Water has implemented a wide range of programs to reduce customer water usage. In 2010, we achieved the lowest consumption on record despite increased customer numbers in our service area. City West Water is proud of its water efficiency achievement which has seen a reduction in total water use of 48.7% (compared to the 1990s average).

Figure 5 highlights these savings for residential and non residential customers.

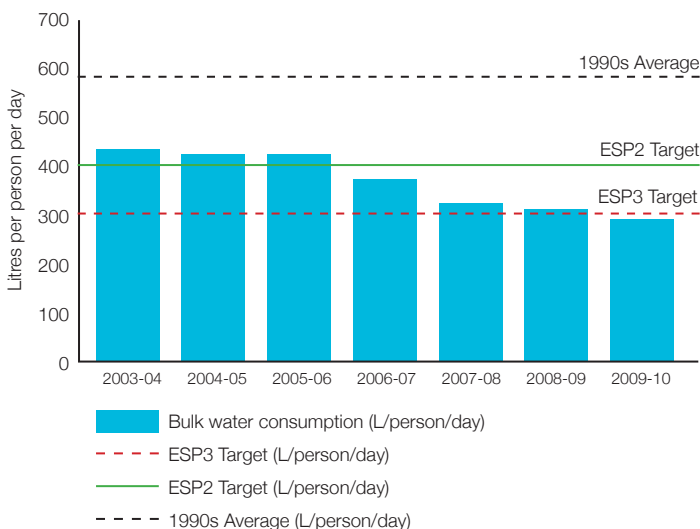


Figure 5: Water consumption by City West Water customers

## Residential water usage

Residential programs that have contributed to the above reductions in water usage include:

- exchanging a total of 98,911 shower heads (as at end March 2011)
- working with the highest residential water consumers to help them reduce their water consumption. Working on a pro-active basis, City West Water officers visit high water using homes to identify leaks and educate customers on ways to save water in the home
- community seminars on sustainable gardening practices
- residential water audits and retrofit of water fixtures for pensioners and concession card holders
- replacement of approximately 2000 toilets with water efficient systems as part of the Toilet Replacement Program.

## Non residential water usage

City West Water's Business Resource Efficiency program integrates its approach to business (non residential) customer water efficiency with energy and waste. Business water efficiency achievements are therefore discussed in the next section.

## 6.2 Driving a resource efficient future

Strategic Objective & Measures	Action	Target
<p><b>Clean and efficient producers</b></p> <ul style="list-style-type: none"> <li>• non residential water usage</li> <li>• reduce priority pollutants</li> <li>• energy efficiency</li> </ul>	<ul style="list-style-type: none"> <li>• support energy and resource efficiency as a direct benefit of delivering customers' non residential water efficiency projects</li> <li>• support energy efficiency of our customers through expanding the offerings of our Business Resource Efficiency program</li> <li>• work with customers to facilitate implementation of actions from the Steam Systems Efficiency Program</li> <li>• ensure customers discharging priority pollutants in trade waste develop a Resource Management Action Plan containing actions to improve waste efficiency as identified in Priority Pollutant Management Plans or trade waste agreements.</li> </ul>	<p><b>Target 4</b></p> <p>Develop and review Resource Management Action Plans (ResourceMAPs) with customers required to manage priority pollutants which also identify cost effective water and water related energy actions for implementation<sup>1</sup></p> <p><b>Target 5</b></p> <p>Complete delivery of stage two of steam systems efficiency assessment program by June 2011-12</p>
<p><b>Efficient water users</b></p> <ul style="list-style-type: none"> <li>• Residential resource efficiency program</li> </ul>	<ul style="list-style-type: none"> <li>• complete further testing of laundry detergents' salt levels with Choice magazine</li> </ul>	<p><b>Target 6</b></p> <p>Publish results of laundry detergents testing during life of this ESP</p>

Notes to table: <sup>1</sup>target (number of ResourceMAPs) to be set each year based on customers required to manage priority pollutants in trade waste agreements.

### Background

#### Business Resource Efficiency

We recognise that a considerable amount of energy is required to treat, supply, pump, transfer and heat water, and transfer, pump and treat sewage, and alternate water. The high reliance on coal as an energy source in Victoria also means there is a large water demand to produce electricity. This demonstrates the strong link between energy and water, and how efficiencies extracted from each resource can benefit the other.

The Business Resource Efficiency program brings together City West Water's business water efficiency and cleaner production resources into an integrated resource efficiency program. The program continues to help business customers to improve water and trade waste efficiency and now also helps customers to improve energy efficiency.

The Business Resource Efficiency program seeks resource efficiency improvement through productive relationships with business customers including:

- using Resource Management Action Plans — integrated water, water related energy and waste management action plan (formerly water Management Action Plans) — to help customers identify improvement actions
- working with customers that discharge priority pollutants to sewer to identify source reduction solutions in a similar manner to how we have led the industry implementation of the Salt Reduction Plan for Western Treatment Plant.

- working with over 500 business customers who use 10 megalitres or more of water per annum where the potential for efficiency improvements exist in a range of activities including boiler and steam systems efficiency, rainwater harvesting in fit for purpose uses and large scale amenity retrofits
- working with business customers using less than 10 megalitres of water per annum, especially in targeted programs including restaurants and retail food preparation businesses that use woks and dishwashers and retrofitting water efficient toilets and plumbing fixtures in small and medium enterprises
- providing access to expertise, fact sheets and case studies to help identify efficiency improvements in like businesses
- providing access to check meters to help measure and gauge improvement opportunities
- co-funding cost effective water, water related energy and waste efficiency projects
- maintaining and developing partnerships with key customers, industry associations and other stakeholders
- working with customers to identify and implement alternate water supply options where feasible.

Our Business Resource Efficiency program also includes research and development into opportunities to overcome barriers to: reduce priority pollutants at source and improve water efficiency and water related energy efficiency by customers.

We are working with relevant stakeholders on a strategy to expand the Business Resource Efficiency program to assist customers to implement energy efficiency in areas such as airconditioning and lighting which have indirect impacts on water use.

The benefits of this approach to Business Resource Efficiency include:

- ensuring the security of Melbourne's water supply through improved water efficiency and use of alternate water for fitforpurpose uses
- achieving City West Water's wider corporate sustainability goals by assisting business to improve its bottom line through improved environmental performance
- improving recycled water and effluent quality through a reduction in priority pollutants discharged to sewer
- reducing greenhouse gas emissions related to water and energy use by our customers.

## Achievements to date

Through our previous Water Conservation Solutions program (for commercial and institutional customers) and Cleaner Production Solutions program (for industrial customers) we have:

- helped customers reduce salt discharged to sewer in trade waste by 62 tonnes per day discharged to Western Treatment Plant
- raised awareness in business of water, waste and energy efficiency
- co-funded over 100 water efficiency projects with business which will save over 20 billion litres of water over their useful life
- completed two investigations with Choice magazine to identify and publish information on the lowest salt laundry detergents that can be used by residential customers to help reduce salt loads to Western Treatment Plant
- identified opportunities to improve the efficiency of customers' steam and hot water systems which have the potential to save over 120 million litres of water and 7000 tonnes of greenhouse gas emissions per year
- researched practical solutions to water and energy efficiency improvements for businesses in areas including cooling tower water and energy efficiency, irrigation efficiency and water and waste efficiency in the meat and livestock processing and chemical industries
- improved opportunities for students from local universities to link with business to further their studies and provide potential employment opportunities.

## Residential customer resource efficiency

In 2008, we partnered with the EPA through a third Sustainability Covenant to conduct a life cycle assessment of clothes washing options for our residential customers. The assessment considered water use, energy use and global warming potential, eutrophication potential of waterways, non renewable resource depletion (fossil fuels and minerals) and land use. The findings from the assessment are available on our website and will be used to inform the Washing Machine Replacement program for residential customers and ongoing education programs to help residential customers adopt more sustainable behaviours for washing clothes.

## 6.3 Alternate water supplies

Strategic Objective & Measures	Action	Target
<p><b>Balance the needs of our customers and the environment in managing the supply and demand for water</b></p> <ul style="list-style-type: none"> <li>Melbourne will be green and no water wasted</li> </ul> <p><b>Maximise sustainable use of alternate water</b></p> <ul style="list-style-type: none"> <li>Alternate water to reduce potable water usage</li> </ul> <p><b>Towards zero waste</b></p> <ul style="list-style-type: none"> <li>Reuse of effluent</li> </ul>	<p>Continue to implement projects under City West Water's Alternative Water Strategy including:</p> <ul style="list-style-type: none"> <li>Sunshine Golf Club sewer mining</li> <li>Altona Recycled Water Project</li> <li>Werribee Employment Precinct</li> <li>MacKillop College</li> <li>Western Treatment Plant standpipes</li> </ul> <p>Investigate and implement feasible new projects including:</p> <ul style="list-style-type: none"> <li>West Werribee Dual Supply Scheme</li> <li>aquifer storage and recovery for recycled water produced for West Werribee</li> <li>Altona Recycled Water Project Stage 2</li> <li>stormwater harvesting including Footscray Central Activity District, Footscray Park, J.T. Gray Reserve, Paisley Park, Laverton Recreation Reserve, Keilor Park Golf Course, Afton Street and Green Gully Reserve.</li> </ul>	<p><b>Target 7</b></p> <p>Supply fit for purpose total volume of alternate water to customers:</p> <ul style="list-style-type: none"> <li>2600 million litres (2011-12)</li> <li>3000 million litres (2012-13)</li> </ul>

### Background

City West Water is committed to maximising sustainable water reuse through provision of alternate water supplies to reduce the demand on drinking water supplies. Water recycling and utilisation of non-traditional water supplies is now an integral component of the water cycle. We aim to deliver the most sustainable water supply solution to all of our customers, and in doing so, contribute to the transition of Melbourne toward becoming a sustainable water city.

In addition to reducing demand on drinking water supplies, alternate water supplies can have the following benefits:

- improving water security, particularly in times of water restrictions
- reducing the amount of wastewater discharged to Port Phillip Bay in the case of water that is recycled from sewage treatment plants or mined from sewers
- reducing the impact of storm event in terms of peak flows and contaminants that enter Port Phillip Bay in the case of stormwater and rainwater reuse.

### Achievements to date

In 2009-10 we delivered 380 million litres of alternate water to the following projects:

- Sunshine Golf Club sewer mining
- Werribee Employment Precinct
- MacKillop College
- Standpipes at Western Treatment Plant.

We have also invested in large water recycling projects. The Altona Recycled Water Plant was completed in April 2011 which is able to deliver up to 9 million litres of Class A recycled water per day for use by Qenos and the Koorringal and Sanctuary Lakes golf courses as well as the local council. The Werribee Employment precinct has also been expanded to deliver an extra 300 million litres of recycled water per year and the West Werribee Dual Supply project is undergoing pre-construction works to provide recycled water to 20,000 homes. We are also investigating the potential of supplying recycled water (4.7 billion litres per year) to other Altona industrial customers as part of the Altona Recycled Water Project Stage 2.

We have continued to identify new opportunities for alternate water supplies by:

- working with councils, developers, and industrial, commercial and institutional customers to identify and implement a number of smaller alternate water supply projects
- providing a water mapping and support service for our customers to understand potential applications for alternate water
- working with developers to create water sensitive designs for new urban development
- working with councils to plan precincts using integrated water management guidelines.

## 6.4 Driving environmental improvements in our operations

Strategic Objective & Measures	Action	Target
<b>Protect the environment and minimise the impact of our services on the environment</b>	<b>Environmental Management System</b> Implement Environmental Management System to drive continuous improvement and manage environmental risks	<b>Target 8</b> Annual recertification of the Environmental Management System to ISO14001 accreditation
		<b>Target 9</b> All relevant environmental aspects identified in an Environmental Assessment for each project to have these aspects and controls included in the contractor Environmental Management Plan or contract documents
		<b>Target 10</b> All project sites that require Environmental Assessments are to implement controls which are specified in Contractor's Environmental Management Plans or contract documents
	<b>Sewerage system</b> Continue to implement City West Water's asset management plan including: <ul style="list-style-type: none"> <li>a risk based assessment model which considers environmental impact of sewerage assets</li> <li>waterway studies to assess potential sources of exfiltration to waterways</li> </ul>	<b>Target 11</b> Have zero spills due to fixed equipment failure
<b>Protect the environment and minimise the impact of our services on the environment</b> <ul style="list-style-type: none"> <li>EPA discharge quality</li> </ul>	<b>Sewage treatment</b> <ul style="list-style-type: none"> <li>manage and monitor Altona Treatment Plant operations in accordance with EPA requirements<sup>1</sup></li> <li>support a student project investigating alternative options for brine waste disposal and reuse</li> </ul>	<b>Target 12</b> 100% compliance with Altona Treatment Plant licence conditions <sup>1</sup>
		<b>Target 13</b> Three year student project to investigate alternative brine disposal options to commence 2011 (to be completed in 2014)
	<b>Recycled water management</b> Manage and monitor supply of recycled water to comply with EPA requirements and minimise environmental risk <sup>2</sup>	<b>Target 14</b> Supply of 100% of City West Water produced recycled water within water quality parameters specified in Environment Improvement Plans and Recycled Water Quality Management Plans <sup>3</sup>
<b>Towards zero waste</b> <ul style="list-style-type: none"> <li>Reuse of biosolids</li> </ul>	<b>Sewage treatment</b> Manage and monitor biosolids produced at Altona Treatment Plant in accordance with EPA requirements <sup>1</sup>	<b>Target 15</b> Beneficially use 100% of biosolids generated from Altona Treatment Plant

Notes to table: <sup>1</sup>Reflects a regulated requirement. <sup>2</sup>Is a regulated requirement for recycled water produced from sewage only. Is not a regulated requirement for recycled water produced from other source including rainwater, stormwater or groundwater.

## 6.4 Driving environmental improvements in our operations (continued)

Strategic Objective & Measures	Action	Target
<b>Clean and efficient producers</b>  <b>Reduce priority pollutants</b>	<b>Sewage quality management</b>  Manage sewage quality in accordance with City West Water's Integrated Sewage Quality Management System including development and implementation of: <ul style="list-style-type: none"> <li>• Priority Pollutant Management Plans to improve sewage quality in consultation with the other Melbourne water businesses</li> <li>• a plan for improved commercial customer trade waste focused on prevention of fat blockages and spills to the environment</li> </ul>	<b>Target 16</b>  Annual recertification of the Integrated Sewage Quality Management System to ISO22000 accreditation
		<b>Target 17</b>  Priority Pollutant Management Plan actions implemented in accordance with agreed timeframes <sup>3</sup>
		<b>Target 18</b>  Commercial customer trade waste improvement plan in place by 30 June 2012
<b>Towards zero waste</b> <ul style="list-style-type: none"> <li>• Reuse of maintenance and construction materials</li> <li>• Reduce our own waste</li> </ul>	<b>Solid Waste</b>  Develop and implement City West Water's Waste and Resource Recovery Plan including: <ul style="list-style-type: none"> <li>• annual waste audits</li> <li>• implementation of feasible avoidance and reduction actions</li> <li>• review of procurement processes</li> </ul>	<b>Target 19</b>  Reduce total waste from office per FTE by 10% (all currently measurable streams including recycled). Baseline 2008-09
		<b>Target 20</b> <ul style="list-style-type: none"> <li>• 50% diversion of office waste from landfill in 2011-12</li> <li>• 60% diversion of office waste from landfill by 2011-13</li> </ul>

Notes to table: <sup>3</sup>Target (actions for priority pollutants and timelines) to be set each year based on outcome of agreed Priority Pollutant Management Plans in consultation with retail water businesses and Melbourne Water

### Background

Our Environmental Management System has been externally accredited to ISO14001 since 1997. It is a system that is integral to our operations. It manages environmental risks from all of our business operations including construction works, maintenance and operations risks and office building. In order to maintain its effectiveness, our Aspects and Impacts Register and relevant legal requirements are frequently reviewed, updated and opportunities for improvement are identified through internal compliance audits. These opportunities present a chance to improve business processes to reduce environmental risks. Our significant and high environmental risks are published on our website.

#### Assessing and controlling environmental impacts from new projects

Environmental assessments continue to be conducted on relevant construction projects. These assess environmental impacts of works, and identify control measures to minimise the impact of these works on the environment. In 2010 the process for assessing environmental aspects was reviewed which introduced an options

analysis phase prior to designing a project. This enables the project manager to factor in environmental considerations at the options analysis phase of a project.

Environmental aspects that are identified in an Environmental Assessment are communicated to contractors for appropriate risk mitigation measures as part of an Environmental Management Plan or the terms of the contract.

The process for auditing the environmental requirements identified in Environmental Assessments was improved in 2010 through the appointment of a dedicated environmental and cultural heritage specialist in the Project Delivery Group.

#### Altona Treatment Plant

The Altona Treatment Plant is licensed by the EPA Victoria to discharge treated wastewater to the environment. The licence sets specific conditions which are monitored and reported to EPA Victoria. We also recycle 100% of biosolids produced at the plant for beneficial reuse.

In 2011, we completed construction of a salt reduction plant to produce high quality fit for purpose recycled water to supply

industrial and commercial customers locally. This resulted in an increase in the concentration of salt and nutrients in the wastewater discharged to Port Phillip Bay due to the discharge of brine from the salt reduction plant. Prior to construction of the salt reduction plant, City West Water undertook a detailed environmental risk assessment for discharge, including impacts to the bay. The assessment indicated that the plant upgrade would not result in unacceptable impacts on the bay and formed part of our Works Approval application accepted by EPA Victoria. The final design includes a diffuser on the outfall to the Bay which assists in mixing and dispersion of the effluent.

In October 2010 we developed a revised monitoring plan for the Altona Treatment Plant consistent with new EPA guidelines. The scope of this plan includes monitoring of:

- influent raw sewage
- treated effluent discharged to the Port Phillip Bay
- digested sludge
- soil
- groundwater
- the marine environment
- additional monitoring requirements post commissioning of the salt reduction plant.

We will continue to monitor our activities at the Altona Treatment Plant in accordance with the monitoring plan developed under our EPA discharge licence. A summary of the results is submitted to EPA annually as part of our Annual Performance Statement. We also remain committed to investigating alternatives to disposal of the brine stream from Altona Treatment Plant.

### City West Water key environmental service standards

In addition to setting the targets in our ESP, we continually measure how well we are delivering our services using our key service standards which have been approved by the Essential Services Commission. The following service standards relate to environmental impacts and are outlined in our Customer Service Code. We report on these standards regularly to the Essential Services Commission, City West Water management and Board and in our annual report:

- number of sewer blockages per 100km of sewer main
- average time (minutes) to attend sewer spills and blockages
- average time to rectify a sewer blockages
- percentage of sewer spills contained within five hours of the reported spill
- percentage of unaccounted for water.

The Essential Services Commission annually reports these publicly for all Melbourne water retailers.

### Water and sewerage system performance

We manage our water and sewerage system to meet our required service standards and ESP targets. Asset planning and maintenance programs for water main performance are aimed at prevention of water leakages and bursts, while sewerage system performance programs are aimed at preventing, managing and containing sewer spills and blockages. These programs include:

- asset planning to identify and manage water and sewerage system performance including ability to attain environmental standards, such as containing sewerage flows associated with a one in five year rainfall event
- preventative maintenance programs such as leak detection for water mains to minimise the water lost through water main failures and the damage to the environment that may occur when these assets fail
- asset management plans to manage risk of asset failure and asset performance to meet required standards including condition monitoring, preventative maintenance of renewals based on risk
- efficient renewals programs which identify potential renewals in roadways that are also planned for reconstruction by the local council or other works authorities. This allows the renewal to be undertaken with less disruption to land and the community.

### Managing sewage leaks and spills

In 2008, City West Water initiated a risk based approach for the identification and management of leaking sewerage assets in the vicinity of waterways. The assessed risk is based on the likelihood of leaking sewers entering the waterway combined with the consequence to the beneficial uses of the receiving water.

All waterways within City West Water's licence area that are located in the vicinity of sewerage assets will be tested over a four year period and the waterway risk rating will determine the retesting frequency of them. The information gathered each year will determine the need for any investigation, maintenance or rehabilitation works.

Our sewer spill contingency plan is aimed at minimising harmful environmental effects of a sewer spill. It documents roles and responsibilities for spill response, clean up, monitoring and stakeholder communication.

### Sewage quality management

Our Integrated Sewage Quality Management System focuses on managing risks to sewer assets, treatment plants, sewer workers and facilitating water and biosolids recycling. An important part of this is monitoring and managing trade waste customer compliance with trade waste agreements and educating customers on ways to improve trade waste management.

We are also working with the other Melbourne water businesses to identify and manage priority pollutants in sewage through development and implementation of Priority Pollutant Management Plans. These plans are developed in consultation with customers, Essential Services Commission and other stakeholders such as the EPA.

### **City West Water's water consumption and waste**

Our head office activities produced 51 tonnes of solid waste (2009-10). Twenty four tonnes was diverted from landfill for recycling. Water consumption at head office was 1.7 million litres per year which equates to approximately 15 litres/employee day. We believe it is important for all our staff to be able to contribute to environmental improvement of our business no matter what their role within the business. Our staff members are engaged in water saving initiatives and waste reduction and recycling.

We also recognise that purchasing and procurement decisions can significantly impact on waste and resource consumption and seek to make decisions in accordance with the waste hierarchy.

In 2014, we plan to move into a new energy and water efficient building which will further improve our waste, energy and water practices. We are actively involved in the design phase of this project and influencing sustainability outcomes. During this ESP we will focus on behavioural change programs and actions to assist with the transitional period during the move to the new building.

### **Achievements**

- review and implementation of our EPA monitoring program at Altona Treatment Plant and of the receiving environment (Port Phillip Bay) to reflect the operations of the recycled water plant
- completed an investigation on the feasibility of reusing brine from the Altona Treatment Plant at the Cheetham wetlands
- certification of our Integrated Sewage Quality Management System to the ISO22000 accreditation standard in February 2009 and ongoing maintenance of certification since then
- reduction in unaccounted-for water from 8.4% (78.5 billion litres) in 2007-08 to 7.4% (67.2 billion litres) in 2009-10 representing water savings of approximately 11.4 billion litres
- surveyed approximately 5795 kilometres of City West Water's water supply system for leakages each year since 2004 with approximately 1775 million litres per year of water saved
- 100% recycling of biosolids from Altona Treatment Plant for the ESP2 reporting period
- 100% compliance with the EPA licence for Altona Treatment Plant for the ESP2 reporting period
- implementation of improved solid waste management at head office to reuse and recycle more than 47% of our waste in 2009-10
- implementation of a Water Management Action Plan during ESP2 for our office building including alternate water supplies for the new office extension, vehicle washing and gardens and a cooling tower replacement program
- working with our catering contractor, Alliance, and staff to reduce disposable packaging from our onsite canteen completed April 2011
- working with our cleaning contractors to implement green cleaning products and sustainable practices

## 6.5 Climate change mitigation

Strategic Objective & Measures	Action	Target
<b>Protect the environment and minimise the impact of our services on the environment</b> <ul style="list-style-type: none"> <li>CO<sub>2</sub> emissions tonnes</li> <li>Minimise and offset greenhouse gas emissions</li> </ul>	<b>Greenhouse gas management</b> <ul style="list-style-type: none"> <li>develop a climate change adaptation and mitigation strategy</li> <li>maintenance and improvement of our greenhouse gas inventory for our operations</li> </ul>	<b>Target 21</b> Net zero greenhouse gas emissions from our operations (this will be reviewed upon implementation of a carbon price)
		<b>Target 22</b> Complete climate change adaption and mitigation strategy plan by 30 June 2012
		<b>Target 23</b> Voluntarily report in accordance with National Greenhouse and Energy Reporting System by July 2012 if feasible
<b>Towards zero waste</b> <ul style="list-style-type: none"> <li>Minimise energy use</li> </ul>	<ul style="list-style-type: none"> <li>investigate further efficiency improvements from operations including pumping efficiency and further fleet efficiency</li> <li>investigate renewable energy opportunities e.g. from biosolids and organic waste, review solar and hydro opportunities</li> <li>implement feasible actions from the efficiency and renewable energy studies</li> </ul>	<b>Target 24</b> Annual report on implementation of actions from efficiency and renewable energy studies.

### Background

Changes in the climate are forecast to result in more extreme weather events including severe rainfall and drought. The combined effect of increased storm events and sea level rise will place infrastructure at risk. We believe this is one of the biggest environmental challenges facing the local, national and international community. We are committed to working with a range of stakeholders to reduce greenhouse gas emissions, adapt to and minimise the impacts of climate change on our infrastructure.

The implementation of a carbon price in Australia is very likely within the period of this ESP. The potential impact of a carbon price will almost certainly lead to an increase in the price of electricity, construction and operation of our existing infrastructure. It is important to understand that this may have varied socio-economic and environmental impacts. Business cases and financial analysis will take into consideration the market price of carbon and our commitment to net zero greenhouse gas emissions will also be reviewed at this time in terms of customer impacts and benefits.

### Greenhouse gas emissions

In 2009-10, the breakdown of total greenhouse gas emissions from our operations is shown in Figure 6.

In terms of greenhouse gas emissions from our operations, City West Water contributed to approximately 11,921 tonnes of carbon dioxide equivalent (tCO<sub>2</sub>-e, the universal measure of greenhouse gas emissions) in the 2009-10 reporting period.

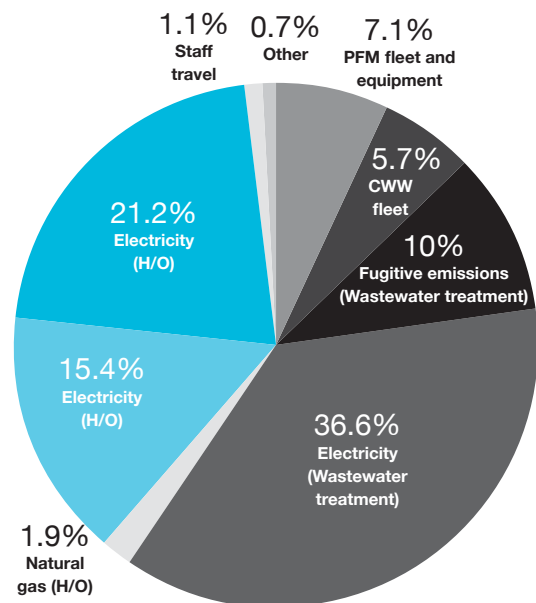


Figure 6: Breakdown of Greenhouse Gas Emissions for City West Water Operations

Note: The chart above describes consumption of energy associated with each activity, displayed in tonnes CO<sub>2</sub>-e. It includes all the scopes 1, 2 and 3 emissions as reported in the inventory. It does not take into account offsets

## Greenhouse gas management

There has been an increase in our gross emissions from our operations compared to the previous years and this is forecast to increase in the coming years with the increase in the production of alternate water and significant population growth in our service area. It will be a major challenge to minimise our reliance on offsets to maintain net zero greenhouse gas emissions, and we will need to closely follow the EPA's carbon management principles. Our methodology for managing our inventory and scope for net zero emissions is detailed in Appendix A.

By adopting the carbon management principles, we have achieved net zero emissions from our operations by improving energy efficiencies, continuing to purchase 10% Green Power for all its sites and offsetting the balance emissions. The balance of emissions and a breakdown of offsets (indicated as a negative figure for graphical purposes only) is shown in Figure 7. The detailed balance sheet is available in Appendix B.

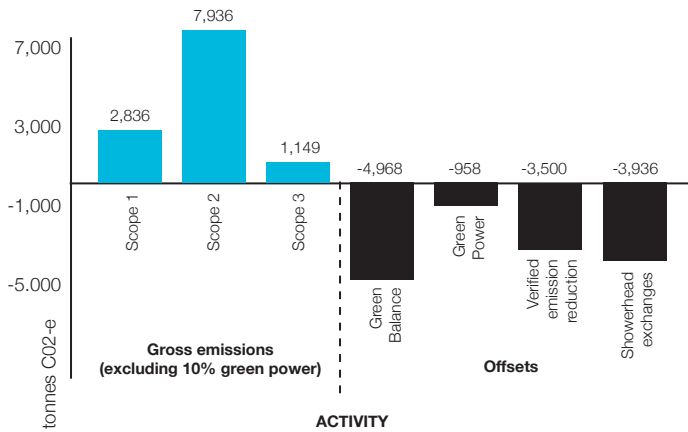


Figure 7: 2009-10 City West Water's Greenhouse Gas Balance

Figure 8 shows the increase in amount of purchase of external offsets in 2009-10 and a further projected increase in the 2011-12. Reasons for this increase are:

- showerhead exchanges are diminishing because customers have already exchanged showerheads or are purchasing/exchanging showerheads externally (not from City West Water)
- Green Balance (offsets purchased from our energy provider) ceased to exist with the introduction of the Federal Government's National Carbon Offset Standard on 1 July 2010
- increase in emissions with service area growth and increases in the treatment and supply of alternate water.

We will continue to abate greenhouse gas emissions through the purchase of externally accredited offsets using the most recent guidance published by EPA and the National Carbon Offset Standard.

## Achievements

- phased upgrade of the aerators in the aerobic digester at Altona Treatment Plant to improve energy efficiency
- installation of energy recovery devices at the Altona Recycled Water Plant to reduce energy usage in the removal of salt for the recycled water customers
- achieved net zero greenhouse gas emissions from our operations since 2006-07
- ongoing improvement to accuracy of greenhouse gas inventory and accounting methodology
- improved fleet efficiency of City West Water owned vehicles by 15%
- completed feasibility studies for mini hydro, solar and wind power, tree planting at our office in Sunshine and a roof garden
- implementation of key findings from an energy audit at Sunshine head office including the decommissioning of the cooling towers, progressive change over of fluorescent light fittings to T5 triphosphor lamps and energy efficient hand dryers improving the energy efficiency of our building by 20%.

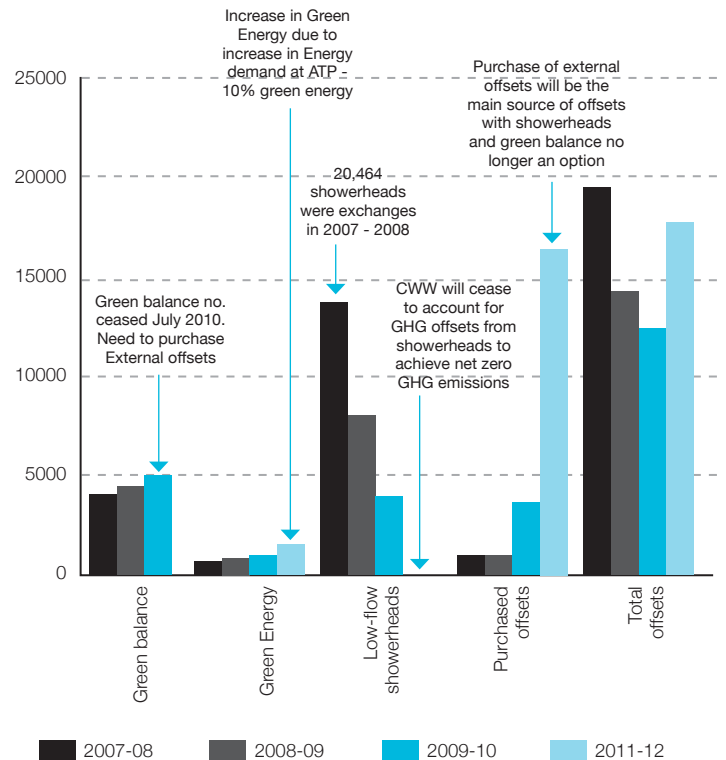


Figure 8: Offsets/Green Power and future projects for our operations

## 6.6 Greening the West

Strategic Objective & Measures	Action	Target
<p><b>Partnering for sustainable outcomes</b></p> <ul style="list-style-type: none"> <li>• Create alliances in every municipality for Greening the West</li> </ul>	<p>Provide a secure supply of fit for purpose water in the western suburbs of Melbourne in accordance with the Greening the West Strategic Plan to enable the planting and maintenance of suitable trees and vegetation that will deliver:</p> <ul style="list-style-type: none"> <li>• an improvement in suburb microclimate, i.e. reduced urban heat island effect, by reducing the area of paved surfaces exposed to sunlight through increased canopy cover</li> <li>• a reduction in airborne particulate matter and contaminants</li> <li>• an increase in the number and size of passive recreation sites to enhance the health of residents and reduce stress on the health system.</li> </ul>	<p><b>Target 25</b></p> <p>Development of a Greening the West Strategic Plan including criteria to assess the success of the initiative by 30 June 2012</p>
		<p><b>Target 26</b></p> <p>Facilitate the development of a Greening the West steering committee and reference group to guide the project development and delivery by June 2013</p>
		<p><b>Target 27</b></p> <p>Develop pilot sites and identify and supply water from alternate sources as required for newly planted trees within the life of this ESP delivery through the life of the ESP3</p>

### Background

In the face of growing population and impacts of climate change, many cities in the developed world are considering how they can be more sustainable in the future. This quest is resulting in the concept of integrated planning across a number of major planning elements including transport, education, health, water and the environment.

City West Water has reviewed our strategic direction and it is clear that we can help the community and the environment by partnering to deliver low cost liveability improvements using fit for purpose water supplies in our service area. Although the planning for liveable communities is dependant on many stakeholders, the water enabled component can be provided by us.

We recognise that the urban habitat is an extended customer base that includes flora, fauna, communities and waterways, each requiring a water supply for existence. The needs of the urban habitat will be varied, but recent discussions with Department of Health, EPA Victoria and Melbourne City Council have confirmed that increased vegetation, particularly tree canopy cover, would deliver health benefits including increased liveability to many communities.

We would like to work collaboratively to develop a healthy urban habitat to enable the planting and maintenance of suitable trees and vegetation in the right areas, that will deliver:

- an improvement in suburb microclimate, i.e. urban heat island effect
- a reduction in airborne particulate matter and contaminants
- an increase in the number and size of passive recreation areas to promote better health of residents
- increased habitat corridors in new and established areas to promote wildlife diversity
- an increase in the amenity value of new and established suburb streetscapes.

### Achievements

As a starting point, to deliver on the Greening the West Strategic Plan, we have brought together key external stakeholders currently involved in vegetation and tree planting strategies at a 'Think Tank' workshop to:

- identify target areas for vegetation and tree planting
- identify innovative ways to supply water to trees and vegetation
- link secure and reliable supply of fit for purpose water to target areas
- agree on stakeholder roles and responsibilities
- understand the cost benefit analysis of target sites.

We have collated the findings from the 'Think Tank' that will assist a Steering Committee and Reference Group to oversee its development.

## 7.0 Website resources

### City West Water

#### [Sustainability Policy](#)

[citywestwater.com.au/documents/Sustainability\\_Policy.pdf](http://citywestwater.com.au/documents/Sustainability_Policy.pdf)

#### [Environmental Policy](#)

[citywestwater.com.au/documents/Environmental\\_Policy\\_for\\_web.pdf](http://citywestwater.com.au/documents/Environmental_Policy_for_web.pdf)

### The City West Water Community Liaison Committee

[citywestwater.com.au/our\\_company/community\\_liaison\\_committee.aspx](http://citywestwater.com.au/our_company/community_liaison_committee.aspx)

#### [Community Liaison Committee's Sustainable Water City Principles](#)

[citywestwater.com.au/our\\_company/community\\_liaison\\_committee\\_a\\_sustainable\\_water\\_city.aspx](http://citywestwater.com.au/our_company/community_liaison_committee_a_sustainable_water_city.aspx)

### Essential Services Commission

[esc.vic.gov.au/public/Water/](http://esc.vic.gov.au/public/Water/)

## 8.0 Appendix A

### Consultation and feedback on the ESP

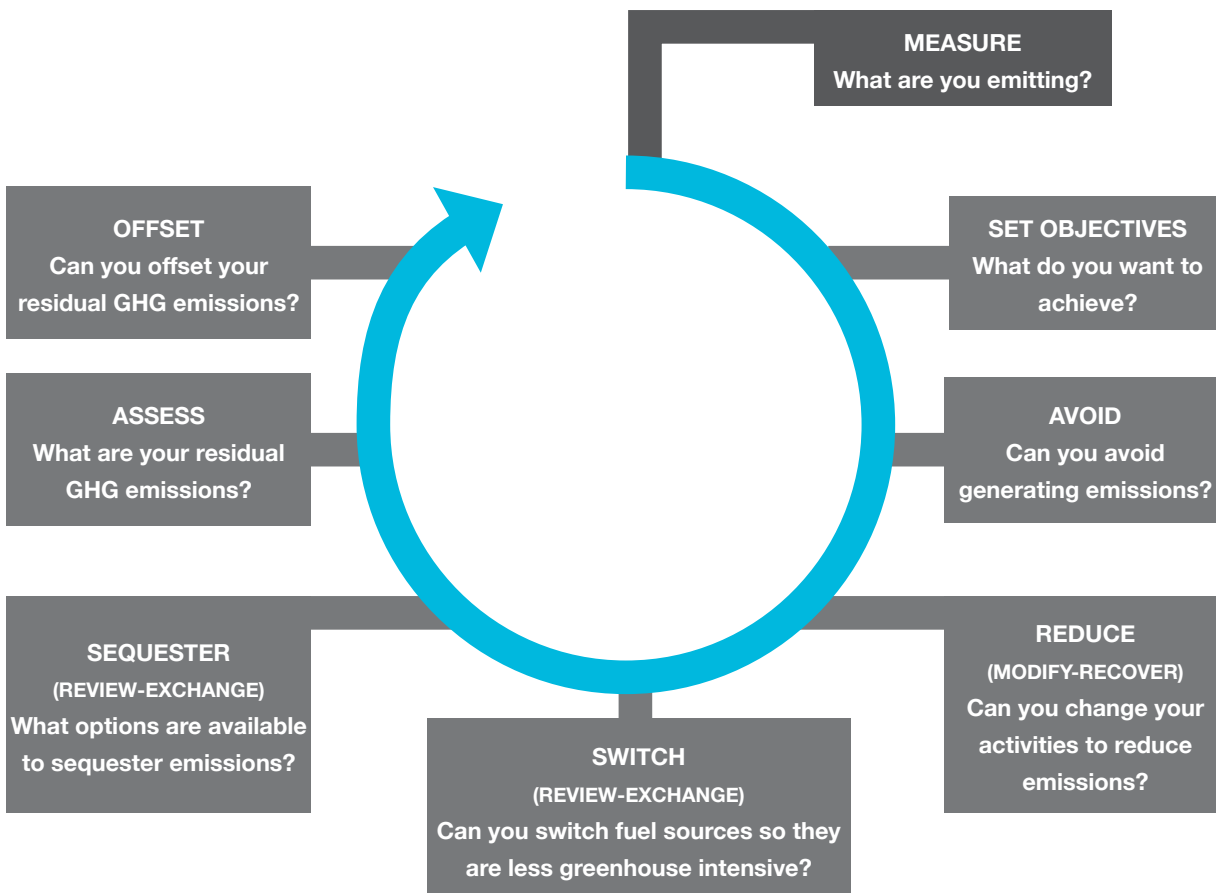
The City West Water Community Liaison Committee (CLC) was involved in the review and development of this ESP. Feedback and input from the CLC was important in shaping the final plan. Some specific feedback on the water efficiency targets is summarised below.

ESP section	CLC feedback
<b>Water efficiency – residential</b>	The CLC has provided feedback to City West Water about the usefulness of the Target 155 program and the desire to see this program continue.
<b>Water efficiency – non residential</b>	The CLC provided feedback regarding the establishment of individual water efficiency targets for large water using non residential customers.  Water efficiency programs are identified in Resource Management Action Plans (ResourceMAPs) for individual customers in consultation with City West Water. City West Water then works with these customers to implement feasible water efficiency actions. Progress towards development and implementation of Resource MAPs will be reported to the CLC and annually in the Sustainability Report.

## 9.0 Appendix B

### Methodology for greenhouse gas emissions/inventory

To achieve net zero greenhouse gas emissions we will manage our greenhouse gas emissions in line with EPA’s carbon management principles shown below.



## Carbon management principles

### Method for the quantification of greenhouse gas emissions

The City West Water inventory will include sources of the six gases covered by the Kyoto Protocol: carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), hydro fluorocarbons (HFCs), perfluorocarbons (PFCs), and sulphur hexafluoride (SF<sub>6</sub>)

Using the internationally recognised Greenhouse Gas Protocol, we have defined our emissions as scope 1 (direct emissions), scope 2 (indirect emissions resulting from electricity generation) and scope 3 (other indirect emissions). We will then collect activity data on each of the activities as we have defined under the scopes. This has been broken down as:

#### Scope 1

- City West Water vehicle fleet
- Programmed FM vehicle fleet (maintenance contractor)
- refrigeration units including air conditioning units
- natural gas use on City West Water head office site
- any emissions resulting from wastewater treatment and sludge production.

#### Scope 2

- electricity use at Sunshine head office
- electricity use at Altona Treatment Plant and Sunshine Golf Club
- electricity use at all of our water, sewer and recycled water pump stations.

#### Scope 3

- fuel extraction factors for vehicles — all types (LPG, diesel, unleaded)
- fuel extraction factors for machinery — all types
- transmission losses due to supply of electricity to all City West Water infrastructure
- paper use in office building (excluding letters, envelopes and bills)
- business travel, including flights, public transport (train only) and taxis
- quantifying emissions associated with the transport of scrap showerheads from the showerhead exchange program to recycling facility and its recycling
- waste to landfill from Sunshine head office.

We will then apply emission factors from the most recent *National Greenhouse Accounts (NGA) Factors*, Department of Climate Change and Energy Efficiency. Where the appropriate factor has not been published in the NGA factors, we will seek to use another appropriate Australian factor, from the Department of Climate Change, where available.

### Offsetting unavoidable greenhouse gas emissions

Where we have greenhouse gas emissions that cannot be avoided we will offset the residual emissions through a combination of:

- purchase of certified Green Power
- purchase of externally verified offsets, such as those approved under the National Carbon Offset Standard (NCOS).

#### Green Power

Green Power is electricity sourced from renewable sources, typically wind, solar, biomass or hydro. A national accreditation scheme has been developed for compliant schemes. Compliant schemes are required to purchase electricity from accredited renewable energy sources. We currently purchase 10% certified green power through AGL.

#### Verified offsets

There are many offsetting schemes and providers currently operating in the marketplace and there has been much discussion about the quantity and validity of some offsets.

City West Water will ensure that any additional offsets that we purchase have been verified under credible schemes and international programs such as the Clean Development Mechanism (made under the Kyoto Protocol). Prior to its ceasing in July 2010, City West Water purchased certified offsets through the Green House Friendly scheme.

The Australian Government introduced the National Carbon Offset Standard (NCOS) on 1 July 2010 to provide national consistency and consumer confidence in the voluntary carbon market. The standard serves two primary functions – it provides guidance on what is a genuine voluntary offset and sets minimum requirements for calculating, auditing and offsetting the carbon footprint of an organisation or product to achieve carbon neutrality.

City West Water will use the guidance of this standard to voluntarily offset its emissions.

This standard defines eligible offset units which include international units issued under the Kyoto Protocol and the voluntary market standards, the Gold Standard and Verified Carbon Standard (VCS).

The NCOS guidelines and EPA's guidance provided at [carbonoffsetguide.com.au](http://carbonoffsetguide.com.au) will be used by City West Water to ensure credibility of purchased offsets.

## City West Water 2009-10 Green house gas inventory balance sheet

Description	Activity	Units	Total emissions (tCO <sub>2</sub> -e)
<b>Scope 1</b>			
City West Water fleet unleaded	187,505	L	429.14
City West Water fleet LPG	64,693	L	102.04
City West Water fleet diesel	38,443	L	103.59
PFM fleet unleaded	29,007	L	66.39
PFM fleet LPG	188,881	L	297.91
PFM fleet diesel	133,470	L	359.66
PFM equipment unleaded	1,800	L	4.12
PFM equipment diesel	4,072	L	10.91
Refrigeration (kitchens - domestic)	1.38	kg	2.78
Refrigerants (commercial & building airconditioning)	43.71	kg	20.28
Refrigeration (vehicles)	14.31	kg	18.60
Refrigeration (mobile sampling units)	0.12	kg	0.15
City West Water natural gas	4,100	GJ	211.57
SGC Wastewater treatment	Nitrous oxide	tCO <sub>2</sub> -e	241
ATP Wastewater treatment	Nitrous oxide	tCO <sub>2</sub> -e	967
<b>Total Scope 1 emissions</b>		<b>tCO<sub>2</sub>-e</b>	<b>2835.91</b>

<b>Scope 2</b>			
Electricity usage (head office)	1,372,694	kWh	1674.69
Electricity usage (ATP)	3,148,961	kWh	3841.73
Electricity usage (SGC)	111,046	kWh	135.48
Electricity usage (pump stations)	1,889,263	kWh	2284.40
<b>Total Scope 2 emissions</b>	<b>6,521,964</b>	<b>kWh</b>	<b>7936.29</b>

Description	Activity	Units	Total emissions (tCO <sub>2</sub> -e)
<b>Scope 3</b>			
Head Office — fuel extraction natural gas	4,100	GJ	18.45
City West Water fleet — fuel extraction for LPG	64,693	L	8.47
City West Water fleet — fuel extraction diesel	38,443	L	7.86
City West Water fleet — fuel extraction unleaded	187,505	L	33.99
PFM fleet — fuel extraction LPG	188,881	L	24.74
PFM fleet — fuel extraction diesel	133,470	L	5.26
PFM fleet — fuel extraction unleaded	29,007	L	71.64
PFM equipment — fuel extraction diesel	4,072	L	0.83
PFM equipment — fuel extraction unleaded	1,800	L	0.36
Head office electricity — fuel extraction and transmission line losses	1,372,694	kWh	164.72
ATP electricity — fuel extraction & transmission line losses	3,148,961	kWh	377.88
SGC electricity — fuel extraction & transmission line losses	111,046	kWh	13.33
Fuel extractions & transmission line losses (pump stations)	1,889,263	kWh	241.44
Staff air travel	432,852	km	132.57
Staff public transport	60	km	0.01
Staff taxi journeys	5,701	\$	0.08
Municipal waste	26,821	kg	29.50
Showerhead scrap recycling	372	kg	0.17
Office paper consumption	9,201	kg	17.53
<b>Total Scope 3 emissions</b>			<b>1148.85</b>
<b>Total GHG emissions</b>			<b>11,921.05</b>
Greenbalance	3,679,797	kWh	4967.73
Three star showerheads	7,401	no. of households exchanged	3935.72
Verified emission reduction (Carbon Reduction Institute)	3,500	tCO <sub>2</sub> -e	3500
<b>Total offsets</b>			<b>12,403.45</b>
<b>Emissions avoided through purchase of Green Power (included in total greenhouse gas emissions figure)</b>	<b>709,460</b>	<b>kWh</b>	<b>-957.77</b>
<b>GHG Net result 2009-10</b>		<b>tCO<sub>2</sub>-e</b>	<b>-482.40</b>



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