



WATER DEMAND MANAGEMENT STRATEGY

2009 – 2012



TABLE OF CONTENTS

EXECUTIVE SUMMARY	3
1. INTRODUCTION	4
2. MANAGING THE DEMAND FOR WATER	5
2.1 Demand Reduction and Supply System Management	6
2.2 Water Supply and Future Demand	6
2.3 New Water Supplies	9
2.4 Sector analysis – Who uses water.....	10
2.5 Targets	10
3. CAIRNS WATER DEMAND MANAGEMENT STRATEGY 2006-2009 .	11
3.1 Demand Reduction Actions	11
3.1.1 Media.....	11
3.1.2 Schools and Community Education.....	12
3.1.3 Council Water Conservation.....	13
3.1.4 Permanent Water Conservation Measures.....	13
3.1.5 Water Conservation Incentives for Commercial Customers	14
3.1.6 Market Research	15
3.2 System Management Actions	17
3.2.1 Non Revenue Water	17
3.2.2 Demand Management Zones, Leak Detection, Pressure Management	18
3.2.3 Optimisation of raw water supply and treatment plant operations	21
3.2.4 Meter Installation	21
3.2.5 Recycled Water	21
3.3 Human Resources	22
4. EXTERNAL INFLUENCES	22
4.1 <i>Water Supply (Safety and Reliability) Act 2008</i>	23
4.2 Climate Change	24
5. IMPACT OF DEMAND MANAGEMENT	25
6. DEMAND MANAGEMENT ACTIONS 2009 - 2012	26
6.1 Water Demand Reduction Behaviour Change Initiatives	26
6.1.1 Public Education and Communication	26
6.2 Commercial and Industrial Sector.....	27
6.3 Recycled Water	28
7. SYSTEM MANAGEMENT INITIATIVES	28
7.1 Installation of district meters, pressure management and leak detection.....	28
7.2 Other Non Revenue Water - Apparent Losses	29
8. FUNDING AND RESOURCES	30
8.1 Organisational structure and management.....	30
8.2 Budget	31
8.3 References	34

EXECUTIVE SUMMARY

The population and the economy of the Cairns Regional Council (CRC) continue to grow rapidly placing increased demands on water supplies. Existing water supplies for Cairns City may not be able to meet the demand for water in the next 3-4 years and run of river water supplies for the major urban centres of Port Douglas and Mossman may be near or at their limit.

Reducing the demand for water can delay the need to find new water supplies and could result in downsizing water supply infrastructure requirements.

The Water Demand Management Strategy 2009 -2012 (the Strategy) builds on the previous actions undertaken under the Demand Management Strategy 2006 – 2009 and complements existing regional plans i.e. *Far North Queensland Draft Regional Water Supply Strategy*, Department of Natural Resources and Water 2007 and the *Far North Queensland Regional Plan 2009 – 2031*, Department of Infrastructure and Planning 2009.

The former Cairns City Council adopted a target of 10% per capita reduction from a 2005 baseline of 500 litres per person i.e. 450 litres per person per day (total water consumption by all sectors). Since the start of the demand management measures in 2006 gross per capita water consumption has dropped by approximately 15% from 528 litres in 2006 to 447 litres in 2008. The ongoing aim is to ensure that the total daily per capita consumption for all sectors in Cairns stays at or below 450 litres.

Water consumption in the former Douglas Shire area is considerably higher than Cairns City and separate targets have been set which are consistent with the Draft Division 10 Water Supply Planning Report, May 2009. Demand management measures detailed in the Strategy apply throughout the CRC area.

The aims of the Strategy are:

- To build on the current demand management activities;
- To achieve significant and sustained water savings by customers;
- To continue to build a water conservation culture in the community;
- To minimise losses and non revenue water in our distribution network;
- To improve water accounting via metering, data management and reporting; and
- To ensure CRC is leading by example in water conservation.

The CRC Water Demand Management Strategy details the key activities that Cairns Regional Council Water and Waste (CRCWW) intends to undertake over the next 3 years to assist in reducing water demand and improving water use efficiency across the region.

The following list outlines the key demand management actions outlined in the Strategy and the corresponding objective to be achieved.

1. **Public Education and Communication** - engage with the community to improve understanding of water supply and demand issues and reduce water consumption.
2. **Commercial and Industrial Sector** - encourage the commercial sector to engage in water conservation initiatives.
3. **Recycled Water** – identify and implement feasible recycled water opportunities across the region.
4. **Installation of district meters, pressure management and leak detection** - complete demand management zones via proofing of zones in relation to data monitoring, leak detection and repair and pressure management
5. **Other Non Revenue Water - Apparent Losses** - ensure the level of water losses across the Cairns Region is <250 litres/connection/day as per Customer Service Standards

1. INTRODUCTION

The Draft Far North Queensland Regional Water Supply Strategy 2007 has clearly identified that the major challenges for water supply and management in Far North Queensland relate to population growth, strong economic development and sustainable resource use.

As the CRC area continues to grow so too does the demand on our existing water supplies.

Existing water supplies for Cairns City may not be able to meet the demand for water in the next 3-4 years and run of river water supplies for the major urban centres of Port Douglas and Mossman may be near or at their limit.

The region experiences wet and dry seasons and during the 'dry' the ability to extract water directly from rivers may be limited to meet environmental flow requirements. If too much water is extracted from rivers then the environmental integrity of the river and associated ecosystems may be compromised.

New water supplies for the region will need to be secured in the near future, however reducing demand on existing and future water sources is an equally high priority. Major catchments close to the population centres are largely located in World Heritage listed areas and the potential for siting new storages such as dams and associated infrastructure is limited. Reducing the demand on existing supplies will delay the need to find new water supplies and may result in downsizing water supply infrastructure requirements. Using less water can reduce pressure on sensitive riverine and aquatic ecosystems dependant on river flows in those water supplies taking water directly from rivers.

The impact of climate change on the yield and reliability of water supply is also a dominant factor in water management planning. Climate change forecasts indicate rainfall variability in Far North Queensland will be higher from year to year with rainfall expected to increase slightly in the wet season but could decrease in the dry season, when demand for water is greatest.

Establishing a commitment by the community to take positive action to conserve water is critical to the long term success of the demand management program. In the Wet Tropics this can be a formidable task. Residents and visitors to the region are not faced with images of almost dry dams and parched earth like they are, at times, in the more temperate regions of Australia. The reasons for saving water in the tropics are not necessarily obvious and water conservation messages and information must be designed to relate to local conditions and be understood and accepted by the local community and visitors alike.

The challenges are to ensure the efficient use and management of existing water supplies and to secure new water sources that can meet social and economic needs into the future while maintaining the environmental values of the region.

The CRC Water Demand Management Strategy details the key activities that CRCWW intends to undertake over the next 3 years to assist in reducing water demand and improving water use efficiency across the region.

2. MANAGING THE DEMAND FOR WATER

The CRC Water Demand Management Strategy (the Strategy) is based on the following underlying principles:

- Reducing the demand for potable water is a high priority for the region;
- In order to secure new water supplies it will be incumbent on CRCWW to demonstrate effective demand management and the efficient uses of existing supplies;
- Balancing the economic, social and environmental needs for water;
- Acknowledgement that there are likely to be climatic changes that will affect the yield and reliability of rainfall;
- Utilising alternative water sources such as recycled water and stormwater where viable for non potable applications;
- Everyone has a role to play in responsible water resource management; and
- Environmental sustainability will be a cornerstone in the management of water supply and use consistent with the CRC Corporate Plan 2009 -2014.

The above points have been considered in the development of the Strategy. They represent a holistic approach to managing water resources in the CRC and build on the previous actions undertaken by the former Cairns City Council in line with the Demand Management Strategy 2006.

The strategy is consistent with the *Far North Queensland Draft Regional Water Supply Strategy (September 2007)* which has, as one of its key principles –

Promoting efficient use of water for example, by improving demand management and by reusing and recycling water.

The *Far North Queensland Regional Plan 2009 – 2031* also specifically recognises that a key challenge in planning for future urban growth is ensuring efficient use of water supplies and reducing water consumption through improved management of the demand for water.

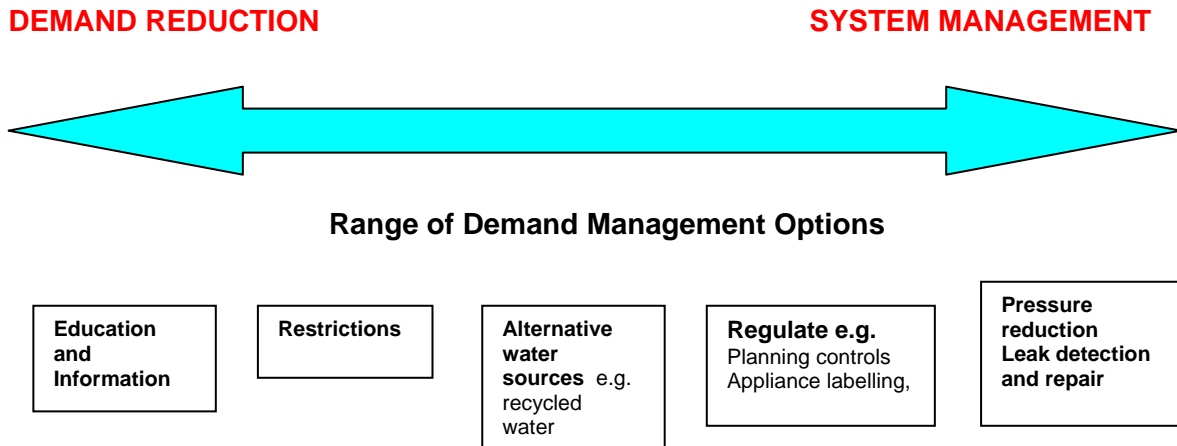
The aims of the Strategy therefore are:

- To build on the current demand management activities;
- To achieve significant and sustained water savings by customers;
- To continue to build a water conservation culture in the community;
- To minimise losses and non revenue water in our distribution network;
- To improve water accounting via metering, data management and reporting; and
- To ensure CRC is leading by example in water conservation.

2.1 Demand Reduction and Supply System Management

There are two distinct streams of actions that fall under the title of Demand Management:

1. Water Demand Reduction; and
2. System Management



These require different approaches in terms of practical implementation and monitoring. Table 1 outlines the streams and actions involved with each stream relevant to Cairns Regional Council.

The Water Demand Reduction component is based on a combination of communication and education programs, incentives, regulation and internal (Cairns Regional Council) water efficiency improvements. It relies heavily on behaviour change by water users.

System Management is more related to operational issues and is based on reducing water losses in the reticulation system, reducing illegal and un-metered connections, and optimising operations. Details of specific actions are provided in the following sections of the Strategy.

Table 1: Summary of Demand Management Actions

Water Demand Reduction Actions	System Management Actions
Education and communication	Installation of district meters, pressure management, leak detection and repair
Council water conservation	Reduction of unbilled and illegal connections, metering and volumetric charging for all connections
Drought Management Plan, Permanent water conservation measures,	Optimisation of raw water supply and treatment plant operations
Water conservation incentives for commercial customers	
The production and supply of recycled water to customers	

2.2 Water Supply and Future Demand

The Cairns region covers 4135km² from Bloomfield, located in the Daintree National Park in the north, to the sugar village of Miriwinni in the south. The eastern boundary is formed by the Coral Sea coastline abutting the Great Barrier Reef Marine Park. The Cairns Region is one of the fastest growing in Australia, with around 150,000 people and approximately 3 per cent annual growth.

The main community centres include Miriwinni, Babinda, Bramston Beach, Gordonvale, Edmonton, the Cairns CBD, the Northern Beaches suburbs, Mossman, Port Douglas, and the beachside communities of Wonga, Newell and Cooya.

Copperlode Falls Dam, constructed in 1976, is the primary water supply source for Cairns City. The Copperlode Falls Dam supply is supplemented by Behana Creek together with several low volume rural sources. The area has experienced several phases of sustained population growth since the construction of Copperlode Falls Dam. This continued population growth will impact on both the capacity of the existing supplies to meet demand and the capacity of the existing water treatment infrastructure in the near future, depending on climatic conditions and the success of demand management initiatives.

Within the CRC there are also a number of rural water supply schemes with water sourced from local rivers and therefore water use is restricted to allocated license conditions.

Table 2 shows forecast demand for all CRC water supply schemes to a 10 year horizon.

Table 2: Projected Demand for Water Supplies

Water Supply Services					
Scheme Name	Annual Allocation (ML)	License	Water Demand ML / annum		
			Current (2007/08)	5 years (2012/13)	10 years (2017/18)
Copperlode Falls Dam/Behana Creek supplying Buchans Point to Earlville	30,625		25,336.6	27,985.1	30,449.0
Copperlode Falls Dam/Behana Creek supplying Earlville to Gordonvale	16,060				
Bartle Frere	Unknown application 2008)	(license lodged	254.4	283.4	312.4
Bellenden Ker	136		101.8	116.8	131.8
Babinda	871		348.8	371.8	394.8
Fishery Falls	151		147.7	175.7	203.7
Bessie Point	153		19.2	19.2	19.2
Miriwinni	181		137.1	153.1	169.1
Bramston Beach	242		52.8	57.8	62.8
Mountain View	23		9.5	10.5	11.5
Orchid Valley	30		9.5	10.5	11.5
Mossman /Port Douglas	513		3,638	4,217.4	4,889.2
Whyanbeel	Unknown application 2008)	(license lodged	470.5	545.4	632.3
Daintree	29		19.4	20.4	21.4
Dagmar Heights	66		5.1	5.1	5.1

Source: Cairns Regional Council Drought Management Plan March 2009

Projected water demand from the Copperlode Falls Dam / Behana Creek Scheme indicates that the reliable yield of the scheme will be exceeded in the near future.

Projected demands to 2017/2018 for the following rural water supply schemes (refer Table 2) indicate available water supply is expected to meet demand. In most cases demand is expected to steadily increase within the limits of the license allocation.

1. Bellenden Ker
2. Babinda
3. Fishery Falls
4. Miriwinni
5. Bramston Beach
6. Mountain View
7. Orchid Valley

A comparison against the license allocation was not made for Bartle Frere as CRC is still awaiting response to a license application lodged in 2008. A steady increase in demand is expected.

In dry periods, many of the rural schemes are supplemented from the Copperlode/Behana Creek system, with the exception of Mountain View, Orchid Valley and Bramston Beach. Mountain View and Orchid Valley operate solely from an independent source. In the event of failure of this source it is feasible to supply water for household purposes by tanker.

Bramston Beach is also independent of other supply sources. Planning is currently in progress to determine new sources of supply to the town. Many existing residences have bores, which may in emergency situations be utilised.

Demand for water from schemes in the former Douglas Shire Council area is projected to increase. Forecast use from the Daintree water supply scheme is unlikely to exceed the license allocation. This comparison could not be completed for the Whyanbeel water supply scheme as a license application lodged in 2008 is still awaiting approval.

A comparison of the historic annual demands from Rex Creek with the annual license allocation indicates that water demand exceeds current license volumes. The license allocation for the Rex Creek water supply scheme is currently under review.

Demand management will be used across the region to achieve permanent and reliable decreases in water consumption and ensure that water resources are available to meet foreseeable water demand needs. Demand management endeavors to protect water resources from over extraction and defer the need for new and costly water supply infrastructure.

Figure 1 compares the assessed safe yield of the combined sources of Copperlode Falls Dam and Behana Creek with the adopted forecast of annual demand.

The existing scheme presently appears to be at or near its limit to safely service the community. In fact the safe yield has already been exceeded on more than one occasion in the recent past. It is expected that demands are likely to exceed the safe yield of the scheme in the near future.

The projections show a continuing increase in demand in line with population growth however recent actual water production figures show a downward trend in water demand. Demand management measures already undertaken are clearly contributing to the reduction in water demand.

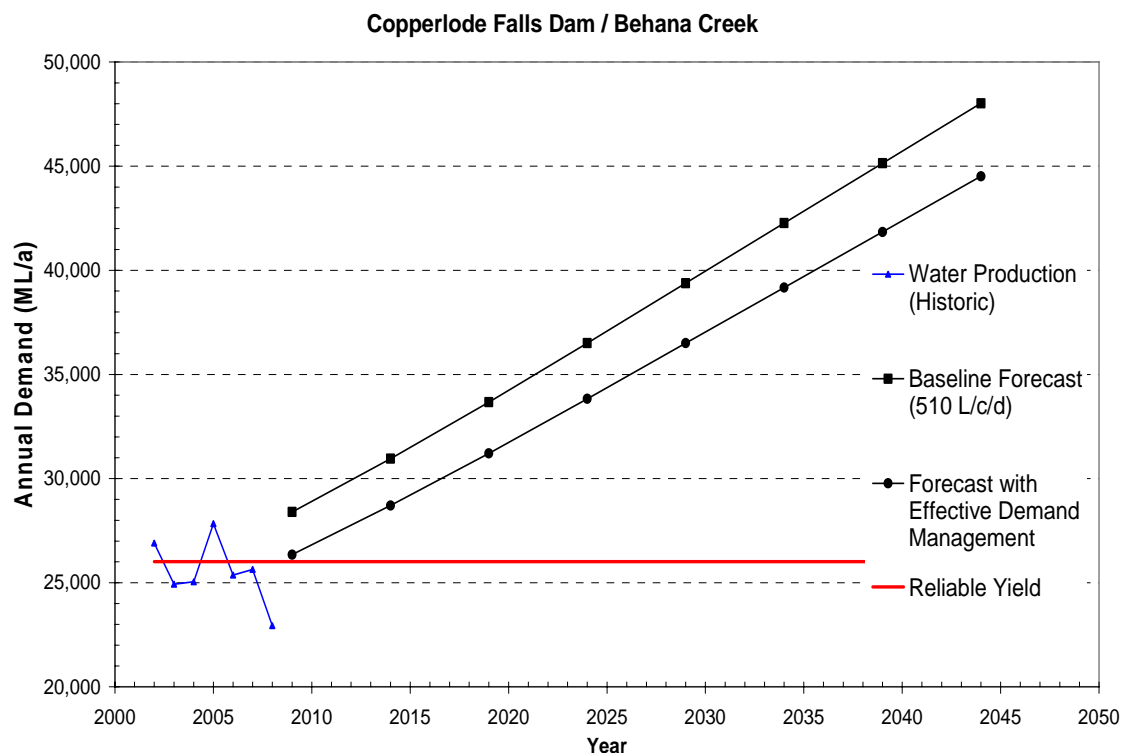


Figure 1 - Forecast projected demand for Copperlode Falls Dam and Behana Creek over a 50 year planning horizon

The demand for water in the major population centre of Cairns City is projected to increase from the 2005 level of 26,000 ML/annum to 48,000 ML/annum in 2044, assuming that there is no change in per capita demand from the present level. The increase in total water use will primarily be due to the region's population growth. The growth in the tourist industry and associated commercial activity will also contribute to the demand on water resources.

2.3 New Water Supplies

Significant investigation and planning has been completed to augment Cairns water supply with a new source. This is the subject of a current planning report to be submitted to the Department of Environment and Resource Management in 2009 with a view to commence the development of a new source in 2009/2010 to increase the reliable yield of the scheme. (refer to doc 1846091 Report for Overall Water Supply Strategy for Cairns Planning Report March 2009)

A Water Supply Planning Report for Division 10 of the CRC (the former Douglas Shire) will be completed in mid 2009. The report will include the following information:

- Update of current and forecast demand growth within the urban areas;
- Assessment of the existing water source, treatment, distribution and storage capacities of the water supply system;
- Identification of augmentation requirements for the existing water supply system;
- Desktop evaluation of new water supply source options (FNQ Regional Water Supply Strategy); and
- A package of demand management options, consistent with the principles outlined in the CRC Water Demand Strategy, 2009 - 2012 that will allow the most cost effective delivery of water services in the former Douglas Shire Council local government area. The recommended measures for demand management in the final report may also be included as part of actions relevant across the Cairns region.

2.4 Sector analysis – Who uses water

Breakdown of demand by sector is useful to identify where the highest water use occurs and make comparisons across sectors. This information can be used to make more informed decisions and deliver targeted and appropriate demand management strategies.

Analysis of water usage in Cairns by sector shows that total consumption is dominated by the single family residential (unattached dwellings) and tourist sectors. The single family residential sector shows the highest use of water using 42.3% of all water. The tourist sector consumes 22.7% of total water demand, followed by the commercial sector at 17.9% of total consumption.

The following figure from the Cairns Water Least Cost Planning Study (MWH 2005) shows the breakdown in water consumption by sector for the former Cairns City Council area.

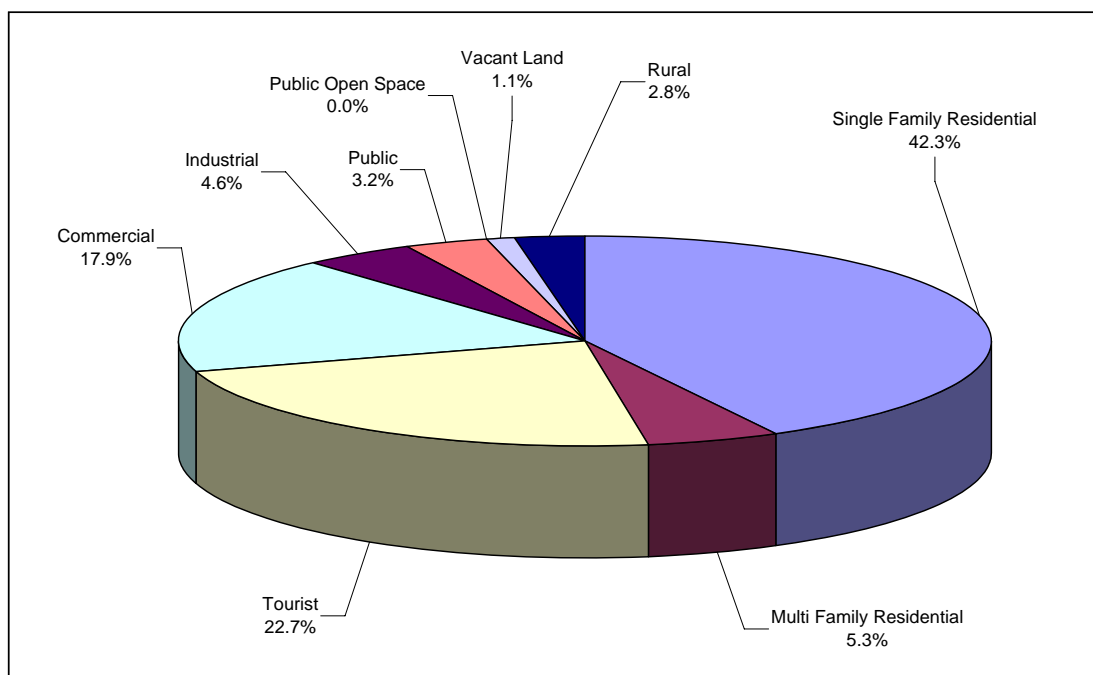


Figure 2 - Water Consumption Breakdown by Sector 2002 – 2003 Cairns Area (Least Cost Planning Study 2005)

Sectoral analysis of water consumption for Division 10 (former Douglas Shire Council) shows residential consumption being the highest users at 53% of all water. The commercial, industrial and tourism sectors account for 24% of all water used (MWH 2009).

2.5 Targets

The former Cairns City Council adopted a target of 10% per capita reduction from the 2005 baseline of 500 litres per person i.e. 450 litres per person per day (total water consumption by all sectors).

Table 3 shows 2007/2008 per capita consumption for the Cairns and Port Douglas/Mossman water supply areas. The target for Cairns City of a 10% per capita reduction was achieved in 2008 and the ongoing aim is to ensure that the total daily per capita consumption for all sectors stays at or below 450 litres.

Targets set for Port Douglas/Mossman are estimated targets taken from the Division 10 Water Supply Planning Report (Draft May 2009) and are based on the implementation of the demand management scenarios recommended in that report. On receipt of the final report demand management measures specific to Division 10 will be reviewed and will be included as actions under the Strategy for the Cairns region.

Table 3 -Current per Capita Water Consumption and Targets

Supply Area	Residential Use l/c/d	Non Residential Use l/c/d	Total Use l/c/d	Target l/c/d
Cairns 2008	212	235	447	*450
Pt Douglas/Mossman 2007	**608	814	1,422^	**1312 by 2013

*10% reduction target based on 2005 per capita daily consumption 500 litres

**source: Draft Division 10 Water Supply Planning Report MWH May 2009

^Total per capita consumption does account for high water demand associated with the transient population. System inaccuracies such as flow meter inaccuracies are also possible.

The Draft Far North Queensland Regional Water Supply Strategy (FNQRWSS) assumes that urban centres could apply demand management initiatives that could achieve similar targets to the former Cairns City Council i.e. 10% per capita reduction, however the final FNQRWSS due for release in mid to late 2009 may include mandatory targets for each water supply area.

3. CAIRNS WATER DEMAND MANAGEMENT STRATEGY 2006-2009

In June 2006 Cairns City Council adopted the Cairns Water Demand Management Strategy. The three year Strategy included actions for both demand reduction and supply system management.

The following is a summary of the actions undertaken to date and key outcomes.

3.1 Demand Reduction Actions

3.1.1 Media

In 2006 the Cairns City Council appointed an advertising agency that specialises in social marketing to develop an integrated multi media marketing campaign.

The “Our Cairns Water” campaign was designed to firstly highlight the importance of water in our tropical environment and that even though we have high rainfall we cannot take our water resources for granted. The second stage was to provide information for residents to take action to conserve water.

The primary campaign message is the need to share our water and only use what we need so we can sustain our tropical environment.

Campaign elements included:

- TV and press advertising;
- New website – ourcairnswater.com.au;
- Leaflets with water saving tips;
- Static displays; and
- Promotional materials
- Special promotional events

The Campaign was officially launched on April 23rd 2007 with the first of three television commercials and press ads.



3.1.2 Schools and Community Education

CRCWW appointed an Education Officer in January 2008 for a twelve month term. The role of the Education Officer is to assist with the development and delivery of education services specific to CRCWW initiatives. These include:

- Provision of educational services to enhance community awareness of water conservation and waste minimisation;
- Visiting and establishing a network of contacts at education facilities within the Cairns region;
- Assessment of existing educational resources and develop new resources as required;
- Instilling a sense of stewardship, in children and the wider community, for the Cairns region.

School visits and tours of water and waste facilities are becoming increasingly popular with a total of 66 school visits and 54 facility tours in 2008 (Figures 3 and 4).

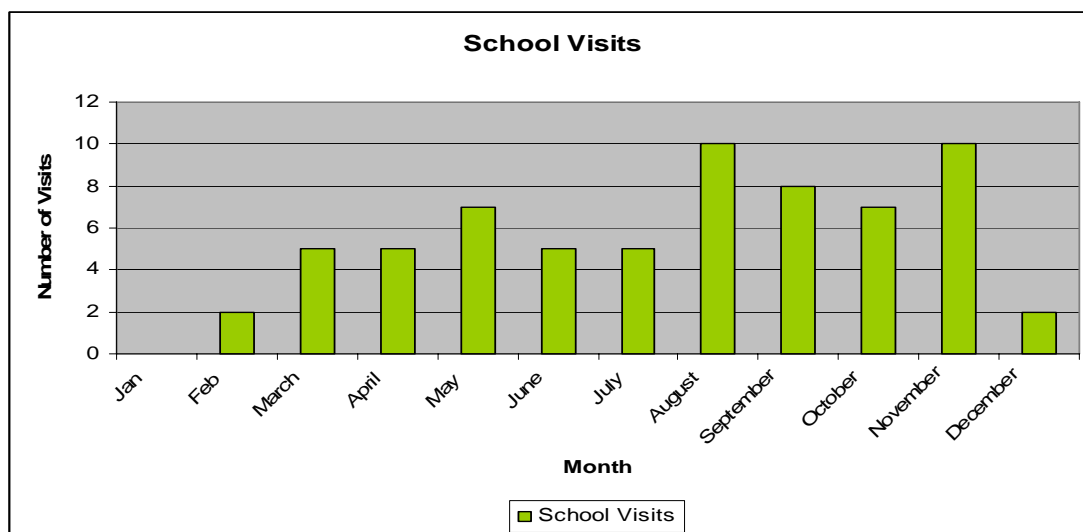


Figure 3 - School presentations/activities within the Cairns region 2008

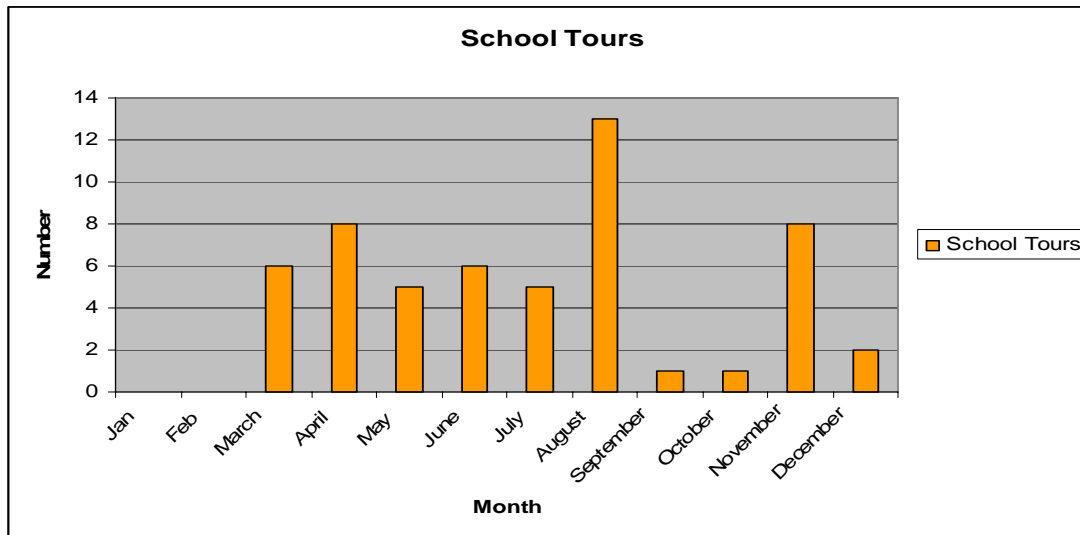


Figure 4 - School tours to water and waste facilities within the Cairns region 2008

The Education Officer has established a strong network of contacts at education facilities (primary and secondary schools, James Cook University and TAFE campuses) and has successfully partnered with various government and local community stakeholders to strengthen the message of water education within the region. Community education and information has also been undertaken by CRCWW staff via attendance at major public events.

3.1.3 Council Water Conservation

CRC is a major user of potable water and therefore it is important that Council be seen to be actively participating in water conservation activities. The 2006 Strategy specified three actions that would be undertaken:

1. Undertake an audit of all Council operations and facilities to identify water conservation improvements.
2. Implement water conservation measures in relevant Council operations and facilities.
3. Installation of meters to all Council facilities and water charging to apply to all Council operations.

The following actions have been completed or are underway:

- Cairns City Council adopted the Cairns City Council Water Conservation Policy in November 2006 that included the requirement for the Council to audit all Council facilities and requirements for new and existing buildings to install water efficient appliances and fixtures during building or renovations
- Community water grants were received for two Council projects to install water efficiency measures with a total water saving of 3.2ML per year
- Council has installed water efficient public urinals at Palm Cove and the Esplanade
- Water meters are being installed to all Council facilities – for details see s 3.3.2 Table 4. Volumetric charging for Council properties is currently not being considered.

3.1.4 Permanent Water Conservation Measures

Restrictions were introduced in Cairns in 2002 in response to a prolonged period of below average rainfall. Low level restrictions remained permanently in place and in December 2005 the former Cairns City Council endorsed the current Permanent Water Conservation Measures. The simple measures restrict watering times to morning and evening to reduce

evaporation losses and to alternate days to reduce the incidence of over watering and encourage more efficient watering practices.

- No sprinklers on Mondays
- Sprinkler watering times 5:00am to 9:00am and 5:00pm to 9:00pm
- Odd number houses on Tuesday, Thursday and Saturday
- Even number houses on Wednesday, Friday and Sunday
- Hand held hoses at any time.

The measures were introduced across the CRC after amalgamation with the former Douglas Shire in 2008. The introduction of these measures provides a platform for the promotion of water conservation on an ongoing basis even during the wet season.

More stringent water restrictions, in line with the CRC Drought Management Plan (#1960183) can be introduced during periods of expected water shortages. The Drought Management Plan details the Permanent Water Conservation Measures and higher level restrictions that will be introduced in response to predetermined trigger levels for water schemes under CRC's control.

3.1.5 **Water Conservation Incentives for Commercial Customers**

Business Water Efficiency Program (BWEP)

Funded by the Department of Local Government, Sport and Recreation, managed by SEQ Water and delivered locally by CRC, the BWEP was established to assist business to reduce water use, save money, reduce environmental impact and build a positive community profile as a water efficient business.

BWEP funding was available in the form of rebates and subsidies, to private businesses in Queensland that consumed more than one million litres of reticulated water in 2005-06. BWEP was delivered locally by the CRC with funding from the State Government to administer the program.

The aim of the BWEP was to reduce consumption of reticulated water by business across regional Queensland by 8 million litres a day. The State Government assigned a target of 1 million litres per day in reticulated water savings for CRC.

Outcomes from local delivery of the BWEP include:

- A total of 30 businesses in the CRC area applied for funding assistance; with 43 applications received overall (some businesses submitted more than one application);
- CRC was recognised as the most active Council in the regional Queensland BWEP when funding applications closed. CRC BWEP participants made up almost 40% of the applications received from regional Queensland;
- The accommodation sector dominated the applications, representing over 40% of the local BWEP participants;
- Each year CRC BWEP participants will reduce consumption of reticulated water by over 180 ML/annum.
- CRC will reduce consumption of reticulated water by 0.49 ML/day from the BWEP. This equates to 49% of the water savings target; and
- Businesses intend to spend over \$1.3 million on water efficiency improvements and the BWEP will contribute in excess of \$300,000.

The State Government discontinued the BWEP in August 2008.

ecoBiz

In 2007, Cairns Water formed an alliance with the Queensland Government Environmental Protection Agency for the local implementation of the ecoBiz program. The ecoBiz program aims to encourage and assist business to become more eco-efficient and profitable through smarter water, energy and materials consumption. Participating business may also be eligible to apply for rebates towards the cost of implementing water, waste or energy projects.

As an ecoBiz ally, Council has played an active role informing and encouraging local business to take advantage of the program. A number of local businesses have completed the program, enjoying the benefits of increased eco-efficiency as well as achieving partnership status in the program, however there has not been a significant uptake of the program in the region.

The original ecoBiz Toolbox was designed for the industrial/manufacturing sector and therefore not ideally suitable for the majority of businesses in Cairns which are small to medium size commercial and tourism oriented enterprises.

The EPA launched the ecoBiz Small Business Edition in 2008, to assist small to medium businesses to achieve improvements in eco-efficiency, extending the benefits of the program to a wider business audience.

3.1.6 Market Research

Qualitative and quantitative market research was undertaken in 2006, prior to the development of the media campaign. The aim was to gain an understanding of what Cairns residents thought were important issues facing the region now and in the future and to gauge understanding of water issues facing Cairns.

Quantitative research showed that Cairns residents are most concerned about development and growth of the City (figure 5). Residents however ranked water as their third most important issue. Qualitative research undertaken showed that the things residents most love about the area are the lifestyle and the environment and these are the major reasons people choose to live here. The results of the research proved invaluable in the development of the media campaign which has a strong environmental message reflecting the issues that residents were likely to identify with.

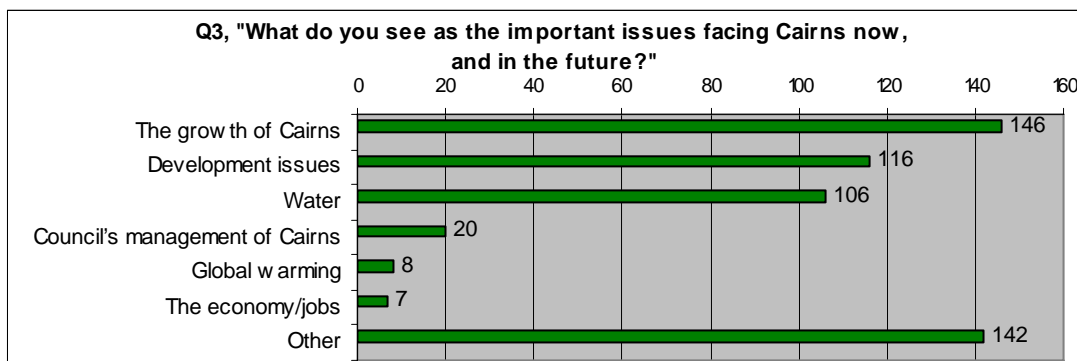


Figure 5

Market research was conducted at the end of Phase 1 (September 2007) of the campaign to gauge the community's acceptance and awareness of the media campaign. Questions were structured to be able to make a direct comparison with the pre campaign research undertaken in 2006.

The results showed that a much higher percentage of people had taken up water conservation practices since the start of the campaign – up from 63% in 2006 to 92% in 2007 (figure 6).

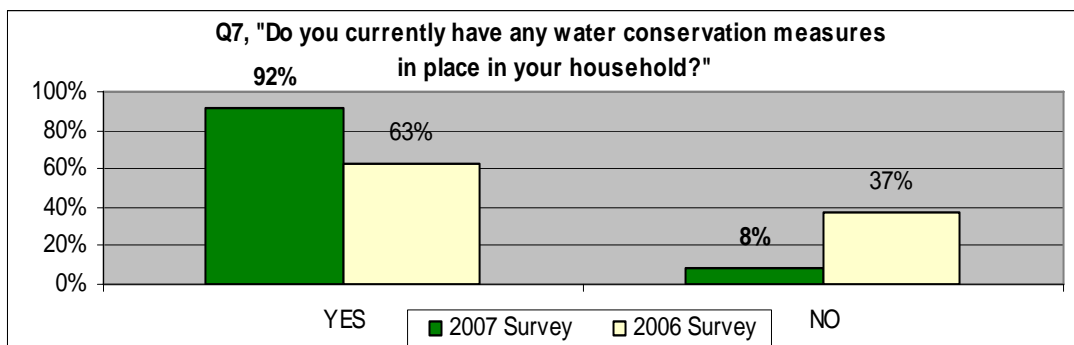


Figure 6

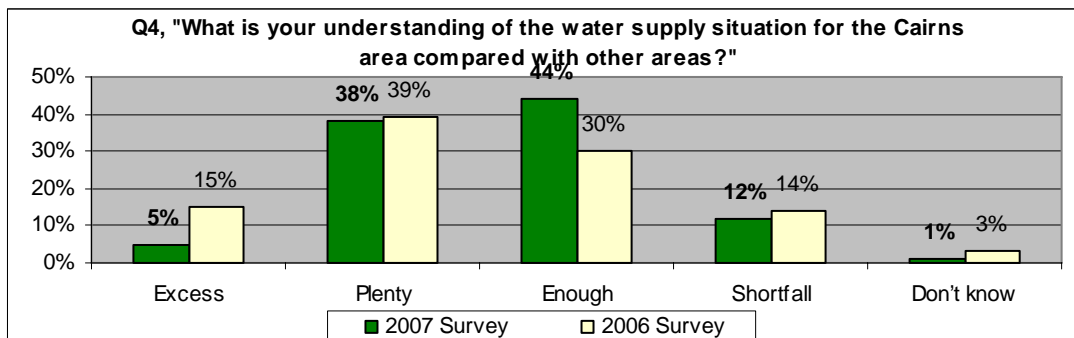


Figure 7

Interestingly though people still think there is plenty of water as shown in figure 7 above. The results are not much different for before the campaign in 2006 and after Phase 1 of the campaign in 2007.

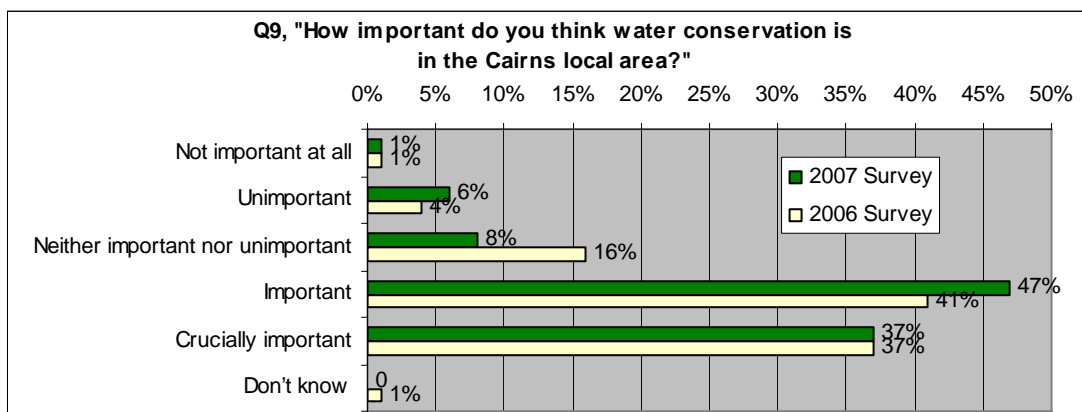


Figure 8

The profile of peoples thinking on the importance of water conservation was also very similar for 2006 and 2007; with the majority of people thinking water conservation was either important or crucially important (figure 8).

What can be taken from the results is that people recognise that even though the region receives high rainfall they are still prepared to actively participate in water conservation.

These results could be attributable to the Our Cairns Water campaign as this is the main message being promoted. It is also important to acknowledge the extent of measures that have been introduced in response to drought conditions being experienced elsewhere and

that these are likely to impact on community attitudes and water consumption behaviour patterns. These external influences are summarised in section 5.

3.2 System Management Actions

3.2.1 Non Revenue Water

The efficiency of the water supply system can be monitored through measurement of Non-Revenue Water (NRW). NRW is the difference between system input volume (post either extraction point or treatment plant) and billed authorised consumption. NRW can be classified as real losses and apparent losses.

Examples of real losses that can be severe and undetected for long periods of time include:

- Leakage and bursts from pipes, joints and fittings;
- Leakage through service reservoir floor and walls; and
- Reservoir and mains overflows up to the point of customer metering.

Apparent losses are due to:

- Bulk and customer meter inaccuracies;
- Unauthorised consumption (water theft);
- Unmetered use;
- Unmetered standpipes;
- Unbilled metered connections;
- Unbilled unmetered connections; and
- Fire fighting and training.

The combined level of real and apparent losses varies significantly during the year in the Cairns area from almost 30% of all water produced to around 13% (figure 9). Non revenue water in the former Douglas Shire area in 2006/2007 is estimated to be 43% with real losses accounting for 27% of water produced.

Projected - Estimation of the Level of Non Revenue Water and Leakage

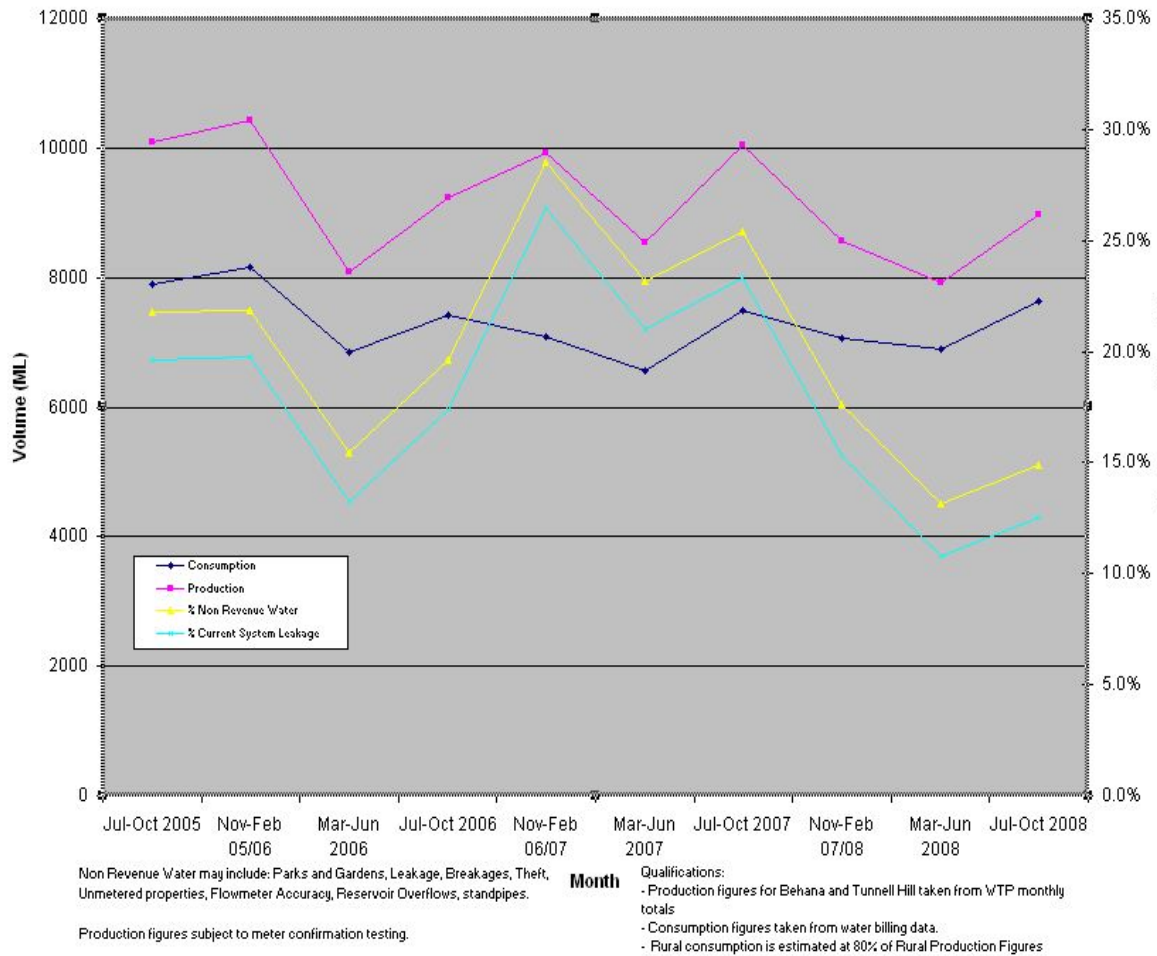


Figure 9 – Estimated level of non revenue water and leakage for Cairns water supply

The following actions have been undertaken to address the level of non revenue water and to improve the efficiency of the water supply system.

3.2.2 Demand Management Zones, Leak Detection, Pressure Management

The largest undertaking by Council for supply side demand management is the establishment of demand management zones, pressure management and leak detection and repair. Pressure and leak management is a program of controlled reduction of water pressure and leak detection and repair within manageable water supply zones which are generally between 500 and 1,200 properties in the Cairns area. The installation of meters into distinct water supply zones across Cairns allows daily monitoring of zone demands and allows assessment of non-revenue water and leakage by zone. The data collected also assists in network modelling for future water supply planning purposes.

In water supply areas where pressure is high, system leakage may also be high. High pressures also lead to increased water usage by consumers. Cairns has a number of zones where pressure is known to be high due to the location of service reservoirs and the reticulation system. Monitoring of pressure in each zone will allow these areas to be identified and pressure reduced to lower levels without impacting on the level of service consumers receive.

Water pressure management involves adjusting water pressure levels in the water supply system, thereby reducing the frequency at which new leaks occur and reducing the rate at which water is lost. Reduction in service pressure can be achieved by installing a pressure

reducing valve, or by improving network management, such as connecting properties to a lower reservoir were possible.

Pro-active leak detection assists water loss management by identifying leaks that may not be visible above ground, and by finding leaks earlier.

Table 4 details the actions undertaken to 2009 in relation to demand management zones, pressure management and leak detection and repair.

Table 4 - Summary of System Improvement Demand Management Actions to 2009

Demand Management Areas	Summary of Actions to 2009
Demand Management Zones	<p>The following actions have been undertaken in the establishment of demand zones:</p> <ul style="list-style-type: none"> • 71 magflow meters have been installed as part of the creation of the demand management zones • 27 completed zones in Greater Cairns Area • 1 completed rural zone • 3 completed far north region zones (former Douglas Shire Council) <p>Outstanding Actions</p> <ul style="list-style-type: none"> • 6 partially completed zones in Greater Cairns Area • 2 planned zones in Greater Cairns Area • 3 planned rural zones • 11 scoped zones in Greater Cairns Area (unlikely to proceed until effects of Mount Peter planning is confirmed)
Pressure Management	<p>Pressure management by installation of pressure reducing valves has been undertaken as follows:</p> <ul style="list-style-type: none"> • Machans Beach – approx 300kpa pressure reduction • Holloways Beach – approx 350kpa pressure reduction • Fishery Falls – approx 200kpa pressure reduction • Port Douglas and Mossman – approx 130kpa pressure reduction • Pressure reduction has recently been implemented on the trunk main to Port Douglas resulting in savings of approximately 2.8 ML of water per day. <p>Pressure management by improved network management has been undertaken as follows:</p> <ul style="list-style-type: none"> • Paradise Palms north – approx 250kpa pressure reduction • Paradise Palms south – approx 120kpa pressure reduction • Centenary Heights – approx 60kpa pressure reduction • Whiterock and Swallow Road - approx 200kpa pressure reduction • Plantation Road, Edmonton – approx 70kpa pressure reduction • Babinda – approx 190kpa pressure reduction • Bellenden Ker – approx 280kpa pressure reduction • Bartle Freer – approx 180kpa pressure reduction
Leak Detection and Repair Work	<p>Pressure management by altering planning requirements for new subdivisions has been in acted as follows</p> <ul style="list-style-type: none"> • FNQROC Development Manual was revised in 2006 to reduce the maximum allowable pressure by approx 200kpa for new developments. <p>Leak detection and repair work undertaken includes:</p> <ul style="list-style-type: none"> • Leak Detection at Palm Cove (PCz1) conducted in 2004 – no leaks identified. • Leak Detection at Aeroglen (AGz1) conducted in 2006 – no leaks identified. • Leak Detection at Cairns CBD conducted in 2006 – 3 leaks identified and repaired • Contract awarded for the provision of leakage detection services to be conducted on the 27 installed zones in the Greater Cairns Area. Work is expected to be completed in August 2009. Leaks identified under this contract will be repaired by operations staff.
Non Revenue Water (apparent losses)	<p>The following actions have been undertaken to assist reducing non-revenue water.</p> <ul style="list-style-type: none"> • 231 previously un-metered services are now metered (e.g. median strip irrigation, parks and gardens, council facilities) • The meter replacement program has been resumed, to assist reducing meter inaccuracies. • All new Council water connections (e.g. parks, irrigation) are now required to be metered. • All Council issued standpipes have been changed to metered standpipes.

3.2.3 **Optimisation of raw water supply and treatment plant operations**

CRCWW has installed a backwash water reuse system at the Freshwater Creek Water Treatment Plant. The backwash water is returned to the treatment plant resulting in reducing the amount of backwash water released to Freshwater Creek by approximately 50,000 ML per annum.

A backwash reuse system has been installed at the Mossman Treatment Plant realising savings of approximately 3ML per day. As water is extracted from Rex Creek this level of water savings helps to maintain healthy environmental flows particularly during the dry season.

Recycled water was substituted for potable water for wastewater treatment plant process operations resulting in annual savings of approximately 700 ML of potable water in two of Cairns major waste water treatment plants.

3.2.4 **Meter Installation**

CRC's combined operations are the largest user of water in the water supply area. The installation of meters to all Council properties including buildings, parks and facilities has been ongoing with 231 previously un-metered services now metered (e.g. median strip irrigation, parks and gardens, Council facilities). All new Council facilities are now required to be metered. The installation of meters will act as an incentive to reduce consumption and raise awareness of actual water used by Council.

Water used via standpipes can account for large volumes of water that previously was not accounted for. All standpipes issued by CRCWW are now metered and water consumption recorded.

3.2.5 **Recycled Water**

Cairns City Council commissioned the development of the "Strategic Plan for Recycled Water Use in Cairns" in 2007. The aim of the Strategy was to investigate the viability of the development of recycled water schemes in the Cairns area. The Strategy identified potential recycled water customers and recycled water supply projects that could be further developed.

The opportunity to supply recycled water to the Cairns Botanic Gardens was identified as part of the planned upgrade of the Northern WWTP and redevelopment of the Cairns Botanic Gardens and surrounding precinct. To assess the feasibility of recycled water supply to the Botanic Gardens site, Cairns City Council commissioned a scoping study in 2006. The study identified potential to use recycled water for irrigation and other non potable uses. The total demand for water is estimated at 246 kL/day, representing a significant opportunity to reduce consumption of potable water. CRCWW commissioned a concept design for the recycled water scheme in 2009 to further assess infrastructure requirements and estimated costs.

Plans are also underway to supply to the first dual reticulation scheme in the CRC area, the Smithfield Village development at Trinity Park. Class A+ recycled water will be supplied to approximately 900 homes for non potable uses such as toilet flushing and outdoor purposes. Recycled water is expected to reduce potable water consumption by 130 ML each year.

Recycled water has been supplied to golf courses in Cairns from existing wastewater treatment plants for irrigation with approximately 650 ML supplied in 2008.

CRC Water and Waste has received commitment from Yorkeys Knob State School to receive recycled water. Other possible future projects include the Mt Peter urban growth corridor, Bramston Beach and Cairns Airport.

3.3 Human Resources

The following CRCWW staff have been directly involved with the development, implementation and management of the “Our Cairns Water” campaign:

- Project Manager Water Demand Management - 40% of time
- Communication and Education Officer – 50% of time for two years
- An Education Officer was appointed in January 2008 for twelve month period.

A new position of Water Demand Management Project Officer position was filled in March 2008 and the Education Officer position was extended to June 2010.

Water supply side initiatives such as the installation of district meters, pressure management and leak detection and repair has been carried out by Cairns Water and Waste Operations staff Demand Management Team. As of 2009 much of this work will be outsourced e.g. leak detection and installation of flow meters to demand management zones and will be managed by the CRCWW Infrastructure Branch in consultation with the Operations Branch.

4. EXTERNAL INFLUENCES

Given the prolonged drought conditions being experienced in many areas of the Country there have been unprecedented moves by all levels of government to introduce measures to reduce the demand on existing water supplies.

The Queensland State Government has been proactive in the introduction of a number of initiatives in relation to demand management and improving water efficiency. Many of these initiatives have come about as a direct result of the severe water shortages in South East Queensland and have consequently been introduced state wide. These measures have and will continue to contribute to more sustainable use of water. A summary of relevant Queensland State Government and Federal Government measures to facilitate water conservation are shown in Table 5.

Table 5 Summary of Queensland and Federal Government Water Conservation Initiatives

Queensland State Government Initiatives	Details
Mandatory Water Savings Targets	<p>Under the Queensland Development Code there are new mandatory efficiency standards aimed at preserving drinking water supplies:</p> <ul style="list-style-type: none"> • Part MP 4.1. New houses are required to install water efficient toilets and showerheads that are a minimum of a 3 star rating. • Part MP 4.1. Retrofitting of dual-flush toilet suites and three star showerheads are a mandatory requirement where renovations are undertaken in residential properties. • Part MP 4.2. All new homes are required to source a portion of household water from sources other than the reticulated potable water supply such as a rainwater tank, a dual reticulation system, and communal rainwater, approved grey water recycling system, stormwater reuse or a combination of these measures. • Part MP 4.3. Alternative water sources for new commercial buildings under the Queensland Development Code Part MP4.3. New commercial buildings are required to meet water savings targets by offsetting potable water use by connecting toilets to an alternative water source such as a rainwater tank or approved grey water reuse system. In addition the regulation requires swimming pools to be topped up via a rainwater tank. • This came into effect in the Cairns City area as of 1st July 2008 and 1st July 2009 in the former Douglas shire.
Home and Garden Water Wise Rebate	<ul style="list-style-type: none"> • Up until December 2008 rebates were available for owners and/or tenants of residential properties for a range of water efficient devices, appliances and garden products. The rebates have been discontinued
Water Supply (Safety)	<ul style="list-style-type: none"> • The Act requires Councils to report water loss and leakage via System Leakage

Federal Government Initiatives	Details
Water for the Future	<ul style="list-style-type: none"> In April 2008, the Federal Government announced the new 'Water for the Future' national water plan, a commitment of \$12.9 billion over 10 years to respond to climate change and secure water supplies for rural and urban consumption and protect the health of Australia's river systems. The plan addresses four key priorities, taking action on climate change; using water wisely; securing water supplies and supporting healthy rivers. Funding provided by 'Water for the Future' will be invested in infrastructure refurbishment, new infrastructure, practical projects and direct incentives.
National Rainwater and Greywater Initiative	<ul style="list-style-type: none"> As part of its 'Water for the Future' plan, the Australian Government is delivering the National Rainwater and Greywater Initiative, providing \$250 million in the form of rebates to assist households and surf life saving clubs to install rainwater tanks or greywater systems.
Water Regulations 2008	<ul style="list-style-type: none"> The Water Regulations 2008 authorised under section 126 of the <i>Commonwealth Water Act 2007</i>, gives the Bureau of Meteorology (BOM) new functions which include analysing, managing and reporting Australia's water resources information. The Water Regulations 2008 include a schedule of organisations that are required to give specific water information to the BOM and includes Cairns Regional Council. Categories of information include surface water information, information on major and minor water storages and information about water restrictions when they are announced.
and Reliability) Act 2008	<p>Management Plans and to develop contingencies to ensure adequate supply of water during drought conditions via Drought Management Plans.</p> <ul style="list-style-type: none"> The Act enables Councils to require businesses to develop Water Efficiency Management Plans (WEMP). WEMPS are likely to become mandatory for large water users in some or all regional areas. The Act requires Council to prepare Outdoor Water Use Conservation Plans for reducing outdoor water use and promoting efficient water management outdoors. By 2011 water service providers are required to provide water use information to non owner residents as an incentive to reduce water use. By 2011 water service providers are required to provide standardised water use information on water bills.
Business Water Efficiency Program	<ul style="list-style-type: none"> A program funded by Queensland Department of Local Government, Sport and Recreation, managed by SEQWater and delivered locally in coordination with Councils and water service providers. The BWEP provided \$55 million in incentive funding in the form of rebates and subsidies aimed to encourage businesses in South East and regional Queensland to reduce their water use. BWEP applications closed for South East and regional Queensland on 31st January 2008 and 8th August 2008 respectively.
ecoBiz	<ul style="list-style-type: none"> A program delivered by the Environmental Protection Agency which encourages industries to improve resource efficiency including water and energy and waste avoidance and resource recovery.
Draft Far North Queensland Regional Water Supply Strategy (FNQRWSS)	<ul style="list-style-type: none"> The Draft FNQRWSS (NRW 2008) provides the framework, information and guidance for the long term management of water supply issues in the region including promoting the efficient use of water by improving demand management and by reusing and recycling water.

It is important to acknowledge the dynamic nature of the development of water conservation measures by all levels of government and that strategic initiatives will be constantly reviewed and revised to keep up to date with new requirements that may be developed during the period of this strategy.

4.1 **Water Supply (Safety and Reliability) Act 2008**

The *Water Supply (Safety and Reliability) Act 2008* (WSSR Act) received assent on 21st May 2008. The purpose of the WSSR Act is to provide for the safety and reliability of water supply. Chapter 2 of the WSSR Act relates to infrastructure and services and outlines the powers, liabilities and obligations of Water Service Providers as they relate to:

System Leakage Management Plan (SLMP) (#1531704) – Documents the level of system leakage and measures to minimise water losses from leakage from the water supply distribution system. A revised SLMP is required by March 2010. Regular audit reports are generally required to be conducted every three years in accordance with the notice approving the SLMP issued by the Department of Environment and Resource Management.

Drought Management Plan (#1995258) – Outlines how CRC Water and Waste intends to minimise the impacts of water shortages caused by drought. Reviews are to be conducted every three years or immediately after experiencing drought conditions.

Combined Total Management Plan and Strategic Asset Management Plan (#1649222) – Audits of the SAMP are required every 3 years with the first audit due in March 2012 and the TMP is required to be reviewed and updated by June 2012.

Outdoor Water Use Conservation Plans (OWUCP) - OWUCP's require water service providers to develop and implement permanent outdoor water use restrictions. The provisions for OWUCP's of the WSSR Act came into effect on May 22 2009. Registered water service providers outside of south east Queensland (SEQ) must have an approved OWUCP in place within two years of the commencement date i.e. May 2011.

Consistent Residential Water Billing for Water Service Providers - S138 of the WSSR Act requires that a rate notice or account issued by the water service provider in areas outside of SEQ for the supply of water must comply with the Guidelines for Consistent Residential Water Billing. Consistent billing aims to provide customers with standardised information in relation to their water consumption. The goal is to trigger a reduction in water use. Compliance with the guidelines is required by November 16, 2011.

Provision of Water Use Information to Non Owner Residents - S139 of the WSSR Act requires water service providers to provide water advice to non owner residents of residential properties stating the volume of water supplied to premises for each billing period. The aim is to encourage non owner residents to save water by providing them with meaningful information on how their water usage compares with other customers with the goal of triggering a reduction in water use. Compliance with the guidelines is required by November 16, 2011

Water Efficiency Management Plans (WEMP) - Provisions for WEMPs in regional Queensland are part of the WSSR Act (Ch 2, part 3, Div 6). The regulator may, by written direction, require a water service provider to give a non residential customer a written notice to prepare a WEMP.

It is proposed that the trigger for a WEMP notification will be when:

- A water service provider requires augmentation of water supply and/or sewerage systems within 10 years
- The aggregate water use for commercial, industrial and power generation customers is greater than 50ML per annum.

Where the above is the case the water use trigger will be when an individual customer's water use reaches more than 10ML per annum.

The requirement for WEMPS by large water users in the CRC area is likely to become a mandatory requirement in the near future.

4.2 Climate Change

Climate change is likely to impact on the future availability and demand for water in FNQ. Climate change scenarios are predicting north east Queensland to become warmer with more hot days and nights as a result of climate change. Reduced rainfall and higher evaporation could reduce run off into rivers placing pressure on limited run of river water supplies and dam inflows in the region. Increases in severe storm events are predicted and this could result in damage to infrastructure including water and sewerage. More efficient use of water through demand management measures will be needed to accommodate the possible effects of climate change.

5. IMPACT OF DEMAND MANAGEMENT

Water production and consumption data clearly demonstrates the impact of demand management since the implementation of the Demand Management Strategy 2006.

Water production and rainfall from 2006 to 2008 for the Copperlode Falls/Behana Creek water supply scheme is shown in figure 10. Water production figures for 2008 are consistently below the previous two years despite population growth of around 2.5% per annum.

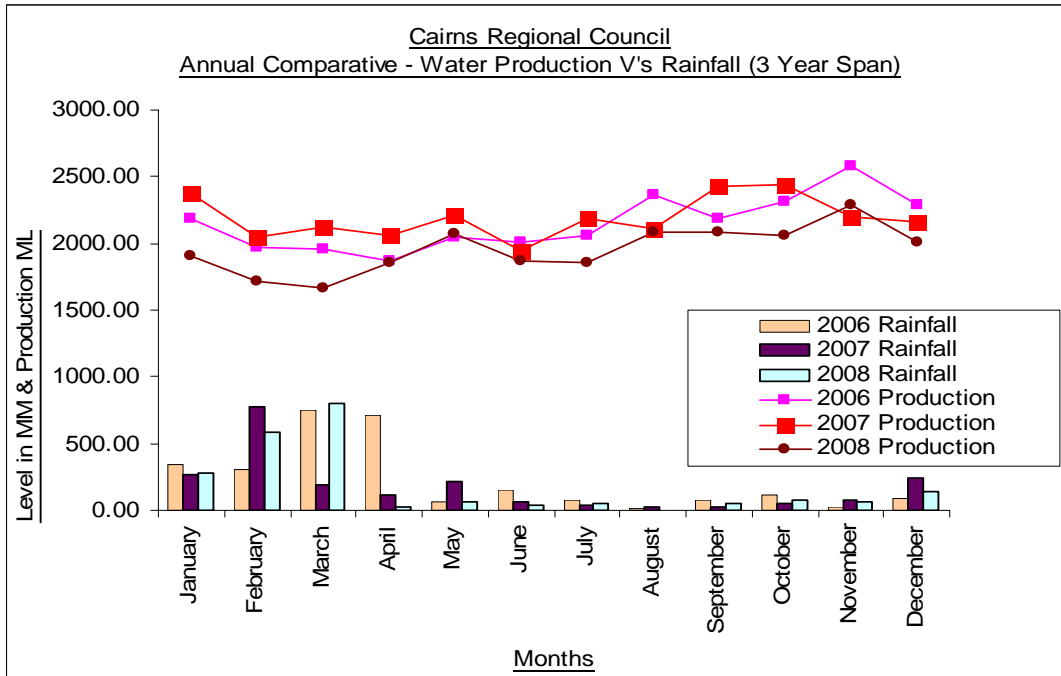
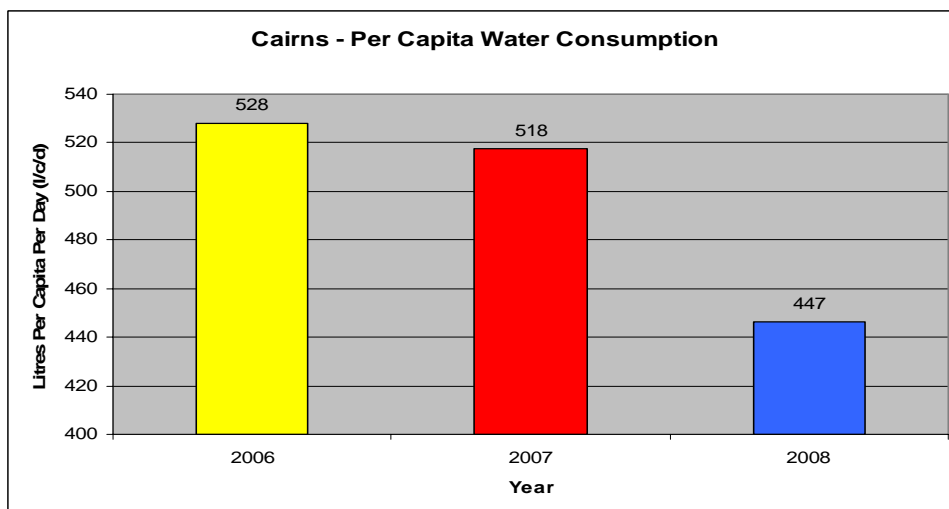


Figure 10 - Annual Comparative Water Production vs. Rainfall

Since the start of the demand management measures in 2006 gross per capita water consumption has dropped by approximately 15% from 528 litres in 2006 to 447 litres in 2008 (Figure 11). Gross per capita consumption figures are calculated using total water production data that includes residential, commercial and industrial consumption and system losses.



Daily Gross Per capita consumption = total water produced for the Copperlode Falls/Behana Creek water supply area divided by Cairns City population divided by 365 days

Figure 11 – Gross Per Capita Water Consumption for Cairns

6. DEMAND MANAGEMENT ACTIONS 2009 - 2012

The following sections outline the demand management measures to be undertaken from 2009 to 2012. The actions aim to build on the existing demand management initiatives and will extend across the entire CRC area. The actions again include both behavioural and system management initiatives to provide an integrated approach to reduce the demands on water resources.

6.1 Water Demand Reduction Behaviour Change Initiatives

6.1.1 Public Education and Communication

Objective	Engage with the community to improve understanding of water supply and demand issues and reduce water consumption.
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Establishing a commitment by the community to take positive action to conserve water is critical to the long term success of the demand management program. The “Our Water” media campaign has been successful to date and will be continued for the next 3 years. Reviews of the campaign will be undertaken to measure effectiveness and drive any changes that could be made to enhance or change the messages and/or delivery mediums.

Other public education and communication activities include attendance and displays at major public events. A water efficient garden will be included in the redevelopment of the Cairns Botanic Gardens and the proposed new Visitors Centre. The garden will be partially sponsored by CRCWW and will demonstrate water efficient gardening techniques and plants suitable for the tropics.

Permanent Water Conservation Measures will be promoted more strongly than they have been previously via the local media. CRCWW Officers will actively take steps to inform customers of any breaches and if necessary take actions to enforce the measures if customers fail to respond to formal requests to adhere to the measures. More authorised officers, heightened enforcement and increased promotion are required to maximise the effectiveness of this measure.

The demand for educational resources, in particular presentations to schools and other institutions and visits to water and wastewater facilities, continues to grow. A strong network of educational contacts has been developed by the Education Officer and this level of interaction will be continued with the extension of the Education Officer Position. Partnership building will be a key priority to extend the resource network of environmental educators that are willing to deliver water education projects.

Actions

- 1. Continuation of the “Our Water” media campaign**
- 2. Regularly update “Our Water” website**
- 3. Attendance at major public events to promote water conservation**
- 4. Promote the Permanent Water Conservation Measures more strongly during the dry season.**
- 5. Extend the Education Officer position until January 2013**
- 6. Conduct educational tours to water and wastewater facilities**
- 7. Assess educational resources with a view to developing new resources or source existing appropriate external resources.**

6.2 Commercial and Industrial Sector

Objective	Encourage the commercial sector to engage in water conservation initiatives
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The amount of water used by the commercial sector is estimated at 40% of total water produced and therefore demand management measures for the commercial sector are a high priority. The following measures are designed to encourage the commercial sector to implement practical measures to conserve water as part of their operations and also to promote water conservation behaviours by visitors to the region.

CRC is the single largest user of water in the region. Council will implement real measures to reduce demand on potable water supplies.

Non-residential Water Audits

CRCWW will assist businesses to audit water use at their premises to help track water consumption and identify options for water efficiency improvement. The benefits of water auditing were identified through Councils local delivery of the BWEP. Commercial operators indicated their willingness to undertake an audit however financial constraints and being unaware of local auditors were identified as key barriers to implementation.

We will build the capacity for businesses to self-audit their premises to help raise awareness of water use and wasteful practices, and assist businesses to reduce their demand for potable water with practical advice about efficient water use.

Council Water Efficiency Measures

To demonstrate its commitment to water efficiency, CRC will take steps to reduce water consumption within its own buildings and facilities. Council intends to use its position of leadership to influence the community to use water wisely. Council will:

- Incorporate water efficiency measures and water source diversification in all new Council facilities and buildings and as part of refurbishment programs;
- Carefully track Council water use and provide regular feedback to Council departments on water consumption;
- Prepare guidelines for Council staff to undertake audits of Council buildings and facilities to identify water efficiency improvements;
- Promote water efficiency improvements in Council facilities and buildings to raise awareness and inspire community action.

Education and Raising Awareness

Integrated with other initiatives, education will be a key tool for fostering water conservation in the commercial sector.

From an education perspective it is proposed to:

- Develop joint initiatives with the tourism industry to promote water efficiency in the tourism sector;
- Host water conservation information sessions for businesses using real local case studies;
- Investigate opportunities to host a forum/trade show/information evening for commercial customers;
- Prepare water conservation information materials i.e. case studies
- Provide information on the website on funding programs.

Actions

1. *Assist businesses to self audit their premises to assess water use and how consumption can be reduced*
2. *Reduce water consumption in Council buildings and facilities*
3. *Develop joint initiatives with the tourism industry to promote water efficiency in the tourism sector*
4. *Host water conservation information sessions for businesses using real local case studies;*
5. *Provide information on the website on funding programs and case studies*

6.3 Recycled Water

Objective	Identify and implement feasible recycled water opportunities across the region
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CRCWW will continue to promote and identify appropriate recycled water customers and implement feasible recycled water opportunities.

The first recycled water schemes at the Cairns Botanic Gardens and the Smithfield Village will be completed and operational by the end of 2010 and these schemes will provide the framework that will be used to implement schemes into the future.

The Mt Peter urban growth corridor has the potential for large scale recycled water use primarily for dual reticulation schemes in new housing and commercial developments. Mount Peter is expected to be the largest population growth area for the Cairns region and has been formally designated by the State for master planning through collaboration between Council and State agencies.

Information and promotional resources will be developed to support the technical and non technical aspects of recycled water schemes. This will include guidelines for use, updates on recycled water scheme developments and community information on points of interest.

Actions

1. *Recycled water promotion/advertising*
2. *Continue to identify potential customers that could use recycled water from the Cairns WWTP's*
3. *Preparation of recycled water information*
4. *Implement feasible recycled water opportunities*

7. SYSTEM MANAGEMENT INITIATIVES

The aim of system management initiatives is to ensure the level of water losses across the Cairns Region is below 250 litres/connection/day (as per Customer Service Standards).

7.1 Installation of district meters, pressure management and leak detection

Objective	Complete demand management zones via proofing of zones in relation to data monitoring, leak detection and repair and pressure management
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Existing Demand Management Zones, within the Cairns area, where flow meters are operational will be completed by March 2010. The completion of these zones will entail ensuring all zones are accurately recording data from installed flow meters, leak detection works are carried out and leaks are repaired and pressure management has been undertaken to reduce pressure to an acceptable level for each zone.

Demand Management Zones where flow meters have been partially installed or where the zone has been identified but no flow meters have been installed will be reviewed to confirm the integrity of the zone and if previously planned actions are relevant or need to be reviewed.

Where appropriate new demand management zones will be established. Approximately 800 km of the reticulation network was checked for leaks in mid 2009. Leak detection and repair will be progressively undertaken for the remaining reticulation network in 2010 and 2011.

Actions

- 1. Leak detection and repair for reticulated water network**
- 2. Complete partially completed Demand Management Zones**
- 3. Identify pressure management areas and install pressure control systems to Demand Management Zones**
- 4. Review the reticulation network to determine developed areas where new Demand Management Zones can be established**
- 5. Ongoing monitoring and analysis**

7.2 Other Non Revenue Water - Apparent Losses

Objective	Ensure the level of water losses across the Cairns Region is <250 litres/connection/day (as per Customer Service Standards)
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Other NRW or “apparent” losses includes

- Bulk and customer meter inaccuracies;
- Unauthorised consumption (water theft);
- Unmetered standpipes;
- Unbilled metered connections;
- Unbilled unmetered connections; and
- Unmetered billed connections (non volumetric rate charge for water use).

The following actions will be undertaken to assist in meeting the adopted standards for non revenue water.

On going meter replacement program

CRCWW is continuing its commitment to ensure their water fleet is recording water usage accurately and within the bounds set out in legislation. For this purpose, the Meter Replacement Program will remain consistent with the adopted Lifecycle Asset Management Plan for Domestic Water Meters issued on 10 March 2008 (#1555585v5)

Reduce the level of unauthorised consumption

CRCWW will attempt to identify unauthorised consumption and illegal connections and take steps to rectify the situation. It is an offence under the Water Act 2000 to take, supply or interfere with water unless authorised to do so.

Install meters on all authorised unmetered properties

CRCWW is planning to ensure, where practical and possible, all properties are metered within the Cairns region in accord with the Meter Installation Policy (#273463) adopted on 19 June 2008. This will specifically facilitate more accurate meter reading for currently unmetered rural areas (e.g., south of Cairns) and equitable charging for actual water usage. Thereby removing potential subsidisation of heavy water consumers by smaller

water users within that region. An audit of all CRC properties and facilities will be undertaken to identify properties that are unmetered.

Identify Authorised Unbilled Connections

As a priority all authorised unbilled connections will be identified and entered into the water billing database. Authorised unbilled connections include a large number of CRC facilities. These have been identified and meters are being installed.

Ensure the timely update of all new connections into the water billing (Authority) database

To assist in the accurate reporting of non revenue water it is critical to have up to date customer use information. Systems will be reviewed to ensure the processes to receive data and enter into the water billing system are timely and accurate.

Actions

1. **On going meter replacement program**
2. **Reduce the level of unauthorised consumption**
3. **Install meters on all authorised unmetered properties**
4. **Identify Authorised Unbilled Connections**
5. **Ensure the timely update of all new connections into the water billing (Authority) database**

8. FUNDING AND RESOURCES

8.1 Organisational structure and management

Water demand management spans all areas of the organisation with all branches having some level of responsibility for specific actions and projects. Figure 12 shows the areas of responsibility by CRCWW branch and the operational linkages between them.

The implementation of the Strategy will be managed by a Steering Group made up of representatives from each branch. Day to day responsibility for operational activities and reporting will be via the Infrastructure Branch with a dedicated Water Demand Project Manager and Project Officer.

DEMAND MANAGEMENT ORGANISATIONAL STRUCTURE

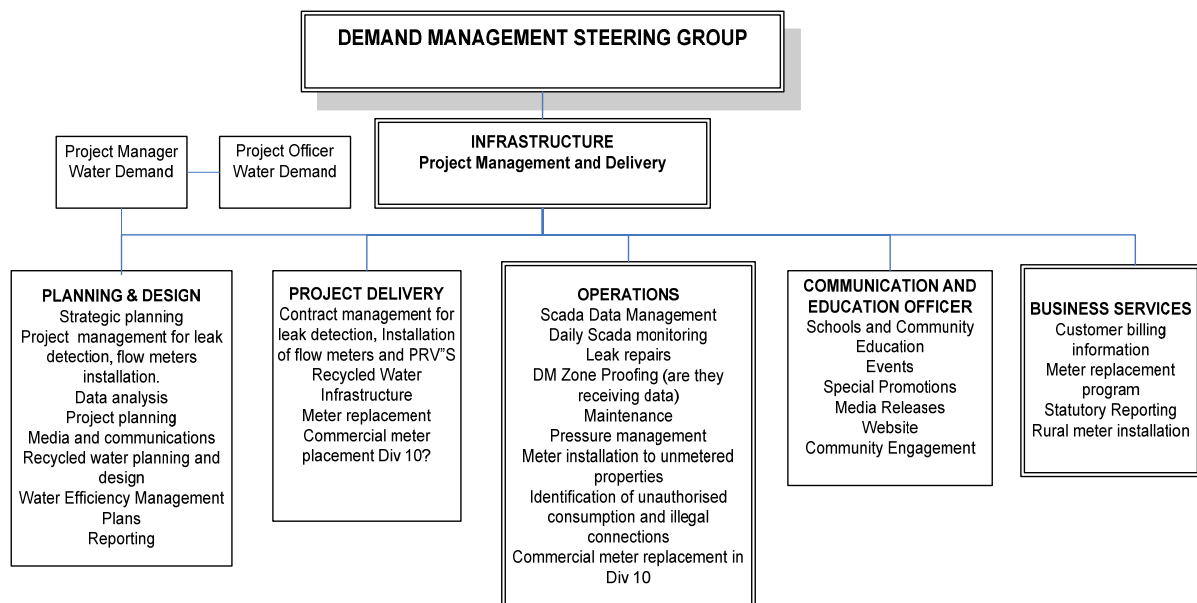


Figure 12. Organisational Structure for Water Demand Management

8.2 Budget

The actions outlined in the Strategy include new actions that require additional budget allocations and actions that are included in existing budgets such as the installation flow meters or are ongoing capital projects such as meter replacement. Capital projects such as recycled water schemes will require separate budget allocations for individual projects as they arise. Budgeted capital projects such as the installation of flow meters have been carried over from 2008/2009.

Table 6 provides budget estimates for operating initiatives. The 2009/2010 budget has been approved.

Table 6 Estimated budgets for Water Demand Management actions

CRC Water Demand Management Strategy 2009-2012						
Budget for Water Demand Management Actions						
Action	Activity	Budget				Responsibility
		*2009/2010	2010/2011	2011/2012	Total	
Public Education and Communication						
1	Our Water advertising campaign	\$ 30,000	\$ 30,000	\$ 30,000	\$ 90,000	CRCWW Planning and Design
2	Reprint of brochures	\$ 2,000	\$ -	\$ 2,000	\$ 4,000	CRCWW Planning and Design
3	Website update	\$ 3,000	\$ 3,000	\$ 3,000	\$ 9,000	Communication and Education Officer
4	Attendance and events/promotional materials	\$ 3,000	\$ 3,000	\$ 3,000	\$ 9,000	Communication and Education Officer
5	Permanent Water Conservation Measures - greater level of promotion/advertising	\$ 4,000	\$ 5,000	\$ 5,000	\$ 14,000	Communication and Education Officer
6	Demonstration water efficient garden at Cairns Botanic Gardens	\$ 15,000	\$ -	\$ -	\$ 15,000	CRCWW Planning and Design
7	Market research	\$ -	\$ -	\$ 10,000	\$ 10,000	CRCWW Planning and Design
8	Education Officer (**50% of salary and on costs)		\$ 39,000	\$ 40,500	\$ 79,500	Communication and Education Officer
9	Tours to water and wastewater facilities	\$ -	\$ -	\$ -	\$ -	Education Officer
10	Water education presentations to schools	\$ -	\$ -	\$ -	\$ -	Education Officer
11	Assess educational resource requirements	\$ -	\$ -	\$ -	\$ -	Education Officer
12	Develop educational resources	\$ 20,000	\$ -	\$ 10,000	\$ 30,000	Communication and Education Officer
Total		\$ 77,000	\$ 80,000	\$ 103,500	\$260,500	
Commercial/Industrial Sector						
1	Business water audits - self audit materials and water saving advice from CRC Water and Waste plumbers	\$ 33,000	\$ 10,000	\$ 10,000	\$ 53,000	CRCWW Planning and Design
2	Council water efficiency measures	\$ 1,500	\$ 1,500	\$ 1,500	\$ 4,500	CRCWW Planning and Design
3	Develop joint initiatives with the tourism industry to promote water efficiency in the tourism sector	\$ 5,000	\$ 6,000	\$ 6,000	\$ 17,000	CRCWW Planning and Design
4	Host water conservation information sessions for businesses using real local case studies	\$ -	\$ 2,000	\$ 2,000	\$ 4,000	CRCWW Planning and Design
5	Television ad to promote water conservation at work	\$ -	\$ 15,000	\$ -	\$ 15,000	CRCWW Planning and Design
6	Preparation of water conservation information and materials	\$ 1,000	\$ 1,000	\$ 1,000	\$ 3,000	CRCWW Planning and Design
Total		\$ 40,500	\$ 35,500	\$ 20,500	\$ 96,500	

<i>Recycled Water</i>						
1	Recycled Water Promotion/advertising	\$ 3,000	\$ 8,000	\$ 5,000	\$ 16,000	CRCWW Planning and Design
2	Continue to identify potential customers that could use recycled water from the Cairns WWTP's	\$ -	\$ -	\$ -	\$ -	CRCWW Planning and Design
3	Preparation of recycled water information	\$10,000	\$ 5,000	\$ 5,000	\$ 20,000	CRCWW Planning and Design
4	Implement feasible recycled water opportunities				\$ -	CRCWW Planning and Design
Total		\$ 13,000	\$ 13,000	\$ 10,000	\$ 36,000	
Overall Total		\$ 130,500	\$ 128,500	\$ 134,000	\$393,000	
<i>System Management</i>						
1	Leak detection (Approved capital budget for 09/10 - PCW 09610)	\$ 174,210	\$ 150,000	\$ 120,000	\$444,210	CRCWW Planning and Design/Project Delivery
2	Install flow meters (Approved capital budget for 09/10 - PCW 10312)	\$ 400,000	\$ -	\$ -	\$400,000	CRCWW Planning and Design/Project Delivery
3	Complete partially completed zones	\$ -	\$ -	\$ -	\$ -	CRCWW Planning and Design/Project Delivery/Operations
4	Ongoing monitoring and analysis of data	\$ -	\$ -	\$ -	\$ -	CRCWW Planning and Design/Project Delivery
Total		\$ 574,210	\$ 150,000	\$ 120,000	\$844,210	

* Budget approved

**Salary and on costs shared between Infrastructure, Waste and Environment branches

8.3 References

Population projections

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