

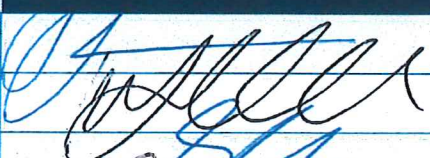
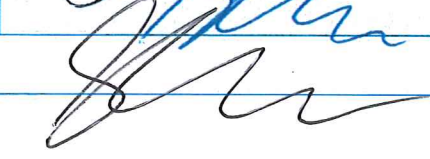


**Kāpiti Coast Water Conservation Report  
2017/18**

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## Revision History

Revision N°	Prepared By	Description	Date
1	Ben Thompson	Initial draft for review	20/7/2018
2	Ben Thompson	Final draft for issue to AMG	3/8/2018
3	Ben Thompson	Final document	24/9/2018

## Document Acceptance

Action	Name	Signed	Date
Prepared by	Ben Thompson		3/8/2018
Reviewed by	Martyn Cole		3/8/2018
Approved by	Sean Mallon		3/8/18
on behalf of	Kāpiti Coast District Council		25/9/2018

# Executive Summary

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## Overview

Kāpiti Coast District Council (Council) is committed to delivering a sustainable water management strategy and achieving the adopted water conservation target. This Water Conservation Report has been prepared to:

- Document performance against the 490 litres/person/day (lpd) peak water target and water conservation management activities in 2017/18
- Meet the reporting requirements of the consents governing the operation of River Recharge with groundwater scheme
- Set out the proposed water conservation work programme for 2018/19.

This report covers the three water supplies managed by Council; Ōtaki Supply, Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati (WPR) and Paekākāriki Water Supply.

## Key water conservation activities in 2017/18

In 2017/18 Kāpiti Coast District Council focused on:

- Continued use of water meter based charging to encourage efficient water use
- Continued assistance to the District's residents to reduce water use and repair leaks
- Monitoring network performance and targeted leak location and repair activities.

## District peak water met 490 lpd again in 2017/18

The 2017/18 spring and early summer was much hotter than 2016/17. While peak demand increased, at a District level, peak demand stayed below the 490 lpd target. The WPR supply met the 490 lpd target while Ōtaki and Paekākāriki did not due to undetected leakage. Table 1 shows the peak day demand as litres per person per day (lpd) for each water supply and District-wide.

Year	Ōtaki	WPR	Paekākāriki	District-wide
2013/14	777	532	486	557
2014/15	554	406	726	437
2015/16	511	404	475	420
2016/17	491	353	403	369
2017/18	613	411	588	417
<b>Result 2017/18</b>	Not Reached	Target met	Not reached	Target met

Table one. Comparing peak daily demand for each water supply and the Kāpiti Coast District

Figure one highlights the spike in water use during the hot spring early summer..

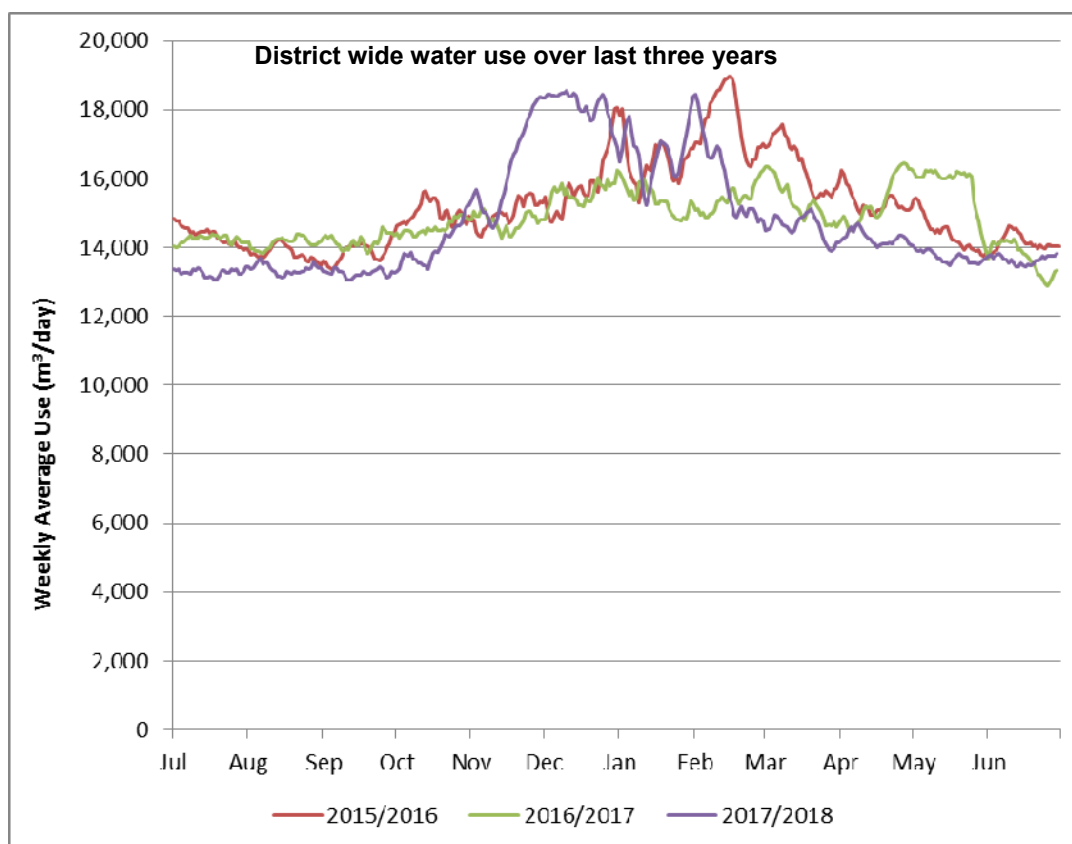


Figure one. Comparing the District water demand for the last three years

## Investigating and repairing public and private leaks

Council undertook weekly reviews of minimum night flows at each District Meter Area (zones), network and supply. Council prioritised five zones for leak detection and repair (two in Ōtaki, two zones in Waikanae and the Paekākāriki network). The investigations covered 95.8km, 23% of the 413.9 of water networks (excluding Hautere Scheme).

The key highlights included:

- In Waikanae, contractors found a large leak that once repaired, reduced overall water loss by an estimated 267m³/day.
- Despite finding a significant leak in Paekākāriki water loss in the network increased overall.
- Contractors had limited success finding leaks in Ōtaki this year due to the plastic mains dampening the noise of the leaks. The water balance for Ōtaki and the data for water supplied highlights leaks are increasing.

Water meter based charging continued to encourage people to repair their leaks. Over 2017/18, Council gave 297 property owners a credit for repairing their leaks.

## Estimated water loss lower in 2017/18 than 2016/17

Council uses the Waterloss Benchmark approach to estimate water loss across the reticulated supplies. Table two summarises the estimated daily water loss for the District over the last three years. Results for each scheme are set out in section 4 of this report

	2015/16	2016/17	2017/18
<b>Peak day</b>	19,617 m <sup>3</sup> /day or 420 lpd	17,422 m <sup>3</sup> /day or 369 lpd	19,820 m <sup>3</sup> /day or 417 lpd
<b>Average day</b>	15,180 m <sup>3</sup> /day or 325 lpd	14,872 m <sup>3</sup> /day or 315 lpd	14,783 m <sup>3</sup> /day or 311 lpd
<b>Current Annual Water Loss</b>	3,350 m <sup>3</sup> /day (+/- 10.3%)	3,650 m <sup>3</sup> /day (+/- 9.2%)	2,838 m <sup>3</sup> /day +/- 12.6%
<b>International Leakage Index (ILI)</b>	1.99 (A Band)	2.62 (B Band)	2.04 (B Band)

Table two. Comparing performance of Council water supplies

The International Leakage Index (ILI) grading is the ratio between the amount of water lost for the year and the annual amount of unavoidable water loss. The lower the ratio, the better performing the network is for water loss. Scores around 2 indicate a good balance between leakage management efforts and opportunity for leak reduction. Higher scores indicate potential further work is needed and lower scores suggest further leak management may be uneconomic. Appendix 2 provides more detail on ILI.

## Work programme for 2018/19

Council's focus for 2018/2019 will be on:

- Locate and repair leaks in Ōtaki and Paekākāriki
- Continued support of the community to use water wisely
- Analyse consumer water use to identify future reduction and education opportunities
- Continued monitoring of network performance and prioritise of leak location, repairs and renewals.
- Continued proactive lateral replacement.

A total of \$804,000 of funding is available in 2018/19 for activities associated with water conservation and demand management.

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# 1 Introduction and overview

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The Kāpiti Coast Water Conservation Report documents how Council met the peak water use 490 litres/person day target and efforts in reducing private and public leakage over the 2017/18 financial year. Section four discusses how effective Council was in reaching the peak demand and leak targets at a District level and for each water supply. Section five provides more detail on what Council did over 2017/18 and section six discusses the work planned for 2018/19.

This report covers the three water supplies managed by Council; Ōtaki Supply, Waikanae Supply (servicing, Waikanae, Paraparaumu and Raumati) and Paekākāriki Water Supply. Section four

## 1.1 Sustainable Water Management Strategy 2003 set the direction

The 2002 Sustainable Water Management Strategy sets out Kāpiti Coast District Council's vision for water management in the district over the next fifty years. Central to this Strategy is there is considerable room within each catchment within the next fifty years for further development. That potential is only there if demand for water is reduced and there is careful management of water storage.

The Strategy set a peak water target of 400 Litre/person/day by 2013/14, with an additional 75 litres for leakage. To reach the target, Council recognized households, schools and businesses and Council itself each play their part. This was subsequently revised by the water conservation plan and consent requirements.

## 1.2 Kāpiti Coast Water Conservation Plan 2010 mapped how to get there

Council developed Water Conservation Plan to ensure it and the community reached the 490 litres per person (lpd) per peak day target by 2016. It contains a series of measures and tactics. No one initiative alone will help reach the target but by combining them, it is hoped the peak water target can be reached and sustained.

There are seven action areas in the plan:

- Council leadership – Council needs to demonstrate throughout its own activities that is walking the talk. Council also recognised its role in supporting local residents and businesses with good information on saving water.
- Better data, better results – with better information on where water being used and lost, Council can better target resources for better outcomes.
- Managing leaks in public networks and private property – fixing leaks provides more capacity for future generations.
- Regulation – Council uses the District Plan to require new homes meet the 490 lpd target. The Water Supply bylaw to manage summer demand, water pricing and minimising wastage.
- Financial Assistance – Council offers an interest free targeted rate for households to install rainwater or greywater systems to offset public water use. Also offers rates support for hardship.
- Education – Council recognised the importance of students of all ages understanding the importance of their water supply and the role water has in local life.
- Technical innovation – Council recognised the importance of new ideas and technology in assisting local businesses and residents save water.



## 2 Consent requirements

A number of consents held by Council, including those for the development and operation of the River Recharge with Ground Water scheme, have water conservation consent conditions. The relevant consent conditions that this report addresses are listed below.

### **Water Permit WGN130103 [34384] Groundwater take**

Condition 4 requires the implementation of water conservation and water demand management measures referred to in section 1.3 of the *Assessment of Environmental Effects* (Appendix 1) that accompanied the application as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 litres per person per day for the Waikanae, Paraparaumu and Raumati supply area by 31 July 2016.

### **Water Permit WGN130103 [34399] Surface water take**

Condition 4 requires the implementation of water conservation and water demand management measures referred to in section 1.3 of the *Assessment of Environmental Effects* (Appendix 1) that accompanied the application as necessary to achieve the reductions in water demand necessary to reduce maximum peak daily water demand to 490 litres per person per day for the Waikanae, Paraparaumu and Raumati supply area by 31 July 2016.

Condition 25 requires the submission of an annual Water Conservation Report to the Manager by 30<sup>th</sup> August each year. The annual Water Conservation Report shall be made available to the public on the Kāpiti Coast District Council website by 30th August each year. The annual Water Conservation Report shall report on the year 1st July to 30th June inclusive, and includes Table 3 to assist in assessing report for compliance.

### **Water Permit WGN050025 [33147]**

Condition 15b requires reporting on measures undertaken to investigate, implement and manage water conservation methods to reduce water demand on the Kāpiti Coast, including the introduction of water meters, any increases in population, any reduction in peak daily water demand and the achieved results of these measures.

Conditions	Section in this annual report
a) Summary of the consent holder's progress towards achieving its water conservation target of 490 Litres/person/day;	Executive Summary
b) Details of peak summer daily use, expressed as L/person/day;	4.1
c) Outcomes of any water conservation measures to reduce peak demand, including but not limited to water meters;	5.1 – 5.7
d) A discussion of any reduction in peak daily demand;	4.1-4.2
e) Details of any increases in population	7.1
f) Investigations and work completed to identify and fix leaking water pipes;	5.3
g) Details of any planned work to identify and fix leaking water pipes in the coming year.	6.3

Table three. Condition 25 of consent WGN130103 [33760]

### 3 Peak day and water loss performance for 2017/18

#### 3.1 District peak water target use met despite severe drought conditions

The 2017/18 summer was the driest in the last ten years. Outdoor use often increases in response to increasing hot weather. Figure two shows the New Zealand Drought Index (NZDI) developed by NIWA. NIWA considers any value higher than 1.5 to be drought conditions and any above 1.75 to be in severe drought conditions. The 2017/18 summer peaked at almost 2.5.

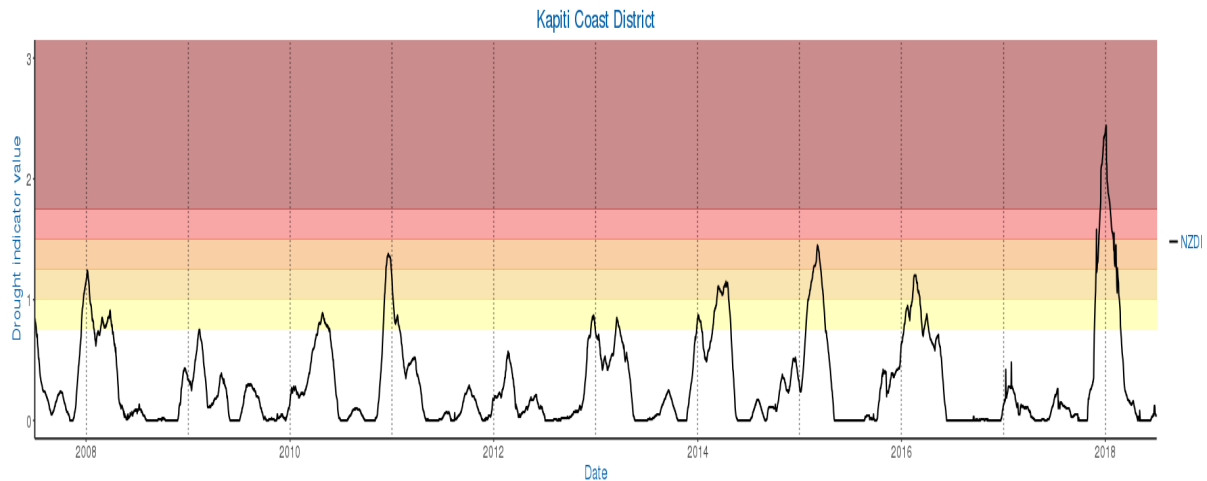


Figure two shows the severe drought conditions in 2017/18 compared to the last 10 years

Despite the hot conditions, peak water use at the District level met the peak water targets without the need to introduce water restrictions. Figure three shows overall demand was similar to 2015/16 summer, a summer that was classed as very dry. Average daily demand dropped slightly from 14,872 m<sup>3</sup>/day to 14,783 m<sup>3</sup>/day, while peak use increased from 17,722 m<sup>3</sup>/day to 19,820 m<sup>3</sup>/day.

Table four shows the gross daily peak water use for the three water supplies for 2017/18 and the preceding two years. While the Council reached the District and WPR target, leaks in Ōtaki and Paekākāriki caused the peak demand to exceed the 490 target. Section 4.2 provides more detail on the performance of each water supply.

Year	Ōtaki	WPR	Paekākāriki	District-wide
2013/14	777	532	486	557
2014/15	554	406	726	437
2015/16	511	404	475	420
2016/17	491	353	403	369
2017/18	613	411	588	417
<b>Result 2017/18</b>	Not Reached	Target met	Not reached	Target met

Table four. Peak consumption for each water supply for last three years

#### 3.2 Water demand and water loss management performance

This section set out more detail for each supply including:

- A graph comparing daily demand for last three years
- Average and peak daily demand in cubic meters per day (m<sup>3</sup>/day ) and litres/person/day (lpd)
- Number of days the supply was over the 490 lpd target
- The Current Annual Water Loss (CARL) which is the amount of water lost through leakage for the year as a daily amount (results by supply available for the first time this year)

- The International Leakage Index (ILI) grading of the supply. ILI is the ratio between the amount of water lost for the year and the annual amount of unavoidable water loss. The lower the ratio, the better performing the network is for water loss. Appendix 2 provides more detail on ILI.
- The World Bank Institute performance band and their recommended actions for that band.

### 3.2.1 District-wide Water Supply Summary

- Despite hot dry spring and early summer, no requirement for water restrictions
- 490 litre/person/day peak target met
- Repairing large leaks in late 2016/17 and mid 2017/18 helped reduce overall leakage
- District Supplies as a whole are in the World Bank's low end of B Band.

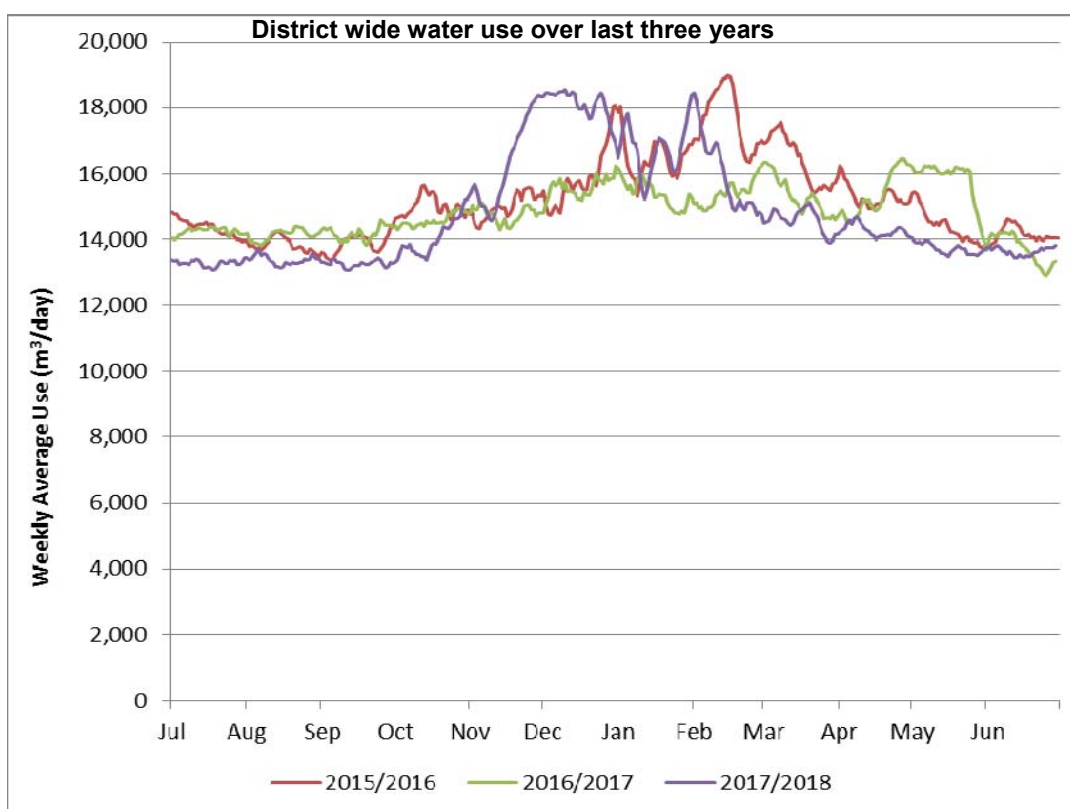


Figure three. Changes in District-wide water demand for the last three years

District Combined	2015/16	2016/17	2017/18
<b>Peak day</b>	19,617 m <sup>3</sup> /day 420 lpd	17,422 m <sup>3</sup> /day 369 lpd	19,820 m <sup>3</sup> /day 417 lpd
<b>Days over 490 lpd target</b>	0	0	0
<b>Average day</b>	15,180 m <sup>3</sup> /day 325 lpd	14,872 m <sup>3</sup> /day 315 lpd	14,783 m <sup>3</sup> /day 311 lpd
<b>Current Annual Water Loss</b>	3,350 m <sup>3</sup> /day (+/- 10.3%)	3650 m <sup>3</sup> /day (+/- 9.2%)	2838 m <sup>3</sup> /day +/- 12.6%
<b>International Leakage Index (ILI)</b>	1.99 (A Band)	2.62 (B Band)	2.04 (B Band)

Table five. Compares performance of Council water supplies for last three years

### 3.2.2 Ōtaki Water Supply

- 490 litre/person/day peak target not met
- Public side leaks increased, despite sweeping 76% of Ōtaki network for leaks
- Further leak investigation needed for 2018/19.

The leak detection contractors had limited success in finding leaks due to high levels of plastic mains through the network. Plastic dampened the leak noise and location. Over 2018/19, Council's priority will be to find a plastic friendly leak approach and find the hidden leaks. Section 5.3.1 provides more detail on the leak detection results.

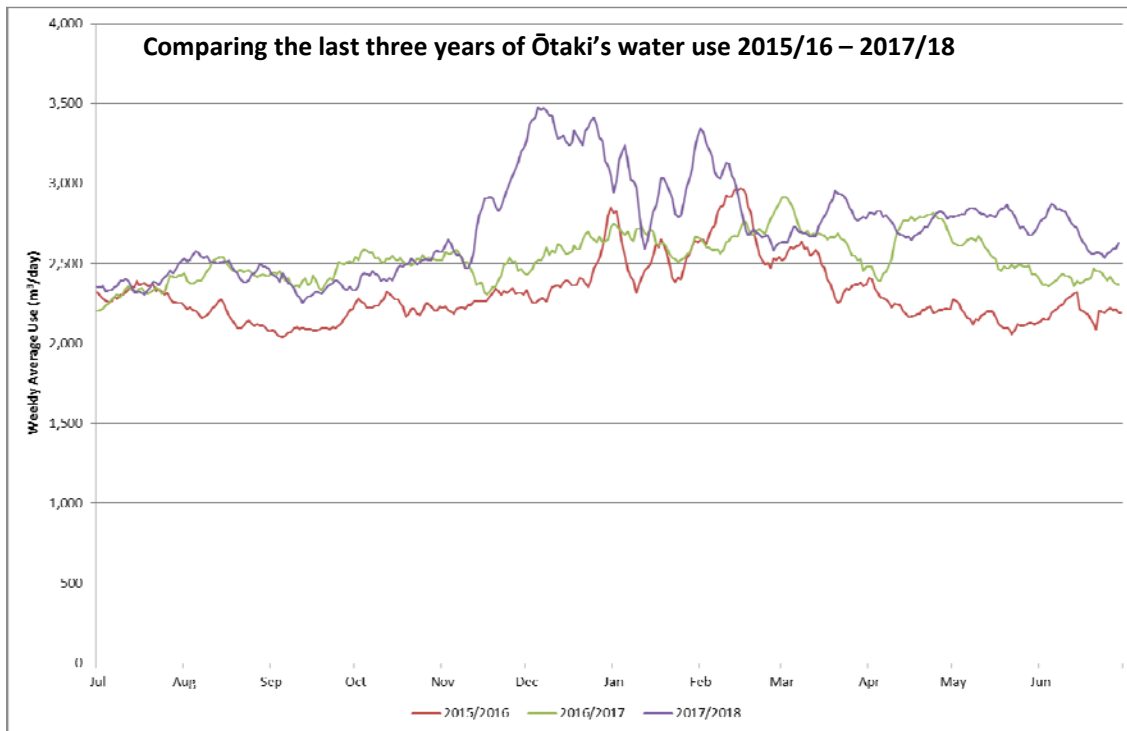


Figure four. Changes in the Ōtaki Scheme over the last three years. Note the impact of the increased water loss

Ōtaki Supply	2015/16	2016/17	2017/18
<b>Peak day</b>	3116 m³/day 511 lpd	3011 m³/day 491 lpd	3780 m³/day 613 lpd
<b>Days over 490lpd target</b>	6	2	61
<b>Average day</b>	2315 m³/day 380 lpd	2534 m³/day 413 lpd	2723 m³/day 442 lpd
<b>Current Annual Water Loss</b> (2017/18 is base year)			764 m³/day +/- 7.5%
<b>International Leakage Index (ILI)</b> (2017/18 is base year)			3.22 (B band) Possibilities for further improvement

Table six. Comparing performance of Ōtaki water supply for last three years

### 3.2.3 Waikanae/Paraparaumu/Raumati Water Supply

- 490 litre/person/day peak target met
- Despite hot dry spring and early summer, no requirement for water restrictions
- Significant leaks found and repaired.

Council made significant inroads repairing legacy leaks and significantly reduced water loss in the Waikanae network. Council will continue with the current approach as current practices are working and the state of the WPR network is in good shape. Section 5.3.1 provides more detail on the leak detection results.

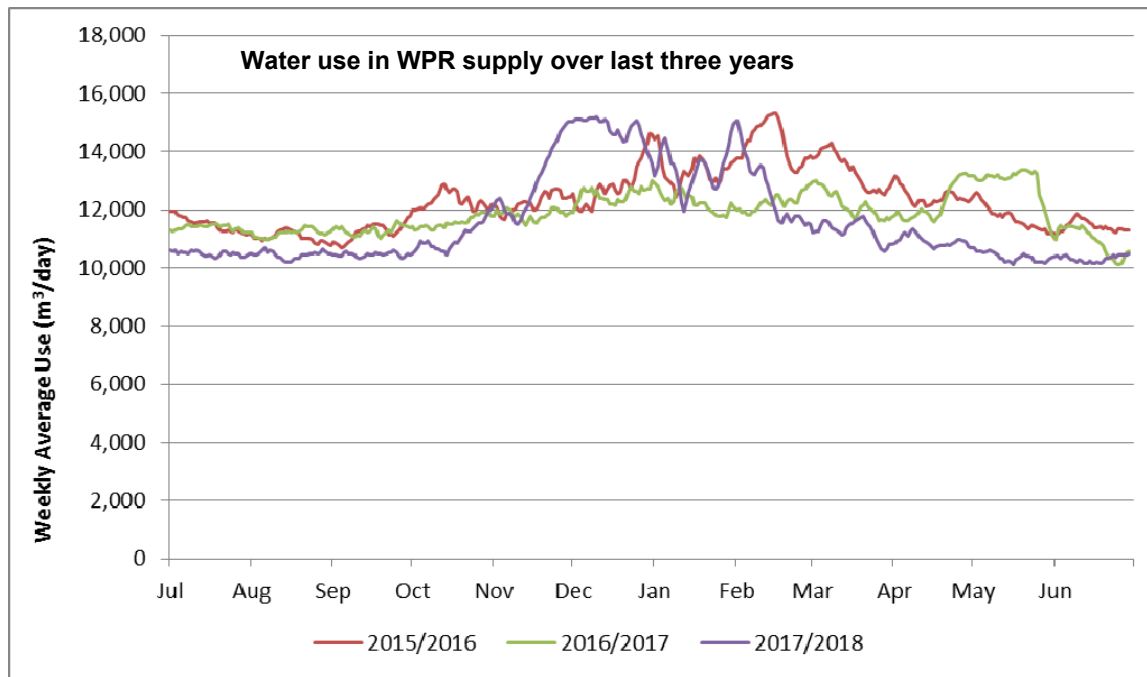


Figure five. Changes in the WPR water demand for the last three years

WPR Supply	2015/16	2016/17	2017/18
<b>Peak day</b>	15,773 m <sup>3</sup> /day 404 lpd	13,912 m <sup>3</sup> /day 353 lpd	16,365 m <sup>3</sup> /day 411 lpd
<b>Days over 490lpd target</b>	0	0	0
<b>Average day</b>	12,309 m <sup>3</sup> /day 315 lpd	11,878 m <sup>3</sup> /day 301 lpd	11,597 m <sup>3</sup> /day 291 lpd
<b>Current Annual Water Loss</b> (2017/18 is base year)			1813 m <sup>3</sup> /day +/- 15.9%
<b>International Leakage Index (ILI)</b> (2017/18 is base year)			1.65 (A band) Further loss reduction may be uneconomic

Table seven. Compares performance of Council water supplies for last three years

### 3.2.4 Paekākāriki Water Supply

- 490 litre/person/day peak target not met
- Despite hot dry spring and early summer, no requirement for water restrictions
- Despite sweeping for leaks in town, leaks almost double daily demand
- Further leak investigation needed for 2018/19.

The current leaks arose after contractors completed their leak sweep. The small size of the Paekākāriki network makes overall demand sensitive to leaks. For example in 2014/15, a single displaced 50mm caused demand to almost double.

The contractors swept for leaks in the Paekākāriki Township but not on the Transmission Gully worksite nor along State Highway One. Over 2018/19, Council will consider a more extensive sweep to address the high leakage. Section 5.3.1 provides more detail on the leak detection results.

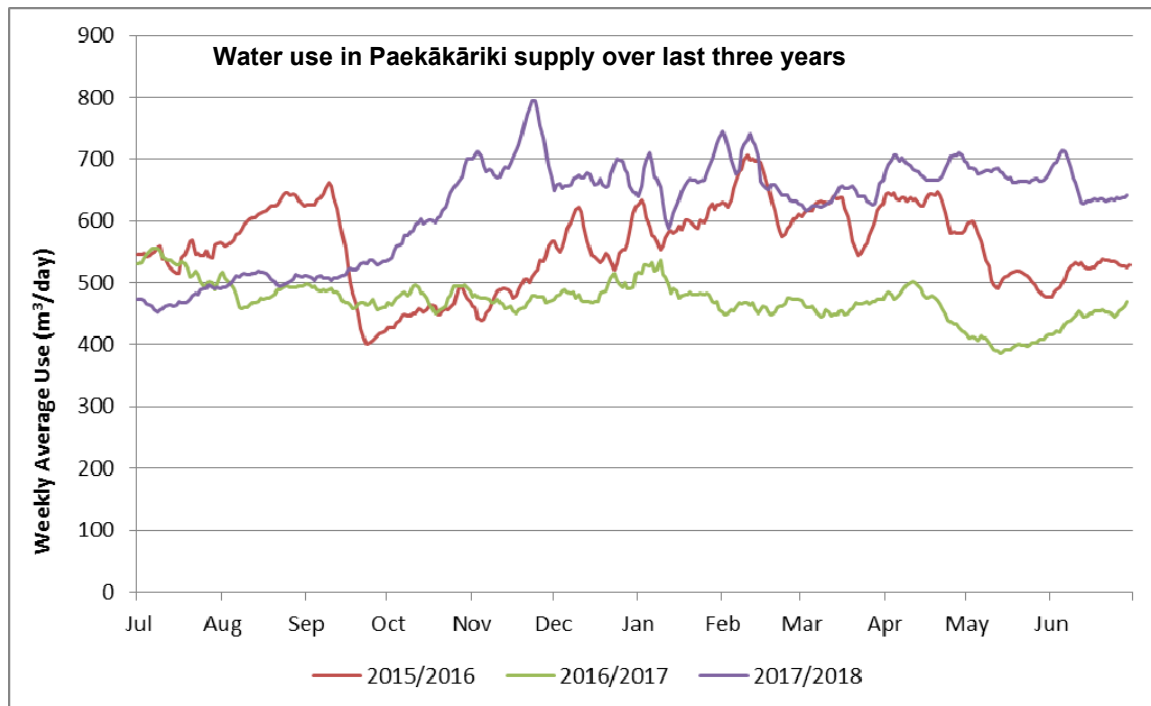


Figure six. Changes in the Paekākāriki Supply water demand for the last three years

Paekākāriki	2015/16	2016/17	2017/18
<b>Peak day</b>	769 m <sup>3</sup> /day 475 lpd	643 m <sup>3</sup> /day 403 lpd	927 m <sup>3</sup> /day 588 lpd
<b>Days over 490lpd target</b>	0	0	10
<b>Average day</b>	559m <sup>3</sup> /day 345 lpd	471m <sup>3</sup> /day 294 lpd	625m <sup>3</sup> /day 397 lpd
<b>Current Annual Water Loss</b> (2017/18 is base year)			256 m <sup>3</sup> /day +/- 4.3%
<b>International Leakage Index (ILI)</b> (2017/18 is base year)			4.92 (C band) Poor leakage, intensify reduction efforts

Table eight. Compares performance of Council water supplies for last three years

## 4 Water conservation and demand management activities 2017/18

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### 4.1 Council leadership

#### 4.1.1 Keeping the community informed

Over 2017/18 Council continued keeping the community informed through its usual channels.

##### **Informed community outcomes**

- Wide range of channels used to communicate with public
- Community had clear information to make decisions on improving their water use

##### **4.1.1.1 Keeping community informed via online resources**

Council uses its website and Facebook page to inform the community and answer any question raised by the community.

Council contacted property owners if their high water use was suspected to be caused by a leak. In addition to the advice offered through the water conservation advisor service, a directory of local plumbers (including advice from consumer affairs on engaging a tradesman) was publically available and included with all leak notifications.

##### **4.1.1.2 Ensure frontline staff had up to date information**

Customer services staff remain critical to answering residents queries. As the front face of Council its important customer services is able to field people's queries efficiency as they are received.

#### 4.1.2 Council provided quality advice and information

Council offers a range of services to assist community manage their water use.

##### **Quality advice and information outcomes**

- Targeted residents and businesses with high water use to support them to fix leaks or reduce their use
- Community water use awareness raised and residents informed of water use reductions actions and support available to them.

##### **4.1.2.1 Water Conservation Advisor (WCA)**

After each water meter reading cycle, the WCA investigated any property using more than 2,000 litres/day for possible leaks, misreads or high use. The Council sends a leak notice to any property with a leak.

Council is also investigating any properties with reads that do not change. Council replaced any faulty meters.

##### **4.1.2.2 Green Gardener**

The Green Gardener offered free garden advice to residents to create water efficient gardens via articles, workshops and demonstrations. Throughout the year the Green Gardener:

- Using the results from the community garden irrigation trial, Green Gardener developed irrigation brochures for public

- Provided weekly advice on Beach Fm and monthly articles on gardening in Council publication Ontoit
- Ran 40 workshops on water efficient gardening

The Green Gardener also worked with schools to encourage waterwise gardening practice. This included:

- Advising schools on their school gardens
- Running cluster meetings for teachers to upskill on water-wise gardening

#### **4.1.2.3 Ecodesign Advisor (EDA)**

The EDA offered free independent advice on new, proposed and existing homes and this year:

- Visited residents homes and as part of the whole home consultation, awareness was raised on water conservation. Typically, water conservation makes up 20% of the two hour consultation and covers:
  - Water use in kitchens, bathrooms, WC, laundries and gardens;
  - Water meters;
  - Explain what grey water and rain water collection is and how the water can be used,
  - Promote the Targeted Rate Funding for grey water and rain water collection use.
  - Also provided free shower water flow rate bags, shower timers and WC water saving Gizmo where appropriate.
- Delivered presentations to community groups, professional groups and Government Departments: The whole home review presentation includes residential water conservation, rain and grey water systems and reading of water meters.

### **4.1.3 Council aimed to manage water efficiently in its Council assets**

Council provides a number of services for the local community requiring water. Council made efforts to ensure it uses water efficiently.

#### **Reduce Council water use outcomes**

- Future proof new buildings to be water efficient
- Appropriate use on non-potable water sources
- Report tool in place to identify opportunities to fix leaks or replace inefficient fixtures.

#### **4.1.3.1 Making new buildings and renovations more water efficient**

When Council builds new or renovates, it makes every effort to install water efficient appliances where possible the use of rainwater for toilet flushing and outdoor use.

#### **4.1.3.2 Minimise public water use on sportsfields and amenity areas**

All major Council sportsfields use onsite bores as preferred source of water for irrigation.

Council selects summer hardy plants for much of its amenity planted areas and concentrates annuals around town centre areas. This reduces the amount of water needed to areas with high pedestrian activity.



#### 4.1.3.3 Council monitors water use at its properties

Council has a number of properties it owns, manages on behalf of other government agencies or leases to businesses or community groups.

Council uses a water use database to monitor consumption on Council properties. The Property Group and Community Service Group receive updates after each reading cycle on water use from each property. The data helps prioritise any maintenance needed, such as repairing leaks or replacing inefficient toilets or taps.

## 4.2 Better data, better results

### 4.2.1 Understanding trends in water use and leakage

#### Better data, better results outcomes

- Monitored and prioritised zones for leak detection and repair
- Targeted zones based on ILI leakage performance
- Set 2017/18 as base year for reporting water loss for each water supply
- Monitored water consumption at the property level. Notified owners if they had a suspected leak.

#### 4.2.1.1 Undertake weekly monitoring of leaks across District networks and supplies

Council uses a weekly minimum night flow “traffic light report” to assess the performance of each network at a zone level.

Each week, the automated report provides feedback on the ILI performance in each zone, where:

- Anything lower than an ILI score of 3 is green
- Anything between 3 and 4 is yellow
- Anything higher than 4 is red.

Council bases the grading on the World Bank’s leak management bands shown table nine. In October, Council reviewed the performance of each zone and selected those with consistently high ILI for leak detection. Any network with a grade higher than 2 has opportunities for future improvements.

Band	ILI Range	Guideline description of Real Loss Management Performance Categories
A	<2.0	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost – effective leak management
B	2.0 to <4.0	Possibilities for further improvement consider pressure management, better active leakage control, better maintenance
C	4.0 to <8.0	Poor Leakage management, tolerable only of plentiful cheap resources; even then, analyse level and nature of leakage, intensify efforts
D	8.0 or more	Very inefficient use of resources, indicative of poor maintenance and system condition in general, leakage reduction programs imperative and high priority

Table nine. World Bank Institute Bands for Leak Management in Developed Countries

Figure seven shows three examples from the Waikanae network. In this example, if the results remained unchanged then Kakariki would be selected for leak investigation, Hemi may if budget permitted and Te Moana would be left alone.



Figure seven. Examples of how Council grades a zone's performance week to week

#### 4.2.1.2 Rolled out water balance report for all water supplies

For last four years, Council used the WaterNZ Benchloss tool to calculate the Districtwide water loss. From this year, Council will expand the use of WaterNZ Benchloss tool to each water supply to show:

- Daily water loss
- International Leak Index grade and World Bank Band for leak management
- World Bank's recommendations for further improvement

#### 4.2.1.3 Monitoring water use at the property level

Council uses a reporting tool to analyse water use by customer, zone, network and District. Council uses the tool to:

- identify properties with potential leaks or faulty meters
- understand consumption by user type (such as households, schools, motels etc)
- feed annual water use into the water balance model to determine annual water lost through leaks.

### 4.3 Finding and repairing public and private leaks

Over 2017/18 Council informed properties with suspected leaks and investigated 23% of the District's three major supplies for leaks.

#### Finding and repairing leak outcomes:

- Five of the 19 zones investigated, 23% of the network length surveyed for leakage.
- Big gains in reducing Waikanae network losses
- Difficulties finding leaks in Ōtaki, ongoing challenges in Paekākāriki
- 105,290m<sup>3</sup>/year of estimated leakage identified and repaired through leak surveys.

#### 4.3.1 Finding and repairing leaks on the public side of reticulation network

##### 4.3.1.1 Leak investigations

After six months of weekly monitoring, Council prioritized two zones in Ōtaki, two in Waikanae and the Paekākāriki township for leak detection and repair for 2017/18. Table ten summarises the size of the leakage, how long the leaks took to repair and the estimated water loss over 2017/18.

Network	Zone	Average night flow before sweep (l/s)	Average night flow after repairs (l/s)	Reduction (l/s)	Estimated size of leak (m <sup>3</sup> /day)	Leak duration (days)	Estimated water lost from leak 2017/18 (m <sup>3</sup> )
Ōtaki	Ōtaki Beach			Negligible			-
	Ōtaki main			Negligible			-
Waikanae	Hemi	6.1	4.9	1.2	101	290	29,290
	Kakarariki	6.8	3.7	3.1	267.8	263	70,440
Paekākāriki		4.8	3.4	1.4	122.0	46	5,560
Total							105,290m <sup>3</sup> /year

Table 10. Large leaks had a high impact on overall water use

##### 4.3.1.2 Little change in leaks in Ōtaki

The Ōtaki Main and Beach Zone's high concentration of plastic material made it difficult to investigate for leaks. Plastic mutes the leak noise signal, making it hard to find or isolate leaks. Over 2018/19, Council will be work with our contractor to develop a methodology for finding leaks in plastic based water networks.

##### 4.3.1.3 Good success in the Waikanae/Paraparaumu/Raumati Supply

Over the last three years, Council concentrated on reducing the high water loss in the Kakariki Zone to an acceptable level. Contractors found a 4-5 l/s leak on a 100mm main that lost over 70,000m<sup>3</sup> of water until repaired.

#### 4.3.1.4 Paekākāriki presenting challenges

There were mixed results in reducing leaks across the Paekākāriki Scheme. The early November leak sweep found a 1.4 l/s leak or 120m<sup>3</sup>/day. However from December the night flows began increasing and in the last quarter an average daily amount of around 256m<sup>3</sup>/day was being lost to leaks.

The effect of the unknown leaks has had an impact on overall usage, with higher per capita use shown.

The challenge for the Paekākāriki scheme is lengths of the network lie in the State Highway corridor and within the transmission gully work site. The traffic management costs are expensive for the State Highway and there are challenges in coordinating leak investigations in the Transmission Gully site.

In 2018/19 Council has Paekākāriki as the first area to investigate and if no leaks are discovered in the township, Council will target resources investigates along SH1 and in the Transmission Gully site.

#### 4.3.1.5 Council focused renewal budgets on replacing mains

Council's *Water Assessment Report* suggested laterals (service pipes between the mains and the water meter) are a significant risk for network water loss. This year, Council used planned capital budgets for mains replacement and will target lateral replacements in 2018/19.

#### 4.3.1.6 Reactive renewal work undertaken by Council

Table 11 shows the reactive work undertaken by Council in 2017/18 on the public networks to resolve leaks as they arose. The Council noted a 20% increase in laterals needing repair or replacing from 2016/17.

Activity undertaken	2016/17 District Total	2017/18 District Total
Repair or replace leaking hydrants	19	11
Repair or replace leaking valves	14	18
Repair or replace leaking manifolds	89	139
Repair or replace leaking laterals	298	366
Repair or replace leaking mains	53	37
<b>Total interventions</b>	<b>473</b>	<b>618</b>

Table 11. Reactive leak maintenance on the each network over the 1 July 2017 – 30 June 2018 period

## 4.4 Finding and repairing private leaks

After each billing cycle, Council assesses the water accounts for any properties using more than 2000 litres/day, or have experienced a 40% increase in water consumption for the quarter. The Water Conservation Advisor visits the properties to assess if there is a leak, a misread or high legitimate use.

If there is a leak, the Council sends the property owner a leak notification letter to fix the issue within 21 days, a directory of local plumbers who can help and a credit due to water loss application form (invites the property owner to apply for a credit on their water account if they fix the leak in a timely manner).

## 4.5 Regulation

Council approved 231 District Plan compliant homes across the District over the 2017/18 period.

Since 2008, Council has required all new homes with an on demand connection to Council water supply to include one of:

- 10,000 litre of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 litres, mains water will top up the tank at a rate of 600 litres/day.

- A greywater diversion device and a 4,000 litre of rainwater storage to supply the toilets and outside taps. When the rainwater level falls below 1,000 litres, mains water will top up the tank at a rate of 600 litres/day.
- An alternative solution that demonstrates it can achieve the reduced peak water use targets.

## 4.6 Financial Incentives

### 4.6.1 Encouraging people to fix their leaks

297 property owners received credits on their water account for fixing leaks.

Property owners can apply for a credit on their water account if they can provide evidence of fixing their private leak. Successful applicants were not charged for the water lost to leaks. The aim was to encourage property owners to fix their leaks.

### 4.6.2 Providing financial support to those in need

Over 2017/18, Council offered three schemes to support residents on limited income to assist residents in financial hardship:

- 672 households obtained the General Hardship Rates Remission. The General Hardship Rate Remission provides up to \$300 towards rates.
- 15 households obtained a Rate Remission for Significant Costs related to water costs. The Rate Remission for Significant Costs causing financial hardship provides up to \$300 towards significant costs causing financial hardship.
- Six households obtained a water rate remission on their water account. The Water Rate Remission for Vulnerable Households relating to high water use provides a rates remission towards the cost of water for households with four or more dependents who receive the Working for Families Tax credit and meet other criteria.

### 4.6.3 Interest free rates payback scheme to install rainwater tanks

Three properties obtained a targeted rate to install a rainwater tank. Council offers a \$5,000 targeted rate for residents to install a rainwater tank or greywater system for outdoor irrigation.

## 4.7 Education

Council has education resources on the website and water testing kits available for schools to use. Staff are available to talk with school when requested.

## 4.8 Fostering innovation

Council continued its “open for business” approach to companies developing new technology by providing feedback on any designs shown or legislation that may apply.

## 5 Water Conservation and Demand Management Activities 2018/19

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### 5.1 Council leadership

#### 5.1.1 Keeping the community informed

##### 5.1.1.1 Continue using website and Facebook page to keep people informed

Council will ensure it keeps the information current and up to date on water. Council's Facebook page and other channels will be used to inform the community and identify and answer any questions from the public.

##### 5.1.1.2 Elected members and Council staff will be kept up to date

Elected members and Council staff will continue to be kept up to date with developments in water.

#### 5.1.2 Providing advice to the community on saving water

##### 5.1.2.1 Water Conservation Advisor

Water Conservation Advisor will continue providing the free water conservation home visit service to offer advice (leaks and water use).

##### 5.1.2.2 Green Gardener

Green Gardener will continue offering free garden advice to residents, community groups and schools to create water efficient gardens via articles, workshops and demonstrations.

#### 5.1.3 Reduce Council water use

All Council properties pay applicable rates in accordance with the ratings Act (2002) including water rates. Council will monitor and continue to seek ways to reduce water use at properties under its control using the information provided by water metering.

### 5.2 Better data, Better results

#### 5.2.1 Zone metering

The Council will continue monitoring minimum night flows and prioritise leak detection by a zone's snapshot International Leakage Index grade.

#### 5.2.2 Reporting water use and water leaks

Council will provide a water balance on water used and lost over the year at the District and Supply level.

## 5.3 Reducing leakage in water supplies

### 5.3.1 Finding and repairing private leaks

Council will continue proactively reviewing the latest billing data for signs of leakage and approaching property owners early if an issue is identified.

Council will use its Water Supply Bylaw to request property owners to fix their private leaks within 21 days of notification. Property owners will still be able to apply for a credit on their water account due to fixing the leak. All identified leaks will be actively monitored and outstanding leakage pursued.

### 5.3.2 Finding and repairing leaks on the public side of reticulation network

Using information from the Wateroutlook monitoring and reporting tool, Council will monitor zones weekly to prioritise zones for leak investigation and repairs. Paekākāriki and Ōtaki will be an important focus for 2018/19.

## 5.4 Regulation

### 7.4.1 Council's District Plan water demand management requirements

There will be no change over 2018/19.

## 5.5 Financial Incentives

### 5.5.1 Interest free rates payback scheme

No changes expected with this activity and \$165,000 of funding has been allocated of 2018/19.

### 5.5.2 Rates relief

Over 2018/19, Council will continue providing financial assistance to those in need. The following remissions will be available in 2018/19:

- The General Hardship Rate Remission provides up to \$300 of rates remission. There is a total of \$ 125,000 available for 2018/19.
- Rate Remission for Significant Cost provides up to \$300 to towards significant costs causing financial hardship. This includes repairing leaks. There is a total of \$ 25,000 available for 2018/19.
- Water Rate Remission for Vulnerable Households provides rate remissions towards the cost of water for households with four or more dependents who receive the Working for Families Tax credit and meet other criteria. There is a total of \$25,000 available for 2018/19.

## 5.6 Education

Council will continue providing water education resources for local schools.

## 5.7 Fostering innovation

Council will continue its “open for business” approach to companies developing new technology by providing feedback on any designs shown or legislation that may apply.

## 5.8 Investing in water demand management and leak reduction for 2018/19

Table 12 outlines the key funding allocations for water conservation and leak management work for 2018/19.

Activity	District-wide budget for 2017/18
Keeping community informed	\$ 90,000
Targeted rate for rainwater or greywater systems	\$ 165,000
Financial assistance	\$ 175,000
Water network condition rating and investigation	\$ 61,000
Leak detection and repair	\$ 58,000
Reticulation maintenance	\$ 205,000
Mains renewal and repair	\$ 50,000
<b>Total</b>	<b>\$804,000</b>

Table 12. Planned expenditure for 2018/19 for water demand management and leak reduction



## 6 Population changes

### 6.1 Population figures

Council uses the New Zealand Census “Usual Resident Population” data for population calculations. In the inter-Census years, Council uses population estimates developed for Council’s 2015 Long Term Plan. To calculate the per capita consumption the census area units are overlaid with the water supply area boundaries and populations allocated to DMAs and Water supply schemes. Table 14 shows the population figures for each supply and the District.

Population source	Year	Ōtaki	WPR combined	Paekākāriki	District Total
Sum of 2013 zone population estimates from Census 2013 Usually Resident Population aligned to zone boundaries	2012/13	5,986	37,899	1,691	45,576
2013 to 2018 linear interpolation	2013/14	6,022	38,281	1,668	45,971
2013 to 2018 linear interpolation	2014/15	6,059	38,663	1,645	46,366
2013 to 2018 linear interpolation	2015/16	6,095	39,045	1,622	46,761
2013 to 2018 linear interpolation	2017/18	6,131	39,427	1,598	47,156

Table 14. Population numbers connected to each water supply

### 6.2 Calculating per capita water consumption

The flow meters for reservoirs and zones report to Councils SCADA system where flows are recorded and daily totals calculated. Council calculates the daily per capita water consumption by dividing the daily reading by population to give an average water litres/person/day. This is recorded for the Ōtaki, Waikanae, Paraparaumu and Raumati networks, for WPR as a whole and Paekākāriki.

## 8 Bibliography

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- Sustainable Water Use Strategy, Kāpiti Coast District Council, September 2003
- Kāpiti Coast Water Conservation Plan, Kāpiti Coast District Council, October 2010
- Kāpiti Coast Long Term Plan 2015, Kāpiti Coast District Council, 2015
- Water Loss Guidelines. NZWater, 2010.
- Kāpiti Coast District Council Water Management Review, GHD, May 2014
- Water Use Management – Project Scoping Report, CH2M Beca, February 2015
- Water Laterals Assessment, CH2M Beca, December 2015
- Charging Regime Advisory Group Tariff Review, CRAG, March 2016
- Water Use Management Procedures Manual, CH2M Beca and M & P Consulting , May 2016

# Appendix 1 Assessment of Environmental Effects

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## 1.3 Meeting Water Conservation Targets

Council is implementing the Water Matters Strategy and working towards improving water conservation across the district. The district has historically been a high water consumer in comparison with other districts. The intention is to stabilise daily WPR consumption at 490 litres per person per day (L/person/day), which includes an allowance for water losses. This allowance is for unaccounted water lost from the reticulation, including unauthorised connections and loss through leaks from reservoirs, supply pipes, and connections.

RRwGW has been designed to deliver a peak of 490 L/person/day to an estimated population of between 53,120 and 65,940 by 2060.

"Litres per person per day" is a common measure but does not mean that all of this water is used by individuals at home. The measure is an average figure for all users, including homes, businesses, industry, schools, hospitals, Council facilities, fire fighting, etc.

Peak daily use across the WPR area currently stands at around 590 L/person/day. Within the WPR area, the peak use averages around 550 L/person/day (Paraparaumu/Raumati) and around 720 L/person/day (Waikanae). These usage figures include water losses.

The importance of water conservation has been an ongoing theme during the community consultation for this project, with both Council and the community raising a range of methods to achieve lower consumption rates of drinking water. Council's water conservation initiatives go hand-in-hand with the water supply project. Council has a wide range of conservation initiatives for reducing demand, from the Green Plumber and the Green Gardener services; the Eco Design Advisor; the Kāpiti Coast Sustainable Home and Garden Show, the Summer On The Coast programme, Plan Change 75 (requiring a water tank/ grey water system for any new or relocated dwelling), education in local schools, water metering and financial incentives that provide loans for installation of non-potable water systems. Water metering is a critical element of Council's conservation strategy.

The conservation target of 490 L/person/day forms a fundamental design assumption for the Kāpiti Water Supply Project. Council believes it is an important and realistic target and has implemented a range of measures to help ensure 'water wasters' and inefficient users of drinking water are mindful of the need to reduce consumption and use water wisely. However, should the target not be achieved by 2016, the benefit of the RRwGW scheme is that its staged delivery can be brought forward if required. Council is committed to seeing its water supply infrastructure and associated consents as part of a long-term framework for water abstraction, environmental monitoring and responsible management of the district's water resource.

## Appendix 2 Infrastructure Leakage Index Water Losses:

There has been considerable thought given to performance measures for water networks and this is captured in Water New Zealand's Water Loss Guidelines 2010.

Extract from Water New Zealand's Water Loss Guidelines 2010 –Page 17

Since the early 1980's it has been recognised that percentages are unsuitable for assessing the operational efficiency of management of real losses (leakage and overflows) in distribution systems. This is because the calculated percentages are strongly influenced by the consumption of water in each individual system, and variations in that consumption. Non-Revenue Water expressed as a % by volume of Water Supplied, although traditionally widely used, also suffers from similar significant problems to % Real Losses when used as a PI. Appendix C provides more information on this topic, in the context of the range of consumption data in New Zealand.

Extract from Water New Zealand's Water Loss Guidelines 2010 –Page 18

Around 2005, the IWA Performance Indicators Task Force began to consider the need to select the most appropriate PIs not only on the basis of Function (Financial, Operational, etc), but also to distinguish (Ref. 8) between:

- **Metric benchmarking** – for more demanding comparisons between Water Suppliers
- **Process benchmarking** –for setting targets and ongoing monitoring of progress towards those targets.

The 2008 Benchloss NZ manual recommends that:

- **Infrastructure Leakage Index (Op 29)** is preferable for **Metric benchmarking**, as it takes account of differences in system specific key parameters (mains length, number of service connections, customer meter location, average pressure)
- **Litres/service connection/day (Op 27) or kl/km of mains/day (Op 28) (depending upon service connection density)** is preferable for **Process benchmarking** of progress towards reaching target for reductions in Real Losses of a specific Water Supplier

The Infrastructure Leakage Index calculates the ratio between current annual real losses (m3/year) and unavoidable annual real losses (m3/year) as defined in the Water New Zealand's Water Loss Guidelines 2010. While it can be a bit tricky to explain the concept of the calculation of ILI the World Bank Institute leakage management bands give a clear measure of loss management performance for water networks.

Extract of band descriptions from Water New Zealand's Water Loss Guidelines 2010 –Page 18

**Table 2.3 World Bank Institute Bands for Leakage Management in Developed Countries**

Band	ILI Range	Guideline Description of Real Loss Management Performance Categories for Developed Countries
A	< 2.0	Further loss reduction may be uneconomic unless there are shortages; careful analysis needed to identify cost-effective leakage management
B	2.0 to < 4.0	Possibilities for further improvement; consider pressure management, better active leakage control, better maintenance
C	4.0 to < 8.0	Poor leakage management, tolerable only if plentiful cheap resources; even then, analyse level and nature of leakage, intensify reduction efforts
D	8.0 or more	Very inefficient use of resources, indicative of poor maintenance and system condition in general, leakage reduction programs imperative and high priority